



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

State of Good Repair Initiative REPORT TO CONGRESS

December 2011

Prepared by:
Federal Transit Administration



Contents

| | |
|---|-----------|
| 1. Introduction | 3 |
| 2. Overview of FTA’s Asset Management Initiative | 5 |
| 3. Asset Management Pilot Projects..... | 6 |
| 4. Technical Assistance Efforts | 14 |
| 5. Data Improvements..... | 18 |
| 6. Conclusions | 20 |
| | |
| <i>Appendix A 2010 SGR Asset Management System Grants</i> | <i>22</i> |
| <i>Appendix B 2011 SGR Asset Management System Grants.....</i> | <i>25</i> |
| <i>Appendix C Excerpt from the Senate Committee Report of the DOT-HUD FY2010 Appropriations Bill.....</i> | <i>28</i> |
| <i>Appendix D Impact of Recovery Act Funding Seen Primarily in Bus SGR</i> | <i>29</i> |

This page is purposely left blank

1. Introduction

The Federal Transit Administration (FTA), one of the thirteen agencies in the U.S. Department of Transportation (DOT), has the primary responsibility of carrying out the Federal mandate of promoting and improving the nation's public transportation system. As part of its role, FTA provides over \$10 billion annually in financial assistance to transit agencies and States for building and maintaining public transportation systems. However, there is growing concern, based on FTA data, that a significant portion of the nation's public transportation assets are in need of capital reinvestment due to the historically inadequate level of financial resources from all sources available for maintenance and asset replacement activities. At many transit agencies a lack of technical ability to set appropriate recapitalization priorities is also a concern. FTA estimates¹ that, in 2009, the nation had a single-year transit capital reinvestment shortfall of at least \$1.4 billion and that this chronic 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 Mod and National SGR Assessment studies use an objective, multi-factor project scoring process to help rank and prioritize their investment needs.”

Congress and FTA are working together to address these issues in several ways. In Fiscal Year (FY) 2010 FTA initiated a State of Good Repair (SGR) grant program to support reinvestment in bus fleets and bus facilities for both urbanized and rural areas. FTA provided \$776 million of available Section 5309 Bus and Bus Facilities funding for this effort. The announcement of funding availability resulted in FTA receiving nearly 400 project applications representing \$4.2 billion in requests from transit providers across the country. FTA was able to fund 152 projects, about a third of the applications. The funding requested was more than five times what was available, an indication of the significant level of unmet SGR needs. In announcing the grants Secretary LaHood noted the connection between safety and state of good repair saying that “safety is our highest priority, and it goes hand-in-hand with making sure our transit systems are in the best working condition possible.” In FY 2011, FTA provided almost \$753 million to continue this program and has received applications for 519 projects totaling \$3.65 billion. FTA has proposed a new Bus and Rail SGR formula grant program as part of the President's 2012 budget request to Congress.

In 2010, FTA released a study titled *Transit Asset Management Practices—A National and International Review*² which found:

“for U.S. transit agencies as a whole there is room for improvement in asset management practice, particularly in terms of aligning agency policy goals and objectives with achieving an SGR, 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 accordance with this finding, the need for improved asset management was specifically noted in the FY 2010 and FY 2011 SGR Bus & Bus Facilities Notices of Funding Availability (NOFAs). From this program, FTA awarded \$36 million to 17 transit agencies in FY 2010 and \$12 million to 14 transit

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 http://www.fta.dot.gov/documents/TAM_A_National_and_International_Review_-_6.10_FINAL.pdf

agencies in FY 2011 program funds to further the development of better asset management systems. Details of these projects are provided in Appendix A and Appendix B.

In the conference report accompanying H.R. 3288, the Consolidated Appropriations Act of 2010, Congress specified additional financial resources for FTA to use in improving the state-of-practice for asset management in the transit industry³. The report summarized this request to FTA in this way:

Asset Management – The conference agreement includes \$5,000,000 to develop asset management plans, technical assistance, data collection and a pilot program as proposed by the Senate. The House did not include similar language. The conferees expect the pilot program to include transit agencies that vary in size and direct FTA to report findings to the House and Senate Committees on appropriations within 18 months of enactment.

FTA included the additional funding into its ongoing SGR efforts which have been expanded and carried over into FY 2011. The following sections of this report describe how the \$5 million specified by Congress was spent and how FTA supported other SGR-related programs using an additional \$5.4 million in discretionary funds. This would be in addition to the \$776 million in FY 2010 and the \$753 million in FY 2011 of SGR Bus and Bus Facilities program funds.

Appendix C of this report provides the complete Senate language associated with the above passage. H.R. 3288 was signed into law in December 2009. This report fulfills that requirement.

Appendix D includes an analysis of the projected impact of Recovery Act expenditures on transit SGR.

³ “\$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.”

2. Overview of FTA's Asset Management Initiative

FTA is developing strategies to promote an understanding and awareness of national transit recapitalization needs and the potential solutions to address those needs. This report describes activities FTA has specifically undertaken in response to the Congressional request to spend \$5 million to develop “asset management plans, technical assistance, data collection and a pilot program.” It also describes additional SGR and asset management activities that FTA funded in addition to \$5 million for asset management projects.

These projects are described in the next three sections: Pilot Projects, Technical Assistance, and Data Improvement. Each section starts by listing projects funded from the \$5 million set-aside then lists the other activities FTA initiated to build on or support these efforts. Overall, FTA obligated more than \$10 million on initiatives that support improved asset management and the objective of keeping the Nation's transit assets in a state of good repair. These funds are in addition to the \$776 million in FY 2010 and \$753 million of FY 2011 bus and bus facilities funds used to support SGR and asset management systems.

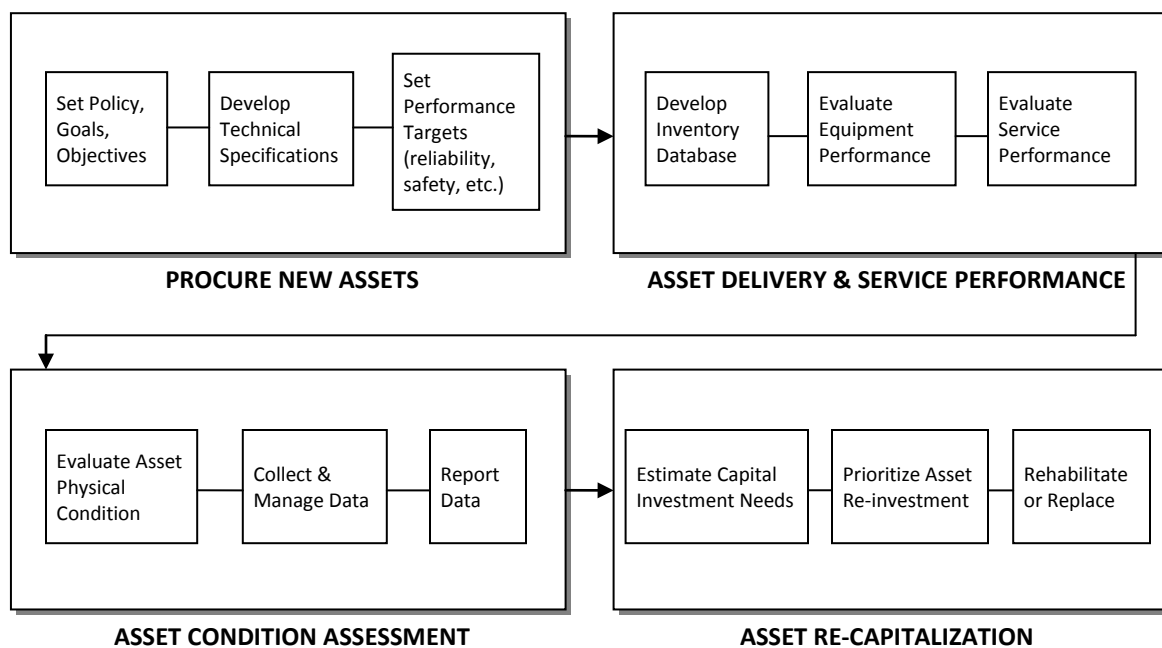
3. Asset Management Pilot Projects

In April 2009, FTA released its *Rail Modernization Study Report to Congress* which evaluated the condition of assets at the nation’s seven largest rail transit agencies. This study found that there is a pressing need for approximately \$50 billion to replace or rehabilitate these assets so that these systems can continue to provide necessary transportation services to their communities. Further, the report concluded that existing apportionment formulas do not effectively match Federal resources to local agency needs and that local agencies do not use state-of-the-art asset management practices to direct what resources they have to where they are most needed.

