



# Massachusetts Bay Transportation Authority

Deval L. Patrick  
Governor

Timothy P. Murray  
Lt. Governor

Jeffrey B. Mullan  
MassDOT  
Secretary & CEO

John R. Jenkins  
MassDOT  
Board Chair

Richard A. Davey  
General Manager and  
Rail & Transit Administrator

July 14, 2010

Dear Interested Party:

On July 9, 2010, the Massachusetts Department of Transportation submitted an annual status report pursuant to Section B (15) of the Transit Commitments Administrative Consent Order Amendment dated September 1, 2000. This Annual Report provides an update on those projects that are listed in the ACO.

A copy of the report is enclosed. The report references an Attachment (Tab A) which is a list of all MassDOT Highway Division contracts and the associated information regarding the construction retrofit program. This attachment is quite large (approximately 400 double sided pages). Given its size, the attachment will be provided upon request.

As required, MassDOT and the MBTA are seeking public comments on the 2010 Annual Report. Comments should be addressed to:

**Andrew D. Brennan**  
**Director of Environmental Affairs**  
**Massachusetts Bay Transportation Authority**  
**10 Park Plaza – Room 6720**  
**Boston, MA 02116**

Or by email at [abrennan@mbta.com](mailto:abrennan@mbta.com)

*Comments must be received no later than Friday, August 20, 2010.*

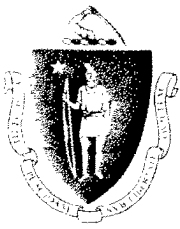
If you have any questions, please do not hesitate to contact me.

Sincerely,

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Andrew D. Brennan  
Director of Environmental Affairs





DEVAL L. PATRICK  
GOVERNOR  
TIMOTHY P. MURRAY  
LT. GOVERNOR  
JEFFREY B. MULLAN  
SECRETARY & CEO



July 9, 2010

Margaret Stolfa  
General Counsel  
Department of Environmental Protection  
One Winter Street  
Boston, MA 02110

Re: Administrative Consent Order (ACO – BO – 007001)  
Annual Status Report – July 2010

Dear Ms. Stolfa:

Pursuant to Section B (15) of the Administrative Consent Order Amendment dated September 1, 2000, enclosed please find the required Annual Status Report on the various items listed in that consent order as well as in the subsequent ACO Amendments. We are also providing information on the status of the Supplemental Environmental Projects required as part of the ACO and its Amendments.

This notification will be sent to everyone listed on the ACO distribution list informing them that the document has been posted on the MBTA website at [www.mbta.com](http://www.mbta.com).

If you have any questions, do not hesitate to contact me.

Sincerely,

David J. Mohler  
Executive Director for Planning

cc. Richard A. Davey, MBTA General Manager and Rail & Transit Administrator

**DEP/MASSDOT AMENDED ADMINISTRATIVE CONSENT ORDER**  
**AC0-BO-00-7001**  
**STATUS REPORT**  
*JULY 9, 2010*

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**DEP/MASSDOT AMENDED ADMINISTRATIVE CONSENT ORDER**  
**ACO-BO-00-7001**  
**ANNUAL STATUS REPORT**  
**JULY 9, 2010**

This report is submitted to the Massachusetts Department of Environmental Protection in order to fulfill the requirements of Section (V)(1) of the Administrative Consent Order (ACO-BO-00-7001) entered into by the DEP and Massachusetts Department of Transportation (MassDOT)<sup>1</sup> on January 26, 2005. Below is a project description and status information for each of the projects required under the ACO and its amendments.

**1. New Orange Line Vehicle Procurement**

**a. Project Description**

The initial commitment as described in the September 2000 ACO requires signal improvements be made to the Orange Line, such that peak period headways can be improved from 5 minutes to 4 minutes. A reduction in headways requires three additional trains running in the peak hour. These three trains are comprised of 18 Orange Line coaches.

The signal improvements to allow for the improved headways have been completed. As reported in prior Transit Commitment Reports, the MBTA has determined that it is cost prohibitive to purchase 18 new Orange Line coaches as well as cost prohibitive to convert existing Blue Line coaches to Orange Line coaches.

In the alternative, the MBTA will proceed with the planning and programming necessary to purchase a new Orange Line fleet of vehicles; included in this fleet will be a sufficient number of coaches to accommodate the improved scheduling. The preliminary step is to develop an infrastructure survey to see what changes need to occur to accommodate new vehicles. That infrastructure survey will include an analysis of bridge upgrades, track alterations, track work, platform changes, and alterations to the maintenance facility as well as several other issues. The MBTA will use this survey to determine how the vehicles and the associated infrastructure improvements need to be developed so as to accommodate the new vehicles.

