



U.S. Department  
Of Transportation  
**Federal Transit Administration**

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## **Progress on State of Good Repair Pilot Projects Report to Congress**

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**Table of Contents**

Executive Summary ..... 1  
Introduction ..... 2  
Asset Management Pilot Projects ..... 2

**List of Tables**

Table 1 FTA Asset Management Projects Initiated in Response to  
FY 2010 Congressional Request ..... 4  
Table 2 Methodologies for Developing Primary Pilot Project Products ..... 6

**Abstract**

This document reports on the status of the Federal Transit Administration's (FTA) six State of Good Repair (SGR) Pilot Projects. FTA initiated these projects in response to direction from Congress in the Consolidated Appropriations Act of 2010 conference report. The goal of the pilots is to advance the state of asset management practice in the U.S. transit industry. The six projects are underway at a diverse selection of transit providers across the country. Each is developing asset management tools that suit their particular circumstances. Each agency is contractually obligated to provide outreach and training to other agencies on their asset management tools produced in these projects. This broad-based promotion of better asset management techniques, along with the required peer-to-peer training is intended to produce a quantum leap in transit asset management practices. This paper describes each of these projects in turn and reports on their status.

## **Executive Summary**

### **Progress on State of Good Repair Pilot Projects Report to Congress**

FTA provides over \$10 billion annually in financial assistance to states, local governments, and transit agencies for building, maintaining, operating, and planning transit systems. A large portion of the Nation's transit assets need to be rebuilt or replaced. FTA estimated in 2010 that the nation then had an accumulated state of good repair reinvestment shortfall of \$77.7 billion. Many transit agencies still lack effective asset condition assessment tools and have limited technical ability to set effective capital spending priorities.

In the conference report accompanying H.R. 3288, the Consolidated Appropriations Act of 2010, Congress directed FTA to use up to \$5 million of research funds for asset management, including a pilot program for improving asset management in the transit industry. This report describes how \$4 million of FTA research funds were spent on six asset management pilot projects.

Effective asset management systems use reliable data on capital assets to make better decisions on allocation and use of available funds. FTA's goal is to increase the number of transit agencies with up-to-date capital asset inventories and good asset management practices. The asset management pilot projects described in this report present a variety of solutions to the challenges faced in the transit industry related to asset management.

FTA solicited proposals, evaluated them, and negotiated grant agreements for the highest ranked proposals. Agencies selected for the pilot program include one of the largest and oldest rail operators; a regional transportation organization that supports a variety of service providers; an operator of commuter rail service; a medium-sized agency that has recently expanded its system; a smaller agency; and a state agency that coordinates rail services.

Pilot project agencies include:

- Massachusetts Bay Transportation Authority (MBTA)
- Regional Transportation Authority of Northeastern Illinois (RTA)
- Peninsula Corridor Joint Powers Board (CALTRAIN)
- Utah Transit Authority (UTA)
- Valley Regional Transit (Idaho)
- Virginia Department of Rail and Public Transportation (VDRPT)

## Introduction

The Federal Transit Administration (FTA) is one of thirteen operating administrations in the U.S. Department of Transportation (DOT) and is charged with improving the nation's public transportation systems. FTA provides over \$10 billion annually in financial assistance to states, local governments, and transit agencies for building, maintaining, operating, and planning transit systems. There is a growing concern that a large portion of the Nation's transit assets need to be rebuilt or replaced. Funding from all levels of government for maintenance and replacement activities has not kept up with the need. FTA estimates[1] that in 2010 the nation had a single-year transit capital reinvestment shortfall of at least \$1.4 billion and that this situation has led to an accumulated shortfall of \$77.7 billion. Most transit agencies also lack effective asset condition assessment tools and systems:

*"Only two of the 23 agencies contacted for (FTA's) Rail Modernization and National SGR [state of good repair] Assessment studies use an objective, multi-factor project scoring process to help rank and prioritize their investment needs."*[2]

In 2010, FTA released a study titled *Transit Asset Management Practices—A National and International Review*[3] which found:

*"for U.S. transit agencies as a whole, there is room for improvement in asset management practices, particularly in terms of aligning agency policy goals and objectives with achieving a SGR (state of good repair), establishing condition and performance measures that effectively communicate asset conditions, and developing the systems and processes that can best optimize scarce agency funds for preservation and improvement of transit assets"*

In the conference report accompanying H.R. 3288, the Consolidated Appropriations Act of 2010, Congress directed FTA to use up to \$5 million of research funds for asset management including a pilot program for improving asset management in the transit industry[4]. This report describes how \$4 million of those funds have been allocated to six asset management pilot projects located in Massachusetts, Illinois, California, Utah, Idaho, and Virginia.

