Safety Management Systems

SMS Gap Analysis Report

Washington Metropolitan Area Transit Authority

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U.S. Department of Transportation
Federal Transit Administration

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Introduction

On March 3, 2015, the Federal Transit Administration (FTA) initiated its *Safety Management Inspection* of the Washington Metropolitan Area Transit Authority (WMATA). The *Safety Management Inspection* was a multi-faceted effort that included an evaluation of WMATA's safety management practices as well as operating and maintenance policies, procedures, and practices for both rail and bus systems. In conjunction with the *Safety Management Inspection*, FTA conducted a pilot *Safety Management Systems (SMS) Gap Analysis* of WMATA from March 3-5, 2015.

The SMS Gap Analysis provided FTA with an opportunity to evaluate WMATA's approach to safety management practices as they relate to a fully mature SMS. The goal of this effort was to identify areas where WMATA can develop methodologies for integrating SMS processes and activities that meaningfully identify, assess, and resolve safety risks, safety deficiencies, and safety concerns.

FTA piloted its new SMS gap analysis tool and provided training to apprise executive, safety, and technical management personnel of SMS concepts and requirements.

SMS Gap Analysis

FTA has adopted SMS principles to guide the advancement of public transit safety programs and training. SMS is a management approach that ensures each public transportation agency, regardless of its size or service environment, has the necessary organizational structures, accountabilities, policies, and procedures in place to direct and control resources for safety management. SMS builds on the public transportation industry's existing safety foundation to mitigate safety risk better, detect and correct safety problems earlier, share and analyze safety data more effectively, and measure safety performance more accurately.

SMS is not a requirement in the public transportation industry. Thus, this cooperative effort with WMATA serves as a tool for continuous improvement in WMATA SMS development and implementation activities. The gap analysis was not an exercise in safety compliance.

FTA understands that it may take 2-4 years for a transit agency, depending on its size and complexity, to reach a fully mature SMS. As such, the gap analysis is the first task in gathering a snapshot of a transit agency's level of maturity in SMS development and implementation. Because SMS is relatively new to the public transportation industry, FTA anticipated that WMATA would reside somewhere between the *Planning* and *Implementing* levels of SMS maturity. FTA notes that there were areas in which WMATA safety management practices reside in the *Managing and Monitoring* level of SMS maturity.

Using a standard gap analysis checklist, FTA worked with WMATA representatives to identify the approximate level of SMS maturity at WMATA. FTA distributed SMS gap analysis checklists to the following WMATA personnel:

- Acting General Manager (GM)/Chief Executive Officer (CEO)
- Executive Management Team
- Safety Management Department
- Technical Liaisons
- Rail Technical Management
- Bus Technical Management
- Supervisors/Employees

Report Organization

This *Safety Management Systems Gap Analysis Report* is the result of the FTA review of WMATA safety management processes and activities. The following bullets show the report's organization:

- **SMS Levels of Maturity Table** – presents the general criteria for maturity level placement and guidelines for SMS implementation phasing
- **Summary of SMS Maturity Levels** – provides an average score for each SMS major component and sub-component based on a scale of 1-4
- **SMS Gap Analysis Report Results** – discusses results from the gap analysis by SMS component and presents the phase of implementation maturity (to the right of each sub-component item header)
- **SMS Maturity Table** – presents the SMS maturity level for each SMS sub-component item