Effective asset management systems use quality data and well-defined objectives as part of a systematic process to strategically maintain and improve capital assets that can result in the optimal allocation and use of available funds. To help increase the number of transit agencies with complete and up-to-date capital asset inventories and to improve the level of asset management in the public transportation industry as a whole, FTA is partnering with transit agencies, State DOTs, Metropolitan Planning Organizations (MPOs), and asset management system suppliers to demonstrate innovative approaches for managing transportation assets.

These asset management pilot projects are aimed at demonstrating solutions to the challenges faced in each of the four phases of the asset management cycle (Figure 1), as well as improve the overall asset management flow and approach. FTA intends to disseminate innovative and/or improved asset management methods developed as part of this pilot program to the industry-at-large so that public transportation agencies, State DOTs and MPOs can better prioritize their transit asset repair, recapitalization and replacement needs, and can develop reasonable cost/schedule estimates for achieving a “state of good repair.”

Figure 1: Typical Transportation Asset Management Cycle



Asset management tools that promote better management of safety-related public transportation capital assets are of particular interest. FTA will participate in transit asset management pilot program activities at the project level by attending review meetings, commenting on technical reports, and maintaining frequent contact with project managers. FTA subject matter experts will also be included in the project evaluations. Grantees will be required to assist FTA in reporting the asset management pilot program’s progress to Congress, as necessary.

FTA received 25 technical proposals to participate in the pilot program. These were evaluated, scored and ranked according to overall value. Proposals were evaluated based on the following criteria and scoring system:

1. Project understanding and approach. (25%)
2. Technical capacity. (20%)
3. Product superiority based on the degree to which all eligibility requirements are met or exceeded, including software products that promote data interoperability. (30%).
4. Preliminary Project Implementation Plan. (15%)
5. Small Business Subcontracting Plan, detailing how small businesses will be utilized as members of the proposing team. (10%)

FTA is currently negotiating grant agreements to implement the highest ranked proposals. \$3 million of the \$5 million specified by Congress supports these pilot projects. FTA used \$1 million in other funds to support two additional meritorious projects. These projects, described in Table 1, represent different approaches to asset management at a varied selection of agencies that manage transit resources and are concerned with maintaining them in a state of good repair. The agencies include: one of the largest and oldest rail operators; a regional transportation organization that allocates resources across a very different set of service providers; a state agency that operates commuter rail service; a medium-sized agency that has experienced substantial system expansion in recent years; a smaller local agency that coordinates several different types of service; and a state agency that coordinates several rail services.

Table 1: FTA asset management projects initiated in response to FY 2010 Congressional Request

| Asset Management Pilot Project | Status | FTA Funding |
|--|----------------|--------------------|
| Massachusetts Bay Transportation Authority (MBTA) | In negotiation | \$950,000* |
| Regional Transportation Authority of Northeastern Illinois (RTA) | In negotiation | \$800,000* |
| Peninsula Corridor Joint Powers Board (CALTRAIN) | In negotiation | \$750,000* |
| Utah Transit Authority (UTA) | Started 11/11 | \$500,000* |
| Valley Regional Transit | In negotiation | \$300,000 |
| Virginia Department of Rail and Public Transportation (VDRPT) | In negotiation | \$700,000 |

*funded from the \$5 million 2010 Congressional asset management set-aside

Massachusetts Bay Transportation Authority (MBTA) - \$950,000

In 1897, America's first subway was constructed in Boston between the Park and Boylston Street stations. This half-mile section of subway is still in operation today, making the MBTA the oldest continuously operating subway system in the country. MBTA is also the fifth largest public transportation system in the United States as measured by a daily ridership of approximately 1.24 million passengers. The Authority maintains over 182 bus routes, four rapid transit lines of heavy and light rail, five bus rapid transit lines, four trackless trolley lines, 14 commuter rail lines, three ferry routes, and a demand response service. Its large roster of equipment currently consists of 432 heavy rail vehicles, 217 light rail vehicles, 628 diesel buses, 360 compressed natural gas (CNG) buses, 32 electric/diesel buses, two prototype alternative fuel buses, 33 trackless trolleys, 80 commuter rail locomotives, 410 commuter rail coaches, 12 ferry boats, and 568 vehicles for THE RIDE. Service is provided to more than 255 stations.

The success of this project will permit MBTA to make significant technical advances in several critical areas related to its asset management business processes, databases, and supporting management tools. Specific project objectives include the following:

- Make application and updating of their SGR Database a continuous process, by converting from a PC-based to a web-based version to provide direct access for field and maintenance personnel.
- Improve MBTA business processes to bring the Authority in alignment with the underlying principles of PAS 55⁴ and forthcoming International Standards Organization (ISO) standards on asset management.
- Leverage their current enterprise asset management system (Asset Works) data to link asset condition with maintenance cost experience.
- Expand current application of their SGR Database to address asset condition vs. maintenance relationships for all asset classes.
- Enhance their SGR Database by applying decay curves and condition scores utilized in the FTA Transit Economic Requirements Model (TERM).
- Examine projections of asset condition over time, across a broad range of performance measures, under alternative funding scenarios.
- Improve the Authority's current project prioritization process, including a consensus-based, decision support tool to better link the agency's strategic goals with the evaluation of projects competing for limited capital funds.
- Use the transit asset management system outputs to articulate a compelling argument for more capital funding for SGR infrastructure projects.
- Address a wide range of transit asset management challenges that can be shared with FTA and other transit agencies as part of this pilot program initiative.

⁴ PAS 55 is the British Standards Institution's (BSI) Publicly Available Specification for the optimized management of physical assets.

The success of the program will be measured in terms of the Authority's ability to: (1) provide for a more robust accounting of all its assets and their condition; (2) quantify the level of funding required to achieve SGR over time; (3) demonstrate the customer service and maintenance cost impacts of under-funding SGR projects; and, (4) make better, more informed resource allocation decisions that are linked to agency goals and understood and supported by the entire organization.

More importantly, this Transit Asset Management pilot project will be a success when other transit agencies of various sizes and modes are able to learn from the MBTA's experiences and implement similar solutions to improve their asset management practices. MBTA is eager to share its asset management system experiences and "lessons learned" across all modes (i.e., bus, BRT, rapid transit and commuter rail) with the FTA, other US transit agencies, and the industry as a whole.

Regional Transportation Authority of Northeastern Illinois (RTA) - \$800,000

RTA is responsible for planning, funding and oversight of all public transportation in Northeastern Illinois. As such, RTA allocates funding to three transit service providers: the Chicago Transit Authority (CTA), Metra commuter rail and Pace suburban bus. The RTA network serves the third largest U.S. transit market, with nine million in population and two million daily rides. RTA's asset base includes 8,400 passenger vehicles, 1,490 track miles, 565 stations, and 57 maintenance facilities. With some of the nation's oldest transit assets, RTA also has significant reinvestment needs, including an estimated \$25 billion over the next ten years to attain a state of good repair, which is more than three times higher than projected funding during the same time period.

RTA's current asset management system consists of an ongoing regional transit asset inventory condition assessment program and an SGR needs-assessment process based on that inventory. Furthermore, the system includes a capital plan development process that begins with the goals and objectives set in its Strategic Plan and links to an ongoing performance measurement program resulting in candidate projects being effectively screened and prioritized. With this project, RTA will move to a more integrated prioritization decision support tool compatible with FTA's TERM model.

RTA's existing asset management capability consists of data collection and analysis processes that provide key inputs to regional decision making but which have yet to be fully integrated. A more complete integration will be achieved through the following tasks, to be accomplished in this pilot project:

- Enhance and document RTA's ongoing regional asset inventory maintenance and condition assessment process. The enhanced process will ensure alignment with TERM, applicability to other transit systems, and improved asset sampling methods. Process documentation will consist of "how-to" instructions regarding database structure, data collection methods, asset tracking methods, inspection, and physical condition assessments.
- Enhance RTA's capital planning process through implementation of an objective, multi-criteria investment prioritization process to rank SGR investments based on cost-effectiveness, mission criticality and impact on performance, reliability and safety. Documentation will include process mapping and implementation instructions.
- Develop a process to group related asset replacement needs into logical capital projects using an asset type and location numbering convention to connect asset based long-term needs analysis with shorter-term capital improvement planning and capital project budgeting.

