FTA | United States Department of Transportation
Federal Transit Administration

emsINSTITUTE
environmental & sustainability management system

FTA EMS Training & Assistance

October 1, 2008 – September 30, 2010

Foreword

The report summarizes FTA's environmental management systems (EMS) training and assistance project. This report includes the results of a two year effort to advance international environmental management standard ISO 14001 in public transit agencies in the United States.

Participation included:

- Federal Transit Administration (FTA);
- Eight local transit agencies; and
- The Center for Organizational and Technological Advancement (COTA) at Virginia Polytechnic Institute and State University (Virginia Tech)

The intent of this program responds to requests from transit industry representatives that FTA establish an EMS training and assistance program similar to FTA's successfully concluded EMS Institute.

FTA's focus was three-fold:

1. To introduce a geographically and size diverse set of public transit entities throughout the US to EMS;
2. To stimulate these agencies into adopting EMS and becoming EMS champions in the universe of public transit agencies; and
3. To develop an EMS training program that would be, to a certain extent, transit specific.

EMS training and assistance participants included FTA grantees from New England, the Middle Atlantic Region, the South East, and the West Coast. These agencies ranged from medium sized traditional bus and para-transit operations to large organizations operating busses, ferries and commuter rail. As the FTA project comes to a close, six participating transit agencies have declared their intent to submit their EMS for ISO 14001 certification

Acknowledgements

This document was developed under Cooperative Agreement, Project Number VA-26-1011-00 awarded by the Federal Transit Administration (FTA) to the Center for Organizational and Technological Advancement (COTA) at Virginia Tech.

FTA, Virginia Tech and the participants would like to thank Dr. Jerry Benson of Utah Transit based in Salt Lake City, Utah and Perry Weinberg of Sound Transit in Seattle, Washington for their generous support of FTA's Round 2 EMS Training and Assistance. Both generously donated their time, expertise and enthusiasm to the effort.

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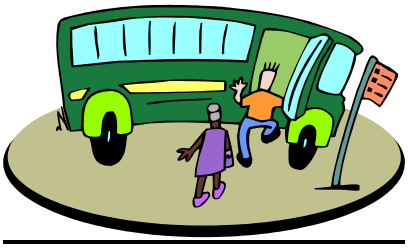

FTA Participating Transit Agencies

- Central Florida Regional Transportation Authority
- City of Asheville Transit System
- Los Angeles County Metropolitan Transportation Authority
- Maryland Transit Administration
- Massachusetts Bay Transportation Authority
  - Southampton Bus Facility
  - Design and Construction
- Miami-Dade Transit
- Worcester Regional Transit Authority

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Executive Summary

In the summer of 2008, FTA placed a notice in the Federal Register inviting transit agencies throughout the United States to apply for the FTA sponsored training and assistance for implementing an ISO 14001 based EMS. FTA's first initiative of EMS training for public transit agencies in 2004, supported Executive Order 13148 *Greening the Government* initiative and Executive Order 13274 *Environmental Stewardship and Transportation Infrastructure Project Reviews*, which directed federal agencies to promote environmental stewardship in the nation's transportation system while streamlining the environmental review and development of proposed transportation projects.

An Environmental Management System (EMS) is a set of processes and practices that enable an organization to reduce its environmental impacts and increase its operating efficiency. Organizations with an EMS report being able to more effectively manage their environmental obligations. Additionally, organizations report enhanced ability to analyze, control and reduce environmental impacts, and to operate with greater efficiency and control.

FTA believes that an EMS is a valuable tool and desired to continue its ongoing effort to introduce the doctrine of environmental management systems to a pilot group within the public transit sector. The ISO 14001 Standards served as the foundation of EMS training. FTA left the option of ISO 14001 certification to the discretion of the individual agencies.

How Were Teams Selected?

After receiving applications and completing interviews, FTA selected eight of the applicant agencies to participate in the training. FTA used a number of criteria to select participants, including:

- Organizational commitment by transit agency leadership to EMS implementation;
- Geographical diversity;
- Previous environmental experiences; and
- Environmental challenges from operations and/or pending capital projects.

FTA believed that organizational commitment to environmental protection and sustainability were the most important elements of the program and additionally, that senior management buy-in was crucial to successful EMS implementation.

It was important to the FTA that participating agencies attempt to demonstrate quantitative costs and benefits of the EMS implementation. FTA required teams to track both internal and external costs such as staff (managerial time and other employee time), costs of potential consulting assistance and outside training of personnel, and to the extent possible, the quantitative benefits of measuring individual environmental objectives and targets.

FTA Assistance

FTA contracted with The Center for Organizational and Technological Advancement (COTA) at Virginia Polytechnic Institute and State University (Virginia Tech) to provide training and assistance under a cooperative agreement. COTA developed a Letter of Agreement with each participating transit agency that outlined the roles and responsibilities of all the parties (FTA, Virginia Tech and the transit agency). The Letter of Agreement was acknowledged by the parties as a condition of participation, prior to any work being performed.

COTA provided assistance in the form of:

1. Baseline Environmental Reviews at each agency;
2. Four 3-day workshops;
3. Team Conference Calls between workshops;
4. Senior Management Conference Calls prior to Workshops 2, 3 and 4;
5. Technical site visit; and
6. One concluding EMS audit at each agency.

Benefits of Adopting an EMS

Benefits of implementing an EMS were reported by each participant transit agency and are documented in individual case studies found in ***Appendix "A"***.

Reported benefits include:

- Improved relationships with state and federal regulators;
- Enhanced public image with system users and the general public;
- Improved employee awareness of potential environmental impacts of work activities;
- Improved communications and cooperation through training and outreach;
- Increased management awareness of environmental issues;
- Reinforcement of environmental processes currently in place;
- Proactive management systems for environmental issues;
- Documentation of standard operating procedures;
- Institutionalization of best practices in and permanent improvements of on-time performance;
- Increased fuel economy;
- Reduction of air emissions; and
- Reduction of amount of oil in waste water.

Cost Savings

Cost savings and cost avoidances are identified in each agency case study found in Appendix A.

Federal Transit Administration Effort

Baseline Environmental Reviews: COTA, a US EPA Public Entity EMS Local Resource (PEER) Center (www.peercenter.net) began its effort in October 2008 with a one day visit to each participating agency to meet with executive management and the core EMS team. The site visit included a presentation of FTA expectations, briefing of workshop(s) curriculum and an environmental audit of the agency's fenceline facility. Fencelines chosen by participants typically included a bus or rail maintenance facility. One exception was MBTA's Construction Management Division which had significant new facilities coming online in its Transit Plan. MBTA was interested in developing an EMS for its capital construction program.

During the baseline audit, COTA took note of a variety of physical improvements as well as site storm water runoff, hazardous waste disposition, water and energy usage, recycling efforts, waste management, fuel storage and environmental permitting. A summary report of the environmental findings was prepared by COTA for each agency and provided as background material in advance of Workshop #1.

EMS Training Workshops: Four 3-day workshops were held over a 10 month period at Virginia Tech's training facility in Roanoke, Virginia.

Workshop # 1: January 2009
Workshop # 2: April 2009
Workshop # 3: July 2009
Workshop # 4: November 2009

Eight transit teams came to Roanoke for each of the four workshops. Approximately one-fourth of the 17 elements of ISO 14001 were presented at each workshop. The COTA concept was to introduce the ISO Standards, provide transit specific case studies to practice implementation, and then release the teams back to their locality for a 3 month implementation period.

The ISO 14001 implementation strategy included selecting individualized environmental objectives and targets based upon agency need and rigorous homework requirements. Each team had access to a web based EMS library. The EMS library included a comprehensive set of worksheets, procedures and operational controls for implementing an ISO 14001 EMS. The web based EMS library included detailed sample EMS procedures for every section of ISO 14001 which were easily modified to meet specific user needs. Finally, the electronic library also contained Best Management Practices from transit agencies participating in the first FTA EMS Institute.

Onsite training was supported by regular conference calls with EMS teams, COTA and the FTA project manager. Conference calls helped to identify problems teams might be having implementing workshop homework. As a condition of participation, all teams were required to hold regular agency EMS meetings, maintain good meeting minutes and regularly brief senior management on the progress of their EMS.

The FTA project manager held quarterly conference calls with agency senior management in an effort to maintain a high level of management support for the implementation efforts and to address intra-agency roadblocks. As the project went forward, these calls were the critical component in sustaining the momentum of the EMS core teams.

Post Workshop Activities: Homework assignments were to be completed by January 25, 2010. COTA scheduled a one day site visit to each agency to conduct an EMS pre-assessment. Two to four months later, COTA returned to each agency to conduct a formal two day EMS audit. This enabled a certified ISO 14001 auditor to verify and document systematically the degree to which each transit agency has an EMS in place in conformance with the audit criteria set out in *ISO 14010, Guidelines for Environmental Auditing - General Principles of Environmental Auditing and ISO 14011, Guidelines for environmental auditing - Audit procedures - Auditing of environmental management systems*. Final scoring from the COTA EMS Audit is provided for each agency at the end of each case study found in Appendix "A".

The eight transit agencies produced their initial EMS case studies documenting the organizations efforts related to their obligations. Case studies include:

- Narrative outlining their participation in the program;
- Costs and benefits of EMS implementation;
- Documentation on hours spent implementing the EMS;
- Statement of benefits of adopting an EMS;
- Cost savings and cost avoidances; and
- Next steps for the EMS in the agency.

What is an EMS?

An Environmental Management System (EMS) is a set of processes and practices that enable an organization to reduce its environmental impacts and increase its operating efficiency. Organizations with an EMS report being able to more effectively manage their environmental obligations. Additionally, organizations report enhanced ability to analyze, control and reduce environmental impacts, and to operate with greater efficiency and control.

Additional program benefits include cost savings over time, reduced insurance premiums, and better community relations. An EMS integrates the environmental ethic into business operations and environmental stewardship becomes part of the daily organizational responsibility.

An EMS is appropriate for organizations of varying size in public and private sectors. From start to finish, a two-year timeframe is suggested for the EMS implementation process. However, the process can be shortened or extended based upon the organizational culture and needs.

FTA transit participants utilized the 17 elements of ISO 14001 (2004) International Standard Reference. Working definitions of the 17 elements are as follows:

1. **Environmental policy**: Statement by the organization of its intentions and principles in relation to its overall environmental performance. The Environmental Policy is the

driver for implementing and improving the organization's environmental management system so that it can maintain and potentially improve it environmental performance.

2. **Environmental aspects**: Elements of an organization's activities, products and services that can interact with the environment. Consideration should be given to normal and abnormal operations within the organization and to potential emergency conditions.
3. **Legal and other requirements**: Element is heavily focused on all regulatory obligations legislated by local, state and federal environmental enforcement agencies as well as other requirements that subscribe to industry codes of practice and agreements with public authorities.
4. **Objectives, targets and programs**: Element requires that once the agency's aspects have been deemed significant, to consider setting objectives and targets that are measurable and in concert with the Environmental Policy, applicable legal requirements and in concert with the principal of continual improvement.
5. **Resources, roles, responsibility and authority**: Element requires organization to define, document and communicate roles, responsibility and authorities to implement the EMS. Roles refer to appointing specific management representative(s) who have responsibility for ensuring the ongoing implementation of the EMS as well as reporting the performance of the EMS to top management.
6. **Competence, training and awareness**: Element requires the organizations identification of training needs and requires that all personnel who work for, or on behalf of the organization, who may impact the environment, in regards to their environmental duties and activities, receive specific and appropriate training.
7. **Communication**: Element requires organization to insure that procedures be established and maintained that assure good internal communication between the various levels and functions of the organization as well as receiving, documenting and responding to relevant communications from external interested parties.
8. **Documentation**: Element requires the agency to establish and maintain information in paper or electronic format to describe the management system.
9. **Control of documents**: Organization is required to establish and maintain procedures for controlling all documents and assure that documents can be located, periodically reviewed, revised and approved by authorized personnel.
10. **Operational control**: Element requires the establishment and maintenance of documented procedures to cover operations where the absence of procedures could lead to deviations from the environmental policy and the objectives and targets.
11. **Emergency preparedness and response:** Element requires the establishment and maintenance of procedures to identify potential for and response to accidents and emergency situations and periodically test the procedures where practicable.
12. **Monitoring and measurement:** The organization establishes and maintains documented procedures to monitor and measure the key characteristics of its operations and activities that have a significant impact on the environment. The organization commits to monitor the calibration and maintenance of its equipment and ensures that procedures are in place that requires periodic evaluation of compliance with environmental legislation.
13. **Evaluation of compliance:** Consistent with its commitment to compliance, the organization shall establish, implement and maintain a procedure for periodically evaluating compliance with all legal requirements.

14. **Nonconformity, corrective action and preventive action:** The organization establishes and maintains procedures for defining responsibility and authority for handling and investigating nonconformance and taking action to mitigate any impacts caused. Additionally, the element requires a further review to identify preventive actions to eliminate nonconformances.
15. **Control of records:** The organization is required to develop procedures that will establish and maintain the identification, maintenance and disposition of environmental records, training records, and the results of audits and reviews.
16. **Internal audit:** The internal EMS audit evaluates the adequacy of documents, procedures, programs, and records and reviews the implementation, integration, and consistency of procedures and programs. It looks at the organization's planned activities for meeting its objectives and targets, its control of significant aspects, and pollution prevention accomplishments. Internal audit looks for evidence of management's commitment to the environmental policy and the EMS, and awareness and competency among employees. Finally the audit has a look at how the organization is fulfilling its commitment to continual improvement. Results of internal audits are ***part of,*** not a substitute for the management review process.
17. **Management review:** The EMS core team ensures that the management review addresses the possible need for changes to policies, objectives and other element of the EMS, in light of EMS audit results, changing circumstances and the commitment to continual improvement. Senior management must be informed on the progress of objectives and targets as well as results of internal EMS audits. Senior management will then review the recommendations from the EMS Team for suitability, adequacy and effectiveness. The frequency of Management Review is recommended quarterly during the first two years of the EMS implementation to keep Senior Management informed and engaged with the process of setting and tracking progress on the Objectives, Targets and Programs and monitoring the results of Audits.

Four Phases of EMS

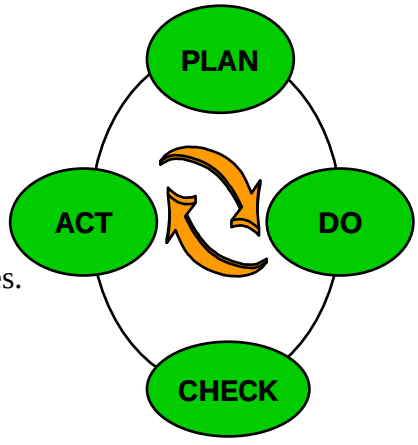
A four-phased implementation process (four workshop series) was utilized and ultimately provided a successful model for manageable implementation of the EMS elements/requirements. Most EMSs are built on the "Plan, Do, Check, Act" model. This model leads to continual improvement based upon:

PLAN
Planning, including identifying environmental aspects and establishing goals

DO
Implementing, including training and operational controls framework

CHECK
Checking, including monitoring and corrective action

ACT
Reviewing, including progress reviews and acting to make needed changes.



Benefits of EMS

EMS can result in both business and environmental benefits. For example, an EMS may help you:

- Improve environmental performance;
- Enhance compliance;
- Prevent pollution and conserve resources;
- Reduce/mitigate risks;
- Increase efficiency;
- Reduce costs;
- Enhance employee morale and possibly enhance recruitment of new employees;
- Enhance image with public, regulators, lenders, investors; and
- Achieve/improve employee awareness of environmental issues and responsibilities.

Appendix "A" contains 8 participant transit agency case studies. The case studies delineate in detail the individual accrued benefits documented by the participant transit agencies.

Keys to Successful Implementation

EMS Core Team: FTA required each team to be organized around a minimum of 4 persons. A number of agencies created core teams made of six to eight individuals. Having sufficient manpower to learn the ISO elements, practice them on transit specific case studies and then to return home to implement after each workshop was critical to the success of the EMS.

Virginia Tech identified a skill set for an **ideal EMS team** and guided the FTA teams to create their teams based on:

- ✓ **Top Management Representative:** This person should be top management's representative and have the authority and responsibility to ensure that the EMS is fully implemented through the Virginia Tech program. This team member would travel to and participate in all four of the Virginia Tech workshops with the three individuals recommended below.

- ✓ **Environmental Champion***:* This person should be:
  - An excellent communicator;
  - A respected leader;
  - Technically competent regarding EMS;
  - Experienced at delegation;
  - Experienced at implementing change;
  - Knowledgeable at conducting systems audits; and
  - Capable of transferring information learned and developed at the workshops back to the facility/department.

- ✓ **Operations Manager, Superintendent or Supervisor**: This person should have the following characteristics:
  - Possess strong communication skills;
  - Effective at delegation;
  - Strong knowledge of all facility/department operations;
  - Respected by the organization;
  - Exhibit leadership characteristics; and
  - Possess the management authority to implement changes as necessary.

- ✓ **Administrative Person**: This person should have the following characteristics:
  - Excellent computer skills;
  - Aptitude to learn software;
  - Be organized and project oriented;
  - Be diligent;
  - Portray effective communication skills;
  - Aptitude for conducting audits; and
  - Have an environmental interest.

Senior Management Support: The interest and support of senior management proved critical to the success of EMS implementation. FTA required a formal commitment by senior management to conduct a quarterly management review of the team's homework prior to returning to workshops 2-4.

More importantly, FTA required the transit agency senior management representatives to participate in an FTA conference call one week prior to workshops 2-4. Two categories of critical questions were asked:

1. Are you satisfied with the quality of instruction provided by Virginia Tech? Do you have any concerns or requests for change in the format of the program?
2. Is your team completing their assigned homework? Are you discussing barriers to EMS implementation and are you coaching them how to overcome barriers or if necessary, intervening on their behalf?

Objectives and Targets: FTA urged teams to select measurable objectives and to chart their progress based on valid baseline data. Relevant Objectives and Targets are critical to long term success of the EMS. Senior Management discussed and approved this element at an early stage, and they tracked the progress of the steps necessary to achieve the objectives through quarterly management review sessions.

EMS Audits: Along with the above, auditing the progress of the EMS was absolutely necessary in insuring ongoing progress of the EMS. The results of the audit drive the continual improvement effort that is the centerpiece of EMS.

Management Review: Regular participation by Senior Management in the development and progress of the EMS is extremely important to its success. FTA required this effort as a condition of participation. FTA believes that senior management participation in management review was a crucial factor in the success of the participating agencies.

Appendix “A”

Case Studies

City of Asheville - Asheville Transit Operations
EMS Case Study 2010

Profile

The City of Asheville, located in Buncombe County, North Carolina, is the largest municipality within the only metropolitan area in Western North Carolina (Asheville's population is about 70,000 and Buncombe County about 230,000). As the central municipality the City of Asheville plays a leadership role in the direction of Western North Carolina. This region is known for having the highest mountains on the east coast (6000 ft), a beautiful leaf season and numerous waterfalls.

Asheville, NC, has received national prominence for the location of the Biltmore Estate; the largest single family home ever built in the United States. The Grove Park Inn is a classic hotel. Asheville is the closest large city to the nation's most visited National Park, Smokey Mountain National Park.
In 1889 Asheville was the second city in the United States to start using the new electric trolleys and maintained the second most extensive electric trolley in the state of NC up until the 1920's with about five million riders a year.

This historic electric trolley system was changed to buses in the 1940's like many systems across the United States. The City of Asheville took over responsibility for the transit service from an authority in 1999. Today the Asheville Transit operates 22 routes with 21 buses to areas within the city limits except for one Intercity route which serves the neighboring town of Black Mountain. All routes leave from the Transit Center. Asheville Transit serves about 1.5 million

riders a year (5000 per day). These services are operated out of one maintenance facility by the following staff; three city staff planners, 41 drivers, 7 dispatchers, and 9 maintenance personnel.

Ridership on Asheville Transit has grown an average in excess of 10% each year since 2003 while population has seen only a 1.25% growth. The systems transportation infrastructure has not kept pace the needs. In October 2009, the City Council approved the city's first ever transit master plan. This plan will provide guidance for the next ten years of system growth and infrastructure development.

Asheville Transit is managed as part of the City of Asheville Transportation Department. Asheville Transit is advised by the Transit Commission, a board of seven citizens appointed by City Council. In addition, one City Council person is appointed to work with this commission to advise City Council and staff on transit matters.

More information on Asheville Transit and the City of Asheville is available at www.ashevilletransit.com

Fence-line

The City of Asheville Transit Division has chosen a fence-line that includes our operations center. This center includes three primary physical areas: The maintenance facility that houses the maintenance garage; operations staff administrative offices; the bus parking garage, wash rack and bus yard; the Transit Center which includes the ticket office, bus slips/driveway, and inside/outside passenger waiting area; and our twenty one vehicles, shelters and approximately 1000 bus stops.

Core Team

The Asheville Transit EMS Team is comprised by five full-time members. The EMS Management Representative of the Team is the Transportation Manager for the city. The Core team includes the following members;

- Ken Putnam, City of Asheville Director of Transportation
- Mariate Echeverry, City of Asheville Transportation Planning Manager
- Yuri Koslen, City of Asheville Transit Projects Coordinator
- Edna Johnson, Transit Management of Asheville, Inc. General Manager
- Ronnie Payne, Transit Management of Asheville, Inc. Director of Maintenance
- Eugenia Singleton, Transit Management of Asheville, Inc. , Driver Supervisor

The EMS team has included other staff members to be able to accomplish the tasks. The Transportation Department Office Manager, Janet George Murr continues to provide critical logistic support; specifically meeting note taking, scheduling management, and travel arrangements for the team among other details.

The City of Asheville's contract operations staff, Transit Management of Asheville, have been included in the EMS development; this includes Transit Operations, Dispatchers and Mechanics. The front line staff is not only responsible for enacting the operational changes that will determine the success of the EMS, but they have helped the EMS team identifying Aspects for the EMS Team to consider as part of the project.

Working with the Senior Management, Jeff Richardson, Assistant City Manager, has been invaluable. Senior management has been a key supporting and advising the team.

In addition, other staff members have been available to provide advice and help in the development of the EMS system, specifically:

- Martha McGlohon, Legal Department
- Maggie Ullman, Energy Coordinator
- Lauren Bradley, Administration Department Director

The City of Asheville's Energy Coordinator, Maggie Ullman is becoming increasingly instrumental in the development of the significant aspects action plans.
This collaborative effort from all levels within the organization not only provides valuable information for the EMS Teams deliberation, it creates a sense of ownership and participation that will facilitate the implementation of the ISO 14001 program.

Key Drivers for Adopting an EMS
Asheville Transit recognizes that a healthy and sustainable environment is important to our economy, our future, and the citizens of the Western North Carolina region. The City of Asheville has taken a leadership role in passing sustainability initiatives with the April 2007 Council Resolution to build LEED certified buildings and Resolution establishing GHG reduction goal.

Leadership by our city's elected officials provided staff with the direction to look for opportunities to improve our environmental stewardship and sustainability initiatives within our operations. Seeking the adoption of an EMS was a natural fit. With Asheville Transit in its 10-year anniversary as a City of Asheville run operation, we are still early in our evolution as a transit operator. The EMS allows us to:

- Formalize our business practices
- Provide clear direction, create institutional stability, and seek continual improvement.

Significant Aspects & Impacts
Within the fence line, the core team initiated an extensive, internal communication effort designed to inform personnel about the EMS program and solicit input and help in identifying potential environmental aspects and their associated impacts. The EMS team through the leadership of the General Manager encouraged drivers and mechanics to identify areas that needed improvement or potential environmental aspects and their associated impacts, and then the EMS Team used this input to build its Aspect Matrix.

Using this input, the EMS team then developed a list of activities, products, and services within the fence line and rated each of 22 aspects based on the following criteria,

- Scale, Severity and Duration of Impact;
- Probability of Occurrence;
- Potential Legal and Regulatory Exposure;
- Ease of Impact Avoidance;
- Effect on Public Image;
- Effect on Sustainability;
- Concerns of Interested parties; and
- Cost of changing the Impact.

Each aspect was given a score between one and five. The scores were then averaged and the aspects with the highest scores became the focus of the EMS.

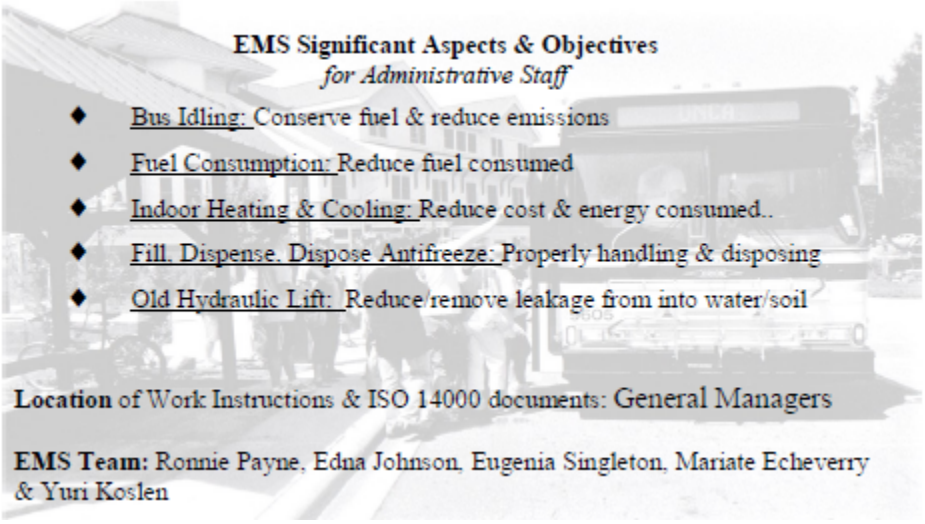
Significant EMS aspects, meaning those of the highest priority for meeting the Agency's commitment to the environment, were then identified primarily by the collective rating of each aspect. The significant aspects are:

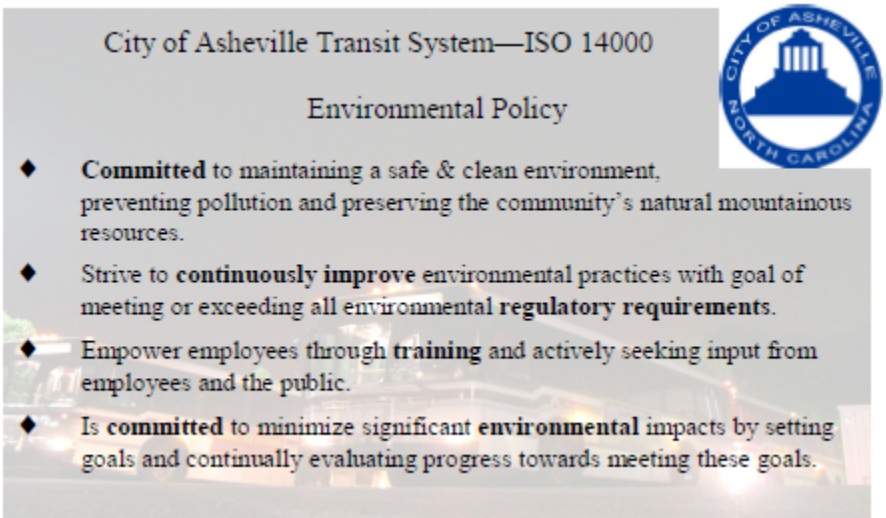
1. Bus Idling
2. Anti-Freeze, fill, dispense & dispose
3. Old Hydraulic Lift
4. Fuel consumption
5. Indoor heating and Cooling
6. Bus Exhaust
7. Aerosol Solvent Cans

8. Fluorescent light bulbs
9. Water and Electrical Consumption

The EMS Team chose the top five aspects listed above to focus on initially. The team intends to review the Agency operations at least annually to determine if additional EMS aspects should be considered.

The primary tool used for the internal communication program was to hold meetings between the EMS Team and transit drivers and mechanics as well as trainings held by the leadership with Transit Management of Asheville. In addition, we have created EMS wallet cards for all staff working within the EMS fence-line to carry while at work. These wallet cards are specifically designed for each employee's area of responsibility, listing the EMS policy, EMS Significant Aspects & Objectives, Location of Work Instructions & ISO 14000 documents, and the EMS Team.





Objectives & Targets 2010-2011

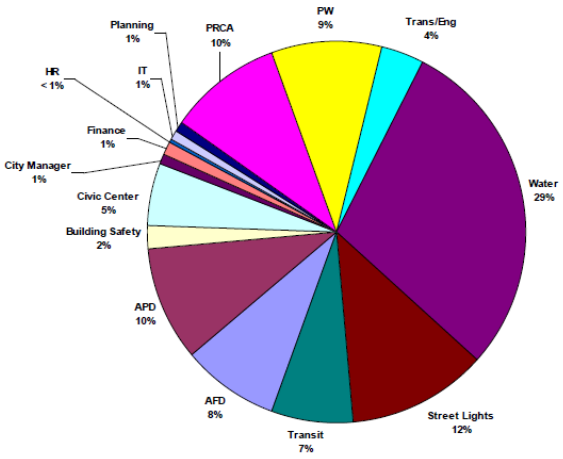
Objective	Target	Performance Indicator	Projected Complete Date
Implement project commitments made in environmental documents, permits, and other executed agreements by ensuring a system exists to manage, monitor and track compliance throughout the project lifecycle in order to minimize environmental impacts, prevent pollution, and protect and enhance the environment.	1) Conduct final review of all EMS documents and incorporate into day to day operations. 2) Prepare for gap analysis. 3) Prepare for audit.		1) February 2010 2) March 2010 3) July 2010
To minimize environment impact associated with emission	Reduce bus idling time by 5 to 10% by March 2011.	Research best practices and establish policy, develop WI, employee trainings and track idling time.	Mar-11
To manage the proper procedure for handling antifreeze by all shop personnel.	Mechanic education training documented for current and new employees.	Number of employees Trained, update procedures	Continual
Reduce and remove leakage of hydraulic fluid from lift in order to prevent soil and water contamination.	Determine if the removal of lift and or tank is the best corrective action by June 2011.	Lift inspection	Jun-11
Reduce the amount of fuel consumed	3-5% reduction in fuel consumption over first year of implementation with intent of continuing reducing	Research best practices and establish policy, develop WI, employee trainings and annual fuel tracking analysis	Jan-11
Reduce energy consumption at the Transit Center and the Transit Operations Facility by creating procedures for maintaining heating and cooling equipment and the building envelop, setting temperature standards, looking into the feasibility using of solar energy or other more efficient energy systems..	Reduction in utility bills and energy consumption by 2% every year to meet City Council Resolution No. 07-09	Research best practices and establish policy, Establish maintenance policy of all units, conduct energy audit, Tracking utility bill costs and energy used.	Yearly goal of 2% energy reduction

Benefits and Results of Adopting an EMS

The City of Asheville Transit EMS Team recognizes benefits of developing an EMS. Some benefits seen include:

- Establishing an EMS Team that allows key staff to address environmental questions from multiple perspectives.
- Receiving support from the City Manager's Office in the adoption of the Transit Services Division Environmental Policy.
- Putting crucial institutional knowledge into written form and establishing document control.
- Providing a strong foundation to support the Agency in choosing sustainable and environmentally responsible practices.
- Reduce Carbon Emissions in line with City Council Resolution establishing GHG reduction goal.
- Increased City employee awareness of environmental issues.
- Increased management awareness.
- Strong Employee involvement with EMS implementation.
- Proactive management systems.
- Documentation of standard operating procedures.
- Training matrix for maintenance and operations.
- Database for tracking employee training.
- Increased employee initiative.
- Increased accountability throughout organization.
- Built-in controls.

Total Municipal Carbon Footprint by Department



The most important benefit of the EMS is that the Environmental Policy has institutionalized the proactive process of continual improvement for the prevention of environmental degradation.

Resources

Asheville Transit estimates it has devoted the following staff time to undergo the training (including travel cost/time) and develop the EMS from the period between January 2009 and March 2010 as follows:

- ✓ EMS Steering Committee: 760.25 hours
- ✓ Subcommittees and other personnel: 109 hours
- ✓ Estimated labor cost: $21,756.25
- ✓ Estimated travel, food and lodgings cost $18,825

Most of the effort was expended on development of EMS procedures, work instructions, researching policies, and document management. Additional time has also been expended with

EMS training and communicating the status of the EMS. Most recently the EMS Team has worked to fill the gaps of our EMS identified in the GAP Audit held in mid-March 2010.

Cost Savings or Avoidance

As the Asheville Transit EMS is in its early stages of development and implementation, the Agency has not yet been able to quantify cost savings from the EMS. Nonetheless, Asheville Transit values the benefits and efficiencies resulting from the EMS these include;

- Improved lines of communication among management and operations staff,
- Development of written procedures for implementing environmental obligations,
- Capture of institutional knowledge related to addressing transit system environmental impacts and
- Promotion of proactive responses in evaluating and addressing environmental issues.

It is our intent to track project schedules closely to identify opportunities for savings and cost efficiencies resulting from the implementation of the EMS.

Next Steps

Asheville Transit is preparing for the EMS Audit in August 2010. After this audit, Asheville Transit will work to correct the nonconformances in our EMS. Asheville Transit will continue to meet all requirements and time frames identified within the EMS including; legal, action plans, monitoring, management review, communications, emergency management, documentation and internal auditing. Finally, the City of Asheville Transit Operations will seek to obtain ISO 14001 EMS certification in FY 2012. All of this will occur through continued meetings of the EMS Team.

Management Commitment

As the provider of transit services for the City of Asheville, Asheville Transit is committed to balancing Asheville City Council goals of fiscal responsibility and sustainability. To that end, the Director of Transportation and the City Manager's office adopted an environmental policy that not only identifies our commitment to be an environmental leader, but also requires the development and implementation of the EMS. A copy of the policy follows and is posted on the Agency's website and has been distributed to staff. In addition, the EMS program has benefited greatly from the strong and unwavering support of senior management, including the City Manager, Assistant City Manager, and the department's director. The Assistant City Manager has been actively involved in the Management Review process of the City of Asheville's Transit Operation's EMS program and his enthusiasm and effective executive support for this program is clear.

Since Asheville Transit was awarded the FTA EMS grant for EMS training, our staff has worked continuously to transform Asheville Transit into a more sustainable operation. Our transit operation has grown in a very short time from having no environmental policy to the development of:

- dedicated EMS Team
- Environmental Policy
- Procedures that infuses this commitment into all aspects of transit operations,

- list of transit specific projects that will further demonstrate the city's commitment to safety, fiscal responsibility, green energy and sustainability.

Although our agency has an excellent environmental record, Asheville Transit had been looking for ways to be proactive and take our environmental program to the next level. The FTA's training provided the support our staff needed. The EMS provides us with a ready-made and internationally recognized program that can be tailored to our needs.

Our approach to EMS implementation was to apply it to our transit operations, including the Transit Garage, Center, and transit stops throughout the city. Our EMS Team has involved all levels of employee's throughout the organization in the development of the EMS. This approach has been a key factor in allowing us to see the value in developing the EMS. The program has the unwavering support from senior management, including the City Manager and the department directors. We are absolutely committed to its successful implementation.

Asheville Transit is committed to providing excellent transit service. We know that developing, implementing, communicating and continuously improving our sustainability aspects is critical to engaging our future riders and preserves our community's natural mountainous resources.

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Environmental Management System (EMS)
Environmental Policy

The City of Asheville, Department of Transportation, Transit Services Division:

- Is strongly committed to maintaining a safe and clean environment, preventing pollution and preserving the community's natural mountainous resources.
- Strives to continuously improve environmental practices with the goal of meeting or exceeding all environmental regulatory requirements.
- Empowers each employee through ongoing training and will actively seek employee and public input in promoting environmental stewardship.
- Is committed to minimizing significant environmental impacts by setting environmental objectives and continually evaluating progress toward meeting those objectives.

This policy is documented and communicated to employees and the community and is available for review.

Mariate Echeverry
Transportation Planning Manager
Transportation Department

Ken J. Putnam, PE
Director
Transportation Department

Edna Johnson
General Manager
First Transit Management
Asheville Transit System

Jeffrey B. Richardson
Assistant City Manager
City of Asheville

City of Asheville Transit Operations Audit Report

This Environmental Management System (EMS) Audit was based on a request by the Federal Transit Administration (FTA) as a final follow-up to an eighteen month program for EMS development and was conducted in accordance with the approved schedule.

W. Robert Herbert, Principle Contractor and ISO 14001 certified Lead Auditor with Virginia Tech, conducted the EMS Audit for the City of Asheville Transit Operations on August 25 and 26, 2010, to report on its conformance with the requirements of the ISO 14001:2004 standard.

The EMS was evaluated against each of the requirements set out in the ISO 14001:2004 standard titled "Environmental management system – General guidelines on principals, systems and support techniques." The Audit included the examination of documents, interviews of personnel and observations of activities and conditions.

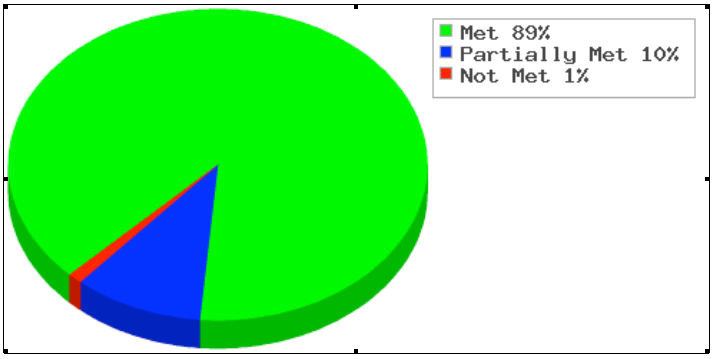
The site visit involved a review of the core EMS documents with the EMS team. The Asheville EMS Team participated in the review and discussion regarding the scoring.

Detailed scoring on next page

City of Asheville Transit Operations - Overall EMS Performance Results

This section compares the percentage of requirements *met, partially met and not met* with respect to meeting the requirements of an EMS as specified in the ISO 14001:2004 standard. The following scores are the result of the EMS audit presented in this report:

Percent meeting all requirements **"Overall Score"**	**94%**
Percent of requirements **"Met"**	**89%**
Percent of requirements **"Partially Met"**	**10%**
Percent of requirements **"Not Met"**	**1%**



	The ISO 14001:2004 standard elements of an EMS	Overall Score (%)	Met (%)	Partially Met (%)	Not Met (%)
4.1	General Requirements	100	100	0	0
4.2	Environmental Policy Requirements	100	100	0	0
4.3.1	Environmental Aspects Requirements	100	100	0	0
4.3.2	Legal and Other Requirements	100	100	0	0
4.3.3	Objectives, Targets and Programs Requirements	91	82	18	0
4.4.1	Resources, Roles, Responsibility and Authority	100	100	0	0
4.4.2	Competence, Training and Awareness	71	57	29	14
4.4.3	Communication	100	100	0	0
4.4.4	EMS Documentation	100	100	0	0
4.4.5	Control of Documents	100	100	0	0
4.4.6	Operational Control	100	100	0	0
4.4.7	Emergency Preparedness and Response	88	75	25	0
4.5.1	Monitoring and Measurement	50	0	100	0
4.5.2	Evaluation of Compliance	100	100	0	0
4.5.3	Nonconformity, Corrective Action and Preventive Action	94	88	13	0
4.5.4	Control of Records	100	100	0	0
4.5.5	Internal Audits	100	100	0	0
4.6	Management Review	100	100	0	0

Central Florida Regional Transportation Authority

d.b.a. LYNX

ISO 14001

EMS Case Study

June 2010

LYNX

Profile

The Central Florida Regional Transportation Authority d.b.a. LYNX is the public transportation provider for Orange, Seminole and Osceola counties. The agency started in 1931 as the Orlando Transit Company and eventually became LYNX in 1992.

LYNX won national recognition in 1996 and 1998 as the Outstanding Public Transportation System in the United States. The agency currently operates out of three locations; The LYNX South Street Operations Center opened in July 1974; LYNX Central Station opened in November 2004 as a futuristic Downtown Inter-modal Transportation Center and the LYNX Operations Center opened in August 2007 serving as the center hub for LYNX Operation and Maintenance.

LYNX service area stretches over 2,500 square miles, making it one of the largest in the nation operating 790 miles of fixed routes. That does not include the morning and afternoon Express Service it runs for commuters from nearby Lake and Volusia counties.

LYNX has broken ridership records 24 times in the last 25 years.

In August of 2007, LYNX celebrated the 10th anniversary of LYMMO, the first fully-functional Bus Rapid Transit (BRT) system in the United States.

LYNX FAST FACTS

Service area: Orange, Osceola and Seminole counties	
Population of service area:	1.83 million
Size of service area:	2,500 square miles
Operating budget:	$113,807,706
Operating expense per passenger mile:	$0.47

Fleet Fast Facts

Number of buses:	267
Number of fixed-route links:	65
Number of bus stops in system:	4,347
Average miles fleet travels per day:	51,886
Average miles per bus per year:	68,000
Diesel fuel used in average year:	4 million gallons
Miles per gallon per bus:	3.9 mph

Ridership Fast Facts

Weekday average passenger count:	83,538
Breakdown of ridership:	51 % female; 49 % male
Percentage of riders using bus to get to work:	73
Percentage of riders with no other form of transportation:	40
Percentage of riders who use the bus more than five times a week:	68

Para transit Fast Facts

Passenger trips scheduled per day:	2100
Vehicles in use:	126
Operators driving vehicles:	241

Van Pool Fast Facts

Number of vanpools:	65
Number of passengers annually:	200,563
Miles vanpools travel annually:	975,645

Fence Line

LYNX chose the LYNX Operations Center. The LOC is located at 2500 Lynx Lane, Orlando, Fl. 32804 and serves as LYNX largest operating and maintenance facility covering 24.1 acres. The LOC is one of two operating in the Orlando area. LYNX operates approximately 267 buses, 199 of which operate out of the LOC division, seen below. There are 716 employees at the LOC, 460 are bus operators, and 165 are Mechanics and Facilities Techs, 23 Maintenance administrative employees. The operation and maintenance staff are, for the most part, represented by the Amalgamated Transit Union AFL-CIO Local 1596.

Figure 1: Photograph of LYNX Operation Center Facility

Core Team

The core team is made up of four members representing various functions within LYNX.

- Lisa Darnall, Chief Operating Officer (Senior Management Representative)
- Bill Zielonka, Director of Safety, Security and Risk Management (Environmental Champion)
- Steve Robinson, Manager of Facility Maintenance (Operation's Management)
- Janell Thomas, Administrative Specialist for Safety, Security and Risk Management

LYNX chose a diverse team in anticipation of expanding the EMS into other areas of the organization and because these representatives bring to the table a unique set of skills and knowledge that would benefit the implementation of the EMS.

Key Drivers

LYNX, like most organizations, is goal oriented and is committed to maintaining and/or improving our four service standards; Safety, Courtesy, Efficiency and Cleanliness. LYNX efforts surrounding the continual improvement concept are a result of its internal structure and training the workforce on the LYNX philosophy. In addition to the philosophical reason for adopting ISO 14001 standards, LYNX chose to embark on its quality improvement program by implementing an EMS in an effort to be proactive in the organization's environmental compliance obligations.