## Asset Management Pilot Projects

Effective asset management systems use reliable data on capital assets to make better decisions on allocation and use of available funds. FTA's goal is to increase the number of transit agencies with up-to-date capital asset inventories and good asset management practices. FTA is partnering with transit agencies, State DOTs, Metropolitan Planning

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[1] FTA, *National State of Good Repair Assessment*, June, 2010, [http://www.fta.dot.gov/documents/National\\_SGR\\_Study\\_072010\(2\).pdf](http://www.fta.dot.gov/documents/National_SGR_Study_072010(2).pdf)

[2] FTA, *National State of Good Repair Assessment*, June, 2010

[3] [http://www.fta.dot.gov/documents/TAM\\_A\\_National\\_and\\_International\\_Review\\_-\\_6.10\\_FINAL.pdf](http://www.fta.dot.gov/documents/TAM_A_National_and_International_Review_-_6.10_FINAL.pdf)

[4] "\$5,000,000 shall be available to the Secretary to develop standards for asset management plans, provide technical assistance to recipients engaged in the development or implementation of an asset management plan, improve data collection through the National Transit Database, and conduct a pilot program designed to identify the best practices of asset management."

Organizations (MPOs), and asset management system suppliers to demonstrate innovative approaches for managing transportation assets.

The asset management pilot projects described in this report present a variety of solutions to the challenges faced in the transit industry related to asset management. At the conclusion of the pilots, FTA will share the innovative and/or improved asset management methods developed as part of these pilot projects with the transit industry so that these organizations can both better prioritize current reinvestment needs, and can develop reasonable cost/schedule estimates for future needs.

FTA received 25 technical proposals for the pilot program. The proposals were evaluated, scored and ranked according to the following criteria and scoring system:

1. Project understanding and approach. (25%)
2. Technical capacity. (20%)
3. Degree to which all requirements listed in the RFP are met or exceeded by the proposal. (30%).
4. Preliminary Project Implementation Plan. (15%)
5. Subcontracting Plan for how small businesses will be utilized as members of the proposing team. (10%)

FTA negotiated grant agreements for the highest ranked proposals. These projects, listed in **Table 1**, represent different approaches to asset management at a varied selection of agencies.

Agencies selected for the pilot program include one of the largest and oldest rail operators; a regional transportation organization that supports a variety of service providers; an operator of commuter rail service; a medium-sized agency that has recently expanded its system; a smaller agency; and a state agency that coordinates rail services.

**Table 2 Methodologies for Developing Primary Pilot Project Products**

1. Document Inventory / Condition Assessment Process	2. Multi-Criteria Investment Prioritization Process	3. Asset-to-Capital Project Numbering Convention	4. Capital Prioritization Decision Support Tool
<ul style="list-style-type: none"> <li>• Refine inventory collection / condition assessment process</li> <li>• Document inventory condition assessment steps, data input templates and level of effort</li> <li>• Prepare "How to" Guide</li> </ul>	<ul style="list-style-type: none"> <li>• RTA/Service Board Task Force identifies preferred criteria</li> <li>• Develop and test points-based rankings using multi-criteria decision analysis (MCDA)</li> <li>• Implement within RTA's decision support tool</li> </ul>	<ul style="list-style-type: none"> <li>• RTA / Service Board working group identifies logical asset to project groupings</li> <li>• RTA develops asset type and location-based numbering convention to map related assets to capital projects</li> </ul>	<ul style="list-style-type: none"> <li>• Modify existing FTA TERM model to implement products 1, 2 and 3</li> <li>• Update decay curves based on RTA data</li> <li>• Document development and use of tool</li> </ul>

***Peninsula Corridor Joint Powers Board (CALTRAIN) - \$750,000***

Passenger rail service on the San Francisco peninsula began in 1863. In 1980, the State of California assumed its operation and it became known as Caltrain. The Peninsula Corridor Joint Powers Board (JPB) took over the operation of Caltrain service in 1992. Caltrain is now a commuter railroad carrying over 30,000 riders a day along a 77 mile long corridor with 34 stations serving 19 communities from San Francisco to Gilroy. Caltrain has identified a 10 year need for approximately \$900 million worth of projects for its SGR program, well beyond projected revenue sources for this work. In 2006 the JPB developed the Microsoft Excel-based Caltrain Asset Management System (CTAMS) to prioritize replacement and rehabilitation needs within existing budget constraints.

