

Chapter 10: Equipment Program and Other Projects

The Equipment Program provides the tools needed for the continued operation of Muni's operating, maintenance and administrative functions, such as the replacement or acquisition of such items as rail grinders and computers. Many of the projects in this program are related to technology and communications.

Other Projects include security projects, such as the Graffiti Prevention and Security Program, and station area projects such as Bayview Connections and Balboa Park.

Highlights of Muni's technology and communications initiatives are described in this chapter. All of the existing capital project descriptions are included at the end of this chapter.

Recent Accomplishments

Technology projects are critical to maintaining and improving Muni's service delivery and internal efficiency. Projects are developed with input from all divisions within Muni and DPT. The following technology projects have been completed in the past two years:

- Shop History and On-line Parts System (SHOPS) replaced Muni's existing Vehicle Maintenance System
- Trapeze, a transit-specific scheduling package, was implemented
- TransitSafe, Muni's database used to analyze safety, security, and training trends began
- Enterprise Server Room was implemented
- MIS TESS Integration completed

Geographic Information Systems

Spatial data is crucial to Muni's mission of providing transportation services. Enhancing Muni's Geographic Information Systems (GIS) capabilities will facilitate easier sharing of spatial data within Muni and with other agencies, including MTC's 511.org, which provides a public transit trip planning service through the Regional Transit Information System. By maintaining precise stop and route locations, the GIS additionally provides base data that is crucial for the NextBus® passenger information system and the new Scheduling and Operator Dispatch system. Muni's GIS will leverage the NextBus® vehicle location data to improve its mileage and time point adherence reporting. The system also adds map-based reporting tools to TransitSafe to show incident hotspots and location analysis to guide corrective action for improved passenger safety. Facility and overhead department electronic maps will enhance system reliability through linear referencing of assets, inspections and repairs. For service and accessible service planning, map surveys and analysis of demographic, curb cut and slope data will contribute to better system design, customer convenience, safety, and public information. The GIS also allows MUNI to assess and predict locational impacts of route modifications and construction on city residents and businesses.

Automatic Vehicle Locator System

Automatic Vehicle Location (AVL) system data provides real-time vehicle location information, and generates live transit information and arrival schedules to transit patrons. AVL system data also provides operations line managers continuous updates of vehicle locations, headway, and on-time reports, which assist operations managers in line management and recovery from service disruptions. In addition, archived AVL data provides the basis for performance and schedule adherence analysis and reporting.

Muni issued a competitive AVL System Request for Proposals in April 2001 and issued Notice to Proceed to NextBus® in August 2002. The 5-year contract provides for system design and implementation to all Muni's rail vehicles (LRVs, Cable Cars, and Historic Rail) in the first year, which is now complete. Year 2 equips all electric trolley coaches and installs up to 400 roadside passenger information signs; Year 3 equips all motor coaches; Years 4 & 5 provide ongoing service.

There are about 4,000 Muni stops in San Francisco. Muni only has funding to install 400 wayside NextBus® signs. The NextBus® signs require electrical power to operate and they must be installed in a protected, sheltered area. Approximately 1,000 bus shelters currently have electrical power. The proposed criteria for shelter installations are as follows:

- Powered shelters only
- Signage equitably distributed among districts
- At least one of the following operating characteristics must apply:
 - The stop is a transfer point
 - The stop is a high loading point (many passengers boarding/deboarding)
 - The stop has a long headway with passengers waiting a long time (community lines)
 - The stop has restricted line of sight along the corridor (passenger cannot see the bus coming from far away)

With this technology, passengers, Muni managers, and the general public have the ability to access specific arrival information via the Internet, hand-held cellular devices, and/or illuminated shelter signs. Automatic Vehicle Location systems increase customer satisfaction by reducing unnecessary waiting, with the added benefit of providing vehicle arrival information and on-time performance data to Muni management. DPT's SFgo™ project receives AVL data for integration into its Traffic Management Software system, to coordinate traffic signals for implementing centralized traffic priority and to facilitate on-time transit service. Muni also provides AVL data to the MTC's 511 system to deliver arrival information to transit patrons throughout the Bay Area region. The final implementation of this project for the motor coach fleet and for wayside signs will be complete by August, 2006

As a separate project, the Accessible Services Program developed a proposal to procure AVL equipment for installation in paratransit vans. There are approximately 75 paratransit vans providing nearly 11,000 trips per month. The AVL system will be used to increase the monitoring of paratransit vans, enhance communications between dispatchers and drivers, improve the customer reliability response to "where's my ride" phone calls, and generate more accurate on-time performance reports.