State of Good Repair Initiative Report to Congress

- Build a data-driven technology-based tool to facilitate the integration and practical application of the first three tasks. The outcome will be a tool that supports multiple inputs for use in optimizing the allocation of resources.

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 stepped in to continue its operation and it became known as Caltrain. The Peninsula Corridor Joint Powers Board (JPB) took over the operation of Caltrain service in 1992. The 100+ year old railroad had experienced many decades of deferred maintenance by that time. The JPB has invested hundreds of millions of dollars over the past two decades to help bring its rail system into a state of good repair. This has been essential to ensuring safe and efficient operation and increasing customer satisfaction and ridership. It has also laid a foundation for plans for electrification and a shared alignment with the California High Speed Rail project.

Caltrain is 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. The JPB developed the Caltrain Asset Management System (CTAMS) in 2006 in order to make the most effective decisions to prioritize replacement and rehabilitation needs within existing budget constraints. CTAMS is a Microsoft Excel based asset management system that tracks the condition of capital assets, identifies trends affecting system assets over time, and helps to prioritize and coordinate replacement and rehabilitation needs.

CTAMS currently includes modules to monitor tracks, structures, crossings, stations, and signals. It incorporates factors such as age, Federal Railroad Administration (FRA) standard requirements and Caltrain's SGR standard criteria to account for asset condition. Furthermore, the system contains linkages with related documents such as track charts with maps, videos, Google pictures and aerial photographs, as-built drawings, and maintenance inspection reports. This project will further expand and enhance the functionality and capabilities of CTAMS through these tasks:

- Integration of CTAMS into a relational database to increase its user friendliness and provide the ability to generate automated reports configured to the user's specifications.
- Continuation of the build-out of fixed rail infrastructure asset modules within the system, including the development of additional modules and the addition of cost forecasting elements.
- Inclusion of a user's manual that will serve as a guide on how to use CTAMS.

CTAMS can be expanded to all transit assets including rail rolling stock and bus facilities. Additionally, the system can be integrated with other agency systems such as maintenance and financial asset management systems. The template upon which CTAMS has been designed can be easily customized to fit the needs of any transit organization using off-the shelf software. The end product of this project will be based on a universal, non-proprietary format, compatible with the FTA TERM model and systems at other transit organizations. The final system will be well documented so that it may be implemented by other transit agencies.

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

UTA was founded on March 3, 1970, to provide bus service to Salt Lake City and the surrounding communities of Murray, Midvale, Sandy and Bingham. In December 1999, UTA expanded its operations to rail as its first TRAX light rail line opened. A second light rail line, between downtown Salt Lake City and the University of Utah, opened in 2001, and UTA extended that line from the University's stadium to its medical center in 2003. In April 2008, UTA opened its commuter rail system, the FrontRunner, with high-speed rail service along a 44-mile stretch of the Wasatch Front between Weber County and downtown Salt Lake City. UTA plans to open 70 more miles of rail projects by 2015, including TRAX in the communities of West Valley City and Draper, between downtown Salt Lake City and the Salt Lake City International Airport, and a 10.6 mile extension serving the cities of Murray, Midvale, West Jordan and South Jordan. UTA also plans to extend FrontRunner commuter rail from downtown Salt Lake City to Provo, located 45 miles to the south.

Today, after one of the most aggressive expansion campaigns in transit history, UTA has a service area of more than 1,400 square miles and is one of the largest public transportation agencies in the country, by geographic extent. Covering 75 cities in six counties, UTA provides public transportation services to 80 percent of Utah residents. Operating this greatly expanded system, and planning to keep it in SGR as the extensive asset inventory starts to age, is a significant challenge.

UTA will be partnering with InspectTech (a major provider of mobile inspection and asset management solutions) to develop a risk-based approach to managing their assets. The focus of this project will be to simplify and consolidate inspection and data collection methods across their different asset categories. Condition assessments will be linked to the risk of failure and to the associated work required to mitigate adverse impacts. UTA already has state-of-the-art bridge inspection and maintenance procedures and their approach is based on expanding this system to cover all asset types. They will be using geographic information system (GIS) technology and are providing a dollar-for-dollar cost share.

UTA and InspectTech will produce a management and inspection system for all of UTA's assets. The system will be interoperable with diverse types of information technology systems through the use of open data formats and standard data communication protocols. It will contain an online web-based module for access from any UTA computer and a field-based module that will run without an internet connection. The field version will give inspectors with handheld or laptop computers the ability to attach photos to reports, insert notes, submit reports for review, and add maintenance tasks. The online version will support all functions and will be able to provide summary information about any group of assets, serving as a one-stop location for accessing any asset data, including past reports. The system will ensure that assets are managed as part of a unified network and will even be able to make projections of future asset conditions and budget consequences. The project will produce clear documentation on how to produce and implement similar systems for other transit agencies.

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

VRT is the regional transportation authority for Ada and Canyon counties in southwest Idaho, which include the cities of Boise, Meridian, Nampa and Caldwell. As the transportation authority for the region, VRT's role is to coordinate services it offers and services provided by several other local providers such as: ValleyRide, Ada County Highway District CommuteRide, Boise State University (BSU), and community/social service agencies. These services include: local fixed route transit; express inter-county commuter bus; demand response; vanpools; vehicle sharing for social service agencies and

community groups; a volunteer driver program using agency vehicles; campus shuttles; and shuttle services for social service organizations.

Small systems, which typically have limited funding, capital equipment, technical capacity, and human resources, need to make assets last as long as possible and to maximize the benefits of any available funding. Being able to replace capital equipment simply because it has reached the end of its useful life is a luxury not afforded to the providers VRT oversees. The bigger VRT providers have independent maintenance systems to collect data regarding 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 that will facilitate coordinated asset condition assessments, cost-benefit analyses, and development of a regional recapitalization plan for all the VRT providers.

In addition to the traditional transit, vanpool and demand response services, the VRT is expanding mobility options by implementing vehicle sharing between community service organizations, a volunteer driver program using pooled vehicles, expanded park and ride facilities, a multi-modal center, and a bus shelter program. The existing asset inventory and maintenance tracking 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. The system would then provide reports evaluating the condition of all assets in the region and compare this to established performance measures.

This project will build a Microsoft Access database to gather key regional inventory, maintenance, performance and physical condition information. By combining this data with performance measure standards, the software program will be able to conduct the cost-benefit analyses necessary to assure the region uses existing funding and grant opportunities to their fullest potential. For the first time, this project will bring together all alternative transportation capital information in the metropolitan planning area into one planning system. As a result, VRT and the Community Planning Association of Southwest Idaho (COMPASS), the metropolitan planning organization, will have consistent, comprehensive data when allocating FTA Urbanized Area formula grants program, Job Access to Reverse Commute, and New Freedom funds to the various service providers in the region.

COMPASS, CommuteRide, and VRT have established policies stating that maintaining existing capital equipment and facilities has priority over expansion. Both VRT and COMPASS, the region's direct recipients of federal funds, have developed extensive application and scoring systems to evaluate funding requests from individual service providers. However, each provider interprets needs and data differently when completing applications. In addition to assuring all applications are presented consistently, this asset management system will help assess resource needs from a regional perspective not an individual agency perspective.

Virginia Department of Rail and Public Transportation (VDRPT) - \$700,000

VDRPT, in partnership with Cambridge Systematics, Inc. (CS), will develop a next-generation Transit Asset Management system (Trans-AM) that will provide FTA with a suite of open source asset management tools that can facilitate the implementation of SGR practices across the entire transit industry. The project is grounded in best practices for asset management and information system design, building on an established platform to ensure a successful outcome.