The MBTA will then program in the appropriate CIP, the purchase of a sufficient number of new Orange Line cars such that the total is 18 more than are in the fleet in 2005 (or its equivalent carrying capacity if the coaches are of a different length) as well as the infrastructure improvements to accommodate the new vehicles.

**b. Project Schedule and Status Report**

The schedule for Orange Line vehicle procurement is as follows:

- a. Completion of initial infrastructure survey: May 1, 2005 – **This report was completed in April 2005.** The report identifies a series of recommendations for procurement of Orange Line vehicles

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<sup>1</sup> At the time of the original ACO and its Amendment, the Commonwealth's Transportation agency was called "the Executive Office of Transportation and Public Works" and was abbreviated as "EOTPW" or sometimes as "EOT." In June 2008, the legislature passed and Governor Patrick signed landmark transportation reform for the Commonwealth. In this transportation reform legislation, agency functions were consolidated and refined under a new executive transportation secretariat called "the Massachusetts Department of Transportation" (MassDOT). In this status report, for simplicity, the name MassDOT is consistently used throughout when describing the Commonwealth's transportation agencies.

under a number of different scenarios as well as the various infrastructure improvements necessary to accommodate the new vehicles.

- b. Assessment of infrastructure improvements necessary to accommodate the new coaches: December 1, 2006. **This assessment has been completed.** Based on the suggestions in the report completed in April 2005, the MBTA has determined what types of infrastructure improvements are necessary to bring new Orange Line vehicles into service. From this report, the MBTA has determined that power upgrades are required at the power substations at Sullivan Square, Wellington, Malden and Oak Grove. Track improvements (*e.g.*, Mainline turnout replacement at Wellington, Wellington Yard Rehabilitation, Cross Tie Renewal from Oak Grove to Community College, *etc.*) are also required. Signal modifications for the maintenance yard are also required.

Major upgrades are also required at the Wellington Car House. These upgrades include a major expansion of the car house to accommodate new lifts, hoists, wheel truing equipment, a lift/turn table as well as a Clean Room. Building a 96,000 square foot expansion on to the facility will accommodate these upgrades. In addition, new third rail upgrades and special track work are required for the Wellington Yard.

At its meeting in April 2008, the MBTA Board of Directors approved the most recent Capital Investment Plan (CIP) for Fiscal Years 2009 through 2013. In this CIP, the MBTA has programmed over \$133 million for overall Orange Line vehicle procurement.<sup>2</sup> The prior CIP (FY 2008 through 2012) had \$73 million for the Orange Line project.

Future CIP's (which are prepared annually) will identify funds for third rail upgrades, Wellington Yard special track work, the maintenance facility improvements, as well as vehicle procurement.

- c. Provide schedule with milestones for purchase of additional coaches: December 1, 2007.

**This schedule milestone has been met.** In a letter dated November 30, 2007, MassDOT provided the DEP with a schedule, including milestones for the delivery of Orange Line vehicles. The ACO requires MassDOT to provide the DEP with a revised schedule for the procurement of a new Orange Line fleet. This fleet must include a sufficient number of new Orange Line cars such that the total is 18 more (or the equivalent carrying capacity) than are in the 2005 fleet, on a time line consistent with the replacement of existing Orange Line fleet at the end of the current cars' useful life (2015).

The MBTA's current Orange Line fleet is comprised of 120 coaches. The MBTA has developed a procurement strategy and timeline for purchasing a new fleet comprised of 146 new Orange Line coaches. The MBTA's Orange Line vehicle schedule is as follows:

- i. In September 2007, the MBTA advertized for consultant services to assist the MBTA in the development of a new specification for 146 New Orange Line Vehicles. **This interim milestone has been met.**

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<sup>2</sup> These costs include \$80 million for the vehicle procurement, \$10 million to make the signal systems compatible with the new vehicles and over \$43 million for ancillary improvements associated with the new vehicles such as power system upgrades, bridge modifications, modifications to the maintenance facilities, *etc.*

