TRANSIT EFFECTIVENESS PROJECT (TEP) IMPLEMENTATION STRATEGY

TEP
Transit Effectiveness Project

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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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

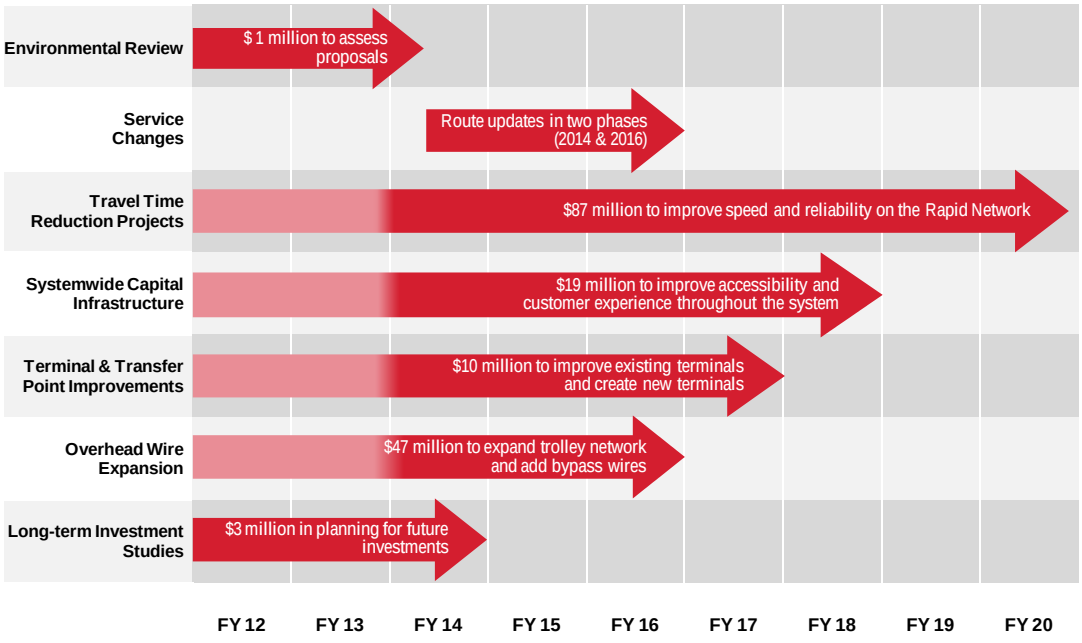
[1] The SFMTA fiscal year is July 1–June 30, so FY 11 is July 1, 2010 through June 30, 2011.

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.

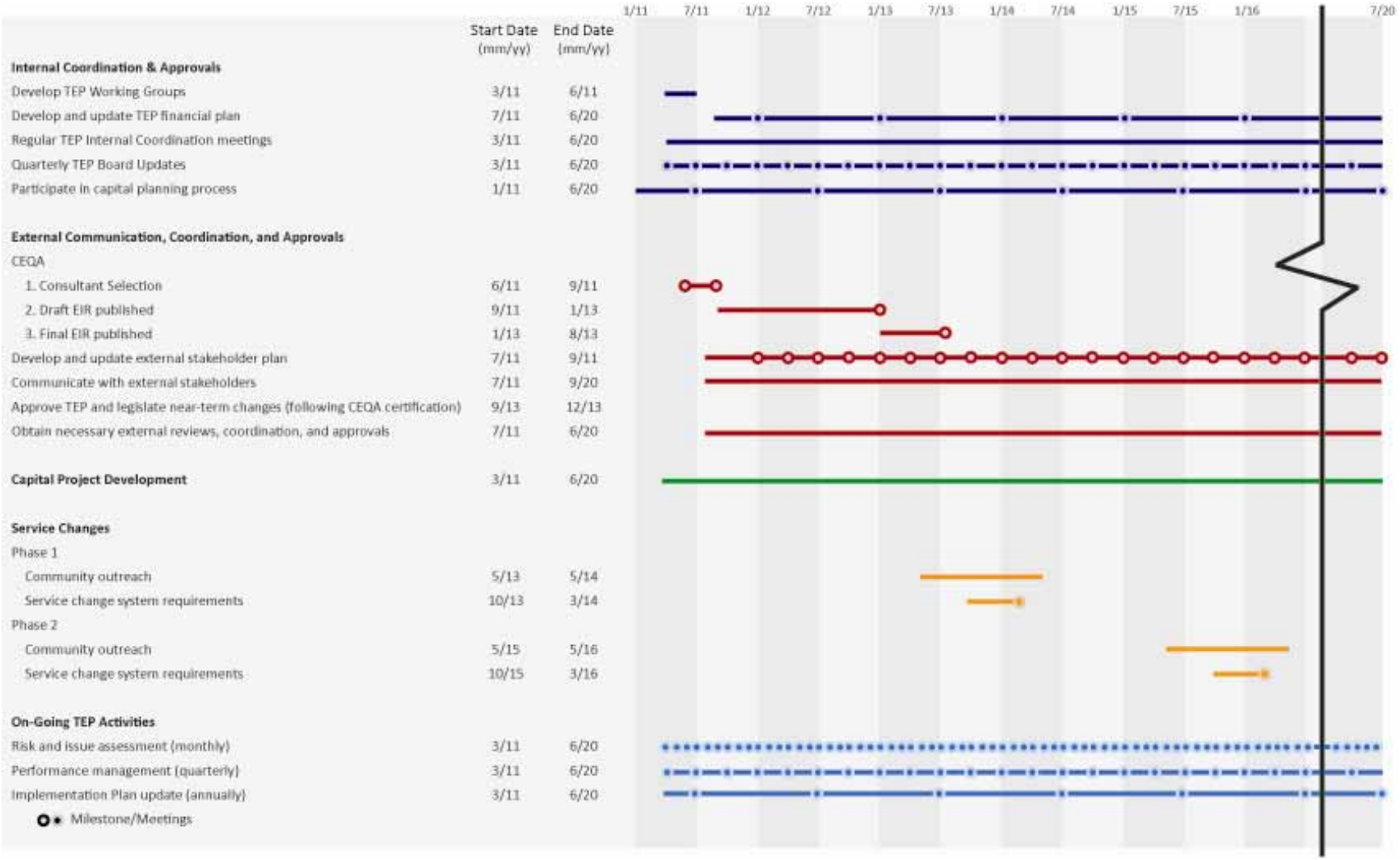
In addition to capital costs, this document considers the operating cost implications. The TEP service improvements represent a net increase in service hours. This would be partially covered by the operational efficiencies gained by the TTRP, but would also require additional operating resources to be 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

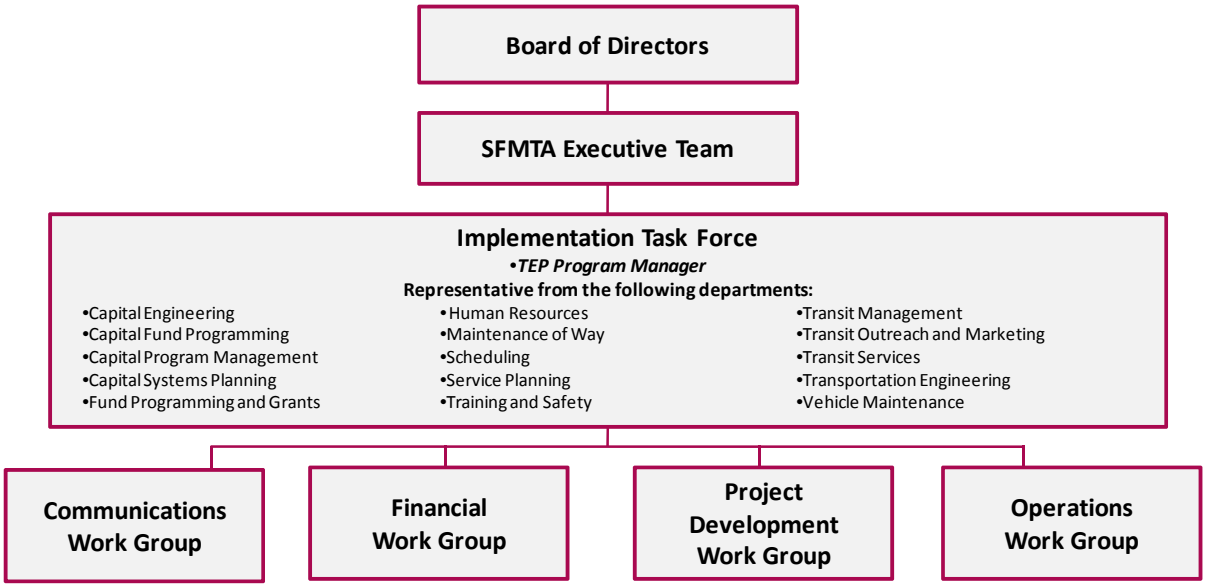
This document includes a comprehensive work proposal for TEP implementation with measurable objectives, timelines, and roles and responsibilities. It will serve as the guiding document to enable the TEP Program Manager and the Implementation Task Force to plan and oversee the timely implementation, pending 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



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?
- 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?

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

3. INITIATIVES OVERVIEW

The TEP proposals include a series of service improvements and concurrent necessary capital investments designed to address the needs identified by the public and past advisory groups' efforts for improving service reliability and reducing travel time, in addition to improving customer comfort, information and safety. In recent years, the Agency implemented some of the TEP-recommended route updates to address the Agency's fiscal emergency. This TEP strategy builds on initial work completed to fully achieve TEP goals over the next nine years. This chapter describes TEP investments—organized by proposal categories—and the timeframe in which they are expected to be completed.

3.1 Highlights of TEP Initiatives

This strategy groups proposals to assure a coordinated, efficient approach to project delivery. The following categories of proposals comprise the TEP:

- Service improvements
- Travel time reduction proposals
- Systemwide capital improvements
- Terminal transfer point improvements
- Overhead wire expansion
- Long-term investment studies

These categories are described in more detail below.

Service Improvements (SI)

The TEP planning phase identified a series of service improvements that would better match current travel patterns with the service network. A portion of the initial recommendations were implemented as part of the last two years of service re-structuring. The remaining improvements represent a 5- to 10-percent increase in total service hours. They include physical route changes and schedule changes (frequency changes, span of service, and vehicle type changes) that would direct resources where they are most needed, increase service on the busiest routes, streamline circuitous routes, and eliminate duplicative or less cost-effective routes. The service improvements are proposed to be implemented in two phases, pending resource availability in fiscal year (FY) 14[2] and FY 16. Many of the service improvements would rely on capital improvements (e.g., overhead wire expansion)

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

being completed. Also, implementation of rail frequency changes may be contingent on vehicle availability and Muni Metro tunnel-capacity improvements.

Travel Time Reduction Proposals (TTRP)

To help achieve the TEP goal of reducing customer travel time, the Travel Time Reduction Proposals (TTRP) would implement treatments to reduce delays on the Rapid Network and make transit more appealing for customers. The TTRP were developed by dividing the Rapid Network into similarly sized corridor segments and developing conceptual proposals that draw upon a toolbox of travel time improvements. By applying targeted methods customized to each corridor, TTRP would reduce travel times by 10 to 30 percent, depending on the corridor segment, with an average time savings of 20 percent.

A range of TTRP proposals are being considered for each corridor segment; from modest initiatives to more ambitious. The basic alternatives would provide essential travel-time improvements while minimizing parking and traffic-circulation impacts with elements like traffic-engineering changes, stop-spacing optimization and customer-amenity improvements. Premium improvements, such as queue jumps and dedicated lanes, are also being considered. These investments would bring additional travel time savings through a higher cost or more changes to parking and traffic circulation. All corridors would receive customer amenities, such as stop upgrades, ticket vending machines, all-door boarding, and improved branding. The public outreach process and further design work would inform the ultimate implementation. All of these measures, supported by traffic signal priority work, would improve the speed and reliability of the SFMTA's most heavily used transit routes while enhancing the customer's waiting experience.

Note: Some routes or route segments were excluded from the TTRP because complementary corridor projects, such as the Geary and Van Ness BRT, Central Subway, and the Better Market Street projects, are already underway.

Systemwide Capital Improvements (SCI)

To achieve the TEP goals of improved customer service, system speed, and reliability, this category focuses on systemwide infrastructure not included in the TTRP. Proposals in this category include, for example, accessible rail platforms, NextMuni signs, and community connector vans. Accessible rail platforms would allow disabled customers improved access to the light rail system. NextMuni signs would enhance the customer experience at transit stops, and vans would better match the demand along certain routes and better match the narrow streets (in addition to being more neighborhood-friendly). These infrastructure investments would be phased over all TEP timeframes; however, more or less investment could occur, depending on TEP priorities and resource availability.

Terminal and Transfer Point Improvements (TTPI)

To achieve the TEP goals of improving customer experiences and service reliability, this category focuses on investments in terminals and transfer points that serve both customers and operational needs. Terminals and transfer points are stops that handle significant customer interchanges and/or handle vehicle layovers. Some of the TEP route changes would require additional buses to layover and/or customers to transfer at new locations. Capital investments associated with this category include new bus stop and hub (way-finding) signage, new switches and overhead work, and new operator restrooms. These infrastructure investments would primarily support service improvements and, consequently, occur before FY 16.

Overhead Wire Expansion (OWE)

In support of all TEP goals, this category includes investments in the overhead wire system to improve service on the system's busiest corridors, increase transit access, and provide more reliable and streamlined service. The addition of bypass wires would allow new limited-stop service on Fulton Street to pass local service routes. Additionally, many of these investments would accommodate planned service improvements, improve terminal operations, and provide more reliable service by reducing bus turns and streamlining routes. Overhead wire expansion would occur throughout the TEP implementation timeframe, with the bypass wire proposals to be completed by FY 16.

Long-term investment studies (LIS)

This category includes the capital costs associated with the environmental review process, which would be integral to the success of the TEP, and the Comprehensive Communications Plan, which would ensure that the benefits of the TEP are effectively communicated to customers. The two other studies focused on the longer-term success of the SFMTA include the traction power system upgrade study and the long-range rail system study. The City is expecting residential and job growth, which would result in more demand for bus and rail service. This is expected to put more pressure on an already constrained system. The traction power system upgrade study would identify the traction power needs associated with the trolley coach demands of the TEP service improvements as well as longer-range needs. The long-range rail system study would answer questions that were beyond the scope of the TEP planning process, including how to expand tunnel throughput and whether the system should migrate to low-floor vehicles. All studies are estimated to commence within the first two years of TEP implementation.

Up-to-date and comprehensive information on all non-TTRP initiatives, including project descriptions, justifications, dependencies, data sources, and capital financial costs and implications, are documented in detailed overviews and can be found in

Appendix II. Information on the components of the TTRP corridor segments can be found in Appendix III.[3]

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.

3.2 Timeframe Summaries

The TEP capital investments are expected to occur in three major timeframes between FY 11[4] and FY 20, with significant route re-structuring and initial travel time proposals in place by FY 15. Table 3-1 highlights the activities intended to take place within each of these three timeframes.

TABLE 3-1: TEP TIMEFRAME HIGHLIGHTS

Timeframe	Highlights
FY 11 – First Half of FY 13	• Environmental review • Planning and design would begin for highest priority SCI, LIS, and OWE initiatives
Last Half of FY 13 – FY 15	• Upon environmental clearance, Phase 1 route updates would be implemented, capital initiatives and TTRP would begin implementation • Planning, development and construction of capital initiatives and TTRP continue
FY 16 – FY 20	• In FY 16, the Phase 2 route updates would be implemented • Planning, development, and construction of larger, more complex capital initiatives • TTRP conclude

The following sections describe the capital proposals and service improvements that are proposed to be completed during the respective timeframes. The tables following these descriptions provide specific proposals and cost estimates. This information was provided by SFMTA staff, and planning-level cost estimates are based on agency experience and industry research. More detailed proposal details can be found in Appendix II.

[3] The TTRP are in the conceptual engineering phase; they will be further developed with community input in the coming months.

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

FY 11 – First Half of FY 13: Planning, Design, Outreach, and Environmental Activities

The majority of the TEP proposals would require environmental review under the California Environmental Quality Act (CEQA), before they could be implemented; therefore, the environmental review process would be a crucial activity in this timeframe. While the environmental review process is underway, it would also be vital for all design, outreach, and project development activities associated with the earliest implementation proposals to be completed. The intent is that some initiatives (depending on resource availability) would be ready to be implemented immediately after the completion of CEQA review and project approval.

Some investments that support TEP goals, but are ongoing SFMTA programs, are expected to be implemented irrespective of whether the TEP is approved and executed during this time period (e.g., NextMuni signs). Other activities to occur in this phase include the initial development of a TEP Comprehensive Communications Plan, a Long-Range Rail System Plan and Traction Power System Study (Table 3-2).

Last Half of FY 13 – FY 15: Phase 1 Investments and TTRP Implementation

This timeframe immediately following CEQA review includes constructing capital proposals that have been planned and designed, and implementing the first few TTRP segments. There are high capital costs in this timeframe because of the significant level of project implementation that would occur. During this timeframe, 11 of the TTRP corridor segments would be completed, while many others would be in the design and engineering phases. These projects are outlined in Table 3-3.

This timeframe also includes implementing the Phase 1 service improvements. Table 3-4 describes these service improvements and their relationship to capital projects (if applicable). Phase 1 is estimated to occur in FY 14. Route maps depicting the proposed service improvements can be found in Appendix IV.

FY 16 – FY 20: Phase 2 Investments, TTRP Implementation, and Stand-Alone Capital Proposals

The final five fiscal years focus on completing the remaining 13 TTRP segments[5] and the larger and more complex TEP capital proposals. Initiatives completed during this period would involve significant resource investments, both in staff support and capital funding (Table 3-5).

The Phase 2 route updates are estimated to take place in FY 16 once the associated capital projects are completed (Table 3-6). Any additional schedule

[5] TTRP projects that do not have project-level clearance would require additional environmental review.

frequency changes that were not implemented in Phase 1 would be implemented in Phase 2, pending available resources. Finally, there are proposed route updates that could be implemented only once the more complex capital projects are completed (Table 3-7). These route updates are intended to occur after Phases 1 and 2 are implemented.

TABLE 3-2: TEP TTRP AND CAPITAL PROPOSALS IN FY 11 – FIRST HALF OF FY 13 TIMEFRAME

TEP Ref #	Project Name	Project Description	Total Project Cost (YOE $, 000s)
SCI.2	NextMuni Signage[1]	This would include purchasing and installing NextMuni electronic real-time information signs at shelters currently without NextMuni signage. This effort would alert and inform customers of the status of transit services to improve their route choice and improving the customer experience.	$2,194
SCI.10	Accessibility Improvements – Bus Stop Conversion	This would convert many of the SFMTA's (approximately) 2,000 flag stops to bus zones for better accessibility, easier customer boarding, and improved safety.	$N/A[2]
TTPI.6	Balboa Park BART Station Pedestrian Improvement (Ocean Ave)	This would create a new pedestrian crossing at Ocean Avenue and Interstate 280, which would be necessary to accommodate proposed reroutes of the 29 and 54, and would provide access to the newly opened BART entrance. This improvement would increase pedestrian safety, improve station access for Route 29, 49, and 54 customers.[3]	$91
LIS.1	TEP Comprehensive Communications Plan	Plan would include developing the approach to marketing and communicating the customer benefits of the TEP and help the Agency resolve political conflicts when they arise. The plan would develop key messages and promotional materials capable of transitioning existing and attracting new customers to the new and revised Muni services.	$850
LIS.2	Traction Power System Upgrade Study	This study would evaluate the traction power needs associated with the TEP route updates and schedule changes. This study would also anticipate future service needs associated with city-wide growth captured in the SFMTA Fleet Plan.	$565
LIS.3	Long-Range Rail System Plan	During the TEP planning phase, several longer term issues were identified related to the light rail system that exceeded the TEP's scope and timeline. To address these issues and support long-term planning at the agency, this plan would develop a long-term expansion strategy for the light rail system that would identify low to high cost solutions to improve operations and the customer experience.	$1,053

Notes:

1 The NextMuni project is listed in this table and is discussed in the Implementation Strategy because it would improve customer experiences and as such, support the goals of the TEP; however, the NextMuni project is part of an ongoing SFMTA program and is expected to be implemented irrespective of whether the TEP is approved and implemented.

2 The costs associated with the Accessibility Improvements – Bus Stop Conversion project are typically funded out of the operating budget and cost approximately $1,000/stop. There are also community outreach costs that may be associated with parking removal.

3 The Balboa Park project is listed in this table and is discussed in the Implementation Strategy because it is a predecessor to proposed service changes and as such, supports the goals of the TEP; however, the Balboa Park project is part of an ongoing SFMTA program and is expected to be implemented irrespective of whether the TEP is approved and implemented.

SCI = systemwide capital improvements **TTPI =** terminal and transfer point improvements **LIS =** long-term investment studies.

TABLE 3-3: TEP TTRP AND CAPITAL PROPOSALS IN LAST HALF OF FY 13 – FY 15 TIMEFRAME

TEP Ref #	Project Name	Project Description	Total Project Cost (YOE $, 000s)
SCI.1	Accessible Rail Platforms	Build accessible platforms to expand the number of accessible stops along the surface portions of the light rail system. This would allow mobility impaired people to better utilize the light rail system.	$8,670
SCI.4	Sansome Contraflow Extension	Extend southbound "transit-commercial" contraflow lane north three blocks on Sansome Street to Broadway using paint, signage, and signal modifications from Broadway to Clay. This would eliminate two bus turns to increase on-time performance and simplify route for travel time savings. This project is related to the 10 Sansome service change.	$78
SCI.5	Additional Cameras and Monitoring Equipment	Install cameras and monitoring equipment at strategic locations along rapid corridor terminals and routes. This would allow Operations and Security to have a real-time view of the system, which would allow issues to be addressed proactively, potentially improved on-time performance and enhanced security.	$214
SCI.7	Installation of TSP Equipment at non-TTRP Intersections[1]	This proposal only includes the equipment at the 225 intersections not already addressed in TTRP (supporting the larger Radio Replacement Project). TSP technology would enable transit priority, which would reduce travel time variability to improve overall on-time performance.	$5,090
SCI.9	Historic Streetcar Rehabilitation	Continue rehabilitation of historic streetcars for expanded F Line service and the new E Line service. This project would likely increase ridership and reduce over-crowding. Historic streetcar rehabilitation is a state of good repair project that also supports TEP implementation.	$N/A[2]
TTPI.1	Van Ness Avenue & North Point Street Hub & Terminal	Build enhanced terminal facilities to accommodate proposed route changes, including routes 11, 19, 28L, 30, 47 and 49L. Components include street geometry changes to accommodate transit vehicle movements and to provide adequate on-street layover space, as well as customer amenities such as improved wayfinding signage.	$1,154

Notes:

1 The TSP project is listed in this table and is discussed in the Implementation Strategy because it is expected to reduce travel time and as such, supports the goals of the TEP; however, the TSP project is part of an ongoing SFMTA program and is expected to be implemented irrespective of whether the TEP is approved and implemented. Funding for TSP could come from a variety of sources including a general bond obligation measure on the November 2011 ballot.

2 Historic Streetcar Rehabilitation is a TEP supportive project that is already funded, so the costs are not included in the TEP Implementation Strategy.