LYNX recognized the processes outlined in the ISO 14001 standard would provide an improved framework for identifying and correcting areas of potential concern before they became problems. LYNX also saw that the EMS structure would improve its ability to train and communicate the goals and expectations to all employees. As a result of this effort, LYNX identified several key drivers for adopting an EMS which included the following:

- Shift management approach from "reactive" to "proactive"
- Development of better day-to-day management systems
- Creation of a more efficient operational system
- Avoidance of environmental disasters
- Enhanced awareness of employee impact on environment

Significant Aspects and Impacts

The establishment of the key drivers guided the core team's identification and evaluation of significant aspects and impacts. The core team analyzed the organization's activities and evaluated the potential for adverse environmental impacts, the extent of those potential impacts, environmental controls already in place and the ability of LYNX to manage and/or influence those impacts.

The core team initiated an extensive, internal outreach program designed to inform personnel about the EMS program and solicit input and help in identifying potential environmental aspects and their associated impacts. The outreach program included shift meetings, postings and presentations to LYNX management and staff both within and outside the EMS fence line were included in this effort.

Members of the core team then rated each aspect based on ISO 14001 and EMS's established criteria. Each aspect was given a score between one and five. The scores were then averaged and the aspects with the highest scores became the focus of the EMS. The team came up with a list of 51 aspects and rated 10 of them as significant aspects. The list of aspects, with the ten highest scores and rated as significant aspects are identified and listed below:

- Storm Water Run-off (A)
- Diesel Fuel, Loading and Unloading (A)
- Emissions Reduction (A)
- Fluorescent Bulb Disposal (A)
- Oil Water Separator Sludge
- High Intensity Bulb Discharge
- Parts Washer Maintenance Program
- Electricity usage
- Petroleum spills
- Recycling of Office Waste Paper

Objectives and Targets

The team, through the rating process, identified four significant aspects to be covered in the initial EMS focus. The team then established a series of objectives and targets for those four aspects. The following table outlines the objectives, targets and goals for those identified.

Summary					
Aspect	**Objective**	**Target**	**Performance Indicator**	**Projected Complete Date**	**Progress Status Corrective Action**
1. Diesel Fuel Loading & Unloading Tankers	To ensure there are no spills with the fuels, that is utilized at LYNX. Loading & unloading plan and to ensure the trainers, operators, blenders and Shipping / receiving personal are trained.	Have revised SPCC Plan in place and adopted by November 2009. Start training employees in December 2009 Complete all training by February 2010	To train all of our employees in preventing and the containment of spills.	January 2010 May 2010 February 2010	Plan development is in the final stages and to be reviewed and adopted in November. Once adopted, a training program will be put into place for all employees involved.
2. Carbon Emissions	1. To develop a plan to evaluate how long we can shut down the fleet to cut carbon emissions down and save fuel. 2. Completion of the biodiesel blending station and converting 100% of LYNX fleet to B20.	Reduction of carbon emission by 15% through the combined efforts of each program. W.V.U. report to be released in 7/2010	Establishing carbon emission baseline, utilizing the West Virginia University	May 2010	15% reduction in the amount of carbon emissions from the fleet of 267 Buses. 2009/ 2010 by implementing the engine shutdown procedure and converting 100% of the bus fleet to B20 biodiesel.
3. Stormwater runoff	To prevent Stormwater from picking up debris, chemicals, dirt, and other pollutants that flow into a Stormwater sewer system or directly into lakes or streams.	To monitor all systems for leaks daily and to test the water every six months to a year depending on baseline conditions.	Maintain an action plan by establishing a baseline evaluating process and documenting.	November 2009	Water samples have been taken and LYNX now has a baseline. November 2009.
4. Fluorescent Bulbs/Tube	Identify & educate for proper disposal of Fluorescent Bulbs/Tubes	Develop implementation of the plan	Implement and maintain the disposal of fluorescent bulbs/tubes through action plan by establishing a baseline. By 1/01/2010.	October 2009 December 2009 January 2010	Improve training and education of LYNX employees on proper handling of waste (florescent bulbs) generated at the vehicle maintenance garage and upkeep of facilities.

Benefits of Adopting an EMS

The core team regards the process of establishing an EMS program as very productive. The adoption of the EMS program has improved LYNX's ability to anticipate and evaluate potential environmental events and activities that may have associated environmental impacts. With the adoption of its EMS, LYNX has realized the following benefits:

- Increased employee awareness of environmental issues and their direct impact
- Increased management awareness
- Reinforcement of environmental processes currently in place
- Employee involvement and buy-in with EMS implementation
- Proactive management systems
- Documentation of standard operating procedures
- Institutionalization of best practices and permanent improvements of on-time performance
- Training matrix for maintenance and operations
- Database for tracking employee training
- Increased employee initiative
- Increased accountability throughout organization
- Built-in controls
- Increased ability to identify exposure and smaller aspects
- Framework for sustainable growth

Resources

The resources needed to implement the EMS at LYNX are represented below:

Environmental Management Representative:	102.50	hours
Core Team:	417.00	hours
Other:	638.85	hours
Consulting:	0	hours
Total Hours	1158.35	hours
Total Internal Labor Cost	$ 35,561.35	

Estimated Cost Saving

LYNX estimated savings from its four new EMS Aspects implementation:

- Biodiesel Fuel Savings $159,597.00
- Biodiesel Parts Reduction $6,432.00
- Biodiesel Labor Reduction $1,464.00
- Reduction of Engine Idle Time $275,787.00
- Fluorescent Bulb Disposal Reduced Hazardous Waste in Landfills by 3,800 lbs./yr

Total Yearly Cost Savings: $443,280.00

Next Steps

Once the first four significant aspects are underway, LYNX will continue to build on the EMS Program to accommodate all significant aspects and continue all aspects indentified within the fence line.

The management of LYNX is highly committed to the EMS program. The support from top management has contributed greatly to LYNX's overall success with the program. This, coupled with FTA support, has produced a positive and growing experience for the core team as well as all LYNX employees. LYNX as an organization and each individual employee will be able to take pride that providing our core service is a manner that preserves the environment.

LYNX Chief Executive Officer's comments summarize our commitment to continual improvement in environmental leadership:

> "Every day, LYNX bus operators take our customers through our beautiful community. I'm proud of our employees who come to work each day, doing their part to bring a better quality of life to residents, businesses and all those who live and work in our community. This attitude reflects our agency's commitment to the environment and our desire to protect and manage the resources around us. Many of you have heard the phrase, "think globally, act locally," which means that actions to protect our rich, natural heritage begin at home. That is why LYNX is working to further develop its Environmental Management System. This is a proven, effective organizational tool that provides a framework for managing environmental responsibilities so they become more efficient and more integrated into our overall business operations. The EMS is a business management tool for any organization. LYNX' EMS helps managers identify harmful environmental impacts of our projects, services and activities and finds ways to resolve and prevent these impacts. And it allows every employee to take part in preventing problems and promoting environmental sustainability at work and even at home. As we all learn more about our EMS, we will be one step closer to being an environmental management leader in our community…The implementation of an EMS is not just a requirement--it's a good idea. It supports our credentials for providing a good transportation value for a better quality of life."

Central Florida Regional Transportation Authority (LYNX) Audit Report

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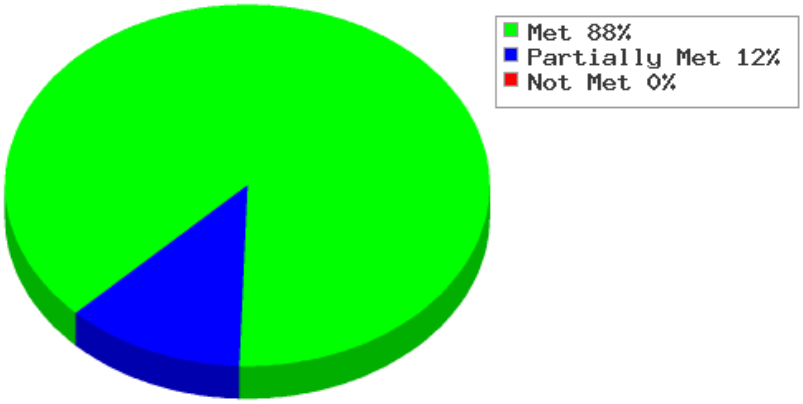
LYNX - Overall EMS Performance Results

This section compares the percentage of requirements *Met, Partially Met and Not Met* with respect to meeting the requirements of an EMS as specified in the ISO 14001:2004 standard. The following scores are the result of the EMS audit presented in this report:

Percent meeting all requirements **"Overall Score"**	**94%**
Percent of requirements **"Met"**	**88%**
Percent of requirements **"Partially Met"**	**12%**
Percent of requirements **"Not Met"**	**0%**



	The ISO 14001:2004 standard elements of an EMS	Overall Score (%)	Met (%)	Partially Met (%)	Not Met (%)
4.1	General Requirements	100	100	0	0
4.2	Environmental Policy Requirements	100	100	0	0
4.3.1	Environmental Aspects Requirements	100	100	0	0
4.3.2	Legal and Other Requirements	100	100	0	0
4.3.3	Objectives, Targets and Programs Requirements	100	100	0	0
4.4.1	Resources, Roles, Responsibility and Authority	90	80	20	0
4.4.2	Competence, Training and Awareness	57	14	86	0
4.4.3	Communication	100	100	0	0
4.4.4	EMS Documentation	100	100	0	0
4.4.5	Control of Documents	100	100	0	0
4.4.6	Operational Control	100	100	0	0
4.4.7	Emergency Preparedness and Response	100	100	0	0
4.5.1	Monitoring and Measurement	100	100	0	0
4.5.2	Evaluation of Compliance	100	100	0	0
4.5.3	Nonconformity, Corrective Action and Preventive Action	94	88	13	0
4.5.4	Control of Records	100	100	0	0
4.5.5	Internal Audits	75	50	50	0
4.6	Management Review	75	50	50	0

EMS Case Study
June 2010

Profile

Metro is a unique agency. It functions as:

- **Transit operator,**
- **Transportation planner,**
- **Transportation infrastructure builder,**
- **Overseer of all transportation funding in Los Angeles County.**

Metro's system includes (March 2010):

- **Metro Rail** – 17 miles of heavy rail, 62 miles of light rail, 14 miles of dedicated busway with about 14.5 miles of additional light rails opening in the next 3 years.
- **Metro Bus** – total of 2,635 buses (approximately 95% of which is run on compressed natural gas) plus over one dozen municipal bus companies.
- **Commuter Rail** – (as funding partner to Metrolink) 512 miles serving regional commuters.
- **HOV Lanes** – High Occupancy Vehicle lanes for carpools, vanpools and express buses.
- **Metro Access** - Dial-a-ride services for the elderly and disabled.
- **Metro FSP** - Freeway Service Patrol, a system of contracted tow trucks for servicing disabled vehicles on the freeways.
- **Call Boxes** - A countywide system of cellular call-boxes for emergency use in the freeway and highway system.
- **Bikeways** - A system of bikeways for commuter and recreational purposes in L.A. County.
- **Smart Streets** - Synchronized signals, ramp metering and communication in order to keep traffic flowing.
- **Transportation Demand Management (TDM)** - includes rideshare, flexible work hours telecommunicating & transit voucher programs.
- **Pedestrian Program** - A countywide program that allocates resources to build and sustain pedestrian access to the transit system.
- **Transportation Enhancement Program** - A countywide program that allocates resources to improve transportation infrastructure to maximize infrastructure and improve transportation connectivity.
- **Regional Integration of Intelligent Transportation Systems (ITS)** - A countywide program that allocates resources and coordinates integration of technology and communication systems to maximize travel efficiency on highways and streets.

A 14-member Board of Directors, 13 locally elected officials and 1 Ex- Officio appointed by the Governor of California oversee Metro. In 2010, Metro has about 9,300 full-time employees. The FY 2010 budget was $3.9 billion.

Formed in 1993, Metro serves a population of approximately 10 million people in all of Los Angeles County through its growing bus and rail system. Metro operates the second largest bus system in the nation and has the largest compressed natural gas (CNG) powered bus fleet in the nation. The system also includes five fixed guideways: four are rail and one dedicated busway. As of March 2010, average bus and rail weekday boardings are estimated to be 1,445,340.

In addition to bus and rail facilities, Metro also operates 425 lane miles of carpool lanes, 520 miles of bike routes, 481 miles of bike lanes, and 251 miles of bike paths. We also operate the Metro Freeway Service Patrol that has a total fleet of 152 tow trucks on patrol serving 450 miles of freeway. On average, the FSP assists 25,000 motorists per month.

Fenceline

The Red Line Yard is located at 320 S. Santa Fe Street, Los Angeles, CA 90012. The facility sits on a 39 acre site (50% impervious). It services 104 rail cars and has about 500 employees working in all of the facilities.

The Red Line Yard consists of the Division 20 main shop building and warehouse building, Maintenance of Way Buildings A & B, cleaning station, train car wash, and a traction and power compound. Division 20 is Metro's Red Line Subway Railcar Maintenance yard. Industrial activities involving the electric train maintenance and vehicle maintenance operations are conducted within the main shop and maintenance buildings, respectively (indoors). The outdoor portions of the site are used for electric train rail lines and vehicle parking.

Non-revenue vehicle operations located at the northwest corner of the Maintenance of Way Building B is not part of the fenceline. However, for practical purposes, this portion of the Red Line Yard will be evaluated for and will be maintained to comply with environmental regulations.

Core Team

The Core Team was initially made up of five members representing various business units. Since then, the Core Team has expanded to a total of twenty members. The new members come from business units that 1) were being impacted by the highest prioritized significant aspects and 2) from departments that supported the development of the EMS (i.e., Procurement, Organizational Development and Training, Communications and Marketing).

Key Drivers for Adopting an EMS

Metro is responsible for complying with environmental laws and regulations that are enforced by federal, state and local environmental agencies. They include (among others)

- Resource Conservation and Recovery Act;
- Hazardous and Solid Waste Amendments Act;
- Clean Water Act;
- Clean Air Act;
- Code of Federal Regulations, Title 49;
- Code of Federal Regulations, Title 40;
- Code of Federal Regulations, Title 29;
- California Hazardous Waste Control Laws;
- California Health and Safety Code, Division 20;
- California Code of Regulations, Title 22, Division 4.5;
- California Code of Regulations, Title 23;
- California Code of regulations, Title 8, section 5192 – Emergency Response to Hazardous Materials;
- California Health and Safety Code, Chapter 6.95, section 25500 et al – Hazardous Materials Business Plan; and
- South Coast Air Quality Management District (AQMD) rules.

Metro also complies with other key regulatory guidelines that pertain to specific key issues associated with the identified aspects. The above and other regulations including their applicability are listed in the Red Line Yard EMS Procedures under Legal and Other Requirements.

Metro is in the forefront of environmental responsibility. We pride ourselves in running the largest compressed natural gas bus fleet in the nation. We have incorporated sustainability design elements in the construction of our Division 3 Maintenance Building, our Division 9 Transportation Center and the Metro Orange Line dedicated busway. We have included "sustainability" as a criterion in our Call for Projects program. The objective would be to optimize the transportation services in a corridor to increase person and goods throughput, safety, and security while reducing energy, motorized Vehicle Miles Traveled (VMT) and greenhouse gas emissions (GHGe). **We have publicly committed to ensuring the inclusion of sustainability principles on projects to be constructed under new funding mechanisms such as Measure R and the American Recovery and Reinvestment Act.**

Measure R is a half-cent sales tax for Los Angeles County that will finance new transportation projects and programs, and accelerate many of those already in the pipeline – everything from new rail and/or bus rapid transit projects, commuter rail improvements, Metro Rail system improvements, highway projects, improved countywide and local bus operations and local city sponsored transportation improvements. The measure passed in the November 2008 election and the tax took effect in July 2009.

Measure R is expected to generate approximately $40 billion in new local sales tax revenues over the 30 year term of the measure. It is estimated that about $20 billion of construction projects, which will be mostly funded by Measure R, will require mandated environmental reviews (per California Environmental Quality Act).

Metro's bus and rail fleets facilities face unique environmental challenges related to construction, upgrades and maintenance. These challenges include procedural standardizations; hazardous materials and waste management; recycling programs; mobile and non-mobile emissions reductions; underground storage tank upgrades and repairs; soil and groundwater remediation programs; stormwater compliance and training; noise and vibration mitigation; and environmental impact assessments.

Metro's participation in the FTA EMS Training and Assistance Program reinforces our ability to implement mitigation measures and compliance to accomplish desired results.

Metro is a leader in creating opportunities for energy efficiency and pollution prevention and mitigation. Through this opportunity, we built a robust Environmental Management System (EMS) to capture and implement our environmental compliance and mitigation best practices. We are seeking ISO14001 certification. The templates we created in this pilot effort will be used in an agency-wide EMS roll-out. The EMS will provide an effective framework to proactively address environmental issues and create cost-effective operations that enhances our employee's skills while maintaining our commitment to environmental stewardship.

EMS as a principle is now used in the development of projects and studies associated with our Sustainability Program. We are incorporating EMS in our methodologies for addressing climate change issues. In this context, while we have focused on developing EMS for the Red Line Yard, the benefits we get from this effort go beyond those of the fenceline. We indicate these specific benefits and accomplishments below.

Significant Aspects and Impacts

The Core Team identified six distinct areas of Significant Aspects: Fueling, Cleaning, Rail Car Overhauls/Repairs, System Material Storage and Pesticide & Weed Control. Within these areas, a total of 80 activities were evaluated by the Core Team and Division 20 management staff. Each activity was ranked in ten categories of "Significance of Impact" on a scale of 1 to 5 (5 being the highest impact). The activity categories were:

- Scale or size of aspect
- Severity of impact
- Probability of occurrence
- Duration of impact
- Potential legal and regulatory exposure
- Ease of implementing change
- Public Image impact
- Affect on sustainability
- Relational and cultural change
- Cost of change

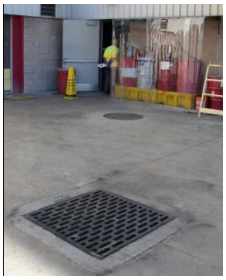
Ranking these aspects (higher ranking=higher impact) helped us to determine that the following five significant aspects will be our highest priority items at the fenceline.

Underground Storage Tank – Aspect Ranking = 70

- Diesel Fuel for Back-up generator
- Testing/Certification of UST Systems and components
- Monitoring of leak detection monitoring system
- Inspection of emergency generator

Wastewater/Stormwater Management – Aspect Ranking = 63

- Wastewater Treatment. Process and activities linked with wastewater treatment and neutralization
- Spill/Leak Prevention. Spill and leak at the acid wash and clarifiers
- Rain Water Runoff. Manhole or drainage protection from shop & yard activity wastewater



Rail Car Wash Cleaning – Aspect Ranking = 58

- Automatic acid car wash to clean stainless steel revenue cars

Batteries Management – Aspect Ranking = 54

- Replacement and disposal of waste batteries
- Establish consolidation points

Above Ground Storage Tanks – Aspect Ranking = 52

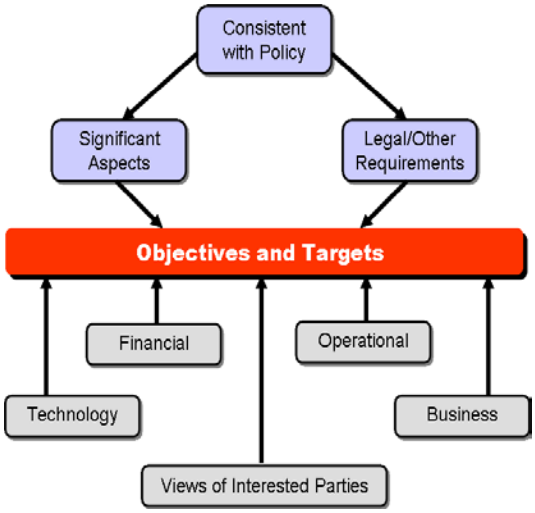
- Amber fuel for non-revenue hi-rail trucks
- Diesel fuel for maintenance shop emergency generator
- Inspection of emergency generator

Objectives and Targets

One of Metro's main strategic goals (Goal #9) is to "Sustain the environment with efficiency and reduce greenhouse gas emission." With this strategic goal in mind, an environmental policy was developed to reflect our commitment to an EMS. In summary, the environmental policy stipulates the following goals:

1. Identify potential environmental impacts generated by our development activities and develop mitigation measures to address those impacts;
2. Operate and maintain Metro vehicles and facilities to minimize negative impacts on the environment;
3. Reduce our consumption of natural resources;
4. Reduce or eliminate the use of hazardous materials;
5. Increase the amount of recycling and use of recycled products; and
6. Reduce and/or divert the amount of solid waste going to landfills.

The objective and targets were to be consistent with our Environmental Policy and to meet legal and regulatory requirements.



Additionally, the five selected significant aspect items were further evaluated by the Core Team to establish specific plans of action.

The objectives and targets took into account:

- Technology requirements
- Financial considerations
- Views of interested parties
- Operational impacts
- Business issues

The team developed these objectives and targets for the five significant aspects.

▶ Underground Storage Tank

Objective – Prevent or mitigate diesel fuel spillage

Target – Review and implement UST Monitoring System Plan. Prevent the amount of diesel fuel spillage by June 30, 2010

Action Plan

- ☐ Conduct baseline review to determine spill losses.
- ☐ Review UST Monitoring System Plan.
- ☐ Evaluate spill potential and review findings with EMS Aspects team.
- ☐ Begin awareness and operational training.
- ☐ Evaluate work instructions and prepare standard operating procedures.
- ☐ Review SPCC Plan and perform tank testing annually.
- ☐ Prepare annual progress report for Management Review.
- ☐ Perform inspection of emergency generator.

▶ Wastewater/Stormwater Management

Objective – Prevent uncontrolled release of untreated waste water, chemicals, and untreated stormwater.

Target – Prevent the uncontrolled release of untreated waste water, chemicals, and untreated stormwater by June 30, 2010

Action Plan

- ☐ Review and update SOPs, SWPPP, and other relevant documents.
- ☐ Evaluate uncontrolled release potential and exposure to employees.
- ☐ Review findings with EMS Aspects team.
- ☐ Inspect potential for uncontrolled wastewater release and exposure monthly.
- ☐ Begin awareness and operational training.
- ☐ Evaluate work instructions and prepare standard operating procedures.
- ☐ Inspect integrity of physical/operational controls monthly.
- ☐ Prepare annual progress report for Management Review.

▶ Rail Car Wash Cleaning

Objective – Prevent the uncontrolled release of carwash wastewater into the environment and exposure of facility employees

Target – Prevent the uncontrolled release of acid carwash wastewater by June 30, 2010

Action Plan

- □ Review acid carwash procedure and determine baseline amount.
- □ Evaluate uncontrolled release potential and exposure of employees.
- □ Review findings with EMS Aspects team.
- □ Inspect monthly potential for uncontrolled wastewater release and exposure.
- □ Begin awareness and operational training.
- □ Evaluate work instructions and prepare standard operating procedures.
- □ Evaluate feasibility of replacing acid car wash facility.
- □ Weekly monitoring and calibration of sensors.
- □ Prepare annual progress report for Management Review.

▶ Batteries Management

Objective – Prevent the inappropriate disposal of batteries

Target – Reduce to 0% the amount of inappropriately disposed batteries by June 30, 2010

Action Plan

- □ Establish battery generation baseline.
- □ Evaluate each battery generation stream for 100% diversion.
- □ Begin awareness and operational training.
- □ Evaluate work instructions and prepare standard operating procedures.
- □ Measure batteries generation to track progress quarterly.
- □ Prepare annual progress report for Management Review.

▶ Above Ground Storage Tank [Including the Maintenance Shop Emergency Generator AST]

Objective – Prevent the uncontrolled release and eliminate fuel spillage

Target – Review and implement SPCC Plan. Reduce the amount of amber fuel spillage through assessment of environmental release vectors and make repairs and upgrades by June 30, 2010

Action Plan

- □ Review SPCC Plan.
- □ Review baseline amber fuel delivery, storage, and fueling processes.
- □ Evaluate spill potential and review findings with EMS Aspects team.
- □ Begin awareness and operational training.
- □ Evaluate work instructions and prepare standard operating procedures.
- □ Inspect integrity of amber fuel tank and berm monthly.
- □ Review SPCC Plan and perform tank testing annually.

- □ Prepare annual progress report for Management Review.
- □ Perform inspections of emergency generator.

Benefits of Adopting an EMS

- The EMS process allowed for a better understanding of **what personnel within the Red Line Yard are doing and how processes are implemented**. We also gained an understanding of which processes and activities need to be documented and the importance of such documentation.

- Development of Standard Operating Procedures (SOP) allowed for us to systematically address the environmental issues like those associated with the proper management of waste batteries for the rail cars and all other stationary power sources. This exercise also **allowed us to develop new SOPs and update existing procedures.**

- The Emergency Response exercises conducted twice highlighted **awareness of the agency's emergency response limitations**. While documents are in place, it appears that we still have specific coordination issues that need to be resolved in order for us to be more responsive in real emergencies in the future. The corrective actions to be taken regarding coordination and procedures are not only anticipated to save time and money in case of an actual emergency, but also will improve the mitigation of the emergency.

- The EMS process exposed a need for proper document management **to better monitor the Rail Operation Division's documents and understand how each document relates** to the physical Red Line Yard procedures and other site documents.

- Setting Targets and Objectives in this process has aided us in **clearly defining our expectations**. .

- Our Senior Management meetings opened everyone's eyes to the benefits of EMS in an organization as complex as Metro. We are **better able to understand the roles and responsibilities of all stakeholders** and have re-discovered that we are indeed one Metro.

- We are able to fully **appreciate our environmental policy** especially during the development of the Red Line Yard Targets and Objectives.

- By expanding our internal Metro team, we are able to meet new personnel within our agency that we may not have had the chance to work with if not for the EMS. We are better **able to leverage the power of working together**; that nothing is impossible as long as our stakeholders are well informed of the purpose and intent of our actions.

- The EMS process has now become endemic in the development, implementation, and operations of our Sustainability Program projects. Staff has been empowered and been challenged to ask questions of how we can **improve our systems and implement small changes that, because of Metro's size, collectively would provide significant cost-savings to our agency**.

Accomplishments to Date and Cost Savings

Metro is currently developing several solutions associated with our significant aspects. As our processes in our other facilities have some similarity to our fenceline, the solutions we are developing and the projected cost savings are being considered for implementation agency-wide. The template we are developing at the Red Line Yard is of significant value in the agency-wide roll-out of EMS.

Through our environmental compliance efforts, we anticipate avoiding a minimum of $5,000 per day in cost-avoidance costs (fines and violations costs). Cost avoidance benefits are directly associated with our Above Ground and Underground Storage Tank and Wastewater/Stormwater Management Aspects.

We are in the process of completing the development of an Environmental Information Management System (EIMS) that will house all of our environmental and energy/utility information. Specifically related to our storage tank and Material Safety Data Sheet information, we will **save our agency** approximately **$50,000 per year in labor costs**. This cost is associated with monitoring and information update in the Red Line Yard and all other divisions. We anticipate this savings to grow as we build more modules into the EIMS.

The EMS has facilitated the strengthening of our existing programs that include:

- Monthly environmental inspection and reporting;
- Stormwater and wastewater programs;
- Underground and aboveground storage program;
- Battery and Universal Waste Disposal; and
- Recycling Program.

We have also developed multi-media training tools that we are now using in our Sustainability Awareness Training and Environmental Management System Awareness Training efforts. Our Sustainability Awareness Training was recognized with the 2009 National Model Program by the National Transit Institute (NTI). The recognition has given significant credibility to the EMS training modules we have developed and continue to develop, serving as a template for others in the nation to follow.

We have produced an EMS Awareness Video that emphasizes the practicability of EMS principles and their usefulness for maintaining environmental stewardship at work and at home.

We have incorporated EMS principles in our contract documents, design criteria, and our specifications.

EMS has brought indirect benefits as a result of a changing culture in our agency. We are currently completing three documents that were spurred by the awareness brought about by the development of this EMS. These include:

- *Evaluation of Strategies to Reduce Greenhouse Gas Emissions* study that looks at the whole universe of strategies for us to implement the “lowest hanging fruit” strategies that have low cost/high rate of return characteristics for reducing our carbon footprint.

- *Water Action Plan* that identifies water conservation and reduction strategies to reduce Metro’s water operations cost. This plan has direct impact to the Car Wash significant aspect and on how we will be operating our car washes in the future.

- *2010 LACMTA Sustainability Report* that includes a discussion of the aspects identified in our fenceline and the rest of Metro. The report also includes a discussion of our progress on 10 indicators as well as proposed sustainability-related goals.

We are about to embark on developing an Energy Conservation and Management Plan.

Capital and operational enhancement projects identified in these documents are anticipated to not only provide an avenue for enhanced compliance, but also potentially generate revenue and cost savings. These include those related to utility and resource conservation, recycling, and similar attributes.

Our FY10 EMS budget is approximately $655,000. As we have demonstrated, the benefits are enormous. **We estimate that the potential direct and indirect benefit and cost-savings to our agency for the implementation of EMS in our fenceline [and EMS principles across our facilities] initially amount to $2 million.** The three major components of these benefits are associated with energy and utility savings and cost avoidance. These benefits and cost-savings will be verified in the forthcoming fiscal year.

Next Steps

Our next steps are modest. We aim to:

- Increase awareness of the use of EMS and its principles to the entire Metro organization;
- Continue development and implementation of policies and procedures related to the EMS;
- Develop and maintain better recordkeeping mechanisms; and
- Establish the EMS and Sustainability projects as part of the annual Metro budget completely paid for by cost-savings generated from the implementation of these projects.

Management Commitment

- On April 16, 2009, the Metro Board approved the Environmental Policy which formalizes Metro's "*commitment to protecting the environment using sustainable principles and practices in our Planning, Construction, Operations, and Procurement Departments. This policy illustrates our leadership in maximizing our environmental efforts and its benefits for Los Angeles County through transportation."*

- Senior staff embraces the EMS program but there is lingering concern about cost because of a structural deficit the agency is facing.

- Senior Management has been actively involved in our discussions. Our regular Core Team meetings include briefings to our Deputy Chief Capital Management Officer who communicates any issues to fellow executives, including the CEO. The Chief Operations Officer has attended our Management Review meetings.

- The Deputy Chief Capital Management Officer and our Environmental Compliance and Services Department Manager report to our Ad Hoc Sustainability and Climate Change Committee regarding any efforts related to the EMS. Ad Hoc Sustainability and Climate Change Committee members consist of Metro Board Members.

- The EMS Core Team commits to a semi-annual meeting with Executive Staff to update them of EMS related issues and solutions.

"Really all MTA employees are and should be involved in this [EMS], not just because it is our duty as citizens to improve things, but also because it is our duty as employees. So we really need to work together to make a contribution to improving Los Angeles and improving the environment. That's why we have EMS. "

- Arthur T. Leahy, CEO, Los Angeles County Metropolitan Transportation Authority

Los Angeles County Metropolitan Transportation Authority Audit Report

This Environmental Management System (EMS) Audit was based on a request by the Federal Transit Administration (FTA) as a final follow-up to an eighteen month program for EMS development and was conducted in accordance with the approved schedule.

W. Robert Herbert, Principle Contractor and ISO 14001 certified Lead Auditor with Virginia Tech, conducted the EMS Audit for the Los Angeles County Metropolitan Transportation Authority on July 15 and 16, 2010, to report on its conformance with the requirements of the ISO 14001:2004 standard.

The EMS was evaluated against each of the requirements set out in the ISO 14001:2004 standard titled "Environmental management system – General guidelines on principals, systems and support techniques." The Audit included the examination of documents, interviews of personnel and observations of activities and conditions.

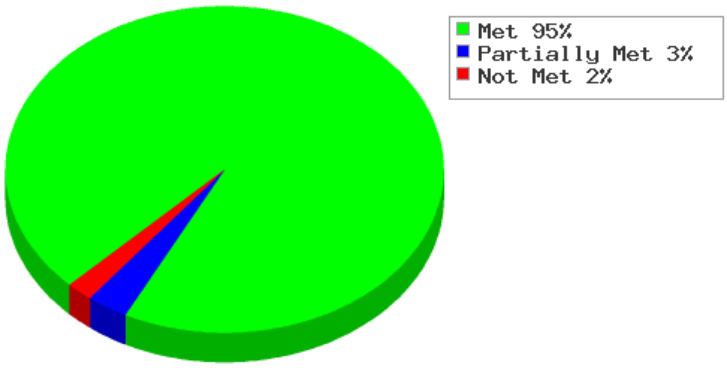
The site visit involved a review of the core EMS documents with the EMS team. The LACMTA EMS Team participated in the review and discussion regarding the scoring.

Detailed scoring on next page

LACMTA - Overall EMS Performance Results

This section compares the percentage of requirements *met, partially met and not met* with respect to meeting the requirements of an EMS as specified in the ISO 14001:2004 standard. The following scores are the result of the EMS audit presented in this report:

Percent meeting all requirements **"Overall Score"**	**96%**
Percent of requirements **"Met"**	**95%**
Percent of requirements **"Partially Met"**	**3%**
Percent of requirements **"Not Met"**	**2%**



	The ISO 14001:2004 standard elements of an EMS	Overall Score (%)	Met (%)	Partially Met (%)	Not Met (%)
4.1	General Requirements	100	100	0	0
4.2	Environmental Policy Requirements	95	90	10	0
4.3.1	Environmental Aspects Requirements	100	100	0	0
4.3.2	Legal and Other Requirements	100	100	0	0
4.3.3	Objectives, Targets and Programs Requirements	100	100	0	0
4.4.1	Resources, Roles, Responsibility and Authority	60	60	0	40
4.4.2	Competence, Training and Awareness	86	71	29	0
4.4.3	Communication	100	100	0	0
4.4.4	EMS Documentation	100	100	0	0
4.4.5	Control of Documents	100	100	0	0
4.4.6	Operational Control	100	100	0	0
4.4.7	Emergency Preparedness and Response	100	100	0	0
4.5.1	Monitoring and Measurement	100	100	0	0
4.5.2	Evaluation of Compliance	100	100	0	0
4.5.3	Nonconformity, Corrective Action and Preventive Action	100	100	0	0
4.5.4	Control of Records	100	100	0	0
4.5.5	Internal Audits	100	100	0	0
4.6	Management Review	92	83	17	0

Profile

The Maryland Transit Administration (MTA) is a mode of the Maryland Department of Transportation (MDOT), a principal agency of the State of Maryland. MTA directly operates local and commuter bus, paratransit, light rail, and heavy rail. MTA also contracts with independent operators to provide commuter bus service, commuter rail service and paratransit service. MTA's annual ridership is approximately 100 million.

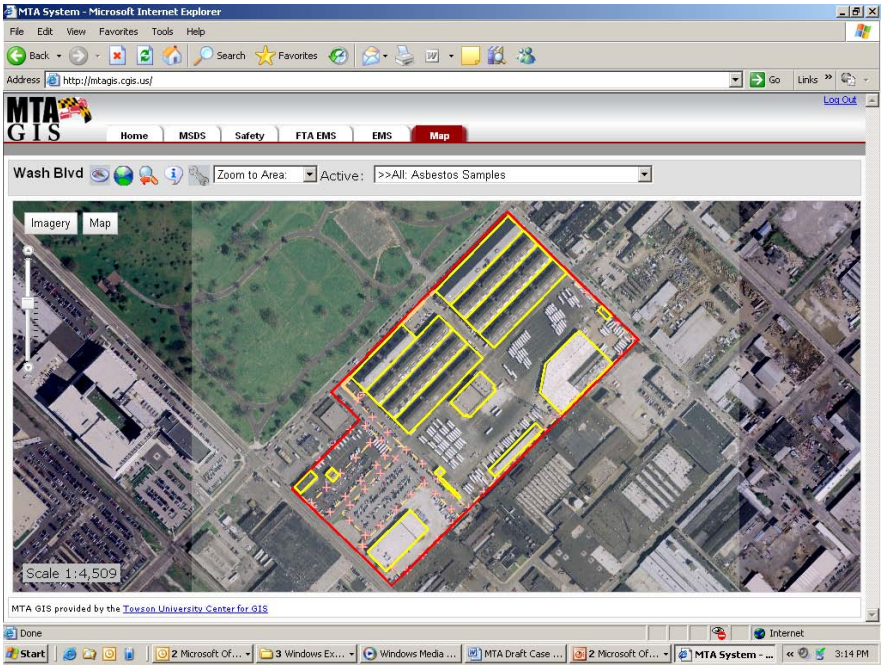
MTA operates 78 local, express, and commuter bus lines through Central and Southern Maryland. Bus service is operated on a 24-hour basis. MTA provides complementary paratransit service 24 hours a day within 3/4 of a mile of a core bus route. MTA contracts with three private companies which use a combination of MTA and privately-owned vehicles to supplement MTA's directly operated service.

MTA's heavy rail line is a grade-separated, double-tracked line that runs 14.3 miles and serves 14 stations in the northwest corridor of the Baltimore region. Metro Subway service operates Monday through Friday, 5:00 am to midnight, and 6:00 am to midnight on Saturdays, Sundays and holidays. Metro has 8-minute headway during peak service, 10-minute headway during the day, and 15- to 20-minute headways during other operating hours. The system requires 66 cars during peak service. The total fleet is 100.

MTA's Light Rail line operates as three overlapping routes covering 37 route-miles and serving 33 stations. MTA has a fleet of 53 articulated Light Rail Vehicles (LRVs) and operates up to 33 vehicles during peak hours. Light Rail service is provided 6 AM to 11 PM Monday through Friday, 7 AM to 11 PM on Saturday and 11 AM to 7 PM on Sunday. Light Rail operates at 10 to 30 minute intervals, depending on the station.

Fenceline

The Washington Boulevard Complex is located at 1515 Washington Boulevard in Baltimore, Maryland. The area surrounding the complex is general commercial/light industrial, with public parkland to the north and residential areas to the east. The complex comprises approximately 21.1 acres of land and consists of 13 buildings and associated grounds (mostly asphalt-paved area).



MTA'S Washington Boulevard Complex

Building No. 1 is used mainly for administrative offices, and Buildings Nos., 2 through 8 are used for bus maintenance activities. A print shop, revenue control operations, and facilities maintenance are also located in Building No. 8. Building No. 9 is used mainly for bus washing and fueling activities and Building No. 10 is used for storage. Shipping and receiving and their administrative office activities are located in the 1330 South Monroe Street building and the Ryder Building is used by facilities maintenance for storing their equipment and supplies. Two other smaller buildings are located on the northeast side of the complex; the buildings are used for storage. Exterior areas for the complex are mostly asphalt-paved and the areas are used for storing buses and for employee parking.

Core Team

Our EMS team consisted of the following members:

- Bernadette Bridges, Executive Director, Safety, Quality Assurance and Risk Management
- Robert Frazier, Environmental Manager
- Doy Miller, Safety Engineer
- David Varner, Director, Bus Maintenance
- Jamie Harvey, Manager, Bus Maintenance
- John Newton, Manager, Environmental Planning
- Beth Kreider, Director, Operations Support
- Ed Moore, Manager, Office of Training and Development
- Sarah Smith, Safety Training Specialist
- Tim Muir, Chief, Bus Maintenance
- Jim Hoover, Director, Operations Support
- Thomas Chisholm, Technical Support
- Claire Fox, Environmental Services Consultant

Key Drivers for Adopting an EMS

The MTA provides vital transportation services to the State of Maryland. Providing services consistent with MTA's mission requires daily processes and product handling that may impact the environment. MTA must also plan future transportation services and facilities to accommodate the growing role of transit in the region. Protecting the environment is one of the MTA's most important responsibilities in seeking to accomplish our mission.

The MTA has several drivers for developing and implementing an EMS:

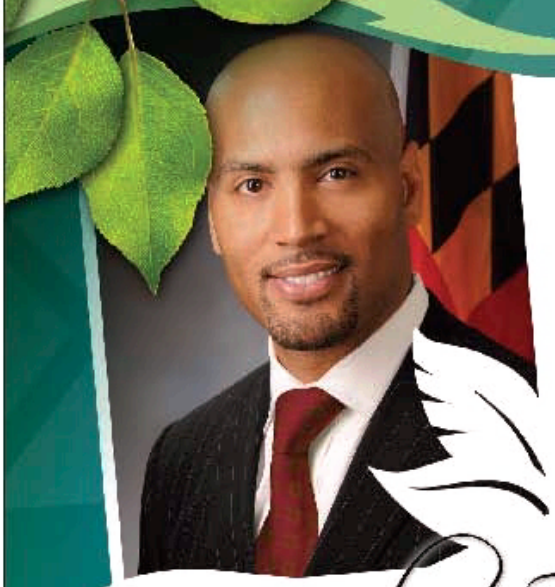
- MDOT has environmental initiatives underway and is committed to facilitating the protection of natural resources and promoting stewardship in environmental management. This commitment is in keeping with Governor O'Malley's policy of making Maryland the national leader in the area of environmental protection. The EMS project is consistent with supporting Governor O'Malley's environmental policies and initiatives.

MTA EMS Intranet page

- The EMS project is fostering our relationship with regulatory agencies as it demonstrates a commitment toward 'continuous improvement'.
- An additional driver for adopting an EMS was to sustain environmental issues as a priority and promote awareness and support for day-to-day compliance activities.
- The MTA developed an Environmental Policy.

Maryland Transit Administration

ENVIRONMENTAL Policy Statement



The Maryland Transit Administration (MTA) provides vital transportation services to the State of Maryland. In conducting our mission, we must manage daily processes and handle products that may impact the environment. In addition, the MTA must plan future transportation services and facilities that reflect the growing role of transit in the region. The protection of the environment is one of the MTA's most important responsibilities as we seek to accomplish our mission.

It is MTA's policy to conduct our mission in a manner that is protective of human health and the environment. Thus, it is incumbent on each employee to perform his or her duties in a manner that protects the environment, prevents pollution, and supports conservation of our natural and cultural resources.