- ii. Award Contract for consultant Services for the Vehicle Procurement – May 2008. The MBTA had previously planned on awarding this contract at its March 2008 Board of Directors’ meeting. Given the complexity of the proposals and questions from prospective consulting companies, the MBTA decided to allow more time for consultant review and selection. This contract was awarded at the July 2008 Board of Directors’ meeting. **This interim milestone has been met.**
- iii. Advertise Request for Proposal for New Orange Line Vehicle Manufacturing and Delivery Contract – November 2010
- iv. MBTA Board of Directors Awards Contract – February 2011
- v. Issue Notice to Proceed to Selected Manufacturer – May 2011
- vi. Delivery of Pilot Vehicle – December 2012
- vii. Delivery of Final Vehicle – December 2015

## **2. MassDOT – Highway Division Construction Retrofit Program**

The ACO requires MassDOT to implement a construction equipment retrofit program and retrofit equipment with emission control technologies such as oxidation catalysts and particulate filters for large MassDOT (Highway and Transit Division) funded projects. The ACO Amendment #2 dated January 26, 2005 expands on the requirements of the MassDOT – Highway Division retrofit program.

As required under Amendment 2, MassDOT – Highway Division adopted a standard specification for all construction contracts requiring its contractors to implement diesel construction retrofits (such as oxidation catalysts or particulate filters) on the exhaust system of all large non-road diesel construction equipment greater than 50 horsepower. The specification was implemented for all contracts advertised since March 15, 2005 and required contractors to submit a certification stating that they will abide by the new retrofit specification. This information is provided at **Tab A**. In addition, the specification required contractors to submit a list of all equipment that will be used on the contract’s job site(s). The March 15, 2005 specification was revised November 1, 2008 (Revision 1). The revised specification provided greater detail as to the type of retrofit devices that are to be used (i.e., only verified devices), exemptions allowed, compliance and non-compliance requirements, cost and schedule as well as the contractor certification required under the original specification. In February 2009, the specification was further revised (proposed Revision 2) to take into account comments received by the Construction Industries of Massachusetts (CIM). The major change proposed in Revision 2 allows a permanent grandfather clause for “manufacturer equivalent” retrofit devices that were installed by contractors on equipment under the original specification.

In response to the modifications proposed in the Revision 2 specification, MassDOT – Highway Division met with MassDEP on several occasions during this reporting period to discuss CIM’s comments and the proposed changes to the specification. A meeting was held with DEP, MassDOT – Highway Division, CIM and UCANE (Utility Contractors) on March 23, 2009 to review and comment to DEP on a revised contract specification. Presentations were made by CIM and UCANE, as well as representatives of equipment manufacturers and rental companies who also attended. The presentations were directed to issues regarding retrofit availability and installation.

As a result of the March 23, 2009 meeting, MassDOT – Highway Division reissued its diesel retrofit specification on September 2, 2009. The revised diesel retrofit specification provides detailed requirements and information for contractors who will be operating non-road, diesel-powered construction equipment in excess of 50 horsepower on MassDOT job sites. One major change of the revised specification is the requirement that contractor equipment meet one of the following options:

- Option 1: equipment engines meet the most current Environmental Protection Agency (EPA) particulate matter (PM) Tier emission standards in effect for non-road diesel engines for the applicable engine power group, or
- Option 2: equipment engines contain emission control technology verified by EPA or the California Air Resources Board (CARB) for use with “non-road engines,” or
- Option 3: equipment engines contain emission control technology verified by EPA or CARB for use with “on-road engines,” provided that such equipment is operated with Ultra Low Sulfur Diesel fuel, or
- Option 4: equipment engines contain emission control technology certified by manufacturers to meet or exceed emission reductions provided by either “on-road” or “non-road” emission control technology verified by EPA or CARB.

If contractors have equipment that complies with Option 1, then that equipment will not have to be retrofitted with either an oxidation catalyst or particulate filter. However, if emissions from diesel equipment comply with the most current EPA emission standards for particulate matter in effect at the time, but are superseded by newer Tier emission standards (i.e., Tier 3 emission standards replaced by Tier 4 emission standards), then the superseded diesel equipment will have to be retrofitted prior to the end of the contract with emission control technology per Options 2, 3, or 4.

Several other pertinent changes contained in MassDOT’s revised diesel retrofit specification include the following:

- Rented diesel equipment greater than 50 horsepower that is used on site for 30 days or less over the life of the project will be exempt from having to comply with the revised specification. If used over 30 days, the rented equipment will have to comply with the revised specification.
- Retrofit devices that were installed under the original retrofit specification can be used to comply with the revised specification if a manufacturer certification is provided that shows the retrofit device meets the following minimum emission reductions:

**For Diesel Oxidation Catalysts**

- at least 20 % for PM
- at least 40 % for CO
- at least 50 % for VOC’s

**For Diesel Particulate Filters**

- at least 85% for PM

- If additional or replacement equipment is brought onto the job site after work has commenced, the contractor has 15 calendar days from the time the replacement equipment is brought on site to comply with the new specification.