The project has several key elements:

- Build upon an existing transit asset management product, the Program Guidance and Grant Evaluation System (PROGGRES). PROGGRES, now in its third year of active use, is a state-of-the-art transit asset management system that effectively addresses both the capital needs and policy issues associated with state of good repair programs.
- Expand beyond simple “asset replacement” strategies to include major overhaul and other investments that affect the life of capital assets.
- Explicitly evaluate the impact of service expansion strategies on capital requirements, providing potential links with VDRPT’s transit development plans or similar service-oriented planning documents from other agencies.
- Enhance policy evaluation capabilities to enable transit properties to understand the impact of policies that encompass different mixes of replacement, maintenance, and service expansion.
- Implement a capability for linking FTA grant program sources with capital program costs to determine funding needs and local match requirements.
- Release the enhanced system as open source software, making it freely available to the entire transit industry.

The project will modify the architecture of the PROGGRES software so that it can be adapted and used effectively by any other transit property. The current version of PROGGRES is an ASP.NET application using Microsoft SQL Server that links directly to internal DRPT information systems. 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 via XML interfaces. It will use free or open-source tools (such as MySQL) to reduce the cost of deployment and maintenance and will operate in either an in-house IT facility or in a hosted environment. These aspects will enable effective use by transit agencies with limited in-house IT resources.

4. Technical Assistance Efforts

FTA provides technical assistance to transit agencies through training, research, and by providing opportunities to collaborate and share information. All of these approaches are represented in the portfolio of activities listed in Table 2 below and described in this section. Note also that each of the six pilot projects above will provide 40 hours of webinars and other technical assistance as part of their funding agreements. This assistance will be designed to help fellow agencies benefit from any lessons the pilot agencies might learn and from the best practices they will be developing.

Table 2: FTA technical assistance activities initiated in response to FY 2010 Congressional Request

| Technical Assistance Activity | Status | FTA Funding |
|---|---------------------------|-------------|
| Development of Transit Asset Management Guidelines and Training | Started 4/11 | \$700,000* |
| Asset Condition Assessment Research | Started 4/11 | \$700,000* |
| SGR Industry Working Group and Roundtables | 8/08, 7/09, 7/10, 7/11 | \$100,000 |
| NTI Asset Management Training Courses | ongoing | \$350,000 |
| Rail Car Maintenance | Reviewing Proposals | \$400,000 |
| Elevator/Escalator Consortium | Reviewing Proposals | \$1,350,000 |
| Best Practices to Maintain Safe Operation of Aging Infrastructure | Reviewing Proposals | \$350,000 |
| Automated Track Inspection | Reviewing Proposals | \$500,000 |
| Development of Transit Economic Requirements Model for local agency use (TERM-Lite) | Started 5/11 | \$500,000 |
| TERM-Lite Stakeholder Outreach and Beta Testing | Started 2/11 | \$100,000 |

*funded from the \$5 million 2010 Congressional asset management set-aside

Development of Transit Asset Management Guidelines and Training - \$700,000

The objective of this effort is to adapt asset management methods from other industries to fit the unique requirements of the transit industry. This information will then be used to develop a *Framework for Transit Asset Management* document similar to the comprehensive framework produced by the Federal Highway Administration (FHWA), the Transportation Research Board (TRB), and the Association of American State Highway and Transportation Officials (AASHTO) for highway agencies. A variety of existing sources will be reviewed and stakeholders interviewed to determine the essential elements of effective transit asset management and how they should be implemented. Teaching material for a one-week National Transit Institute (NTI) course that covers this material will be developed to supplement

the introductory course FTA already offers. This effort will give FTA the ability to train transit agencies on how to conduct asset management activities.

Asset Condition Assessment Research - \$700,000

The objective of this technical assistance is to investigate and prepare a report on asset condition assessment methodologies. The work will explore how transit agencies can consolidate data in their maintenance management systems to inform condition reporting in asset inventories for capital asset management. Researchers will consider how hierarchical structures can be designed to aggregate detailed asset lists into whole-vehicle and system-level information and how maintenance data and life-cycle information can be used to derive the condition of these aggregated entities for purposes of planning reinvestments. A major task will include defining what condition data needs to be in an asset inventory. Data elements may consist of asset type, quantity, location, condition, usage, in-service date, age, useful/remaining life, and replacement/renewal cost. Recommendations will be made regarding standardized common language and definitions for asset condition assessments and ratings that will serve as guide for industry.

SGR Industry Working Group and Roundtable Discussions - \$100,000

On August 13 and 14, 2008, FTA held a *Beginning the Dialogue* SGR workshop with a select group of industry experts. The results of this workshop were published in October 2008, and are available on the FTA website⁵. This industry working group has continued to meet through regular conference calls with FTA staff and has provided invaluable advice and support in implementing FTA's asset management activities.

FTA currently conducts annual "roundtable" meetings with industry engineering and capital planning experts with the objective of sharing approaches and solutions to common state of good repair problems. These roundtables help ensure that FTA's strategies for attaining state of good repair accurately reflect real world reinvestment realities. Roundtables were hosted by the Washington Metropolitan Area Transit Authority (WMATA) in Washington, DC, July 8-10, 2009; by CTA in Chicago, July 21-23, 2010; and by Metropolitan Atlanta Rapid Transit Authority (MARTA) in Atlanta, July, 20-23, 2011.

NTI Asset Management Training Courses - \$350,000

FTA has offered pilot versions of a two-day *Introduction to Transit Asset Management* course in New York, San Francisco, and Atlanta. The pilot format allows FTA experts to present material in an interactive format as part of the course development process. This same piloting approach will be used in developing a week-long *Advanced Transit Asset Management* course from material delivered through the *Development of Transit Asset Management Guidelines and Training* activity described above. This is intended to be the core course of a transit asset management curriculum to be delivered by the National Transit Institute (NTI). Its purpose will be to assist transit agencies in building effective strategies for maintaining an asset inventory and using it to more efficiently allocate resources to keep assets in a state of good repair. Topics covered will include conducting condition assessments, building asset hierarchies, understanding replacement costs, safety, and basic life cycle management. NTI

⁵ <http://www.fta.dot.gov/documents/SGR.pdf>

State of Good Repair Initiative Report to Congress

courses are offered in small classroom settings at locations around the country, usually in transit agency training facilities.

Rail Car Maintenance - \$400,000

This project will document best practices in rail car maintenance for public transit agencies operating passenger service in North America and will provide detailed information on transit agency railcar fleets. The data elements of this information will include railcar manufacturer, age of the fleet, number of cars, availability of fleet, average miles per year per vehicle, etc. The project will explore life-cycle maintenance experience and develop manufacturer-specific recommendations for the most effective railcar maintenance practices. Practices will be documented to describe how other transit agencies might integrate these practices into their operations. Given rail car fleets are a critical component to the transit infrastructure, servicing these fleets to maintain a state of good repair is a serious concern for transit executives.

Elevator/Escalator Consortium - \$1,350,000

Maintaining and repairing transit escalator and elevator systems is of critical importance to transit agencies and their customers. Inadequate or poorly maintained vertical transportation creates a multitude of problems ranging from widespread inconvenience, to mobility concerns for the elderly and disabled, to serious threats to the health and safety of transit patrons and workers. The Elevator/Escalator Consortium is a group of several major transit agencies Southeastern Pennsylvania Transportation Authority (SEPTA), MARTA, New York Metropolitan Transportation Authority (MTA), Bay Area Rapid Transit (BART), and WMATA and their associated labor unions. This group was formed in order to develop a full training courseware program for transit workers who manage vertical transportation systems (elevators and escalators) in transit systems. This group works closely with Transit for Livable Communities (TLC), with the American Public Transportation Association (APTA), and transit labor unions to further this effort. FTA has provided \$1.35 million dollars in funding (\$675,000/year for two years) to support this effort. This funding has been matched by the five participating transit agencies and their labor unions.

Best Practices to Maintain Safe Operation of Aging Infrastructure - \$350,000

Transit agencies are often faced with the challenge of continuing to operate revenue service using equipment and other assets that are approaching or have even exceeded their useful lives. This situation not only increases the maintenance level-of-effort but can also have an effect on the safety of customers and employees. For example, maintaining aging trackwork in good condition requires an increased inspection frequency, thus increasing the amount of time ROW workers are out on the alignment. This project will identify, document and disseminate transit industry best practices for (1) achieving exemplary safety performance while operating and maintaining reliable service with aging equipment and other infrastructure assets, and (2) using a robust, systematic approach that accounts for the safety considerations in prioritizing which assets to replace or rehabilitate/overhaul.