MTA ADMINISTRATOR

Ralign T. Wells

THROUGH THIS POLICY MTA COMMITS TO:

- Comprehensive environmental protection and continual environmental process improvement.
- Early introduction of environmental protection and pollution prevention in the planning states of new programs, transit facilities and in all work conducted on MTA properties.
- Compliance with applicable federal, State and local environmental regulations and policies, supported by regularly scheduled internal assessments.
- Evaluation of the effectiveness of MTA's environmental management program through application and review of the Environmental Management System (EMS) to ensure that established objectives and targets are met.
- Promotion of a spirit of collaboration, cooperation and responsiveness both internally and with federal, State and local regulators.
- Establishment, implementation, and maintenance of MTA's environmental policy to support effective communications to all employees and interested parties.
- Proactive, sound environmental stewardship.

www.mta.maryland.gov

Martin O'Malley, Governor | Anthony G. Brown, Lt. Governor

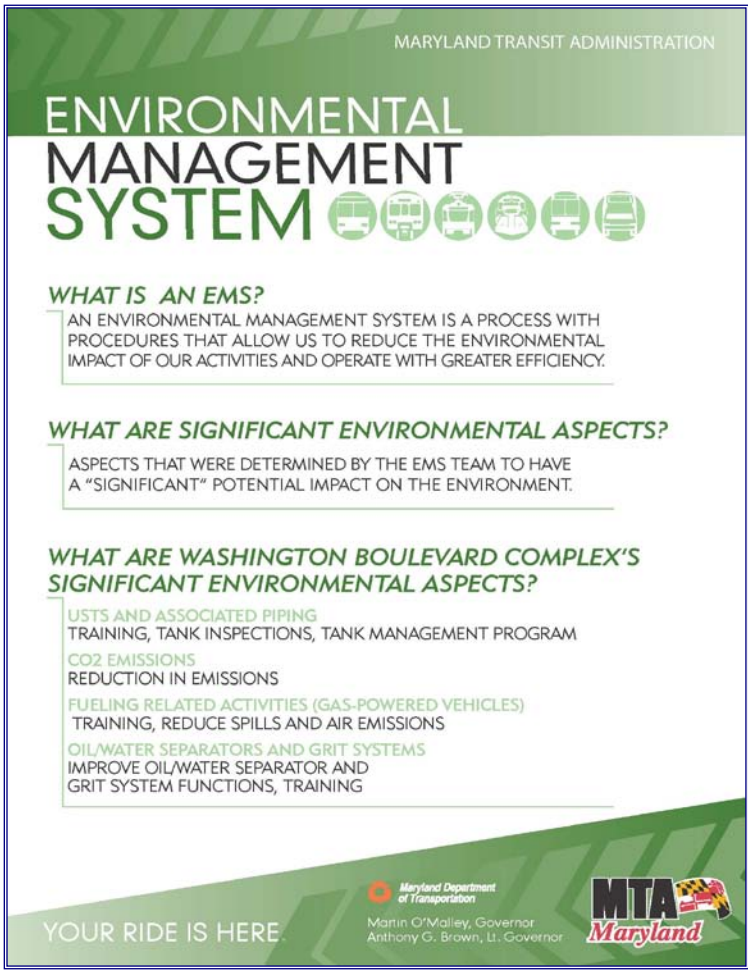
Maryland Department of Transportation

MTA Maryland

Significant Aspects and Impacts

The EMS team held several meetings with the supervisors and other employees from each shop at the Washington Boulevard Complex to review their work activities and identify and rank the environmental aspects. Approximately 55 environmental aspects were identified in the day-to-day Washington Boulevard Complex activities, products and services. Each environmental aspect was ranked and discussed to determine which aspects have or can have significant impacts on the environment. In assessing the environmental and business impacts of the aspects, the EMS team prioritized the following as 'Significant Aspects'. The Significant Aspects were identified and prioritized on a 'ranking system'. The significant aspects included:

- Underground Storage Tanks and Associated Piping
- CO^2 Emissions from Buses
- Fueling-related Activities (gas-powered vehicles)
- Oil/water Separators and Grit Systems



Promotional flyer for EMS awareness

Objectives and Targets

For each significant aspect, the Core Team, with appropriate supervisors, developed Objectives and Targets to address the significant environmental aspects.

Significant Aspect	Objective	Targets	Benefits
USTs and Associated Piping	Management of UST systems at Washington Boulevard Complex (including requirements for the design, construction and operation, as well as maintenance, monitoring, and reporting) in accordance with applicable Federal, and State of Maryland Regulations.	• 100% UST Reconciliation Training complete by January 31, 2011. • 100% implementation of a tank management program by January 31, 2011. • 100% of USTs inspected for compliance (by a MDE certified inspector) by August 31, 2009.	• Standard Operating Procedure (SOP) developed and approved. • USTs inspected for compliance and corrective actions complete. • Tank Unloading/Loading Sign posted by fueling areas. • Tank inspection dates included in MTA GIS and formatted to send notification emails.
CO2 Emissions from Buses	Reduce the amount of CO2 emissions generated by buses based at the Bus Division.	25% reduction in CO2 emissions from 2006 levels by 2020, in accordance with Maryland's Greenhouse Gas Reduction Act.	• Anti-Idling Policy developed and approved. • New Anti-Idling Transportation Bulletin.
Fueling-related activities (gas-powered vehicles)	Reduce the amount of spills and air emissions with the fueling of gas-powered vehicles at the Washington Boulevard Complex.	100% of an active Stage 2 Recovery training program in place by December 30, 2009.	• Stage 2 Recovery training complete. • SOP developed. • Daily inspection checklist utilized. • Stage 2 Vapor Recovery Fueling Sign posted by fueling areas.
Oil water separator systems and grit systems	Manage quantifiable improvement in the oil/water separator and grit systems functions at the Washington Boulevard Complex.	To be determined based on results of baseline in-house sampling and inspection of oil/water separator systems and grit systems.	• SOP developed. • New OWS included in capital projects for 2012. • Additional information on OWS obtained through investigations.

ENVIRONMENTAL MANAGEMENT SYSTEM
Maryland Transit Administration
Washington Boulevard Complex

Verification	Person responsible for maintaining	Comments provided by	Reviewed by	Approved by
Initials	DM	EMS Team	BF	BB

ED 4.3.3-1 Objective & Target Action Plan – Management of USTs

Document Name:	**Management of USTs Action Plan**	**Facility Affected:**	Washington Boulevard/Bush Bus Division Complex
Document No:	EP 4.3.3 – AP#001	**Relevant Process:**	Operation and Maintenance of underground storage tank systems
Start Date:	5/15/09	**Related Significant Aspect or Legal and Other Requirement:** USTs and Associated Piping	
Date Fully Completed:		**Last Revised:** 10/12/09	

1.0	**Person Responsible for Overall Action Plan:** ***Thomas J. Chisholm (OSQARM)***
2.0	**GOAL STATEMENT:** **Maintain regulatory compliance in order to reduce the likelihood of a petroleum release.**
3.0	**OBJECTIVE:** **Management of UST systems (including requirements for the design, construction and operation, as well as maintenance, monitoring, and reporting) in accordance with applicable Federal and State of Maryland regulations.**
4.0	**PRIMARY MEASURABLE TARGETS AND COMPLETION DATES:** 1. **100% UST Reconciliation Training complete by January 31, 2011.** 2. **100% implementation of a tank management program by January 31, 2011.** 3. **100% of USTs inspected for compliance (by a MDE certified inspector) by August 31, 2009.**
5.0	**STRATEGY:** To improve management of USTs and associated piping by implementing new methods/procedures to track performance of tank testing, inspections, and other tank management tasks.
6.0	**Has Senior Management approved the resources necessary to implement this Objective and Target Action Plan?** Approved during Sr. Mgmt Review on 7/7/09.
7.0	**Date of Senior Management approval:** 7/7/09

ENVIRONMENTAL MANAGEMENT SYSTEM

Maryland Transit Administration
Washington Boulevard Complex

Verification	Person responsible for maintaining	Comments provided by	Reviewed by	Approved by
Initials	DM	EMS Team	BF	BB

ED 4.3.3-2 Objective & Target Action Plan – Reduction of CO_2 Emissions from Buses

Document Name:	**Reduction of CO_2 Emissions Action Plan**	**Facility Affected:**	Washington Boulevard Complex
Document No:	EP 4.3.3 – AP#001	**Relevant Process:**	Idling of Buses
Start Date:	5/13/09	**Related Significant Aspect or Legal and Other Requirement:** CO_2 Emissions from Buses	
Date Fully Completed:		**Last Revised:** 10/12/09	

1.0	**Person Responsible for Overall Action Plan:** *Dave Varner*
2.0	**GOAL STATEMENT: Reduce the amount of CO_2 emissions from buses based at the Washington Boulevard Complex by purchasing new hybrid buses and training and educating bus operators on the idling of buses at layover points.**
3.0	**OBJECTIVE: Reduce the amount of CO_2 emissions generated by buses based at the Washington Boulevard Complex.**
4.0	**PRIMARY MEASURABLE TARGET & COMPLETION DATE:** • **25% reduction in CO_2 emissions from 2006 levels by 2020, following Maryland's Greenhouse Gas Reduction Act.** *(*This target will be broken down into incremental targets following completion of the baseline.)*
5.0	**STRATEGY:** To establish a baseline by determining the quantity of emissions currently produced by buses based at the Washington Boulevard Complex and to reduce these emissions through the purchasing and use of new hybrid coaches and training on methods to reduce idling of buses.
6.0	**Has Senior Management approved the resources necessary to implement this Objective and Target Action Plan?** Approval during Sr. Mgmt Review on 7/7/09.
7.0	**Date of Senior Management approval:** 7/7/09

ENVIRONMENTAL MANAGEMENT SYSTEM
Maryland Transit Administration
Washington Boulevard Complex

Verification	Person responsible for maintaining	Comments provided by	Reviewed by	Approved by
Initials	DM	EMS Team	BF	BB

ED 4.3.3-3 Objective & Target Action Plan – Fueling-related activities (gas-powered vehicles)

Document Name:	**Fueling-related Activities (gasoline vehicles) Action Plan**	**Facility Affected:**	Washington Boulevard Complex
Document No:	EP 4.3.3 – AP#001	**Relevant Process:**	Fueling of gas-powered vehicles
Start Date:	5/15/09	**Related Significant Aspect or Legal and Other Requirement:** Fueling-related activities (gasoline vehicles)	
Date Fully Completed:		**Last Revised:** 10/12/09	

1.0	**Person Responsible for Overall Action Plan:** ***Robert Frazier***
2.0	**GOAL STATEMENT:** **Reduce spills and air emissions associated with the fueling of gas-powered vehicles.**
3.0	**OBJECTIVE:** **Reduce the amount of spills and air emissions associated with the fueling of gas-powered vehicles at the Washington Boulevard Complex.**
4.0	**MEASURABLE TARGET & COMPLETION DATE:** • **Have 100% active Stage 2 Recovery training program in place by December 30, 2009.**
5.0	**STRATEGY**: To reduce the amount of air emissions associated with the fueling of gas-powered vehicles through the training of required personnel on Stage 2 vapor recovery and correct fueling practices. Implement regulatory required inspections and testing of recovery systems. To reduce the amount of spills through the use of tank monitoring software, tank alarm systems, signage, and employee training.
6.0	**Has Senior Management approved the resources necessary to implement this Objective and Target Action Plan**? Approved during Sr. Mgmt Review on 7/7/09.
7.0	**Date of Senior Management approval**: 7/7/09

ENVIRONMENTAL MANAGEMENT SYSTEM
Maryland Transit Administration
Washington Boulevard Complex

Verification	Person responsible for maintaining	Comments provided by	Reviewed by	Approved by
Initials	DM	EMS Team	BF	BB

ED 4.3.3-4 Objective & Target Action Plan – Management of Oil/Water Separators and Grit Systems

Document Name:	**Management of Oil/water Separators and Grit Systems Action Plan**	**Facility Affected:**	Washington Boulevard Complex
Document No:	EP 4.3.3 – AP#001	**Relevant Process:**	Use of oil/water separators and grit systems
Start Date:	5/15/09	**Related Significant Aspect or Legal and Other Requirement:** Oil/water separators and grit systems	
Date Fully Completed:		**Last Revised:** 10/12/09	

1.0	**Person Responsible for Overall Action Plan:** ***Robert Frazier***
2.0	**GOAL STATEMENT: Improve oil/water separator and grit systems functions at the Washington Boulevard Complex.**
3.0	**OBJECTIVE: Manage quantifiable improvement in the oil/water separator and grit systems functions at the Washington Boulevard Complex.**
4.0	**MEASURABLE TARGET & COMPLETION DATE:** • **To be determined based on results of baseline in-house sampling and inspection.**
5.0	**Strategy:** Evaluate the cost of purchasing new oil/water separators, evaluate in-house analysis of current OWS performance, use of spill kits, and employee training. Evaluate and employ electronic equipment to monitor oil levels and water quality in the separators. Check separator structural integrity. Evaluate work processes to improve discharge quality to the separator system.
6.0	**Has Senior Management approved the resources necessary to implement this Objective and Target Action Plan?** Approved during Sr. Mgmt Review on 7/7/09.
7.0	**Date of Senior Management approval:** 7/7/09

Benefits of Adopting an EMS

There are many potential benefits identified for adopting an EMS; specific areas that were significant to MTA include:

- Sustaining and re-enforcing ongoing compliance activities.
- Promoting compliance through 'organizational outreach and awareness'.
- Expanding MTA's 'Think Green – Ride MTA' campaign.
- Improved employee awareness of potential environmental impacts of work activities.
- Improved communications and cooperation through training and outreach.
- Improved relations with regulatory agencies.

- Modified environmental procedures and improved work procedures.
- Adoption of an agency-wide environmental policy.
- Improved environmental performance related to the environmental aspects and reduced environmental liabilities.
- Identification of corrective actions which will reduce risk.
- Incorporation of environmental stewardship into all services.
- Compliance monitoring through use of the MTA Geographic Information System (GIS).
- Promoting discussion between MTA departments on environmental topics.

Resources

Since first meeting with Virginia Tech and FTA, through July 1, 2010, the following labor hours have been estimated to be expended:

Group	Estimated Hours
EMS Core Team	2,003
Other MTA Employees	141
Consultant	648
Employee Training	200
TOTAL	3,028

Discipline	Estimated Costs
MTA Labor	$68,100
Consultant	$48,600
Travel	$4,800
Materials	$2,500
TOTAL	$124,000

Cost Savings and Avoidance

Through the monitoring and management of the CO^2 significant aspect, the MTA is reducing CO^2 emissions and is realizing estimated fuel cost savings.

The table below shows the estimated fuel costs and CO^2 emissions of the all diesel fleet in 2004 to partial hybrid fleet in 2012 to all hybrid fleet in 2015.

	FY2004	FY2012	FY2015
Fuel Costs	**$22,954,960**	**$13,672,120**	**$11,339,750**
CO^2 Emissions	**101,151 tons**	**66,031 tons**	**60,781 tons**

Next Steps

MTA is in the process of developing and implementing procedures which are the framework for the EMS. The primary administrative components of the EMS are mostly addressed by the Office of Safety, Quality Assurance and Risk Management. The objectives and targets involve participation by the actual operating work groups at the facility are the keys to the components.

The next steps for the EMS include:

- Respond to suggestions and implement corrective actions of the Virginia Tech Lead Auditor, based on the results of the Final Audit (July 13-14, 2010).
- Develop request for proposal (RFP) for ISO certification audit.
- Increase participation in the MTA EMS.
- Maintain continual improvement of the MTA EMS by continuing to track progress on Objective and Targets Action Plans.
- Expand the EMS to other MTA facilities.

Management Commitment

The senior management of MTA has been committed to the intent of the FTA-sponsored implementation of the EMS at the fence line.

MTA Maryland

"Developing and implementing an EMS at the MTA has supported compliance with several MDOT environmental initiatives underway. MDOT is committed to facilitating the protection of natural resources and promoting stewardship in environmental management. MTA's EMS commitment is in keeping with Governor O'Malley's policy of making Maryland the national leader in the area of environmental protection. The EMS supports Governor O'Malley's environmental policies, programs, and initiatives.

The EMS is fostering our relationship with regulatory agencies as it demonstrates a commitment toward 'continual improvement'. Further EMS benefits include sustaining environmental issues at the forefront and promoting awareness for day-to-day compliance activities.

The MTA has benefitted participating in this effort with Virginia Tech/FTA in promoting environmental awareness, stewardship, and compliance."

Bernadette Bridges,
Executive Director, Office of Safety,
Quality Assurance and Risk Management.

Maryland Transit Administration Audit Report

This Environmental Management System (EMS) Audit was based on a request by the Federal Transit Administration (FTA) as a final follow-up to an eighteen month program for EMS development and was conducted in accordance with the approved schedule.

W. Robert Herbert, Principle Contractor and ISO 14001 certified Lead Auditor with Virginia Tech, conducted the EMS Audit for the Maryland Transit Administration on July 13 and 14, 2010, to report on its conformance with the requirements of the ISO 14001:2004 standard.

The EMS was evaluated against each of the requirements set out in the ISO 14001:2004 standard titled "Environmental management system – General guidelines on principals, systems and support techniques." The Audit included the examination of documents, interviews of personnel and observations of activities and conditions.

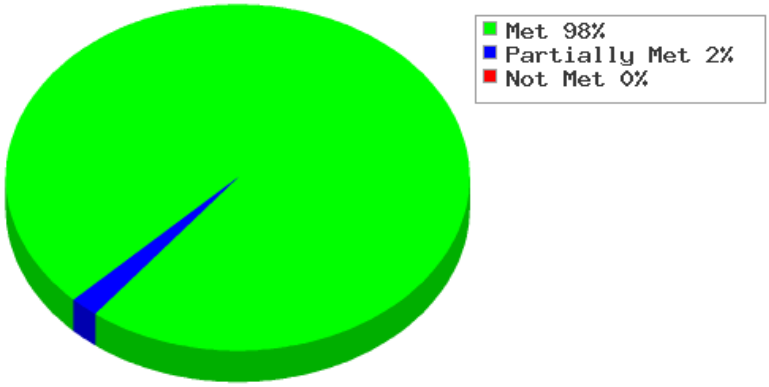
The site visit involved a review of the core EMS documents with the EMS team. The Maryland Transit Administration EMS Team participated in the review and discussion regarding the scoring.

Detailed scoring on next page

Maryland Transit Administration - Overall EMS Performance Results

This section compares the percentage of requirements *met, partially met and not met* with respect to meeting the requirements of an EMS as specified in the ISO 14001:2004 standard. The following scores are the result of the EMS audit presented in this report:

Percent meeting all requirements **"Overall Score"**	**99%**
Percent of requirements **"Met"**	**98%**
Percent of requirements **"Partially Met"**	**2%**
Percent of requirements **"Not Met"**	**0%**



	The ISO 14001:2004 standard elements of an EMS	Overall Score (%)	Met (%)	Partially Met (%)	Not Met (%)
4.1	General Requirements	100	100	0	0
4.2	Environmental Policy Requirements	100	100	0	0
4.3.1	Environmental Aspects Requirements	100	100	0	0
4.3.2	Legal and Other Requirements	100	100	0	0
4.3.3	Objectives, Targets and Programs Requirements	100	100	0	0
4.4.1	Resources, Roles, Responsibility and Authority	100	100	0	0
4.4.2	Competence, Training and Awareness	79	57	43	0
4.4.3	Communication	100	100	0	0
4.4.4	EMS Documentation	100	100	0	0
4.4.5	Control of Documents	100	100	0	0
4.4.6	Operational Control	100	100	0	0
4.4.7	Emergency Preparedness and Response	100	100	0	0
4.5.1	Monitoring and Measurement	100	100	0	0
4.5.2	Evaluation of Compliance	100	100	0	0
4.5.3	Nonconformity, Corrective Action and Preventive Action	100	100	0	0
4.5.4	Control of Records	100	100	0	0
4.5.5	Internal Audits	100	100	0	0
4.6	Management Review	100	100	0	0

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY (MBTA)
BOSTON, MASSACHUSETTS

June 2010

DESIGN & CONSTRUCTION

Dean Road Bridge Demolition Green Line Brookline, MA

Profile

In 1897, America's first subway was constructed between Park Street and Boylston Street in Boston, Massachusetts. This half-mile section of subway is still operated today by the MBTA, making the MBTA the oldest continuously operating subway system in the country. In the 113 years since this service opened, Boston's public transportation system has remained a critical part of the city, and has grown dramatically in response to an ever-increasing demand for transportation services. The MBTA now serves 175 communities, providing transit alternatives to a population of 4.7 million over an area of 3,200 square miles.

Currently, the MBTA is the fifth largest mass transit system in the United States as measured by ridership. The Authority serves a daily ridership of approximately 1.2 million passengers. To provide these services the Authority maintains 200 bus routes, 4 rapid transit lines of heavy and light rail, 1 bus rapid transit line, 4 trackless trolley lines, 11 commuter rail lines, several ferry lines and a paratransit service. Its large roster of equipment currently consists of 408 heavy rail vehicles, 204 light rail vehicles, 927 diesel buses, 61 compressed natural gas (CNG) buses, 2 prototype alternative fuel buses, 40 trackless trolleys, 80 commuter rail locomotives, 377 commuter rail coaches, 2 ferry boats, and 418 vehicles for the RIDE. Service is provided to 275 stations. The Authority maintains 885 miles of track, 478 bridges, and 20 miles of tunnel. Rail system expansion includes a commuter rail line to New Bedford and an extension to the Green Line to Somerville, MA. The MBTA operates 19 commuter rail, light/heavy rail and bus maintenance facilities, numerous right-of-way (ROW) maintenance facilities, and currently has 6,000+ employees.

A five member Board of Directors manages the affairs of the Authority. The Governor on a rotating schedule appoints the members of the Board. The Board has the power to appoint and employ a General Manager and other officers and approves all capital investments over $500,000. The MBTA has an Advisory Board, consisting of representatives from each of the cities and towns within the MBTA's service area that approves the annual operating budget and reviews the five-year Capital Investment Program.

In 1999, the Governor of Massachusetts signed into law legislation reforming the finances of the MBTA. This new law, known as "Forward Funding" established a new funding mechanism as of July 1, 2000. MBTA funding is now limited to: fares and other own source revenues, 20% of the state-wide sales tax, and assessments from the 175 cities and towns in its service district.

Fenceline

The MBTA had the opportunity to participate in the Federal Transit Administration's first round of Environmental Management Training offered in 2004. In 2004 the MBTA developed and implemented an EMS at a bus maintenance facility as well as a subway maintenance facility. Following the initial two facilities, the MBTA expanded the EMS to 11 (eleven) additional facilities.

Through the EMS development process we realized the need to expand our EMS beyond "bus and subway operations" and the "maintenance facilities" to include key operational departments

that have a significant role in all of our operations. The departments identified were Design and Construction, System wide Maintenance and Improvements, and Operations Support.

Following the training we received from the first round of FTA EMS Training, we requested to participate in Round II.

For the second round of training, the MBTA took the opportunity to focus on **Capitol Projects, specifically developing an EMS for our Design and Construction Department,** concentrating on soil and debris management. The Design and Construction Department consists of 190 employees who administer and manage all design and construction projects within the MBTA's Capital Investment Program, which has a total budget of $3.68 billion to be expended in fiscal years 2010 through 2014.

Core Team

The MBTA formed a 15-member team to travel to Roanoke, Virginia for EMS training. The team consisted of representatives from the Environmental Affairs Department, Subway Operations, Bus Operations, System-wide Maintenance and Improvements, Power Department and the Design and Construction Department.

The Core Team for Design and Construction consisted of:

Manager of Environmental Construction
Deputy Director of Design and Construction
Project Director of Design & Construction
Deputy Director Quality Assurance

Supporting team members consisted of:

Director of Environmental Compliance
Environmental Compliance Officer
Superintendent of Bus Maintenance
Superintendent of Southampton Facility
Superintendent of Maintenance
RVM Training Instructor
Superintendent, Power Systems & Equipment
Division Engineer, SMI

Additionally, the Design and Construction Department established a sub-team consisting of project engineers and resident engineers working on current MBTA projects.

Key Drivers for Adopting an EMS

The MBTA began its efforts to develop an EMS in 2002 with the adoption of our Environmental Policy. Our commitment to develop an EMS was further solidified and formalized in a Settlement Agreement with the Massachusetts Department of Environmental Protection (DEP)

and in a Consent Decree with the United States Department of Justice (DOJ) and the United States Environmental Protection Agency Region 1 (EPA). The settlement with DEP involved soil contamination at an old rail yard acquired by the MBTA through the Penn Central Railroad Bankruptcy Proceedings.

The Consent Decree with the DOJ and EPA stemmed from violations of the Clean Water Act (CWA) and the Clean Air Act (CAA). The CWA violations involved the unpermitted discharging of process water and storm water associated with industrial activity, the failure to prepare Spill Prevention Control and Countermeasure (SPCC) plans, and the failure to prepare Storm Water Pollution Prevention Plans (SWPPP).

The CAA violation involved the excessive idling of 56 buses at four MBTA Bus Yards. In Massachusetts, the operator of a motor vehicle is not permitted to unnecessarily operate "the engine of a motor vehicle while said vehicle is stopped for a foreseeable period of time in excess of five minutes." (310 CMR 7.11)

The Agreement/Consent Decree contain specific requirements for the content of our EMS as well as a definite schedule for development, implementation and audit of our EMS. Under these agreements, the MBTA is required to conduct initial assessments and develop an EMS Manual encompassing all MBTA Facilities. The EMS Manual was submitted to EPA and DEP for comment. The MBTA has implemented the EMS Manual at all facilities, the MBTA then rolled out the EMS System-wide in three phases (Phase I – 5 additional facilities, Phase II – 6 additional facilities, Phase III – 5+ facilities).

Significant Aspects & Impacts

Members of the Core Team reviewed and evaluated a typical MBTA construction project from start to finish identifying significant environmental aspects associated with a construction project. This included the review of technical specifications, design guidelines, contractor submittals, the resident engineer manual and overall contract management to include budgeting, invoices, cost overruns, timelines, and change of conditions. To determine the significance of each aspect, the Core Team scored their aspects using a numerical weighting system on a matrix answering the following questions:

1. Is the aspect regulated?
2. Does the aspect pose a potential environmental impact?
3. Is the aspect associated with a legal obligation?
4. Is there significant financial risk or an opportunity to control the aspect?

Below is the form used in identifying their significant aspects.

ASSIGNING IMPACTS TO ASPECTS & DETERMINING SIGNIFICANCE

Facility: Design and Construction
Prepared by: Holly Palmgren
Date: 3/18/09
Activity: Soil and Construction Debris Management

Aspects	Impacts				Questions for Significance				
	Air	Water	Land	Financial Impacts	Is it Regulated	Does the aspec pose a potentia environmental impact	Is there significant stakeholder interest	Is there significant financial risk or opportunity	Is it a significant aspect? Yes/No
Air Emissions-Heavy Equipment	3	1	1	2	yes	yes	yes	no	yes
Asbestos	3	1	1	3	yes	yes	yes	yes	yes
Concrete Dust	3	1	3	2	yes	yes	yes		yes
Construction Debris	1	1	5	5	yes	yes	yes	yes	**yes**
Contaminated Soil	1	5	5	5	yes	yes	yes	yes	**yes**
Erosion Control	1	4	4	4	yes	yes	yes	yes	yes
Fugitive Dust	3	1	1	2	yes	yes	yes		yes
Groundwater Elevations	1	5	1	3	yes	yes	yes		yes
Groundwater Dewatering	1	4	1	3	yes	yes	yes		yes
Lead-Based Paint	3	1	3	4	yes	yes	yes	yes	yes
Natural Gas	3	1	1	2	yes	yes			yes
Noise	3	1	1	3	yes	no	yes		yes
Scrap Metal	1	1	4	4	yes	yes	yes	yes	yes
Stormwater	1	4	4	4	yes	yes	yes	yes	yes
Water Consumption	1	3	1	3		yes	yes	yes	yes
Spill Response	3	4	4	4	yes	yes	yes	yes	yes
Wetlands	1	5	1	4	yes	yes	yes	yes	yes

Following completion of the above form, the Core Team decided to focus on the two aspects that had the highest financial impact. These aspects were construction debris and contaminated soil.

Objectives and Targets

Objectives	Targets
DESIGN & CONSTRUCTION	
Improve Management of Demolition Debris (with an emphasis on minimizing unauthorized dumping of debris on MBTA property)	• Evaluate current MBTA technical specifications and design guidelines and determine if revisions are required; • Review current contractor submittal process and determine if revisions are required; • Establish improved contract language and procedure to manage demolition debris; • Educate and train employees on proper management of demolition debris; • Track performance of newly established language and procedures.
Improve Management of Soil Reuse and Soil Disposal (with an emphasis on properly managing contaminated soil excavated from MBTA construction projects.	• Evaluate current MBTA technical specifications and design guidelines and determine if revisions are required; • Review current contractor submittal process and determine if revisions are required; • Establish improved contract language and procedures to manage soil reuse and soil disposal; • Educate and train employees on proper management of soil reuse and soil disposal; • Track performance of newly established language and procedures.

Mixed Construction Debris

Before with Construction Materials

After with Construction Material Removed

Benefits of Adopting an EMS

MBTA has realized a number of immediate benefits resulting from our EMS. These benefits include:

- The creation of the Core Team and the development of the EMS have improved communications across departments at the MBTA.
- Increased and improved understanding of all environmental aspects of construction projects.
- Improved communication between the MBTA and its contractors.
- Improved control of contract documentation.
- Improved knowledge of Design and Construction employees and contracts of environmental aspects and impacts.

Resources

To date, the MBTA expended the following level of effort (estimated in hours) in the development of the EMS:

Core Team	2,495
Sub Teams	96
Consultants	32

To date, the MBTA incurred the following estimated cost in the development of the EMS:

MBTA Labor	$93,302
Travel/Supplies	$23,253
Consultant/Training	$60,450

Cost Savings or Avoidance

To date, the MBTA has not been able to quantify cost savings from our EMS. Since our EMS efforts began we have had improved compliance with our management of contaminated soil and reduced unauthorized dumping of construction debris on MBTA property. We have also experienced improved relations with state, federal and local agencies.

Next Steps

The MBTA is committed to implementing a system-wide EMS. The EMS will be evaluated annually by the MBTA Core Team.

The MBTA has developed an EMS Manual, as well as an Environmental Management System page on our Portal. The MBTA Portal is an online resource that provides information to employees via the web-browser, 24 hours a day, 7 days a week. The MBTA portal also contains our SOPs, Environmental Procedures, and Programs developed during the first FTA EMS Implementation Course. We have found both our EMS Manual and the Portal useful tools for EMS Training and Documentation.

Management Commitment

The Senior Management at the MBTA is committed to implementing a successful EMS. The General Manager has made eliminating negative environmental impacts as one of the things that will make the MTBA, a world-class public transportation system. To this end, his chief of staff has become a key “ad-hoc” member of the Core Team.

MBTA System


OAK GROVE
Malden
Wellington
Sullivan Square
WONDERLAND
Revere Beach
Beachmont
Suffolk Downs
Orient Heights
Wood Island
Airport
Maverick
AIRPORT TERMINALS
Logan International Airport
Davis
ALEWIFE
Porter
Harvard
Community College
LECHMERE
Science Park
North Station
Central
BOWDOIN
Haymarket
Kendall/MIT
Gov't Center
Aquarium
State**
Charles/MGH
Park St
Downtown Crossing
Courthouse
World Trade Ctr.
Silver Line Way
Silver Line Waterfront
SL1
SL2
SL3
BOSTON MARINE INDUSTRIAL PARK
CITY POINT
BOSTON COLLEGE
Washington St
Harvard Ave
Washington Square
Coolidge Corner
BU Central
BU East
CLEVELAND CIRCLE
RIVERSIDE
Woodland
Waban
Eliot
Newton Highlands
Newton Centre
Chestnut Hill
Reservoir
Beaconsfield
Brookline Hills
Brookline Village
St. Mary's St
Fenway
Longwood
Prudential
Symphony
Northeastern
Museum of Fine Arts
Longwood
Brigham Circle
HEATH
Kenmore
Hynes
Copley
Arlington
*Boylston
Back Bay
Chinatown
NE Medical Center
South Station
Broadway
Andrew
JFK/UMass
Herald St
E. Berkeley St
Union Park St
Newton St
Worcester Sq
Mass Ave
Lenox St
Melnea Cass Blvd
DUDLEY SQ
Silver Line Washington St
Mass Ave
Ruggles
Roxbury Crossing
Jackson Sq
Stony Brook
Green St
FOREST HILLS
Savin Hill
Fields Corner
Shawmut
ASHMONT
Cedar Grove
Butler
Milton
Central Ave
Valley Rd
Capen St
MATTAPAN
North Quincy
Wollaston
Quincy Center
Quincy Adams
BRAINTREE

MBTA Design & Construction Audit Report

This Environmental Management System (EMS) Audit was based on a request by the Federal Transit Administration (FTA) as a final follow-up to an eighteen month program for EMS development and was conducted in accordance with the approved schedule.

W. Robert Herbert, Principle Contractor and ISO 14001 certified Lead Auditor with Virginia Tech, conducted the EMS Audit for MBTA Design & Construction on June 9, 2010, to report on its conformance with the requirements of the ISO 14001:2004 standard.

The EMS was evaluated against each of the requirements set out in the ISO 14001:2004 standard titled "Environmental management system – General guidelines on principals, systems and support techniques." The Audit included the examination of documents, interviews of personnel and observations of activities and conditions.

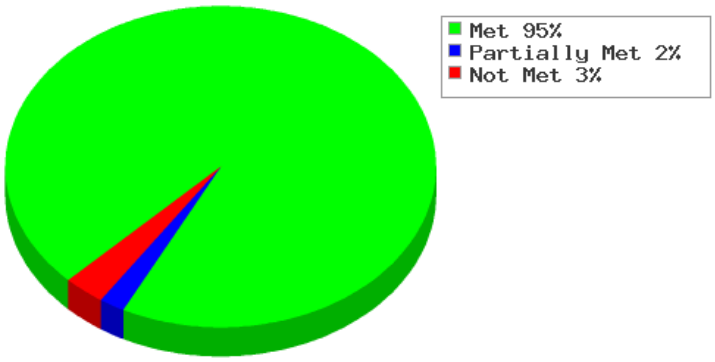
The site visit involved a review of the core EMS documents with the EMS team. The Design & Construction EMS Team participated in the review and discussion regarding the scoring.

Detailed scoring on next page

MBTA Design & Construction - Overall EMS Performance Results

This section compares the percentage of requirements *met, partially met and not met* with respect to meeting the requirements of an EMS as specified in the ISO 14001:2004 standard. The following scores are the result of the EMS audit presented in this report:

Percent meeting all requirements **"Overall Score"**	**96%**
Percent of requirements **"Met"**	**95%**
Percent of requirements **"Partially Met"**	**2%**
Percent of requirements **"Not Met"**	**3%**



	The ISO 14001:2004 standard elements of an EMS	Overall Score (%)	Met (%)	Partially Met (%)	Not Met (%)
4.1	General Requirements	100	100	0	0
4.2	Environmental Policy Requirements	100	100	0	0
4.3.1	Environmental Aspects Requirements	100	100	0	0
4.3.2	Legal and Other Requirements	100	100	0	0
4.3.3	Objectives, Targets and Programs Requirements	100	100	0	0
4.4.1	Resources, Roles, Responsibility and Authority	100	100	0	0
4.4.2	Competence, Training and Awareness	100	100	0	0
4.4.3	Communication	100	100	0	0
4.4.4	EMS Documentation	100	100	0	0
4.4.5	Control of Documents	100	100	0	0
4.4.6	Operational Control	100	100	0	0
4.4.7	Emergency Preparedness and Response	50	50	0	50
4.5.1	Monitoring and Measurement	100	100	0	0
4.5.2	Evaluation of Compliance	100	100	0	0
4.5.3	Nonconformity, Corrective Action and Preventive Action	100	100	0	0
4.5.4	Control of Records	100	100	0	0
4.5.5	Internal Audits	100	100	0	0
4.6	Management Review	83	67	33	0

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY (MBTA)
BOSTON, MASSACHUSETTS

June 2010

SOUTHAMPTON BUS FACILITY

Southampton Maintenance Facility was constructed in 2005 originally designed to handle 76 buses.

Profile

In 1897, America's first subway was constructed between Park Street and Boylston Street in Boston, Massachusetts. This half-mile section of subway is still operated today by the MBTA, making the MBTA the oldest continuously operating subway system in the country. In the 108 years since this service opened, Boston's public transportation system has remained a critical part of the city, and has grown dramatically in response to an ever-increasing demand for transportation services. The MBTA now serves 175 communities, providing transit alternatives to a population of 4.7 million over an area of 3,200 square miles.

Currently, the MBTA is the fifth largest mass transit system in the United States as measured by ridership. The Authority serves a daily ridership of approximately 1.2 million passengers. To provide these services the Authority maintains 200 bus routes, 4 rapid transit lines of heavy and light rail, 1 bus rapid transit line, 4 trackless trolley lines, 11 commuter rail lines, several ferry lines and a paratransit service. Its large roster of equipment currently consists of 408 heavy rail vehicles, 204 light rail vehicles, 927 diesel buses, 61 compressed natural gas (CNG) buses, 2

prototype alternative fuel buses, 40 trackless trolleys, 80 commuter rail locomotives, 377 commuter rail coaches, 2 ferry boats, and 418 vehicles for the RIDE. Service is provided to 275 stations. The Authority maintains 885 miles of track, 478 bridges, and 20 miles of tunnel. Rail system expansion includes a commuter rail line to New Bedford and an extension to the Green Line to Somerville, MA. The MBTA operates 19 commuter rail, light/heavy rail and bus maintenance facilities, numerous right-of-way (ROW) maintenance facilities, and currently has 6,000+ employees.

A five member Board of Directors manages the affairs of the Authority. The Governor on a rotating schedule appoints the members of the Board. The Board has the power to appoint and employ a General Manager and other officers and approves all capital investments over $500,000. The MBTA has an Advisory Board, consisting of representatives from each of the cities and towns within the MBTA's service area, that approves the annual operating budget and reviews the five-year Capital Investment Program.

In 1999, the Governor of Massachusetts signed into law legislation reforming the finances of the MBTA. This new law, known as "Forward Funding" established a new funding mechanism as of July 1, 2000. MBTA funding is now limited to: fares and other own source revenues, 20% of the state-wide sales tax, and assessments from the 175 cities and towns in its service district.

Fenceline

The MBTA had the opportunity to participate in the Federal Transit Administration's first round of Environmental Management Training offered in 2004. In 2004 the MBTA developed and implemented an EMS at a bus maintenance facility as well as a subway maintenance facility. Following the initial two facilities, the MBTA expanded the EMS to 11 (eleven) additional facilities.

Through the EMS development process we realized the need to expand our EMS beyond "bus and subway operations" and the "maintenance facilities" to include key operational departments that have a significant role in all of our operations. The departments identified were Design and Construction, System wide Maintenance and Improvements, and Operations Support.

Following the training we received in the first round of FTA EMS Training, we requested to participate in Round II.

For the second round of training MBTA took the opportunity to focus on the **Southampton Bus Maintenance facility**. The Facility is located at 220-240 Southampton Street in Boston, Massachusetts. The Facility is commercially zoned and situated in a heavy traffic area of Roxbury. The Facility is bounded on the west by Moore Street, on the north by the Southeast Expressway, on the east by private property that includes an electric substation and industrial building, and on the south by Southampton Street. It is considered a bus operating facility that stores, services, maintains and repairs dual-mode electric trolley buses for the Transitway and Compressed Natural Gas (CNG) powered buses that may be used on the other MBTA routes, such as Washington Street. The Facility, which houses approximately 76 buses and an estimated 170 full-time employees, includes a Parking Garage, Fueling Building, Bus Wash and Degreaser Building and a Maintenance Building.

The Parking Garage, located along the southern limit of the site, is a three-story structure. The ground level is used for bus parking and queuing prior to leaving the Facility. The subsequent floors are used to park both private and official vehicles owned and operated by the MBTA, its employees and visitors. Several floor drains, located throughout the Garage, transport any fluidized materials to a common point. The liquid passes through an oil/water separator (OWS) and a grit removal chamber, prior to being discharged to the site storm water collection system and ultimately to Southampton Street. The Parking Garage is equipped with emergency eye wash stations, telephone and communications equipment, and fire protection.

The Fueling Building, located toward the center of the site and west of the Maintenance Garage, is used to fuel the buses with either CNG or diesel fuel. The diesel fuel is supplied from two (2) 9,900-gallon aboveground storage tanks (ASTs), located southwest of the fueling building. In addition to the fuel, the building also contains antifreeze, automatic transmission fluid (ATF), chassis grease, engine and gear oil, windshield washing solvent and waste oil. All of the products have emergency shut-off valves to isolate the flow in case of a spill/release. The building is equipped with emergency eye wash stations, telephone and communications, fire protection, and first aid kits. The building is also equipped with an emergency generator, powered by CNG. Also located on the western side of this building is an electrical transformer, which contains 150 gallons of mineral oil. The facility is equipped with floor drains, which are directed into a Boston Water and Sewer Commission (BWSC) approved OWS prior to discharge into the site drainage system.

The Bus Wash and Degreasing Building, located to the south of the fueling building, is used to clean the exterior and undercarriage of the buses. The degreasing portion of the building cleans the undercarriage of the buses and collects residual water for recycling. This degreasing washwater enters an inflow trench below the buses and flows to a grit chamber, followed by an OWS and a second grit chamber before it enters a water reclamation system to be used again for bus washing purposes. All reclaimed water is stored in a 2,000-gallon recycled water storage tank. The sediment from this operation is collected for disposal. The building is equipped with emergency eye wash stations, telephone and communications, fire protection, and first aid kits. The facility contains floor drains, which are directed into a BWSC approved oil/water separator prior to discharge into the site drainage system.

The Maintenance Building, located in the northeast corner of the site, is used to service the MBTA bus fleet. The Facility, which includes a tire shop and battery room, contains compressor lube oil,

chassis grease, ATF, diesel fuel, gear oil, engine oil, windshield wash solvent, antifreeze and waste oil (in a designated lube room). There is also a flammable storage cabinet in the parts storeroom of the Building. The building is equipped with emergency eye wash stations, telephone and communications, fire protection, and first aid kits. The facility contains floor drains, which are directed into a BWSC approved OWS prior to discharge into the site drainage system.

Core Team

The MBTA formed a 15-member team to travel to Roanoke, Virginia for EMS training. The team consisted of representatives from the Environmental Affairs Department, Bus Operations, Subway Operations, the Design and Construction Department, System-wide Maintenance and Improvements and the Power Department.

The Core Team for Bus Operations consisted of:

Superintendent of Southampton Facility
Superintendent of Bus Maintenance
Director of Environmental Compliance
Environmental Compliance Officer

Supporting Team members consisted of:

Manager of Environmental Construction
Deputy Director of Design and Construction
Project Director of Design & Construction
Deputy Director Quality Assurance
Superintendents of Maintenance
RVM Training Instructors
Superintendent, Power Systems & Equipment
Division Engineer, SMI

Additionally, the Southampton Bus facility established a Sub-team consisting of mechanics, painters, cleaners, and foremen/supervisors. Members of the Core Team met with the Sub-team on a regular basis as a way of tracking progress at the Southampton Bus facility.

Key Drivers for Adopting an EMS

The MBTA began its efforts to develop an EMS in 2002 with the adoption of our Environmental Policy. Our commitment to develop an EMS was further solidified and formalized in a Settlement Agreement with the Massachusetts Department of Environmental Protection (DEP) and in a Consent Decree with the United States Department of Justice (DOJ) and the United States Environmental Protection Agency Region 1 (EPA). The settlement with DEP involved soil contamination at an old rail yard acquired by the MBTA through the Penn Central Railroad Bankruptcy Proceedings.

The Consent Decree with the DOJ and EPA stemmed from violations of the Clean Water Act (CWA) and the Clean Air Act (CAA). The CWA violations involved the unpermitted discharging of process water and storm water associated with industrial activity, the failure to

prepare Spill Prevention Control and Countermeasure (SPCC) plans, and the failure to prepare Storm Water Pollution Prevention Plans (SWPPP).