In the fall of 2009, Highway Division personnel conducted a series of outreach programs for contractors throughout the Commonwealth. The purpose of the outreach program was to provide contractors with information regarding the revised diesel retrofit specification, and to respond to specific questions contractors had regarding retrofitting their equipment. To further assist contractors, MassDOT created an information page under its Highway Division web site that provides specific information for diesel retrofits. The page contains answers to frequently asked questions that contractors have for retrofitting their equipment.

As a result of the outreach program and the information contained on MassDOT's web site, MassDOT Highway Division's diesel retrofit program has been very successful. Since March, 2005, over 850 pieces of construction equipment have been tagged with diesel retrofit compliance stickers. In order to ensure a high compliance rate by contractors, MassDOT's diesel retrofit coordinator continues to conduct daily random state-wide diesel retrofit inspections of large and small job sites. The coordinator also attends various pre-construction meetings for contractors who have been awarded construction contracts and are ready to start work. The purpose of attending pre-construction meetings is to ensure that contractors understand their retrofit obligations and to answer any question they may have. In addition, in the first quarter of 2010, a series of diesel retrofit training seminars were conducted for Highway Division construction field personnel to ensure that construction field staff is aware of diesel retrofit requirements.

### **3. Urban Ring Draft Environmental Impact Report**

#### **a. Project Description**

This project includes the development of federal environmental review documents to develop, evaluate and recommend non-radial transit service alternatives that would provide better access to key activity centers in a 15-mile long, one-mile wide corridor located just beyond the Boston central core through the municipalities of Chelsea, Everett, Medford, Somerville, Cambridge, Brookline and Boston. The project is intended to provide better transit travel times from existing radial transit lines to points in the Urban Ring corridor, ease congestion in the central subway system, and increase the overall MBTA system ridership. The Urban Ring corridor passes through areas with existing travel demand and/or future development potential, and a portion of the corridor generally follows the alignment of the previously proposed Inner Belt Highway. The alternatives include Transportation System Management (TSM) improvements to existing cross-town and express bus services, and new and overlapping Bus Rapid Transit (BRT) routes and light or heavy rail services. The alternatives would connect to new and current station stops on the existing and planned radial lines wherever they cross the Urban Ring Corridor.

#### **b. Project Schedule and Status Report**

On November 30, 2004, in compliance with the Administrative Consent Order, the MBTA filed a Draft Environmental Impact Report (DEIR) with the Executive Office of Environmental Affairs (EOEA). Amendment #2 to the ACO further required MassDOT to submit a draft Environmental Impact Statement (EIS) through the NEPA process on or before October 31, 2005, provided that the Federal Transit Administration (FTA) had accepted proposed modeling revisions and the Commonwealth had identified the source of 50% non-federal matching funds.



In a letter dated May 18, 2005, the MBTA informed MEPA of its intent to re-link the EIR and EIS. In November 2008, the Executive Office of Transportation filed a Revised Draft Environmental Impact Report/Statement with MEPA.

On January 22, 2010, the Massachusetts Department of Transportation (MassDOT) submitted a letter to EOEEA indicating its intent to suspend further environmental review on the project and withdraw from the special review procedures. This decision was driven by the lack of available funding with which to pursue the project in its entirety in the near term (the Boston Region Metropolitan Planning Organization's Regional Transportation Plan amended in late 2009 did not include the project in its recommended list of projects over the next 20 years).

In recognition of the effort that had been put into planning for the project, and the design consensus reached by municipal and institutional stakeholders, MassDOT stated in the January 22 letter its intent to continue to pursue early actions on some segments of the project corridor, to pursue bus rapid transit improvements on existing routes in the corridor, and to continue to plan for the corridor as a whole. EOEEA responded by letter on June 23, 2010. The letter offered support for MassDOT's decision, and provided guidance on how to approach MEPA review on the future implementation of early actions in the corridor.

The ACO required the filing of the Draft EIR, and then by extension, the filing of the Draft EIS. MassDOT believes that the Draft EIS/EIR filed in November 2008 met the requirements of the ACO and that this ACO matter has been completed.