The work plan addresses challenges the JPB and other agencies have encountered in managing assets and SGR. Prior to CTAMS, the agency relied on the knowledge and memory of its employees in planning maintenance and capital work. As employees leave, valuable knowledge is lost. When the JPB acquired the 100+ year old railroad, there was some knowledge of the condition of the railroad, but nothing complete or formalized, and the agency did not have the knowledge of employees who had worked on the corridor in the past. After the purchase, the JPB's immediate focus was on maintenance and capital work to improve corridor safety, function, and ridership. The JPB did not have a central location storing information on work which had been completed. CTAMS was developed to capture this valuable information. CTAMS possesses much of the necessary information to meet the project objectives, through a process that establishes a consistent approach to measurement by asset class across the transit agencies.

CTAMS currently includes modules for managing tracks, structures, crossings, stations, and signals. These modules track asset conditions to insure that they meet Caltrain and Federal Railroad Administration (FRA) standards. The system contains links to related documents, such as track charts, maps, photographs, as-built drawings, and maintenance inspection reports. This project will enhance the capabilities of CTAMS through:

- Conversion of CTAMS into a relational database to improve its ability to generate specified reports.
- Adding modules for more asset classes (such as fixed-rail infrastructure, rail rolling stock, and bus facilities) and adding data elements to support cost forecasting.
- Including a manual on how to use CTAMS.

The enhanced CTAMS will be non-proprietary so it can be used by other transit organizations. It will be customizable and compatible with many maintenance and financial management systems. It will provide essential data for making decisions and help the JPB achieve the following goals:

- Enhance fiscal responsibility,
- Maintain proper inventory levels,
- Coordinate maintenance and capital construction schedules, and
- Meet safety goals and other operational performance targets.

#### ***Utah Transit Authority (UTA) - \$500,000***

UTA was founded in 1970 to provide bus service to Salt Lake City and surrounding communities. Today, after one of the most aggressive expansion campaigns in transit history, UTA has one of the largest service areas of any transit agency in the country. Covering 75 cities in seven counties, UTA provides public transportation services to 80 percent of Utah residents.

UTA will be partnering with InspectTech (a major provider of asset management solutions) to develop a risk-based approach to managing their assets. This project will simplify inspection and data collection methods across UTA's different asset categories. Condition assessments will be linked to the risk of an asset failing and to the possible adverse impacts of that failure. For example, inspections of key bridges will be done more often since they are more likely to fail than surface track and can kill people and disrupt service for long periods when they do.

UTA is currently adding 70 miles of new rail line. Tracking use and costs for all this new equipment over time will allow collection of "life cycle" data specific to UTA conditions. Several years of this data will provide a foundation for more accurate maintenance and replacement practices. Currently UTA uses data from the FTA that was mostly collected from Eastern transit systems that have very different climates. The expanded system will build upon the processes included in maintenance management and will take it to the next step by specifying maintenance intervals based upon location and risk within the system.

UTA's Asset Management group believes it is less expensive to replace transit components before they fail. The goal of UTA's asset management system is to be able to recognize and fix conditions that lead to equipment failure so they can plan their maintenance work for off-peak periods to minimize interruptions to their customer's travel plans. Upon completion of this project, UTA will have a system that supports this philosophy and will keep its system operating at peak performance. It will also be useful as a planning and budgeting tool for other agencies. This system will be documented so it can be shared and modified to meet the needs of other agencies interested in improving their asset management.



While all the parts of a complete TAM system exist, UTA is working with InspectTech to consolidate them into a single management tool. This tool will help the UTA achieve the following goals:

- Provide a complete asset inventory,
- Quickly flag safety critical items for immediate repair,
- Schedule the most economical time to rehabilitate or replace assets, and
- Give management a tool for long-term budgeting.

The system will streamline the decision-making process and help in the long-term evaluation of advertised versus actual life cycle costs, and the benefits to proactive preventative maintenance. The goal is to simplify inventory development, condition assessment, and prioritization of reinvestment needs.

### ***Valley Regional Transit (VRT) - \$300,000***

VRT is the regional transportation authority for Ada and Canyon counties in southwest Idaho. It coordinates transit services in the region which includes the cities of Boise, Meridian, Nampa and Caldwell. These services are provided directly by VRT and by several local agencies such as ValleyRide, Ada County Highway District CommuteRide, Boise State University (BSU), and some community social service organizations. These services include local fixed-route bus, inter-county commuter bus, demand response, vanpool, and shuttles for colleges and social service organizations.