The CAA violation involved the excessive idling of 56 buses at four MBTA Bus Yards. In Massachusetts, the operator of a motor vehicle is not permitted to unnecessarily operate "the engine of a motor vehicle while said vehicle is stopped for a foreseeable period of time in excess of five minutes." (310 CMR 7.11)

The Agreement/Consent Decree contain specific requirements for the content of our EMS as well as a definite schedule for development, implementation and audit of our EMS. Under these agreements, the MBTA is required to conduct initial assessments and develop a EMS Manual encompassing all MBTA Facilities. The EMS Manual was submitted to EPA and DEP for comment. The MBTA has implemented the EMS Manual at all facilities, the MBTA then rolled out the EMS System-wide in three phases (Phase I – 5 additional facilities, Phase II – 6 additional facilities, Phase III – 5+ facilities).

Significant Aspects & Impacts

Members of the Core Team met with the Sub Team to identify aspects and impacts. To determine the significance of each aspect the Sub Team scored them using a numerical weighting system on a matrix answering the following questions:

5. Is the aspect regulated?
6. Does the aspect pose a potential environmental impact?
7. Is the aspect associated with a legal obligation?
8. Is there significant financial risk or an opportunity to control the aspect?

Below is the form used in identifying significant aspects.

MS DOCUMENT NUMBER: ENV-FRM-001 Revision Date: Effective:09/09/05 Issued By: EMS Team

ASSIGNING IMPACTS TO ASPECTS & DETERMINING SIGNIFICANCE

Facility: (456) Southampton Facility Page __1__ of___1___
Preparec Keith Hayes (Superintendent)
Date: 23-Feb-09
Activity: Vehicle Washing

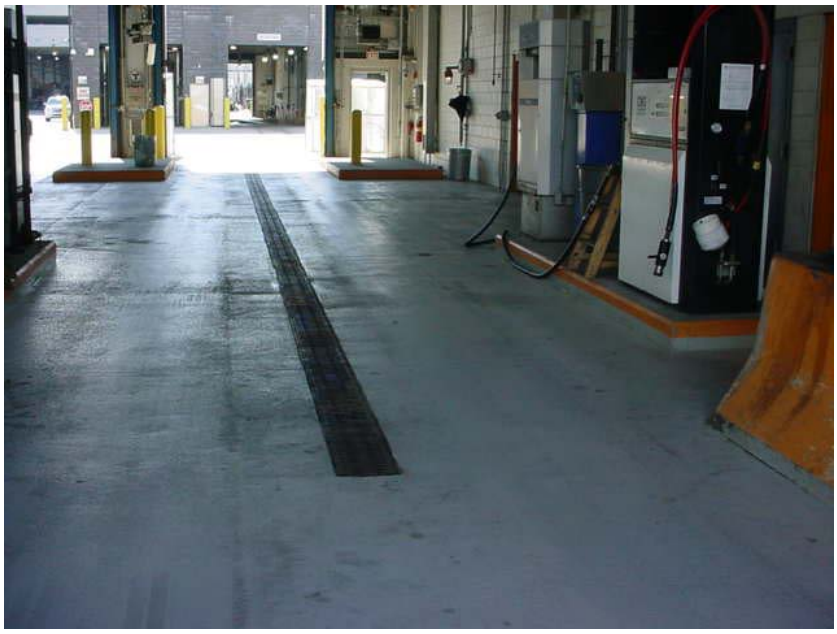
Aspects	Impacts				Questions for Significance				
	Air	Wate	Land	Financial	Is it Regulated	Does the aspec pose a potentia environmental impact	Is aspect associated with legal obligation	Is there significant financial risk or opportunity	Is it a significant aspect? Yes/No
Soaps	1	5	3	2	No	Yes	No	Yes	Yes
Treatment	1	5	1	5	Yes	Yes	Yes	Yes	Yes
Wash Equ	1	5	1	2	No	Yes	No	Yes	Yes
Water Dis	0	5	3	4	Yes	Yes	Yes	Yes	Yes
Water Usa	1	5	1	3	No	Yes	Yes	Yes	Yes

For the development of our EMS, the MBTA selected the four most significant aspects identified and established objectives and targets to improve our environmental performance of each.

Objectives and Targets

Objectives	Targets
Hazardous Materials Handling -Improve the management of petroleum products and hazardous materials (In Massachusetts, waste oil is considered a hazardous waste.) Disposed of as a "recyclable".	• Identify personnel to be trained • Develop training module • Determine training schedule • Conduct employee training
Vehicle Wash Treatment – Ensure compliance with water discharge standards	• Develop baseline and obtain last quarterly sampling results • Obtain schematics of treatment systems • Evaluate baseline data to determine patterns of discharge • Establish standard operating procedure • Evaluate and audit vehicle wash over a one year period
Air Emissions – Eliminate Vehicle idling	• Develop training video for all operators • Train all operators • Develop standard operating procedure for all operators • Monitor peak pull out periods
Water Discharges – Create water discharge permit tracking database	• Confirm location of all industrial and stormwater discharges • Confirm permit, Stormwater Pollution Prevention Plan (SWPPP) and Spill Prevention Control and Countermeasure Plan (SPCC) for each facility • Insure facility training on SWPPP and SPCC • Track and evaluate all permits, SWPPP and SPCC Plans

Fuel Alley Trench Drain – Before



Fuel Alley Trench Drain – After

Benefits of Adopting an EMS

MBTA has realized a number of immediate benefits resulting from instituting an EMS at the bus facility. These benefits include:

- Creation of the Core Team and the development of the EMS have improved communications across departments at the MBTA.

- Increased and improved understanding of all operations at the MBTA, specifically by employees of different departments.

- Development of Standard Operating Procedures has allowed the MBTA to better retain and document institutional knowledge.
- Increased enthusiasm and pride in how employees do their job.
- Improved control and inventory of documentation.
- Improved knowledge by all employees of environmental aspects and impacts.

Resources

To date, the MBTA expended the following level of effort (estimated in hours) in the development of the EMS:

Core Team	2,495
Sub Teams	96
Consultants	32

To date, the MBTA incurred the following estimated cost in the development of the EMS:

MBTA Labor	$93,302
Travel/Supplies	$23,253
Consultant/Training	$60,450

Cost Savings or Avoidance

Since our EMS efforts began we have had improved compliance at our facilities. We have also experienced improved relations with state, federal and local agencies.

Next Steps

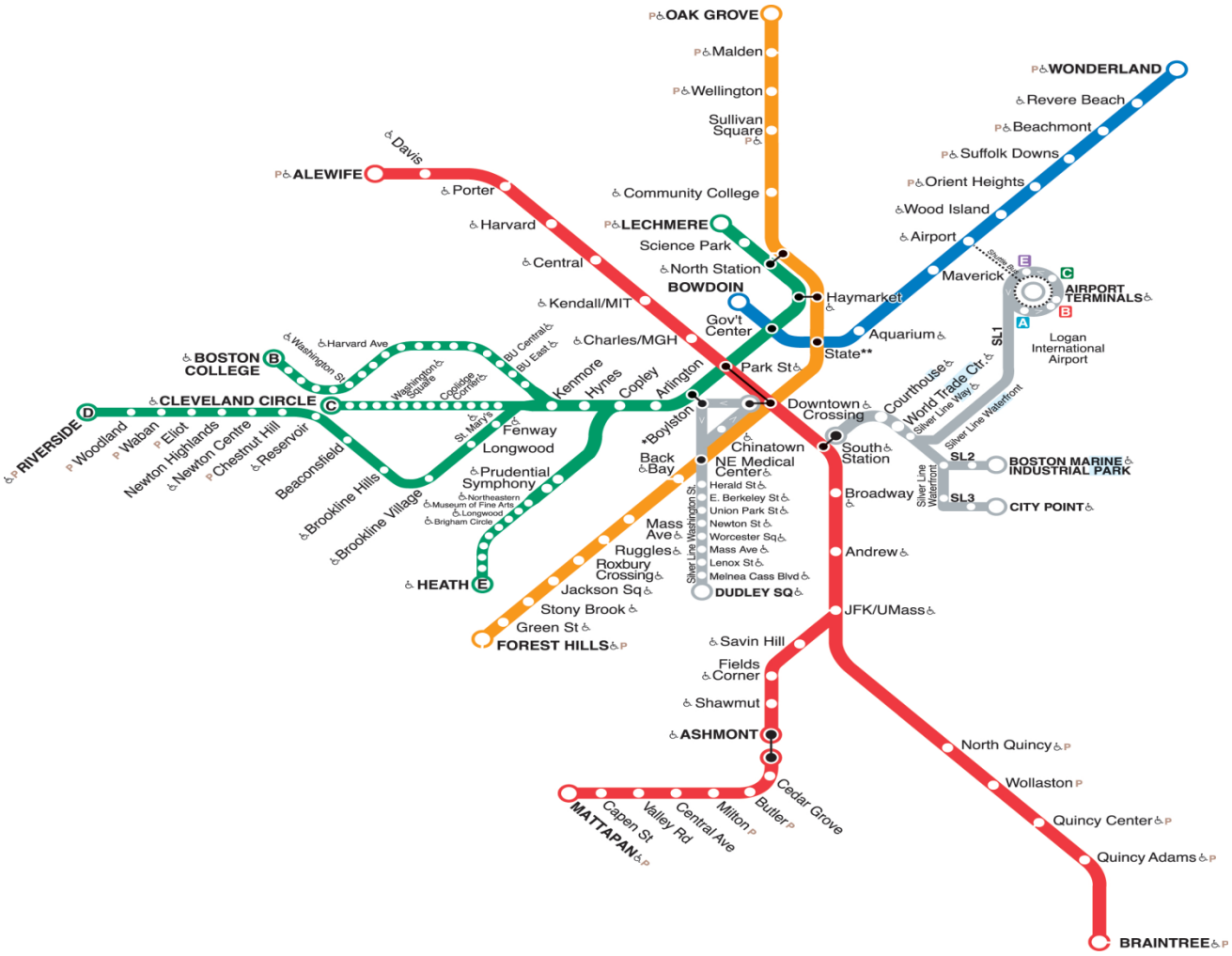
It is anticipated that the EMS for all facilities will be operational by the summer of 2010. The MBTA is committed to implementing a system-wide EMS. The EMS will be evaluated annually by the MBTA Core Team and Senior Management.

The MBTA has developed an EMS Manual, as well as an Environmental Management System page on our Portal. The MBTA Portal is an online resource that provides information to employees via the web-browser, 24 hours a day, 7 days a week. The MBTA portal also contains our SOPs, Environmental Procedures, and Programs developed during the first FTA EMS Implementation Course. We have found both our EMS Manual and the Portal useful tools for EMS Training and Documentation.

Management Commitment

The Senior Management at the MBTA is committed to implementing a successful EMS. The General Manager has made eliminating negative environmental impacts as one of the things that will make the MTBA, a world-class public transportation system. To this end, his chief of staff has become a key “ad-hoc” member of the Core Team.

MBTA System



MBTA Southampton Bus Facility Audit Report

This Environmental Management System (EMS) Audit was based on a request by the Federal Transit Administration (FTA) as a final follow-up to an eighteen month program for EMS development and was conducted in accordance with the approved schedule.

W. Robert Herbert, Principle Contractor and ISO 14001 certified Lead Auditor with Virginia Tech, conducted the EMS Audit for the MBTA Southampton Bus Facility on June 10, 2010, to report on its conformance with the requirements of the ISO 14001:2004 standard.

The EMS was evaluated against each of the requirements set out in the ISO 14001:2004 standard titled "Environmental management system – General guidelines on principals, systems and support techniques." The Audit included the examination of documents, interviews of personnel and observations of activities and conditions.

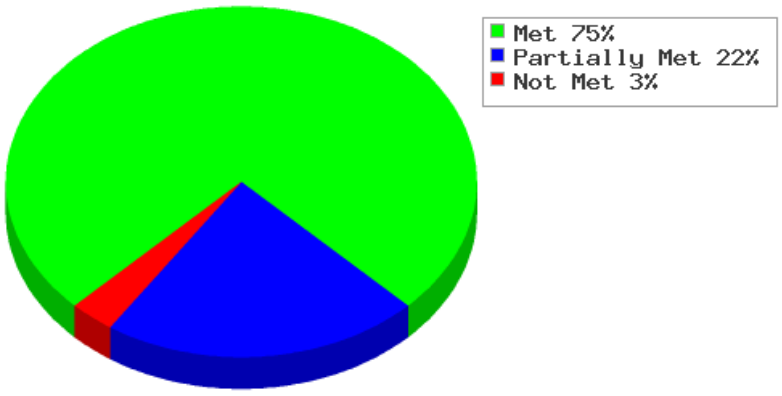
The site visit involved a review of the core EMS documents with the EMS team. The Southampton Bus EMS Team participated in the review and discussion regarding the scoring.

Detailed scoring on next page

MBTA Southampton Bus Facility - Overall EMS Performance Results

This section compares the percentage of requirements *met, partially met and not met* with respect to meeting the requirements of an EMS as specified in the ISO 14001:2004 standard. The following scores are the result of the EMS audit presented in this report:

Percent meeting all requirements **"Overall Score"**	**86%**
Percent of requirements **"Met"**	**75%**
Percent of requirements **"Partially Met"**	**22%**
Percent of requirements **"Not Met"**	**3%**



	The ISO 14001:2004 standard elements of an EMS	Overall Score (%)	Met (%)	Partially Met (%)	Not Met (%)
4.1	General Requirements	100	100	0	0
4.2	Environmental Policy Requirements	100	100	0	0
4.3.1	Environmental Aspects Requirements	100	100	0	0
4.3.2	Legal and Other Requirements	100	100	0	0
4.3.3	Objectives, Targets and Programs Requirements	82	64	36	0
4.4.1	Resources, Roles, Responsibility and Authority	80	60	40	0
4.4.2	Competence, Training and Awareness	50	0	100	0
4.4.3	Communication	100	100	0	0
4.4.4	EMS Documentation	100	100	0	0
4.4.5	Control of Documents	100	100	0	0
4.4.6	Operational Control	50	0	100	0
4.4.7	Emergency Preparedness and Response	38	25	25	50
4.5.1	Monitoring and Measurement	100	100	0	0
4.5.2	Evaluation of Compliance	75	50	50	0
4.5.3	Nonconformity, Corrective Action and Preventive Action	100	100	0	0
4.5.4	Control of Records	100	100	0	0
4.5.5	Internal Audits	100	100	0	0
4.6	Management Review	75	50	50	0

Miami-Dade Transit
Metromover Facility
ISO 14001
EMS Case Study

June 2010

Miami-Dade Transit (MDT) Profile

The Miami-Dade Transit (MDT) is the 14th largest public transit system in the United States and the largest one in the State of Florida. MDT delivers transit services to the pubic through the following four transportation modes: Metrobus; Metrorail; Metromover; and, Paratransit.

Metrobus provides bus service throughout Miami-Dade County and some parts of Monroe and Broward Counties, on I-95 routes. The total fleet size of Metrobus is 893 buses. Metrail is a 22.6-mile elevated double-track heavy rail system with 136 vehicles, 22 stations, and 185 daily trips. Metromover is a fully automated people mover transportation system consisting of 4.4 miles of elevated dual-lane track guideway with 21 stations and one maintenance facility. It provides services to a variety of government, businesses, entertainment, and cultural centers in the Central Downtown, Omni, and Brickel Areas. Paratransit is comprised of the Special Transportation Services (STS) program, providing approximately 135,000 trips on a monthly basis. Annual ridership on all modes of MDT transportation is projected to be 114 million. In November 2002, voters approved a one-half percent increase in the sales tax to fund major transportation improvements defined in the People's Transportation Plan (PTP).

MDT's organizational structure is comprised of the Director, a Deputy Director, and eight additional positions responsible for leading distinct functional areas. There are a total of 3,031 budgeted positions in the Department for fiscal year 2008-2009.

In addition, the MDT has three Metrobus repair facilities. These include the Northeast, Central, Coral Way bus maintenance facilities. For these facilities to function efficiently, different operations and processes occur at the site including vehicular fueling (diesel and unleaded gasoline storage), and maintenance operations (waste oil, oily rag, used filter, and new oil storage). These bus maintenance facilities have several buildings and structures, including the Bus Wash, Steam Cleaning Building, Fuel and Cleaning Islands, Maintenance Building, the Transportation Building, and Guard House/Fare Collection.

The William Lehman Center (WLC) serves as MDT's Metrorail repair yard. For the facility to function efficiently, different operations and processes occur at the site including vehicular fueling (diesel and unleaded gasoline storage), and maintenance operations (waste oil, oily rag, used filter, and new oil storage), The WLC has several buildings and structures, including the Vehicular Fueling Island, Maintenance Building, Warehouse Building, a warehouse and light railcar maintenance building (neither are in-service buildings), a train wash booth, a fire pump station, and an electrical substation.

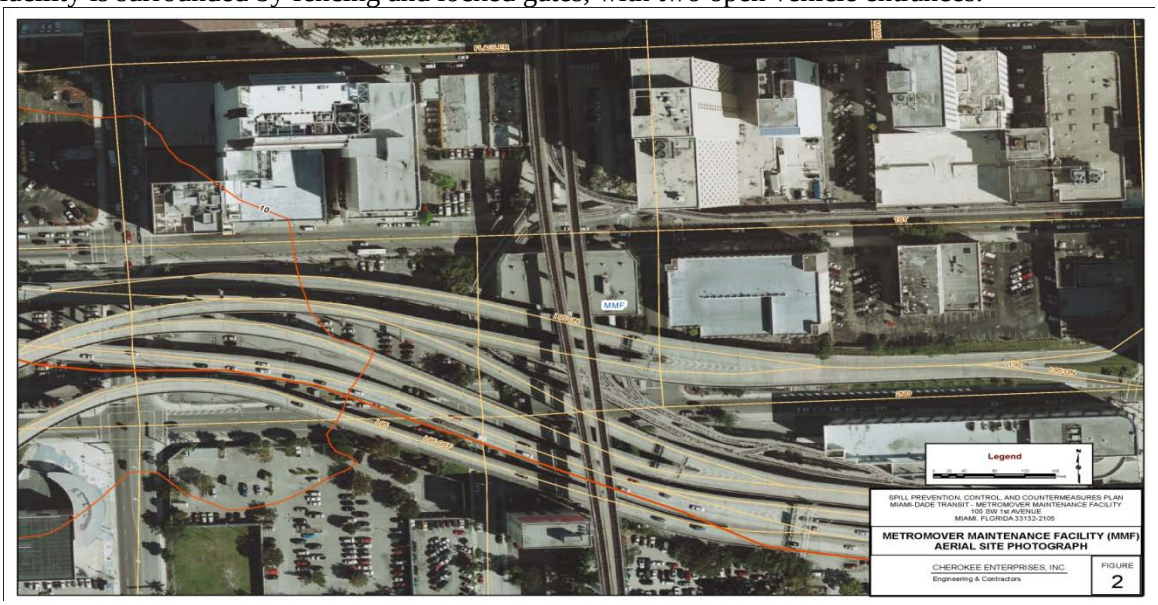
Finally, the Metromover Facility (MMF) serves as MDT's Metromover repair facility. For the facility to function efficiently, different operations and processes occur at the site including maintenance operations (waste oil, oily rag, used aerosol, and new oil storage). The MMF has one bi-level building and two parking lots.

MDT has been committed to achieving its environmental goals by utilizing sound environmental management practices and the organization views the implementation of the ISO 14001 as a way to reinforce its commitment for environmental stewardship and implementing pollution prevention programs and continually improving environmental performance to minimize environmental issues. In addition, the implementation of the ISO 14001 will reinforce MDT's current environmental practices as it starts on a major expansion of metrorail corridor from Earlington Heights Metrorail to the Miami Intermodal Center.

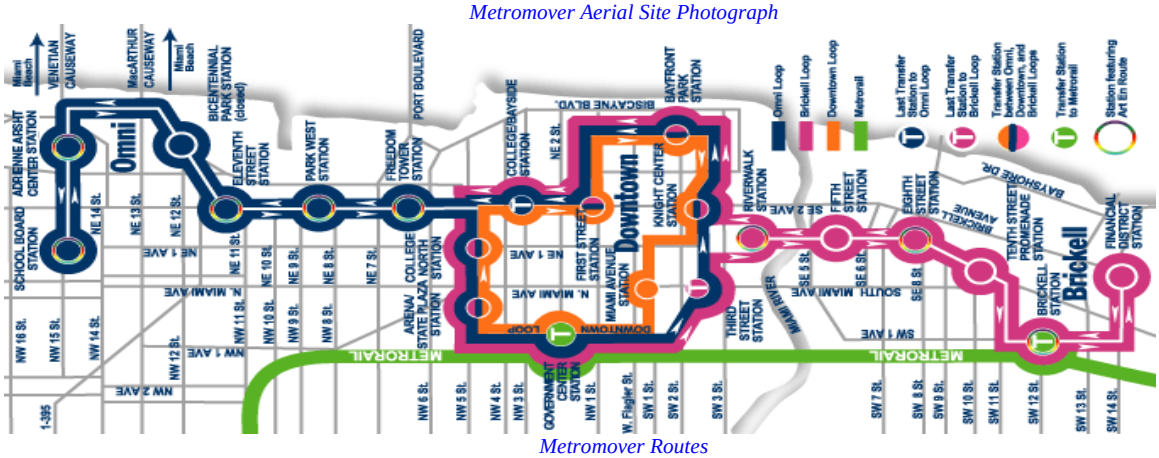
Fence Line

The MDT Metromover Facility (MMF) is situated under several rail and highway overpasses in downtown Miami, Florida. Facility terrain is relatively level and the entire facility encompasses approximately 1.04 acres (property records list the building with a 0.376-acre footprint). The facility is located at 25°46'23.35" degrees north latitude and 80°11'46.57" degrees west longitude.

The surrounding land use, within a one-mile radius, is a mix of commercial and residential properties. The MMF is situated on oolitic limestone in the Miami Oolite formation and the U.S. Fish and Wildlife Service classify its land use as “uplands”, i.e., neither wetlands nor deepwater habitat. According to topographic data, the facility is on flat terrain, about 10 feet above sea level, with area drainage assumedly having an overall bias to the south, to the Miami River. However, four storm water drainage inlets are located in the facility’s parking lots, and they provide drainage for the majority of the facility (excluding the exterior of the building). The MMF has one bi-level building and two parking lots. Petroleum products are stored aboveground inside the loading dock, the lower-level corridor, and the upper level maintenance area. The two parking lots occupy the majority of the facility’s remaining area, with some concrete walkways, compacted gravels, grass, and low-lying vegetation in between. The perimeter of the facility is surrounded by fencing and locked gates, with two open vehicle entrances.



Metromover Aerial Site Photograph



Metromover Routes

Core Team

The EMS core team is made up of the following MDT personnel:

Title/Position/Role/	Responsibilities in the Environmental Management System (EMS)
Director * *Mr. Harpal Kapoor, P.E.*	• Endorses the MDT Corporate Environmental Policy. • Assures all department areas are committed to continual improvement in environmental performance. • Supports the development and continued implementation of the overall EMS program. • Participates in a Management Review of MDT's EMS.
Manager of Materials * *Mr. Freeman Wright*	• Documents procedures and Standard Operational Procedures (SOPs) pertaining to operations (handling, shipping and receiving, and hazardous waste handling). • Assures delivery, transport, handling and storage of all materials on-site is done accordingly to regulatory guidelines, directives, and EMS requirements.
Manager of Training * *Ms. Vivian Urchdorf*	• Ensures complete training of employees in the environmental policy and SOPs as specified in the training procedures. • Collaborates with the EMS Coordinator on the development of training needs and programs. • Facilitates internal communication of EMS elements according to the Communication Procedure. Coordinates with Security to facilitate external communication of EMS elements according to the Communication Procedure.
Manager of Environmental Protection ** *** *Mr. Akbar Sharifi, P.E.*	• Develops, implements, and maintains MDT's EMS. • Ensures the Environmental Office activities meet the environmental regulations, permit conditions, terms, and policies. • Ensures EMS Procedures and SOPs are established, maintained, and followed. • Reviews non-conformances generated by the internal audit process. • Implements and verifies corrective and preventive action plans when required. • Communicates the status of the EMS to the Sr. Mgmt. for the purposes of improvement. • Ensures overall maintenance of the MDT's EMS, including the update and maintenance of: ➢ The Environmental Policy ➢ Environmental Aspects and Significant Aspects ➢ Maintenance of legal and other requirements ➢ Evidence of progress towards objectives and targets ➢ Environmental Management Programs (EMPs) ➢ Environmental Department procedures and SOPs ➢ Environmental Compliance Manual ➢ Pollution Prevention Plan ➢ Forms and environmental records

Facilities Maintenance Manager ** *Mr. Mario Rodriguez* *Mr. Steve Chayt*	• Ensures the Facility Maintenance department activities meet the environmental regulations, permit conditions, terms and policies. • Ensures the EMS SOPs are established, maintained, and followed.
Supervisors ** *** *Mr. Steve Alvarez*	• Communicates employee feedback on the Environmental Policy. • Trains and communicates pertinent SOPs to the employees of their respective areas. • Ensures employees in their respective areas have the training and tools to meet the requirements of the procedures.
Employees	• Performs assigned tasks in accordance with the regulations, the Environmental Policy, pertinent procedures and SOPs. • Communicates concerns to the supervisor regarding the performance of tasks, in accordance to the above listed requirements.
Internal Auditors / Audit Team *** *Mr. Akbar Sharifi, P.E.* *Mr. Adien Toledo*	• Performs audits according to a specific audit plan or schedule. • Conducts internal audits of the MDT, comparing against procedural requirements and the ISO 14001 standard. • Reports the results of the audits to the Manager of Safety and Environmental Protection.
Environmental Team *** *Mr. Akbar Sharifi, P.E.* *Mr. Adien Toledo*	• Represents each operational area during the Environmental Team Meetings. • Identifies MDT's Environmental Aspects, Significant Aspects, Objectives and Targets. • Facilitates the initial drafts of MDT's procedures, SOPs and other elements of the EMS.
Public Safety Officer ** *Mr. Eric Muntan*	• Notifies the Manager of Environmental Protection and Manager of Security in reference to environmental emergencies. • Transfers external calls to the Environmental Office in reference to environmental inquiries and complaints.
Manager of Construction ** *** *Mr. Surinder Sahota, P.E.*	• Ensures construction activities meet the environmental regulations permit conditions, terms and policies. • Ensures the EMS procedures are established, maintained, and followed.
Manager of Contract Procurement ** *Mr. Fred Shields*	• Ensures contractor support of EMS policies through contractual obligations. • Documents SOPs pertaining to purchasing materials and/or services with environmental impacts.

KEY ROLES

* SENIOR MANAGEMENT STAFF
** MANAGEMENT REPRESENTATIVE
*** ENV TEAM

Key Drivers

MDT's most significant programs/initiatives planned for the next couple of years include new programs to improve customer service, maximize revenue, renew infrastructure, and increase transit efficiency and effectiveness. MDT's management team continually sets its strategic objectives by establishing sound management and operation policies, and establishing performance measures and targets. MDT's overall environmental policy provides a roadmap for the Department to improve and protect the environment and the health and safety of our employees, customers and the general public. As a result, MDT has adopted the ISO 14001 standards for implementation of an Environmental Management System (EMS).

Significant Aspects and Impacts

The MDT has established and maintained a procedure to identify the environmental aspects of its activities, products and services and to determine which aspects have or can have significant impacts on the environment. Environmental aspects are determined by analyzing the inputs and outputs relating to current and past activities, products and services. The cause and effect relationship between environmental aspects and impacts means that once aspects have been identified, the impacts that result from these aspects can be determined.

The Miami-Dade Transit (MDT) Environmental Management System (EMS) team has developed the following environmental aspects and impacts including **four (4) Significant Aspects/Impacts (SA/I)**. These include:

- **Used Oil (SA/I)** - Filling, Storing and Removing Used Oils from 200-Gallon AST
- **Fluorescent Lamp/Used Ballast** - Replacing Fluorescent Bulb as needed, and replacing Light Ballasts (an electrical component used with a fluorescent bulb or mercury vapor lamp or arc lamp)
- **Aerosol Cans (SA/I)** - Parts Cleaners, Paints, Coating, Lubricant, etc.
- **Motor Oil (SA/I)** - Lubricant Engine Oil (SAE 30) – stored in 55-gallon drums.
- **Tires** - Changing New and Used Tires – Tires used to guide the Metro Mover in its tracks. Tires are changes once every 90,000 miles (approximately once every 2 years)
- **Industrial Waste Treatment (SA/I)** - Oil/Water Separator
- **Air Compressor Oil** - Changing Air Compressor Oil – used on train brakes. ½-quart of oil is changed once every 3 months.
- **Differential Oil** - Changing Differential Oil – used on tire axel. Approximately 22-pint or 3 gallons of oil is drained during oil changing process and transferred to a small bucket, and ultimately into a 55-gallon drum.
- **Train HVAC Filter** - Replace Train HVAC Filter. Filters are washed every 3 months and changed once a year.
- **Train Batteries** - Battery Servicing (Emergency Light for the Trains) – seal gel battery, which is maintenance free and is changed once every 5 years.
- **Flash Light/Lantern Battery** – power source for the flash light providing light source during maintenance activity in areas not visible by regular light.
- **Used Air Filters** - Preventative Maintenance on Air Compressors
- **Filters** - Office Heat & A/C Units
- **Electricity** - Office Heat & A/C Units (including various Train Stations)
- **Freon** - Office Heat & A/C Units
- **Belts** - Preventative Maintenance of A/C Chillers

- **Water** - Preventative Maintenance of A/C Chillers
- **Freon** - Preventative Maintenance of A/C Chillers
- **Bio-Hazard Waste** - Human Waste Clean-up
- **Absorbent Pads** - Spill Clean Up
- **Socks/Rags** - Spill Clean Up
- **Cleaners** - Interior and Exterior Cleaning
- **Sludge** - Pumping out OWS

Objectives and Targets

The following table outlines the objectives and targets of some of the main aspects:

Summary					
Aspect	**Objective**	**Target**	**Performance Indicator**	**Projected Complete Date**	**Progress Status Corrective Action**
5. Aerosol Cans	1.Reduce waste generation 2.Document handling and recycling of waste	1.Establish process control to reduce waste by 5% 2. Implement Standard Operating Procedures (SOPs).	Receipts and Benchmarking	December 31, 2009	Purchased and implemented aerosol cans crusher equipment. In addition, implemented a strict SOP for Aerosol Cans Management.
6. Fluorescent Tube and Ballast	1.Reduce waste generation 2.Document handling and recycling of waste	1.Establish process control to reduce waste by 5% 2. Implement Standard Operating Procedures (SOPs).	Receipts and Benchmarking	December 31, 2009	Purchased and implemented light bulb crusher equipment. In addition, implemented a strict SOP for Fluorescent Tube and Ballast Management.
7. Used Oil (i.e., filling, storing, transferring and removal of used oil from the 200-gallon abovegrou nd storage tank)	-Reduce and/or prevent any oil spill -Document handling and recycling of used oil	1.Update Spill Prevention, Control & Countermeasure (SPCC) Plan 2.Implement Standard Operating Procedures (SOPs) for Used Oil Management 3.Provide training to facility personnel	Monitor/document any spill events	1.December 3, 2009 2.February 10, 2010 3. May 20, 2010	1. Completed and implemented the SPCC Plan. 2. Implemented a strict SOP for Used Oil Management. 3. Completed the SPCC training.
8. Fresh Oil	-Reduce and/or prevent any oil spill -Document handling and recycling of used oil	1.Update Spill Prevention, Control & Countermeasure (SPCC) Plan 2.Implement Standard Operating Procedures (SOPs) for Fresh Oil Management 3.Provide training to facility personnel	1.Monitor/document any spill events 2.Documented records of inspections and testing	1.December 3, 2009 2.August 31, 2009 3.February 10, 2010 4. May 20, 2010	1. Completed the SPCC Plan. 2. Secondarily contained berm has been set up for the 55-gallon drums. 3. Implemented a strict SOP for Fresh Oil Management. 4. Completed the SPCC training.

5.Chlorofluorocarbons (CFCs) Management (i.e., refrigerant, coolant or freon)	Reduce CFC emission into the air	Train technicians to properly manage, service, and document all CFC's that are removed from a refrigeration unit for recharging or equipment disposal	Training records	1.May 20, 2010 2. February 10, 2010	1. Completed the SPCC training. 2. Implemented a strict SOP for CFC Management.
6. Used Tires	1.Reduce waste generation 2.Document handling and recycling of waste	1.Establish process control to reduce waste by 5% 2. Implement Standard Operating Procedures (SOPs).	Receipts and Benchmarking	February 10, 2010	1. Implemented a strict SOP for Used Tires Management.
7. Industrial Wastewater Treatment (i.e., Oil/Water Separator)	Reduce and/or prevent industrial wastewater discharges	1. Establish baseline for facility industrial wastewater discharge system. 2. Complete evaluation of effectiveness existing system. 3. Document and implement operational controls. 4.Document Best Management Practices (BMPs)	Monitor/document any discharges	1, 2, 3 & 4 - December 31, 2009 5.February 10, 2010	1. Established baseline document. 2. Completed evaluation of effectiveness of existing system. 3. Documented and implemented operational controls. 4. Documented BMPs as part of the Spill Prevention, Control and Countermeasure (SPCC) plan. 5. Implemented a strict SOP for Industrial Waste Management.
8. Used Rags and Cotton Gloves	Properly dispose of contaminated rags and absorbents	Eliminate disposal of contaminated rags and absorbent pads in the landfill	Number of drums picked up by contractors and invoice records	February 10, 2010	Implemented used rag recycling program and a strict SOP for used rag/cotton gloves Management.
9. Used Batteries	Reduce amount of batteries used	Reduce usage by 5%	Monitor the amount of batteries used and train employees	February 10, 2010	Battery recycling program has started and recycling container has been set up in front of the stock room. In addition, implemented a strict SOP for Used Batteries Management.
10. Office and Shop Recyclables	Recycle plastic, aluminum, cardboard, paper, scrap metal, printer & copier cartridges	Provide recycling bins and containers in offices and shop areas	Receipts, recycling vendor sign-in sheets, and employee training	February 10, 2010	Recycling bins for paper and cardboard have been set up in front of the manager's office. In addition, implemented a strict SOP for Office and Shop Recyclables Management.

11.Facility Electricity Reduction	To reduce the amount of electricity used at the Maintenance Shop and Mover Stations	Install new lighting fixtures in shop & office areas that are 25% to 30% more efficient. In addition, reduce overall electricity 5% by 2014 and 20% by 2025	Electrical Bills, train employees, facility assessment	December 31, 2010	Some light bulbs are being replaced. In addition, facility assessment is being in the process of completion.

Benefits of Adopting an EMS

After adopting and implementing the EMS, the MDT will realize the following benefits:

- Reduction and/or prevention of any spill.
- Formalization of Standard Operating Procedures (SOPs).
- Implementation of Best Management Practices (BMPs).
- Reduction of waste.
- Reduction of electricity consumption.
- Increased employee awareness of environmental issues.
- Increased management awareness.
- Increased compliance with regulations.
- Implementation of formal pollution prevention training program.

Resources

Cost	Amount
Total Labor (internal) Determined by an average of the hourly rate of all employees involved in developing and implementing the EMS manual over a period of approximately 1-1/2 year. This includes bi-weekly meetings, site visits, management review meetings, training, gap and final audits. 2,260 hrs x $50/hr. = $113,000.00	$113,000.00
Consultant(s) 610 hrs x $90/hr. = $54,900.00	$54,900.00
Travel	N/A
In-kind contributions from outside organizations (please describe)	N/A
Materials (e.g. promotional materials, software, please describe) Newsletter	$500.00

Total Hours = 2,870 hours
Total Labor Cost = $167,900.00

Cost Savings

For example, for the past six (6) months, MDT has realized a reduction of aerosol cans usage by 11%, which can translate to a cost saving of approximately $10,000 in labor and material. In addition, the MDT has realized a reduction of freon usage from 376 lbs in 2008/2009 to 26 lbs as of May 2010. However, as an overall cost saving evaluation, the MDT is in the process of gathering the cost saving data associated with implementation the EMS.

Next Steps

MDT has successfully implemented an EMS at the Metromover facility. As a result, MDT is seeking to obtain a full certification by an independent ISO 14001 certification body. In addition, MDT is seeking to further expand it ISO 14001 standard to each of the three (3) bus maintenance facility and one (1) rail maintenance facility.

Management Commitment

The MDT EMS team along with senior management is in the process of establishing an EMS program at the MDT Metromover Facility. MDT's overall environmental policy provides a roadmap for the Department to improve and protect the environment, health and safety of our employees, customers and the general public. The Department is committed to achieving its environmental goals by integrating all aspects of its operations with sound environmental management practices. These include:

- Exceed compliance with all applicable local, state, and federal environmental regulations through best management practices;
- Establish waste minimization and pollution prevention programs to prevent or reduce impacts to the environment;
- Establish management system and control for environmental compliance assurance and risk/liability management;
- Streamline operations and management system by periodically evaluating achievement of targeted environmental objectives; and;
- Provide continuous training, and communicate environmental policies and programs to employees.

The Department is committed to implementing pollution prevention programs and continually improving environmental performance to minimize environmental issues. The Environmental Policy will be communicated to all employees and available to the Public via the Department website.

Miami-Dade Transit Audit Report

This Environmental Management System (EMS) Audit was based on a request by the Federal Transit Administration (FTA) as a final follow-up to an eighteen month program for EMS development and was conducted in accordance with the approved schedule.

W. Robert Herbert, Principle Contractor and ISO 14001 certified Lead Auditor with Virginia Tech, conducted the EMS Audit for the Miami-Dade Transit on June 21 and 22, 2010, to report on its conformance with the requirements of the ISO 14001:2004 standard.

The EMS was evaluated against each of the requirements set out in the ISO 14001:2004 standard titled "Environmental management system – General guidelines on principals, systems and support techniques." The Audit included the examination of documents, interviews of personnel and observations of activities and conditions.

The site visit involved a review of the core EMS documents with the EMS team. The Miami-Dade EMS Team participated in the review and discussion regarding the scoring.

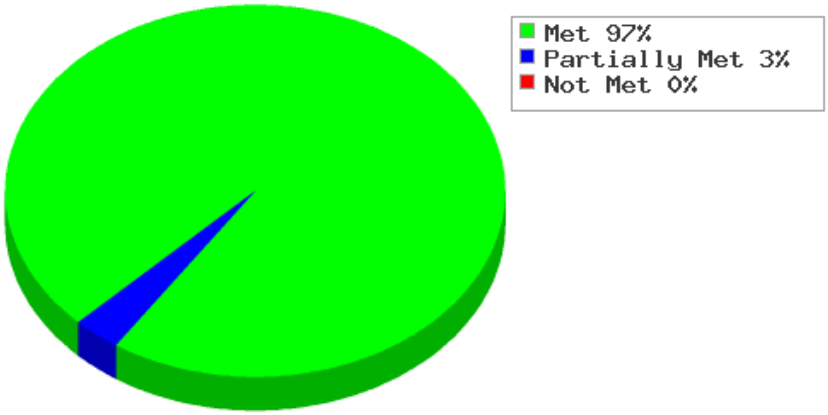
The following scores are the result of the EMS Assessment:

Detailed scoring on next page

Miami-Dade Transit - Overall EMS Performance Results

This section compares the percentage of requirements *met, partially met and not met* with respect to meeting the requirements of an EMS as specified in the ISO 14001:2004 standard. The following scores are the result of the EMS audit presented in this report:

Percent meeting all requirements **"Overall Score"**	**99%**
Percent of requirements **"Met"**	**97%**
Percent of requirements **"Partially Met"**	**3%**
Percent of requirements **"Not Met"**	**0%**



	The ISO 14001:2004 standard elements of an EMS	Overall Score (%)	Met (%)	Partially Met (%)	Not Met (%)
4.1	General Requirements	100	100	0	0
4.2	Environmental Policy Requirements	100	100	0	0
4.3.1	Environmental Aspects Requirements	100	100	0	0
4.3.2	Legal and Other Requirements	100	100	0	0
4.3.3	Objectives, Targets and Programs Requirements	100	100	0	0
4.4.1	Resources, Roles, Responsibility and Authority	100	100	0	0
4.4.2	Competence, Training and Awareness	93	86	14	0
4.4.3	Communication	100	100	0	0
4.4.4	EMS Documentation	100	100	0	0
4.4.5	Control of Documents	100	100	0	0
4.4.6	Operational Control	100	100	0	0
4.4.7	Emergency Preparedness and Response	100	100	0	0
4.5.1	Monitoring and Measurement	100	100	0	0
4.5.2	Evaluation of Compliance	100	100	0	0
4.5.3	Nonconformity, Corrective Action and Preventive Action	100	100	0	0
4.5.4	Control of Records	100	100	0	0
4.5.5	Internal Audits	100	100	0	0
4.6	Management Review	83	67	33	0

Profile

The Worcester Regional Transit Authority is a political subdivision of the Commonwealth of Massachusetts. It is responsible for public transit services in thirty-five (35) communities within the Central Massachusetts region, and is funded with Federal, State and local subsidies, as well as farebox revenue.

The WRTA maintains a fleet of 47 buses for 23 fixed routes in Worcester and 10 of the surrounding communities. The WRTA also provides paratransit service for the elderly and disabled in the region, in addition to a variety of special services for elderly and disabled residents in the entire service area.

The WRTA was created pursuant to Massachusetts General Laws, Chapter 161B. The WRTA is prohibited, by the provisions of Section 25 of Chapter 161B, from directly operating transit service; thus, all fixed-route services, are provided by a subcontractor.

The WRTA has four employees with its subcontractor employing 165 personnel in maintenance, transportation, customer service and administration. Of the 165 employees, 146 are members of the Amalgamated Transit Union Local 22.

More information on the Worcester Regional Transit Authority can be found at www.therta.com.

Fenceline

The Environmental Management System applies to all WRTA facilities, rolling stock, equipment, land and personnel. The initial seven significant aspects are based in the main WRTA office and maintenance facility at 287 Grove Street, but not all of the significant aspects have impacts contained to the facility.

Vehicle idling takes place both on the facility and while a bus is in service outside the facility. Spills can also occur outside the facility during normal operations. By expanding our fenceline beyond 287 Grove Street, we have made ourselves able to effectively monitor, assess and improve the impacts that WRTA activities have not only at our facility, but in the communities we serve.

Core Team

The EMS Core Team consists of seven full time members (from left to right): John Carney, General Manager, Troy Senosk, Parts and Environmental Coordinator, Tom Coyne, Assistant Administrator, Ahmad Yasin, Maintenance Manager, George Mayo, Safety, Security & Training Manger, Stephen O'Neil, Administrator, and Sarah Chiasson, Quality Control and Environmental Coordinator, (not pictured).

Key Drivers for Adopting an EMS

Key drivers that lead to the adoption and implementation of an EMS included the following:

- A desire to become better environmental stewards of the natural and built environment.
- A report prepared by Clark University undergraduate students critical of how the WRTA was not protecting the environment while discharging its duties.
- A desire to save valuable operational funding by implementing and EMS.
- A desire to impress the Environmental Protection Agency and the Massachusetts Department of Environmental Protection just how serious the WRTA considers regulatory compliance.

Significant Aspects and Impacts

The EMS Core Team chose the significant aspects by evaluating 113 identified aspects and their impacts through a three step process. All relevant aspects were first evaluated based on their environmental and business significance to achieve a balanced assessment of their overall impact. Those aspects scoring the highest along with any other aspect the EMS Core Team wanted to assess further were then reassessed based on the following indicators:

- Cost of changing impact
- Ease of changing impact
- Effect on Sustainability
- Immediate impact on Environment.