#### **4 Silver Line Phase III**

On December 13, 2006, MassDOT and DEP executed the Transit Commitments Administrative Consent Order Amendment #3, that among other things, required MassDOT to direct the MBTA to complete a Full Funding Grant Agreement for the Silver Line Phase III project with the Federal Transit Administration (FTA) by December 2010 and to direct the MBTA to complete construction of Phase III by December 2016.

The FTA granted Preliminary Engineering (PE) approval on December 13, 2006, and approved the MBTA's request to return to PE, giving the Project a *Medium* rating as part of the New Starts evaluation process. With this rating and PE approval in hand, the MBTA began PE to support an environmental review document and meet the FTA's requirements to advance the project. Throughout 2007, the MBTA worked on a series of analyses designed to help define the project more specifically. These studies focused on elements of the project, such as the layout of the portal and the streetscape surrounding the portal, the configuration of the headhouses, etc. Based on these design studies, the project was anticipated to cost \$1.8 billion dollars. In addition, the project would require nearly \$10 million per year in operating costs as well as \$400,000 million in finance costs.

In December 2008, the FTA informed the MBTA that the MBTA's most recent New Starts submittal, filed in September 2008, had been reviewed preliminarily. FTA gave the Silver Line project a *Medium High* rating for its land use and project justification. In May 2009, the FTA released its Annual New Starts Report which contained this statement as well. The MBTA's financial analysis demonstrated, however, that the MBTA's current financial situation identifies a higher level of debt and reliance on future borrowing, and as such, the project would receive a *Medium Low* for the financial component of the review, resulting in an overall *Medium Low* for the project. Projects receiving a Medium Low rating are ineligible to move into Final Design.

On October 27, 2009, FTA and the Federal Highway Administration (FHWA) approved the Regional Transportation Plan of the Boston Region Metropolitan Planning Organization (BRMPO) (referred to as the Plan). The Plan is the long-range, comprehensive transportation planning document for the Boston region. The Plan defines transportation visions for the future of the region, establishes goals and policies that will lead to the achievement of the visions, and allocates projected revenue to transportation programs and projects in order to implement those goals and policies.

One important factor limiting project selection for the Plan was the financial constraint requirement. As in many regions around the country, funds are not available to construct all of the projects that have been considered meritorious or beneficial transit investments. As such, the BRMPO was required to eliminate many worthy projects needed to achieve the visions and goals for the region that had been included in previous versions of the Plan. While the BRMPO has worked to use the available funding in a way that produces the optimal benefit, many projects that would help to maintain the existing system and also allow for future expansion or enhancement could not be included. As a result, it voted to include illustrative projects as part of this Plan Amendment. Illustrative projects are defined as projects that meet the BRMPO's criteria for selection, but that are not included in the recommended list of projects because there is not sufficient revenue to fund them.

The Silver Line Phase III project is an illustrative project in the Plan. Consequently, the design and project development for the Silver Line III project has been terminated. No additional design, nor the environmental review of the project will continue without funding in place. MassDOT believes that the region can only reasonably compete for one New Starts project and that the current funding situation at the MBTA cannot support two new expansion projects. In light of this, MassDOT will be seeking New Starts funding for the Green Line extension only. In a letter dated April 15, 2010, MassDOT informed the FTA that it was no longer seeking New Starts funding for the Silver Line project and that it would seek New Starts funding for the Green Line extension only. MassDOT has kept the Executive Office of Energy and Environmental Affairs apprised of the status of the project as well.

## **5. MassDOT/RTA Diesel Retrofit Program**

The ACO Amendment #3 dated December 13, 2006 requires MassDOT to administer the distribution of funds to Regional Transportation Authorities (RTA) for the installation of emission reduction technologies on RTA buses. The ACO also required MassDOT to submit to DEP a three-year plan for completing these retrofits. That plan, which was submitted on March 13, 2007, was to include a list of the relevant RTAs, the number of buses to be retrofitted and the technology to be used.

Fifteen Regional Transit Authorities provide fixed route and demand response public transit service in 231 municipalities across the Commonwealth. Serving over 29 million annual transit customers, the RTAs play a vital role throughout the Commonwealth, including rural and small urban areas where customers often have few alternatives to automobile travel. Responsible for fixed-route and demand-response services, RTAs use a variety of vehicles to meet their service needs, including varying sizes, vintages, and propulsion technologies.