Regional Intelligent Transportation Systems

Intelligent Transportation Systems (ITS) projects are those electronic and communications systems that collect, process, disseminate, or act on information in real-time to improve the operation, safety or convenience of transportation systems. The U.S. Department of Transportation has developed the National ITS Architecture and a related set of tools and standards to facilitate coordination among systems and across agency and regional boundaries. The federal government requires that ITS projects seeking federal funding after April 2005 procure those projects within the framework of a regional ITS architecture.

To address both the needs and opportunities for integration of ITS projects, MTC sponsored development of a Regional ITS Architecture and an ITS Strategic Deployment Plan for the nine-county San Francisco Bay Area. Muni was an active stakeholder in the MTC's Regional Architecture project. The ITS Regional Architecture and ITS Deployment Plan was finalized in July 2004 and is available online at: <http://www.iteris.com/mtcits/>.

ITS Vehicle Projects

Digital Voice Annunciation System (DVAS): Muni's new motor coaches and electric trolleys come equipped with systems to automatically announce and display the next scheduled stop, based on a Global Positioning System (GPS) locator. This project will extend DVAS to all of Muni's revenue fleet, retrofitting LRVs, and older rubber-tire coaches that will remain in service for several years.

LRV Event Recorder: An on-board event-recorder will monitor and log activity on a variety of critical vehicle systems. Event recorder data will greatly aid in diagnosing problems, the source of which may be any of the many interconnected on-board systems with highly complex interactions. The event recorder will also be a key resource in accident investigations. The estimated completion date is in 2012

Automatic Passenger Counters (APC): The APC Project will install automatic passenger counting equipment on a subset of Muni's revenue fleet, providing accurate and timely passenger counts, a key component to effective fleet management and service planning. Approximately 50% of motor coaches in the current procurement process will be equipped with APC.

SFgo™

The mission of SFgo™ is to provide multi-modal, real-time traveler information to the public and to improve traffic flow citywide. In order to succeed in its Mission, SFgo™ will implement Intelligent Transportation Systems (ITS) tools to enhance traffic analysis, to provide transit signal priority and to improve maintenance procedures. These tools include advanced traffic signal controllers, traffic cameras, video detection, variable message signs, a communications network and Transportation Management Center (TMC). One of the goals of SFgo™ is to use ITS to improve Muni's on-time performance and advance the Transit First Policy. Muni is a key stakeholder in the SFgo™ project and has actively participated in the SFgo™ Technical Advisory Committee since 2001.

The benefits of this partnership can already be seen along the Third Street corridor. As Muni builds the new light rail project, it will install the necessary traffic signal infrastructure and communications network to provide transit signal priority along the entire corridor. Light rail simulations using a VISSIM model have shown a time savings of two minutes over a sample of seven intersections. Extending that over the 65 intersections in the Third Street corridor could mean a savings of over 15 minutes in LRT travel time. Transit priority helps Muni improve on-time performance and reliability and increases Muni's modal share of the travel market. Transit signal priority will be implemented citywide in phases as the SFgo™ program expands.

By 2006, DPT will have completed the Initial Phase of the SFgo™ Program. The Initial Phase includes final construction of the Main TMC and the satellite TMC at SBC Park. It also includes 35 intersections in the South of Market Area, 14 traffic cameras, 5 video detection systems, and 4 variable message signs. LRT transit signal priority was also upgraded along the Embarcadero from Mission to SBC Park.