The core team then assessed the procedures that would need to take place to address an aspect and consolidated those aspects which would be affected by a single process.

After this assessment the following seven aspects were chosen:

Activity / Product / Service	Aspect	Impacts
Changing Engine Oil & Transmission Oil	Used Oil & Transmission Oil	Soil and groundwater pollution.
Vehicle Idling	Exhaust, Noise	Air pollution, Fuel consumption, Noise pollution.
Drums	Solid Waste & Hazardous Waste	Air, soil, surface water and ground water pollution associated with landfills
Spill Clean Up	Used Absorbent Pads, Socks, and Stay Dry	Air, soil, surface water and ground water pollution associated with landfills
Cleaning Miscellaneous Parts	Degreaser, Safety Kleen Solvent	Air, soil and groundwater pollution
Major Body Repair	Spray Gun, Paint Filter	Air, soil, surface water and ground water pollution associated with landfills
Office Activities	Paper	Air, soil, surface water and ground pollution associated with landfills

Objectives and Targets 2009

Aspect	Objectives & Targets	Program Plan
Cleaning Miscellaneous Parts	Objective: Reduce use by 50% of degreaser and Safety Kleen Solvent by converting to alternatives Target: 100% training no later than 11/1/10	• Develop Standard Operating Procedure • Post and disseminate SOP to all maintenance personnel • Develop or ascertain training program • Complete 100% of training • Develop daily and weekly observation checklist to observe compliance
Hazardous Fluids	Objective: Prevent used hazardous fluids from migrating into soil and groundwater Target: 100% training no later than 11/1/10	• Develop Standard Operating Procedure • Post and disseminate SOP to all maintenance personnel • Develop or ascertain training program • Complete 100% of training • Develop daily and weekly observation checklist to observe compliance

Major Body Repair	Objective: Prevent spillage of used paint waste and solvents into soil and groundwater Target: 100% training no later than 11/1/10	• Develop Standard Operating Procedure • Post and disseminate SOP to all maintenance personnel • Develop or ascertain training program • Complete 100% of training • Develop daily and weekly observation checklist to observe compliance
Monitoring Drums	Objective: Insure the proper handling, disposal, and documentation of all hazardous and solid waste Target: 100% training no later than 11/1/10	• Develop Standard Operating Procedure • Cordon off Drum Storage Area and label drum Hazardous Waste • Post and disseminate SOP to all maintenance personnel • Complete 100% of training • Develop daily and weekly observation checklist to observe compliance
Office Activities	Objective: Implement a recycling program and reduce the amount of office supply waste Target: Implement a process to increase the amount of recycled materials no later than 11/1/10	• Select a recycling TEAM • Conduct a waste audit • Decide what to recycle • Select collection contractor • Design collection system • Develop and disseminate SOP
Spill Clean Up	Objective: Insure proper handling, disposal and documentation of used absorbent pads, socks and Stay Dry Target: 100% training no later than 11/1/10	• Develop Standard Operating Procedure • Post and disseminate SOP to all maintenance personnel and Street Supervisors • Develop or ascertain training program • Complete 100% of training • Develop daily and weekly observation checklist to observe compliance
Vehicle Idling	Objective: Comply with M.G.L Chapter 90 section 16A – Stopped Motor Vehicles; Operation of Engine; Time Limit; Penalty Target: 100% training no later than 11/1/10, Increase average MPG of fleet	• Develop Standard Operating Procedure • Post and disseminate SOP to all employees authorized to operate company vehicles • Develop or ascertain training program • Complete 100% of training • Develop daily and weekly observation checklist to observe compliance. To include monitoring fleet MPG

Benefits and Results of Adopting an EMS

The WRTA has realized numerous benefits from its EMS including:

- By involving union representation on the core team, and by appealing to its employees' desire for a pollution free environment, the WRTA was able to achieve organizational buy in.
- Formalized policies and procedures with greater accessibility.
- Improved relations and better compliance with regulatory agencies
- Cost savings.
- Increased environmental awareness.
- Pollution prevention.

Resources

The number of hours associated with the development and implementation of the WRTA EMS from January 27, 2009 – March 31, 2010 are listed below

EMS Core Team:	1190 hours
Total Labor	$46,606

Cost Savings or Avoidance

Two of our current aspects are expected to produce cost savings: Vehicle Idling and Cleaning Miscellaneous Parts. Another aspect, Office Activities (recycling) is expected to produce savings but accurate calculations are not available.

Vehicle idling burns approximately one half gallon of diesel fuel per hour. For every 5 minutes of reduced idling the WRTA expects to burn 375 less gallons of fuel and save $1,500.

The WRTA discontinued the use of Safety Kleen products to clean miscellaneous parts. Five alternative parts washers that use soap and hot water were purchased using capital funds at a cost of $6,000. The annual savings to the WRTA operational budget is expected to be $7,200.

By implementing a recycling program, much of the waste that would normally end up in the trash dumpster is being recycled. Recycling is more cost effective than regular trash disposal, and by increasing the amount of non-recycled waste, we will be able to decrease the amount of regular trash. This will allow us to use a smaller trash dumpster and lead to cost savings.

Next Steps

Continue to refine and improve the EMS and seek ISO 14001 Certification before the end of the calendar year. The WRTA intends on constructing a new bus hub facility and a maintenance and operations facility and lessons learned now will be brought forth to these new facilities.

Management Commitment

"The WRTA is fully committed to the implementation of the EMS. The WRTA's Advisory Board approved the EMS policy in August 2009 and senior management met with abutters to review the EMS plan. Moreover, senior management is committed to seeking ISO 14001 certification."

Stephen O'Neil, WRTA Administrator

Worcester Regional Transit Authority Audit Report

This Environmental Management System (EMS) Audit was based on a request by the Federal Transit Administration (FTA) as a final follow-up to an eighteen month program for EMS development and was conducted in accordance with the approved schedule.

W. Robert Herbert, Principle Contractor and ISO 14001 certified Lead Auditor with Virginia Tech, conducted the EMS Audit for the Worcester Regional Transit Authority on June 7 and 8, 2010, to report on its conformance with the requirements of the ISO 14001:2004 standard.

The EMS was evaluated against each of the requirements set out in the ISO 14001:2004 standard titled "Environmental management system – General guidelines on principals, systems and support techniques." The Audit included the examination of documents, interviews of personnel and observations of activities and conditions.

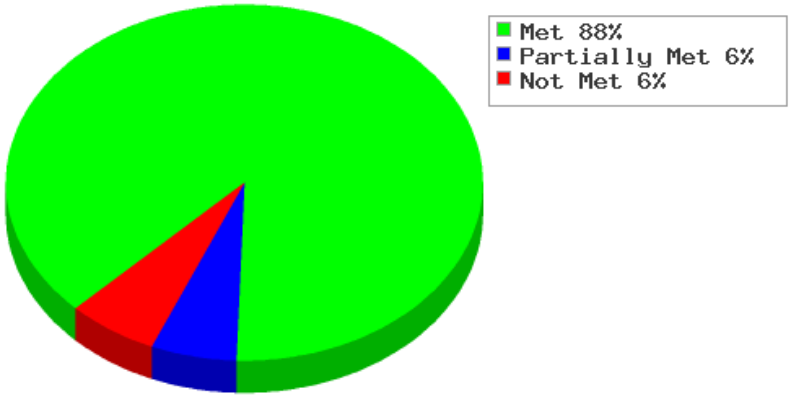
The site visit involved a review of the core EMS documents with the EMS team. The WRTA EMS Team participated in the review and discussion regarding the scoring.

Detailed scoring on next page

WRTA - Overall EMS Performance Results

This section compares the percentage of requirements *Met, Partially Met and Not Met* with respect to meeting the requirements of an EMS as specified in the ISO 14001:2004 standard. The following scores are the result of the EMS audit presented in this report:

Percent meeting all requirements **"Overall Score"**	**91%**
Percent of requirements **"Met"**	**88%**
Percent of requirements **"Partially Met"**	**6%**
Percent of requirements **"Not Met"**	**6%**



	The ISO 14001:2004 standard elements of an EMS	Overall Score (%)	Met (%)	Partially Met (%)	Not Met (%)
4.1	General Requirements	100	100	0	0
4.2	Environmental Policy Requirements	95	90	10	0
4.3.1	Environmental Aspects Requirements	100	100	0	0
4.3.2	Legal and Other Requirements	100	100	0	0
4.3.3	Objectives, Targets and Programs Requirements	100	100	0	0
4.4.1	Resources, Roles, Responsibility and Authority	100	100	0	0
4.4.2	Competence, Training and Awareness	64	29	71	0
4.4.3	Communication	100	100	0	0
4.4.4	EMS Documentation	100	100	0	0
4.4.5	Control of Documents	100	100	0	0
4.4.6	Operational Control	100	100	0	0
4.4.7	Emergency Preparedness and Response	100	100	0	0
4.5.1	Monitoring and Measurement	100	100	0	0
4.5.2	Evaluation of Compliance	50	50	0	50
4.5.3	Nonconformity, Corrective Action and Preventive Action	63	63	0	38
4.5.4	Control of Records	100	100	0	0
4.5.5	Internal Audits	100	100	0	0
4.6	Management Review	67	50	33	17

Central Florida Regional Transportation Authority

d.b.a. LYNX

ISO 14001

EMS Case Study

June 2010

LYNX

Profile

The Central Florida Regional Transportation Authority d.b.a. LYNX is the public transportation provider for Orange, Seminole and Osceola counties. The agency started in 1931 as the Orlando Transit Company and eventually became LYNX in 1992.

LYNX won national recognition in 1996 and 1998 as the Outstanding Public Transportation System in the United States. The agency currently operates out of three locations; The LYNX South Street Operations Center opened in July 1974; LYNX Central Station opened in November 2004 as a futuristic Downtown Inter-modal Transportation Center and the LYNX Operations Center opened in August 2007 serving as the center hub for LYNX Operation and Maintenance.

LYNX service area stretches over 2,500 square miles, making it one of the largest in the nation operating 790 miles of fixed routes. That does not include the morning and afternoon Express Service it runs for commuters from nearby Lake and Volusia counties.

LYNX has broken ridership records 24 times in the last 25 years.

In August of 2007, LYNX celebrated the 10th anniversary of LYMMO, the first fully-functional Bus Rapid Transit (BRT) system in the United States.

LYNX FAST FACTS

Service area: Orange, Osceola and Seminole counties	
Population of service area:	1.83 million
Size of service area:	2,500 square miles
Operating budget:	$113,807,706
Operating expense per passenger mile:	$0.47

Fleet Fast Facts

Number of buses:	267
Number of fixed-route links:	65
Number of bus stops in system:	4,347
Average miles fleet travels per day:	51,886
Average miles per bus per year:	68,000
Diesel fuel used in average year:	4 million gallons
Miles per gallon per bus:	3.9 mph

Ridership Fast Facts

Weekday average passenger count:	83,538
Breakdown of ridership:	51 % female; 49 % male
Percentage of riders using bus to get to work:	73
Percentage of riders with no other form of transportation:	40
Percentage of riders who use the bus more than five times a week:	68

Para transit Fast Facts

Passenger trips scheduled per day:	2100
Vehicles in use:	126
Operators driving vehicles:	241

Van Pool Fast Facts

Number of vanpools:	65
Number of passengers annually:	200,563
Miles vanpools travel annually:	975,645

Fence Line

LYNX chose the LYNX Operations Center. The LOC is located at 2500 Lynx Lane, Orlando, Fl. 32804 and serves as LYNX largest operating and maintenance facility covering 24.1 acres. The LOC is one of two operating in the Orlando area. LYNX operates approximately 267 buses, 199 of which operate out of the LOC division, seen below. There are 716 employees at the LOC, 460 are bus operators, and 165 are Mechanics and Facilities Techs, 23 Maintenance administrative employees. The operation and maintenance staff are, for the most part, represented by the Amalgamated Transit Union AFL-CIO Local 1596.

Figure 1: Photograph of LYNX Operation Center Facility

Core Team

The core team is made up of four members representing various functions within LYNX.

- Lisa Darnall, Chief Operating Officer (Senior Management Representative)
- Bill Zielonka, Director of Safety, Security and Risk Management (Environmental Champion)
- Steve Robinson, Manager of Facility Maintenance (Operation's Management)
- Janell Thomas, Administrative Specialist for Safety, Security and Risk Management

LYNX chose a diverse team in anticipation of expanding the EMS into other areas of the organization and because these representatives bring to the table a unique set of skills and knowledge that would benefit the implementation of the EMS.

Key Drivers

LYNX, like most organizations, is goal oriented and is committed to maintaining and/or improving our four service standards; Safety, Courtesy, Efficiency and Cleanliness. LYNX efforts surrounding the continual improvement concept are a result of its internal structure and training the workforce on the LYNX philosophy. In addition to the philosophical reason for adopting ISO 14001 standards, LYNX chose to embark on its quality improvement program by implementing an EMS in an effort to be proactive in the organization's environmental compliance obligations.

LYNX recognized the processes outlined in the ISO 14001 standard would provide an improved framework for identifying and correcting areas of potential concern before they became problems. LYNX also saw that the EMS structure would improve its ability to train and communicate the goals and expectations to all employees. As a result of this effort, LYNX identified several key drivers for adopting an EMS which included the following:

- Shift management approach from "reactive" to "proactive"
- Development of better day-to-day management systems
- Creation of a more efficient operational system
- Avoidance of environmental disasters
- Enhanced awareness of employee impact on environment

Significant Aspects and Impacts

The establishment of the key drivers guided the core team's identification and evaluation of significant aspects and impacts. The core team analyzed the organization's activities and evaluated the potential for adverse environmental impacts, the extent of those potential impacts, environmental controls already in place and the ability of LYNX to manage and/or influence those impacts.

The core team initiated an extensive, internal outreach program designed to inform personnel about the EMS program and solicit input and help in identifying potential environmental aspects and their associated impacts. The outreach program included shift meetings, postings and presentations to LYNX management and staff both within and outside the EMS fence line were included in this effort.

Members of the core team then rated each aspect based on ISO 14001 and EMS's established criteria. Each aspect was given a score between one and five. The scores were then averaged and the aspects with the highest scores became the focus of the EMS. The team came up with a list of 51 aspects and rated 10 of them as significant aspects. The list of aspects, with the ten highest scores and rated as significant aspects are identified and listed below:

- Storm Water Run-off (A)
- Diesel Fuel, Loading and Unloading (A)
- Emissions Reduction (A)
- Fluorescent Bulb Disposal (A)
- Oil Water Separator Sludge
- High Intensity Bulb Discharge
- Parts Washer Maintenance Program
- Electricity usage
- Petroleum spills
- Recycling of Office Waste Paper

Objectives and Targets

The team, through the rating process, identified four significant aspects to be covered in the initial EMS focus. The team then established a series of objectives and targets for those four aspects. The following table outlines the objectives, targets and goals for those identified.

Summary					
Aspect	**Objective**	**Target**	**Performance Indicator**	**Projected Complete Date**	**Progress Status Corrective Action**
1. Diesel Fuel Loading & Unloading Tankers	To ensure there are no spills with the fuels, that is utilized at LYNX. Loading & unloading plan and to ensure the trainers, operators, blenders and Shipping / receiving personal are trained.	Have revised SPCC Plan in place and adopted by November 2009. Start training employees in December 2009 Complete all training by February 2010	To train all of our employees in preventing and the containment of spills.	January 2010 May 2010 February 2010	Plan development is in the final stages and to be reviewed and adopted in November. Once adopted, a training program will be put into place for all employees involved.
2. Carbon Emissions	1. To develop a plan to evaluate how long we can shut down the fleet to cut carbon emissions down and save fuel. 2. Completion of the biodiesel blending station and converting 100% of LYNX fleet to B20.	Reduction of carbon emission by 15% through the combined efforts of each program. W.V.U. report to be released in 7/2010	Establishing carbon emission baseline, utilizing the West Virginia University	May 2010	15% reduction in the amount of carbon emissions from the fleet of 267 Buses. 2009/ 2010 by implementing the engine shutdown procedure and converting 100% of the bus fleet to B20 biodiesel.
3. Stormwater runoff	To prevent Stormwater from picking up debris, chemicals, dirt, and other pollutants that flow into a Stormwater sewer system or directly into lakes or streams.	To monitor all systems for leaks daily and to test the water every six months to a year depending on baseline conditions.	Maintain an action plan by establishing a baseline evaluating process and documenting.	November 2009	Water samples have been taken and LYNX now has a baseline. November 2009.
4. Fluorescent Bulbs/Tube	Identify & educate for proper disposal of Fluorescent Bulbs/Tubes	Develop implementation of the plan	Implement and maintain the disposal of fluorescent bulbs/tubes through action plan by establishing a baseline. By 1/01/2010.	October 2009 December 2009 January 2010	Improve training and education of LYNX employees on proper handling of waste (florescent bulbs) generated at the vehicle maintenance garage and upkeep of facilities.

Benefits of Adopting an EMS

The core team regards the process of establishing an EMS program as very productive. The adoption of the EMS program has improved LYNX's ability to anticipate and evaluate potential environmental events and activities that may have associated environmental impacts. With the adoption of its EMS, LYNX has realized the following benefits:

- Increased employee awareness of environmental issues and their direct impact
- Increased management awareness
- Reinforcement of environmental processes currently in place
- Employee involvement and buy-in with EMS implementation
- Proactive management systems
- Documentation of standard operating procedures
- Institutionalization of best practices and permanent improvements of on-time performance
- Training matrix for maintenance and operations
- Database for tracking employee training
- Increased employee initiative
- Increased accountability throughout organization
- Built-in controls
- Increased ability to identify exposure and smaller aspects
- Framework for sustainable growth

Resources

The resources needed to implement the EMS at LYNX are represented below:

Environmental Management Representative:	102.50	hours
Core Team:	417.00	hours
Other:	638.85	hours
Consulting:	0	hours
Total Hours	1158.35	hours
Total Internal Labor Cost	$ 35,561.35	

Estimated Cost Saving

LYNX estimated savings from its four new EMS Aspects implementation:

- Biodiesel Fuel Savings $159,597.00
- Biodiesel Parts Reduction $6,432.00
- Biodiesel Labor Reduction $1,464.00
- Reduction of Engine Idle Time $275,787.00
- Fluorescent Bulb Disposal Reduced Hazardous Waste in Landfills by 3,800 lbs./yr

Total Yearly Cost Savings: $443,280.00

Next Steps

Once the first four significant aspects are underway, LYNX will continue to build on the EMS Program to accommodate all significant aspects and continue all aspects indentified within the fence line.

The management of LYNX is highly committed to the EMS program. The support from top management has contributed greatly to LYNX's overall success with the program. This, coupled with FTA support, has produced a positive and growing experience for the core team as well as all LYNX employees. LYNX as an organization and each individual employee will be able to take pride that providing our core service is a manner that preserves the environment.

LYNX Chief Executive Officer's comments summarize our commitment to continual improvement in environmental leadership:

> "Every day, LYNX bus operators take our customers through our beautiful community. I'm proud of our employees who come to work each day, doing their part to bring a better quality of life to residents, businesses and all those who live and work in our community. This attitude reflects our agency's commitment to the environment and our desire to protect and manage the resources around us. Many of you have heard the phrase, "think globally, act locally," which means that actions to protect our rich, natural heritage begin at home. That is why LYNX is working to further develop its Environmental Management System. This is a proven, effective organizational tool that provides a framework for managing environmental responsibilities so they become more efficient and more integrated into our overall business operations. The EMS is a business management tool for any organization. LYNX' EMS helps managers identify harmful environmental impacts of our projects, services and activities and finds ways to resolve and prevent these impacts. And it allows every employee to take part in preventing problems and promoting environmental sustainability at work and even at home. As we all learn more about our EMS, we will be one step closer to being an environmental management leader in our community…The implementation of an EMS is not just a requirement--it's a good idea. It supports our credentials for providing a good transportation value for a better quality of life."

Central Florida Regional Transportation Authority (LYNX) Audit Report

This Environmental Management System (EMS) Audit was based on a request by the Federal Transit Administration (FTA) as a final follow-up to an eighteen month program for EMS development and was conducted in accordance with the approved schedule.

W. Robert Herbert, Principle Contractor and ISO 14001 certified Lead Auditor with Virginia Tech, conducted the EMS Audit for the Central Florida Regional Transportation Authority (LYNX) on June 23 and 24, 2010, to report on its conformance with the requirements of the ISO 14001:2004 standard.

The EMS was evaluated against each of the requirements set out in the ISO 14001:2004 standard titled "Environmental management system – General guidelines on principals, systems and support techniques." The Audit included the examination of documents, interviews of personnel and observations of activities and conditions.

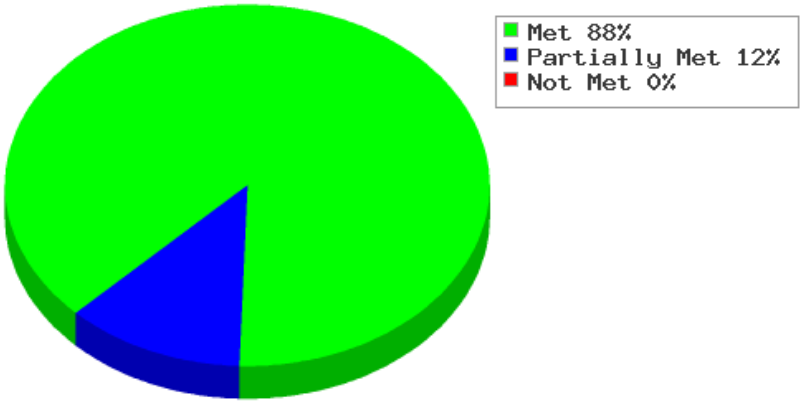
The site visit involved a review of the core EMS documents with the EMS team. The LYNX EMS Team participated in the review and discussion regarding the scoring.

Detailed scoring on next page

LYNX - Overall EMS Performance Results

This section compares the percentage of requirements *Met, Partially Met and Not Met* with respect to meeting the requirements of an EMS as specified in the ISO 14001:2004 standard. The following scores are the result of the EMS audit presented in this report:

Percent meeting all requirements **"Overall Score"**	**94%**
Percent of requirements **"Met"**	**88%**
Percent of requirements **"Partially Met"**	**12%**
Percent of requirements **"Not Met"**	**0%**



	The ISO 14001:2004 standard elements of an EMS	Overall Score (%)	Met (%)	Partially Met (%)	Not Met (%)
4.1	General Requirements	100	100	0	0
4.2	Environmental Policy Requirements	100	100	0	0
4.3.1	Environmental Aspects Requirements	100	100	0	0
4.3.2	Legal and Other Requirements	100	100	0	0
4.3.3	Objectives, Targets and Programs Requirements	100	100	0	0
4.4.1	Resources, Roles, Responsibility and Authority	90	80	20	0
4.4.2	Competence, Training and Awareness	57	14	86	0
4.4.3	Communication	100	100	0	0
4.4.4	EMS Documentation	100	100	0	0
4.4.5	Control of Documents	100	100	0	0
4.4.6	Operational Control	100	100	0	0
4.4.7	Emergency Preparedness and Response	100	100	0	0
4.5.1	Monitoring and Measurement	100	100	0	0
4.5.2	Evaluation of Compliance	100	100	0	0
4.5.3	Nonconformity, Corrective Action and Preventive Action	94	88	13	0
4.5.4	Control of Records	100	100	0	0
4.5.5	Internal Audits	75	50	50	0
4.6	Management Review	75	50	50	0

City of Asheville - Asheville Transit Operations
EMS Case Study 2010

Profile

The City of Asheville, located in Buncombe County, North Carolina, is the largest municipality within the only metropolitan area in Western North Carolina (Asheville's population is about 70,000 and Buncombe County about 230,000). As the central municipality the City of Asheville plays a leadership role in the direction of Western North Carolina. This region is known for having the highest mountains on the east coast (6000 ft), a beautiful leaf season and numerous waterfalls.

Asheville, NC, has received national prominence for the location of the Biltmore Estate; the largest single family home ever built in the United States. The Grove Park Inn is a classic hotel. Asheville is the closest large city to the nation's most visited National Park, Smokey Mountain National Park.
In 1889 Asheville was the second city in the United States to start using the new electric trolleys and maintained the second most extensive electric trolley in the state of NC up until the 1920's with about five million riders a year.

This historic electric trolley system was changed to buses in the 1940's like many systems across the United States. The City of Asheville took over responsibility for the transit service from an authority in 1999. Today the Asheville Transit operates 22 routes with 21 buses to areas within the city limits except for one Intercity route which serves the neighboring town of Black Mountain. All routes leave from the Transit Center. Asheville Transit serves about 1.5 million

riders a year (5000 per day). These services are operated out of one maintenance facility by the following staff; three city staff planners, 41 drivers, 7 dispatchers, and 9 maintenance personnel.

Ridership on Asheville Transit has grown an average in excess of 10% each year since 2003 while population has seen only a 1.25% growth. The systems transportation infrastructure has not kept pace the needs. In October 2009, the City Council approved the city's first ever transit master plan. This plan will provide guidance for the next ten years of system growth and infrastructure development.

Asheville Transit is managed as part of the City of Asheville Transportation Department. Asheville Transit is advised by the Transit Commission, a board of seven citizens appointed by City Council. In addition, one City Council person is appointed to work with this commission to advise City Council and staff on transit matters.

More information on Asheville Transit and the City of Asheville is available at www.ashevilletransit.com

Fence-line

The City of Asheville Transit Division has chosen a fence-line that includes our operations center. This center includes three primary physical areas: The maintenance facility that houses the maintenance garage; operations staff administrative offices; the bus parking garage, wash rack and bus yard; the Transit Center which includes the ticket office, bus slips/driveway, and inside/outside passenger waiting area; and our twenty one vehicles, shelters and approximately 1000 bus stops.

Core Team

The Asheville Transit EMS Team is comprised by five full-time members. The EMS Management Representative of the Team is the Transportation Manager for the city. The Core team includes the following members;

- Ken Putnam, City of Asheville Director of Transportation
- Mariate Echeverry, City of Asheville Transportation Planning Manager
- Yuri Koslen, City of Asheville Transit Projects Coordinator
- Edna Johnson, Transit Management of Asheville, Inc. General Manager
- Ronnie Payne, Transit Management of Asheville, Inc. Director of Maintenance
- Eugenia Singleton, Transit Management of Asheville, Inc. , Driver Supervisor

The EMS team has included other staff members to be able to accomplish the tasks. The Transportation Department Office Manager, Janet George Murr continues to provide critical logistic support; specifically meeting note taking, scheduling management, and travel arrangements for the team among other details.

The City of Asheville's contract operations staff, Transit Management of Asheville, have been included in the EMS development; this includes Transit Operations, Dispatchers and Mechanics. The front line staff is not only responsible for enacting the operational changes that will determine the success of the EMS, but they have helped the EMS team identifying Aspects for the EMS Team to consider as part of the project.

Working with the Senior Management, Jeff Richardson, Assistant City Manager, has been invaluable. Senior management has been a key supporting and advising the team.

In addition, other staff members have been available to provide advice and help in the development of the EMS system, specifically:

- Martha McGlohon, Legal Department
- Maggie Ullman, Energy Coordinator
- Lauren Bradley, Administration Department Director

The City of Asheville's Energy Coordinator, Maggie Ullman is becoming increasingly instrumental in the development of the significant aspects action plans.
This collaborative effort from all levels within the organization not only provides valuable information for the EMS Teams deliberation, it creates a sense of ownership and participation that will facilitate the implementation of the ISO 14001 program.

Key Drivers for Adopting an EMS
Asheville Transit recognizes that a healthy and sustainable environment is important to our economy, our future, and the citizens of the Western North Carolina region. The City of Asheville has taken a leadership role in passing sustainability initiatives with the April 2007 Council Resolution to build LEED certified buildings and Resolution establishing GHG reduction goal.

Leadership by our city's elected officials provided staff with the direction to look for opportunities to improve our environmental stewardship and sustainability initiatives within our operations. Seeking the adoption of an EMS was a natural fit. With Asheville Transit in its 10-year anniversary as a City of Asheville run operation, we are still early in our evolution as a transit operator. The EMS allows us to:

- Formalize our business practices
- Provide clear direction, create institutional stability, and seek continual improvement.

Significant Aspects & Impacts
Within the fence line, the core team initiated an extensive, internal communication effort designed to inform personnel about the EMS program and solicit input and help in identifying potential environmental aspects and their associated impacts. The EMS team through the leadership of the General Manager encouraged drivers and mechanics to identify areas that needed improvement or potential environmental aspects and their associated impacts, and then the EMS Team used this input to build its Aspect Matrix.

Using this input, the EMS team then developed a list of activities, products, and services within the fence line and rated each of 22 aspects based on the following criteria,

- Scale, Severity and Duration of Impact;
- Probability of Occurrence;
- Potential Legal and Regulatory Exposure;
- Ease of Impact Avoidance;
- Effect on Public Image;
- Effect on Sustainability;
- Concerns of Interested parties; and
- Cost of changing the Impact.

Each aspect was given a score between one and five. The scores were then averaged and the aspects with the highest scores became the focus of the EMS.

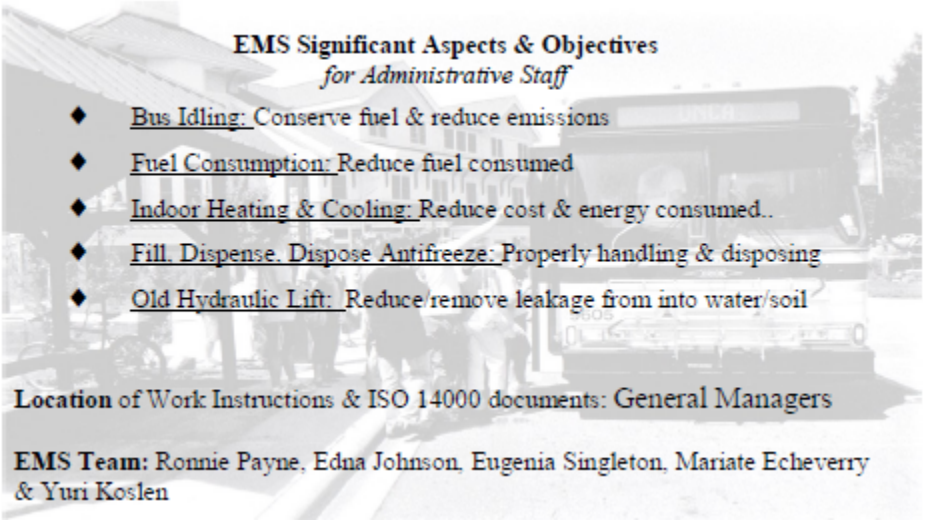
Significant EMS aspects, meaning those of the highest priority for meeting the Agency's commitment to the environment, were then identified primarily by the collective rating of each aspect. The significant aspects are:

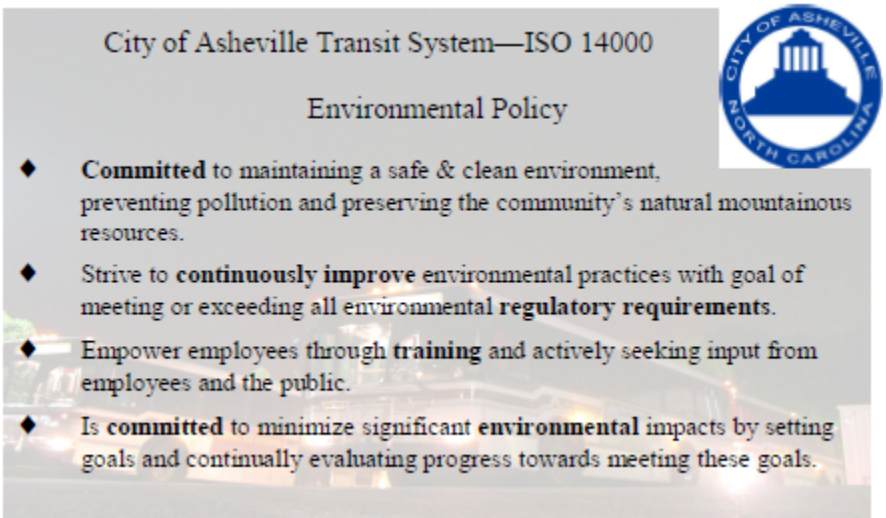
1. Bus Idling
2. Anti-Freeze, fill, dispense & dispose
3. Old Hydraulic Lift
4. Fuel consumption
5. Indoor heating and Cooling
6. Bus Exhaust
7. Aerosol Solvent Cans

8. Fluorescent light bulbs
9. Water and Electrical Consumption

The EMS Team chose the top five aspects listed above to focus on initially. The team intends to review the Agency operations at least annually to determine if additional EMS aspects should be considered.

The primary tool used for the internal communication program was to hold meetings between the EMS Team and transit drivers and mechanics as well as trainings held by the leadership with Transit Management of Asheville. In addition, we have created EMS wallet cards for all staff working within the EMS fence-line to carry while at work. These wallet cards are specifically designed for each employee's area of responsibility, listing the EMS policy, EMS Significant Aspects & Objectives, Location of Work Instructions & ISO 14000 documents, and the EMS Team.





Objectives & Targets 2010-2011

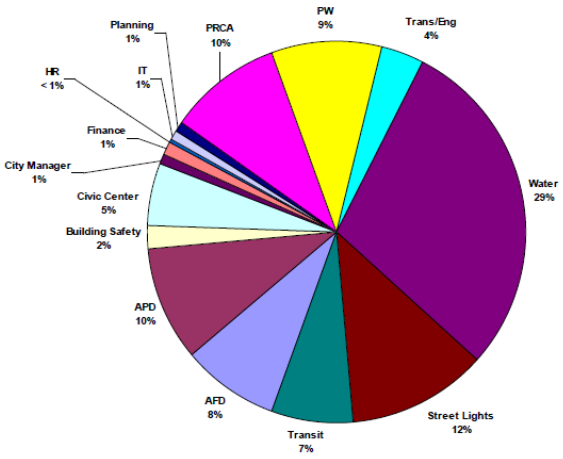
Objective	Target	Performance Indicator	Projected Complete Date
Implement project commitments made in environmental documents, permits, and other executed agreements by ensuring a system exists to manage, monitor and track compliance throughout the project lifecycle in order to minimize environmental impacts, prevent pollution, and protect and enhance the environment.	1) Conduct final review of all EMS documents and incorporate into day to day operations. 2) Prepare for gap analysis. 3) Prepare for audit.		1) February 2010 2) March 2010 3) July 2010
To minimize environment impact associated with emission	Reduce bus idling time by 5 to 10% by March 2011.	Research best practices and establish policy, develop WI, employee trainings and track idling time.	Mar-11
To manage the proper procedure for handling antifreeze by all shop personnel.	Mechanic education training documented for current and new employees.	Number of employees Trained, update procedures	Continual
Reduce and remove leakage of hydraulic fluid from lift in order to prevent soil and water contamination.	Determine if the removal of lift and or tank is the best corrective action by June 2011.	Lift inspection	Jun-11
Reduce the amount of fuel consumed	3-5% reduction in fuel consumption over first year of implementation with intent of continuing reducing	Research best practices and establish policy, develop WI, employee trainings and annual fuel tracking analysis	Jan-11
Reduce energy consumption at the Transit Center and the Transit Operations Facility by creating procedures for maintaining heating and cooling equipment and the building envelop, setting temperature standards, looking into the feasibility using of solar energy or other more efficient energy systems..	Reduction in utility bills and energy consumption by 2% every year to meet City Council Resolution No. 07-09	Research best practices and establish policy, Establish maintenance policy of all units, conduct energy audit, Tracking utility bill costs and energy used.	Yearly goal of 2% energy reduction

Benefits and Results of Adopting an EMS

The City of Asheville Transit EMS Team recognizes benefits of developing an EMS. Some benefits seen include:

- Establishing an EMS Team that allows key staff to address environmental questions from multiple perspectives.
- Receiving support from the City Manager's Office in the adoption of the Transit Services Division Environmental Policy.
- Putting crucial institutional knowledge into written form and establishing document control.
- Providing a strong foundation to support the Agency in choosing sustainable and environmentally responsible practices.
- Reduce Carbon Emissions in line with City Council Resolution establishing GHG reduction goal.
- Increased City employee awareness of environmental issues.
- Increased management awareness.
- Strong Employee involvement with EMS implementation.
- Proactive management systems.
- Documentation of standard operating procedures.
- Training matrix for maintenance and operations.
- Database for tracking employee training.
- Increased employee initiative.
- Increased accountability throughout organization.
- Built-in controls.

Total Municipal Carbon Footprint by Department



The most important benefit of the EMS is that the Environmental Policy has institutionalized the proactive process of continual improvement for the prevention of environmental degradation.

Resources

Asheville Transit estimates it has devoted the following staff time to undergo the training (including travel cost/time) and develop the EMS from the period between January 2009 and March 2010 as follows:

- ✓ EMS Steering Committee: 760.25 hours
- ✓ Subcommittees and other personnel: 109 hours
- ✓ Estimated labor cost: $21,756.25
- ✓ Estimated travel, food and lodgings cost $18,825

Most of the effort was expended on development of EMS procedures, work instructions, researching policies, and document management. Additional time has also been expended with

EMS training and communicating the status of the EMS. Most recently the EMS Team has worked to fill the gaps of our EMS identified in the GAP Audit held in mid-March 2010.

Cost Savings or Avoidance

As the Asheville Transit EMS is in its early stages of development and implementation, the Agency has not yet been able to quantify cost savings from the EMS. Nonetheless, Asheville Transit values the benefits and efficiencies resulting from the EMS these include;

- Improved lines of communication among management and operations staff,
- Development of written procedures for implementing environmental obligations,
- Capture of institutional knowledge related to addressing transit system environmental impacts and
- Promotion of proactive responses in evaluating and addressing environmental issues.

It is our intent to track project schedules closely to identify opportunities for savings and cost efficiencies resulting from the implementation of the EMS.

Next Steps

Asheville Transit is preparing for the EMS Audit in August 2010. After this audit, Asheville Transit will work to correct the nonconformances in our EMS. Asheville Transit will continue to meet all requirements and time frames identified within the EMS including; legal, action plans, monitoring, management review, communications, emergency management, documentation and internal auditing. Finally, the City of Asheville Transit Operations will seek to obtain ISO 14001 EMS certification in FY 2012. All of this will occur through continued meetings of the EMS Team.

Management Commitment

As the provider of transit services for the City of Asheville, Asheville Transit is committed to balancing Asheville City Council goals of fiscal responsibility and sustainability. To that end, the Director of Transportation and the City Manager's office adopted an environmental policy that not only identifies our commitment to be an environmental leader, but also requires the development and implementation of the EMS. A copy of the policy follows and is posted on the Agency's website and has been distributed to staff. In addition, the EMS program has benefited greatly from the strong and unwavering support of senior management, including the City Manager, Assistant City Manager, and the department's director. The Assistant City Manager has been actively involved in the Management Review process of the City of Asheville's Transit Operation's EMS program and his enthusiasm and effective executive support for this program is clear.

Since Asheville Transit was awarded the FTA EMS grant for EMS training, our staff has worked continuously to transform Asheville Transit into a more sustainable operation. Our transit operation has grown in a very short time from having no environmental policy to the development of:

- dedicated EMS Team
- Environmental Policy
- Procedures that infuses this commitment into all aspects of transit operations,

- list of transit specific projects that will further demonstrate the city's commitment to safety, fiscal responsibility, green energy and sustainability.

Although our agency has an excellent environmental record, Asheville Transit had been looking for ways to be proactive and take our environmental program to the next level. The FTA's training provided the support our staff needed. The EMS provides us with a ready-made and internationally recognized program that can be tailored to our needs.

Our approach to EMS implementation was to apply it to our transit operations, including the Transit Garage, Center, and transit stops throughout the city. Our EMS Team has involved all levels of employee's throughout the organization in the development of the EMS. This approach has been a key factor in allowing us to see the value in developing the EMS. The program has the unwavering support from senior management, including the City Manager and the department directors. We are absolutely committed to its successful implementation.

Asheville Transit is committed to providing excellent transit service. We know that developing, implementing, communicating and continuously improving our sustainability aspects is critical to engaging our future riders and preserves our community's natural mountainous resources.

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Environmental Management System (EMS)
Environmental Policy

The City of Asheville, Department of Transportation, Transit Services Division:

- Is strongly committed to maintaining a safe and clean environment, preventing pollution and preserving the community's natural mountainous resources.
- Strives to continuously improve environmental practices with the goal of meeting or exceeding all environmental regulatory requirements.
- Empowers each employee through ongoing training and will actively seek employee and public input in promoting environmental stewardship.
- Is committed to minimizing significant environmental impacts by setting environmental objectives and continually evaluating progress toward meeting those objectives.

This policy is documented and communicated to employees and the community and is available for review.

Mariate Echeverry
Transportation Planning Manager
Transportation Department

Ken J. Putnam, PE
Director
Transportation Department

Edna Johnson
General Manager
First Transit Management
Asheville Transit System

Jeffrey B. Richardson
Assistant City Manager
City of Asheville

City of Asheville Transit Operations Audit Report

This Environmental Management System (EMS) Audit was based on a request by the Federal Transit Administration (FTA) as a final follow-up to an eighteen month program for EMS development and was conducted in accordance with the approved schedule.

W. Robert Herbert, Principle Contractor and ISO 14001 certified Lead Auditor with Virginia Tech, conducted the EMS Audit for the City of Asheville Transit Operations on August 25 and 26, 2010, to report on its conformance with the requirements of the ISO 14001:2004 standard.

The EMS was evaluated against each of the requirements set out in the ISO 14001:2004 standard titled "Environmental management system – General guidelines on principals, systems and support techniques." The Audit included the examination of documents, interviews of personnel and observations of activities and conditions.

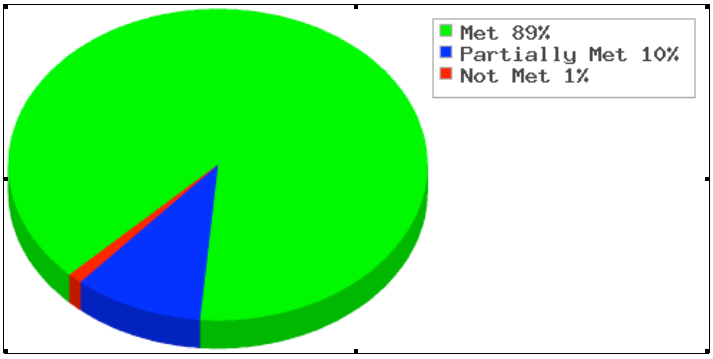
The site visit involved a review of the core EMS documents with the EMS team. The Asheville EMS Team participated in the review and discussion regarding the scoring.