Automated Track Inspection - \$500,000

This project will demonstrate advanced track inspection techniques that can reduce track inspector exposure to rail traffic and enhance the quality of inspection while reducing operating costs. This project has two objectives: 1) enhancing the quality of the inspection program by increasing the

inspection frequency and reporting of defects and; 2) improving the safety of transit track inspectors by limiting the exposure to rail right-of-way by visually inspecting the condition of the tracks from a safe location.

Transit agencies can use the automated track inspection system to provide warnings of sudden changes in the infrastructure and monitor the rate of deterioration at any location, enabling a more accurate prediction of when track components need to be repaired or replaced. Automated track inspection technology will also minimize the dangers inherent in traditional walking inspections by allowing tracks to be surveyed from a safe location. This technology could be placed on an inspection vehicle or in front of a computer at the maintenance shop.

Development of Transit Economic Requirements Model for Local Agency Use (TERM-Lite) - \$500,000

FTA's Transit Economic Requirements Model (TERM) is an analysis tool designed to help planners evaluate long-term transit recapitalization needs. In development for more than a decade, TERM can estimate the level of capital investment required to attain a state of good repair (or other investment objective) and can also assess how variations in capital funding availability will likely impact the future condition and performance of transit infrastructure. FTA is developing a user-friendly version of TERM (TERM-Lite) for use by local agency capital planning staff.

FTA uses TERM to calculate the state of good repair *backlog* and *normal replacement* needs as well as to project the impact of constrained funding scenarios. This project will make these analysis capabilities available to local transit agencies. FTA is developing a user-friendly version of TERM to distribute without cost on its web site for use by transit agencies of all sizes. They will only need to have asset inventories in TERM format, which can be easily assembled from their required annual NTD Fixed Asset Reporting data set (described above).

TERM is a financial forecasting tool that imputes asset condition from the age of the asset and from statistical data on the age-condition relationship. It is useful as a high-level tool for capital planning purposes designed to augment, not replace, condition assessments of key infrastructure assets and comprehensive maintenance management practices.

TERM-Lite Stakeholder Outreach and Beta Testing - \$100,000

FTA has negotiated cooperative agreements with Chicago RTA and Los Angeles Metro to work with the TERM support contractor on developing requirements for modifying TERM to meet the capital planning needs of transit agencies. This includes developing a user-friendly interface for the application and modifying the software program algorithms to make it consistent with transit agency assumptions and practices. RTA and Metro signed their cooperative agreements and work started in February of 2011.

5. Data Improvements

In the conference report accompanying H.R. 3288, the Consolidated Appropriations Act of 2010, Congress specifically directed FTA to “*improve data collection through the National Transit Database.*” SGR reporting is currently based on NTD data and on special requests to select agencies for information on assets that is not collected in the NTD. The NTD collects comprehensive data on vehicles (about 20 percent of the total value of transit assets) and collects partial data on guideway elements. It does not collect data on power, communication, or train control systems and only collects basic information on stations and maintenance facilities. Activities in this section (Table 3) will provide FTA with a more comprehensive source of asset information and to improve associated analysis capabilities.

Table 3: FTA data improvement activities initiated in response to FY 2010 Congressional Request

| Data Improvement Activity | Status | FTA Funding |
|---|--------------|-------------|
| National Transit Database (NTD) Fixed Asset Reporting | Started 4/11 | \$600,000* |
| TERM Analysis and Maintenance | ongoing | \$350,000 |
| Independent Review of TERM methodology by the Transportation Research Board (TRB) | Started 9/11 | \$250,000 |
| SGR Coordination | Started 5/11 | \$150,000 |

*funded from the \$5 million 2010 Congressional asset management set-aside

National Transit Database (NTD) Fixed Asset Reporting - \$600,000

A prerequisite to effective, long-term transit capital reinvestment analysis – at either the national or local level – is the availability of a good quality asset inventory. U.S. transit operators, with the exception of some of the larger ones, generally keep asset inventories for financial purposes but don’t maintain the data at the level of detail required for capital planning. FTA is working to expand NTD reporting requirements in order to support better assessment of national reinvestment needs and to encourage agencies that are not currently collecting this data to make it available to support investment decisions. FTA will also use this data to develop annual measures to report on the success of its infrastructure preservation programs.

Transit providers that receive FTA formula funds are required to submit annual reports on their assets to the NTD. These reports are used for informing apportionment formulas and to improve understanding of transit issues. They are required to report comprehensive data on their rolling stock but only a minimal level of data for their fixed assets. This project will add required data elements to the NTD to enhance collection of fixed asset data. This extra data will allow FTA to do a much better job of estimating agency needs and their SGR backlog. The project will build on work done by a Transportation Research Board (TRB) committee several years ago. FTA staff will ensure that this project meets all “notice and comment” requirements, Paperwork Reduction Act requirements, and is acceptable to agency stakeholders.

TERM Analysis and Maintenance - \$350,000

FTA has a contract with Booz Allen Hamilton to provide technical support for maintenance of the TERM program and for analysis using the program. Analysis products under this contract include the biannual production of the *Conditions & Performance Report to Congress* as well as other SGR-related reports. FTA has an ongoing contract for this work that consists of a base year with four option years. Cost is \$500,000 per year of which the base year was funded from 2009 Program Plan funds. \$500,000 has been committed from 2010 Program Plan funds for the first option year. There is a development task in this contract, worth \$150,000 per year, which is being used as part of the TERM-Lite development activity described above.

Independent Review of TERM methodology by the Transportation Research Board - \$250,000

FTA has used TERM as the basis for its state of good repair backlog and normal replacement needs calculations in the *Rail Modernization Study* and in the *National SGR Assessment* reports. TERM is also the basis of biennial transit projections in the Department of Transportation (DOT) *Conditions and Performance* report provided to Congress. As a standard practice, DOT periodically performs external reviews of models this complex, both to identify weaknesses and to suggest further enhancements. FTA has arranged for a panel of Transportation Research Board (TRB) experts to perform an independent review of TERM to evaluate the soundness of its methodology and reasonableness of its assumptions. TRB policy studies are highly respected and rigorously independent. They comply fully with requirements of the Federal Advisory Committee Act (FACA).

Working with TRB, FTA has determined that a workshop-based review with the following deliverables would be appropriate:

- A fourteen month long project (from start to final report);
- Appoint a committee of nine experts that meets three times to plan the workshop, participate in it, and develop and reach consensus on findings;
- Develop four commissioned expert papers on different aspects of the model;
- Deliberate in a workshop format with 20 participants to discuss papers; and,
- Deliver a letter report with consensus findings of the committee

The estimated cost of this effort is \$250,000. FTA funds will be transferred through the TCRP cooperative agreement with TRB in July, 2011, and work will start shortly thereafter.

State of Good Repair Coordination - \$150,000

Since FTA has no State of Good Repair or Asset Management program authorized by statute, staffing for this initiative has been provided from the policy, research, and engineering offices. With all the activities listed in this report underway, or soon to be underway, it has become challenging to stay on track with each deliverable. Accordingly, contract support is provided to help FTA evaluate SGR projects, manage outreach activities, and produce documentation that will fully capture the value of this work.

6. Conclusions

Since 2010, FTA has made great strides in improving the state of practice for asset management in the transit industry by:

- Funding transit agency asset management systems
- Developing asset management plans,
- Providing technical assistance to the transit industry,
- Developing the reporting module to collect better data on transit assets,
- Implementing an asset management pilot program with transit agencies that vary in size.

With the awarding of 31 SGR grants for asset management and six asset management pilot projects, FTA has provided more than \$52 million to develop 37 different asset management systems. Furthermore, FTA has initiated more than a dozen technical assistance activities spending more than \$5 million to assist transit agencies in managing their assets. FTA has started the process of identifying additional asset data elements for collection in the NTD and will be evaluating how effectively that data is analyzed in the TERM review. This data collection process represents an investment of close to \$1 million and a large commitment of staff time.