SCI = systemwide capital improvements

TTPI = terminal and transfer improvements

TABLE 3-3: TEP TTRP AND CAPITAL PROPOSALS IN LAST HALF OF FY 13 – FY 15 TIMEFRAME (CONT'D)

TEP Ref #	Project Name	Project Description	Total Project Cost (YOE $, 000s)
TTPI.2	Daly City Bus Terminal and Transfer Point Improvements	Expand and reconfigure SFMTA stop and bus layover facilities at the Daly City BART station to accommodate new layover of the Route 14 Mission, and existing service on Routes 28 & 54.	$3,160
TTPI.3	Lee Street Terminal for 52	Create on-street terminal space on Lee Street near Phelan Avenue, which is needed to accommodate extending the Route 52 to the City College area. Extending the 52 would improve customer transfers to BART, and provide access to a new ridership market by servicing City College.	$10
TTPI.7	Richardson/Lyon Bus Stop – Transfer Point	Improve transfer point at Lyon and Richardson for the SFMTA's 28L Route and Golden Gate Transit (GGT) services. This project would create a more convenient and comfortable transfer point, and replace the transfer currently at the Golden Gate Bridge toll plaza, which the 28L would no longer serve. 28 Local customers would continue to transfer at Bridge.	$156
TTPI.8	San Francisco General Hospital Transfer Point	Design and implement new transfer hub on 23rd or 24th Street and Potrero Avenue to make transferring between Routes 9, 9L, 10, 19, 48 and 58 more convenient. This would create improved customer satisfaction by facilitating more accessible transfers at this critical junction.	$136
OWE.1	New Overhead Wiring – Reroute 33 on to Valencia	Construct new overhead wire to allow the 33 Stanyan to be rerouted on to Valencia between 16th and 18th Streets. This would reduce friction with Mission Street buses to improve the reliability of Mission transit services and would improve connections to the 22 Fillmore at the 16th St BART station.	$2,049
OWE.3	New Overhead Wiring – 6 Parnassus on Stanyan Street	New overhead wires from Haight Street to Parnassus Avenue (0.3 mile) that would allow the 6 Parnassus to operate on the full length of Haight Street. This would increase service on the busiest portion of Haight Street west of Masonic. The full length of Haight Street would be served by both a limited and a local bus.	$5,334

Notes:

TTPI = terminal and transfer improvements

OWE = overhead wire expansion

TABLE 3-3: TEP TTRP AND CAPITAL PROPOSALS IN LAST HALF OF FY 13 – FY 15 TIMEFRAME (CONT'D)

TEP Ref #	Project Name	Project Description	Total Project Cost (YOE $, 000s)
OWE.4	5 Limited/Local Bypass Wires	Install bypass wires at strategic locations between 6th Avenue and Fulton Street, and Market and McAllister Streets, to allow for introduction of a 5L Fulton Limited trolley coach service alongside the 5 Fulton (local) trolley coach service, allowing both services to run concurrently on Fulton with electric trolley vehicles.	$966
TTRP.30_1	Stockton Street and Kearny Street (30 Stockton, 45 Union/ Stockton, 8X Bayshore Express, 8AX Bayshore 'A' Express, and 8BX Bayshore 'B' Express)	Stockton Street from Market Street to Columbus Avenue; Sutter Street from Stockton Street to Kearny Street; and Kearny Street from Sutter Street to Market Street. These TTRP improvements would improve travel time and reliability for customers along this corridor segment and contribute to increasing the operating speed of the network.	$1,572
TTRP.30_2	North Point Street and Columbus Avenue (30 Stockton, 11 Sansome)	North Point Street from Columbus Avenue to Van Ness Avenue; Van Ness Avenue from North Point Street to Chestnut Street; and Columbus Avenue from Stockton Street to North Point Street. These TTRP improvements would improve travel time and reliability for customers along this corridor segment and contribute to increasing the operating speed of the network.	$4,115
TTRP.9_2	San Bruno (8X Bayshore Express, 8AX Bayshore 'A' Express, 9 San Bruno, and 9L San Bruno Limited)	Silver Avenue from Bayshore Boulevard to San Bruno Avenue; and San Bruno Avenue from Silver Avenue to Arleta Avenue. These TTRP improvements would improve travel time and reliability for customers along this corridor segment and contribute to increasing the operating speed of the network.	$1,014

Notes:

OWE = overhead wire expansion

TTRP = travel time reduction proposals (For additional detail, see Appendix III)

TABLE 3-3: TEP TTRP AND CAPITAL PROPOSALS IN LAST HALF OF FY 13 – FY 15 TIMEFRAME (CONT'D)

TEP Ref #	Project Name	Project Description	Total Project Cost (YOE $, 000s)
TTRP.N_1	Irving Street and Carl Street (N)	Irving Street from 9th Avenue to Arguello Boulevard; Carl Street from Arguello Boulevard to Clayton Street; and Duboce Avenue from Scott Street to Church Street. These TTRP improvements would improve travel time and reliability for customers along this corridor segment and contribute to increasing the operating speed of the network.	$2,013
TTRP.14_2	Inner Mission Street (14 Mission, 14L Mission Limited and 49L Van Ness/Mission Limited)	Mission Street from 11th Street to Cesar Chavez Street; and Otis Street from South Van Ness Avenue to 13th Street. These TTRP improvements would improve travel time and reliability for customers along this corridor segment and contribute to increasing the operating speed of the network.	$3,299
TTRP.14_3	Outer Mission Street (14 Mission, 14L Mission Limited, 14X Mission Express and 49L Van Ness-Mission Limited)	Mission Street from Cesar Chavez Street to San Jose Avenue in Daly City. These TTRP improvements would improve travel time and reliability for customers along this corridor segment and contribute to increasing the operating speed of the network.	$6,233
TTRP.28_2	19th Avenue Richmond-Sunset Districts (28 19th Avenue and 28L 19th Avenue Limited)	Park Presidio Boulevard from Lake Street to Fulton Street; Park Presidio Bypass from Fulton Street to Crossover Drive; Crossover Drive from Park Presidio Bypass to Lincoln Way; and 19th Avenue from Lincoln Way to Eucalyptus Drive. These TTRP improvements would improve travel time and reliability for customers along this corridor segment and contribute to increasing the operating speed of the network.	$5,299

Notes:

TTRP = travel time reduction proposals (For additional detail, see Appendix III)

TABLE 3-3: TEP TTRP AND CAPITAL PROPOSALS IN LAST HALF OF FY 13 – FY 15 TIMEFRAME (CONT'D)

TEP Ref #	Project Name	Project Description	Total Project Cost (YOE $, 000s)
TTRP.M_28	19th Avenue (M Ocean View, 28 19th Avenue and 28L 19th Avenue Limited)	19th Avenue from Junipero Serra Boulevard to Eucalyptus Drive. These TTRP improvements would improve travel time and reliability for customers along this corridor segment and contribute to increasing the operating speed of the network.	$1,110
TTRP.14_1	Mission Street east of South Van Ness Avenue (14 Mission, 14L Mission Limited, 14X Mission Express)	Mission Street from Steuart Street to 11th Street; Steuart Street from Mission Street to Market Street; Market Street from Steuart Street to Main Street; and Main Street from Market Street to Mission Street. These TTRP improvements would improve travel time and reliability for customers along this corridor segment and contribute to increasing the operating speed of the network.	$1,509
TTRP.8X_1	Geneva Avenue (8X Bayshore Express, 43 Masonic, 52 Excelsior and 8BX Bayshore 'B' Express)	Geneva Avenue from Ocean Avenue to Santos Street. These TTRP improvements would improve travel time and reliability for customers along this corridor segment and contribute to increasing the operating speed of the network.	$3,757
TTRP.5_1	Fulton Street and McAllister Street (5 Fulton)	La Playa Street from Cabrillo Street to Fulton Street; Fulton Street from La Playa Street to Central Avenue; Central Avenue from Fulton Street to McAllister Street; McAllister Street from Central Avenue to Market Street; Hyde Street from McAllister Street to Market Street; and Market Street from 8th Street to McAllister Street. These TTRP improvements would improve travel time and reliability for customers along this corridor segment and contribute to increasing the operating speed of the network.	$7,629

Notes:

TTRP = travel time reduction proposals (For additional detail, see Appendix III)

TABLE 3-4: PHASE 1 (FY 14) SERVICE IMPROVEMENTS

Route Affected	Description of Service Change	Relationship to Capital Projects
1ABX/31ABX/ 38ABX	Add stop at Van Ness to improve connectivity to Civic Center destinations and future Van Ness BRT.	None
8X/8BX	Discontinue northern route to end at Broadway. Eliminated segment would be replaced by new downtown connector (Route 11). This would maximize resources by serving the northern portion of Route 8X with Route 11 service.	None
10/11/12/27	10 - Revised routing replacing south end of route 10, with a new alignment through Mission Bay and Potrero Hill 11 - Replaces northern portion of the 8X/8BX and part of the 47 12 - Discontinue route with segment on Pacific served by 10 and segment on Folsom served by 11 and 27. 27 - In South of Market, reroute from Harrison and Bryant to Harrison and Folsom in Mission District. This combination of improvements would consolidate service corridors east of Mission to streamline routing, save resources, and eliminate duplication. Route 10 would provide improved service to customers in new development in Mission Bay upon completion of Mission Bay South street grid. Route 11 would provide a new route connecting Fisherman's Wharf with Downtown and SoMa neighborhoods, including connections to BART, Muni Metro, and the Transbay Terminal.	Sansome Contraflow lane
49L	49L would operate as a limited-stop service from South Van Ness to Ocean Avenue to provide improved service in a major travel corridor.	Shelter improvements, distinctive signage
16X	Extension to Market/Spear, which would provide better penetration of downtown core and greater connectivity, which would make route more attractive to new customers.	None

Notes:

1. For a graphic depiction of all service improvements, see route maps in Appendix IV.
2. Implementation of rail frequency changes may be contingent on vehicle availability and Muni Metro tunnel capacity improvements.
3. Many routes are recommended for frequency changes. These changes do not require route updates and could be made in Phase 1 or Phase 2, depending on resource availability. These routes include the following: M Ocean View Line, N Judah Line, 2 Clement, 5 Fulton, 8X Bayshore Express, 9 and 9L San Bruno, 10 Sansome, 14L Mission, 17 Parkmerced, 22 Fillmore, 24 Divisadero, 27 Folsom, 28 19th Avenue and 28 L, 35 Eureka, 43 Masonic, 47 Van Ness, 48 Quintara/24th Street, 49L Van Ness/Mission, 52 Excelsior, 56 Rutland, 71L Haight/Noriega Limited, and 88 BART Shuttle.

TABLE 3-4: PHASE 1 (FY 14) SERVICE IMPROVEMENTS (CONT'D)

Route Affected	Description of Service Change	Relationship to Capital Projects
17/18	Route 17 would replace existing Route 18 segment around Lake Merced via John Muir Drive and Skyline Blvd. Also, Route 18 would use a more direct route between the Zoo and Stonestown. This would provide improved connections on Route 17 from regional transit (Daly City BART) to major west side destinations, including West Portal, Stonestown, Lakeside Plaza and Westlake Mall, and regional transit at Daly City BART. It would provide more straightforward routing of 18 service around Lake Merced and through Parkmerced.	None
19/35/48/58	Redesign 48 to extend to Hunters Point, replacing 19, which would terminate at SF General Hospital. Introduce the 58 to increase service on 24th St and reroute 35 to replace existing 48 service on Hoffman and Douglass Streets and provide access to Glen Park BART station. These changes would improve service between Hunters Point and the Mission and increase frequency on 24th street.	None
23	Route change in Produce District. This would provide more direct routing for Palou Street customers.	None
28	Shorten to Golden Gate Bridge to save resources. Change coordinated with 28L and occurs during times when 28L is running.	None
28L	Expand to all-day service and extend route to Van Ness/North Point & Mission/Geneva. This would provide a competitive travel time option to automobile travel in the outer neighborhoods and link new destinations, including SFSU and City College from Marina, Richmond, Sunset, and Excelsior areas. This is coordinated with the Route 28 change.	Van Ness-North Point terminal improvements
29	Reroute from Geneva and Mission onto Ocean to streamline route.	Balboa Park Ped Improvement and Lyon/ Richardson Transfer Point
38L	Introduce Sunday limited-stop service. Offers better travel times for Sunday customers and coordinates with Geary BRT project study, which aims to achieve significant travel time and reliability improvements.	None
43	Reroute in Presidio, extend to Fort Mason. Links Fort Mason recreation area with Presidio destinations.	None

TABLE 3-4: PHASE 1 (FY 14) SERVICE IMPROVEMENTS (CONT'D)

Route Affected	Description of Service Change	Relationship to Capital Projects
47	Eliminate segment along North Point and reroute south of Market. Routing would provide time savings between Civic Center and Caltrain.	None
52/54	Reroute of the 54 onto Ocean Avenue would provide better access to City College, BART, and other community services. Route extensions and two-way service on Hunters Point hilltop would provide improved access and shorter travel times by straightening out segments of both routes. Reroute of the 52 would provide Excelsior District with service to two BART stations. More legible route would be provided by running two ways on Excelsior and Naples Streets.	Balboa Park Pedestrian Improvement, Lee St. Terminal
32/36/37/56	Splitting the 37 into 2 routes (32 and 37) and shortening 36 to run more frequently and discontinuing Forest Knolls and Glenview Loop segments. Route 56 would eliminate segments to Executive Park and Sunnydale Avenue. Routes would be more direct and efficient.	Would eventually benefit from introduction of vans
76	Run 76 on both weekend days to provide improved customer access.	None
91A, 91B, N (Owl)*	Split 91 Owl into two lines. 91B would incorporate present N Owl. Breaks up overly-long Owl route to improve service reliability and customer understanding.	None

Notes:

* Owl route numbers would be updated prior to implementation.

TABLE 3-5: TEP CAPITAL PROPOSALS IN FY 16 – FY 20 TIMEFRAME

TEP Ref #	Project Name	Project Description	Total Project Cost (YOE $, 000s)
SCI.6	Community Connector Vans	Replace larger motor coaches with customer vans to serve some of the Community Connector routes. Vans are a better fit for the ridership and route environment in many hilly areas of the City.	$2,731
TTPI.4	E Line Independent Terminal at Jones/Beach	Create one block of new parallel track and overhead, switches and boarding island to facilitate independent movement of E and F lines at northern terminus. This would improve on-time reliability.	$5,424
TTPI.5	M Extension for Parkmerced	Reroute the M Ocean View into Parkmerced and create a new terminal. This terminal would allow for half of the peak period trains to turnaround in Parkmerced, with the remaining extending to Balboa Park.	$N/A*
OWE.2	Bypass Wires at Various Terminal Locations	Install bypass wires to improve terminal operations where multiple trolley routes share a terminal. This would allow buses to pass each other, which would result in improved on-time performance and reliability.	$1,692
OWE.5	22 Fillmore Extension to Mission Bay	New overhead wire on 16th Street and 3rd Street that would provide much-needed connections to Mission Bay, including the new UCSF campus and hospital, and new residential projects and research facilities. The 33 would be re-routed from Potrero to cover 22 service on 18th Street.	$14,193
OWE.6	New Overhead Wiring – 6 Extension to West Portal	This project would provide a direct connection for customers on the west side of Twin Peaks (residents currently unserved by transit) and existing customers in the western portions of the Haight and Cole Valley to Muni Metro service at West Portal.	$22,654

Notes:

* Because this rail extension is independent of the TEP and not anticipated to be constructed until after 2020, it is not included in the TEP implementation strategy costs. The rail extension will be funded by the Parkmerced developers and is included in a full-funding agreement with the Parkmerced project sponsor. Note: At the time of publishing, the SFMTAB has not taken an action on the Parkmerced M line proposal, but is expected to review it in Spring 2011. The original TEP proposal to extend the J Church to SFSU and truncated M Ocean View at SFSU is not being pursued at this time. This proposal is part of the Parkmerced project and is included in the Parkmerced EIR.

SCI = systemwide capital improvements

TTPI = terminal and transfer point improvements

OWE = overhead wire expansion

TABLE 3-5: TEP CAPITAL PROPOSALS IN FY 16 – FY 20 TIMEFRAME (CONT'D)

TEP Ref #	Project Name	Project Description	Total Project Cost (YOE $, 000s)
TTRP.22_2	16th Street (22 Fillmore)	16th Street from Church Street to Kansas Street. These TTRP improvements would improve travel time and reliability for customers along this corridor segment and contribute to increasing the operating speed of the network.	$2,482
TTRP.28_1	Lombard Street (28 19th Avenue/28L 19th Avenue Limited)	Lombard Street from Van Ness Avenue to Broderick Street; and Richardson Avenue from Broderick Street to Lyon Street. These TTRP improvements would improve travel time and reliability for customers along this corridor segment and contribute to increasing the operating speed of the network.	$1,968
TTRP.9_1	11th Street, Potrero Avenue, and Bayshore Boulevard (9 San Bruno and 9L San Bruno Limited)	11th Street from Mission Street to Bryant Street; Division Street from Bryant Street to Potrero Avenue; Potrero Avenue from Division Street to Bayshore Boulevard; and Bayshore Boulevard from Jerrold Avenue to Silver Avenue. These TTRP improvements would improve travel time and reliability for customers along this corridor segment and contribute to increasing the operating speed of the network.	$2,978
TTRP.30_3	Chestnut Street (30 Stockton and 30X Marina Express)	Chestnut Street from Van Ness Avenue to Broderick Street; Broderick Street from Chestnut Street to Jefferson Street; Jefferson Street from Broderick Street to Divisadero Street; and Divisadero Street from Jefferson Street to Chestnut Street. These TTRP improvements would improve travel time and reliability for customers along this corridor segment and contribute to increasing the operating speed of the network.	$1,666

Notes:

TTRP = travel time reduction proposals (For additional detail, see Appendix III.)

TABLE 3-5: TEP CAPITAL PROPOSALS IN FY 16 – FY 20 TIMEFRAME (CONT'D)

TEP Ref #	Project Name	Project Description	Total Project Cost (YOE $, 000s)
TTRP.1_2	California Street (1 California, 1AX California 'A' Express and 1BX California 'B' Express)	Sacramento Street from Steiner Street to Gough Street; Steiner Street from Sacramento Street to California Street; California Street from Steiner Street to 32nd Avenue; 32nd Avenue from California Street to Geary Boulevard; Geary Boulevard from 32nd Avenue to 33rd Avenue; 33rd Avenue from Geary Boulevard to Clement Street; and Clement Street from 33rd Avenue to 32nd Avenue. These TTRP improvements would improve travel time and reliability for customers along this corridor segment and contribute to increasing the operating speed of the network.	$6,848
TTRP.22_1	Fillmore Street (22 Fillmore)	Fillmore Street from Marina Boulevard to Hermann Street; Hermann Street from Fillmore Street to Church Street; Church Street from Hermann Street to 16th Street. These TTRP improvements would improve travel time and reliability for customers along this corridor segment and contribute to increasing the operating speed of the network.	$7,977
TTRP.N_2	Judah Street (N Judah)	Judah Street from La Playa Street to 9th Avenue; and 9th Avenue from Judah Street to Irving Street. These TTRP improvements would improve travel time and reliability for customers along this corridor segment and contribute to increasing the operating speed of the network.	$5,357
TTRP.L_1	Taraval Street (L Taraval)	47th Avenue from Vicente Street to Wawona Street; Wawona Street from 47th Avenue to 46th Avenue; Vicente Street from 47th Avenue to 46th Avenue; 46th Avenue from Wawona Street to Taraval Street; Taraval Street from 46th Avenue to 15th Avenue; 15th Avenue from Taraval Street to Ulloa Street; and Ulloa Street from 15th Avenue to West Portal Station. These TTRP improvements would improve travel time and reliability for customers along this corridor segment and contribute to increasing the operating speed of the network.	$4,366

Notes:

TTRP = travel time reduction proposals (For additional detail, see Appendix III.)

TABLE 3-5: TEP CAPITAL PROPOSALS IN FY 16 – FY 20 TIMEFRAME (CONT'D)

TEP Ref #	Project Name	Project Description	Total Project Cost (YOE $, 000s)
TTRP.K_1	Ocean Avenue (K Ingleside)	Ocean Avenue from San Jose Avenue to Junipero Serra Boulevard. These TTRP improvements would improve travel time and reliability for customers along this corridor segment and contribute to increasing the operating speed of the network.	$1,536
TTRP.J_1	Church Street (J Church)	Church Street from Duboce Avenue to 30th Street; 30th Street from Church Street to San Jose Avenue; and San Jose Avenue from 30th Street to Randall Street. These TTRP improvements would improve travel time and reliability for customers along this corridor segment and contribute to increasing the operating speed of the network.	$4,576
TTRP.71_1	Haight Street (6 Parnassus, 71 Haight-Noriega and 71L Haight-Noriega Limited)	Haight Street from Market Street to Stanyan Street; Stanyan Street from Haight Street to Frederick Street; Frederick Street from Stanyan Street to Arguello Boulevard; and Lincoln Way from Arguello Boulevard to 3rd Avenue. These TTRP improvements would improve travel time and reliability for customers along this corridor segment and contribute to increasing the operating speed of the network.	$3,445
TTRP.1_1	Sacramento Street and Clay Street (1 California)	Sacramento Street from Drumm Street to Gough Street; Drumm Street from Clay Street to Sacramento Street; Gough Street from Clay Street to California Street; and Clay Street from Gough Street to Drumm Street. These TTRP improvements would improve travel time and reliability for customers along this corridor segment and contribute to increasing the operating speed of the network.	$2,757
TTRP.71_2	Noriega Street, 22nd Avenue, 23rd Avenue and Lincoln Way (71L Haight-Noriega Limited and 16X Noriega Express)	Lincoln Way from 3rd Avenue to 23rd Avenue; 22nd Avenue from Lincoln Way to Noriega Street; 23rd Avenue from Lincoln Way to Noriega Street; Noriega Street from 22nd Avenue to 48th Avenue; Ortega Street from 48th Avenue to 47th Avenue; Lower Great Highway from Ortega Street to Noriega Street; and 47th Avenue from Ortega Street to Noriega Street. These TTRP improvements would improve travel time and reliability for customers along this corridor segment and contribute to increasing the operating speed of the network.	$3,725

Notes:

TTRP = travel time reduction proposals (For additional detail, see Appendix III.)

TABLE 3-6: PHASE 2 (FY 16) SERVICE IMPROVEMENTS

Route Affected	Description of Service Change	Relationship to Capital Projects
E/F*	Introduce E Line and increase F Line service, which is a major tourist attractor. Also supplements F Line service along Embarcadero.	Completion of streetcar rehab program, with the addition of more double ended cars
5, 5L	Introduce 5L with addition of bypass wires, which would improve service in a major corridor.	Limited stop segment bypass wire addition
6 (reroute on Stanyan), 71L	Reroute via Stanyan Street between Haight Street and Parnassus Street. Discontinue Frederick/Clayton/Masonic routing. Discontinued routing replaced by 32 Van. This would allow for 71L to provide Limited service along length of Haight Street, offering rapid service for customers on the trunk corridor.	Installation of overhead on Stanyan Street

* E Line Terminal capital project is not a prerequisite for this service change; however, the capital project is desired for operational flexibility and service reliability.