The program described here – the MassDOT/RTA Diesel Retrofit Program – proposed to reduce the emissions associated with the diesel engines used by many RTA vehicles by making verified diesel particulate filters (DPF) widely available to all RTAs – at no cost to the Authorities themselves – and by providing administrative support and encouragement to the RTA's. This program will target RTA vehicles that were manufactured prior to 2007, which were equipped with particulate trap technology in order to comply with the revised standards.

MassDOT staff developed and submitted a plan that determined that diesel retrofit technology be utilized on up to 579 vehicles. This plan, unique in its breadth since MassDOT didn't actually own or control the candidate fleets, was prepared as a working estimate of the maximum number of vehicles that could be included in a program. Shortly after submitting the plan, MassDOT began coordination work with the RTAs on how to implement the plan. Once engineering and technical operations reviews were made on the candidate fleet, a number of significant issues became evident, including ongoing engineering complications that the original project staff or the ACO could not have anticipated.

One of the early issues facing the implementation of the plan is that the original 579 coaches included every diesel transit coach in the RTA fleets, including those well past their FTA stipulated life span and actively being retired and sold for scrap. Installing expensive retrofit kits on a retiring fleet is neither economically nor programmatically prudent. The de facto industry standard, well documented by the State of Connecticut<sup>3</sup>, is for retrofit technology to be installed on coaches at or younger than 2/3 of their remaining capital life cycle. Additionally, Connecticut made the compelling case of mandatory retirement of fleets exceeding their twelve year life span as one the most beneficial investments that could be considered.

Unlike the MBTA, most RTA buses that would receive the retrofit kits are Gillig Phantom model transit coaches powered by Cummins diesel engines. Engineering issues specifically associated with the Cummins power plant with diesel particulate filters (DPF) have become well known in the transit industry. There have been regular instances when unrelated failures of the engine turbo system can cause the DPF filter to crack and require full component replacement, a costly problem. Several peer agencies have sued Cummins and Gillig over this unique problem, including a \$1.25 million lawsuit covering 59 buses filed by the Rochester Genesee Regional Transportation Authority (RGRTA) for this problem.

Without a resolution to this ongoing Cummins/Gillig problem, RTA operation staffs would not implement the original MassDOT retrofit program. With the substantial replacement cost and installation time, the participating RTAs will not agree to a DPF retrofit without being held harmless from all future claims. Determining the engineering and cost exposure for each RTA would take additional due diligence and further delay the implementation of this ACO requirement. The RTAs will not assume mechanical risk for a MassDOT program without adequate compensation as their lean spare ratios and minimal staffing makes any mechanical campaign, especially unscheduled in-service failures, makes supporting engineering programs such as this one difficult. For some RTA fleets, missing a bus from the lineup translates into no service on a particular route, stranding transit dependent customers. How this commitment gets resolved is part of the plan update currently being developed with DEP.

MassDOT Rail & Transit has now assumed project management of this ACO commitment. MassDOT continues to work closely with DEP staff on an implementation strategy to complete this commitment on or near schedule, despite the unique engineering complications associated with the project.

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## **Funding**

MassDOT continues to support this program using funds from the Congestion Mitigation & Air Quality Improvement Program, up to a three-year total of \$4.5 million. The use of CMAQ funds for diesel retrofit purposes has already been approved by the CMAQ Consultation Committee, and MassDOT will provide the 20% non-federal match required for CMAQ funds. Due to federal restrictions placed on the use of CMAQ funds, the MassDOT/RTA Diesel Retrofit Program will run for three years from official commencement.

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<sup>3</sup> Connecticut Clean Diesel Plan, January 2006, Pg 33.

## Measurable Milestones

MassDOT proposed that participation in the MassDOT/RTA Diesel Retrofit Program be voluntary for the RTA's and that it would dedicate substantial resources to encouraging the Authorities to take part. Working through the MassDOT Transit Office, the Massachusetts Association of Regional Transit Authorities (MARTA), and the Massachusetts Association of Regional Planning Agencies, MassDOT educated the RTA's about the program and promoted the benefits of diesel retrofit technologies. However, once implementation of the plan was initiated, substantial engineering issues were presented by the RTAs, including substantial fleet risk unique to the retrofit of the Gillig Phantom fleet equipped with Cummins diesel engines.