Detailed scoring on next page

City of Asheville Transit Operations - Overall EMS Performance Results

This section compares the percentage of requirements *met, partially met and not met* with respect to meeting the requirements of an EMS as specified in the ISO 14001:2004 standard. The following scores are the result of the EMS audit presented in this report:

Percent meeting all requirements **"Overall Score"**	**94%**
Percent of requirements **"Met"**	**89%**
Percent of requirements **"Partially Met"**	**10%**
Percent of requirements **"Not Met"**	**1%**



	The ISO 14001:2004 standard elements of an EMS	Overall Score (%)	Met (%)	Partially Met (%)	Not Met (%)
4.1	General Requirements	100	100	0	0
4.2	Environmental Policy Requirements	100	100	0	0
4.3.1	Environmental Aspects Requirements	100	100	0	0
4.3.2	Legal and Other Requirements	100	100	0	0
4.3.3	Objectives, Targets and Programs Requirements	91	82	18	0
4.4.1	Resources, Roles, Responsibility and Authority	100	100	0	0
4.4.2	Competence, Training and Awareness	71	57	29	14
4.4.3	Communication	100	100	0	0
4.4.4	EMS Documentation	100	100	0	0
4.4.5	Control of Documents	100	100	0	0
4.4.6	Operational Control	100	100	0	0
4.4.7	Emergency Preparedness and Response	88	75	25	0
4.5.1	Monitoring and Measurement	50	0	100	0
4.5.2	Evaluation of Compliance	100	100	0	0
4.5.3	Nonconformity, Corrective Action and Preventive Action	94	88	13	0
4.5.4	Control of Records	100	100	0	0
4.5.5	Internal Audits	100	100	0	0
4.6	Management Review	100	100	0	0

EMS Case Study
June 2010

Profile

Metro is a unique agency. It functions as:

- **Transit operator,**
- **Transportation planner,**
- **Transportation infrastructure builder,**
- **Overseer of all transportation funding in Los Angeles County.**

Metro's system includes (March 2010):

- **Metro Rail** – 17 miles of heavy rail, 62 miles of light rail, 14 miles of dedicated busway with about 14.5 miles of additional light rails opening in the next 3 years.
- **Metro Bus** – total of 2,635 buses (approximately 95% of which is run on compressed natural gas) plus over one dozen municipal bus companies.
- **Commuter Rail** – (as funding partner to Metrolink) 512 miles serving regional commuters.
- **HOV Lanes** – High Occupancy Vehicle lanes for carpools, vanpools and express buses.
- **Metro Access** - Dial-a-ride services for the elderly and disabled.
- **Metro FSP** - Freeway Service Patrol, a system of contracted tow trucks for servicing disabled vehicles on the freeways.
- **Call Boxes** - A countywide system of cellular call-boxes for emergency use in the freeway and highway system.
- **Bikeways** - A system of bikeways for commuter and recreational purposes in L.A. County.
- **Smart Streets** - Synchronized signals, ramp metering and communication in order to keep traffic flowing.
- **Transportation Demand Management (TDM)** - includes rideshare, flexible work hours telecommunicating & transit voucher programs.
- **Pedestrian Program** - A countywide program that allocates resources to build and sustain pedestrian access to the transit system.
- **Transportation Enhancement Program** - A countywide program that allocates resources to improve transportation infrastructure to maximize infrastructure and improve transportation connectivity.
- **Regional Integration of Intelligent Transportation Systems (ITS)** - A countywide program that allocates resources and coordinates integration of technology and communication systems to maximize travel efficiency on highways and streets.

A 14-member Board of Directors, 13 locally elected officials and 1 Ex- Officio appointed by the Governor of California oversee Metro. In 2010, Metro has about 9,300 full-time employees. The FY 2010 budget was $3.9 billion.

Formed in 1993, Metro serves a population of approximately 10 million people in all of Los Angeles County through its growing bus and rail system. Metro operates the second largest bus system in the nation and has the largest compressed natural gas (CNG) powered bus fleet in the nation. The system also includes five fixed guideways: four are rail and one dedicated busway. As of March 2010, average bus and rail weekday boardings are estimated to be 1,445,340.

In addition to bus and rail facilities, Metro also operates 425 lane miles of carpool lanes, 520 miles of bike routes, 481 miles of bike lanes, and 251 miles of bike paths. We also operate the Metro Freeway Service Patrol that has a total fleet of 152 tow trucks on patrol serving 450 miles of freeway. On average, the FSP assists 25,000 motorists per month.

Fenceline

The Red Line Yard is located at 320 S. Santa Fe Street, Los Angeles, CA 90012. The facility sits on a 39 acre site (50% impervious). It services 104 rail cars and has about 500 employees working in all of the facilities.

The Red Line Yard consists of the Division 20 main shop building and warehouse building, Maintenance of Way Buildings A & B, cleaning station, train car wash, and a traction and power compound. Division 20 is Metro's Red Line Subway Railcar Maintenance yard. Industrial activities involving the electric train maintenance and vehicle maintenance operations are conducted within the main shop and maintenance buildings, respectively (indoors). The outdoor portions of the site are used for electric train rail lines and vehicle parking.

Non-revenue vehicle operations located at the northwest corner of the Maintenance of Way Building B is not part of the fenceline. However, for practical purposes, this portion of the Red Line Yard will be evaluated for and will be maintained to comply with environmental regulations.

Core Team

The Core Team was initially made up of five members representing various business units. Since then, the Core Team has expanded to a total of twenty members. The new members come from business units that 1) were being impacted by the highest prioritized significant aspects and 2) from departments that supported the development of the EMS (i.e., Procurement, Organizational Development and Training, Communications and Marketing).

Key Drivers for Adopting an EMS

Metro is responsible for complying with environmental laws and regulations that are enforced by federal, state and local environmental agencies. They include (among others)

- Resource Conservation and Recovery Act;
- Hazardous and Solid Waste Amendments Act;
- Clean Water Act;
- Clean Air Act;
- Code of Federal Regulations, Title 49;
- Code of Federal Regulations, Title 40;
- Code of Federal Regulations, Title 29;
- California Hazardous Waste Control Laws;
- California Health and Safety Code, Division 20;
- California Code of Regulations, Title 22, Division 4.5;
- California Code of Regulations, Title 23;
- California Code of regulations, Title 8, section 5192 – Emergency Response to Hazardous Materials;
- California Health and Safety Code, Chapter 6.95, section 25500 et al – Hazardous Materials Business Plan; and
- South Coast Air Quality Management District (AQMD) rules.

Metro also complies with other key regulatory guidelines that pertain to specific key issues associated with the identified aspects. The above and other regulations including their applicability are listed in the Red Line Yard EMS Procedures under Legal and Other Requirements.

Metro is in the forefront of environmental responsibility. We pride ourselves in running the largest compressed natural gas bus fleet in the nation. We have incorporated sustainability design elements in the construction of our Division 3 Maintenance Building, our Division 9 Transportation Center and the Metro Orange Line dedicated busway. We have included "sustainability" as a criterion in our Call for Projects program. The objective would be to optimize the transportation services in a corridor to increase person and goods throughput, safety, and security while reducing energy, motorized Vehicle Miles Traveled (VMT) and greenhouse gas emissions (GHGe). **We have publicly committed to ensuring the inclusion of sustainability principles on projects to be constructed under new funding mechanisms such as Measure R and the American Recovery and Reinvestment Act.**

Measure R is a half-cent sales tax for Los Angeles County that will finance new transportation projects and programs, and accelerate many of those already in the pipeline – everything from new rail and/or bus rapid transit projects, commuter rail improvements, Metro Rail system improvements, highway projects, improved countywide and local bus operations and local city sponsored transportation improvements. The measure passed in the November 2008 election and the tax took effect in July 2009.

Measure R is expected to generate approximately $40 billion in new local sales tax revenues over the 30 year term of the measure. It is estimated that about $20 billion of construction projects, which will be mostly funded by Measure R, will require mandated environmental reviews (per California Environmental Quality Act).

Metro's bus and rail fleets facilities face unique environmental challenges related to construction, upgrades and maintenance. These challenges include procedural standardizations; hazardous materials and waste management; recycling programs; mobile and non-mobile emissions reductions; underground storage tank upgrades and repairs; soil and groundwater remediation programs; stormwater compliance and training; noise and vibration mitigation; and environmental impact assessments.

Metro's participation in the FTA EMS Training and Assistance Program reinforces our ability to implement mitigation measures and compliance to accomplish desired results.

Metro is a leader in creating opportunities for energy efficiency and pollution prevention and mitigation. Through this opportunity, we built a robust Environmental Management System (EMS) to capture and implement our environmental compliance and mitigation best practices. We are seeking ISO14001 certification. The templates we created in this pilot effort will be used in an agency-wide EMS roll-out. The EMS will provide an effective framework to proactively address environmental issues and create cost-effective operations that enhances our employee's skills while maintaining our commitment to environmental stewardship.

EMS as a principle is now used in the development of projects and studies associated with our Sustainability Program. We are incorporating EMS in our methodologies for addressing climate change issues. In this context, while we have focused on developing EMS for the Red Line Yard, the benefits we get from this effort go beyond those of the fenceline. We indicate these specific benefits and accomplishments below.

Significant Aspects and Impacts

The Core Team identified six distinct areas of Significant Aspects: Fueling, Cleaning, Rail Car Overhauls/Repairs, System Material Storage and Pesticide & Weed Control. Within these areas, a total of 80 activities were evaluated by the Core Team and Division 20 management staff. Each activity was ranked in ten categories of "Significance of Impact" on a scale of 1 to 5 (5 being the highest impact). The activity categories were:

- Scale or size of aspect
- Severity of impact
- Probability of occurrence
- Duration of impact
- Potential legal and regulatory exposure
- Ease of implementing change
- Public Image impact
- Affect on sustainability
- Relational and cultural change
- Cost of change

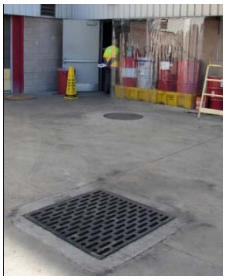
Ranking these aspects (higher ranking=higher impact) helped us to determine that the following five significant aspects will be our highest priority items at the fenceline.

Underground Storage Tank – Aspect Ranking = 70

- Diesel Fuel for Back-up generator
- Testing/Certification of UST Systems and components
- Monitoring of leak detection monitoring system
- Inspection of emergency generator

Wastewater/Stormwater Management – Aspect Ranking = 63

- Wastewater Treatment. Process and activities linked with wastewater treatment and neutralization
- Spill/Leak Prevention. Spill and leak at the acid wash and clarifiers
- Rain Water Runoff. Manhole or drainage protection from shop & yard activity wastewater



Rail Car Wash Cleaning – Aspect Ranking = 58

- Automatic acid car wash to clean stainless steel revenue cars

Batteries Management – Aspect Ranking = 54

- Replacement and disposal of waste batteries
- Establish consolidation points

Above Ground Storage Tanks – Aspect Ranking = 52

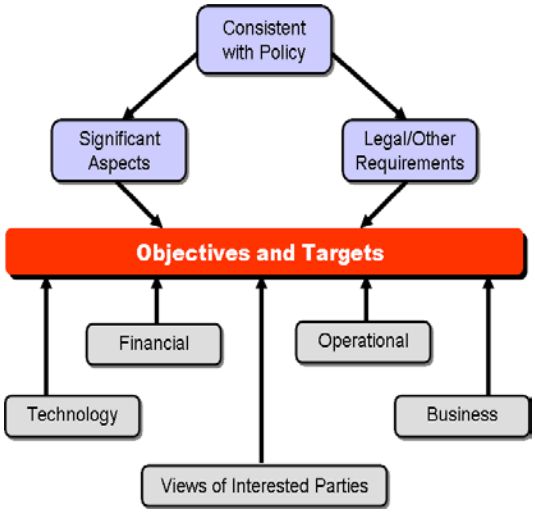
- Amber fuel for non-revenue hi-rail trucks
- Diesel fuel for maintenance shop emergency generator
- Inspection of emergency generator

Objectives and Targets

One of Metro's main strategic goals (Goal #9) is to "Sustain the environment with efficiency and reduce greenhouse gas emission." With this strategic goal in mind, an environmental policy was developed to reflect our commitment to an EMS. In summary, the environmental policy stipulates the following goals:

1. Identify potential environmental impacts generated by our development activities and develop mitigation measures to address those impacts;
2. Operate and maintain Metro vehicles and facilities to minimize negative impacts on the environment;
3. Reduce our consumption of natural resources;
4. Reduce or eliminate the use of hazardous materials;
5. Increase the amount of recycling and use of recycled products; and
6. Reduce and/or divert the amount of solid waste going to landfills.

The objective and targets were to be consistent with our Environmental Policy and to meet legal and regulatory requirements.



Additionally, the five selected significant aspect items were further evaluated by the Core Team to establish specific plans of action.

The objectives and targets took into account:

- Technology requirements
- Financial considerations
- Views of interested parties
- Operational impacts
- Business issues

The team developed these objectives and targets for the five significant aspects.

▶ Underground Storage Tank

Objective – Prevent or mitigate diesel fuel spillage

Target – Review and implement UST Monitoring System Plan. Prevent the amount of diesel fuel spillage by June 30, 2010

Action Plan

- ☐ Conduct baseline review to determine spill losses.
- ☐ Review UST Monitoring System Plan.
- ☐ Evaluate spill potential and review findings with EMS Aspects team.
- ☐ Begin awareness and operational training.
- ☐ Evaluate work instructions and prepare standard operating procedures.
- ☐ Review SPCC Plan and perform tank testing annually.
- ☐ Prepare annual progress report for Management Review.
- ☐ Perform inspection of emergency generator.

▶ Wastewater/Stormwater Management

Objective – Prevent uncontrolled release of untreated waste water, chemicals, and untreated stormwater.

Target – Prevent the uncontrolled release of untreated waste water, chemicals, and untreated stormwater by June 30, 2010

Action Plan

- ☐ Review and update SOPs, SWPPP, and other relevant documents.
- ☐ Evaluate uncontrolled release potential and exposure to employees.
- ☐ Review findings with EMS Aspects team.
- ☐ Inspect potential for uncontrolled wastewater release and exposure monthly.
- ☐ Begin awareness and operational training.
- ☐ Evaluate work instructions and prepare standard operating procedures.
- ☐ Inspect integrity of physical/operational controls monthly.
- ☐ Prepare annual progress report for Management Review.

▶ Rail Car Wash Cleaning

Objective – Prevent the uncontrolled release of carwash wastewater into the environment and exposure of facility employees

Target – Prevent the uncontrolled release of acid carwash wastewater by June 30, 2010

Action Plan

- □ Review acid carwash procedure and determine baseline amount.
- □ Evaluate uncontrolled release potential and exposure of employees.
- □ Review findings with EMS Aspects team.
- □ Inspect monthly potential for uncontrolled wastewater release and exposure.
- □ Begin awareness and operational training.
- □ Evaluate work instructions and prepare standard operating procedures.
- □ Evaluate feasibility of replacing acid car wash facility.
- □ Weekly monitoring and calibration of sensors.
- □ Prepare annual progress report for Management Review.

▶ Batteries Management

Objective – Prevent the inappropriate disposal of batteries

Target – Reduce to 0% the amount of inappropriately disposed batteries by June 30, 2010

Action Plan

- □ Establish battery generation baseline.
- □ Evaluate each battery generation stream for 100% diversion.
- □ Begin awareness and operational training.
- □ Evaluate work instructions and prepare standard operating procedures.
- □ Measure batteries generation to track progress quarterly.
- □ Prepare annual progress report for Management Review.

▶ Above Ground Storage Tank [Including the Maintenance Shop Emergency Generator AST]

Objective – Prevent the uncontrolled release and eliminate fuel spillage

Target – Review and implement SPCC Plan. Reduce the amount of amber fuel spillage through assessment of environmental release vectors and make repairs and upgrades by June 30, 2010

Action Plan

- □ Review SPCC Plan.
- □ Review baseline amber fuel delivery, storage, and fueling processes.
- □ Evaluate spill potential and review findings with EMS Aspects team.
- □ Begin awareness and operational training.
- □ Evaluate work instructions and prepare standard operating procedures.
- □ Inspect integrity of amber fuel tank and berm monthly.
- □ Review SPCC Plan and perform tank testing annually.

- □ Prepare annual progress report for Management Review.
- □ Perform inspections of emergency generator.

Benefits of Adopting an EMS

- The EMS process allowed for a better understanding of **what personnel within the Red Line Yard are doing and how processes are implemented**. We also gained an understanding of which processes and activities need to be documented and the importance of such documentation.

- Development of Standard Operating Procedures (SOP) allowed for us to systematically address the environmental issues like those associated with the proper management of waste batteries for the rail cars and all other stationary power sources. This exercise also **allowed us to develop new SOPs and update existing procedures.**

- The Emergency Response exercises conducted twice highlighted **awareness of the agency's emergency response limitations**. While documents are in place, it appears that we still have specific coordination issues that need to be resolved in order for us to be more responsive in real emergencies in the future. The corrective actions to be taken regarding coordination and procedures are not only anticipated to save time and money in case of an actual emergency, but also will improve the mitigation of the emergency.

- The EMS process exposed a need for proper document management **to better monitor the Rail Operation Division's documents and understand how each document relates** to the physical Red Line Yard procedures and other site documents.

- Setting Targets and Objectives in this process has aided us in **clearly defining our expectations**. .

- Our Senior Management meetings opened everyone's eyes to the benefits of EMS in an organization as complex as Metro. We are **better able to understand the roles and responsibilities of all stakeholders** and have re-discovered that we are indeed one Metro.

- We are able to fully **appreciate our environmental policy** especially during the development of the Red Line Yard Targets and Objectives.

- By expanding our internal Metro team, we are able to meet new personnel within our agency that we may not have had the chance to work with if not for the EMS. We are better **able to leverage the power of working together**; that nothing is impossible as long as our stakeholders are well informed of the purpose and intent of our actions.

- The EMS process has now become endemic in the development, implementation, and operations of our Sustainability Program projects. Staff has been empowered and been challenged to ask questions of how we can **improve our systems and implement small changes that, because of Metro's size, collectively would provide significant cost-savings to our agency**.

Accomplishments to Date and Cost Savings

Metro is currently developing several solutions associated with our significant aspects. As our processes in our other facilities have some similarity to our fenceline, the solutions we are developing and the projected cost savings are being considered for implementation agency-wide. The template we are developing at the Red Line Yard is of significant value in the agency-wide roll-out of EMS.

Through our environmental compliance efforts, we anticipate avoiding a minimum of $5,000 per day in cost-avoidance costs (fines and violations costs). Cost avoidance benefits are directly associated with our Above Ground and Underground Storage Tank and Wastewater/Stormwater Management Aspects.

We are in the process of completing the development of an Environmental Information Management System (EIMS) that will house all of our environmental and energy/utility information. Specifically related to our storage tank and Material Safety Data Sheet information, we will **save our agency** approximately **$50,000 per year in labor costs**. This cost is associated with monitoring and information update in the Red Line Yard and all other divisions. We anticipate this savings to grow as we build more modules into the EIMS.

The EMS has facilitated the strengthening of our existing programs that include:

- Monthly environmental inspection and reporting;
- Stormwater and wastewater programs;
- Underground and aboveground storage program;
- Battery and Universal Waste Disposal; and
- Recycling Program.

We have also developed multi-media training tools that we are now using in our Sustainability Awareness Training and Environmental Management System Awareness Training efforts. Our Sustainability Awareness Training was recognized with the 2009 National Model Program by the National Transit Institute (NTI). The recognition has given significant credibility to the EMS training modules we have developed and continue to develop, serving as a template for others in the nation to follow.

We have produced an EMS Awareness Video that emphasizes the practicability of EMS principles and their usefulness for maintaining environmental stewardship at work and at home.

We have incorporated EMS principles in our contract documents, design criteria, and our specifications.

EMS has brought indirect benefits as a result of a changing culture in our agency. We are currently completing three documents that were spurred by the awareness brought about by the development of this EMS. These include:

- *Evaluation of Strategies to Reduce Greenhouse Gas Emissions* study that looks at the whole universe of strategies for us to implement the “lowest hanging fruit” strategies that have low cost/high rate of return characteristics for reducing our carbon footprint.

- *Water Action Plan* that identifies water conservation and reduction strategies to reduce Metro’s water operations cost. This plan has direct impact to the Car Wash significant aspect and on how we will be operating our car washes in the future.

- *2010 LACMTA Sustainability Report* that includes a discussion of the aspects identified in our fenceline and the rest of Metro. The report also includes a discussion of our progress on 10 indicators as well as proposed sustainability-related goals.

We are about to embark on developing an Energy Conservation and Management Plan.

Capital and operational enhancement projects identified in these documents are anticipated to not only provide an avenue for enhanced compliance, but also potentially generate revenue and cost savings. These include those related to utility and resource conservation, recycling, and similar attributes.

Our FY10 EMS budget is approximately $655,000. As we have demonstrated, the benefits are enormous. **We estimate that the potential direct and indirect benefit and cost-savings to our agency for the implementation of EMS in our fenceline [and EMS principles across our facilities] initially amount to $2 million.** The three major components of these benefits are associated with energy and utility savings and cost avoidance. These benefits and cost-savings will be verified in the forthcoming fiscal year.

Next Steps

Our next steps are modest. We aim to:

- Increase awareness of the use of EMS and its principles to the entire Metro organization;
- Continue development and implementation of policies and procedures related to the EMS;
- Develop and maintain better recordkeeping mechanisms; and
- Establish the EMS and Sustainability projects as part of the annual Metro budget completely paid for by cost-savings generated from the implementation of these projects.

Management Commitment

- On April 16, 2009, the Metro Board approved the Environmental Policy which formalizes Metro's "*commitment to protecting the environment using sustainable principles and practices in our Planning, Construction, Operations, and Procurement Departments. This policy illustrates our leadership in maximizing our environmental efforts and its benefits for Los Angeles County through transportation."*

- Senior staff embraces the EMS program but there is lingering concern about cost because of a structural deficit the agency is facing.

- Senior Management has been actively involved in our discussions. Our regular Core Team meetings include briefings to our Deputy Chief Capital Management Officer who communicates any issues to fellow executives, including the CEO. The Chief Operations Officer has attended our Management Review meetings.

- The Deputy Chief Capital Management Officer and our Environmental Compliance and Services Department Manager report to our Ad Hoc Sustainability and Climate Change Committee regarding any efforts related to the EMS. Ad Hoc Sustainability and Climate Change Committee members consist of Metro Board Members.

- The EMS Core Team commits to a semi-annual meeting with Executive Staff to update them of EMS related issues and solutions.

"Really all MTA employees are and should be involved in this [EMS], not just because it is our duty as citizens to improve things, but also because it is our duty as employees. So we really need to work together to make a contribution to improving Los Angeles and improving the environment. That's why we have EMS. "

- Arthur T. Leahy, CEO, Los Angeles County Metropolitan Transportation Authority

Los Angeles County Metropolitan Transportation Authority Audit Report

This Environmental Management System (EMS) Audit was based on a request by the Federal Transit Administration (FTA) as a final follow-up to an eighteen month program for EMS development and was conducted in accordance with the approved schedule.

W. Robert Herbert, Principle Contractor and ISO 14001 certified Lead Auditor with Virginia Tech, conducted the EMS Audit for the Los Angeles County Metropolitan Transportation Authority on July 15 and 16, 2010, to report on its conformance with the requirements of the ISO 14001:2004 standard.

The EMS was evaluated against each of the requirements set out in the ISO 14001:2004 standard titled "Environmental management system – General guidelines on principals, systems and support techniques." The Audit included the examination of documents, interviews of personnel and observations of activities and conditions.

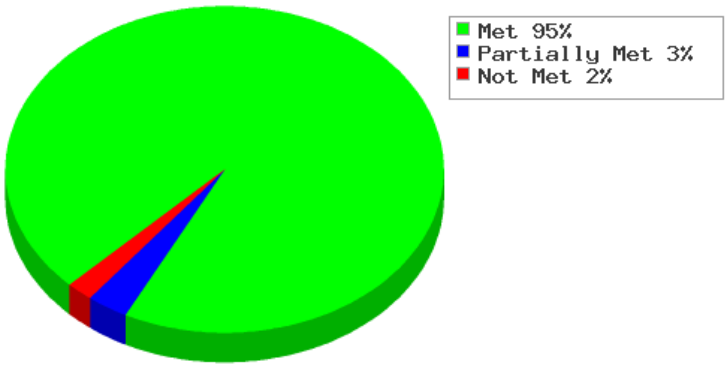
The site visit involved a review of the core EMS documents with the EMS team. The LACMTA EMS Team participated in the review and discussion regarding the scoring.

Detailed scoring on next page

LACMTA - Overall EMS Performance Results

This section compares the percentage of requirements *met, partially met and not met* with respect to meeting the requirements of an EMS as specified in the ISO 14001:2004 standard. The following scores are the result of the EMS audit presented in this report:

Percent meeting all requirements **"Overall Score"**	**96%**
Percent of requirements **"Met"**	**95%**
Percent of requirements **"Partially Met"**	**3%**
Percent of requirements **"Not Met"**	**2%**



	The ISO 14001:2004 standard elements of an EMS	Overall Score (%)	Met (%)	Partially Met (%)	Not Met (%)
4.1	General Requirements	100	100	0	0
4.2	Environmental Policy Requirements	95	90	10	0
4.3.1	Environmental Aspects Requirements	100	100	0	0
4.3.2	Legal and Other Requirements	100	100	0	0
4.3.3	Objectives, Targets and Programs Requirements	100	100	0	0
4.4.1	Resources, Roles, Responsibility and Authority	60	60	0	40
4.4.2	Competence, Training and Awareness	86	71	29	0
4.4.3	Communication	100	100	0	0
4.4.4	EMS Documentation	100	100	0	0
4.4.5	Control of Documents	100	100	0	0
4.4.6	Operational Control	100	100	0	0
4.4.7	Emergency Preparedness and Response	100	100	0	0
4.5.1	Monitoring and Measurement	100	100	0	0
4.5.2	Evaluation of Compliance	100	100	0	0
4.5.3	Nonconformity, Corrective Action and Preventive Action	100	100	0	0
4.5.4	Control of Records	100	100	0	0
4.5.5	Internal Audits	100	100	0	0
4.6	Management Review	92	83	17	0

Profile

The Maryland Transit Administration (MTA) is a mode of the Maryland Department of Transportation (MDOT), a principal agency of the State of Maryland. MTA directly operates local and commuter bus, paratransit, light rail, and heavy rail. MTA also contracts with independent operators to provide commuter bus service, commuter rail service and paratransit service. MTA's annual ridership is approximately 100 million.

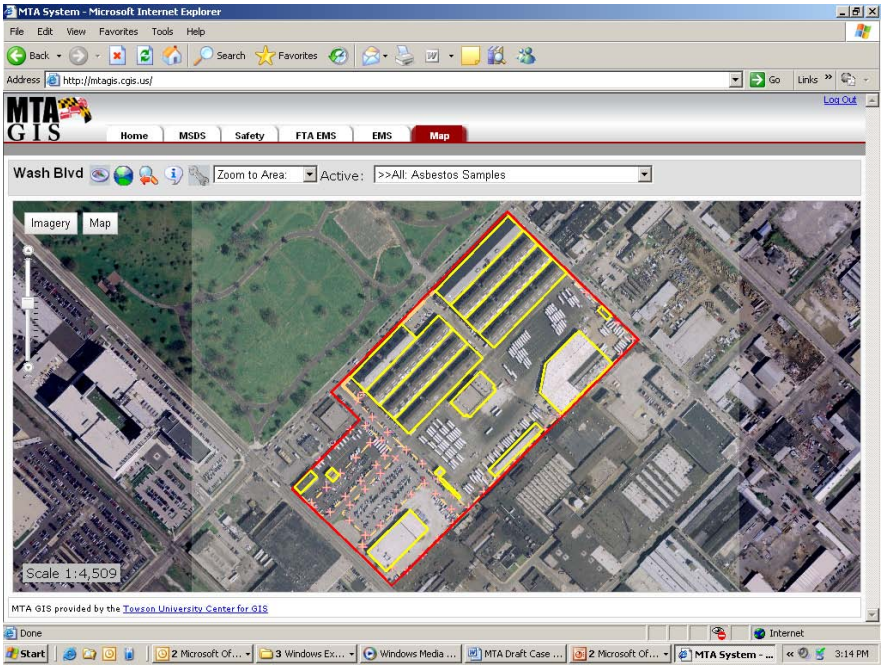
MTA operates 78 local, express, and commuter bus lines through Central and Southern Maryland. Bus service is operated on a 24-hour basis. MTA provides complementary paratransit service 24 hours a day within 3/4 of a mile of a core bus route. MTA contracts with three private companies which use a combination of MTA and privately-owned vehicles to supplement MTA's directly operated service.

MTA's heavy rail line is a grade-separated, double-tracked line that runs 14.3 miles and serves 14 stations in the northwest corridor of the Baltimore region. Metro Subway service operates Monday through Friday, 5:00 am to midnight, and 6:00 am to midnight on Saturdays, Sundays and holidays. Metro has 8-minute headway during peak service, 10-minute headway during the day, and 15- to 20-minute headways during other operating hours. The system requires 66 cars during peak service. The total fleet is 100.

MTA's Light Rail line operates as three overlapping routes covering 37 route-miles and serving 33 stations. MTA has a fleet of 53 articulated Light Rail Vehicles (LRVs) and operates up to 33 vehicles during peak hours. Light Rail service is provided 6 AM to 11 PM Monday through Friday, 7 AM to 11 PM on Saturday and 11 AM to 7 PM on Sunday. Light Rail operates at 10 to 30 minute intervals, depending on the station.

Fenceline

The Washington Boulevard Complex is located at 1515 Washington Boulevard in Baltimore, Maryland. The area surrounding the complex is general commercial/light industrial, with public parkland to the north and residential areas to the east. The complex comprises approximately 21.1 acres of land and consists of 13 buildings and associated grounds (mostly asphalt-paved area).



MTA'S Washington Boulevard Complex

Building No. 1 is used mainly for administrative offices, and Buildings Nos., 2 through 8 are used for bus maintenance activities. A print shop, revenue control operations, and facilities maintenance are also located in Building No. 8. Building No. 9 is used mainly for bus washing and fueling activities and Building No. 10 is used for storage. Shipping and receiving and their administrative office activities are located in the 1330 South Monroe Street building and the Ryder Building is used by facilities maintenance for storing their equipment and supplies. Two other smaller buildings are located on the northeast side of the complex; the buildings are used for storage. Exterior areas for the complex are mostly asphalt-paved and the areas are used for storing buses and for employee parking.

Core Team

Our EMS team consisted of the following members:

- Bernadette Bridges, Executive Director, Safety, Quality Assurance and Risk Management
- Robert Frazier, Environmental Manager
- Doy Miller, Safety Engineer
- David Varner, Director, Bus Maintenance
- Jamie Harvey, Manager, Bus Maintenance
- John Newton, Manager, Environmental Planning
- Beth Kreider, Director, Operations Support
- Ed Moore, Manager, Office of Training and Development
- Sarah Smith, Safety Training Specialist
- Tim Muir, Chief, Bus Maintenance
- Jim Hoover, Director, Operations Support
- Thomas Chisholm, Technical Support
- Claire Fox, Environmental Services Consultant

Key Drivers for Adopting an EMS

The MTA provides vital transportation services to the State of Maryland. Providing services consistent with MTA's mission requires daily processes and product handling that may impact the environment. MTA must also plan future transportation services and facilities to accommodate the growing role of transit in the region. Protecting the environment is one of the MTA's most important responsibilities in seeking to accomplish our mission.

The MTA has several drivers for developing and implementing an EMS:

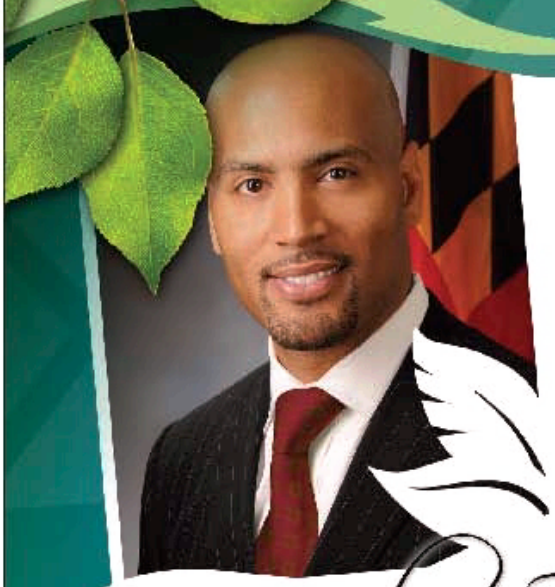
- MDOT has environmental initiatives underway and is committed to facilitating the protection of natural resources and promoting stewardship in environmental management. This commitment is in keeping with Governor O'Malley's policy of making Maryland the national leader in the area of environmental protection. The EMS project is consistent with supporting Governor O'Malley's environmental policies and initiatives.

MTA EMS Intranet page

- The EMS project is fostering our relationship with regulatory agencies as it demonstrates a commitment toward 'continuous improvement'.
- An additional driver for adopting an EMS was to sustain environmental issues as a priority and promote awareness and support for day-to-day compliance activities.
- The MTA developed an Environmental Policy.

Maryland Transit Administration

ENVIRONMENTAL Policy Statement



The Maryland Transit Administration (MTA) provides vital transportation services to the State of Maryland. In conducting our mission, we must manage daily processes and handle products that may impact the environment. In addition, the MTA must plan future transportation services and facilities that reflect the growing role of transit in the region. The protection of the environment is one of the MTA's most important responsibilities as we seek to accomplish our mission.

It is MTA's policy to conduct our mission in a manner that is protective of human health and the environment. Thus, it is incumbent on each employee to perform his or her duties in a manner that protects the environment, prevents pollution, and supports conservation of our natural and cultural resources.

MTA ADMINISTRATOR

Ralign T. Wells

THROUGH THIS POLICY MTA COMMITS TO:

- Comprehensive environmental protection and continual environmental process improvement.
- Early introduction of environmental protection and pollution prevention in the planning states of new programs, transit facilities and in all work conducted on MTA properties.
- Compliance with applicable federal, State and local environmental regulations and policies, supported by regularly scheduled internal assessments.
- Evaluation of the effectiveness of MTA's environmental management program through application and review of the Environmental Management System (EMS) to ensure that established objectives and targets are met.
- Promotion of a spirit of collaboration, cooperation and responsiveness both internally and with federal, State and local regulators.
- Establishment, implementation, and maintenance of MTA's environmental policy to support effective communications to all employees and interested parties.
- Proactive, sound environmental stewardship.

www.mta.maryland.gov

Martin O'Malley, Governor | Anthony G. Brown, Lt. Governor

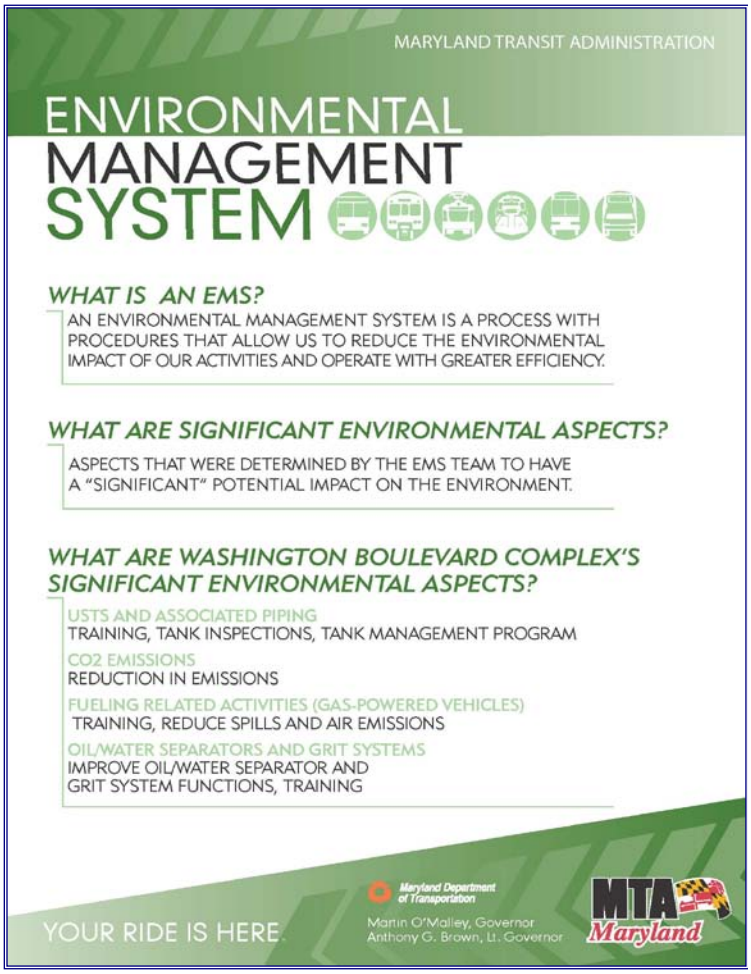
Maryland Department of Transportation

MTA Maryland

Significant Aspects and Impacts

The EMS team held several meetings with the supervisors and other employees from each shop at the Washington Boulevard Complex to review their work activities and identify and rank the environmental aspects. Approximately 55 environmental aspects were identified in the day-to-day Washington Boulevard Complex activities, products and services. Each environmental aspect was ranked and discussed to determine which aspects have or can have significant impacts on the environment. In assessing the environmental and business impacts of the aspects, the EMS team prioritized the following as 'Significant Aspects'. The Significant Aspects were identified and prioritized on a 'ranking system'. The significant aspects included:

- Underground Storage Tanks and Associated Piping
- CO^2 Emissions from Buses
- Fueling-related Activities (gas-powered vehicles)
- Oil/water Separators and Grit Systems



Promotional flyer for EMS awareness

Objectives and Targets

For each significant aspect, the Core Team, with appropriate supervisors, developed Objectives and Targets to address the significant environmental aspects.

Significant Aspect	Objective	Targets	Benefits
USTs and Associated Piping	Management of UST systems at Washington Boulevard Complex (including requirements for the design, construction and operation, as well as maintenance, monitoring, and reporting) in accordance with applicable Federal, and State of Maryland Regulations.	• 100% UST Reconciliation Training complete by January 31, 2011. • 100% implementation of a tank management program by January 31, 2011. • 100% of USTs inspected for compliance (by a MDE certified inspector) by August 31, 2009.	• Standard Operating Procedure (SOP) developed and approved. • USTs inspected for compliance and corrective actions complete. • Tank Unloading/Loading Sign posted by fueling areas. • Tank inspection dates included in MTA GIS and formatted to send notification emails.
CO2 Emissions from Buses	Reduce the amount of CO2 emissions generated by buses based at the Bus Division.	25% reduction in CO2 emissions from 2006 levels by 2020, in accordance with Maryland's Greenhouse Gas Reduction Act.	• Anti-Idling Policy developed and approved. • New Anti-Idling Transportation Bulletin.
Fueling-related activities (gas-powered vehicles)	Reduce the amount of spills and air emissions with the fueling of gas-powered vehicles at the Washington Boulevard Complex.	100% of an active Stage 2 Recovery training program in place by December 30, 2009.	• Stage 2 Recovery training complete. • SOP developed. • Daily inspection checklist utilized. • Stage 2 Vapor Recovery Fueling Sign posted by fueling areas.
Oil water separator systems and grit systems	Manage quantifiable improvement in the oil/water separator and grit systems functions at the Washington Boulevard Complex.	To be determined based on results of baseline in-house sampling and inspection of oil/water separator systems and grit systems.	• SOP developed. • New OWS included in capital projects for 2012. • Additional information on OWS obtained through investigations.

ENVIRONMENTAL MANAGEMENT SYSTEM
Maryland Transit Administration
Washington Boulevard Complex

Verification	Person responsible for maintaining	Comments provided by	Reviewed by	Approved by
Initials	DM	EMS Team	BF	BB

ED 4.3.3-1 Objective & Target Action Plan – Management of USTs

Document Name:	**Management of USTs Action Plan**	**Facility Affected:**	Washington Boulevard/Bush Bus Division Complex
Document No:	EP 4.3.3 – AP#001	**Relevant Process:**	Operation and Maintenance of underground storage tank systems
Start Date:	5/15/09	**Related Significant Aspect or Legal and Other Requirement:** USTs and Associated Piping	
Date Fully Completed:		**Last Revised:** 10/12/09	

1.0	**Person Responsible for Overall Action Plan:** ***Thomas J. Chisholm (OSQARM)***
2.0	**GOAL STATEMENT:** **Maintain regulatory compliance in order to reduce the likelihood of a petroleum release.**
3.0	**OBJECTIVE:** **Management of UST systems (including requirements for the design, construction and operation, as well as maintenance, monitoring, and reporting) in accordance with applicable Federal and State of Maryland regulations.**
4.0	**PRIMARY MEASURABLE TARGETS AND COMPLETION DATES:** 1. **100% UST Reconciliation Training complete by January 31, 2011.** 2. **100% implementation of a tank management program by January 31, 2011.** 3. **100% of USTs inspected for compliance (by a MDE certified inspector) by August 31, 2009.**
5.0	**STRATEGY:** To improve management of USTs and associated piping by implementing new methods/procedures to track performance of tank testing, inspections, and other tank management tasks.
6.0	**Has Senior Management approved the resources necessary to implement this Objective and Target Action Plan?** Approved during Sr. Mgmt Review on 7/7/09.
7.0	**Date of Senior Management approval:** 7/7/09

ENVIRONMENTAL MANAGEMENT SYSTEM

Maryland Transit Administration
Washington Boulevard Complex

Verification	Person responsible for maintaining	Comments provided by	Reviewed by	Approved by
Initials	DM	EMS Team	BF	BB

ED 4.3.3-2 Objective & Target Action Plan – Reduction of CO_2 Emissions from Buses

Document Name:	**Reduction of CO_2 Emissions Action Plan**	**Facility Affected:**	Washington Boulevard Complex
Document No:	EP 4.3.3 – AP#001	**Relevant Process:**	Idling of Buses
Start Date:	5/13/09	**Related Significant Aspect or Legal and Other Requirement:** CO_2 Emissions from Buses	
Date Fully Completed:		**Last Revised:** 10/12/09	

1.0	**Person Responsible for Overall Action Plan:** *Dave Varner*
2.0	**GOAL STATEMENT: Reduce the amount of CO_2 emissions from buses based at the Washington Boulevard Complex by purchasing new hybrid buses and training and educating bus operators on the idling of buses at layover points.**
3.0	**OBJECTIVE: Reduce the amount of CO_2 emissions generated by buses based at the Washington Boulevard Complex.**
4.0	**PRIMARY MEASURABLE TARGET & COMPLETION DATE:** • **25% reduction in CO_2 emissions from 2006 levels by 2020, following Maryland's Greenhouse Gas Reduction Act.** *(*This target will be broken down into incremental targets following completion of the baseline.)*
5.0	**STRATEGY:** To establish a baseline by determining the quantity of emissions currently produced by buses based at the Washington Boulevard Complex and to reduce these emissions through the purchasing and use of new hybrid coaches and training on methods to reduce idling of buses.
6.0	**Has Senior Management approved the resources necessary to implement this Objective and Target Action Plan?** Approval during Sr. Mgmt Review on 7/7/09.
7.0	**Date of Senior Management approval:** 7/7/09

ENVIRONMENTAL MANAGEMENT SYSTEM
Maryland Transit Administration
Washington Boulevard Complex

Verification	Person responsible for maintaining	Comments provided by	Reviewed by	Approved by
Initials	DM	EMS Team	BF	BB

ED 4.3.3-3 Objective & Target Action Plan – Fueling-related activities (gas-powered vehicles)

Document Name:	**Fueling-related Activities (gasoline vehicles) Action Plan**	**Facility Affected:**	Washington Boulevard Complex
Document No:	EP 4.3.3 – AP#001	**Relevant Process:**	Fueling of gas-powered vehicles
Start Date:	5/15/09	**Related Significant Aspect or Legal and Other Requirement:** Fueling-related activities (gasoline vehicles)	
Date Fully Completed:		**Last Revised:** 10/12/09	

1.0	**Person Responsible for Overall Action Plan:** ***Robert Frazier***
2.0	**GOAL STATEMENT:** **Reduce spills and air emissions associated with the fueling of gas-powered vehicles.**
3.0	**OBJECTIVE:** **Reduce the amount of spills and air emissions associated with the fueling of gas-powered vehicles at the Washington Boulevard Complex.**
4.0	**MEASURABLE TARGET & COMPLETION DATE:** • **Have 100% active Stage 2 Recovery training program in place by December 30, 2009.**
5.0	**STRATEGY**: To reduce the amount of air emissions associated with the fueling of gas-powered vehicles through the training of required personnel on Stage 2 vapor recovery and correct fueling practices. Implement regulatory required inspections and testing of recovery systems. To reduce the amount of spills through the use of tank monitoring software, tank alarm systems, signage, and employee training.
6.0	**Has Senior Management approved the resources necessary to implement this Objective and Target Action Plan**? Approved during Sr. Mgmt Review on 7/7/09.
7.0	**Date of Senior Management approval**: 7/7/09

ENVIRONMENTAL MANAGEMENT SYSTEM
Maryland Transit Administration
Washington Boulevard Complex

Verification	Person responsible for maintaining	Comments provided by	Reviewed by	Approved by
Initials	DM	EMS Team	BF	BB

ED 4.3.3-4 Objective & Target Action Plan – Management of Oil/Water Separators and Grit Systems

Document Name:	**Management of Oil/water Separators and Grit Systems Action Plan**	**Facility Affected:**	Washington Boulevard Complex
Document No:	EP 4.3.3 – AP#001	**Relevant Process:**	Use of oil/water separators and grit systems
Start Date:	5/15/09	**Related Significant Aspect or Legal and Other Requirement:** Oil/water separators and grit systems	
Date Fully Completed:		**Last Revised:** 10/12/09	

1.0	**Person Responsible for Overall Action Plan:** ***Robert Frazier***
2.0	**GOAL STATEMENT: Improve oil/water separator and grit systems functions at the Washington Boulevard Complex.**
3.0	**OBJECTIVE: Manage quantifiable improvement in the oil/water separator and grit systems functions at the Washington Boulevard Complex.**
4.0	**MEASURABLE TARGET & COMPLETION DATE:** • **To be determined based on results of baseline in-house sampling and inspection.**
5.0	**Strategy:** Evaluate the cost of purchasing new oil/water separators, evaluate in-house analysis of current OWS performance, use of spill kits, and employee training. Evaluate and employ electronic equipment to monitor oil levels and water quality in the separators. Check separator structural integrity. Evaluate work processes to improve discharge quality to the separator system.
6.0	**Has Senior Management approved the resources necessary to implement this Objective and Target Action Plan?** Approved during Sr. Mgmt Review on 7/7/09.
7.0	**Date of Senior Management approval:** 7/7/09

Benefits of Adopting an EMS

There are many potential benefits identified for adopting an EMS; specific areas that were significant to MTA include:

- Sustaining and re-enforcing ongoing compliance activities.
- Promoting compliance through 'organizational outreach and awareness'.
- Expanding MTA's 'Think Green – Ride MTA' campaign.
- Improved employee awareness of potential environmental impacts of work activities.
- Improved communications and cooperation through training and outreach.
- Improved relations with regulatory agencies.