Notes:

1. For a graphic depiction of all service improvements, see route maps in Appendix IV.
2. Implementation of rail frequency changes may be contingent on vehicle availability and Muni Metro tunnel capacity improvements.
3. Many routes are recommended for frequency changes. These changes do not require route updates and could be made in Phase 1 or Phase 2, depending on resource availability. These routes include the following: M Ocean View Line, N Judah Line, 2 Clement, 5 Fulton, 8X Bayshore Express, 9 and 9L San Bruno, 10 Sansome, 14L Mission, 17 Parkmerced, 22 Fillmore, 24 Divisadero, 27 Folsom, 28 19th Avenue and 28 L, 35 Eureka, 43 Masonic, 47 Van Ness, 48 Quintara/24th Street, 49L Van Ness/Mission, 52 Excelsior, 56 Rutland, 71L Haight/Noriega Limited, and 88 BART Shuttle.

TABLE 3-7: ROUTE UPDATES ASSOCIATED WITH CAPITAL-INTENSIVE PROPOSALS

Route Impacted	Description of Route Update	Relationship to Capital Projects
22, 33	Trolley coach extension and reroute, which would serve new development and improve connectivity across 16th Street while maintaining service to 18th Street corridor via Route 33.	Extension of overhead on 16th Street and Connecticut
M Extension into Parkmerced	Pending proposals with Parkmerced. Operate peak period short-line/long-line so trunk between SF state and downtown has twice as much service as branch between Parkmerced and Balboa Park. Alternate trips would continue to serve Balboa Park Station. These improvements would increase service on most used service of route and conserve resources on lighter portions.	Line construction, junction with existing route
6	Extension to West Portal to provide better connectivity.	Extended overhead

Notes:

1. For a graphic depiction of all service improvements, see route maps in Appendix IV.
2. Implementation of rail frequency changes may be contingent on vehicle availability and Muni Metro tunnel capacity improvements.

4. COST AND FUNDING SUMMARY

Between FY 11 and FY 20, the TEP proposals would require significant investments in planning, developing and constructing capital projects, including additional staff, materials and consulting services. During this time, the SFMTA will be investing in other complementary projects, like the Van Ness and Geary BRT projects and the Central Subway. As a result, it will be important for the Agency to make strategic policy and funding decisions in the near term that would allow TEP improvements to be delivered in an ambitious timeframe. The following section summarizes the TEP capital costs and available and potential funding sources, and begins a discussion of O&M implications of the TEP capital investments. Estimated operating costs associated with the service improvements are also discussed. It outlines an approach for modifying decisions based on funding availability. Together, these investments would provide meaningful improvements in key routes as well as ensure cost-effective customer service for both now and the future.

4.1 Capital Cost Summary

The TEP capital cost summary estimates (Table 4-3) compile the sequenced TEP capital proposals with annual costs in YOE dollars[6] from FY 11 to FY 20.[7] As shown in the bottom row of the tables, the total approximate capital cost of the TEP would be $151 million in 2010 dollars and $167 million in 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 4-1 provides a breakdown of these totals.

[6] YOE calculations are based on Global Insight's 30-year forecast of the Consumer Price Index for San Francisco-Oakland-Fremont, California. Additional inflation assumptions can be found in Appendix VI.

[7] Appendix V contains the Capital Cost Summary in FY 10 dollars.

TABLE 4-1: TEP CAPITAL PROPOSAL CATEGORY TOTALS

TEP Proposal Category	FY 11–FY 20 TEP Cost Estimates (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	$3,476,000
TOTAL ESTIMATE	**$167,137,000**

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

Capital Cost Summary Assumptions

Key assumptions associated with the TEP Capital Cost Summary include:

- Capital costs are based on unit costs developed by SFMTA staff. These are planning-level estimates that are based on industry research and experience developing similar projects. Table 4-3 provides an abbreviated version of the cost estimating approach used for each of the major project groupings.
- All years represent the SFMTA's fiscal year (July 1 – June 30).
- All figures are in YOE dollars (unless otherwise noted) and represent the project's total TEP cost.
- Annual figures reflect the total amount of funding that should be committed to TEP each year. The TEP Capital Cost Summary reflects an unconstrained funding scenario. The proposal sequencing would need to be modified if fewer resources are available or more resources become available sooner. (For information regarding this flexibility, see Section 4.3, Approach for Maximizing Available Funding.)
- This strategy assumes that environmental review would be completed by the end of FY 13. Subsequently, proposed projects could seek approvals and enter the final design and construction phase.
- This strategy also assumes that Phase 1 service improvements would occur in FY 14 and Phase 2 service improvements would occur in FY 16.
- TTRP costs are based on concepts with moderate assumptions and less complex elements. Additional concepts would be developed for most corridors to provide a range of options, from a basic alternative that provides essential travel-time improvements while minimizing parking and traffic circulation impacts, to a more premium alternative that would have the potential to bring additional travel time savings though a higher cost or more changes to parking and traffic circulation.

TABLE 4-2: CAPITAL COSTING APPROACH[1]

Capital Project	Cost Estimation (FY 10 $)	Source
Travel Time Reduction Proposals (TTRP)[2]	Segments are composed of various combinations of the following elements: • Bus bulbs – $200,000 • Boarding islands – $100,000 • Queue jump – $2,000/intersection • Replacing stop signs with one traffic signal – $350,000 • Transit zone consolidation – $1,000/zone • Various traffic signal improvements – $10,000 – $30,000/intersection • Exclusive transit lanes (paint only) – $10,000/400 feet • On-street parking removal – $1,000/block • Stop amenities - $500,000/mile[3] Note: These are estimates, actual costs can vary significantly depending on technical challenges.	Transportation Engineering
NextMuni Signage	$3,000/sign[4]	SFMTA Finance
Terminals and Other Stand-Alone Projects	Many of these projects have not been designed yet, so estimates are based on input from the SFMTA's planners and engineers.	Capital and Service Planning
Overhead Wire Expansion	$13 million/one-way mile and $17 million/two-way mile[5]	Overhead Wire Engineering
Vans	$150,000/van	Metropolitan Transportation Commission[6]
Start-Up Costs	$200,000/phase[7]	Service Planning
Accessibility Platforms	$1,100,000/stop (which includes two accessible platforms)[8]	Civil Engineering

1. Proposals that are currently in design or soon to be in construction have a greater level detail than those that are currently in the conceptual or planning phase.
2. The procurement and construction of new signals are assumed to occur in 2-year batches, so some TTRP segments have years with spending gaps.
3. TTRP cost estimates reflect stop amenity investments of $500,000 per mile; however, additional work is needed to identify specific investments.
4. NextMuni unit cost does not include the cost of connecting signs to power, which is the contractor's responsibility.
5. Overhead wire cost estimates can vary significantly depending on the location's foundation requirements.
6. Estimate based on Metropolitan Transportation Commission's bus-van price list.
7. Estimate based on December 2009 service changes
8. Estimate was informed by 1995 key stops' final contract costs.

TABLE 4-3: TEP CAPITAL COST ESTIMATE SUMMARY (YEAR-OF-EXPENDITURE DOLLARS)

TEP Ref #	Proposal Name	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	TOTAL
SF Project Milestones					Market St Resurfacing	Van Ness BRT, Doyle Drive Reconstruction Project		Geary BRT		Central Subway		
TEP Milestones				Phase 1 updates		Phase 2 updates						
SERVICE IMPROVEMENTS[1]												
SI.1	Start-Up Costs – Phase 1	—	—	—	212,000	—	—	—	—	—	—	212,000
SI.2	Start-Up Costs – Phase 2	—	—	—	—	—	220,000	—	—	—	—	220,000
Subtotal												**434,000**

1 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.

TABLE 4-3: TEP CAPITAL COST ESTIMATE SUMMARY (YEAR-OF-EXPENDITURE DOLLARS) (CONT'D)

TEP Ref #	Proposal Name	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	TOTAL
SF Project Milestones					Market St Resurfacing	Van Ness BRT, Doyle Drive Reconstruction Project		Geary BRT		Central Subway		
TEP Milestones				Phase 1 updates		Phase 2 updates						
TRAVEL TIME REDUCTION PROPOSALS												
TTRP.30_1	Stockton St and Kearny St (30, 45)	—	322,000	1,250,000	—	—	—	—	—	—	—	1,572,000
TTRP.30_2	North Point St and Columbus Av (30)	—	1,513,000	2,602,000	—	—	—	—	—	—	—	4,115,000
TTRP.9_2	San Bruno Av (8X, 8AX, 9)	—	91,000	923,000	—	—	—	—	—	—	—	1,014,000
TTRP.N_1	Irving St and Carl St (N)	—	107,000	385,000	1,521,000	—	—	—	—	—	—	2,013,000
TTRP.14_2	Inner Mission St (14, 14L, 14X)	—	548,000	844,000	1,907,000	—	—	—	—	—	—	3,299,000
TTRP.14_3	Outer Mission St (14, 14L, 14X)	—	929,000	1,637,000	3,667,000	—	—	—	—	—	—	6,233,000
TTRP.28_2	19th Av Richmond-Sunset Districts (28, 28L)	—	731,000	1,151,000	3,417,000	—	—	—	—	—	—	5,299,000
TTRP.M_28	19th Av-Stonestown/SFSU (M, 28)	—	—	—	192,000	918,000	—	—	—	—	—	1,110,000
TTRP.14_1	Mission St east of Van Ness (14, 14L, 14X)	—	—	31,000	164,000	1,314,000	—	—	—	—	—	1,509,000
TTRP.8X_1	Geneva (8X, 43, 54, 29, 8BX)	—	—	218,0000	916,000	2,623,000	—	—	—	—	—	3,757,000
TTRP.5_1	Fulton St and McAllister (5)	—	203,000	524,000	1,347,000	5,555,000	—	—	—	—	—	7,629,000
TTRP.22_2	16th St (22)	—	—	—	381,000	659,000	1,442,000	—	—	—	—	2,482,000
TTRP.28_1	Lombard St (28)	—	—	—	—	411,000	1,557,000	—	—	—	—	1,968,000

TABLE 4-3: TEP CAPITAL COST ESTIMATE SUMMARY (YEAR-OF-EXPENDITURE DOLLARS) (CONT'D)

TEP Ref #	Proposal Name	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	TOTAL
SF Project Milestones					Market St Resurfacing	Van Ness BRT, Doyle Drive Reconstruction Project		Geary BRT		Central Subway		
TEP Milestones				Phase 1 updates		Phase 2 updates						
TRAVEL TIME REDUCTION PROPOSALS												
TTRP.9_1	11th St, Potrero Av and Bayshore Blvd (9)	—	—	—	—	530,000	2,448,000	—	—	—	—	2,978,000
TTRP30_3	Chestnut St (30)	—	—	—	—	—	263,000	1,403,000	—	—	—	1,666,000
TTRP.1_2	California St (1, 1AX, 1BX)	—	—	—	170,000	347,000	1,975,000	4,356,000	—	—	—	6,848,000
TTRP.22_1	Fillmore St (22)	—	—	—	307,000	1,313,000	2,029,000	4,328,000	—	—	—	7,977,000
TTRP.N_2	Judah St (N)	—	—	—	—	684,000	628,000	4,045,000	—	—	—	5,357,000
TTRP.L_1	Taraval St (L)	—	—	—	—	798,000	653,000	1,305,000	1,610,000	—	—	4,366,000
TTRP.K_1	Ocean Av (K)	—	—	—	—	—	—	193,000	1,343,000	—	—	1,536,000
TTRP.J_1	Church St (J)	—	—	—	—	456,000	373,000	1,464,000	2,283,000	—	—	4,576,000
TTRP.71_1	Haight St (6, 71,71L)	—	—	—	—	—	—	358,000	609,000	2,478,000	—	3,445,000
TTRP.1_1	Sacramento St and Clay St (1)	—	—	—	—	—	—	—	791,000	1,966,000	—	2,757,000
TTRP.71_2	Noriega/22nd/ 23rd St and Lincoln Way (71L)	—	—	—	—	—	133,000	273,000	589,000	2,730,000	—	3,725,000
Subtotal												**87,231,000**

TABLE 4-3: TEP CAPITAL COST ESTIMATE SUMMARY (YEAR-OF-EXPENDITURE DOLLARS) (CONT'D)

TEP Ref #	Proposal Name	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	TOTAL
SF Project Milestones					Market St Resurfacing	Van Ness BRT, Doyle Drive Reconstruction Project		Geary BRT		Central Subway		
TEP Milestones				Phase 1 updates		Phase 2 updates						
SYSTEMWIDE CAPITAL IMPROVEMENTS												
SCI.1	Accessible Rail Platforms	—	203,000	571,000	1,166,000	2,388,000	2,139,000	1,563,000	640,000	—	—	8,670,000
SCI.2	NextMuni Signage	—	320,000	327,000	334,000	342,000	167,000	170,000	174,000	178,000	182,000	2,194,000
SCI.4	Sansome Contraflow Extension	—	—	78,000	—	—	—	—	—	—	—	78,000
SCI.5	Additional Cameras and Monitoring Equipment	—	—	26,000	93,000	95,000	—	—	—	—	—	214,000
SCI.6	Community Connector Vans	—	—	—	318,000	1,302,000	1,111,000	—	—	—	—	2,731,000
SCI.7	Installation of TSP Equipment at Non-TTRP Intersections	—	—	—	796,000	815,000	835,000	854,000	873,000	917,000	—	5,090,000
Subtotal												**17,958,000**

TABLE 4-3: TEP CAPITAL COST ESTIMATE SUMMARY (YEAR-OF-EXPENDITURE DOLLARS) (CONT'D)

TEP Ref #	Proposal Name	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	TOTAL
SF Project Milestones					Market St Resurfacing	Van Ness BRT, Doyle Drive Reconstruction Project		Geary BRT		Central Subway		
TEP Milestones				Phase 1 updates		Phase 2 updates						
TERMINAL AND TRANSFER POINT IMPROVEMENTS												
TTPI.1	Van Ness & North Point Hub & Bus Terminal	—	168,000	228,000	758,000	—	—	—	—	—	—	1,154,000
TTPI.2	Daly City Bus Terminal and Transfer Point Improvements	—	457,000	622,000	1,441,000	640,000	—	—	—	—	—	3,160,000
TTPI.3	Lee St Terminal for 52	—	—	10,000	—	—	—	—	—	—	—	10,000
TTPI.4	E Line Independent Terminal at Beach/Jones	—	—	—	—	—	556,000	739,000	4,129,000	—	—	5,424,000
TTPI.6	Balboa Park BART Station Pedestrian Improvement (Ocean Ave)	91,000	—	—	—	—	—	—	—	—	—	91,000
TTPI.7	Lyon/Richardson Bus Stop – Transfer Point	—	—	156,000	—	—	—	—	—	—	—	156,000
TTPI.8	SFGH Transfer Point	—	—	—	11,000	125,000	—	—	—	—	—	136,000
Subtotal												**10,131,000**

TABLE 4-3: TEP CAPITAL COST ESTIMATE SUMMARY (YEAR-OF-EXPENDITURE DOLLARS) (CONT'D)

TEP Ref #	Proposal Name	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	TOTAL
SF Project Milestones					Market St Resurfacing	Van Ness BRT, Doyle Drive Reconstruction Project		Geary BRT		Central Subway		
TEP Milestones				Phase 1 updates		Phase 2 updates						
OVERHEAD WIRE EXPANSION												
OWE.1	New Overhead Wiring – Reroute 33 on to Valencia	—	203,000	363,000	1,483,000	—	—	—	—	—	—	2,049,000
OWE.2	Bypass Wires at Various Terminal Locations	—	51,000	156,000	212,000	543,000	389,000	341,000	—	—	—	1,692,000
OWE.3	New Overhead Wiring – 6 Parnassus on Stanyan St.	—	203,000	622,000	4,238,000	271,000	—	—	—	—	—	5,334,000
OWE.4	5 Limited/Local Bypass Wires	—	—	140,000	191,000	635,000	—	—	—	—	—	966,000
OWE.5	22 Fillmore Extension to Mission Bay	—	—	1,224,000	2,416,000	9,203,000	622,000	—	—	—	728,000	14,193,000
OWE.6	New Overhead Wiring – 6 Ext to West Portal	—	—	—	—	—	222,000	1,989,000	4,013,000	15,216,000	1,214,000	22,654,000
Subtotal												**46,888,000**

TABLE 4-3: TEP CAPITAL COST ESTIMATE SUMMARY (YEAR-OF-EXPENDITURE DOLLARS) (CONT'D)

TEP Ref #	Proposal Name	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	TOTAL
SF Project Milestones					Market St Resurfacing	Van Ness BRT, Doyle Drive Reconstruction Project		Geary BRT		Central Subway		
TEP Milestones				Phase 1 updates		Phase 2 updates						
LONG-TERM INVESTMENT STUDIES												
LIS.1	Comprehensive Communications Plan	—	203,000	104,000	212,000	109,000	222,000	—	—	—	—	850,000
LIS.2	Traction Power System Upgrade Study	—	254,000	311,000	—	—	—	—	—	—	—	565,000
LIS.3	Long-Range Rail System Plan	—	—	311,000	742,000	—	—	—	—	—	—	1,053,000
LIS.4	Environmental Review Process	500,000	508,000	—	—	—	—	—	—	—	—	1,008,000
Subtotal												**3,476,000**
	TOTAL	**591,000**	**7,014,000**	**14,814,000**	**28,612,000**	**32,076,000**	**17,986,000**	**23,381,000**	**17,054,000**	**23,485,000**	**2,124,000**	
											GRAND TOTAL	**167,137,000**

Capital Proposals' Sequencing Approach

The following section describes how the capital proposals sequencing decisions were determined.

Travel Time Reduction Proposals

To develop TTRP, the Rapid Network routes were divided into corridor segments, ranging from one to six miles, to produce coherent, workable segments. Each toolbox element was given an estimated cost and travel time savings based on Agency experience and best practices. For example, adding a transit bulb was assumed to save five seconds per installation and cost $200,000. Staff evaluated each corridor segment and developed conceptual proposals by applying the TTRP toolbox. The travel time savings and cost of each toolbox element were summed to develop a conceptual cost and impact for each corridor segment.

The implementation of TTRP would be phased over seven years between FY 13 and FY 19. The corridor segment approach described above enabled data-based analysis to prioritize routes based on their cost-effectiveness (customer-seconds saved per dollar spent) and travel-time savings (percent reduction in travel time). The phasing schedule was then modified to allow for coordination with other efforts underway, such as repaving or rail replacement.

While an initial, basic concept was developed for each corridor segment for the purposes of cost estimation and phasing, these concepts would be further developed and vetted. Additional concepts would be developed for most corridors to provide a range of options, from a basic alternative that provides essential travel-time improvements, while minimizing parking and traffic circulation impacts, to a more premium alternative that could bring additional travel-time savings though a higher cost or more changes to parking and traffic circulation.

Remaining Capital Proposals

Remaining capital proposals include the systemwide capital improvements, terminal and transfer point improvements, overhead wire expansion, and long-term investment studies. These proposals were sequenced based on a combination of the following factors:

- Supportive of TEP goals
- Predecessor for service change
- Project impact (e.g., number of customers affected)
- Stage of project development or readiness
- Project complexity (including both technical, political and community)

- Project cost
- Level of funding available
- Required coordination with other projects

4.2 O&M Cost Summary

The service improvements and capital investments would have O&M cost and savings implications. The following sections describe how the estimated O&M costs and savings would likely balance throughout the TEP timeframe.

Service Improvements' O&M Cost Implications

The TEP route recommendations represent a net increase in service hours, on the order of a 5- to 10-percent increase. 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. The SFMTA would need to examine proposed budgets as proposals move towards implementation in terms of service hours provided, and should continue in the process of identifying new, critical operating dollars for the system in the effort to achieve the TEP goals.

During the TEP planning phase, the service recommendations were presented as operating cost-neutral, with the FY 2008 budget as the baseline for operating service hours available. The FY 2008 operating budget included increased spending to support TEP, which was never realized because the SFMTA experienced budget reductions and has, accordingly, delivered fewer service hours to customers.

Capital Proposals' O&M Cost Implications

It is important to note that many of these capital proposals would have O&M implications. In some cases, there would be significant O&M costs associated with the capital investments. For example, there would be costs and complexities associated with introducing a new fleet (vans), which would require new materials and appropriately trained staff. Also, additional employees would be needed to monitor proposed camera output and maintain any additional track, facilities, or overhead wire. On the other hand, many of the capital proposals could have O&M cost savings. TTRP would reduce running time and, additionally, reduce maintenance costs through decreased starts and stops. In some cases, the terminal improvements could reduce operating costs by reducing non-revenue time circulating around the terminal (e.g., Daly City Terminal).

4.3 Funding Options

The TEP proposals would be funded through a variety of federal, state and local sources. Table 4-4 summarizes the TEP capital initiatives' available funding.

TABLE 4-4: CURRENT CAPITAL FUNDING SUMMARY

Category	Capital Cost Estimates (YOE $)	Existing Funding	Funding Source	Funding Amount Allocated
Environmental Review	$434,000*	X	Prop C & FTA	$1,000,000
Travel Time Reduction Proposals	$87,231,000	X	Prop K & FTA	$12,300,000
Systemwide Capital Investments	$18,977,000		N/A	$0
Terminal and Transfer Point Improvements	$10,131,000	X	Safe Routes to Transit	$91,000
Overhead Wire Expansion	$46,888,000	X	SFCTA – Prop. K – EP 10	$2,996,000
Long-Term Investment Studies	$3,476,000	X	SFCTA – Prop. K – EP 43	$300,000
TOTAL ESTIMATE	**$167,137,000**			**$16,687,000**

* 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.

Capital Proposals

In order to be prioritized for funding, the SFMTA capital proposals must be included in the SFMTA Capital Plan. The Capital Plan provides a strategic connection between needs identified during the TEP planning phase and the SFMTA's capital budget, which allows planners and policy-makers to understand all of the SFMTA's capital project needs and prioritize projects to be submitted for funding applications. There is some local sales tax (Proposition K) funding and federal funding allocated that could be used to leverage future funding grants. The funds available will be used to complete the TEP environmental review process, which will be a critical project milestone. Funding will also be available to complete some aspects of project development, including detailed design, conceptual engineering, and construction; however, more funding would be needed to fully implement the TEP.