## Next Steps

MassDOT Rail & Transit has now assumed project management of this ACO commitment. MassDOT continues to work closely with DEP staff on an implementation strategy to complete this commitment on or near schedule, despite the unique engineering complications associated with the project. As part of the MassDOT project team, access to the Chief Mechanical Officer for MBTA Bus and the MBTA Vehicle Engineering group and will greatly enhance MassDOT's ability to fulfill its ACO obligations. A final revision to the retrofit plan is pending final release in order to update technological and organizational changes.

### 6. Service To TF Green/Rhode Island

#### a. Project Description

This project involves the extension of commuter rail service, which currently terminates in Providence RI, to TF Green Airport. The project is being managed by the Rhode Island Department of Transportation (RIDOT) and being assisted by the MBTA.

This project will consist of:

- MBTA commuter rail station
- Consolidated rental car facility, with fueling and washing stations
- Bus Hub for local and intercity buses
- 1,200-foot enclosed elevated walkway from airport terminal to Warwick Intermodal Station
- 3,000-Space Vehicle Garage
  - 2,200 for rental car operations
  - 1,000 for rail commuters
- Services
  - Car rentals
  - RIPTA/intercity buses
  - Taxis/limousines for commuters
  - Intercity/commuter rail

In the mid 1990's, RIDOT looked at several possible train station sites along the Northeast Corridor, including the City of Warwick, at T.F. Green Airport. By 1998 initial federal funding was received for a train station in Warwick in the amount of \$25 million in TEA-21. In 2000, the concept developed included a rental car facility and connection to the airport.

After September 11<sup>th</sup>, project planning was put on hold but it resumed early in 2003. Between 2003 and 2005, planning and design continued and the project evolved into a 3,200-space consolidated parking facility for commuters and rental cars.

In 2005, RIDOT and the Rhode Island Airport Commission (RIAC) dropped the Automated People Mover (APM) connection to the airport, in favor of a skywalk with moving sidewalks. In 2006, all project financing was secured. RIDOT and RIAC enter into a project agreement in June 2006 governing the funding, design and construction management of the project.

The project is estimated at \$222.5 million. Those cost estimates are currently being revised. The project is being financed by RIDOT via a FHWA Grants (40%), TIFIA Loans (19%), First Lien Bonds (16%), CFCs during construction (15%), State Grants (10%). A Customer Facility Change was put in place in January 2001 on rental car transactions as a means to pay off project debt.

## **b. Project Status and Schedule**

In 1999, the original Environmental Assessment (EA) was developed and the FHWA granted a Finding of No Significant Impact (FONSI) for a commuter rail station at T.F. Green Airport. In 2001, the scope of the project was changed to add the car rental facility. This change was subject to a reevaluation pursuant to NEPA. Based on that reevaluation, the original FONSI was validated. A second reevaluation was undertaken in 2002 due to the need to acquire additional abutting property. This reevaluation also resulted in another validation of the original FONSI.

The design of the project is progressing and overall design is at 60% stage. Additional engineering and architecture is required for the Skywalk and rental car fueling/washing stations. RIAC issued a Request for Proposal (RFP) for a Construction Manager to oversee bidding of construction contracts. A CM was hired, and is currently working with RIDOT's consultant on finalizing plans and developing bid packages.

Environmental cleanup system installed and cleanup by RIDOT is ongoing. Traffic and drainage improvements have been completed by RIDOT. The short-term parking lot reconfiguration was completed by RIAC.

- Acquisition of the remaining right-of-way (Amtrak air rights) **was completed in the summer of 2008.**
- Engineering **was completed in Late 2008.**
- Construction contracts were bid in **mid 2008.**
- Garage construction began in **September 2008 and is now approximately 50% complete.**
- Skywalk construction began in **October 2008 and is now 75% complete.**
- A letter agreement between RIOT and the MBTA to extend commuter rail service was signed in **October 2009.**
- Start construction of track infrastructure and two interlocking between Providence and Warwick in late 2010.
- Complete project and commence commuter rail service in **late 2010.**

## **7. Signal Prioritization**

The MBTA has been working with the City of Boston to identify how a Traffic Signal Priority (TSP) program can be developed. As a demonstration project, the MBTA installed TSP at four (4) intersections along the Silver Line on Washington Street. The intersections are at:

- Melnea Cass Boulevard
- Massachusetts Avenue
- East Berkeley Street
- Herald Street.