These reinvestment efforts have been accomplished through collaboration with experts throughout the transit industry who have responded with remarkable enthusiasm to the challenge of improving the effectiveness of their capital reinvestment programs. The transit industry, particularly the big rail agencies, has invested substantial amounts of their own money to improve asset management practices. FTA estimates that national annual transit capital reinvestment from all sources is about \$13 billion, about \$1 billion less than that needed to replace assets that age past their useful life expectancies each year. An eight percent improvement in the efficiency of reinvestment would close that gap and it may be possible to achieve that level of efficiency through continued Federal and local emphasis on better asset management practices.

The Federal Highway Administration (FHWA) started promoting better asset management in 1999 and has a division devoted to providing technical assistance on asset management with 10 full-time staff. The FHWA program, popular with various state DOT constituencies, has been credited with facilitating a considerable improvement in reinvestment effectiveness at both state and local highway departments. FHWA's strategy has been to work closely with stakeholders through the American Association of State Highway and Transportation Officials (AASHTO) and to focus on developing a culture of systematic asset management throughout the industry. Likewise, FTA is considering the appropriate ongoing level of investment in technical assistance, data collection, and staff time and looks to FHWA efforts as a guide of how that can be accomplished.

Although the above-noted asset management programs may be part of the solution to the asset replacement and rehabilitation issue, it is important to realize that there will continue to be a significant backlog of deferred reinvestment needs that must be addressed. As state earlier, FTA estimates that backlog to be almost \$80 billion for the entire US public transportation industry. If we are to maintain, or improve, the quality of transit service in this country it is crucial that the nation find resources to reduce or eliminate that backlog. Federal, State, and local governments will need to provide these funds soon, or face the potentially greater costs and loss of efficiency of deteriorated transit properties.

As discussed in Appendix D, transit agencies will spend approximately \$3.9 billion of American Recovery and Reinvestment Act of 2009 (ARRA) funding to repair and rehabilitate existing transit assets. This should result in a reduction in the national reinvestment backlog of roughly 5 percent. Since most of these funds were spent on replacing buses the reduction in the non-rail backlog should be about 11.6 percent. Data on these expenditures will show up in the 2010 NTD reports (to be released in August, 2011) and will support more definitive analysis.

Appendix A

2010 SGR Grants for Asset Management Systems

The following table lists the 17 grants from FTA’s FY 2010 discretionary bus and bus facilities SGR program that were awarded for development of better asset management systems. These 17 grants represent a Federal investment of \$36.2 million. A complete listing of FY 2010 bus and bus facilities SGR grants can be found in the Federal Register, Vol. 75, No. 229 of November 30, 2010.

| State | Agency | Project Description | Grant Amount |
|--------------|---|---|---------------------|
| CA | Alameda-Contra Costa Transit District | Alameda-Contra Costa Transit District will use these funds to upgrade their existing asset management platform. This will enable in-field use of PDA’s and smart phones that will integrate with the financial and human resource systems. The project will allow the agency to develop a state-of-the-art maintenance plan by tracking and monitoring all components at every level. | \$5,422,400 |
| CA | Anaheim Transportation Network | Anaheim Transportation Network will use these funds for the development of an asset management system to track the condition of the agency’s fleet, facilities and equipment in order to assist in renewal/replacement decision-making. | \$17,458 |
| CA | Long Beach Public Transportation Company | Long Beach Public Transportation Company will use these funds to upgrade their existing asset management technical system infrastructure. This hardware and software upgrade will allow the agency to better manage long-term capital planning and prioritization. It will allow for improved performance throughout the assets’ lifecycle and decreased operating and maintenance costs. | \$1,124,480 |
| CA | San Francisco Metropolitan Transportation Authority (MTA) | San Francisco MTA will use these funds for the application and implementation of an Enterprise Asset Management System (EAM). The project includes a comprehensive asset management program and transit asset management framework. An asset inventory and evaluation criteria will be created. Additionally, a capital optimization tool will be developed for enhanced prioritization of asset renewal or replacement projects. | \$8,800,000 |
| DC | Washington Area Metropolitan Transit Authority (WAMTA) | WMATA will use these funds for the development of criteria and processes to determine asset condition and lifecycles as well as best practices for collecting and storing asset condition data. The project will assist management decision-making for long-term budgeting, planning and prioritization. | \$2,400,000 |

| State | Agency | Project Description | Grant Amount |
|-------|--|---|--------------|
| FL | Broward County Trans Department | Broward County Transportation Department will use these funds to enhance their current asset management system. The existing system is over 15 years old. The system upgrade will allow the agency to better track vehicles, inventory and facilities. Decision making will be based on real-time data and trends creating a predictive /preventative maintenance process. | \$1,000,000 |
| GA | Metropolitan Atlanta Rapid Transit Authority (MARTA) | MARTA will use these funds for the enhancement of their current enterprise asset management system to more readily feed data to their Capital Improvement Plan. Maintenance level data will thus be leveraged for improved long-term planning, prioritization and decision making. Best practices in asset condition assessment and data gathering will be developed. The agency will share lessons learned with the transit industry. | \$1,360,000 |
| ID | Idaho Department of Transportation (DOT) | Idaho DOT will use these funds to better identify and address capital needs. The project will assist the agency with long-term prioritization and decision making processes by linking asset management, financial, and maintenance systems. | \$30,000 |
| IL | Chicago Transit Authority (CTA) | CTA will use these funds for asset condition assessment and the enhancement of their enterprise asset management system. Data will be leveraged for the development of a modeling tool to assist in prioritizing and capital investment decisions. Asset replacement or renewal decisions will be based on age or condition. Capital and Maintenance information will be maintained in the system in order to capture asset life cycle costs. The project will also focus on business process and implementation methodology. CTA will share lessons learned with the transit industry. | \$5,400,000 |
| NC | Charlotte Area Transit System (CATS) | CATS will use these funds for development of a comprehensive facility maintenance plan. This will include an asset inventory with condition assessments. The long term goal is to ensure all major maintenance activities and capital renewal or replacement projects are operationally and financially optimized. | \$400,000 |
| PA | Southeastern Pennsylvania Transportation Authority (SEPTA) | SEPTA will use these funds for the development of a system-wide asset management program. Fleet, facilities and infrastructure assets will be integrated in an automated process for improved prioritization of renewal and replacement investment decisions. Inspectors will be able to update an asset's condition during inspections and maintenance data will be entered or accessed real-time via laptop or smart phone in remote locations. | \$6,400,000 |

State of Good Repair Initiative Report to Congress

| State | Agency | Project Description | Grant Amount |
|--------------|---|---|---------------------|
| TN | Charleston Area Regional Transportation Authority (CARTA) | CARTA will use these funds for the development of an asset management system to track the condition of the agency's assets. The methodology will focus on a statistical and quality management solution. | \$250,000 |
| TN | Nashville Metropolitan Transit Authority | The Nashville Metropolitan Transit Authority will use these funds to upgrade their asset management system. The current system has been in place for twenty years. The goal is to reduce operating costs by implementing more effective preventative/ predictive asset management policies and systems. | \$200,000 |
| WA | Central Puget Sound Regional Transit Authority | Central Puget Sound Regional Transit Authority will use these funds to implement an enterprise asset management system. A focus on process, procedures and policies will be used to develop a strategic vision for managing infrastructure. An asset inventory life cycle will be established to assist the agency with financial planning and capital replacement decisions. | \$1,500,000 |
| WA | Kalispel Tribe of Indians | The Kalispel Tribe of Indians will use these funds to procure a computerized asset management system. This will include technical support, training and purchase of a mobile handheld device. This will allow the agency to better track maintenance, thus reducing operating costs. | \$15,876 |
| WA | Kitsap Transit | Kitsap Transit will use these funds to enhance their current asset management system. Both facilities and fleet will be maintained using the new application. This will allow the agency to migrate to a predictive maintenance plan reducing in-service failures and operating costs. | \$56,000 |
| WA | Spokane Transit Authority | Spokane Transit Authority will use these funds for the replacement of their 25 year old DOS based system. The agency will develop an innovative integrated asset management solution that will enhance risk management analysis by implementing state-of-the-art best practices. | \$1,880,000 |
| | | Total | \$36,240,338 |

Appendix B

2011 SGR Grants for Asset Management Systems

The following table lists the 14 grants from FTA’s FY 2011 discretionary bus and bus facilities SGR program that were awarded for development of better asset management systems. These 14 grants represent a Federal investment of \$12.3 million. A complete listing of FY 2011 bus and bus facilities SGR grants can be found in the Federal Register, Vol. 76, No. 215 of November 7, 2011.