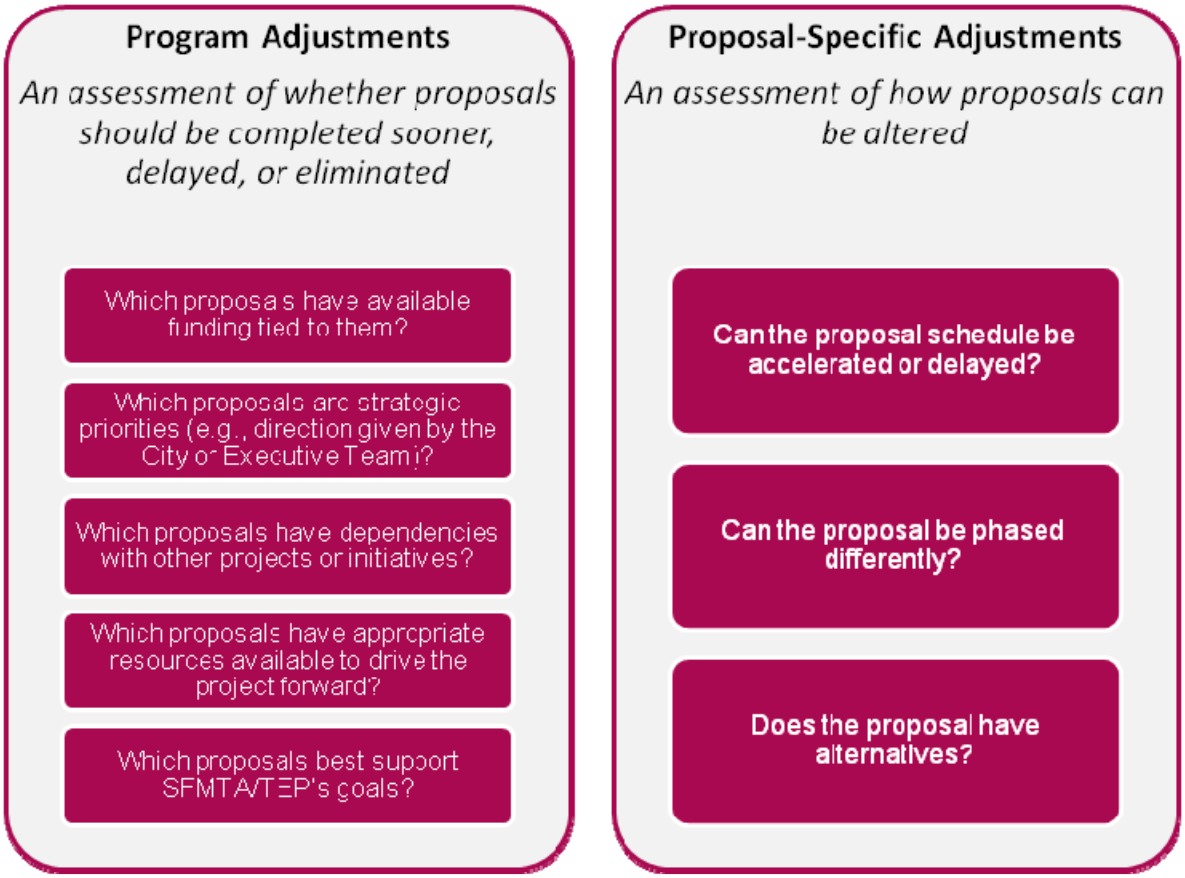
Service Improvements

The service improvements, including route updates and schedule changes, would require additional operating funding. During the FY 12 and FY 14 operating budget development, it will be vital for the TEP Program Manager to work with the Service Planning Team to re-evaluate all of the proposed TEP service improvements and assess the net operating costs. Once identified, this group will work with the Finance Team to identify appropriate funding sources and adjust the service improvements, as needed.

Approach for Maximizing Available Funding

This strategy was developed by assuming a modest amount of funding will be available on an annual basis; however, it is likely that more or less funding could be available throughout this timeframe. Considering this uncertainty, the TEP Program Manager and Finance Working Group (see *Roles and Responsibilities section*) will revisit the timing and approach to deliver the TEP initiatives (with input from the Executive Team and Implementation Task Force) on a regular basis to maximize the funding available. The TEP Program Manager should assess funding levels annually and evaluate the individual proposals and overall program based on the considerations outlined in Figure 4-1.

FIGURE 4-1: PROPOSAL AND PROGRAM EVALUATION BASED ON AVAILABLE FUNDING[8]



[8] Alternatives not analyzed in a completed environmental review would require an assessment as to level of environmental review.

5. IMPLEMENTATION REQUIREMENTS

There are many additional implementation activities and requirements needed to ensure successful implementation of the TEP proposals, including staff assignments, policy decisions, planning studies, and internal and external communications and approvals. The following section describes these requirements.

5.1 Implementation Schedule

There are many people and activities required to come together to implement the program successfully. The SFMTA will need to dedicate resources, both staff and funding, to support the TEP; communication with stakeholders will need to occur methodically throughout the nine-year timeframe; approvals will be needed both within and external to the SFMTA; and the initiatives will need to be planned, designed and constructed. To ensure that all of the many moving pieces are coordinated, implemented and communicated within the appropriate timeframes, the Project Team developed a proposed implementation schedule. It is organized into the following five sections:

- Internal coordination and approvals
- External communications, coordination, and approvals
- Capital project development
- Service improvements
- Ongoing TEP Activities

Figure 5-1 and Table 5-1 presents the implementation schedule and capital project development schedule highlights. Additional information about implementation requirements are found in the following section.

FIGURE 5-1: HIGH-LEVEL IMPLEMENTATION SCHEDULE

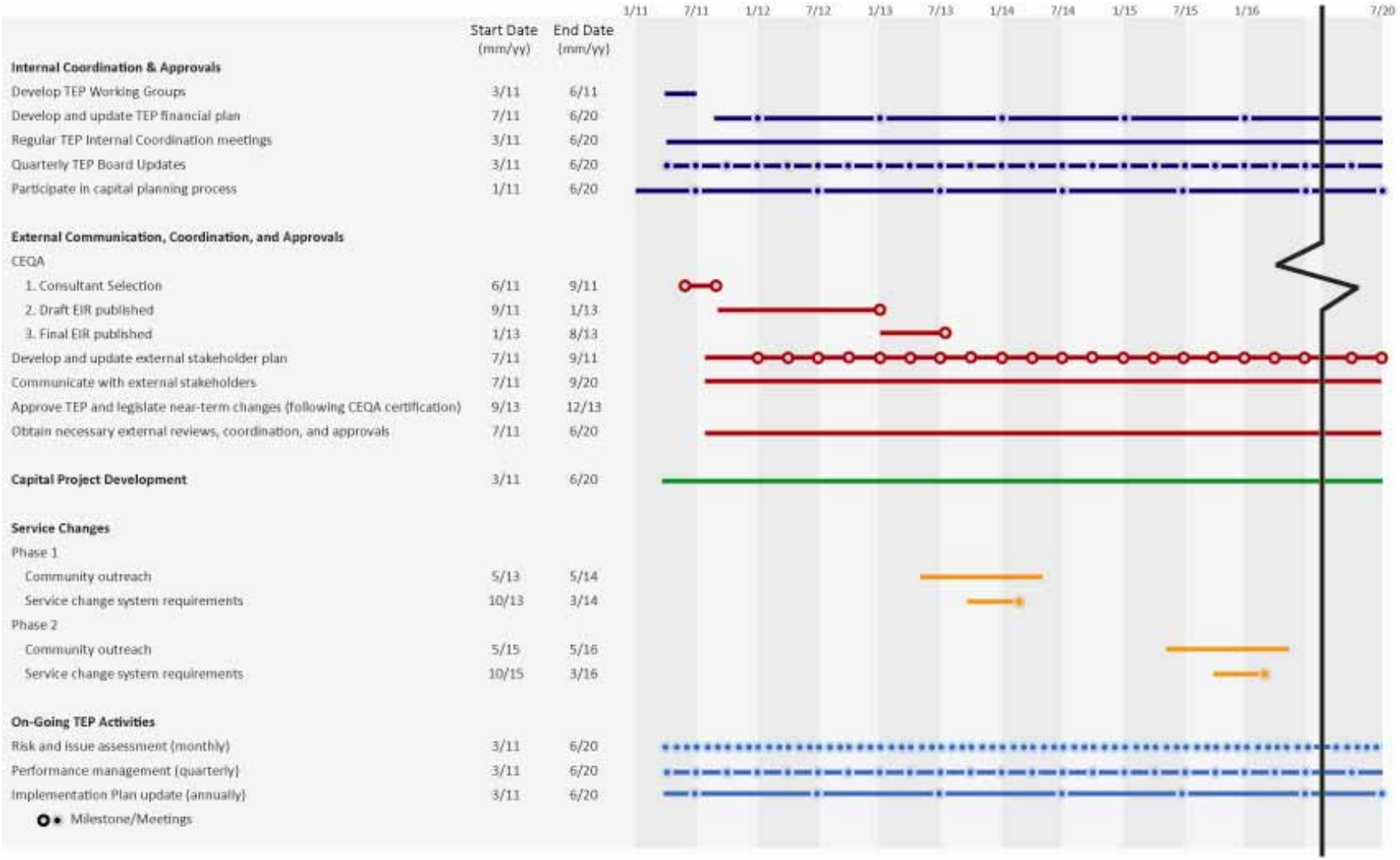


TABLE 5-1: HIGH-LEVEL CAPITAL PROPOSAL DEVELOPMENT SCHEDULE

	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
SERVICE IMPROVEMENTS				**SI.1:** Start-Up Costs – Phase 1		**SI.2:** Start-Up Costs – Phase 2				
TRAVEL TIME REDUCTION PROPOSALS			**TTRP.30_1:** Stockton St and Kearny St (30, 45) **TTRP.30_2:** North Point St and Columbus Av (30) **TTRP.9_2:** San Bruno Av (8X, 8AX, 9)	**TTRP.N_1:** Irving St and Carl St (N) **TTRP.14_2:** Inner Mission St (14, 14L, 14X) **TTRP.14_3:** Outer Mission St (14, 14L, 14X) **TTRP.28_2:** 19th Av Richmond-Sunset Districts (28, 28L)	**TTRP.M_28:** 19th Av-Stonestown/SF SU (M, 28) **TTRP.14_1:** Mission St east of Van Ness (14, 14L, 14X) **TTRP.8X_1:** Geneva (8X, 43, 54, 29, 8BX) **TTRP.5_1:** Fulton St and McAllister (5)	**TTRP.22_2:** 16th St (22) **TTRP.28_1:** Lombard (28) **TTRP.9_1:** 11th St, Potrero Av and Bayshore Blvd (9)	**TTRP30_3:** Chesnut St (30) **TTRP.1_2:** California St (1, 1AX, 1BX) **TTRP.22_1:** Filmore St (22) **TTRP.N_2:** Judah St (N)	**TTRP.L_1:** Taraval St (L) **TTRP.K_1:** Ocean Av (K) **TTRP.J_1:** Church St (J)	**TTRP.71_1:** Haight St (6, 71,71L) **TTRP.1_1:** Sacramento St and Clay St (1) **TTRP.71_2:** Noriega/22nd/ 23rd St and Lincoln Way (71L)	
SYSTEM-WIDE CAPITAL IMPROVEMENTS		**SCI.2:** NextMuni Signage (implemented over many years)	**SCI.4:** Sansome Contraflow Extension		**SCI.5:** Additional Cameras and Monitoring Equipment **SCI.1:** Accessible Rail Platforms (implemented over many years)	**SCI.6:** Community Connector Vans			**SCI.7:** TSP – Installation of Detection Equipment at Intersections	

TABLE 5-1: HIGH-LEVEL CAPITAL PROPOSAL DEVELOPMENT SCHEDULE (CONT'D)

	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
TERMINAL AND TRANSFER POINT IMPROVEMENTS	**TTPI.6:** Balboa Park BART Station Pedestrian Improvement (Ocean Ave)		**TTPI.3:** Lee St Terminal for 52 **TTPI.7:** Lyon/Richards on Bus Stop – Transfer Point	**TTPI.1:** Van Ness & North Point Hub & Bus Terminal	**TTPI.2:** Daly City Bus Terminal Improvements **TTPI.8:** SFGH Transfer Point			**TTPI.4:** E Line Independent Terminal at Beach/Jones		
OVERHEAD WIRE EXPANSION				**OWE.1:** New Overhead Wiring – Re-route 33 on to Valencia	**OWE.3:** New Overhead Wiring – 6 Parnassus on Stanyan St. **OWE.4:** 5 Limited/Local Bypass Wires	**OWE.5:** 22 Fillmore Extension to Mission Bay (Phase 1)	**OWE.2:** Bypass Wires at Various Terminal Locations			**OWE.5:** 22 Fillmore Extension to Mission Bay (Phase 2) **OWE.6:** New Overhead Wiring – 6 Ext to West Portal
LONG-TERM INVESTMENT STUDIES			**LIS.2:** Traction Power System Upgrade Study	**LIS.3:** Long-Range Rail System Plan		**LIS.1:** Comprehensive Communications Plan				

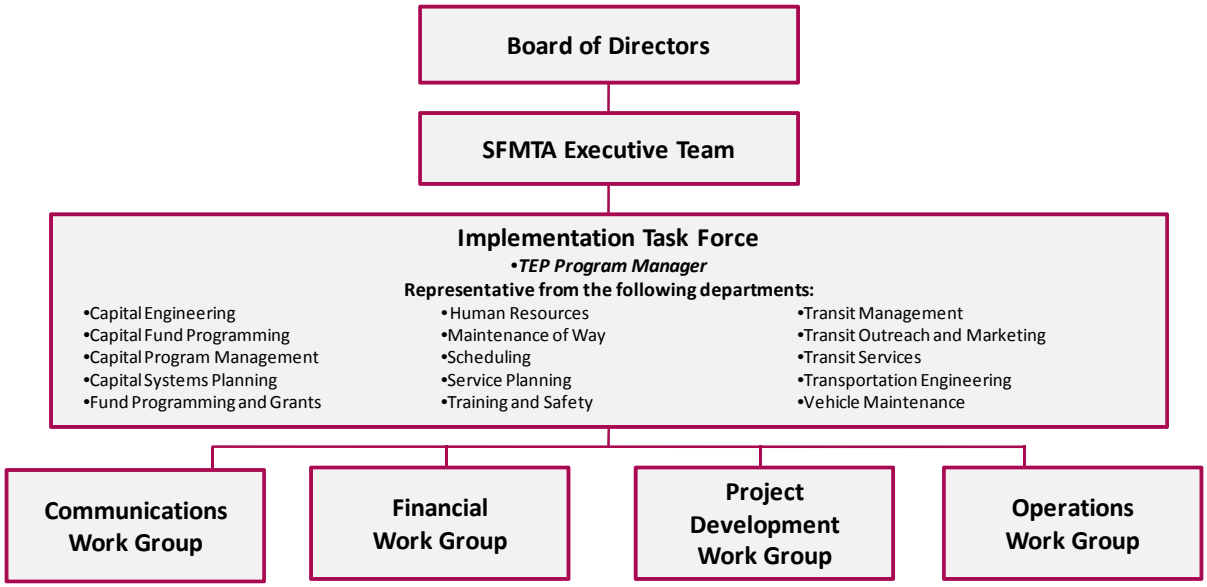
5.2 Internal Coordination and Approvals

The following section describes the people, processes, approvals and communications necessary to implement the TEP.

Roles and Responsibilities

As shown in Figure 5-2, the SFMTAB will be responsible for the overall success of the TEP, with appropriate support coming from the Executive Team, Implementation Task Force and work groups.

FIGURE 5-2: TEP PROPOSED ORGANIZATION CHART



Their roles would include:

- **SFMTAB** – The SFMTAB is ultimately responsible for the overall success of the program's implementation. The SFMTAB would approve the TEP proposals (after the environmental review process is certified), approve policies that are TEP-supportive, determine whether to proceed with proposed projects at appropriate times once environmental review has been completed, and allocate appropriate resources to ensure successful implementation. An inherent risk of the Implementation Strategy is that individual concerns articulated through stakeholders or policymakers would dilute the benefits of the comprehensive strategy. It will be critical for the SFMTAB to communicate and reinforce that transit is a network and not a series of local issues.

- **SFMTA Executive Team** – The SFMTA Executive Team, led by the Executive Director/Chief Executive Officer and his/her direct reports, will provide the policy direction and resources needed to support the TEP implementation. This team would also follow the status of the TEP (as reported by the TEP Program Manager), assist in addressing relevant risks and issues as they arise, and communicate, as needed, with the SFMTAB and other stakeholders.
- **TEP Program Manager** – The TEP Program Manager will be 100 percent dedicated to the TEP implementation and will be the program's biggest champion. The TEP Program Manager will report to the Director of Transit and will make decisions based on the policy direction provided by the SFMTAB and Executive Team. Coordinating with various multi-disciplinary working groups, the TEP Program Manager will focus on integrating the concepts of the TEP into transit management and service planning, capital planning and project development, and ensuring environmental review and certifications of the TEP, as appropriate. The TEP Program Manager will serve as the champion for the TEP and will focus on optimizing the TEP recommendations throughout the transit system. Consistent with the TEP Program Manager job description, responsibilities of the TEP Program Manager include the following:
  - Manage the Implementation Task Force (see below).
  - Coordinate the Work Groups (see below).
  - Manage the environmental review process.
  - Lead the project approval process following environmental certification.
  - Communicate with internal and external stakeholders.
  - Deliver service improvements and capital projects based on funding availability and informed by the TEP Implementation Strategy.
  - Update the Master Schedule based on policy direction, resources, and approvals.
  - Re-assess funding and staffing requirements on a quarterly basis.

  It will be the responsibility of the TEP Program Manager to work with the Executive Team to address these challenges as they relate to TEP implementation.
- **Implementation Task Force** – This group, led by the TEP Program Manager, will be composed of the SFMTA staff who represent each of the key functions involved with implementing the TEP. These Task Force members will establish the TEP direction and supervise their teams as they implement their respective aspects of the TEP. They will also monitor the performance of

the TEP projects as they are developed and implemented. The Implementation Task Force will provide a centralized group for TEP leaders to communicate coordinate and capture lessons learned throughout the duration of TEP implementation. Members of this team will include representatives from Capital Engineering, Capital Fund Programming, Capital Program Management, Capital Systems Planning, Fund Programming and Grants, Human Resources, Maintenance of Way, Scheduling, Service Planning, Training and Safety, Transit Management, Transit Outreach and Marketing, Transit Services, Transportation Engineering, and Vehicle Maintenance. This group is providing indirect support to the TEP, but they will need to draw upon their staff resources, as identified in the staffing plan (see see *Staffing Requirements* section).

- **Work Groups** – Action on specific TEP Implementation strategy tasks will be proposed by the Implementation Task Force, approved by the Executive Team, and subsequently assigned to this work group to develop and carry out detailed action plans to implement tasks. Action plans will include detailed documentation regarding targeted strategies, milestones, activities, roles and responsibilities, and risks and issues. The action plans will need to be approved by the TEP Program Manager, and then progress against the established goals will need to be reported to the TEP Program Manager regularly. The following describes the four work groups that will be necessary (at a minimum):
  - **Communications Work Group** – Led by the Transit Outreach Manager, this group will set the strategy, and coordinate and implement all communications, marketing, and stakeholder outreach associated with the TEP. This group will be expected to be actively engaged throughout the nine-year implementation period.
  - **Financial Work Group** – Led by the Fund Programming Manager, this group will work with the TEP Program Manager to fund the initiatives described earlier in this strategy document. The Financial Work Group will develop and update a financial strategy (this group's version of an action plan) that identifies potential funding sources (both capital and operating) and strategies for pursuing them. This group would be expected to be actively engaged throughout the nine-year implementation period.
  - **Project Development Work Group** – Led by the TEP Capital Project Manager (a proposed new position; see *Staffing Requirements* section for more information), this Work Group leader will ensure that the capital proposals are developed according to the schedule outlined in this strategy document.

- **Operations Work Group** – Led by an Operations manager, this group will ensure that all TEP service improvements are evaluated and implemented appropriately, and that all other TEP initiatives are fully integrated into the SFMTA's operations.

Work group leaders will be members of the Implementation Task Force, which will ensure full communication between the many SFMTA divisions involved.

Staffing Requirements (from FY 11 – FY 13)

The first two years of TEP implementation will involve the following major implementation activities:

- *Program Management.*
- *Environmental Clearance*.
- *Financial Strategy Development and Implementation*.
- *Communications Strategy Development and Implementation*.
- *Phase 1 Service Improvements' Development*, which would include the evaluation and implementation of route updates and other schedule changes.
- *TTRP Development*, which would include up to $14 million on the design of eleven corridors and initiating construction for three corridors.
- *Capital Proposals Development*, which would include the initiation of three planning studies, design and engineering of five overhead wire projects ($3 million), and almost $2 million in Systemwide Capital Improvements.

To successfully complete these activities and effectively prepare for later activities, the SFMTA will need to identify and fund an appropriate level of dedicated staff and/or consultant resources. It will be vital for the TEP Program Manager to work with the Executive Team to ensure that the appropriate quantities of staff with specific skill sets have the time available to support the TEP. Table 5-2 describes the staff requirements (including both existing and new as well as consulting resources) associated with each of the first few years' major implementation activities[9]. Note: the time requirements associated with these positions can include ranges because the staff time commitments will vary depending on which activities are occurring.

[9] As the plans progress towards detailed design and construction, additional staffing will be needed within SFMTA as well as in partner City agencies, such as Department of Public Works.

TABLE 5-2: TEP STAFFING REQUIREMENTS IN FY 11 – FY 13

Major Implementation Activities	Relationship to Organization Chart	Existing Staff Requirements	New/Redirected Staff or Consultant Support Requirements
Program Management • Support information exchange between various work groups. • Assists in TEP orientation of new staff. • Updates project status reports and SFMTAB materials. • Supports capital planning process and any requirements associated with funding sources. • Updates risk management document. • Updates performance management approach and tracks metrics. • Updates TEP Implementation Strategy.	• Program Management Team	• TEP Program Manager (100%)	• 1 mid-level planner (100%) • 1 junior planner (100%)
Environmental Clearance • Support MEA throughout environmental review process. • Updates project status reports and SFMTAB materials.	• Program Management Team	• Needs addressed with staff described above in Program Management	• Needs addressed with staff described above in Program Management
Financial Strategy Development and Implementation • Develops and updates TEP Financial Strategy. • Assists in shaping TEP initiatives to best match available funding. • Develops grant applications and reports. • Communicates with TEP Implementation Task Force.	• Financial Work Group	• 1 senior finance specialist (0-20%) • 1 mid-level finance specialist (0-50%)	• N/A

TABLE 5-2: TEP STAFFING REQUIREMENTS IN FY 11 – FY 13 (CONT'D)

Major Implementation Activities	Relationship to Organization Chart	Existing Staff Requirements	New/Redirected Staff or Consultant Support Requirements
Communications Strategy Development and Implementation • Develops and updates Communications Strategy. • Implements TEP Comprehensive Communications Plan and coordinates with other agency branding initiatives. • Supports the implementation of Phase 1 service improvements. • Communicates with TEP Implementation Task Force.	• Communicat-ions Work Group	• 1 senior communications and outreach specialist (50-75%)	• 1 mid-level communications and outreach specialist (25-50%) • Consultant firm support for marketing strategy development
Phase 1 Service Improvements Development • Re-evaluates Phase 1 service improvements six to nine months before implementation. Coordinates with Operations and Finance Work Groups and ensures consistency with TTRP and capital projects. • Develop cost estimates for proposed Phase 1 service improvements in coordination with Finance Work Group. • Coordinate proposed service improvements with Service Planning, Operations, Scheduling, Transit Engineering, Training, etc. • Obtain necessary approvals for Phase 1 service improvements. • Implement Phase 1 service improvements.	• Operations Work Group	• 1 senior operations specialist (0-30%) • Senior transit engineering specialist (25-50%) • 7 service planners (100% for 5 months before Phase 1) • 8 schedulers (100% for 5 months before Phase 1) • Training team (100% for 2 months before Phase 1) • Senior maintenance specialist (0-20%)	• 2 mid-level service planning specialist (100%) • 2 schedulers (100% for 5 months before Phase 1)

Table 5-2: TEP Staffing Requirements in FY 11 – FY 13 (cont'd)

Major Implementation Activities	Relationship to Organization Chart	Existing Staff Requirements	New/Redirected Staff or Consultant Support Requirements
TTRP Development • Develop detailed strategies for TTRP corridor segments proposed for implementation in next few years (including scope and budgets). • Coordinate with Finance Work Group to ensure sufficient funding is available. • Coordinate with and seek approvals from Operations, Maintenance, Training, and other departments, as needed to refine projects. • Coordinate with Communications Work Group to conduct appropriate outreach activities. • Update schedules, as needed, to reflect travel time savings. • Conceptual engineering to inform environmental review process.	• Project Development Work Group	• 1 senior transportation engineer (100%) • 1 mid-level transportation engineers (100%) • 2 junior transportation engineers (100%) • 1 junior transportation planner The following staff are incorporated in staff and time requirements described in Service Improvements section above: o Mid-level service planning specialist o Senior operations specialist o Senior maintenance specialist o Senior training specialist	• 1 mid-level transportation engineer • 2 mid-level capital engineers (100%)

Table 5-2: TEP Staffing Requirements in FY 11 – FY 13 (cont'd)

Major Implementation Activities	Relationship to Organization Chart	Existing Staff Requirements	New/Redirected Staff or Consultant Support Requirements
Capital Projects' Development and Implementation • Identify projects to be implemented in next few years. • Develop detailed strategies for each of these projects, including detailed scopes and budgets. • Coordinate with Finance Work Group to ensure sufficient funding is available. • Coordinate with Operations, Maintenance, Training, and other departments, as needed. • Design, engineer, and construct capital projects. • Conceptual engineering to inform environmental review process.	• Project Development Work Group	The following staff are incorporated in staff and time requirements described in Service Improvements section above: o Senior operations specialist o Senior maintenance specialist	• 1 capital project manager (100%) • 2 junior engineers (75-100%) • 2 mid-level engineers (75-100%) • 2 senior engineers (75-100%) • 1 mid-level capital planner

Internal Communications and Approvals

For this strategy to be adequately funded, staffed and endorsed, it is vital that the SFMTA's staff, Executive Team, and SFMTAB are appropriately informed throughout the implementation. Table 5-3 summarizes the internal communications that should occur throughout the program's duration.