Small systems typically have limited resources and often need to make assets last as long as possible. The providers VRT oversees are in this category and can't always afford to replace capital equipment when it has reached the end of its useful life. The bigger VRT providers have maintenance systems to collect data on the condition of their vehicles, but the smaller community and social service organizations typically do not. This project will create a regional asset management database to coordinate asset condition assessments and cost-benefit analyses. This will provide data for development of a regional recapitalization plan for all the VRT providers.

In addition to traditional vanpool and demand response services, the VRT is implementing vehicle sharing between community service organizations, a volunteer driver program, expanded park and ride facilities, a multi-modal center, and a bus shelter program. Existing asset management systems do not accommodate the new types of capital equipment used in these services. The new system will track assets other than vehicles and provide a place to gather information and centralize data for all VRT providers.

VRT and the Community Planning Association of Southwest Idaho (COMPASS) are the region's direct recipients of federal grants. They have developed systems to evaluate funding requests from individual service providers and apportion grant funds. However, local agencies are not consistent in their use of data to support their applications for funding. This new asset management system will assess needs from a regional, not local, perspective. A Microsoft Access database will gather key regional asset inventory, maintenance, performance, and physical condition information. By combining this data with performance measures the software will be able to conduct the cost-benefit analyses necessary to assure the region uses existing funding most effectively. For the first time, this will bring together all alternative transportation capital information in the metropolitan planning area into one system. As a result VRT, and COMPASS will have consistent, comprehensive, data when allocating FTA Urbanized Area

Formula Program, Job Access and Reverse Commute, and New Freedom funds to the various service providers in the region.

Microsoft Access was selected so that the product can be easily used by transportation agencies of any size. As many organizations have staff familiar with Access, the software will have a low learning curve and can be customized easily. The program will be designed to allow data downloads from maintenance tracking systems and will allow data to be directly entered for organizations that currently have no capital-related software. Given that the program will be used in this region for transit, vanpool, vehicle sharing, shuttle and demand-response service, it will be usable by organizations that have one, a combination, or all of these transit modes. The project team is working closely with the FTA to ensure that the end product is generally applicable.

### ***Virginia Department of Rail and Public Transportation (DRPT) - \$700,000***

VDRPT is partnering with Cambridge Systematics (CS) to develop the Next-Generation Transit Asset Management (Trans-AM) System. It will be based on the Program Guidance and Grant Evaluation System (PROGGRES) that DRPT has used to forecast capital needs for transit agencies in Virginia since 2008. Trans-AM will allow DRPT to investigate the impact of different funding strategies on Virginia transit agencies.

The project has several key elements:

- Add an ability to go beyond simple “asset replacement” and track the effect of major overhauls and other maintenance investments that increase asset life.
- Add an ability to evaluate the impact of new routes and more frequent service on capital requirements.
- Add an ability to compare the costs of different mixes of replacement and maintenance.
- Link FTA grant program sources with capital program costs to determine funding needs and local match requirements.
- Release of the enhanced system as open-source software, making it freely available to the entire transit industry.

Trans-AM will be designed with a service-oriented architecture that enables it to be linked to a wide variety of existing transit agency information systems. It will use free or open-source tools (such as MySQL) to reduce the cost of deployment and maintenance. It will be easy for transit agencies with limited in-house IT resources to use.

The following core principles of asset management will be applied in this project:

*Policy-Driven:* Resource allocation decisions are based on a well-defined and explicitly stated set of policy goals and objectives. These objectives reflect desired system condition, level of service, and safety, and are tied to economic, community, and environmental goals.

*Performance-Based:* Policy objectives are translated into system performance measures that are used for both day-to-day and strategic management.

*Analysis of Options and Tradeoffs:* Decisions on what to replace or rebuild are based on an analysis of how the choices will contribute to achieving policy objectives. Alternative methods

for achieving objectives are examined and the best method is selected considering both cost and performance.

*Monitoring to Provide Clear Accountability:* Results are monitored and actual performance influences future agency goals and resource allocations.

Applying these asset management principles requires that investment decisions are based on weighing costs against likely outcome. All options are considered and evaluated using quality information for decision-making.

This project was required to show a local match. The original application planned to use previous expenses for the system as local match. When that fell through, the Pennsylvania Department of Transportation (PennDOT) stepped in to fill the gap. Negotiations with PenDOT are underway to have them provide the local match in exchange for having input into the design of the system. This project started in late July of 2012.