The next two corridors to be upgraded by SFgo™ are 3rd Street and Oak/Fell Streets. Both corridors already have advanced traffic signal controllers and are part of the SFgo™ communications network. However, in 2006 DPT will be adding traffic cameras, video detection and variable message signs. These devices will help SFgo™ collect more roadway data as well as provide information to the public. Implementation for Third Street will occur in-June 2006 and Oak-Fell will occur in-June 2007.

Also in 2006, DPT will be extending the communications network from 3rd Street to the DPT Traffic Signal Shop located at 901 Rankin Street. This will provide the Signal Shop with the same functionality as the Main TMC. It will also provide tools to detect signal malfunctions or failures immediately through the SFgo™ network.

As part of the Proposition K 5-Year Prioritization Program, DPT identified another 18 projects to help expand the SFgo™ network. These projects include planning, software improvements, integration with Muni Central Control, Caltrans and 511, and construction projects along the following corridors:

- Central Freeway Area
- Van Ness Avenue, Franklin, Gough and Polk Streets
- Market Street
- Potrero
- Lincoln/Kezar
- Lombard Street
- 19th Avenue/Park Presidio
- Mission Street
- 1st Street & Fremont
- Embarcadero
- Masonic
- Valencia
- Geary

The total cost to implement the SFgo™ Program is estimated to be \$215 million. To date, DPT has secured \$7 million for the SFgo™ Initial Phase Implementation. An additional \$2.6 million has been secured for the Third Street Corridor and Oak/Fell Streets projects. Proposition K also provides \$19.6 million over the next 30 years, however this funding will be used primarily as local match for federal and state grants.

Wireless Radio System

Replacement of obsolete communications systems, emerging FCC rule changes, and the introduction of new technologies are generating the need for updated wireless voice and data communications systems. Muni has embarked on a program to replace its now-obsolete radio system with a state-of-the-art wireless communications system. The new radio system will provide the wireless “backbone” to allow implementation of a variety of ITS applications dependent upon reliable and high-capacity communications between Muni’s Central Control and its revenue fleet. The project will include wireless short-range vehicle-to-wayside data communications, for installation at the maintenance yards, to support data transfers for ITS Vehicle Projects listed above. Muni has secured federal ITS grants for the development of procurement specifications for an “ITS backbone” voice-and-data radio system, and is seeking funding for procurement of the replacement radio system by 2010.

Fare Revenue Integration and Reporting System

Currently Muni uses several systems to manage fare revenue data and cash reconciliation. The Fare Revenue Integration and Reporting (FRIAR) system will bring fare revenue data from all sources into one database to be used for cash reconciliation, financial reporting, ridership trend analysis, and long range planning. This system will replace aging data collection systems and inefficient manual processes.

Central Control Incident Management System

The Central Control Incident Management system will replace the aging Central Control Log application with a real-time incident management system. A real-time application will enable faster communications during the course of regular business and during emergencies. By making incident data available throughout the organization as it happens, Muni can be more responsive to operational situations and make more information available to passengers through the Internet, interactive messaging, and Passenger Services.

Enterprise Application Interface

The Enterprise Service Bus is an integration tool that will tie all of Muni's distributed applications together. The system will follow a web services management model and will allow SHOPS, Trapeze, TransitSafe, NextBus® and other new or legacy systems to communicate or broker information. This project will call data from multiple systems together to offer real-time dashboard views for Managers to use daily to monitor and improve system performance. This project is only in the conceptual phase and is scheduled for completion in spring 2006.

Central Control

The current Central Control Facility is undersized for its existing use, contributing to inefficiencies and limiting the functions that can be accommodated. Expansion or relocation of the facility is needed to provide adequate space for existing functions, and to accommodate expanded service for the Central Subway, BRT lines, and historic rail. Rigorous post-9/11 security requirements will have to be addressed. Current options include: 1) expansion of the existing site; 2) construction of a new facility at the current site; 3) relocation to the new Muni Headquarters.

THIS PAGE INTENTIONALLY LEFT BLANK