| State | Agency | Project Description | Grant Amount |
|--------------|--|---|---------------------|
| CA | Central Contra Costa Transit Authority | Central Contra Costa Transit Authority will develop, upgrade and implement a new asset management system using a Microsoft platform. This will replace the existing visual basic system which can no longer be supported. This will be a proprietary tool. | \$300,000 |
| CA | San Francisco Bay Area Rapid Transit District | The Bay Area Rapid Transit District will use these funds to enhance the asset management business process and integration of business and operations across Finance, Operations and Maintenance to support ongoing, long-term asset management and decision making, including SGR, backlog analysis, project prioritization, and other capital planning activities. | \$2,000,000 |
| CO | Regional Transportation District | The Regional Transportation District (RTD) is upgrading their current Asset Works platform to incorporate Oracle Business Intelligence. This will allow RTD to perform better predictive analysis, benchmarking and performance management. | \$160,000 |
| CO | Colorado Department of Transportation | The Roaring Fork Transportation Authority, in conjunction with the Colorado Department of Transportation, will mentor smaller rural operators on asset management systems and practices. The goal is to develop and enhance rural asset management. | \$200,000 |
| DC | Washington Metropolitan Area Transit Authority | The Washington Metropolitan Area Transit Authority (WMATA) will develop and implement an integrated transit asset management program that provides the framework and tools for managing and monitoring WMATA’s assets. This will establish the basis for better integration of the repair, maintain and/or replace decision making process across departments. | \$1,500,000 |

State of Good Repair Initiative Report to Congress

| State | Agency | Project Description | Grant Amount |
|--------------|--|---|---------------------|
| ID | Idaho Department of Transportation | Idaho Department of Transportation will enhance their current Asset Management application adding additional functionality to the current decision support system for fleet management and capital replacement. | \$70,000 |
| MI | City of Detroit Department of Transportation | City of Detroit Department of Transportation will be enhancing their current Asset Management application. This will include additional inventory controls and Asset Management system infrastructure improvements. | \$518,291 |
| MO | Bi-State Development Agency | Bi-State is upgrading their existing Asset Works platform to include additional fixed asset data elements. This will allow metro to create an asset inventory and access condition on all assets agency-wide. They will incorporate all data records from existing Excel spreadsheets into the Asset Works application to create a single asset data source. | \$677,840 |
| NM | New Mexico Department of Transportation | The New Mexico Department of Transportation will develop a new Transit Asset Management system to consolidate subrecipient data and information. This will replace an antiquated paper/spreadsheet system with a single database reporting mechanism. | \$200,000 |
| OH | Greater Ohio Transit Authority | The Greater Ohio Transit Authority (COTA) will upgrade their current obsolete Asset Management application which can no longer be supported. The upgrade will provide accurate, up-to-date data for maintaining assets in a state of good repair. The new system will also improve COTA's ability to evaluate risk and to plan, monitor, and manage asset maintenance/replacement strategies. | \$1,000,000 |
| RI | Rhode Island Public Transit Authority | The Rhode Island Public Transit Authority (RIPTA) plans to develop an asset management system to replace the current process which is based on Excel spreadsheets. Bar coding and scanning technology will enable (RIPTA) to track component performance, warranty status, age, mileage, and condition. | \$1,500,000 |
| SC | Waccamaw Regional Transportation Authority | The Waccamaw Regional Transportation Authority will add an Asset Management module to its current financial management system. | \$4,799 |

| State | Agency | Project Description | Grant Amount |
|-------|---|---|--------------|
| TX | Metropolitan Transit Authority of Harris County | The Metropolitan Transit Authority of Harris County will enhance its current Asset Management application to capture facility and linear asset data. This will give them the ability to performing condition assessments on their entire asset inventory. They will also develop a decision support tool which will assist in trade-off analysis. | \$3,212,000 |
| WA | King County Public Transportation Benefit Area | The King County Public Transportation Benefit Area will leverage their current robust asset management application to develop a comprehensive Asset Management Plan. The goal is to have a best practice state of the art asset management process. | \$965,951 |
| | | Total | \$12,308,881 |

Appendix C

Excerpt from the Senate Version of the DOT-HUD FY2010 Appropriations Committee Report

Asset Management – In the appropriations act for fiscal year 2008, this Committee required the FTA to assess the condition of the Nation's commuter rail infrastructure. The FTA issued its report this past April. The agency found that one-third of the transit agencies' assets are either in marginal or poor condition, and that significant reinvestment would be necessary to address the backlog of capital needs. Given the large gap between the level of investment needed to bring rail transit into better condition and the level of resources currently available for such investments, it is imperative that every dollar invested in rail capital improvements is put to its best use.

However, the FTA also reported that the transit industry lags behind other sectors in managing its capital assets strategically. Asset management programs would enable transit agencies to take inventory of their capital assets, assess the condition of those assets, use objective and quantitative analysis to estimate reinvestment needs over the long term, and prioritize their capital investments by using all of the information and analysis that was required under the program.

The FTA examined the seven largest transit agencies to inform its report on the condition of transit rail systems. While most of these large agencies took inventory of their capital assets, the inventories varied greatly in how recently the data was collected and in how comprehensive the data were. The FTA found that the large transit agencies regularly assessed the condition of their assets, but that none of the transit agencies had a full asset management program that was used to set long term priorities for capital reinvestment.

The Committee expects the FTA to take a leadership role in improving the use of asset management practices among transit agencies, and the Committee recommendation includes \$5,000,000 in order to support this leadership role. The Committee directs the FTA to use a portion of these funds to develop standards for asset management plans, and to design these standards so that transit agencies are encouraged to place the appropriate priority on protecting safety. The Committee further directs the FTA to use the remaining funds to provide technical assistance to transit agencies that are developing or implementing asset management plans, to improve the ability of the FTA to collect data relevant to asset management, and to conduct a pilot program designed to identify the best practices of asset management. The Committee expects the FTA to include in its pilot program a group of transit agencies that vary in size, and directs the FTA to report its findings to the House and Senate Committees on Appropriations no later than 18 months after the date of enactment of this act.

Appendix D

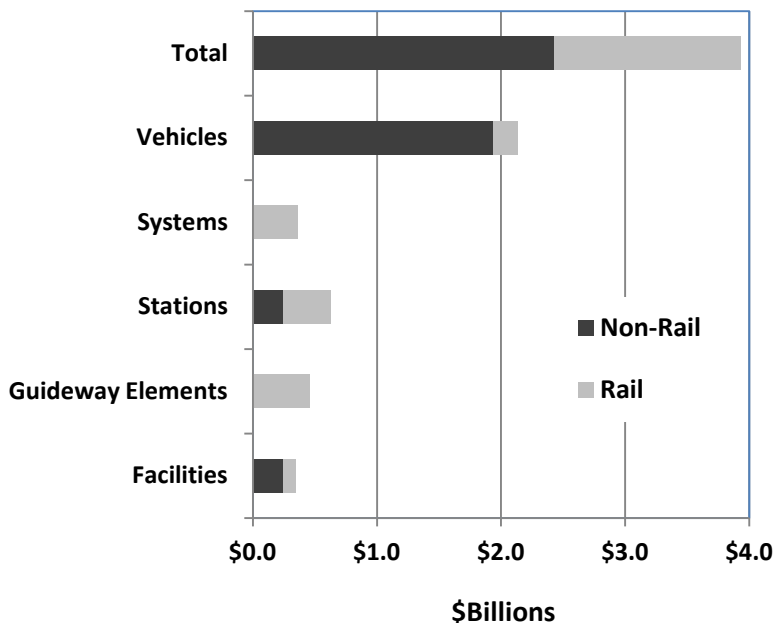
Impact of Recovery Act Seen Primarily in Bus SGR

Of the roughly \$8 billion in funds allocated to transit under the American Recovery and Reinvestment Act (ARRA) it is estimated that roughly \$3.9 billion will ultimately be spent on reinvestment in existing transit assets. Specifically, by the end of this program, roughly \$3.9 billion in funds will have been dedicated to the repair, rehabilitation and replacement of existing transit vehicles (mostly buses), stations, maintenance facilities, control systems, track and structures with deferred investment needs. At the same time, FTA recently estimated the size of the transit investment backlog to be approximately \$78.8 billion (\$2010), an estimate largely based on data that predates the start of the ARRA program. Hence, while the level of funding under ARRA provides a significant increase in transit capital reinvestment (total reinvestment spending from all levels of government currently averages roughly \$11 billion annually), the size of the ARRA increase is about 5 percent relative to the magnitude of outstanding transit reinvestment needs.