- Modified environmental procedures and improved work procedures.
- Adoption of an agency-wide environmental policy.
- Improved environmental performance related to the environmental aspects and reduced environmental liabilities.
- Identification of corrective actions which will reduce risk.
- Incorporation of environmental stewardship into all services.
- Compliance monitoring through use of the MTA Geographic Information System (GIS).
- Promoting discussion between MTA departments on environmental topics.

Resources

Since first meeting with Virginia Tech and FTA, through July 1, 2010, the following labor hours have been estimated to be expended:

Group	Estimated Hours
EMS Core Team	2,003
Other MTA Employees	141
Consultant	648
Employee Training	200
TOTAL	3,028

Discipline	Estimated Costs
MTA Labor	$68,100
Consultant	$48,600
Travel	$4,800
Materials	$2,500
TOTAL	$124,000

Cost Savings and Avoidance

Through the monitoring and management of the CO^2 significant aspect, the MTA is reducing CO^2 emissions and is realizing estimated fuel cost savings.

The table below shows the estimated fuel costs and CO^2 emissions of the all diesel fleet in 2004 to partial hybrid fleet in 2012 to all hybrid fleet in 2015.

	FY2004	FY2012	FY2015
Fuel Costs	**$22,954,960**	**$13,672,120**	**$11,339,750**
CO^2 Emissions	**101,151 tons**	**66,031 tons**	**60,781 tons**

Next Steps

MTA is in the process of developing and implementing procedures which are the framework for the EMS. The primary administrative components of the EMS are mostly addressed by the Office of Safety, Quality Assurance and Risk Management. The objectives and targets involve participation by the actual operating work groups at the facility are the keys to the components.

The next steps for the EMS include:

- Respond to suggestions and implement corrective actions of the Virginia Tech Lead Auditor, based on the results of the Final Audit (July 13-14, 2010).
- Develop request for proposal (RFP) for ISO certification audit.
- Increase participation in the MTA EMS.
- Maintain continual improvement of the MTA EMS by continuing to track progress on Objective and Targets Action Plans.
- Expand the EMS to other MTA facilities.

Management Commitment

The senior management of MTA has been committed to the intent of the FTA-sponsored implementation of the EMS at the fence line.

MTA Maryland

"Developing and implementing an EMS at the MTA has supported compliance with several MDOT environmental initiatives underway. MDOT is committed to facilitating the protection of natural resources and promoting stewardship in environmental management. MTA's EMS commitment is in keeping with Governor O'Malley's policy of making Maryland the national leader in the area of environmental protection. The EMS supports Governor O'Malley's environmental policies, programs, and initiatives.

The EMS is fostering our relationship with regulatory agencies as it demonstrates a commitment toward 'continual improvement'. Further EMS benefits include sustaining environmental issues at the forefront and promoting awareness for day-to-day compliance activities.

The MTA has benefitted participating in this effort with Virginia Tech/FTA in promoting environmental awareness, stewardship, and compliance."

Bernadette Bridges,
Executive Director, Office of Safety,
Quality Assurance and Risk Management.

Maryland Transit Administration Audit Report

This Environmental Management System (EMS) Audit was based on a request by the Federal Transit Administration (FTA) as a final follow-up to an eighteen month program for EMS development and was conducted in accordance with the approved schedule.

W. Robert Herbert, Principle Contractor and ISO 14001 certified Lead Auditor with Virginia Tech, conducted the EMS Audit for the Maryland Transit Administration on July 13 and 14, 2010, to report on its conformance with the requirements of the ISO 14001:2004 standard.

The EMS was evaluated against each of the requirements set out in the ISO 14001:2004 standard titled "Environmental management system – General guidelines on principals, systems and support techniques." The Audit included the examination of documents, interviews of personnel and observations of activities and conditions.

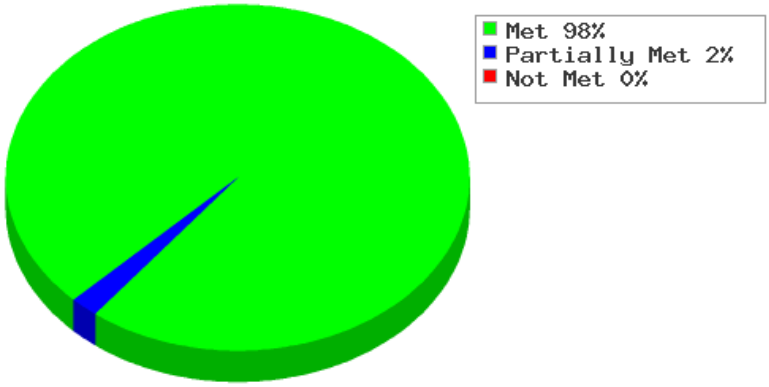
The site visit involved a review of the core EMS documents with the EMS team. The Maryland Transit Administration EMS Team participated in the review and discussion regarding the scoring.

Detailed scoring on next page

Maryland Transit Administration - Overall EMS Performance Results

This section compares the percentage of requirements *met, partially met and not met* with respect to meeting the requirements of an EMS as specified in the ISO 14001:2004 standard. The following scores are the result of the EMS audit presented in this report:

Percent meeting all requirements **"Overall Score"**	**99%**
Percent of requirements **"Met"**	**98%**
Percent of requirements **"Partially Met"**	**2%**
Percent of requirements **"Not Met"**	**0%**



	The ISO 14001:2004 standard elements of an EMS	Overall Score (%)	Met (%)	Partially Met (%)	Not Met (%)
4.1	General Requirements	100	100	0	0
4.2	Environmental Policy Requirements	100	100	0	0
4.3.1	Environmental Aspects Requirements	100	100	0	0
4.3.2	Legal and Other Requirements	100	100	0	0
4.3.3	Objectives, Targets and Programs Requirements	100	100	0	0
4.4.1	Resources, Roles, Responsibility and Authority	100	100	0	0
4.4.2	Competence, Training and Awareness	79	57	43	0
4.4.3	Communication	100	100	0	0
4.4.4	EMS Documentation	100	100	0	0
4.4.5	Control of Documents	100	100	0	0
4.4.6	Operational Control	100	100	0	0
4.4.7	Emergency Preparedness and Response	100	100	0	0
4.5.1	Monitoring and Measurement	100	100	0	0
4.5.2	Evaluation of Compliance	100	100	0	0
4.5.3	Nonconformity, Corrective Action and Preventive Action	100	100	0	0
4.5.4	Control of Records	100	100	0	0
4.5.5	Internal Audits	100	100	0	0
4.6	Management Review	100	100	0	0

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY (MBTA)
BOSTON, MASSACHUSETTS

June 2010

DESIGN & CONSTRUCTION

Dean Road Bridge Demolition Green Line Brookline, MA

Profile

In 1897, America's first subway was constructed between Park Street and Boylston Street in Boston, Massachusetts. This half-mile section of subway is still operated today by the MBTA, making the MBTA the oldest continuously operating subway system in the country. In the 113 years since this service opened, Boston's public transportation system has remained a critical part of the city, and has grown dramatically in response to an ever-increasing demand for transportation services. The MBTA now serves 175 communities, providing transit alternatives to a population of 4.7 million over an area of 3,200 square miles.

Currently, the MBTA is the fifth largest mass transit system in the United States as measured by ridership. The Authority serves a daily ridership of approximately 1.2 million passengers. To provide these services the Authority maintains 200 bus routes, 4 rapid transit lines of heavy and light rail, 1 bus rapid transit line, 4 trackless trolley lines, 11 commuter rail lines, several ferry lines and a paratransit service. Its large roster of equipment currently consists of 408 heavy rail vehicles, 204 light rail vehicles, 927 diesel buses, 61 compressed natural gas (CNG) buses, 2 prototype alternative fuel buses, 40 trackless trolleys, 80 commuter rail locomotives, 377 commuter rail coaches, 2 ferry boats, and 418 vehicles for the RIDE. Service is provided to 275 stations. The Authority maintains 885 miles of track, 478 bridges, and 20 miles of tunnel. Rail system expansion includes a commuter rail line to New Bedford and an extension to the Green Line to Somerville, MA. The MBTA operates 19 commuter rail, light/heavy rail and bus maintenance facilities, numerous right-of-way (ROW) maintenance facilities, and currently has 6,000+ employees.

A five member Board of Directors manages the affairs of the Authority. The Governor on a rotating schedule appoints the members of the Board. The Board has the power to appoint and employ a General Manager and other officers and approves all capital investments over $500,000. The MBTA has an Advisory Board, consisting of representatives from each of the cities and towns within the MBTA's service area that approves the annual operating budget and reviews the five-year Capital Investment Program.

In 1999, the Governor of Massachusetts signed into law legislation reforming the finances of the MBTA. This new law, known as "Forward Funding" established a new funding mechanism as of July 1, 2000. MBTA funding is now limited to: fares and other own source revenues, 20% of the state-wide sales tax, and assessments from the 175 cities and towns in its service district.

Fenceline

The MBTA had the opportunity to participate in the Federal Transit Administration's first round of Environmental Management Training offered in 2004. In 2004 the MBTA developed and implemented an EMS at a bus maintenance facility as well as a subway maintenance facility. Following the initial two facilities, the MBTA expanded the EMS to 11 (eleven) additional facilities.

Through the EMS development process we realized the need to expand our EMS beyond "bus and subway operations" and the "maintenance facilities" to include key operational departments

that have a significant role in all of our operations. The departments identified were Design and Construction, System wide Maintenance and Improvements, and Operations Support.

Following the training we received from the first round of FTA EMS Training, we requested to participate in Round II.

For the second round of training, the MBTA took the opportunity to focus on **Capitol Projects, specifically developing an EMS for our Design and Construction Department,** concentrating on soil and debris management. The Design and Construction Department consists of 190 employees who administer and manage all design and construction projects within the MBTA's Capital Investment Program, which has a total budget of $3.68 billion to be expended in fiscal years 2010 through 2014.

Core Team

The MBTA formed a 15-member team to travel to Roanoke, Virginia for EMS training. The team consisted of representatives from the Environmental Affairs Department, Subway Operations, Bus Operations, System-wide Maintenance and Improvements, Power Department and the Design and Construction Department.

The Core Team for Design and Construction consisted of:

Manager of Environmental Construction
Deputy Director of Design and Construction
Project Director of Design & Construction
Deputy Director Quality Assurance

Supporting team members consisted of:

Director of Environmental Compliance
Environmental Compliance Officer
Superintendent of Bus Maintenance
Superintendent of Southampton Facility
Superintendent of Maintenance
RVM Training Instructor
Superintendent, Power Systems & Equipment
Division Engineer, SMI

Additionally, the Design and Construction Department established a sub-team consisting of project engineers and resident engineers working on current MBTA projects.

Key Drivers for Adopting an EMS

The MBTA began its efforts to develop an EMS in 2002 with the adoption of our Environmental Policy. Our commitment to develop an EMS was further solidified and formalized in a Settlement Agreement with the Massachusetts Department of Environmental Protection (DEP)

and in a Consent Decree with the United States Department of Justice (DOJ) and the United States Environmental Protection Agency Region 1 (EPA). The settlement with DEP involved soil contamination at an old rail yard acquired by the MBTA through the Penn Central Railroad Bankruptcy Proceedings.

The Consent Decree with the DOJ and EPA stemmed from violations of the Clean Water Act (CWA) and the Clean Air Act (CAA). The CWA violations involved the unpermitted discharging of process water and storm water associated with industrial activity, the failure to prepare Spill Prevention Control and Countermeasure (SPCC) plans, and the failure to prepare Storm Water Pollution Prevention Plans (SWPPP).

The CAA violation involved the excessive idling of 56 buses at four MBTA Bus Yards. In Massachusetts, the operator of a motor vehicle is not permitted to unnecessarily operate "the engine of a motor vehicle while said vehicle is stopped for a foreseeable period of time in excess of five minutes." (310 CMR 7.11)

The Agreement/Consent Decree contain specific requirements for the content of our EMS as well as a definite schedule for development, implementation and audit of our EMS. Under these agreements, the MBTA is required to conduct initial assessments and develop an EMS Manual encompassing all MBTA Facilities. The EMS Manual was submitted to EPA and DEP for comment. The MBTA has implemented the EMS Manual at all facilities, the MBTA then rolled out the EMS System-wide in three phases (Phase I – 5 additional facilities, Phase II – 6 additional facilities, Phase III – 5+ facilities).

Significant Aspects & Impacts

Members of the Core Team reviewed and evaluated a typical MBTA construction project from start to finish identifying significant environmental aspects associated with a construction project. This included the review of technical specifications, design guidelines, contractor submittals, the resident engineer manual and overall contract management to include budgeting, invoices, cost overruns, timelines, and change of conditions. To determine the significance of each aspect, the Core Team scored their aspects using a numerical weighting system on a matrix answering the following questions:

1. Is the aspect regulated?
2. Does the aspect pose a potential environmental impact?
3. Is the aspect associated with a legal obligation?
4. Is there significant financial risk or an opportunity to control the aspect?

Below is the form used in identifying their significant aspects.

ASSIGNING IMPACTS TO ASPECTS & DETERMINING SIGNIFICANCE

Facility: Design and Construction
Prepared by: Holly Palmgren
Date: 3/18/09
Activity: Soil and Construction Debris Management

Aspects	Impacts				Questions for Significance				
	Air	Water	Land	Financial Impacts	Is it Regulated	Does the aspec pose a potentia environmental impact	Is there significant stakeholder interest	Is there significant financial risk or opportunity	Is it a significant aspect? Yes/No
Air Emissions-Heavy Equipment	3	1	1	2	yes	yes	yes	no	yes
Asbestos	3	1	1	3	yes	yes	yes	yes	yes
Concrete Dust	3	1	3	2	yes	yes	yes		yes
Construction Debris	1	1	5	5	yes	yes	yes	yes	**yes**
Contaminated Soil	1	5	5	5	yes	yes	yes	yes	**yes**
Erosion Control	1	4	4	4	yes	yes	yes	yes	yes
Fugitive Dust	3	1	1	2	yes	yes	yes		yes
Groundwater Elevations	1	5	1	3	yes	yes	yes		yes
Groundwater Dewatering	1	4	1	3	yes	yes	yes		yes
Lead-Based Paint	3	1	3	4	yes	yes	yes	yes	yes
Natural Gas	3	1	1	2	yes	yes			yes
Noise	3	1	1	3	yes	no	yes		yes
Scrap Metal	1	1	4	4	yes	yes	yes	yes	yes
Stormwater	1	4	4	4	yes	yes	yes	yes	yes
Water Consumption	1	3	1	3		yes	yes	yes	yes
Spill Response	3	4	4	4	yes	yes	yes	yes	yes
Wetlands	1	5	1	4	yes	yes	yes	yes	yes

Following completion of the above form, the Core Team decided to focus on the two aspects that had the highest financial impact. These aspects were construction debris and contaminated soil.

Objectives and Targets

Objectives	Targets
DESIGN & CONSTRUCTION	
Improve Management of Demolition Debris (with an emphasis on minimizing unauthorized dumping of debris on MBTA property)	• Evaluate current MBTA technical specifications and design guidelines and determine if revisions are required; • Review current contractor submittal process and determine if revisions are required; • Establish improved contract language and procedure to manage demolition debris; • Educate and train employees on proper management of demolition debris; • Track performance of newly established language and procedures.
Improve Management of Soil Reuse and Soil Disposal (with an emphasis on properly managing contaminated soil excavated from MBTA construction projects.	• Evaluate current MBTA technical specifications and design guidelines and determine if revisions are required; • Review current contractor submittal process and determine if revisions are required; • Establish improved contract language and procedures to manage soil reuse and soil disposal; • Educate and train employees on proper management of soil reuse and soil disposal; • Track performance of newly established language and procedures.

Mixed Construction Debris

Before with Construction Materials

After with Construction Material Removed

Benefits of Adopting an EMS

MBTA has realized a number of immediate benefits resulting from our EMS. These benefits include:

- The creation of the Core Team and the development of the EMS have improved communications across departments at the MBTA.
- Increased and improved understanding of all environmental aspects of construction projects.
- Improved communication between the MBTA and its contractors.
- Improved control of contract documentation.
- Improved knowledge of Design and Construction employees and contracts of environmental aspects and impacts.

Resources

To date, the MBTA expended the following level of effort (estimated in hours) in the development of the EMS:

Core Team	2,495
Sub Teams	96
Consultants	32

To date, the MBTA incurred the following estimated cost in the development of the EMS:

MBTA Labor	$93,302
Travel/Supplies	$23,253
Consultant/Training	$60,450

Cost Savings or Avoidance

To date, the MBTA has not been able to quantify cost savings from our EMS. Since our EMS efforts began we have had improved compliance with our management of contaminated soil and reduced unauthorized dumping of construction debris on MBTA property. We have also experienced improved relations with state, federal and local agencies.

Next Steps

The MBTA is committed to implementing a system-wide EMS. The EMS will be evaluated annually by the MBTA Core Team.

The MBTA has developed an EMS Manual, as well as an Environmental Management System page on our Portal. The MBTA Portal is an online resource that provides information to employees via the web-browser, 24 hours a day, 7 days a week. The MBTA portal also contains our SOPs, Environmental Procedures, and Programs developed during the first FTA EMS Implementation Course. We have found both our EMS Manual and the Portal useful tools for EMS Training and Documentation.

Management Commitment

The Senior Management at the MBTA is committed to implementing a successful EMS. The General Manager has made eliminating negative environmental impacts as one of the things that will make the MTBA, a world-class public transportation system. To this end, his chief of staff has become a key “ad-hoc” member of the Core Team.

MBTA System


OAK GROVE
Malden
Wellington
Sullivan Square
WONDERLAND
Revere Beach
Beachmont
Suffolk Downs
Orient Heights
Wood Island
Airport
Maverick
AIRPORT TERMINALS
Logan International Airport
Davis
ALEWIFE
Porter
Harvard
Community College
LECHMERE
Science Park
North Station
Central
BOWDOIN
Haymarket
Kendall/MIT
Gov't Center
Aquarium
State**
Charles/MGH
Park St
Downtown Crossing
Courthouse
World Trade Ctr.
Silver Line Way
Silver Line Waterfront
SL1
SL2
SL3
BOSTON MARINE INDUSTRIAL PARK
CITY POINT
BOSTON COLLEGE
Washington St
Harvard Ave
Washington Square
Coolidge Corner
BU Central
BU East
CLEVELAND CIRCLE
RIVERSIDE
Woodland
Waban
Eliot
Newton Highlands
Newton Centre
Chestnut Hill
Reservoir
Beaconsfield
Brookline Hills
Brookline Village
St. Mary's St
Fenway
Longwood
Prudential
Symphony
Northeastern
Museum of Fine Arts
Longwood
Brigham Circle
HEATH
Kenmore
Hynes
Copley
Arlington
*Boylston
Back Bay
Chinatown
NE Medical Center
South Station
Broadway
Andrew
JFK/UMass
Herald St
E. Berkeley St
Union Park St
Newton St
Worcester Sq
Mass Ave
Lenox St
Melnea Cass Blvd
DUDLEY SQ
Silver Line Washington St
Mass Ave
Ruggles
Roxbury Crossing
Jackson Sq
Stony Brook
Green St
FOREST HILLS
Savin Hill
Fields Corner
Shawmut
ASHMONT
Cedar Grove
Butler
Milton
Central Ave
Valley Rd
Capen St
MATTAPAN
North Quincy
Wollaston
Quincy Center
Quincy Adams
BRAINTREE

MBTA Design & Construction Audit Report

This Environmental Management System (EMS) Audit was based on a request by the Federal Transit Administration (FTA) as a final follow-up to an eighteen month program for EMS development and was conducted in accordance with the approved schedule.

W. Robert Herbert, Principle Contractor and ISO 14001 certified Lead Auditor with Virginia Tech, conducted the EMS Audit for MBTA Design & Construction on June 9, 2010, to report on its conformance with the requirements of the ISO 14001:2004 standard.

The EMS was evaluated against each of the requirements set out in the ISO 14001:2004 standard titled "Environmental management system – General guidelines on principals, systems and support techniques." The Audit included the examination of documents, interviews of personnel and observations of activities and conditions.

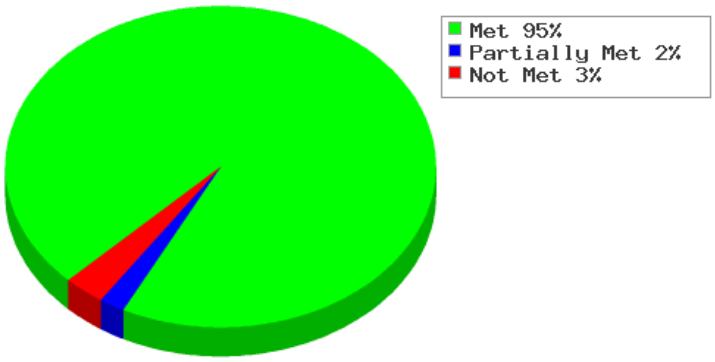
The site visit involved a review of the core EMS documents with the EMS team. The Design & Construction EMS Team participated in the review and discussion regarding the scoring.

Detailed scoring on next page

MBTA Design & Construction - Overall EMS Performance Results

This section compares the percentage of requirements *met, partially met and not met* with respect to meeting the requirements of an EMS as specified in the ISO 14001:2004 standard. The following scores are the result of the EMS audit presented in this report:

Percent meeting all requirements **"Overall Score"**	**96%**
Percent of requirements **"Met"**	**95%**
Percent of requirements **"Partially Met"**	**2%**
Percent of requirements **"Not Met"**	**3%**



	The ISO 14001:2004 standard elements of an EMS	Overall Score (%)	Met (%)	Partially Met (%)	Not Met (%)
4.1	General Requirements	100	100	0	0
4.2	Environmental Policy Requirements	100	100	0	0
4.3.1	Environmental Aspects Requirements	100	100	0	0
4.3.2	Legal and Other Requirements	100	100	0	0
4.3.3	Objectives, Targets and Programs Requirements	100	100	0	0
4.4.1	Resources, Roles, Responsibility and Authority	100	100	0	0
4.4.2	Competence, Training and Awareness	100	100	0	0
4.4.3	Communication	100	100	0	0
4.4.4	EMS Documentation	100	100	0	0
4.4.5	Control of Documents	100	100	0	0
4.4.6	Operational Control	100	100	0	0
4.4.7	Emergency Preparedness and Response	50	50	0	50
4.5.1	Monitoring and Measurement	100	100	0	0
4.5.2	Evaluation of Compliance	100	100	0	0
4.5.3	Nonconformity, Corrective Action and Preventive Action	100	100	0	0
4.5.4	Control of Records	100	100	0	0
4.5.5	Internal Audits	100	100	0	0
4.6	Management Review	83	67	33	0

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY (MBTA)
BOSTON, MASSACHUSETTS

June 2010

SOUTHAMPTON BUS FACILITY

Southampton Maintenance Facility was constructed in 2005 originally designed to handle 76 buses.

Profile

In 1897, America's first subway was constructed between Park Street and Boylston Street in Boston, Massachusetts. This half-mile section of subway is still operated today by the MBTA, making the MBTA the oldest continuously operating subway system in the country. In the 108 years since this service opened, Boston's public transportation system has remained a critical part of the city, and has grown dramatically in response to an ever-increasing demand for transportation services. The MBTA now serves 175 communities, providing transit alternatives to a population of 4.7 million over an area of 3,200 square miles.

Currently, the MBTA is the fifth largest mass transit system in the United States as measured by ridership. The Authority serves a daily ridership of approximately 1.2 million passengers. To provide these services the Authority maintains 200 bus routes, 4 rapid transit lines of heavy and light rail, 1 bus rapid transit line, 4 trackless trolley lines, 11 commuter rail lines, several ferry lines and a paratransit service. Its large roster of equipment currently consists of 408 heavy rail vehicles, 204 light rail vehicles, 927 diesel buses, 61 compressed natural gas (CNG) buses, 2

prototype alternative fuel buses, 40 trackless trolleys, 80 commuter rail locomotives, 377 commuter rail coaches, 2 ferry boats, and 418 vehicles for the RIDE. Service is provided to 275 stations. The Authority maintains 885 miles of track, 478 bridges, and 20 miles of tunnel. Rail system expansion includes a commuter rail line to New Bedford and an extension to the Green Line to Somerville, MA. The MBTA operates 19 commuter rail, light/heavy rail and bus maintenance facilities, numerous right-of-way (ROW) maintenance facilities, and currently has 6,000+ employees.

A five member Board of Directors manages the affairs of the Authority. The Governor on a rotating schedule appoints the members of the Board. The Board has the power to appoint and employ a General Manager and other officers and approves all capital investments over $500,000. The MBTA has an Advisory Board, consisting of representatives from each of the cities and towns within the MBTA's service area, that approves the annual operating budget and reviews the five-year Capital Investment Program.

In 1999, the Governor of Massachusetts signed into law legislation reforming the finances of the MBTA. This new law, known as "Forward Funding" established a new funding mechanism as of July 1, 2000. MBTA funding is now limited to: fares and other own source revenues, 20% of the state-wide sales tax, and assessments from the 175 cities and towns in its service district.

Fenceline

The MBTA had the opportunity to participate in the Federal Transit Administration's first round of Environmental Management Training offered in 2004. In 2004 the MBTA developed and implemented an EMS at a bus maintenance facility as well as a subway maintenance facility. Following the initial two facilities, the MBTA expanded the EMS to 11 (eleven) additional facilities.

Through the EMS development process we realized the need to expand our EMS beyond "bus and subway operations" and the "maintenance facilities" to include key operational departments that have a significant role in all of our operations. The departments identified were Design and Construction, System wide Maintenance and Improvements, and Operations Support.

Following the training we received in the first round of FTA EMS Training, we requested to participate in Round II.

For the second round of training MBTA took the opportunity to focus on the **Southampton Bus Maintenance facility**. The Facility is located at 220-240 Southampton Street in Boston, Massachusetts. The Facility is commercially zoned and situated in a heavy traffic area of Roxbury. The Facility is bounded on the west by Moore Street, on the north by the Southeast Expressway, on the east by private property that includes an electric substation and industrial building, and on the south by Southampton Street. It is considered a bus operating facility that stores, services, maintains and repairs dual-mode electric trolley buses for the Transitway and Compressed Natural Gas (CNG) powered buses that may be used on the other MBTA routes, such as Washington Street. The Facility, which houses approximately 76 buses and an estimated 170 full-time employees, includes a Parking Garage, Fueling Building, Bus Wash and Degreaser Building and a Maintenance Building.

The Parking Garage, located along the southern limit of the site, is a three-story structure. The ground level is used for bus parking and queuing prior to leaving the Facility. The subsequent floors are used to park both private and official vehicles owned and operated by the MBTA, its employees and visitors. Several floor drains, located throughout the Garage, transport any fluidized materials to a common point. The liquid passes through an oil/water separator (OWS) and a grit removal chamber, prior to being discharged to the site storm water collection system and ultimately to Southampton Street. The Parking Garage is equipped with emergency eye wash stations, telephone and communications equipment, and fire protection.

The Fueling Building, located toward the center of the site and west of the Maintenance Garage, is used to fuel the buses with either CNG or diesel fuel. The diesel fuel is supplied from two (2) 9,900-gallon aboveground storage tanks (ASTs), located southwest of the fueling building. In addition to the fuel, the building also contains antifreeze, automatic transmission fluid (ATF), chassis grease, engine and gear oil, windshield washing solvent and waste oil. All of the products have emergency shut-off valves to isolate the flow in case of a spill/release. The building is equipped with emergency eye wash stations, telephone and communications, fire protection, and first aid kits. The building is also equipped with an emergency generator, powered by CNG. Also located on the western side of this building is an electrical transformer, which contains 150 gallons of mineral oil. The facility is equipped with floor drains, which are directed into a Boston Water and Sewer Commission (BWSC) approved OWS prior to discharge into the site drainage system.

The Bus Wash and Degreasing Building, located to the south of the fueling building, is used to clean the exterior and undercarriage of the buses. The degreasing portion of the building cleans the undercarriage of the buses and collects residual water for recycling. This degreasing washwater enters an inflow trench below the buses and flows to a grit chamber, followed by an OWS and a second grit chamber before it enters a water reclamation system to be used again for bus washing purposes. All reclaimed water is stored in a 2,000-gallon recycled water storage tank. The sediment from this operation is collected for disposal. The building is equipped with emergency eye wash stations, telephone and communications, fire protection, and first aid kits. The facility contains floor drains, which are directed into a BWSC approved oil/water separator prior to discharge into the site drainage system.

The Maintenance Building, located in the northeast corner of the site, is used to service the MBTA bus fleet. The Facility, which includes a tire shop and battery room, contains compressor lube oil,

chassis grease, ATF, diesel fuel, gear oil, engine oil, windshield wash solvent, antifreeze and waste oil (in a designated lube room). There is also a flammable storage cabinet in the parts storeroom of the Building. The building is equipped with emergency eye wash stations, telephone and communications, fire protection, and first aid kits. The facility contains floor drains, which are directed into a BWSC approved OWS prior to discharge into the site drainage system.

Core Team

The MBTA formed a 15-member team to travel to Roanoke, Virginia for EMS training. The team consisted of representatives from the Environmental Affairs Department, Bus Operations, Subway Operations, the Design and Construction Department, System-wide Maintenance and Improvements and the Power Department.

The Core Team for Bus Operations consisted of:

Superintendent of Southampton Facility
Superintendent of Bus Maintenance
Director of Environmental Compliance
Environmental Compliance Officer

Supporting Team members consisted of:

Manager of Environmental Construction
Deputy Director of Design and Construction
Project Director of Design & Construction
Deputy Director Quality Assurance
Superintendents of Maintenance
RVM Training Instructors
Superintendent, Power Systems & Equipment
Division Engineer, SMI

Additionally, the Southampton Bus facility established a Sub-team consisting of mechanics, painters, cleaners, and foremen/supervisors. Members of the Core Team met with the Sub-team on a regular basis as a way of tracking progress at the Southampton Bus facility.

Key Drivers for Adopting an EMS

The MBTA began its efforts to develop an EMS in 2002 with the adoption of our Environmental Policy. Our commitment to develop an EMS was further solidified and formalized in a Settlement Agreement with the Massachusetts Department of Environmental Protection (DEP) and in a Consent Decree with the United States Department of Justice (DOJ) and the United States Environmental Protection Agency Region 1 (EPA). The settlement with DEP involved soil contamination at an old rail yard acquired by the MBTA through the Penn Central Railroad Bankruptcy Proceedings.

The Consent Decree with the DOJ and EPA stemmed from violations of the Clean Water Act (CWA) and the Clean Air Act (CAA). The CWA violations involved the unpermitted discharging of process water and storm water associated with industrial activity, the failure to

prepare Spill Prevention Control and Countermeasure (SPCC) plans, and the failure to prepare Storm Water Pollution Prevention Plans (SWPPP).

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The Agreement/Consent Decree contain specific requirements for the content of our EMS as well as a definite schedule for development, implementation and audit of our EMS. Under these agreements, the MBTA is required to conduct initial assessments and develop a EMS Manual encompassing all MBTA Facilities. The EMS Manual was submitted to EPA and DEP for comment. The MBTA has implemented the EMS Manual at all facilities, the MBTA then rolled out the EMS System-wide in three phases (Phase I – 5 additional facilities, Phase II – 6 additional facilities, Phase III – 5+ facilities).

Significant Aspects & Impacts

Members of the Core Team met with the Sub Team to identify aspects and impacts. To determine the significance of each aspect the Sub Team scored them using a numerical weighting system on a matrix answering the following questions:

5. Is the aspect regulated?
6. Does the aspect pose a potential environmental impact?
7. Is the aspect associated with a legal obligation?
8. Is there significant financial risk or an opportunity to control the aspect?

Below is the form used in identifying significant aspects.

MS DOCUMENT NUMBER: ENV-FRM-001 Revision Date: Effective:09/09/05 Issued By: EMS Team

ASSIGNING IMPACTS TO ASPECTS & DETERMINING SIGNIFICANCE

Facility: (456) Southampton Facility Page __1__ of___1___
Preparec Keith Hayes (Superintendent)
Date: 23-Feb-09
Activity: Vehicle Washing

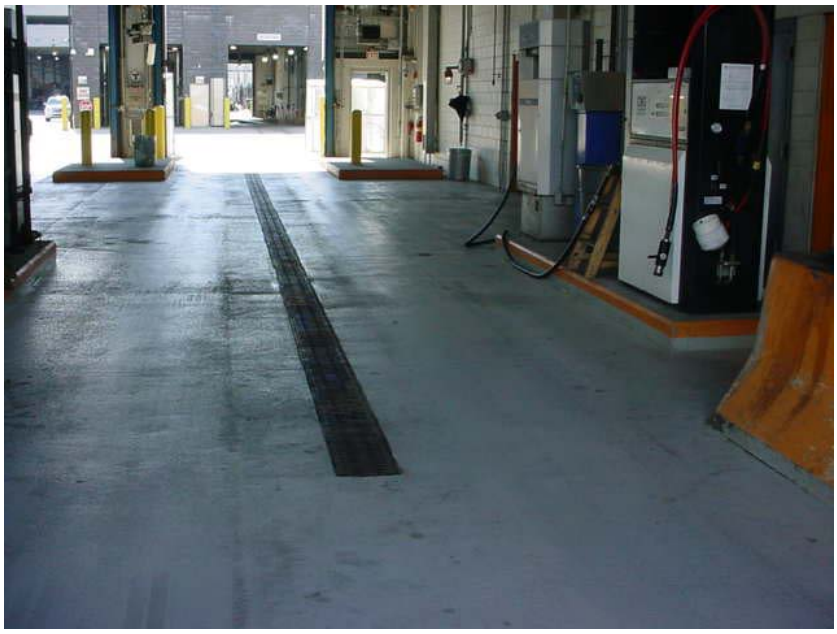
Aspects	Impacts				Questions for Significance				
	Air	Wate	Land	Financial	Is it Regulated	Does the aspec pose a potentia environmental impact	Is aspect associated with legal obligation	Is there significant financial risk or opportunity	Is it a significant aspect? Yes/No
Soaps	1	5	3	2	No	Yes	No	Yes	Yes
Treatment	1	5	1	5	Yes	Yes	Yes	Yes	Yes
Wash Equ	1	5	1	2	No	Yes	No	Yes	Yes
Water Dis	0	5	3	4	Yes	Yes	Yes	Yes	Yes
Water Usa	1	5	1	3	No	Yes	Yes	Yes	Yes

For the development of our EMS, the MBTA selected the four most significant aspects identified and established objectives and targets to improve our environmental performance of each.

Objectives and Targets

Objectives	Targets
Hazardous Materials Handling -Improve the management of petroleum products and hazardous materials (In Massachusetts, waste oil is considered a hazardous waste.) Disposed of as a "recyclable".	• Identify personnel to be trained • Develop training module • Determine training schedule • Conduct employee training
Vehicle Wash Treatment – Ensure compliance with water discharge standards	• Develop baseline and obtain last quarterly sampling results • Obtain schematics of treatment systems • Evaluate baseline data to determine patterns of discharge • Establish standard operating procedure • Evaluate and audit vehicle wash over a one year period
Air Emissions – Eliminate Vehicle idling	• Develop training video for all operators • Train all operators • Develop standard operating procedure for all operators • Monitor peak pull out periods
Water Discharges – Create water discharge permit tracking database	• Confirm location of all industrial and stormwater discharges • Confirm permit, Stormwater Pollution Prevention Plan (SWPPP) and Spill Prevention Control and Countermeasure Plan (SPCC) for each facility • Insure facility training on SWPPP and SPCC • Track and evaluate all permits, SWPPP and SPCC Plans

Fuel Alley Trench Drain – Before



Fuel Alley Trench Drain – After

Benefits of Adopting an EMS

MBTA has realized a number of immediate benefits resulting from instituting an EMS at the bus facility. These benefits include:

- Creation of the Core Team and the development of the EMS have improved communications across departments at the MBTA.

- Increased and improved understanding of all operations at the MBTA, specifically by employees of different departments.

- Development of Standard Operating Procedures has allowed the MBTA to better retain and document institutional knowledge.
- Increased enthusiasm and pride in how employees do their job.
- Improved control and inventory of documentation.
- Improved knowledge by all employees of environmental aspects and impacts.

Resources

To date, the MBTA expended the following level of effort (estimated in hours) in the development of the EMS:

Core Team	2,495
Sub Teams	96
Consultants	32

To date, the MBTA incurred the following estimated cost in the development of the EMS:

MBTA Labor	$93,302
Travel/Supplies	$23,253
Consultant/Training	$60,450

Cost Savings or Avoidance

Since our EMS efforts began we have had improved compliance at our facilities. We have also experienced improved relations with state, federal and local agencies.

Next Steps

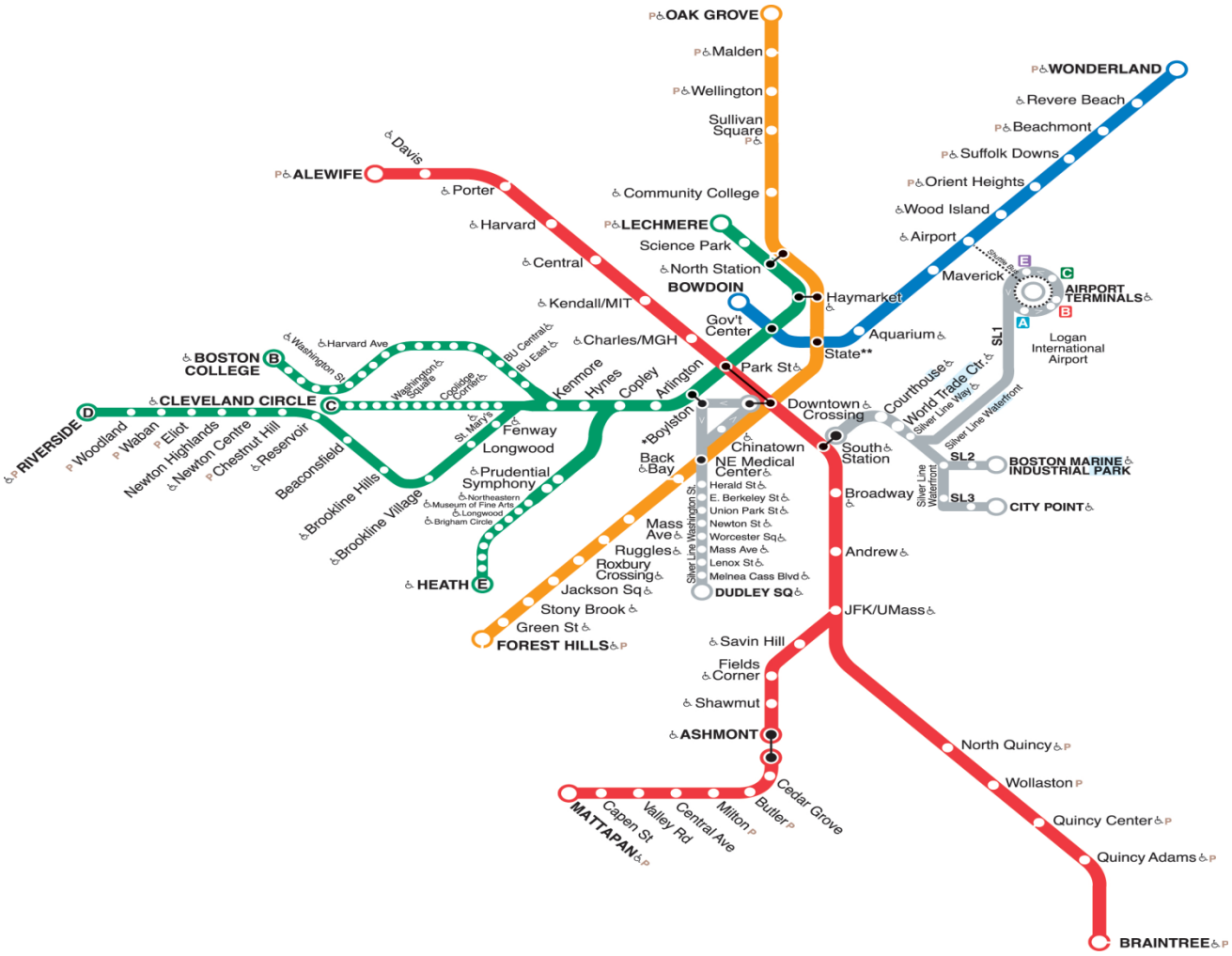
It is anticipated that the EMS for all facilities will be operational by the summer of 2010. The MBTA is committed to implementing a system-wide EMS. The EMS will be evaluated annually by the MBTA Core Team and Senior Management.