TABLE 5-3: TEP COMMUNICATIONS APPROACH

Participants	Discussion Topics and Approvals
SFMTAB	The TEP Program Manager should describe progress towards strategy milestones, upcoming activities, and any risks and issues at its quarterly update meeting. SFMTAB approvals would be needed at the following key TEP milestones: • TEP approval following environmental certification • TEP-supportive policy review • TEP funding decisions • Capital project development • Service improvements (Phases 1 and 2)
SFMTA Executives	At the onset, the TEP Program Manager would present the TEP Implementation Strategy to the SFMTA Executive Team for feedback and approval. Consequently, the TEP Program Manager would describe progress against the Strategy's milestones, upcoming activities, and any risks and issues. The Executive Team would provide decision-making and guidance regarding TEP action plans, staff assignments, funding allocation, and external communications.
Implementation Task Force	The TEP Program Manager would communicate Executive Team and SFMTA SFMTAB direction, and the other Task Force members would discuss progress against TEP action plans. TEP risks and issues would be assessed at these meetings.
Work Groups	The work groups' discussions should focus on progress against action plans and risks and issues.

Funding Process

The TEP requires a Financial Strategy to be developed, which would outline all dedicated and potential funding sources for TEP initiatives (both capital and service investments). The TEP Financial Work Group (working with the TEP Program Manager) would develop and update the Financial Strategy as funding opportunities arise. Coordination with the SFMTA's funding partners, including the San Francisco County Transportation Authority (SFCTA), the Metropolitan Transportation Commission (MTC) and the Federal Transit Administration (FTA), will be vital to ensure new funding sources are identified and secured. The Financial Work Group should also work to best align TEP funding needs with other Agency priorities, such as bicycle and pedestrian plans or parking management goals, in order to

successfully deliver the strategy proposals. The Financial Strategy should be updated every two years as part of the Agency's budget process.

Policy Decisions

Policy direction will continue to be needed as TEP implementation progresses. As needed, the Implementation Task Force would brief the Executive team to ensure consistency with all other SFMTA programs. For example, new technology investments may require a policy decision as technological innovations are identified.

5.3 External Communications, Coordination, and Approvals

The following section describes the TEP activities that involve external stakeholders (organizations and people outside of the Agency). It will be vital to communicate with all relevant City agencies, stakeholder groups, and the public as well as to obtain necessary approvals for implementing all aspects of the TEP.

Environmental Review Process

Critical to the TEP implementation process is satisfying the requirements for environmental review under the California Environmental Quality Act (CEQA), as well as NEPA for projects pursuing federal funding. The TEP Program Manager will work with the San Francisco Planning Department to ensure that environmental review is appropriately addressed. This strategy assumes the environmental review will occur in 24 months (at an estimated cost of one million dollars), with additional time needed for consultant solicitation; however, this timeline will require executive support, dedicated resources, and political resolve. All dates detailed in this document are subject to change and will likely be modified once the environmental review begins.

Some proposals originally associated with the TEP planning phase, including certain route changes, have already satisfied CEQA requirements and been implemented by the SFMTA. This document reflects the baseline changes since the recommendations of the TEP were endorsed by the SFMTAB for the purposes of environmental review. It is anticipated that certain other elements that were initially associated with the TEP, but may have independent utility and/or may not be subject to CEQA, may also be implemented independently of the TEP. These proposals may be environmentally assessed separately by the Planning Department where appropriate.

For example, studies and planning documents, such as the Comprehensive Communications Plan (LIS.1) and the Traction Power System Upgrade Study (LIS.2) may not be considered projects under CEQA or may be subject to exemption. These studies inform practices that may need environmental assessment, but data

collection and analysis are typically not considered subject to CEQA. Other proposals may be subject to environmental review under CEQA, but are not part of the TEP's proposals or may otherwise appropriately reviewed independently. Examples include:

- **SFMTA policies and guidelines,** which are traditionally recommended by staff and approved by the SFMTA Executive leadership and the SFMTAB.
- **Certain changes to Muni routes,** which have independent utility and whose separate implementation is warranted to further other Agency programs.
- **Traffic engineering measures**, which are part of the Agency's normal business practice and have independent utility, such but not limited to relocating bus stops, installing transit bulb-outs, traffic signal timing changes, and minor adjustments to road geometry.
- **TEP predecessor projects,** such as Historic Streetcar Rehabilitation, were planned and will be funded and environmentally assessed independent of the TEP, but are building blocks for future elements of the TEP Implementation Strategy.

This TEP Implementation Strategy provides a proposed framework for proposal delivery but should not be considered the final description of any project that would be moved forward for review under CEQA. This assessment process will include hiring a consultant, and is estimated to take about two years, including the completion of requisite administrative reviews and approvals.

Additionally, individual TEP initiatives may be subject to the National Environmental Policy Act (NEPA) review if federal funds are used for engineering or construction projects.

SFMTAB Approval

Once the TEP initiatives are certified through the environmental review process, the SFMTAB will have the opportunity to approve the TEP proposals. Estimated to occur towards the end of 2013, the Board would legislate specific TEP proposals, which would allow those proposals to move into detailed design and construction.

External Communications

The TEP Program Manager will work with the Communications Work Group to develop an External Stakeholders Communications Strategy framework within the first six months. In the following years, the Communications Work Group should more fully develop this strategy to include detailed plans for marketing, outreach, and other coordination and communications. The work group will develop key messages and promotional materials capable of transitioning existing and attracting

new customers to the new and revised Muni services. The External Stakeholders Communications Strategy will identify all relevant stakeholders, the approach and timing for communications, and the resources necessary to implement the Strategy. The following considerations should be incorporated into the External Stakeholders Communications Strategy:

- External stakeholders should include, but not be limited to, policymakers, employees, advocacy groups, neighborhood groups and business organizations (including the many chambers and merchants associations), City departments, media, etc.
- The Strategy should include the marketing of the TEP overall strategy and specific projects to ensure that SFMTA customers and other stakeholders understand the significance of these initiatives. An advertising firm would likely develop a marketing strategy for the TEP's recommended hierarchy of service levels (i.e., Rapid Network, Local Network, Community Connectors and Specialized Services).
- The message communicated to stakeholders should be consistent with the Comprehensive Communications Plan, which would be developed as part of the TEP.
- All external communications should be consistent with the Agency and BRT branding efforts.
- The SFMTA should ensure sufficient numbers of skilled staff are dedicated to external communications, including bilingual speakers in Cantonese, Mandarin, Spanish, and, potentially, Russian.
- The Strategy should allow for sufficient "grassroots efforts," or on-the-ground, local outreach, to be undertaken.
- Social media should be incorporated into external communications.

The External Stakeholders Communications Strategy should be reviewed on a quarterly basis, revised as needed, and implemented throughout the duration of TEP implementation.

External Coordination

The TEP would require a significant amount of coordination. External coordination could vary significantly, but would likely include multiple City departments, like the Department of Public Works, and neighborhood groups, advocacy and advisory groups (e.g., Citizens Advisory Council), Pacific Gas and Electric, and other organizations.

5.4 Capital Project Development

All capital projects will need to advance from the planning and environmental stage to construction within the specific timeframe and allocated resources. The Capital Project Manager, in conjunction with the Implementation Task Force, would ensure that all capital projects advance through the appropriate project development stages as documented in Figure 5-3.

FIGURE 5-3: CAPITAL PROJECT DEVELOPMENT PROCESS

The SFMTA is a seasoned organization and has well-established procedures to bring a capital project through this development process; however, the ambitious timeline and number of projects in the TEP would increase the pressure on staff resources when combined with the existing system's large capital program. The following are areas that should be addressed prior to implementation:

- The Project Development Work Group would establish the staff responsible for each stage of project development. It should be clear when and how the project would be handed from one staff member to the next.
- This strategy document proposes a moderately ambitious schedule that could result in peak time periods where preliminary and final design activities would overlap.
- The Capital Project Manager should work closely with the Communications Work Group to ensure that appropriate outreach occurs at appropriate times during project development and implementation.
- The TEP Program Manager should work with the Project Development Work Group and Human Resources to evaluate internal staffing availability and capabilities to determine whether internal resources are adequate on an ongoing basis. Should there be concerns, several options could be considered:
  - Project schedules could be altered to either shorten or lengthen project timelines.
  - On-call resources could be established to support certain activities.
  - Certain projects may be suited to hiring an independent consultant team to complete.

- Resources within the agency could be redirected.

To ensure an efficient delivery of the entire program, the Project Development Work Group's Action Plan should include a strategy for SFMTAB approvals and a strategy for addressing permitting and public review in a way that combines activities and streamlines processes.

5.5 Service Improvements

Before the Phase 1 and 2 service improvements can occur, there are both internal and community outreach requirements that would be required. The Operations and Communications Work Group would be responsible for identifying and implementing all of these activities. Responsibilities of the Operations Work Group involve the following:

- Developing and vetting route schedules based on direction received from the TEP Program Manager and Finance Work Group.
- Distributing the schedules, route and system maps, and bus stop signs, as required.
- Conducting the sign-up process.
- Implementing traffic engineering changes.
- Conducting customer information training for parking control officers, street inspectors, transit fare inspectors, San Francisco Police Department, superintendents, station agents and 311 staff.

Responsibilities of the Communications Work Group include:

- Developing and implementing customer alerts.
- Briefing Muni committees, including the SFMTA Citizens Advisory Council, the Muni Accessibility Advisory Committee, and external stakeholders, including the Board of Supervisors and the Office of the Mayor.
- Updating all schedule information on the intranet and internet.
- Conducting SFMTA's Ambassador Program, which places the SFMTA staff and volunteers at key system locations to distribute brochures and communicate directly with customers in the days prior to and following the service change.
- Sending correspondence from the SFMTAB President and Executive Director/CEO regarding service improvements to stakeholders, elected officials, transit peers, and advocacy groups.
- Leading a mayor's press conference and media briefing/roundtable.

The SFMTA would be able to leverage their experience of their past successful implementation of service changes (including those implemented in December 2009, May 2010, and September 2010).

5.6 Ongoing TEP Activities

The following section describes the activities that would need to take place throughout the TEP implementation. These activities include performance management, risk and issue management, and regular TEP Implementation Strategy updates.

Performance Management

Performance management refers to the activities necessary to ensure that goals are consistently being met in the most effective and efficient way. As noted previously, the TEP focuses on achieving the following goals:

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

The performance of the TEP should be measured before, during and after implementation, and the following section describes the metrics and approach necessary for doing so.

The Implementation Task Force should be compiling performance data (both by route and systemwide) and reporting on performance on a quarterly basis to ensure that TEP initiatives are positively affecting the metrics described below. The metrics would be used to identify high-performing routes that warrant additional service investment and underperforming routes that are candidates for remedial action. For each performance metric, the following tables include an explanation and associated data source. When evaluating metrics, it should be noted that these performance metrics are influenced by many factors external to the TEP initiatives.

<u>Service Reliability</u>

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 less efficient competing modes, especially a single occupant car trip. These metrics examine sources of unreliable service, including traffic congestion, insufficient maintenance staff, and limited vehicle availability. (Examples of these metrics appear in Table 5-4.)

TABLE 5-4: SERVICE RELIABILITY PERFORMANCE METRICS

Metric	Explanation of Metric	Data Source
Percent of trips that have less than a 2-minute spacing between buses (by line and route) Percent of trips where gaps in service exceed scheduled headway by more than 5 minutes (by line and route)*	Waiting time variability	NextMuni
Routes over 12 minutes headway: Late = 1 minute early or 4 minutes late (Prop E. Standard)	Schedule adherence	NextMuni
Mean distance between failures	Frequency of vehicle failure	Central Control and Shops data on field and yard breakdowns
Percentage of missed service hours	Percentage of hours of service not provided that is scheduled	Trapeze Ops (dispatching portion of scheduling software)
Percentage of on-time departures	Schedule adherence	NextMuni
Travel Time Variability	Predictability of time spent on transit	Automatic Passenger Count (APC) data

* This measure will be utilized when Automatic Vehicle Locator (AVL) data has been verified for accurate reporting.

Reduce Travel Time

To make Muni a competitive mode choice, reducing travel time is a priority for customers and transit fleet managers alike. The travel time metric measures the efficiency of a trip from terminal to terminal end, 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. These metrics report on the efficiency of fleet movement in comparison to other mode choices. (Examples of these metrics appear in Table 5-5.)

TABLE 5-5: TRAVEL TIME PERFORMANCE METRICS

Metric	Explanation	Data Source
Average System Speed – Revenue Service	Travel time	APC data
Average and Individual Route Speed – Rapid Corridor Segments	Travel time	APC data

Improve Customer Experience

Accommodating and informing customers traveling, transferring, and waiting in a safe and comfortable manner keeps existing customers using the system and attracts new customers. These metrics report on the ability of Muni to provide comfortable and useful waiting areas and rides. (Examples of these metrics appear in Table 5-6.)

TABLE 5-6: CUSTOMER EXPERIENCE PERFORMANCE METRICS

Metric	Explanation	Data Source
Maximum load in peak and off-peak service	Crowdedness of bus	APC data
Meet customer amenity standards	Provision of waiting facilities	Annual Stop Audit

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. These metrics describe the capacity to provide service when and where it is needed, with the correct number of resources. (Examples of these metrics appear in Table 5-7.)

TABLE 5-7: SERVICE EFFECTIVENESS AND EFFICIENCY PERFORMANCE METRICS

Metric	Explanation	Data Source
Passengers per Revenue Hour	Efficiency of bus service provided	APC data
Pay Hours-to-Platform Hours ratio	Efficiency of schedules	Trapeze
Cost per Unlinked Trip	Cost of providing a trip to customers	APC

Risk and Issue Management

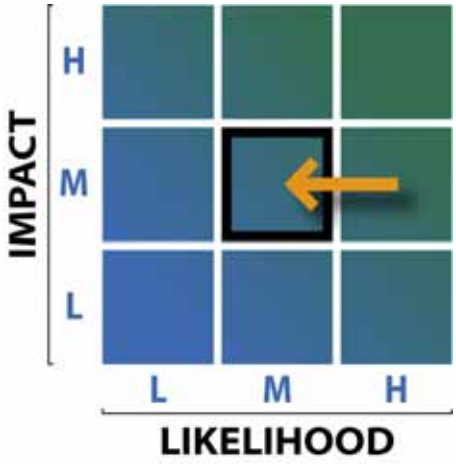
This section describes the activities associated with identifying, assessing, and prioritizing risks and issues throughout the TEP implementation. Risks are outcomes that can potentially be avoided, while issues refer to a current event that requires an action in order to minimize its negative effects. The TEP Program Manager would develop and maintain a Risk Management document, which would include a structured framework for assessing and grouping TEP-related risks and issues, assigning responsibilities, and communicating their status. These risks should reflect a compilation of the risks and issues identified and reported in each work group's action plans.

For example, there is currently no available operations funding to support the service increases associated with the TEP. The TEP Program Manager should assign this risk to someone who can work on incorporating this increased funding need into the next budget cycle. If this risk becomes an issue, the assigned staff person should work with the TEP Program Manager to identify alternatives (e.g., altering or delaying the service improvements) in a manner that still supports the TEP goals.

Risk Identification and Assessment

Risks would include concerns related to the execution of projects but also to the post-implementation activities. Each risk would be evaluated based upon its impact and likelihood. *Risk impact* is a rating (high, medium, or low) of the potential negative consequences that would result if the risk were realized. *Risk likelihood* is a rating (high, medium, or low) of the probability that the risk would be realized. This is shown graphically in the scoring matrix in Figure 5-4. Overall risk area charts with composite risk scores should also be prepared.

FIGURE 5-4: RISK SCORING MATRIX



To illustrate: a risk associated with the TEP is the potential for the TTRP corridor segments to result in less travel time savings than estimated. On a risk scoring matrix, this may have a medium likelihood of occurring; however, the impact could be significant (high), considering the level of customer outreach and investment made in these corridor segments. A risk management document may suggest ways to mitigate this risk by ensuring that the TTRP corridors are implemented gradually, which would ensure that lessons learned can be captured earlier in the TEP implementation timeframe.

Issue Identification and Assessment

The TEP Program Manager, Implementation Task Force, and working groups, would continually monitor the projects, using a variety of techniques to identify trends that might lead to future problems. Early problem identification and continual monitoring would enable the group to implement corrective actions while keeping the overall project impact at a minimum.

Once current and potential issues are identified, the TEP Program Manager should prepare a list of recommendations for decision and action. The approach to defining a recommended course of action would be based on the steps outlined in Figure 5-5.

FIGURE 5-5: RISK MANAGEMENT COURSE OF ACTION

Monitoring unresolved issues and associated action plans is intended to keep the issues visible to the team and help move the issues toward timely resolution. The TEP approach to monitoring issues and associated actions should be based on:

- Communicating the issues and recommendations.
- Defining responsibilities (participating and resolving the issue) and ensuring that issues are being acted upon appropriately. Responsibilities should be defined immediately after issues are identified.
- Facilitating resolution of issues.
- Utilizing tracking tools to monitor status and progress. Tracking tools may be as simple as updating the Risk Management document; however, more sophisticated software can also be utilized.

Risk and Issue Communication

The communication approach with regard to risks and issues should be built upon the following five components:

1. **Regular Project Team Meetings** – Risk and issue identification, strategy development, and progress reporting should be evaluated and discussed during all work group and implementation task force meetings.
2. **Regular Project Management Meetings** – The TEP Program Manager should present a high-level summary of the items discussed in the regular Project Team meetings at the Executive Management meeting.
3. **Formal Reporting** – The TEP Program Manager should document risk and issues in a risk management document that is updated.
4. **Internal Reporting** – The risk management document should be communicated to internal stakeholders, as appropriate.
5. **External Reporting** – Similarly, risks and issues involving or affecting external stakeholders should be reported as well (e.g., the Mayor's Office may need to be debriefed on an issue with high-visibility in the City).

These five components and how they interact are outlined in Figure 5-6.

FIGURE 5-6: RISK AND ISSUE COMMUNICATION STRATEGIES

Regular TEP Implementation Strategy Updates

This TEP Implementation Strategy should be considered a living document that provides the people, processes and tools necessary to implement the TEP over the next nine years. As such, the TEP Program Manager would update this document annually, at a minimum.

6. ORGANIZATIONAL READINESS

The purpose of this section is to determine the SFMTA's level of organizational readiness to implement the TEP as outlined in this strategy document. It is intended to assess the following:

- Is the SFMTA ready and able to deliver the TEP as the organization stands right now?
- Are the TEP goals well-defined and communicated? Are appropriate resources, processes, and controls in place to ensure the successful delivery of the program?

Comparison of industry best practices[10] to the SFMTA's current practices yielded answers to these questions and identified SFMTA's strengths and areas of improvement regarding TEP implementation. Based on an assessment of the SFMTA's current practices, the Consultant Team identified recommended follow-up activities.

6.1 SFMTA Assessment & Recommendations

The assessment reviewed three major categories: program definition, program support, and program processes and controls. A description of best practices, an assessment, and recommendations for each of these categories is described below.

Program Definition

The first component of a successful program is effective program definition. This refers to a program having clearly defined and communicated mission and goals, and the program components are clearly delineated (with scope, schedule, and budget). Additionally, the program team and other stakeholders should support the program. 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. The TTRP corridor segments require more detailed analysis to prepare for the environmental review. In addition, the following recommendations should improve the communications and expedite project development:

[10] Best practices are based on the Consultant team's industry experts' knowledge and experience – both within agencies and on consultant assignments.

- The Communications Work Group should develop and implement the Communications Strategy to ensure all stakeholders are knowledgeable of the goals and objectives of the TEP.
- The Project Development Work Group should fully design the project scope and conceptual engineering reports for all capital proposals.
- The TEP Program Manager should continue to champion and integrate the TEP Implementation strategies into the SFMTA Capital Plan.

Program Support

The second component of a successful program is effective program support. The TEP is an integral part of the policy decision made by the SFMTA Board and the Executive Team in collaboration with the City Controller's Office and the SFMTA Board of Supervisors. However, the TEP is entering a new phase and requires even greater support from policy makers and the public. Despite economic challenges, the SFMTA will need to provide adequate support to fully implement the TEP. Many of these resources include:

- Identify dedicated staff to address the staffing needs outlined in the Staffing Requirements section.
- Develop a Financial Strategy, with attainable funding sources tied to capital and operating proposals.
- Develop working groups' action plans to establish goals and objectives and track and monitor milestones for each work group. Each work group should then work with the Financial Work Group to develop an annual budget.
- Provide progress and status reports to the SFMTA Board, executive team, and Board of Supervisors regarding achievement of milestones and decisions made that impact the Agency.
- Establish a technical support services group to support the GIS mapping, project schematics and drawings, document controls, information systems databases, etc. required to support the implementation of the TEP.

Program Processes and Controls

The last component of a successful program is effective program processes and controls. Best practices suggest that change management processes should be in place to adapt as a project evolves, communication channels should be established, and risk management, quality assurance/quality control (QA/QC), and document control systems should be in place. Currently, these processes and controls are not adequate. While the TEP Implementation Strategy provides the framework, milestones and steps necessary to drive the project forward, the TEP plans, activities, challenges and successes need to be communicated both internally and

externally on a consistent basis. The communications strategy implemented in the TEP planning phase represents best practice by proactively communicating with all internal and external stakeholders. As such, the following activities should occur:

- The Communications Work Group should develop and implement a TEP communications strategy based on the successful communications plan utilized in the planning phase.
- The TEP Program Manager should establish, communicate, and implement a project status template that should be updated and shared regularly.
- The SFMTA board and executives should provide adequate resources and support to continue effective internal and external communications.
- While performance metrics have been established, the TEP Program Manager should develop a mechanism for centralizing and automatically generalizing the metrics in order to effectively manage them.
- The TEP Program Manager should establish, communicate, and implement a QA/QC process, a document filing and version control process, and a risk management document.