At each of these locations TSP is bidirectional, except at Massachusetts Avenue where TSP is available in the outbound direction only.<sup>4</sup> The TSP System is designed as a 'conditional' priority system. That is, the system only requests priority on the condition that the vehicle is late. This conditional element provides benefits to both the MBTA and to the City. From the MBTA's perspective, if priority were granted to vehicles that were early, then those vehicles would continue to get earlier and earlier, having a disbenefit to an evenly spaced headway. From the City's perspective, by granting priority only to late vehicles, the cross street traffic is disrupted less often.

Depending on the time in the traffic signal's cycle when priority is requested, the system can either extend the green light on Washington Street so that the bus makes it through the light, or shorten the red light so the bus has less of a wait. The exact number of seconds of the extension or shortening varies depending on time of day and a number of other factors. Generally a few seconds are saved when a red light is shortened and an entire light cycle is saved when the green light is extended and the bus is able to get through the intersection. Based on observations, the savings that are gained by extending a green light can range from 45 seconds to nearly 2 minutes.

When a bus is late, the systems on the bus automatically inform the computers at the MBTA Bus Control Center that priority is requested. The Bus Control Center computers automatically send the request for priority to the kiosk at the Silver Line station via telephone lines. The kiosk is wired to the Intersection Traffic Control Box that belongs to the City of Boston Traffic Department. The Traffic Control Box passes the request automatically to the City's Traffic Operations Center where central computers determine whether to grant priority. Priority will not be granted on consecutive cycles, nor will it be granted if the side street traffic is too heavy. Once the central computers have determined that priority should be granted, the proper signals are relayed back to the Traffic Control Box and the appropriate action is taken.

In spite of the complex path that the signal priority request must take, tests have shown that requests for priority travel from the Bus to the Bus Control Center to the Kiosk to the Traffic Signal Control Box to the Traffic Operations Center virtually instantaneously.

System testing conducted in February/March of 2006 demonstrated that the signal priority system is generating the information required by the City to initiate changes to the traffic signal timing.

After communication issues between the Silver Line kiosks and the BTB's Traffic Signal Control Boxes were solved, the TSP system was activated in March 2006 and has been running continuously since then.

BTB has upgraded its Traffic Operations Center over the last 2+ years. As part of the upgrade, the City's consultant created a report to provide feedback on how often signal priority was requested and how often

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<sup>4</sup> There is no signal priority at Massachusetts Avenue Inbound because the bus stop is before the traffic signal. A bus heading inbound there might not be stopping at the stop at all, or might be stopping to pick up many passengers, so there is no way for a computer to determine when signal priority should take effect. If the priority happens too early or too late, it won't help the bus (and could actually hurt it).

signal priority was granted. Unfortunately, BTD has not been able to get the report to work and their consultant has been unable to solve the problem.

The City periodically observes instances of signal priority requests in real time, but they are still unable to report on the number of requests or the number of times that requests were granted. The City is continuing to work on the problem from their end.

The MBTA is generating and transmitting requests for signal priority and the City is receiving these messages. The City's traffic department has confirmed that conditional requests for priority are being granted. The MBTA is continuing to fine-tune parameters of the system to ensure the optimal reduction in running times is achieved. In a sample taken from the data provided by the Boston Transportation Department in the first quarter of 2007, the MBTA estimates that 37 vehicle-minutes per day in average running time savings are being achieved as a result of signal priority.

Over the course of the past two years, the MBTA implemented the ITS program over the following schedule:

- Traffic signal priority activated (March 2006)
- New internal standards for countdown sign accuracy developed (April 2006)
- Real-time bus arrival countdown activated for customer use during evaluation and testing (June 2006)
- Most major outstanding issues with Silver Line Washington Street AVL/dispatch operations and data quality resolved (October 2006)
- Radio tower site for Silver Line Washington Street ITS system moved from Quincy to Boston to improve data radio coverage (November 2006)
- Formal acceptance test for real-time countdown component shows 93-98% of countdowns acceptable (December 2006)
- New internal monitoring software developed by the MBTA to better evaluate countdown sign performance (January 2007)
- Tuning of running times and mobile event locations completed for countdown and signal priority (February 2007)
- Integrated system test and final acceptance of Silver Line Washington Street ITS contract (June 2007)
- Full cutover to new system-wide radio-CAD/AVL system (November 2007).

The MBTA believes that this TSP system has provided substantial improvements to the transit delivery along Washington Street and is looking to implement the program in other places. The MBTA sought a federal grant to replicate this system elsewhere but was unable to secure this funding from the FTA. The MBTA will continue to monitor the federal bus grant program to see what other sources of funding may be available.