The MBTA has developed an EMS Manual, as well as an Environmental Management System page on our Portal. The MBTA Portal is an online resource that provides information to employees via the web-browser, 24 hours a day, 7 days a week. The MBTA portal also contains our SOPs, Environmental Procedures, and Programs developed during the first FTA EMS Implementation Course. We have found both our EMS Manual and the Portal useful tools for EMS Training and Documentation.

Management Commitment

The Senior Management at the MBTA is committed to implementing a successful EMS. The General Manager has made eliminating negative environmental impacts as one of the things that will make the MTBA, a world-class public transportation system. To this end, his chief of staff has become a key “ad-hoc” member of the Core Team.

MBTA System



MBTA Southampton Bus Facility Audit Report

This Environmental Management System (EMS) Audit was based on a request by the Federal Transit Administration (FTA) as a final follow-up to an eighteen month program for EMS development and was conducted in accordance with the approved schedule.

W. Robert Herbert, Principle Contractor and ISO 14001 certified Lead Auditor with Virginia Tech, conducted the EMS Audit for the MBTA Southampton Bus Facility on June 10, 2010, to report on its conformance with the requirements of the ISO 14001:2004 standard.

The EMS was evaluated against each of the requirements set out in the ISO 14001:2004 standard titled "Environmental management system – General guidelines on principals, systems and support techniques." The Audit included the examination of documents, interviews of personnel and observations of activities and conditions.

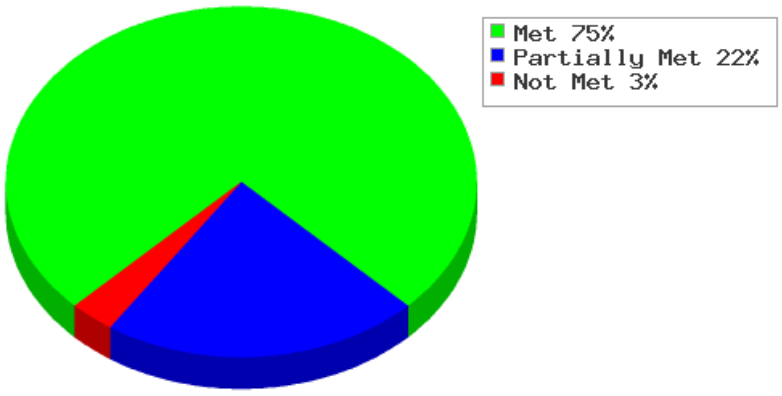
The site visit involved a review of the core EMS documents with the EMS team. The Southampton Bus EMS Team participated in the review and discussion regarding the scoring.

Detailed scoring on next page

MBTA Southampton Bus Facility - Overall EMS Performance Results

This section compares the percentage of requirements *met, partially met and not met* with respect to meeting the requirements of an EMS as specified in the ISO 14001:2004 standard. The following scores are the result of the EMS audit presented in this report:

Percent meeting all requirements **"Overall Score"**	**86%**
Percent of requirements **"Met"**	**75%**
Percent of requirements **"Partially Met"**	**22%**
Percent of requirements **"Not Met"**	**3%**



	The ISO 14001:2004 standard elements of an EMS	Overall Score (%)	Met (%)	Partially Met (%)	Not Met (%)
4.1	General Requirements	100	100	0	0
4.2	Environmental Policy Requirements	100	100	0	0
4.3.1	Environmental Aspects Requirements	100	100	0	0
4.3.2	Legal and Other Requirements	100	100	0	0
4.3.3	Objectives, Targets and Programs Requirements	82	64	36	0
4.4.1	Resources, Roles, Responsibility and Authority	80	60	40	0
4.4.2	Competence, Training and Awareness	50	0	100	0
4.4.3	Communication	100	100	0	0
4.4.4	EMS Documentation	100	100	0	0
4.4.5	Control of Documents	100	100	0	0
4.4.6	Operational Control	50	0	100	0
4.4.7	Emergency Preparedness and Response	38	25	25	50
4.5.1	Monitoring and Measurement	100	100	0	0
4.5.2	Evaluation of Compliance	75	50	50	0
4.5.3	Nonconformity, Corrective Action and Preventive Action	100	100	0	0
4.5.4	Control of Records	100	100	0	0
4.5.5	Internal Audits	100	100	0	0
4.6	Management Review	75	50	50	0

Miami-Dade Transit
Metromover Facility
ISO 14001
EMS Case Study

June 2010

Miami-Dade Transit (MDT) Profile

The Miami-Dade Transit (MDT) is the 14th largest public transit system in the United States and the largest one in the State of Florida. MDT delivers transit services to the pubic through the following four transportation modes: Metrobus; Metrorail; Metromover; and, Paratransit.

Metrobus provides bus service throughout Miami-Dade County and some parts of Monroe and Broward Counties, on I-95 routes. The total fleet size of Metrobus is 893 buses. Metrail is a 22.6-mile elevated double-track heavy rail system with 136 vehicles, 22 stations, and 185 daily trips. Metromover is a fully automated people mover transportation system consisting of 4.4 miles of elevated dual-lane track guideway with 21 stations and one maintenance facility. It provides services to a variety of government, businesses, entertainment, and cultural centers in the Central Downtown, Omni, and Brickel Areas. Paratransit is comprised of the Special Transportation Services (STS) program, providing approximately 135,000 trips on a monthly basis. Annual ridership on all modes of MDT transportation is projected to be 114 million. In November 2002, voters approved a one-half percent increase in the sales tax to fund major transportation improvements defined in the People's Transportation Plan (PTP).

MDT's organizational structure is comprised of the Director, a Deputy Director, and eight additional positions responsible for leading distinct functional areas. There are a total of 3,031 budgeted positions in the Department for fiscal year 2008-2009.

In addition, the MDT has three Metrobus repair facilities. These include the Northeast, Central, Coral Way bus maintenance facilities. For these facilities to function efficiently, different operations and processes occur at the site including vehicular fueling (diesel and unleaded gasoline storage), and maintenance operations (waste oil, oily rag, used filter, and new oil storage). These bus maintenance facilities have several buildings and structures, including the Bus Wash, Steam Cleaning Building, Fuel and Cleaning Islands, Maintenance Building, the Transportation Building, and Guard House/Fare Collection.

The William Lehman Center (WLC) serves as MDT's Metrorail repair yard. For the facility to function efficiently, different operations and processes occur at the site including vehicular fueling (diesel and unleaded gasoline storage), and maintenance operations (waste oil, oily rag, used filter, and new oil storage), The WLC has several buildings and structures, including the Vehicular Fueling Island, Maintenance Building, Warehouse Building, a warehouse and light railcar maintenance building (neither are in-service buildings), a train wash booth, a fire pump station, and an electrical substation.

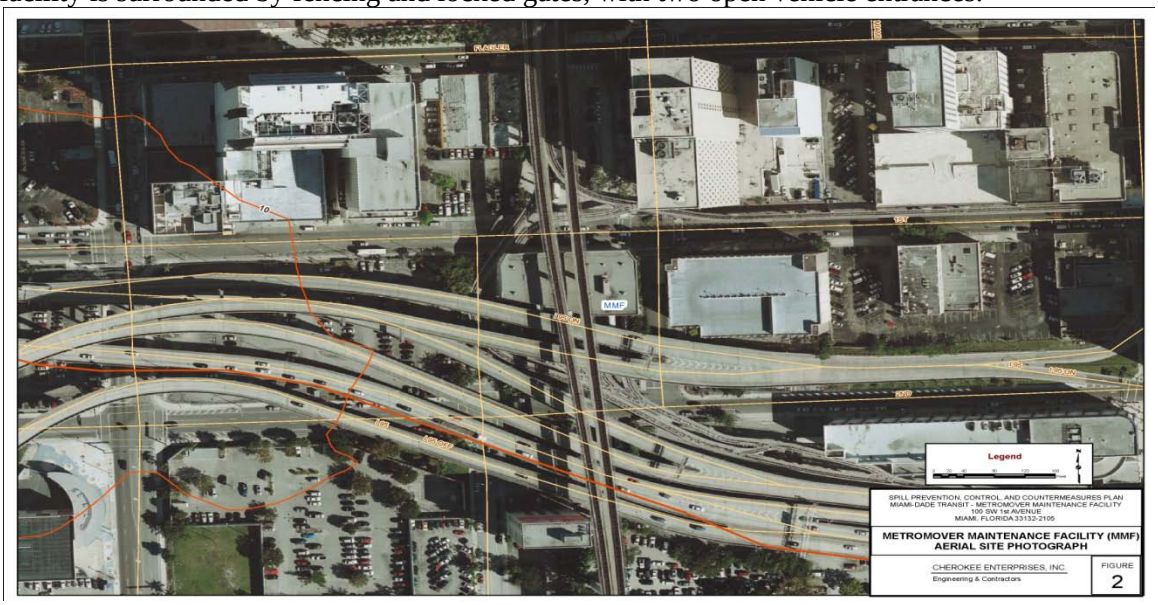
Finally, the Metromover Facility (MMF) serves as MDT's Metromover repair facility. For the facility to function efficiently, different operations and processes occur at the site including maintenance operations (waste oil, oily rag, used aerosol, and new oil storage). The MMF has one bi-level building and two parking lots.

MDT has been committed to achieving its environmental goals by utilizing sound environmental management practices and the organization views the implementation of the ISO 14001 as a way to reinforce its commitment for environmental stewardship and implementing pollution prevention programs and continually improving environmental performance to minimize environmental issues. In addition, the implementation of the ISO 14001 will reinforce MDT's current environmental practices as it starts on a major expansion of metrorail corridor from Earlington Heights Metrorail to the Miami Intermodal Center.

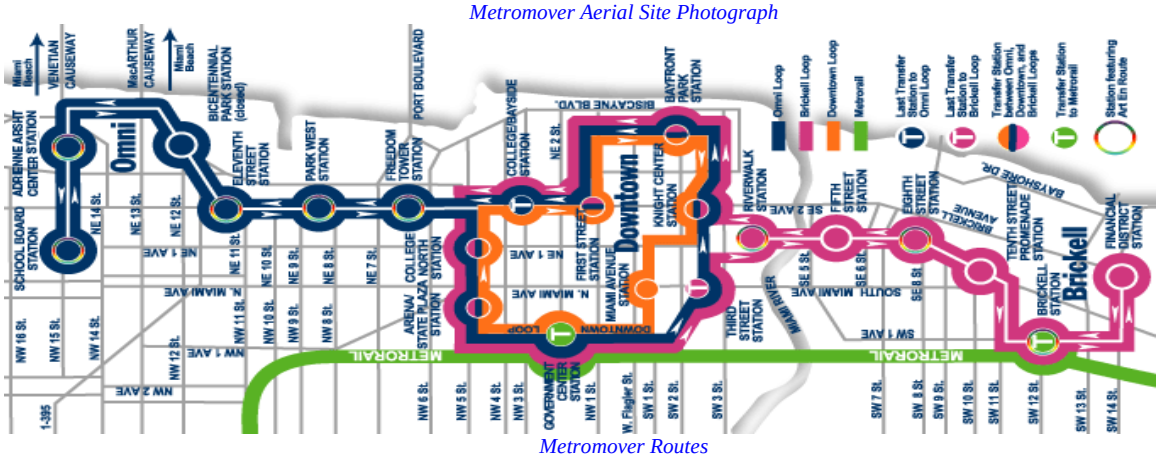
Fence Line

The MDT Metromover Facility (MMF) is situated under several rail and highway overpasses in downtown Miami, Florida. Facility terrain is relatively level and the entire facility encompasses approximately 1.04 acres (property records list the building with a 0.376-acre footprint). The facility is located at 25°46'23.35" degrees north latitude and 80°11'46.57" degrees west longitude.

The surrounding land use, within a one-mile radius, is a mix of commercial and residential properties. The MMF is situated on oolitic limestone in the Miami Oolite formation and the U.S. Fish and Wildlife Service classify its land use as “uplands”, i.e., neither wetlands nor deepwater habitat. According to topographic data, the facility is on flat terrain, about 10 feet above sea level, with area drainage assumedly having an overall bias to the south, to the Miami River. However, four storm water drainage inlets are located in the facility’s parking lots, and they provide drainage for the majority of the facility (excluding the exterior of the building). The MMF has one bi-level building and two parking lots. Petroleum products are stored aboveground inside the loading dock, the lower-level corridor, and the upper level maintenance area. The two parking lots occupy the majority of the facility’s remaining area, with some concrete walkways, compacted gravels, grass, and low-lying vegetation in between. The perimeter of the facility is surrounded by fencing and locked gates, with two open vehicle entrances.



Metromover Aerial Site Photograph



Metromover Routes

Core Team

The EMS core team is made up of the following MDT personnel:

Title/Position/Role/	Responsibilities in the Environmental Management System (EMS)
Director * *Mr. Harpal Kapoor, P.E.*	• Endorses the MDT Corporate Environmental Policy. • Assures all department areas are committed to continual improvement in environmental performance. • Supports the development and continued implementation of the overall EMS program. • Participates in a Management Review of MDT's EMS.
Manager of Materials * *Mr. Freeman Wright*	• Documents procedures and Standard Operational Procedures (SOPs) pertaining to operations (handling, shipping and receiving, and hazardous waste handling). • Assures delivery, transport, handling and storage of all materials on-site is done accordingly to regulatory guidelines, directives, and EMS requirements.
Manager of Training * *Ms. Vivian Urchdorf*	• Ensures complete training of employees in the environmental policy and SOPs as specified in the training procedures. • Collaborates with the EMS Coordinator on the development of training needs and programs. • Facilitates internal communication of EMS elements according to the Communication Procedure. Coordinates with Security to facilitate external communication of EMS elements according to the Communication Procedure.
Manager of Environmental Protection ** *** *Mr. Akbar Sharifi, P.E.*	• Develops, implements, and maintains MDT's EMS. • Ensures the Environmental Office activities meet the environmental regulations, permit conditions, terms, and policies. • Ensures EMS Procedures and SOPs are established, maintained, and followed. • Reviews non-conformances generated by the internal audit process. • Implements and verifies corrective and preventive action plans when required. • Communicates the status of the EMS to the Sr. Mgmt. for the purposes of improvement. • Ensures overall maintenance of the MDT's EMS, including the update and maintenance of: ➢ The Environmental Policy ➢ Environmental Aspects and Significant Aspects ➢ Maintenance of legal and other requirements ➢ Evidence of progress towards objectives and targets ➢ Environmental Management Programs (EMPs) ➢ Environmental Department procedures and SOPs ➢ Environmental Compliance Manual ➢ Pollution Prevention Plan ➢ Forms and environmental records

Facilities Maintenance Manager ** *Mr. Mario Rodriguez* *Mr. Steve Chayt*	• Ensures the Facility Maintenance department activities meet the environmental regulations, permit conditions, terms and policies. • Ensures the EMS SOPs are established, maintained, and followed.
Supervisors ** *** *Mr. Steve Alvarez*	• Communicates employee feedback on the Environmental Policy. • Trains and communicates pertinent SOPs to the employees of their respective areas. • Ensures employees in their respective areas have the training and tools to meet the requirements of the procedures.
Employees	• Performs assigned tasks in accordance with the regulations, the Environmental Policy, pertinent procedures and SOPs. • Communicates concerns to the supervisor regarding the performance of tasks, in accordance to the above listed requirements.
Internal Auditors / Audit Team *** *Mr. Akbar Sharifi, P.E.* *Mr. Adien Toledo*	• Performs audits according to a specific audit plan or schedule. • Conducts internal audits of the MDT, comparing against procedural requirements and the ISO 14001 standard. • Reports the results of the audits to the Manager of Safety and Environmental Protection.
Environmental Team *** *Mr. Akbar Sharifi, P.E.* *Mr. Adien Toledo*	• Represents each operational area during the Environmental Team Meetings. • Identifies MDT's Environmental Aspects, Significant Aspects, Objectives and Targets. • Facilitates the initial drafts of MDT's procedures, SOPs and other elements of the EMS.
Public Safety Officer ** *Mr. Eric Muntan*	• Notifies the Manager of Environmental Protection and Manager of Security in reference to environmental emergencies. • Transfers external calls to the Environmental Office in reference to environmental inquiries and complaints.
Manager of Construction ** *** *Mr. Surinder Sahota, P.E.*	• Ensures construction activities meet the environmental regulations permit conditions, terms and policies. • Ensures the EMS procedures are established, maintained, and followed.
Manager of Contract Procurement ** *Mr. Fred Shields*	• Ensures contractor support of EMS policies through contractual obligations. • Documents SOPs pertaining to purchasing materials and/or services with environmental impacts.

KEY ROLES

* SENIOR MANAGEMENT STAFF
** MANAGEMENT REPRESENTATIVE
*** ENV TEAM

Key Drivers

MDT's most significant programs/initiatives planned for the next couple of years include new programs to improve customer service, maximize revenue, renew infrastructure, and increase transit efficiency and effectiveness. MDT's management team continually sets its strategic objectives by establishing sound management and operation policies, and establishing performance measures and targets. MDT's overall environmental policy provides a roadmap for the Department to improve and protect the environment and the health and safety of our employees, customers and the general public. As a result, MDT has adopted the ISO 14001 standards for implementation of an Environmental Management System (EMS).

Significant Aspects and Impacts

The MDT has established and maintained a procedure to identify the environmental aspects of its activities, products and services and to determine which aspects have or can have significant impacts on the environment. Environmental aspects are determined by analyzing the inputs and outputs relating to current and past activities, products and services. The cause and effect relationship between environmental aspects and impacts means that once aspects have been identified, the impacts that result from these aspects can be determined.

The Miami-Dade Transit (MDT) Environmental Management System (EMS) team has developed the following environmental aspects and impacts including **four (4) Significant Aspects/Impacts (SA/I)**. These include:

- **Used Oil (SA/I)** - Filling, Storing and Removing Used Oils from 200-Gallon AST
- **Fluorescent Lamp/Used Ballast** - Replacing Fluorescent Bulb as needed, and replacing Light Ballasts (an electrical component used with a fluorescent bulb or mercury vapor lamp or arc lamp)
- **Aerosol Cans (SA/I)** - Parts Cleaners, Paints, Coating, Lubricant, etc.
- **Motor Oil (SA/I)** - Lubricant Engine Oil (SAE 30) – stored in 55-gallon drums.
- **Tires** - Changing New and Used Tires – Tires used to guide the Metro Mover in its tracks. Tires are changes once every 90,000 miles (approximately once every 2 years)
- **Industrial Waste Treatment (SA/I)** - Oil/Water Separator
- **Air Compressor Oil** - Changing Air Compressor Oil – used on train brakes. ½-quart of oil is changed once every 3 months.
- **Differential Oil** - Changing Differential Oil – used on tire axel. Approximately 22-pint or 3 gallons of oil is drained during oil changing process and transferred to a small bucket, and ultimately into a 55-gallon drum.
- **Train HVAC Filter** - Replace Train HVAC Filter. Filters are washed every 3 months and changed once a year.
- **Train Batteries** - Battery Servicing (Emergency Light for the Trains) – seal gel battery, which is maintenance free and is changed once every 5 years.
- **Flash Light/Lantern Battery** – power source for the flash light providing light source during maintenance activity in areas not visible by regular light.
- **Used Air Filters** - Preventative Maintenance on Air Compressors
- **Filters** - Office Heat & A/C Units
- **Electricity** - Office Heat & A/C Units (including various Train Stations)
- **Freon** - Office Heat & A/C Units
- **Belts** - Preventative Maintenance of A/C Chillers

- **Water** - Preventative Maintenance of A/C Chillers
- **Freon** - Preventative Maintenance of A/C Chillers
- **Bio-Hazard Waste** - Human Waste Clean-up
- **Absorbent Pads** - Spill Clean Up
- **Socks/Rags** - Spill Clean Up
- **Cleaners** - Interior and Exterior Cleaning
- **Sludge** - Pumping out OWS

Objectives and Targets

The following table outlines the objectives and targets of some of the main aspects:

Summary					
Aspect	**Objective**	**Target**	**Performance Indicator**	**Projected Complete Date**	**Progress Status Corrective Action**
5. Aerosol Cans	1.Reduce waste generation 2.Document handling and recycling of waste	1.Establish process control to reduce waste by 5% 2. Implement Standard Operating Procedures (SOPs).	Receipts and Benchmarking	December 31, 2009	Purchased and implemented aerosol cans crusher equipment. In addition, implemented a strict SOP for Aerosol Cans Management.
6. Fluorescent Tube and Ballast	1.Reduce waste generation 2.Document handling and recycling of waste	1.Establish process control to reduce waste by 5% 2. Implement Standard Operating Procedures (SOPs).	Receipts and Benchmarking	December 31, 2009	Purchased and implemented light bulb crusher equipment. In addition, implemented a strict SOP for Fluorescent Tube and Ballast Management.
7. Used Oil (i.e., filling, storing, transferring and removal of used oil from the 200-gallon abovegrou nd storage tank)	-Reduce and/or prevent any oil spill -Document handling and recycling of used oil	1.Update Spill Prevention, Control & Countermeasure (SPCC) Plan 2.Implement Standard Operating Procedures (SOPs) for Used Oil Management 3.Provide training to facility personnel	Monitor/document any spill events	1.December 3, 2009 2.February 10, 2010 3. May 20, 2010	1. Completed and implemented the SPCC Plan. 2. Implemented a strict SOP for Used Oil Management. 3. Completed the SPCC training.
8. Fresh Oil	-Reduce and/or prevent any oil spill -Document handling and recycling of used oil	1.Update Spill Prevention, Control & Countermeasure (SPCC) Plan 2.Implement Standard Operating Procedures (SOPs) for Fresh Oil Management 3.Provide training to facility personnel	1.Monitor/document any spill events 2.Documented records of inspections and testing	1.December 3, 2009 2.August 31, 2009 3.February 10, 2010 4. May 20, 2010	1. Completed the SPCC Plan. 2. Secondarily contained berm has been set up for the 55-gallon drums. 3. Implemented a strict SOP for Fresh Oil Management. 4. Completed the SPCC training.

5.Chlorofluorocarbons (CFCs) Management (i.e., refrigerant, coolant or freon)	Reduce CFC emission into the air	Train technicians to properly manage, service, and document all CFC's that are removed from a refrigeration unit for recharging or equipment disposal	Training records	1.May 20, 2010 2. February 10, 2010	1. Completed the SPCC training. 2. Implemented a strict SOP for CFC Management.
6. Used Tires	1.Reduce waste generation 2.Document handling and recycling of waste	1.Establish process control to reduce waste by 5% 2. Implement Standard Operating Procedures (SOPs).	Receipts and Benchmarking	February 10, 2010	1. Implemented a strict SOP for Used Tires Management.
7. Industrial Wastewater Treatment (i.e., Oil/Water Separator)	Reduce and/or prevent industrial wastewater discharges	1. Establish baseline for facility industrial wastewater discharge system. 2. Complete evaluation of effectiveness existing system. 3. Document and implement operational controls. 4.Document Best Management Practices (BMPs)	Monitor/document any discharges	1, 2, 3 & 4 - December 31, 2009 5.February 10, 2010	1. Established baseline document. 2. Completed evaluation of effectiveness of existing system. 3. Documented and implemented operational controls. 4. Documented BMPs as part of the Spill Prevention, Control and Countermeasure (SPCC) plan. 5. Implemented a strict SOP for Industrial Waste Management.
8. Used Rags and Cotton Gloves	Properly dispose of contaminated rags and absorbents	Eliminate disposal of contaminated rags and absorbent pads in the landfill	Number of drums picked up by contractors and invoice records	February 10, 2010	Implemented used rag recycling program and a strict SOP for used rag/cotton gloves Management.
9. Used Batteries	Reduce amount of batteries used	Reduce usage by 5%	Monitor the amount of batteries used and train employees	February 10, 2010	Battery recycling program has started and recycling container has been set up in front of the stock room. In addition, implemented a strict SOP for Used Batteries Management.
10. Office and Shop Recyclables	Recycle plastic, aluminum, cardboard, paper, scrap metal, printer & copier cartridges	Provide recycling bins and containers in offices and shop areas	Receipts, recycling vendor sign-in sheets, and employee training	February 10, 2010	Recycling bins for paper and cardboard have been set up in front of the manager's office. In addition, implemented a strict SOP for Office and Shop Recyclables Management.

11.Facility Electricity Reduction	To reduce the amount of electricity used at the Maintenance Shop and Mover Stations	Install new lighting fixtures in shop & office areas that are 25% to 30% more efficient. In addition, reduce overall electricity 5% by 2014 and 20% by 2025	Electrical Bills, train employees, facility assessment	December 31, 2010	Some light bulbs are being replaced. In addition, facility assessment is being in the process of completion.

Benefits of Adopting an EMS

After adopting and implementing the EMS, the MDT will realize the following benefits:

- Reduction and/or prevention of any spill.
- Formalization of Standard Operating Procedures (SOPs).
- Implementation of Best Management Practices (BMPs).
- Reduction of waste.
- Reduction of electricity consumption.
- Increased employee awareness of environmental issues.
- Increased management awareness.
- Increased compliance with regulations.
- Implementation of formal pollution prevention training program.

Resources

Cost	Amount
Total Labor (internal) Determined by an average of the hourly rate of all employees involved in developing and implementing the EMS manual over a period of approximately 1-1/2 year. This includes bi-weekly meetings, site visits, management review meetings, training, gap and final audits. 2,260 hrs x $50/hr. = $113,000.00	$113,000.00
Consultant(s) 610 hrs x $90/hr. = $54,900.00	$54,900.00
Travel	N/A
In-kind contributions from outside organizations (please describe)	N/A
Materials (e.g. promotional materials, software, please describe) Newsletter	$500.00

Total Hours = 2,870 hours
Total Labor Cost = $167,900.00

Cost Savings

For example, for the past six (6) months, MDT has realized a reduction of aerosol cans usage by 11%, which can translate to a cost saving of approximately $10,000 in labor and material. In addition, the MDT has realized a reduction of freon usage from 376 lbs in 2008/2009 to 26 lbs as of May 2010. However, as an overall cost saving evaluation, the MDT is in the process of gathering the cost saving data associated with implementation the EMS.

Next Steps

MDT has successfully implemented an EMS at the Metromover facility. As a result, MDT is seeking to obtain a full certification by an independent ISO 14001 certification body. In addition, MDT is seeking to further expand it ISO 14001 standard to each of the three (3) bus maintenance facility and one (1) rail maintenance facility.

Management Commitment

The MDT EMS team along with senior management is in the process of establishing an EMS program at the MDT Metromover Facility. MDT's overall environmental policy provides a roadmap for the Department to improve and protect the environment, health and safety of our employees, customers and the general public. The Department is committed to achieving its environmental goals by integrating all aspects of its operations with sound environmental management practices. These include:

- Exceed compliance with all applicable local, state, and federal environmental regulations through best management practices;
- Establish waste minimization and pollution prevention programs to prevent or reduce impacts to the environment;
- Establish management system and control for environmental compliance assurance and risk/liability management;
- Streamline operations and management system by periodically evaluating achievement of targeted environmental objectives; and;
- Provide continuous training, and communicate environmental policies and programs to employees.

The Department is committed to implementing pollution prevention programs and continually improving environmental performance to minimize environmental issues. The Environmental Policy will be communicated to all employees and available to the Public via the Department website.

Miami-Dade Transit Audit Report

This Environmental Management System (EMS) Audit was based on a request by the Federal Transit Administration (FTA) as a final follow-up to an eighteen month program for EMS development and was conducted in accordance with the approved schedule.

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The site visit involved a review of the core EMS documents with the EMS team. The Miami-Dade EMS Team participated in the review and discussion regarding the scoring.

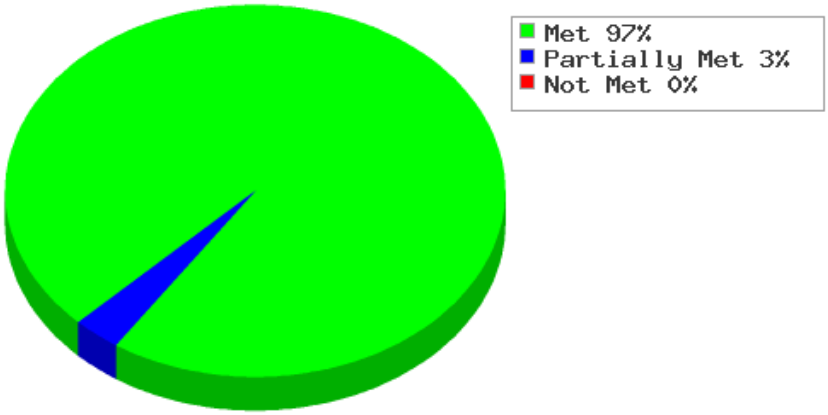
The following scores are the result of the EMS Assessment:

Detailed scoring on next page

Miami-Dade Transit - Overall EMS Performance Results

This section compares the percentage of requirements *met, partially met and not met* with respect to meeting the requirements of an EMS as specified in the ISO 14001:2004 standard. The following scores are the result of the EMS audit presented in this report:

Percent meeting all requirements **"Overall Score"**	**99%**
Percent of requirements **"Met"**	**97%**
Percent of requirements **"Partially Met"**	**3%**
Percent of requirements **"Not Met"**	**0%**



	The ISO 14001:2004 standard elements of an EMS	Overall Score (%)	Met (%)	Partially Met (%)	Not Met (%)
4.1	General Requirements	100	100	0	0
4.2	Environmental Policy Requirements	100	100	0	0
4.3.1	Environmental Aspects Requirements	100	100	0	0
4.3.2	Legal and Other Requirements	100	100	0	0
4.3.3	Objectives, Targets and Programs Requirements	100	100	0	0
4.4.1	Resources, Roles, Responsibility and Authority	100	100	0	0
4.4.2	Competence, Training and Awareness	93	86	14	0
4.4.3	Communication	100	100	0	0
4.4.4	EMS Documentation	100	100	0	0
4.4.5	Control of Documents	100	100	0	0
4.4.6	Operational Control	100	100	0	0
4.4.7	Emergency Preparedness and Response	100	100	0	0
4.5.1	Monitoring and Measurement	100	100	0	0
4.5.2	Evaluation of Compliance	100	100	0	0
4.5.3	Nonconformity, Corrective Action and Preventive Action	100	100	0	0
4.5.4	Control of Records	100	100	0	0
4.5.5	Internal Audits	100	100	0	0
4.6	Management Review	83	67	33	0

Profile

The Worcester Regional Transit Authority is a political subdivision of the Commonwealth of Massachusetts. It is responsible for public transit services in thirty-five (35) communities within the Central Massachusetts region, and is funded with Federal, State and local subsidies, as well as farebox revenue.

The WRTA maintains a fleet of 47 buses for 23 fixed routes in Worcester and 10 of the surrounding communities. The WRTA also provides paratransit service for the elderly and disabled in the region, in addition to a variety of special services for elderly and disabled residents in the entire service area.

The WRTA was created pursuant to Massachusetts General Laws, Chapter 161B. The WRTA is prohibited, by the provisions of Section 25 of Chapter 161B, from directly operating transit service; thus, all fixed-route services, are provided by a subcontractor.

The WRTA has four employees with its subcontractor employing 165 personnel in maintenance, transportation, customer service and administration. Of the 165 employees, 146 are members of the Amalgamated Transit Union Local 22.

More information on the Worcester Regional Transit Authority can be found at www.therta.com.

Fenceline

The Environmental Management System applies to all WRTA facilities, rolling stock, equipment, land and personnel. The initial seven significant aspects are based in the main WRTA office and maintenance facility at 287 Grove Street, but not all of the significant aspects have impacts contained to the facility.

Vehicle idling takes place both on the facility and while a bus is in service outside the facility. Spills can also occur outside the facility during normal operations. By expanding our fenceline beyond 287 Grove Street, we have made ourselves able to effectively monitor, assess and improve the impacts that WRTA activities have not only at our facility, but in the communities we serve.

Core Team

The EMS Core Team consists of seven full time members (from left to right): John Carney, General Manager, Troy Senosk, Parts and Environmental Coordinator, Tom Coyne, Assistant Administrator, Ahmad Yasin, Maintenance Manager, George Mayo, Safety, Security & Training Manger, Stephen O'Neil, Administrator, and Sarah Chiasson, Quality Control and Environmental Coordinator, (not pictured).

Key Drivers for Adopting an EMS

Key drivers that lead to the adoption and implementation of an EMS included the following:

- A desire to become better environmental stewards of the natural and built environment.
- A report prepared by Clark University undergraduate students critical of how the WRTA was not protecting the environment while discharging its duties.
- A desire to save valuable operational funding by implementing and EMS.
- A desire to impress the Environmental Protection Agency and the Massachusetts Department of Environmental Protection just how serious the WRTA considers regulatory compliance.

Significant Aspects and Impacts

The EMS Core Team chose the significant aspects by evaluating 113 identified aspects and their impacts through a three step process. All relevant aspects were first evaluated based on their environmental and business significance to achieve a balanced assessment of their overall impact. Those aspects scoring the highest along with any other aspect the EMS Core Team wanted to assess further were then reassessed based on the following indicators:

- Cost of changing impact
- Ease of changing impact
- Effect on Sustainability
- Immediate impact on Environment.

The core team then assessed the procedures that would need to take place to address an aspect and consolidated those aspects which would be affected by a single process.

After this assessment the following seven aspects were chosen:

Activity / Product / Service	Aspect	Impacts
Changing Engine Oil & Transmission Oil	Used Oil & Transmission Oil	Soil and groundwater pollution.
Vehicle Idling	Exhaust, Noise	Air pollution, Fuel consumption, Noise pollution.
Drums	Solid Waste & Hazardous Waste	Air, soil, surface water and ground water pollution associated with landfills
Spill Clean Up	Used Absorbent Pads, Socks, and Stay Dry	Air, soil, surface water and ground water pollution associated with landfills
Cleaning Miscellaneous Parts	Degreaser, Safety Kleen Solvent	Air, soil and groundwater pollution
Major Body Repair	Spray Gun, Paint Filter	Air, soil, surface water and ground water pollution associated with landfills
Office Activities	Paper	Air, soil, surface water and ground pollution associated with landfills

Objectives and Targets 2009

Aspect	Objectives & Targets	Program Plan
Cleaning Miscellaneous Parts	Objective: Reduce use by 50% of degreaser and Safety Kleen Solvent by converting to alternatives Target: 100% training no later than 11/1/10	• Develop Standard Operating Procedure • Post and disseminate SOP to all maintenance personnel • Develop or ascertain training program • Complete 100% of training • Develop daily and weekly observation checklist to observe compliance
Hazardous Fluids	Objective: Prevent used hazardous fluids from migrating into soil and groundwater Target: 100% training no later than 11/1/10	• Develop Standard Operating Procedure • Post and disseminate SOP to all maintenance personnel • Develop or ascertain training program • Complete 100% of training • Develop daily and weekly observation checklist to observe compliance

Major Body Repair	Objective: Prevent spillage of used paint waste and solvents into soil and groundwater Target: 100% training no later than 11/1/10	• Develop Standard Operating Procedure • Post and disseminate SOP to all maintenance personnel • Develop or ascertain training program • Complete 100% of training • Develop daily and weekly observation checklist to observe compliance
Monitoring Drums	Objective: Insure the proper handling, disposal, and documentation of all hazardous and solid waste Target: 100% training no later than 11/1/10	• Develop Standard Operating Procedure • Cordon off Drum Storage Area and label drum Hazardous Waste • Post and disseminate SOP to all maintenance personnel • Complete 100% of training • Develop daily and weekly observation checklist to observe compliance
Office Activities	Objective: Implement a recycling program and reduce the amount of office supply waste Target: Implement a process to increase the amount of recycled materials no later than 11/1/10	• Select a recycling TEAM • Conduct a waste audit • Decide what to recycle • Select collection contractor • Design collection system • Develop and disseminate SOP
Spill Clean Up	Objective: Insure proper handling, disposal and documentation of used absorbent pads, socks and Stay Dry Target: 100% training no later than 11/1/10	• Develop Standard Operating Procedure • Post and disseminate SOP to all maintenance personnel and Street Supervisors • Develop or ascertain training program • Complete 100% of training • Develop daily and weekly observation checklist to observe compliance
Vehicle Idling	Objective: Comply with M.G.L Chapter 90 section 16A – Stopped Motor Vehicles; Operation of Engine; Time Limit; Penalty Target: 100% training no later than 11/1/10, Increase average MPG of fleet	• Develop Standard Operating Procedure • Post and disseminate SOP to all employees authorized to operate company vehicles • Develop or ascertain training program • Complete 100% of training • Develop daily and weekly observation checklist to observe compliance. To include monitoring fleet MPG

Benefits and Results of Adopting an EMS

The WRTA has realized numerous benefits from its EMS including:

- By involving union representation on the core team, and by appealing to its employees' desire for a pollution free environment, the WRTA was able to achieve organizational buy in.
- Formalized policies and procedures with greater accessibility.
- Improved relations and better compliance with regulatory agencies
- Cost savings.
- Increased environmental awareness.
- Pollution prevention.

Resources

The number of hours associated with the development and implementation of the WRTA EMS from January 27, 2009 – March 31, 2010 are listed below

EMS Core Team:	1190 hours
Total Labor	$46,606

Cost Savings or Avoidance

Two of our current aspects are expected to produce cost savings: Vehicle Idling and Cleaning Miscellaneous Parts. Another aspect, Office Activities (recycling) is expected to produce savings but accurate calculations are not available.

Vehicle idling burns approximately one half gallon of diesel fuel per hour. For every 5 minutes of reduced idling the WRTA expects to burn 375 less gallons of fuel and save $1,500.

The WRTA discontinued the use of Safety Kleen products to clean miscellaneous parts. Five alternative parts washers that use soap and hot water were purchased using capital funds at a cost of $6,000. The annual savings to the WRTA operational budget is expected to be $7,200.

By implementing a recycling program, much of the waste that would normally end up in the trash dumpster is being recycled. Recycling is more cost effective than regular trash disposal, and by increasing the amount of non-recycled waste, we will be able to decrease the amount of regular trash. This will allow us to use a smaller trash dumpster and lead to cost savings.

Next Steps

Continue to refine and improve the EMS and seek ISO 14001 Certification before the end of the calendar year. The WRTA intends on constructing a new bus hub facility and a maintenance and operations facility and lessons learned now will be brought forth to these new facilities.

Management Commitment

"The WRTA is fully committed to the implementation of the EMS. The WRTA's Advisory Board approved the EMS policy in August 2009 and senior management met with abutters to review the EMS plan. Moreover, senior management is committed to seeking ISO 14001 certification."

Stephen O'Neil, WRTA Administrator

Worcester Regional Transit Authority Audit Report

This Environmental Management System (EMS) Audit was based on a request by the Federal Transit Administration (FTA) as a final follow-up to an eighteen month program for EMS development and was conducted in accordance with the approved schedule.

W. Robert Herbert, Principle Contractor and ISO 14001 certified Lead Auditor with Virginia Tech, conducted the EMS Audit for the Worcester Regional Transit Authority on June 7 and 8, 2010, to report on its conformance with the requirements of the ISO 14001:2004 standard.

The EMS was evaluated against each of the requirements set out in the ISO 14001:2004 standard titled "Environmental management system – General guidelines on principals, systems and support techniques." The Audit included the examination of documents, interviews of personnel and observations of activities and conditions.

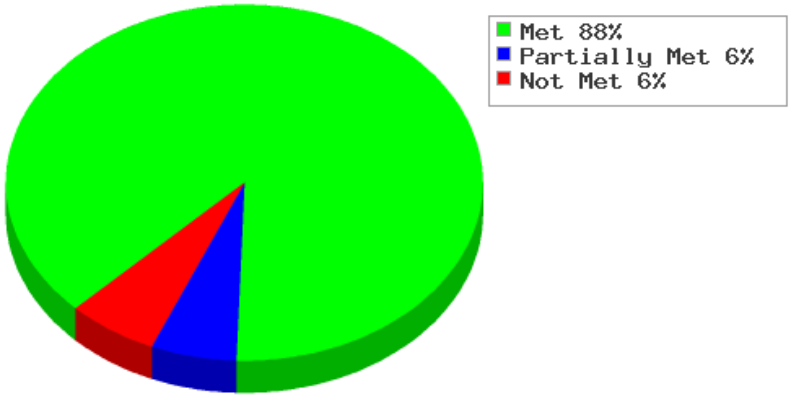
The site visit involved a review of the core EMS documents with the EMS team. The WRTA EMS Team participated in the review and discussion regarding the scoring.

Detailed scoring on next page

WRTA - Overall EMS Performance Results

This section compares the percentage of requirements *Met, Partially Met and Not Met* with respect to meeting the requirements of an EMS as specified in the ISO 14001:2004 standard. The following scores are the result of the EMS audit presented in this report:

Percent meeting all requirements **"Overall Score"**	**91%**
Percent of requirements **"Met"**	**88%**
Percent of requirements **"Partially Met"**	**6%**
Percent of requirements **"Not Met"**	**6%**



	The ISO 14001:2004 standard elements of an EMS	Overall Score (%)	Met (%)	Partially Met (%)	Not Met (%)
4.1	General Requirements	100	100	0	0
4.2	Environmental Policy Requirements	95	90	10	0
4.3.1	Environmental Aspects Requirements	100	100	0	0
4.3.2	Legal and Other Requirements	100	100	0	0
4.3.3	Objectives, Targets and Programs Requirements	100	100	0	0
4.4.1	Resources, Roles, Responsibility and Authority	100	100	0	0
4.4.2	Competence, Training and Awareness	64	29	71	0
4.4.3	Communication	100	100	0	0
4.4.4	EMS Documentation	100	100	0	0
4.4.5	Control of Documents	100	100	0	0
4.4.6	Operational Control	100	100	0	0
4.4.7	Emergency Preparedness and Response	100	100	0	0
4.5.1	Monitoring and Measurement	100	100	0	0
4.5.2	Evaluation of Compliance	50	50	0	50
4.5.3	Nonconformity, Corrective Action and Preventive Action	63	63	0	38
4.5.4	Control of Records	100	100	0	0
4.5.5	Internal Audits	100	100	0	0
4.6	Management Review	67	50	33	17