6.2 Conclusion

Although the SFMTA board and Executive Team has supported the TEP during its initial phases, there remains a need for additional resources and commitment during this crucial time. The TEP is entering an important phase in its implementation and identifying dedicated staff, funding, and other resources is critical to its success. With the new TEP program manager leading the way, the SFMTA should continue to work closely with all policy-making bodies to identify adequate resources to implement the TEP proposals.

APPENDIX I

TEP Implementation Strategy Development Methodology

TEP Implementation Strategy Development Methodology

Identifying the TEP initiatives and, subsequently, developing the Implementation Strategy involved staff from many SFMTA divisions, the Office of the Controller and consultant teams. The following outlines the key activities and personnel involved in developing the TEP Implementation Strategy.

Activities:

- **Planning** – From 2006 – 2008, SFMTA staff, Controllers' staff, and a team of consultants worked together to analyze ridership data, survey data, interview SFMTA management and staff, and evaluate best practices to develop the recommendations for TEP initiatives.
- **Capital Project Development** – With the list of initiatives identified, the Consultant Team spent most of 2009 working with staff throughout the SFMTA organization to compile all available project description, justification, and financial data.
- **TTRP Corridor Segment Development** – The Transportation Engineering Division developed a toolkit and conceptual corridor-level proposals in the 2009–2010 timeframe that outline the roadway and traffic engineering changes required to implement the proposed Rapid Network.
- **Capital Project & TTRP Prioritization & Implementation Requirements** – The Consultant Team led two workshops (in April and July 2010) with representatives from various divisions throughout the SFMTA to gather input on the prioritization and implementation requirements of the capital projects.
- **Service Improvements Development** – The Consultant Team worked with the Service Planning staff to cull the TEP initiatives that are still relevant after the December 2009 service changes, May 2010 service cuts and September 2010 service restoration.
- **Implementation Strategy Development and Review** – The Consultant Team developed multiple drafts of the TEP Implementation Strategy for review and comments. Reviewers included many of the people listed below.

Personnel:

The TEP is jointly-sponsored by the SFMTA and the Office of the Controller, with support from top leaders, including Nathaniel P. Ford, Sr., Executive Director/Chief Executive Officer of the SFMTA and Ben Rosenfield, San Francisco City Controller.

The SFMTA and Office of the Controller (OC) staff involved in various aspects of developing the TEP Implementation Strategy included, but are not limited to:

- Sally Allen (OC)
- Jim Campbell
- Lulu Feliciano
- Jack Fleck
- Peter Gabancho
- Liz Garcia (OC)
- Joel Goldberg
- John Haley
- Drew Howard
- Darton Ito
- John Katz
- Kevin Keck
- Jim Kelly
- Julie Kirschbaum (PM)
- Andrew Kosinski
- Chava Kronenberg (OC)
- Helen Kwan
- Matt Lee
- Cheryl Liu
- Ross Maxwell
- Corina Monzon (OC)
- Ricardo Olea
- Chris Pangilinan
- Timothy Papandreou
- Virginia Rathke
- Gail Stein
- Peg Stevenson (OC)
- Peter Straus
- Britt Tanner
- Brenda Walker
- Kim Walton
- Jane Wang
- Dustin White
- Annette Williams
- Carleton Wong
- Clifton Wong
- Tony Young

Consultant team leadership included Eric Roecks, Lauren Isaac, Jim O'Sullivan, Barb Gilliland, Stuart Sunshine, Dominic Spaethling, Paul Skoutelas, John Pappas, and Angelo Figone.

APPENDIX II

Capital Projects' Detailed Overviews

This appendix includes up-to-date and comprehensive information on all non-TTRP initiatives, including project descriptions, justification, dependencies, data sources, and capital financial costs and implications. Note: Supplemental information on all capital projects can be found in TEP project files.

SI.1 AND SI.2: PROJECT START-UP COSTS - PHASES 1 AND 2

Total Capital Cost Estimates (2010 $)

$400,000	2010 $
$434,000	YOE $

Available Funding

No funding is currently available.

Project Overview

Project Goals	Outreach to existing and new customers information regarding service changes, including route updates, frequency adjustments and changes to span of service.
Project Description	Start-up costs include miscellaneous activities associated with route change implementation such as printing new maps, removing/installing shelters, updating signage, and painting route numbers on pole stops and pavement markings. Also included are outreach and customer alerts associated with rerouting bus routes and related bus stop changes, plus in-reach activities to inform SFMTA employees. NOT included are outreach and in-reach associated with other Capital Proposals and Travel Time Reduction Proposals, such as optimizing bus stops.
Project Justification	Start-up activities provide the necessary information for customers to effectively use transit. Without adequate information, customers become frustrated and may be less likely to use transit in the future. Route changes require customers to re-learn how to use the system. Of particular concern are regular customers who must change their habitual travel patterns. It is vital to inform them of the upcoming change and make signage changes during a short timeframe to avoid confusing habitual and non-habitual customers.
Predecessors	Any necessary capital project needs to be completed, agreements on all routing, terminals and bus stop/parking changes need to be settled; the operating schedule needs to be completed and transit operators' General Signup needs to have started, before the field customer information campaign can begin.
Successors	The route updates associated with the 2 TEP phases.

Capital Cost Estimates (2010 $)

	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Planning/ Environmental										
Conceptual Engineering										
Detailed Design										
Procurement/ Construction				$200,000		$200,000				
Total				**$200,000**		**$200,000**				

SCI.1 ACCESSIBLE RAIL PLATFORMS

Total Capital Cost Estimates (2010 $)

$7,900,000	2010 $
$8,670,000	YOE $

Available Funding

No funding is currently available.

Project Overview

Project Goals	Additional platforms will allow customers with disabilities improved access to the light rail system.
Project Description	Rail accessible platforms provide ramps to elevated rail stops, with audible warnings for when a person is getting too close to the platform edge. The process to determine which stops to invest in is as follows: 1. Engineers study existing reports to develop a list of potential stops. 2. Consultant/Engineers identify 10-20 locations that are feasible and represent prioritized stops. 3. Muni staff lead a community process to obtain input and buy-in. 4. Consultant/Engineers conduct a technical analysis that will determine stop choices. Analysis may include: % of people within range of an accessible stop, location and number of paratransit call requests, distance between accessible stops, etc. This analysis assumes the study will cost $200,000. Once study is complete, the scope, schedule, and budget for implementation will be re-visited. For now, the implementation cost assumes 7 new accessible stops (14 platforms) at $1.1M/stop, with 2 platforms completed each year starting in FY 13.
Project Justification	Improved access for people with disabilities to LRV system expanded beyond ADA-required Tier 1 Key Stops allows greater system availability for people with disabilities.
Predecessors	Need to coordinate with any potential stop consolidation identified in TTRP.
Successors	None noted

Capital Cost Estimates (2010 $)

	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Planning/ Environmental		$200,000								
Conceptual Engineering			$550,000	$550,000	$550,000	$275,000				
Detailed Design				$550,000	$550,000	$550,000	$275,000			
Procurement/ Construction					$1,100,000	$1,100,000	$1,100,000	$550,000		
Total		**$200,000**	**$550,000**	**$1,100,000**	**$2,200,000**	**$1,925,000**	**$1,375,000**	**$550,000**		

SCI.2 NEXTMUNI SIGNAGE

Total Capital Cost Estimates (2010 $)

$2,010,000	2010 $
$2,194,000	YOE $

Available Funding

No funding is currently available.

Project Overview

Project Goals	NextMuni signs at all shelters, improving customer experience.
Project Description	SFMTA has real-time information available at most shelters, but about 20 percent lack signs because of power complexities or limited resources. NextMuni signage refers to the purchase and installation of a public information signage to alert and inform customers of the status of transit services (e.g., bus arrival times and system wide messages). Clear Channel is replacing all shelters over five years starting in 2010 and is required to add power to any shelters without power currently. SFMTA will need to purchase NextMuni signs for shelters not currently equipped with signs. Currently, there are around 200 shelters (of the 1,050) without NextMuni signs and the signs cost $3,000 each. These will be installed over the next 2.5 years (now through December 2013). Additionally, it is estimated that SFMTA will install approximately 50 new shelters/year (not a TEP cost), which implies 50 new NextMuni signs per year. This assumes that stops without shelters will not have NextMuni signs.
Project Justification	This effort will alert and inform customers of the status of transit services to improve their route choice and improving the customer experience.
Predecessors	None noted
Successors	None noted

Capital Cost Estimates (2010 $)

	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Planning/ Environmental										
Conceptual Engineering										
Detailed Design										
Procurement/ Construction		$315,000	$315,000	$315,000	$315,000	$150,000	$150,000	$150,000	$150,000	$150,000
Total		**$315,000**	**$315,000**	**$315,000**	**$315,000**	**$150,000**	**$150,000**	**$150,000**	**$150,000**	**$150,000**

SCI.4 SANSOME CONTRAFLOW EXTENSION

Total Capital Cost Estimates (2010 $)

$75,000	2010 $
$78,000	YOE $

Available Funding

No funding is currently available.

Project Overview

Project Goals	Extend Sansome contraflow lane to reduce transit travel time.
Project Description	Currently, Sansome Street is one-way north of Washington Street, so buses need to turn right on Washington and left on Battery to access Sansome. This project proposes to extend southbound "transit-commercial" contraflow lane north three blocks on Sansome Street to Broadway using paint, signage, and signal modification from Broadway to Clay.
Project Justification	Extending the contraflow lane north past to Broadway will improve transit travel time and eliminate two turns.
Predecessors	None noted
Successors	10 Route Update

Capital Cost Estimates (2010 $)

	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Planning/ Environmental										
Conceptual Engineering			$25,000							
Detailed Design			$25,000							
Procurement/ Construction			$25,000							
Total			**$75,000**							

SCI.5 ADDITIONAL CAMERAS AND MONITORING EQUIPMENT

Total Capital Cost Estimates (2010 $)

$200,000	2010 $
$214,000	YOE $

Available Funding

No funding is currently available.

Project Overview

Project Goals	Provide a real-time view of buses and light rail vehicles to operations professionals, improving system safety and reliability.
Project Description	Install cameras and monitoring equipment at strategic locations along Rapid Network terminals and routes. Currently, all light rail terminals have cameras, so the next priorities are on-street LRV routes (1st) and then bus routes (2nd) and then at bus platforms (3rd). Outdoor cameras require weatherproof boxes ($600 per box) and either a static set-up (in most terminals) or zoom/tilt capability (along routes and in big terminals). A determination still needs to be made regarding either DSL versus wireless technology (decision has significant implications on capital and O&M costs and speed of connection). One full-time FTE ($160,000) will need to be hired to maintain cameras, line management center would monitor cameras. Phase 1 of this project would be a pilot of two routes with priority placed on high capacity routes (including BRT). Options could include: 14th Avenue, Masonic, Geary, and downtown. Pilot cost estimated at $25,000.
Project Justification	Installing monitoring equipment will allow Operations and Security to have a real-time view of bus and rail, which makes them easier to manage. Operations and Security could be more proactive in addressing issues, potentially improve on-time performance, and enhance security. Currently, SFMTA has capabilities to track the network using NextBus technology that allows management the ability to see transit movement along a route, but does not allow management to see what is actually happening on the streets. Installing monitoring equipment would further allow management insight into causes of delays and early arrivals.
Predecessors	None noted
Successors	None noted

Capital Cost Estimates (2010 $)

	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Planning/ Environmental										
Conceptual Engineering			$25,000	$14,450	$14,450					
Detailed Design				$11,050	$11,050					
Procurement/ Construction				$62,000	$62,000					
Total			**$25,000**	**$87,500**	**$87,500**					

SCI.6 COMMUNITY CONNECTOR VANS

Total Capital Cost Estimates (2010 $)

$2,500,000	2010 $
$2,731,000	YOE $

Available Funding

No funding is currently available.

Project Overview

Project Goals	Community van lines will run customer vans rather than the current 30' Hybrid vehicles to improve reliability on Community routes.
Project Description	Procure 17 customer vans (based on peak vehicle requirements plus a 30% spare ratio) to serve certain low ridership Community Connector routes. Using 2010 figures for a 26'+ van with a useful life of 7 years, with a diesel engine, to allow for biodiesel fuel, at $149,000 per van.
Project Justification	This project allows the TEP Community Connector lines to be converted from traditional Muni fleet. The use of vans would better match the demand along these routes in addition to being more neighborhood friendly and better matching the narrow streets. This is a commitment made to the community, and it has community support.
Predecessors	Need to identify location to store and maintain vans, fleet procurement process.
Successors	Routes 32, 35, 36, 56, and 66 cannot be converted to van service until procurement.

Capital Cost Estimates (2010 $)

	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Planning/ Environmental										
Conceptual Engineering										
Detailed Design				$200,000						
Procurement/ Construction				$100,000	$1,200,000	$1,000,000				
Total				**$300,000**	**$1,200,000**	**$1,000,000**				

SCI.7 INSTALLATION OF TSP EQUIPMENT AT NON-TTRP INTERSECTIONS

Total Capital Cost Estimates (2010 $)

$4,526,000	2010 $
$5,090,000	YOE $

Available Funding

No funding is currently available.

Project Overview

Project Goals	Traffic signal priority (TSP) will improve on-time performance and reduce travel time and travel time variability.
Project Description	This is part of a larger project to install a Transit Signal Priority system. This proposal only includes the 225 intersections not already addressed in the TTRP. The Radio Replacement Project will install vehicle equipment on 1100 transit vehicles and intersection equipment for 200 intersections (both on and off the TTRP) and is estimated to be completed by July 2014. Although the Radio Replacement Project may install intersection equipment at some non-TTRP intersections, the quantity is unknown at this time so all non-TTRP intersections are included in this cost estimate. This cost estimate includes upgrading 91 traffic controllers from older style to Type 2070.
Project Justification	Technology will enable transit priority at intersections, which is an important tool for reducing travel time. Savings is approximately 5 seconds per bus per intersection.
Predecessors	Completion of GPS Transit Signal Priority Pilot will select technology.
Successors	None noted.

Capital Cost Estimates (2010 $)

	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Planning/ Environmental										
Conceptual Engineering										
Detailed Design										
Procurement/ Construction				$751,000	$751,000	$751,000	$751,000	$751,000	$771,000	
Total				**$751,000**	**$751,000**	**$751,000**	**$751,000**	**$751,000**	**$771,000**	

SCI.9 HISTORIC STREETCAR REHABILITATION

Total Capital Cost Estimates (2010 $)

N/A

Available Funding

N/A

Project Overview

Project Goals	Will enable Route E to launch and Route F to increase service.
Project Description	This project is a compilation of 3 rehabilitation projects that are already funded through Prop K and 5307 funds: 1. 16 PCC cars ($18.4M) 2. 5 Vintage cars ($8.6M) 3. 11 Milan cars ($16.6M) F line service cannot be increased and the E Line service can't start until this is complete, so it is a TEP-supportive project. Since this project is a TEP predecessor project and already has funding, costs are not included in the TEP Implementation Plan.
Project Justification	The project will rehabilitate double-ended streetcars, to operate on Route E, which currently doesn't have a southern terminal loop.
Predecessors	None noted
Successors	Route E to launch and Route F to increase service.

Capital Cost Estimates (2010 $)

N/A

SCI.10 ACCESSIBILITY IMPROVEMENTS - BUS STOP CONVERSION

Total Capital Cost Estimates (2010 $)

N/A

Available Funding

N/A

Project Overview

Project Goals	Improved bus accessibility for seniors and people with disabilities, improved boarding for all customers and better bus stop legibility.
Project Description	Convert the majority of the 2,000 flag stops to bus zones or front door curb extensions. The cost associated with this is mostly community outreach. Bus zone conversion requires legislation if parking removal is necessary, and street and curb paint. Annual target of 20-30 stops. Bus zone installation is estimated at $1,000 per zone, but funding for bus zone conversion traditionally come from the Muni operating budget and is not associated with capital funding needs.
Project Justification	It is inconvenient and particularly challenging for seniors and people with disabilities to board the bus in the middle of the street. The vertical distance from the street (instead of the curb) to the first step is difficult for some seniors. The wheelchair ramp on low floor buses is steeper when deployed from the bus to the street, versus the bus to the curb. This project creates a more accessible system and increases customer satisfaction as a result of easier customer boarding.
Predecessors	None noted
Successors	None noted

Capital Cost Estimates (2010 $)

N/A

TTPI.1 VAN NESS & NORTH POINT HUB & BUS TERMINAL

Total Capital Cost Estimates (2010 $)

$1,100,000	2010 $
$1,154,000	YOE $

Available Funding

No funding is currently available.

Project Overview

Project Goals	New terminal at Van Ness/ North Point to provide layover space and customer amenities at major transfer hub.
Project Description	An enhanced terminal to serve as a transfer point for Routes 11, 19, 28L, 30, and 47 and 49L (Van Ness BRT) is critical for the completion of the TEP-recommended rapid network. Planned to accommodate the peak number of vehicles at this location, mockups have been created. Capital investments include new bus stop and hub (way-finding) signage, multi-line electronic signage, and other minor improvements ($300K), new switches and overhead work ($400K), and a new operator restroom ($400K). This terminal is a prerequisite for route changes, because without sufficient layover space, route changes cannot be supported.
Project Justification	TEP-recommended route changes for routes 11, 19, 28L, 30, 47, and 49L cannot be fully implemented without improved terminal. Well-designed terminals are critical for maintaining smooth service delivery and provide an important transfer points for customers, as well as layover locations for operators. Also, this will improve line supervision because the departure times of multiple routes can be monitored at a single location.
Predecessors	None noted
Successors	Route changes 11,19,28L,30,47,49L

Capital Cost Estimates (2010 $)

	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Planning/ Environmental										
Conceptual Engineering		$165,000								
Detailed Design			$220,000							
Construction Management				$132,000						
Procurement/ Construction				$583,000						
Total		**$165,000**	**$220,000**	**$715,000**						

TTPI.2 DALY CITY BUS TERMINAL AND TRANSFER POINT IMPROVEMENTS

Total Capital Cost Estimates (2010 $)

$3,000,000	2010 $
$3,160,000	YOE $

Available Funding

No funding is currently available.

Project Overview

Project Goals	Improved terminal space for all necessary Muni bus stops and layover vehicles, and convenient, clearly marked transfers to BART and SamTrans.
Project Description	Build expanded/reconfigured SFMTA stop and bus layover facilities at the Daly City BART station to accommodate additional service and vehicles on routes 14 & 17 and existing service on routes 28 & 54. Started in December 2010, BART is embarking on a year-long station design study. It is unclear what the costs to SFMTA will be at this point in time; however, a placeholder of $15M was estimated.
Project Justification	The existing Daly City BART terminal and stop for SFMTA buses is inadequate to handle additional lines and customers, it also requires a circuitous route to access the layover position and has no Muni restroom facilities. The location, an important transfer point between BART and Muni bus service needs to function more effectively, and have adequate space to accommodate projected new service.
Predecessors	BART study must be completed.
Successors	Route updates 14, 17, 28, 54

Capital Cost Estimates (2010 $)

	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Planning/ Environmental										
Conceptual Engineering		$450,000								
Detailed Design			$600,000							
Construction Management				$360,000						
Procurement/ Construction				$1,000,000	$590,000					
Total		**$450,000**	**$600,000**	**$1,360,000**	**$590,000**					

TTPI.3 LEE STREET TERMINAL FOR 52

Total Capital Cost Estimates (2010 $)

$10,000	2010 $
$10,000	YOE $

Available Funding

No funding is currently available.

Project Overview

Project Goals	Provide an expanded and improved transfer point to BART, improved line supervision, and bathroom access for bus operators.
Project Description	Create on-street terminal space on Lee Street near Phelan Ave. to accommodate the extension of the 52 to the City College area. Project could involve sidewalk/ street modifications. In the short-term, SFMTA needs to coordinate with City College to obtain approval to use their parking lot for a turn-around. Signage investments will be needed. In the long-term, SFMTA needs to coordinate with City College as Lee Street (a new street) is developed to ensure terminal is part of the road network. Again, signage investments will be needed. Capital costs are expected to be less than $10K.
Project Justification	Route 52 will better service the City College campus area and facilitate transfers to BART at Balboa BART station. It will also improve line supervision and allow for operator bathroom access at Phelan Loop. Well-designed terminals are critical for maintaining smooth service delivery and serve as important transfer points for customers, as well as layover locations for operators.
Predecessors	Lee Street must be built out.
Successors	Route 52 change

Capital Cost Estimates (2010 $)

	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Planning/ Environmental										
Conceptual Engineering										
Detailed Design										
Procurement/ Construction			$10,000							
Total			**$10,000**							

TTPI.4 E LINE INDEPENDENT TERMINAL AT BEACH/JONES

Total Capital Cost Estimates (2010 $)

$4,700,000	2010 $
$5,424,000	YOE $

Available Funding

No funding is currently available.

Project Overview

Project Goals	Improved reliability on E and F lines. E and F lines can operate without an independent terminal in the short-term, but increased supervision will be needed to maintain reliable service.
Project Description	Development of an independent terminal for E line at the north end of the line, at Jones and Beach Streets. This would require the installation of new bypass trackage, special trackwork turnouts, track switches, overhead wires and poles, and removal of parking spaces and creation of a new station platform. Existing line tracks on Jefferson and Beach can accommodate this new Muni line. Other work, such as utility relocation, crosswalk ramps, removal of traffic lane or lanes, modification of sidewalk width, and truck delivery access are also required.
Project Justification	An independently accessible terminal track (Bypass track and Platform) for E - Embarcadero at the Wharf would allow all cars of the E and F lines to be able to take layovers independently and then leave the terminal on schedule. This will increase the reliability and predictability of both the E and F lines by increasing capacity, reduce crowding at Embarcadero, and improve connectivity between Mission Bay and Northeast waterfront.
Predecessors	None noted
Successors	Historic Streetcar Extension to Fort Mason. Project is needed for smooth E/F operations, although E/F operations are possible without this project. Lines E and F can operate without an independent terminal in the short-term, but increased supervision will be needed to maintain reliable service.