Given these considerations, it is reasonable to ask how the \$3.9 billion in ARRA funding spent on transit capital reinvestment will ultimately impact both the size and composition of the existing transit reinvestment backlog. Prior to addressing this question, however, it is important to first understand two key characteristics of the ARRA program. First, grant recipients are required to obligate ARRA funds by September 30, 2010, more quickly than normal spending patterns. Second, the Act requires that materials and equipment purchased using ARRA funds be acquired from domestic sources. These requirements are intended to ensure that funds were expended on projects that could be implemented and completed relatively quickly using domestic suppliers, thus maximizing the stimulus impact to the economy. For transit this meant that investments were either: (1) domestically produced equipment that could fully be procured within the required time limits (e.g., replacement fleet vehicles – buses and vans in particular); or (2) accelerated investment in larger capital reinvestment projects already planned or underway and that could be constructed using domestic materials (e.g., maintenance facility rehabilitations).

Figure 2 presents the actual breakout of ARRA funded capital reinvestment activities by mode (rail vs. non-rail). As indicated above, a large proportion of these funds (roughly \$2 billion) have been dedicated to fleet vehicle replacement, most notably buses and vans that are produced domestically (US transit rail car production is limited). The remaining ARRA funded reinvestment activities (just under \$2 billion) were spent on systems (train, control, traction power, and revenue collection), passenger stations, guideway elements

Figure 2: ARRA Funds Expended on Transit Capital Re-Investment



(track and structures) and maintenance facilities. Note that more than 60 percent of the \$3.9 billion in ARRA transit reinvestment dollars were allocated to non-rail (bus and demand response) reinvestment needs, with most of these dollars used for vehicle fleet replacement.

Estimated Impact on Backlog: Approach

To help better understand the expected impact of ARRA funded reinvestment activities on the existing transit backlog, we compared the size and composition of the transit reinvestment backlog as it existed prior to initiation of ARRA funding with an “adjusted backlog” that takes into account how the \$3.9 billion in ARRA reinvestment funds were distributed between expenditures on vehicles, stations, facilities, systems, structures and track. Moreover, in addition to considering the types of assets invested in, this analysis also segmented ARRA funded reinvestment expenditures by mode (e.g., bus, heavy rail, and light rail). The result is a comparison of estimated differences in the size and composition of the transit backlog with and without ARRA funding by asset type and mode.

Analysis Caveat

When reviewing the backlog impact analysis below, the reader should focus more on the estimated *change* in the backlog and place less emphasis on the estimated *final level* of the backlog. The reason being is that while the difference in the size of the backlog with and without ARRA funded investments appears to be well understood, the recent impact of other factors that determine the size or growth of the backlog over time (in particular the level of non-ARRA funded backlog investments over the period 2010 into 2011) are *not* well understood. Most notably, reliable data are not yet available on the extent to which non-federal funding for SGR investments increased, decreased or were maintained either in response to the ARRA funding or to the underlying economic downturn.

Figure 3: SGR Backlog by Mode

Estimated Impact on Backlog: Findings

Figure 3 presents the results of the comparison between the “Pre-ARRA” and the adjusted or “Post-ARRA” backlogs. Note that this analysis consolidates all non-rail modes (including bus, demand response, vanpool, trolley bus, and ferry), into a single mode grouping whereas commuter rail, heavy rail and light rail have all been reported separately. This segmentation is driven by both the manner in which grant data are recorded by FTA and the modal composition of those specific agencies receiving grant funds. Given this information, it is *not* easy to segment between non-rail modes whereas reasonable assumptions can be made regarding the allocation of funds to different types of rail modes.

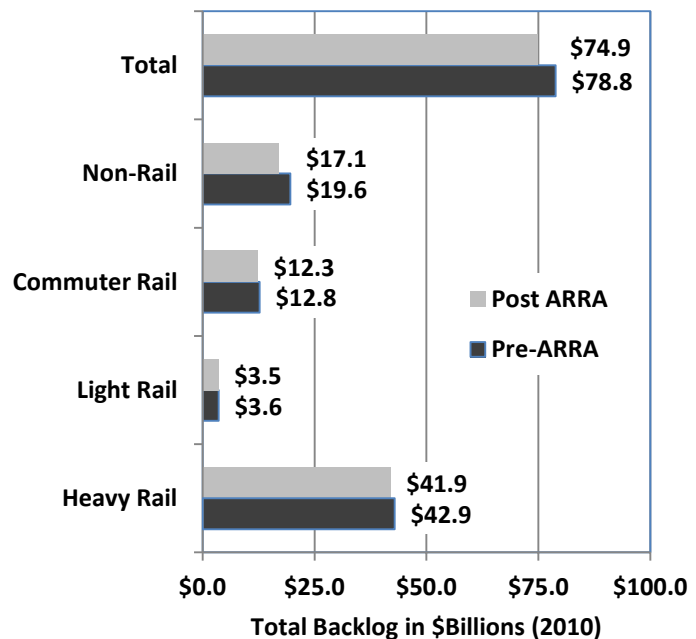


Figure 4 presents the impact of ARRA funded reinvestment on the pre-ARRA investment backlog both in total and by mode type. As expected, the \$3.9 billion in ARRA funds applied to capital reinvestment yielded a roughly equal reduction in the magnitude of the existing backlog. Moreover, as already discussed, most of this reduction is estimated to be concentrated in non-rail modes (primarily bus and demand response), yielding a roughly \$2.5 billion reduction in the investment backlog for these mode types. The remaining funds yield a \$1.4 billion reduction in the rail reinvestment backlog, with the largest share of these funds going to heavy rail (which also has the largest share of the total transit capital investment backlog). Note here that the overall magnitude of the non-rail backlog is much smaller than that of the rail modes (heavy rail in particular) and hence, in percentage terms, the reduction in the non-rail backlog (roughly 11.6 percent) is estimated to be far larger than that for any of the rail modes (e.g., 2.2 percent for heavy rail; see Figure 5. The overall reduction in the backlog resulting from ARRA funded capital reinvestment is estimated to be roughly 5 percent.

Finally, when comparing the size of the existing backlogs by mode with the distribution of ARRA funding, it is important to keep in mind that grantee expenditure decisions were driven as much by ARRA program requirements as by the modal distribution of the backlog. In short, replacement of existing over age bus and paratransit fleets was more easily accomplished within the program time and domestic procurement restrictions than were either replacement of rail vehicles or other major replacement projects, which either require use of foreign suppliers or require extended time periods to complete.

Figure 4: Impact of ARRA on Backlog (\$)

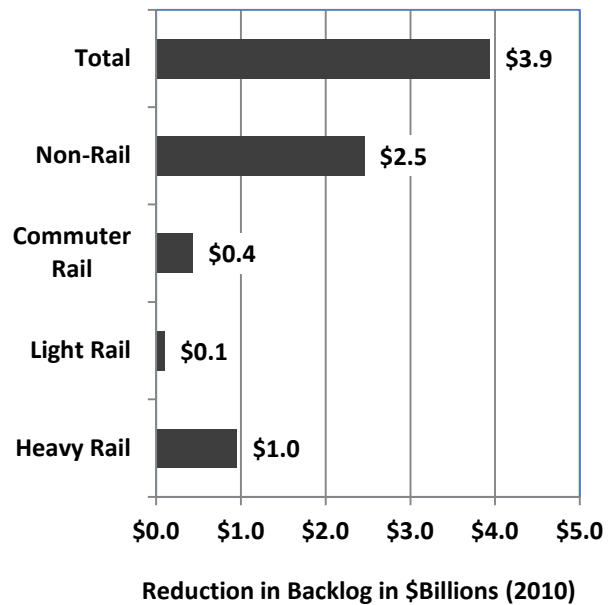


Figure 5: Impact of ARRA on Backlog (%)