Capital Cost Estimates (2010 $)

	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Planning/ Environmental						$200,000	$200,000			
Conceptual Engineering						$300,000				
Detailed Design							$450,000	$150,000		
Construction Management								$564,000		
Procurement/ Construction								$2,836,000		
Total						**$500,000**	**$650,000**	**$3,550,000**		

TTPI.5 M EXTENSION FOR PARKMERCED

Total Capital Cost Estimates (2010 $)

N/A

Available Funding

N/A

Project Overview

Project Goals	Improved transit service delivery and capacity on M-Oceanview route to Parkmerced.
Project Description	Reroute the M Ocean View into Parkmerced and create a new terminal. This terminal will allow for half of the peak period trains to turnaround in Parkmerced, with the remaining extending to Balboa Park. The SFMTA is considering this proposal, instead of the original TEP Proposal to extend the J Church to SFSU and truncated the M Ocean View at SFSU, because it better serves the Parkmerced long range development plans and is included in a full funding agreement with the Parkmerced project sponsor. Because this rail extension is independent of the TEP and not anticipated to be constructed until after 2020, costs are not included in the TEP implementation strategy or project description. The rail extension will be funded by the Parkmerced developers and is included in a full-funding agreement with the Parkmerced project sponsor. ***At the time of publishing, the SFMTA Board of Directors has not taken an action on the Parkmerced M line proposal, but is expected to review it in Spring 2011.*
Project Justification	This new branch would improve service for Parkmerced residents and allow SFMTA the flexibility to schedule every other train to turn back at Parkmerced in the peak period. Terminating a branch of the M Line at Parkmerced improves utilization of available rail cars, efficiently meeting the heavy demand between SFSU and Downtown. The new terminal would also provide operational flexibility and improve system reliability by providing storage for up to four trains in the Southwest corridor. Additionally, the proposal would construct improved customer amenities at SFSU/Parkmerced. Station improvement benefits include pedestrian safety enhancements and more expansive facilities, addressing concerns about the currently overcrowded platforms at SFSU and the necessity of crossing 19th Avenue to reach the platforms.
Predecessors	None noted
Successors	None noted

Capital Cost Estimates (2010 $)

N/A

TTPI.6 BALBOA PARK BART STATION PEDESTRIAN IMPROVEMENT (OCEAN AVE)

Total Capital Cost Estimates (2010 $)

$91,000	2010 $
$91,000	YOE $

Available Funding

$91,000

Project Overview

Project Goals	Improved intersection design to shift routes 29 and 54 Balboa Park stop to Ocean Ave, with improved connections to routes 49 and K. Travel time reductions could be measured, as could ridership and customer satisfaction.
Project Description	The Balboa Park Bike and Pedestrian Improvement project will create an improved pedestrian crossing at Ocean Avenue and Interstate 280 and provide access to the new BART entrance. New, safer pedestrian crossings needed for Balboa BART station on Ocean Avenue are included. One crosswalk - east side of I-280, will be installed. Option A has buses operate in the rail right-of-way to create westbound transit-only lanes, and a Muni westbound center boarding island is also proposed on the east side of the Ocean Avenue/northbound I-280 intersection. Elements include bus bulb, crosswalk, and signals. Option B keeps westbound buses in existing traffic lanes and adds a curbside stop on the east side of the Ocean/northbound I-280 intersection study draft report (7/09) proposes key concepts largely supportive of the TEP.
Project Justification	A more, direct route for the 29 line, improved pedestrian safety in Persia Triangle, decreased bus congestion on Geneva Ave. and better access to BART. The TEP calls for moving the 29 and 54 routes onto Ocean Ave. from Geneva Ave., allowing routes to avoid the congestion on Geneva Ave. They would join the 49 line and K Metro line on Ocean Avenue. Currently pedestrians cannot safely access the farside of Ocean Ave from Balboa Park BART. Improving pedestrian access has the potential to boost ridership on transit and create a more comfortable experience for transit customers.
Predecessors	Finalization of Balboa Park Station Pedestrian and Bicycle Connection Project will offer approved project description. BART Ocean Ave West side walkway
Successors	29 and 54 route changes need the pedestrian environment improved before they can feasibly be moved.

Capital Cost Estimates (2010 $)

	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Planning/ Environmental										
Conceptual Engineering										
Detailed Design										
Procurement/ Construction	$91,000									
Total	**$91,000**									

TTPI.7 LYON/RICHARDSON BUS STOP - TRANSFER POINT

Total Capital Cost Estimates (2010 $)

$150,000	2010 $
$156,000	YOE $

Available Funding

No funding is currently available.

Project Overview

Project Goals	Provide an expanded and improved transfer point at Lyon/ Richardson to facilitate connections between the rapid network 28L Limited to local service on the 28 or regional service on Golden Gate Transit.
Project Description	New transfer point at Lyon and Richardson. This is a new transfer point between SFMTA's route 28L and Golden Gate Transit (GGT) services. Improvements are likely to be largely pedestrian improvements, requiring paint, signage, and/or curb extension, shelter. From Golden Gate to route 28L or Southbound. The project will result in improved pedestrian access and a safer, more comfortable experience for transit customers.
Project Justification	Improving this transfer point is a prerequisite for the 28L route change, as the new route 28 Limited will no longer serve the Golden Gate Bridge stop where customers on the 28 have historically transferred to GGT. This project will support the success of route 28L, a key cross-town Rapid Network line.
Predecessors	None noted
Successors	28L route update

Capital Cost Estimates (2010 $)

	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Planning/ Environmental										
Conceptual Engineering										
Detailed Design										
Procurement/ Construction			$150,000							
Total			**$150,000**							

TTPI.8 SFGH TRANSFER POINT

Total Capital Cost Estimates (2010 $)

$125,000	2010 $
$136,000	YOE $

Available Funding

No funding is currently available.

Project Overview

Project Goals	Provide an expanded and improved transfer point at SF General Hospital to facilitate connections between the rapid network 9L Limited service to local service on the 9, 10, 19, 48 and 58 routes serving Potrero, Mission, Bayview, Noe Valley and downtown connections.
Project Description	This project will develop a transfer hub on Potrero Avenue between 23rd and 24th Street that serves San Francisco General Hospital and routes 9, 9L, 10, 19, 48 and 58. Improvements may include rerouting service to a shared stop, as well as improved stop amenities and signage. Parking removal may be necessary to create longer bus zones.
Project Justification	This project will improve the customer transfer experience by creating a transit hub serving SF General Hospital, the 9L-Potrero Limited and local routes 9, 10, 19, 48 and 58.
Predecessors	None noted
Successors	Would improve routes 9, 9L 10, 19, 48, 58

Capital Cost Estimates (2010 $)

	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Planning/ Environmental				$10,000						
Conceptual Engineering										
Detailed Design					$20,000					
Construction					$20,000					
Procurement/ Construction					$75,000					
Total				**$10,000**	**$115,000**					

OWE.1 NEW OVERHEAD WIRING - REROUTE 33 ON TO VALENCIA

Total Capital Cost Estimates (2010 $)

$1,950,000	2010 $
$2,049,000	YOE $

Available Funding

No funding is currently available.

Project Overview

Project Goals	Reroute Route 33 on Valencia St. to ease transit operation conflicts on Mission Street and allow for a combined Routes 22 and 33 stop, and improved customer access to 16th Street BART station.
Project Description	Build new two-way overhead wire on Valencia between 17th and 18th to allow the 33 Stanyan to be rerouted from 18th to 16th St. via Valencia.
Project Justification	This will improve operations on Mission St. by reducing conflicts between Route 33 and Routes 14/14L/49, and reduces the number of buses turning at the intersection of 16th & Mission, a busy pedestrian and transit intersection. The project will also enable a reroute of the Route 33 so it can include a stop adjacent to the 16th Street BART station on 16th St., improving access to the station and Route 22.
Predecessors	None Noted
Successors	Route 33 Reroute

Capital Cost Estimates (2010 $)

	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Planning/ Environmental		$50,000								
Conceptual Engineering		$150,000								
Detailed Design			$350,000							
Construction Management				$250,000						
Procurement/ Construction				$1,150,000						
Total		**$200,000**	**$350,000**	**$1,400,000**						

OWE.2 BYPASS WIRES AT VARIOUS TERMINAL LOCATIONS

Total Capital Cost Estimates (2010 $)

$1,550,000	2010 $
$1,692,000	YOE $

Available Funding

No funding is currently available.

Project Overview

Project Goals	Enables trolley buses to pass each other at terminals without operators pulling trolley poles.
Project Description	Install bypass wires to improve terminal operations where multiple trolley routes share a terminal. Priority locations include 4th and Townsend (Routes 30 and 45), Lyon and Union (Routes 41 and 45) and Presidio & Sacramento (Routes 1 and 2). Construction at the 4th and Townsend terminal will require coordination with ongoing Central Subway construction.
Project Justification	This project will improve on-time performance and reliability by providing more predictable access and egress from terminals. It will also allow operators to stay in their vehicles. Currently at terminals shared by multiple trolley routes, operators must exit their vehicle and pull trolley poles in order to pass a coach already in the terminal. This project also supports the proposed Route 2 supplemental service that will replace the proposed discontinuance of Route 3.
Predecessors	None noted
Successors	Route changes

Capital Cost Estimates (2010 $)

	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Planning/ Environmental										
Conceptual Engineering		$50,000	$50,000	$50,000						
Detailed Design			$100,000	$100,000	$100,000					
Procurement/ Construction				$50,000	$50,000	$50,000				
Construction Management					$350,000	$300,000	$300,000			
Total		**$50,000**	**$150,000**	**$200,000**	**$500,000**	**$350,000**	**$300,000**			

OWE.3 NEW OVERHEAD WIRING - 6 PARNASSUS ON STANYAN ST.

Total Capital Cost Estimates (2010 $)

$5,050,000	2010 $
$5,334,000	YOE $

Available Funding

No funding is currently available.

Project Overview

Project Goals	New overhead wiring will allow the 6-Parnassus to run the full length of Haight Street. Routing the 6 and the 71L on Haight creates a rapid corridor with both limited and local service.
Project Description	Build new two-way overhead wiring on Stanyan between Haight and Parnassus to enable the 6 Parnassus to operate on Haight St. west of Masonic, and then connect to the existing route at Stanyan and Parnassus. Will require new overhead wires on Stanyan St. between Haight and Parnassus Sts (0.3 mi). Operating the full length of Haight Street, adding increased service on the busiest part of Haight Street, and operating in both directions along Stanyan Street, has been identified as a high priority in the TEP. Rerouting proposal would include discontinuing a segment in Ashbury Heights.
Project Justification	Create a local and a limited network on Haight St., providing improved travel times and transit reliability to majority of customers in the community.
Predecessors	The SFMTA Board has not endorsed a final alignment for the 6 Parnassus. They requested that the TEP alignment and current alignment be evaluated in the environmental review. They will make a final decision pending the environmental analysis.
Successors	Route 6 reroute and 71L all day service.

Capital Cost Estimates (2010 $)

	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Planning/ Environmental		$200,000								
Conceptual Engineering			$600,000							
Detailed Design				$1,000,000						
Construction Management				$500,000	$250,000					
Procurement/ Construction				$2,500,000						
Total		**$200,000**	**$600,000**	**$4,000,000**	**$250,000**					

OWE.4 5 LIMITED/LOCAL BYPASS WIRES

Total Capital Cost Estimates (2010 $)

$900,000	2010 $
$966,000	YOE $

Available Funding

No funding is currently available.

Project Overview

Project Goals	Enables trolley buses to pass each other, improving on-time performance and reliability.
Project Description	Enable Route 5 Local and Route 5 Limited service to operate with trolley coaches on one set of wires in each direction along the route between 6th avenue and Market on Fulton and McAllister. Install two to three bypass wires at strategic points in each direction, between 6th Avenue and Fulton and Market and McAllister so limited stop buses can pass local buses. Each bypass wire will cost approximately $150,000/bypass/direction.
Project Justification	Enables limited-stop service to pass local service. Create a local and a limited network on Fulton and McAllister Sts., providing improved travel times and transit reliability to majority of customers in the community.
Predecessors	None noted
Successors	5 and 5L Route Updates

Capital Cost Estimates (2010 $)

	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Planning/ Environmental										
Conceptual Engineering			$135,000							
Detailed Design				$180,000						
Construction Management					$108,000					
Procurement/ Construction					$477,000					
Total			**$135,000**	**$180,000**	**$585,000**					

OWE.5 22 FILLMORE EXTENSION TO MISSION BAY

Total Capital Cost Estimates (2010 $)

$13,100,000	2010 $
$14,193,000	YOE $

Available Funding

$2,996,000

Project Overview

Project Goals	Extend 22 Fillmore to new Mission Bay community, providing transit access to residents, employees and connections to points west.
Project Description	Construct new overhead wire on 16th Street and Third Street to allow the 22 Fillmore to continue east along 16th Street to Third Street, north on Third Street to a new terminal in Mission Bay. The portion of the project on 16th Street, between Kansas Street to Connecticut Street, is being constructed as part of an overhead replacement project (including the block of Connecticut Street between 16th Street and 17th Street that will be used by the 33 Stanyan to provide service on the portion of Potrero Hill that will no longer be served by route 22). Some infrastructure within Mission Bay is provided by the developers. It is estimated that about 8,600 feet of new two-way overhead and 1,600 feet of new one-way overhead infrastructure will be needed. An additional $600,000 is included to cover overhead related work needed when the Caltrain electrification and grade separation projects occur.
Project Justification	Will provide a direct transit connection between Mission Bay South/UCSF/Mission Bay Hospital to western destinations, including the 16th Street BART Station, the Mission District, and Fillmore Street, with zero-emission vehicles. The project was identified in the Mission Bay Mitigation Plan and recently the San Francisco Board of Supervisors identified the project as a top priority for the Eastern Neighborhoods.
Predecessors	None noted
Successors	Routes 22 and 33 re-route

Capital Cost Estimates (2010 $)

	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Planning/ Environmental			$180,000							
Conceptual Engineering			$1,000,000							
Detailed Design				$2,280,000						$600,000
Construction Management					$1,000,000	$560,000				
Procurement/ Construction					$7,480,000					
Total			**$1,180,000**	**$2,280,000**	**$8,480,000**	**$560,000**				**$600,000**

OWE.6 NEW OVERHEAD WIRING - 6 EXT TO WEST PORTAL

Total Capital Cost Estimates (2010 $)

$19,200,000	2010 $
$22,654,000	YOE $

Available Funding

No funding is currently available.

Project Overview

Project Goals	Provide a connection for existing customers and new customers west of Twin Peaks to West Portal Station, and access to the Muni Metro system.
Project Description	Route 6 Parnassus currently terminates at 14th Ave. and Quintara Street. Construction of two-way overhead wiring would extend Route 6-Parnassus from the existing terminal to West Portal Station via Taraval, looping into the station along one-way overhead wiring via Claremont, Ulloa and Lenox. The Route 6-Parnassus extension to West Portal will require approximately 3,600 feet of new two-way overhead and approximately 2,900 feet of new one-way overhead. *(This does not include new overhead on Stanyan, which is captured by OWI.3.)*
Project Justification	Extending Route 6 Parnassus to West Portal Station provides a direct connection to the Muni Metro service at West Portal. Strong connections on both ends of the trolley route increases the service options of existing Route 6-Parnassus customers and may increase route ridership. Extension increases the cost effectiveness of the route by utilizing the capacity available in both directions.
Predecessors	
Successors	Route 6 service would be extended to West Portal

Capital Cost Estimates (2010 $)

	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Planning/ Environmental						$200,000				
Conceptual Engineering							$1,750,000			
Detailed Design								$3,450,000		
Construction Management									$1,350,000	
Procurement/ Construction									$11,450,000	$1,000,000
Total						**$200,000**	**$1,750,000**	**$3,450,000**	**$12,800,000**	**$1,000,000**

LIS.1 COMPREHENSIVE COMMUNICATIONS PLAN

Total Capital Cost Estimates (2010 $)

$800,000	2010 $
$850,000	YOE $

Available Funding

No funding is currently available.

Project Overview

Project Goals	Attract new customers to the transit service and clarify the transit brand in San Francisco.
Project Description	This project is a comprehensive communications plan for the launch of the Transit Effectiveness Project (TEP), and includes a marketing strategy for the TEP's recommended hierarchy of service levels (i.e., Rapid Network, Local Network, Community Connectors and Specialized Services). This project will determine how BRT integrates into the larger Rapid Network and will develop key messages and promotional materials capable of transitioning existing and attracting new customers to the new and revised Muni services. Additionally, this project will include research of best practices from comparable transit agencies and the development and communication of identifiable branding mechanisms for the service hierarchy. Finally, this project should coordinate with the public relations, outreach and advertising efforts of the TEP launch including the design, translation and production of customer information materials, such as system maps, take ones, car cards, and website configuration. Capital changes associated with the branding strategies, such as vehicle design and bus stop signage, will be addressed under separate funding sources. In addition, branding and launch of BRT will be addressed in a separate future project.
Project Justification	The purpose of this project is to effectively communicate TEP implementation and the benefit of the Rapid Network to customers, designed to make Muni more reliable and convenient. Residents, visitors and others in the City will better understand new transit opportunities and may be more likely to choose transit.
Predecessors	
Successors	Launch of Phase 1 Route Updates and Capital initiatives in FY13 timeframe.

Capital Cost Estimates (2010 $)

	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Planning/ Environmental		$200,000	$100,000	$200,000	$100,000	$200,000				
Conceptual Engineering										
Detailed Design										
Procurement/ Construction										
Total		**$200,000**	**$100,000**	**$200,000**	**$100,000**	**$200,000**				

LIS.2 TRACTION POWER SYSTEM UPGRADE STUDY

Total Capital Cost Estimates (2010 $)

$550,000	2010 $
$565,000	YOE $

Available Funding

No funding is currently available.

Project Overview

Project Goals	Will identify and strategize for the needs of the traction power system to meet the demands of TEP service plan on trolley coach lines as well as support long range growth.
Project Description	During the TEP planning phase, several longer term issues were identified related to the traction power system that exceeded the TEP's scope and timeline.This study identify and strategize for the impact of new service plans, including the TEP on the existing traction power system, and identify future next steps.
Project Justification	Will enable the traction power system to meet electrical demand on trolley coach lines and anticipate future service needs associated with future land use changes.
Predecessors	None.
Successors	Feeders may need to be increased for the Phase 2 route updates (pending study results).

Capital Cost Estimates (2010 $)

	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Planning/ Environmental		250,000	300,000							
Conceptual Engineering										
Detailed Design										
Procurement/ Construction										
Total		**250,000**	**300,000**							

LIS.3 LONG-RANGE RAIL SYSTEM PLAN

Total Capital Cost Estimates (2010 $)

$1,000,000	2010 $
$1,053,000	YOE $

Available Funding

No funding is currently available.

Project Overview

Project Goals	Study will inform future strategy for Light Rail Vehicles including vehicle type, train length, high floor versus low floor, double berthing, Automatic Train Control System (ATCS), and upgrades to the train control system.
Project Description	During the TEP planning phase, several longer term issues were identified related to the light rail system that exceeded the TEP's scope and timeline. The light rail system faces complex challenges that require a detailed study that will identify low to high cost solutions to improve operations and the customer experience. To address these issues and support long-term planning at the agency, this Plan will develop a long term expansion strategy for the Light Rail System. Study will include review of topics such as Muni tunnel capacity, future vehicle type, train length, high floor versus low floor, double berthing, and ATCS (investment in update for train control system). Cost is $1,000,000 for the study.
Project Justification	The City is expecting residential and job growth, resulting in more demand for rail service. putting more pressure on an already constrained system. The Long-Range Rail System Plan will identify needs to ensure system reliability, accessibility and safety.
Predecessors	Muni Metro Core Passenger Study
Successors	None noted

Capital Cost Estimates (2010 $)

	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Planning/ Environmental			$300,000	$700,000						
Conceptual Engineering										
Detailed Design										
Procurement/ Construction										
Total			**$300,000**	**$700,000**						

APPENDIX III

TTRP Overview

To help achieve the TEP goal of reducing customer travel time, the Travel Time Reduction Proposals (TTRP) would implement treatments to reduce delays on the Rapid Network and make transit more appealing for customers. The toolbox of travel time improvements used in the TTRP includes new traffic signals, signal modifications, stop spacing optimization, changes to roadway configuration, transit bulb-outs or boarding islands, circulation changes, and a variety of other roadway improvements, all supported by transit signal priority. In addition, each selected corridor would receive customer amenities, such as shelter/stop upgrades, ticket vending machines, all-door boarding, and improved branding.

TABLE A-1: TTRP OVERVIEW

TEP Ref #	Transit Corridor Segment (Muni Route(s) improved)	Detailed Segment Description	Segment Length (miles)	Transit Signal Priority or Optimized Signal Timing	New Signal	Stop spacing optimization	Bus Bulbs	Dedicated Transit Lane*	Ticket Vending Machines, All-Door Boarding and Customer Amenities	Other
J_1	Church Street (J Church)	Church Street from Duboce Avenue to 30th Street; 30th Street from Church Street to San Jose Avenue; and San Jose Avenue from 30th Street to Randall Street.	2.4	✓	✓	✓	✓	✓	✓	
K_1	Ocean Avenue (K Ingleside)	Ocean Avenue from San Jose Avenue to Junipero Serra Boulevard.	1.9	✓	✓	✓	✓	✓	✓	✓
L_1	Taraval Street (L Taraval)	47th Avenue from Vicente Street to Wawona Street; Wawona Street from 47th Avenue to 46th Avenue; Vicente Street from 47th Avenue to 46th Avenue; 46th Avenue from Wawona Street to Taraval Street; Taraval Street from 46th Avenue to 15th Avenue; 15th Avenue from Taraval Street to Ulloa Street; and Ulloa Street from 15th Avenue to West Portal Station.	2.7	✓	✓	✓	✓	TBD	✓	
M/28	19th Avenue and Stonestown/San Francisco State University (M Ocean View, 28 19th Avenue and 28L 19th Avenue Limited)	19th Avenue from Junipero Serra Boulevard to Eucalyptus Boulevard.	1.0	✓			✓		✓	
N_1	Irving Street, Carl Street and Duboce Avenue (N Judah)	Irving Street from 9th Avenue to Arguello Boulevard; Carl Street from Arguello Boulevard to Clayton Street; and Duboce Avenue from Scott Street to Church Street.	1.6	✓	✓	✓	✓		✓	
N_2	Judah Street (N Judah)	Judah Street from La Playa Street to 9th Avenue; and 9th Avenue from Judah Street to Irving Street.	3.0	✓	✓	✓	✓	TBD	✓	
1_1	Sacramento Street and Clay Street (1 California)	Sacramento Street from Drumm Street to Gough Street; Drumm Street from Clay Street to Sacramento Street; Gough Street from Clay Street to Sacramento Street; and Clay Street from Gough Street to Drumm Street.	1.8	✓		✓	✓	✓	✓	✓
1_2	California Street (1 California, 1AX California 'A' Express and 1BX California 'B' Express)	Sacramento Street from Steiner Street to Gough Street; Steiner Street from Sacramento Street to California Street; California Street from Steiner Street to 32nd Avenue; 32nd Avenue from California Street to Geary Boulevard; Geary Boulevard from 32nd Avenue to 33rd Avenue; 33rd Avenue from Geary Boulevard to Clement Street; and Clement Street from 33rd Avenue to 32nd Avenue.	4.0	✓		✓	✓	TBD	✓	✓

* Recommendations in consideration include new queue jumps at targeted intersections, extension of hours of enforcement of existing transit lane lanes, and new transit lanes on one or more blocks within the corridor segments. The potential to add treatments on corridors marked TBD (to be determined) will be evaluated during project development.

TABLE A-1: TTRP OVERVIEW (CONT'D)

TEP Ref #	Transit Corridor Segment (Muni Route(s) improved)	Detailed Segment Description	Segment Length (miles)	Transit Signal Priority or Optimized Signal Timing	New Signal	Stop spacing optimization	Bus Bulbs	Dedicated Transit Lane*	Ticket Vending Machines, All-Door Boarding and Customer Amenities	Other
5_1	Fulton Street and McAllister Street (5 Fulton)	La Playa Street from Cabrillo Street to Fulton Street; Fulton Street from La Playa Street to Central Avenue; Central Avenue from Fulton Street to McAllister Street; McAllister Street from Central Avenue to Market Street; Hyde Street from McAllister Street to Market Street; and Market Street from 8th Street to McAllister Street.	5.7	✓	✓	✓	✓	✓	✓	✓
8X_1	Geneva Avenue (8X Bayshore Express, 43 Masonic, 52 Excelsior and 8BX Bayshore 'B' Express)	Geneva Avenue from Ocean Avenue to Santos Street.	2.1	✓	✓	✓	✓	TBD	✓	✓
9_1	11th Street, Potrero Avenue, and Bayshore Boulevard (9 San Bruno and 9L San Bruno Limited)	11th Street from Mission Street to Bryant Street; Division Street from Bryant Street to Potrero Avenue; Potrero Avenue from Division Street to Bayshore Boulevard; and Bayshore Boulevard from Jerrold Avenue to Silver Avenue.	3.5	✓		✓	✓	TBD	✓	
9_2	San Bruno (8X Bayshore Express, 8AX Bayshore 'A' Express, 9 San Bruno, and 9L San Bruno Limited)	Silver Avenue from Bayshore Boulevard to San Bruno Avenue; and San Bruno Avenue from Silver Avenue to Arleta Avenue.	1.5	✓		✓	✓	✓	✓	✓
14_1	Mission Street east of South Van Ness Avenue (14 Mission, 14L Mission Limited, 14X Mission Express)	Mission Street from Steuart Street to 11th Street; Steuart Street from Mission Street to Market Street; Market Street from Steuart Street to Main Street; and Main Street from Market Street to Mission Street.	2.1	✓		✓	✓	✓	✓	✓
14_2	Inner Mission Street (14 Mission, 14L Mission Limited and 49L Van Ness –Mission Limited)	Mission Street from 11th Street to Cesar Chavez Street; and Otis Street from South Van Ness Avenue to 13th Street.	1.8	✓		✓	✓	✓	✓	✓
14_3	Outer Mission Street (14 Mission, 14L Mission Limited, 14X Mission Express and 49L Van Ness-Mission Limited)	Mission Street from Cesar Chavez Street to San Jose Avenue.	3.8	✓	✓	✓	✓	TBD	✓	
22_1	Fillmore Street (22 Fillmore)	Fillmore Street from Marina Boulevard to Hermann Street; Hermann Street from Fillmore Street to Church Street; Church Street from Hermann Street to 16th Street	2.9	✓	✓	✓	✓	TBD	✓	✓

* Recommendations in consideration include new queue jumps at targeted intersections, extension of hours of enforcement of existing transit lane lanes, and new transit lanes on one or more blocks within the corridor segments. The potential to add treatments on corridors marked TBD (to be determined) will be evaluated during project development.

TABLE A-1: TTRP OVERVIEW (CONT'D)

TEP Ref #	Transit Corridor Segment (Muni Route(s) improved)	Detailed Segment Description	Segment Length (miles)	Transit Signal Priority or Optimized Signal Timing	New Signal	Stop spacing optimization	Bus Bulbs	Dedicated Transit Lane	Ticket Vending Machines, All-Door Boarding and Customer Amenities	Other
22_2	16th Street (22 Fillmore)	16th Street from Church Street to Kansas Street.	1.4	✓		✓	✓		✓	
28_1	Lombard Street (28 19th Avenue, 28L 19th Avenue Limited)	Lombard Street from Van Ness Avenue to Broderick Street; and Richardson Avenue from Broderick Street to Lyon Street.	1.4	✓		✓	✓	TBD	✓	✓
28_2	19th Avenue Richmond-Sunset Districts (28 19th Avenue and 28L 19th Avenue Limited)	Park Presidio Boulevard from Lake Street to Fulton Street; Park Presidio Bypass from Fulton Street to Crossover Drive; Crossover Drive from Park Presidio Bypass to Lincoln Way; and 19th Avenue from Lincoln Way and Eucalyptus Drive.	4.2	✓		✓	✓		✓	
30_1	Stockton Street and Kearny Street (30 Stockton, 45 Union/Stockton, 8X Bayshore Express, 8AX Bayshore 'A' Express, and 8BX Bayshore 'B' Express)	Stockton Street from Market Street to Columbus Avenue; Sutter Street from Stockton Street to Kearny Street; and Kearny Street from Sutter Street to Market Street.	1.0	✓			✓	✓	✓	✓
30_2	North Point Street and Columbus Avenue (30 Stockton)	Van Ness Avenue from North Point Street to Chestnut Street; North Point Street from Columbus Avenue to Van Ness Avenue; and Columbus Avenue from Stockton Street to North Point Street.	1.3	✓		✓	✓	✓	✓	
30_3	Chestnut Street (30 Stockton and 30X Marina Express)	Chestnut Street from Van Ness Avenue to Broderick Street; Broderick Street from Chestnut Street to Jefferson Street; Jefferson Street from Broderick Street to Divisadero Street; and Divisadero Street from Jefferson Street to Chestnut Street.	1.4	✓		✓	✓		✓	
71_1	Haight Street (6 Parnassus, 71 Haight-Noriega and 71L Haight-Noriega Limited)	Haight Street from Market Street to Stanyan Street; Stanyan Street from Haight Street to Frederick Street; Frederick Street from Stanyan Street to Arguello Boulevard; and Lincoln Way from Arguello Boulevard to 3rd Avenue.	2.5	✓	✓	✓	✓	TBD	✓	✓
71_2	Noriega Street, 22nd Avenue, 23rd Avenue, and Lincoln Way (71 Haight-Noriega, 71L Haight-Noriega Limited and 16X Noriega Express)	Lincoln Way from 3rd Avenue to 23rd Avenue; 22nd Avenue from Lincoln Way to Noriega Street; 23rd Avenue from Lincoln Way to Noriega Street; Noriega Street from 22nd Avenue to 48th Avenue; Ortega Street from 48th Avenue to 47th Avenue; Lower Great Highway from Ortega Street to Noriega Street; and 47th Avenue from Ortega Street to Noriega Street.	3.6	✓		✓	✓	TBD	✓	

* Recommendations in consideration include new queue jumps at targeted intersections, extension of hours of enforcement of existing transit lane lanes, and new transit lanes on one or more blocks within the corridor segments. The potential to add treatments on corridors marked TBD (to be determined) will be evaluated during project development.

APPENDIX IV

Service Improvements Route Maps

This appendix provides graphical depictions of the service improvements described in the document.

Table IV-1: Phase 1 (FY 14) Route Updates and Schedule Changes

Route Affected	Description of Service Change	Relationship to Capital Projects
1ABX/31ABX/ 38ABX	Add stop at Van Ness to improves connectivity to Civic Center destinations and future Van Ness BRT.	None
8X/8BX	Discontinue northern route to end at Broadway. Eliminated segment would be replaced by new downtown connector (Route 11). This would maximize resources by serving the northern portion of Route 8X with Route 11 service.	None
10/11/12/27	10 - Revised routing replacing south end of route 10, with a new alignment through Mission Bay and Potrero Hill. 11 - Replaces northern portion of the 8X/8BX and part of the 47. 12 - Discontinue route with segment on Pacific served by 10 and segment on Folsom served by 11 and 27. 27 - In South of Market, reroute from Harrison and Bryant to Harrison and Folsom in Mission District. This combination of improvements consolidates service corridors east of Mission to streamline routing, save resources, and eliminate duplication. Route 10 provides improved service to customers in new development in Mission Bay upon completion of Mission Bay South street grid. Route 11 provides a new route connecting Fisherman's Wharf with Downtown and SoMa neighborhoods, including connections to BART, Muni Metro, and the Transbay Terminal.	Sansome Contraflow lane
49L	49L would operate as a limited-stop service from South Van Ness to Ocean Ave to provide improved service in a major travel corridor.	Shelter improvements, distinctive signage
16X	Extension to Market/Spear, which would provide better penetration of downtown core and greater connectivity, which would make route more attractive to new customers.	None

TABLE IV-1: PHASE 1 (FY 14) ROUTE UPDATES AND SCHEDULE CHANGES (CONT'D)

Route Affected	Description of Service Change	Relationship to Capital Projects
17/18	Route 17 would replace existing Route 18 segment around Lake Merced via John Muir Drive and Skyline Blvd. Also, Route 18 would use a more direct route between the Zoo and Stonestown. This would provide improved connections on Route 17 from regional transit (Daly City BART) to major west side destinations, including West Portal, Stonestown, Lakeside Plaza and Westlake Mall, and regional transit at Daly City BART. It would provide more straightforward routing of 18 service around Lake Merced and through Parkmerced.	None
19/35/48/58	Redesign 48 to extend to Hunters Point, replacing 19, which would terminate at SF General Hospital. Introduce the 58 to increase service on 24th St and reroute 35 to replace existing 48 service on Hoffman and Douglass Streets and provide access to Glen Park BART station. These changes would improve service between Hunters Point and the Mission and increase frequency on 24th street.	None
23	Route change in Produce District. This would provide more direct routing for Palou Street customers.	None
28	Shorten to Golden Gate Bridge to save resources. Change coordinated with 28L and occurs during times when 28L is running.	None
28L	Expand to all-day service and extend route to Van Ness/North Point & Mission/Geneva. This would provide a competitive travel time option to automobile travel in the outer neighborhoods and link new destinations, including SFSU and City College from Marina, Richmond, Sunset, and Excelsior areas. This is coordinated with the Route 28 change.	Van Ness-North Point terminal improvements
29	Reroute from Geneva and Mission onto Ocean to streamline route.	Balboa Park Ped Improvement and Lyon/ Richardson Transfer Point
38L	Introduce Sunday limited-stop service. Offers better travel times for Sunday customers and coordinates with Geary BRT project study, which aims to achieve significant travel time and reliability improvements.	None
43	Reroute in Presidio, extend to Fort Mason. Links Fort Mason recreation area with Presidio destinations.	None

Table IV-1: Phase 1 (FY 14) Route Updates and Schedule Changes (cont'd)

Route Affected	Description of Service Change	Relationship to Capital Projects
47	Eliminate segment along North Point and reroute south of Market. Routing would provide time savings between Civic Center and Caltrain.	None
52/54	Reroute of the 54 onto Ocean Avenue would provide better access to City College, BART, and other community services. Route extensions and two-way service on Hunters Point hilltop would provide improved access and shorter travel times by straightening out segments of both routes. Reroute of the 52 would provide Excelsior District with service to two BART stations. More legible route would be provided by running two way on Excelsior and Naples Streets.	Balboa Park Pedestrian Improvement, Lee St. Terminal
32/36/37/56	Splitting the 37 into 2 routes (32 and 37) and shortening 36 to run more frequently and discontinuing Forest Knolls and Glenview Loop segments. Route 56 would eliminate segments to Executive Park and Sunnydale Avenue. Routes would be more direct and efficient.	Would eventually benefit from introduction of vans
76	Run 76 on both weekend days to provide improved customer access.	None
91A, 91B, N (Owl)*	Split 91 Owl into two lines. 91B would incorporate present N Owl. Breaks up overly-long Owl route to improve service reliability and customer understanding.	None

Table IV-2: Phase 2 (end of FY 15) Route Updates and Schedule Changes

Route Affected	Description of Service Change	Relationship to Capital Projects
E/F*	Introduce E Line and increase F service, which is a major tourist attractor. Also supplements F Line service along Embarcadero.	Completion of streetcar rehab program, with the addition of more double ended cars
5, 5L	Introduce 5L with addition of bypass wires, which would improve service in a major corridor.	Limited stop segment bypass wire addition
6 (reroute on Stanyan), 71L	Reroute via Stanyan Street between Haight Street and Parnassus Street. Discontinue Frederick/Clayton/Masonic routing. Discontinued routing replaced by 32 Van. This would allow for 71L to provide Limited service along length of Haight Street, offering rapid service for customers on the trunk corridor.	Installation of overhead on Stanyan Street

* E Line Terminal capital project is not a prerequisite for this service change; however, the capital project is desired for operational flexibility and service reliability.

Table IV-3: Route Updates Associated with Capital-Intensive Projects

Route Impacted	Description of Route Update	Relationship to Capital Projects
22, 33	Trolley coach extension and reroute, which would serve new development and improve connectivity across 16th Street while maintaining service to 18th Street corridor via Route 33.	Extension of overhead on 16th Street and Connecticut
M Extension into Parkmerced	Pending proposals with Parkmerced. Operate peak period short line/long-line so trunk between SF state and downtown has twice as much service as branch between Parkmerced and Balboa Park. Alternate trips would continue to serve Balboa Park Station. These improvements would increase service on most used service of route and conserve resources on lighter portions.	Line construction, junction with existing route
6	Extension to West Portal to provide better connectivity.	Extended overhead

Notes:

1. For a graphic depiction of all service improvements, see route maps in Appendix IV.
2. Implementation of rail frequency changes may be contingent on vehicle availability and Muni Metro tunnel capacity improvements.

APPENDIX V

TEP Capital Cost Summary (2010 Dollars)

The document includes the capital cost summary in year-of-expenditure dollars (incorporating inflation). This appendix provides the same information in FY 10 dollars.

Table V-1: TEP Capital Cost Estimate Summary (2010 Dollars)

TEP Ref #	Proposal Name	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	TOTAL
SF Project Milestones					Market St Resurfacing	Van Ness BRT, Doyle Drive Reconstruction Project		Geary BRT		Central Subway		
TEP Milestones				Phase 1 updates		Phase 2 updates						
SERVICE IMPROVEMENTS[1]												
SI.1	Start-Up Costs – Phase 1	—	—	—	200,000	—	—	—	—	—	—	200,000
SI.2	Start-Up Costs – Phase 2	—	—	—	—	—	200,000	—	—	—	—	200,000
											Subtotal	**400,000**

[1] 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.

Table V-1: TEP Capital Cost Estimate Summary (2010 Dollars) (cont'd)

TEP Ref #	Proposal Name	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	TOTAL
SF Project Milestones					Market St Resurfacing	Van Ness BRT, Doyle Drive Reconstruction Project		Geary BRT		Central Subway		
TEP Milestones				Phase 1 updates		Phase 2 updates						
TRAVEL TIME REDUCTION PROPOSALS												
TTRP.30_1	Stockton St and Kearny St (30, 45)	—	317,500	1,205,000	—	—	—	—	—	—	—	1,522,500
TTRP.30_2	North Point St and Columbus Av (30)	—	1,490,000	2,508,000	—	—	—	—	—	—	—	3,998,000
TTRP.9_2	San Bruno Av (8X, 8AX, 9)	—	90,000	890,000	—	—	—	—	—	—	—	980,000
TTRP.N_1	Irving St and Carl St (N)	—	105,000	371,500	1,435,500	—	—	—	—	—	—	1,912,000
TTRP.14_2	Inner Mission St (14, 14L, 14X) RI5	—	540,000	813,750	1,799,750	—	—	—	—	—	—	3,153,500
TTRP.14_3	Outer Mission St (14, 14L, 14X)	—	915,000	1,578,250	3,460,250	—	—	—	—	—	—	5,953,500
TTRP.28_2	19th Av Richmond-Sunset Districts (28, 28L)	—	720,000	1,109,750	3,224,750	—	—	—	—	—	—	5,054,500
TTRP.M_28	19th Av-Stonestown/SFSU (M, 28)	—	—	—	181,250	846,250	—	—	—	—	—	1,027,500
TTRP.14_1	Mission St east of Van Ness (14, 14L, 14X)	—	—	30,000	155,000	1,210,500	—	—	—	—	—	1,395,500
TTRP.8X_1	Geneva (8X, 43, 54, 29, 8BX)	—	—	210,0000	864,250	2,417,250	—	—	—	—	—	3,491,500
TTRP.5_1	Fulton St and McAllister (5)	—	200,000	505,000	1,271,500	5,118,000	—	—	—	—	—	7,094,500
TTRP.22_2	16th St (22)	—	—	—	360,000	607,500	1,297,500	—	—	—	—	2,265,000
TTRP.28_1	Lombard St (28)	—	—	—	—	378,750	1,400,750	—	—	—	—	1,779,500
TTRP.9_1	11th St, Potrero Av and Bayshore Blvd (9)	—	—	—	—	488,000	2,203,000	—	—	—	—	2,691,000
TTRP30_3	Chestnut St (30)	—	—	—	—	—	236,250	1,234,250	—	—	—	1,470,500
TTRP.1_2	California St (1, 1AX, 1BX)	—	—	—	160,000	320,000	1,777,500	3,832,000	—	—	—	6,089,500
TTRP.22_1	Fillmore St (22)	—	—	—	290,000	1,210,000	1,825,750	3,807,750	—	—	—	7,133,500

Table V-1: TEP Capital Cost Estimate Summary (2010 Dollars) (cont'd)

TEP Ref #	Proposal Name	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	TOTAL
SF Project Milestones					Market St Resurfacing	Van Ness BRT, Doyle Drive Reconstruction Project		Geary BRT		Central Subway		
TEP Milestones				Phase 1 updates		Phase 2 updates						
TRAVEL TIME REDUCTION PROPOSALS												
TTRP.N_2	Judah St (N)	—	—	—	—	630,000	565,250	3,558,250	—	—	—	4,753,500
TTRP.L_1	Taraval St (L)	—	—	—	—	735,000	588,000	1,148,250	1,384,250	—	—	3,855,500
TTRP.K_1	Ocean Av (K)	—	—	—	—	—	—	170,000	1,155,000	—	—	1,325,000
TTRP.J_1	Church St (J)	—	—	—	—	420,000	336,000	1,287,750	1,962,750	—	—	4,006,500
TTRP.71_1	Haight St (6, 71,71L)	—	—	—	—	—	—	315,000	523,250	2,084,250	—	2,922,500
TTRP.1_1	Sacramento St and Clay St (1)	—	—	—	—	—	—	—	680,000	1,653,500	—	2,333,500
TTRP.71_2	Noriega/22nd/23rd St and Lincoln Way (71L)	—	—	—	—	—	120,000	240,000	506,250	2,296,250	—	3,162,500
											Subtotal	**79,371,000**

Table V-1: TEP Capital Cost Estimate Summary (2010 Dollars) (cont'd)

TEP Ref #	Proposal Name	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	TOTAL
SF Project Milestones					Market St Resurfacing	Van Ness BRT, Doyle Drive Reconstruction Project		Geary BRT		Central Subway		
TEP Milestones				Phase 1 updates		Phase 2 updates						
SYSTEMWIDE CAPITAL IMPROVEMENTS												
SCI.1	Accessible Rail Platforms	—	200,000	550,000	1,100,000	2,200,000	1,925,000	1,375,000	550,000	—	—	7,900,000
SCI.2	NextMuni Signage	—	315,000	315,000	315,000	315,000	150,000	150,000	150,000	150,000	150,000	2,010,000
SCI.4	Sansome Contraflow Extension	—	—	75,000	—	—	—	—	—	—	—	75,000
SCI.5	Additional Cameras and Monitoring Equipment	—	—	25,000	87,500	87,500	—	—	—	—	—	200,000
SCI.6	Community Connector Vans	—	—	—	300,000	1,200,000	1,000,000	—	—	—	—	2,500,000
SCI.7	Installation of TSP Equipment at Non-TTRP Intersections	—	—	—	751,000	751,000	751,000	751,000	751,000	771,000	—	4,526,000
											Subtotal	**17,211,000**

Table V-1: TEP Capital Cost Estimate Summary (2010 Dollars) (cont'd)

TEP Ref #	Proposal Name	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	TOTAL
SF Project Milestones					Market St Resurfacing	Van Ness BRT, Doyle Drive Reconstruction Project		Geary BRT		Central Subway		
TEP Milestones				Phase 1 updates		Phase 2 updates						
TERMINAL AND TRANSFER POINT IMPROVEMENTS												
TTPI.1	Van Ness & North Point Hub & Bus Terminal	—	165,000	220,000	715,000	—	—	—	—	—	—	1,100,000
TTPI.2	Daly City Bus Terminal and Transfer Point Improvements	—	450,000	600,000	1,360,000	590,000	—	—	—	—	—	3,000,000
TTPI.3	Lee St Terminal for 52	—	—	10,000	—	—	—	—	—	—	—	10,000
TTPI.4	E Line Independent Terminal at Beach/Jones	—	—	—	—	—	500,000	650,000	3,550,000	—	—	4,700,000
TTPI.6	Balboa Park BART Station Pedestrian Improvement (Ocean Ave)	91,000	—	—	—	—	—	—	—	—	—	91,000
TTPI.7	Lyon/Richardson Bus Stop – Transfer Point	—	—	150,000	—	—	—	—	—	—	—	150,000
TTPI.8	SFGH Transfer Point	—	—	—	10,000	115,000	—	—	—	—	—	125,000
											Subtotal	**9,176,000**

Table V-1: TEP Capital Cost Estimate Summary (2010 Dollars) (cont'd)

TEP Ref #	Proposal Name	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	TOTAL
SF Project Milestones					Market St Resurfacing	Van Ness BRT, Doyle Drive Reconstruction Project		Geary BRT		Central Subway		
TEP Milestones				Phase 1 updates		Phase 2 updates						
OVERHEAD WIRE EXPANSION												
OWE.1	New Overhead Wiring – Reroute 33 on to Valencia	—	200,000	350,000	1,400,000	—	—	—	—	—	—	1,950,000
OWE.2	Bypass Wires at Various Terminal Locations	—	50,000	150,000	200,000	500,000	350,000	300,000	—	—	—	1,550,000
OWE.3	New Overhead Wiring – 6 Parnassus on Stanyan St.	—	200,000	600,000	4,000,000	250,000	—	—	—	—	—	5,050,000
OWE.4	5 Limited/Local Bypass Wires	—	—	135,000	180,000	585,000	—	—	—	—	—	900,000
OWE.5	22 Fillmore Extension to Mission Bay	—	—	1,180,000	2,280,000	8,480,000	560,000	—	—	—	600,000	13,100,000
OWE.6	New Overhead Wiring – 6 Ext to West Portal	—	—	—	—	—	200,000	1,750,000	3,450,000	12,800,000	1,000,000	19,200,000
											Subtotal	**41,750,000**

Table V-1: TEP Capital Cost Estimate Summary (2010 Dollars) (cont'd)

TEP Ref #	Proposal Name	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	TOTAL
SF Project Milestones					Market St Resurfacing	Van Ness BRT, Doyle Drive Reconstruction Project		Geary BRT		Central Subway		
TEP Milestones				Phase 1 updates		Phase 2 updates						
LONG-TERM INVESTMENT STUDIES												
LIS.1	Comprehensive Communications Plan	—	200,000	100,000	200,000	100,000	200,000	—	—	—	—	800,000
LIS.2	Traction Power System Upgrade Study	—	250,000	300,000	—	—	—	—	—	—	—	550,000
LIS.3	Long-Range Rail System Plan	—	—	300,000	700,000	—	—	—	—	—	—	1,000,000
LIS.4	Environmental Review Process	500,000	500,000	—	—	—	—	—	—	—	—	1,000,000
Subtotal												**3,350,000**
	TOTAL	**591,000**	**6,907,500**	**14,281,250**	**27,000,750**	**29,554,750**	**16,186,000**	**20,569,250**	**14,662,500**	**19,755,000**	**1,750,000**	
											GRAND TOTAL	**151,258,000**

APPENDIX VI

Inflation Assumption

Inflation Assumptions

As stated in Chapter 4, year-of-expenditure calculations are based on Global Insight's 30-year forecast of the Consumer Price Index for San Francisco-Oakland-Fremont, California. The calculation is based on the conversion factors listed below.

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Annual Increase	1.000	1.016	1.021	1.021	1.024	1.024	1.023	1.023	1.022	1.021
Conversion Factor	1.000	1.016	1.037	1.060	1.085	1.111	1.137	1.163	1.189	1.214