SMS Levels of Maturity

Initiating	Planning	Implementing	Managing & Monitoring
	All of **Initiating** plus:	All of **Planning** plus:	All of **Implementing** plus:
General criteria for determining maturity level placement			
Transit agency is aware of the specific element of the SMS framework under consideration but has not yet started the planning and/or preparation to implement the SMS element.	Transit agency has initiated the planning process for implementation of the SMS framework element under consideration. This includes the identification of resources, responsible personnel, milestones, and training as required.	Transit agency demonstrates that SMS framework element is under implementation. This is evidenced through specific activities, development of procedures, and/or deployment of technology as appropriate.	The SMS framework element has been incorporated into the operations of the transit agency. Activities are in place to manage the SMS framework element and monitor its performance. Transit agency is able to evaluate and identify any deficiencies in SMS operational performance and make corrections as necessary.
General guideposts for SMS implementation maturity phasing			
• Awareness and knowledge of SMS exists. • Planning and/or implementation activities have not yet begun or are in early stages.	• Executive management has committed resources (both human and technical as necessary), commensurate to the size and complexity of the transit agency, to planning SMS implementation activities. • A gap analysis has been completed. • The transit agency has developed an SMS implementation plan that includes provisions for safety performance monitoring. • Basic SMS documentation has been developed: ○ Transit agency Safety Management Policy ○ Transit agency SMS manual	• Formal activities for SMS implementation have been initiated. • Employee safety reporting program is under development and a program of employee training on how/what to report has been designed and implemented. • The basic activities of the two key safety management processes (Safety Risk Management (SRM) and Safety Assurance (SA)) are in place across the transit agency: ○ Hazards are proactively identified and the safety risks of their consequences analyzed. ○ Safety performance monitoring during service delivery operations is conducted on a routine basis. ○ Activities for SMS continuous improvement are under development. • Safety management training is provided as necessary to appropriate personnel.	• SMS implementation has been completed and its two key processes (SRM and SA) are integrated as business processes throughout the transit agency. • The output of SRM and SA activities drives the transit agency's priorities with regard to safety resources allocation. • The transit agency's SMS is reviewed at appropriate intervals to ensure system integrity and to ensure continuous improvement of the SMS. • Safety performance is monitored using quantitative techniques. • Safety performance indicators and safety performance targets for the SMS have been established.

Summary of SMS Maturity Levels '

SMS Element		Maturity Level (Avg)
1.0	Safety Management Policy	2.8
1.1	**Safety Management Policy Statement**	**2.8**
1.2	**Safety Accountabilities and Responsibilities**	**3.2**
1.3	**Integration with Public Safety and Emergency Management**	**2.8**
1.4	**SMS Documentation and Records**	**2.2**
2.0	Safety Risk Management	2.8
2.1	**Hazard Identification and Analysis**	**2.6**
2.2	**Safety Risk Evaluation and Mitigation**	**2.9**
3.0	Safety Assurance	1.7
3.1	**Safety Performance Monitoring and Measurement**	**2.1**
3.2	**Management of Change**	**1.6**
3.3	**Continuous Improvement**	**1.5**
4.0	Safety Promotion	2.1
4.1	**Safety Communication**	**2.0**
4.2	**Competencies and Training**	**2.1**

Overall WMATA Average SMS Maturity Level	2.4

Point scale used to obtain the average of SMS implementation maturity per SMS element:

1 = ◔ Initiating
2 = ◑ Planning
3 = ◕ Implementing
4 = ● Managing and Monitoring

For each sub-component of the SMS Gap Analysis Checklist, FTA averaged the assignment of maturity level values, resulting in a total for each of the four major SMS components and their sub-components. A detailed table is provided in Section 5.0 of this report.

1.0 Safety Management Policy

This section of the WMATA SMS Gap Analysis Report evaluates the level of SMS implementation for the following SMS sub-elements:

- Safety Management Policy Statement
- Safety Accountabilities and Responsibilities
- Integration with Public Safety and Emergency Management
- SMS Documentation and Records

1.1 Safety Management Policy Statement

1.1 a - The Safety Management Policy Statement is signed by the Accountable Executive

WMATA currently maintains a Safety Policy as part of its System Safety Program Plan (SSPP) (required by 49 CFR Part 659). The SSPP is signed by the Accountable Executive and several other executives—the GM/CEO delegates primary authority of safety to the Chief Safety Officer per "System Safety Policy Statement of the WMATA General Manager and Chief Executive Office."

The SSPP references the "WMATA Board of Directors System Safety Policy Statement (Amendment 4)," which is approved by the Board and states that the Board and all WMATA employees are accountable. The SSPP and the Safety Policy, therein, is to be presented to the Board of Directors Safety and Security Committee following revision and approval by its state safety oversight agency (SSOA).

1.1 b - Contents and Attributes of the Safety Management Policy Statement

A fully mature Safety Management Policy Statement contains, at a minimum, the following:

- Transit agency safety objectives
- Commitment to fulfill the transit agency's safety objectives and meet the agency's safety performance targets
- A clear statement about the provision of resources for the management of safety necessary to meet safety performance objectives
- Commitment to the employee safety reporting program that provides for conditions under which exemptions from disciplinary action would be applicable
- A statement to establish employee behaviors that are unacceptable and that may result in discipline or dismissal

The Safety Management Policy Statement must also be visible and communicated with explicit support throughout the agency. WMATA addresses many of the contents and attributes of the Safety Management Policy Statement; for example, WMATA's Safety Policy includes the agency safety objectives by reference:

1. To avoid loss of life, injury of persons, and damage or loss of property;
2. To instill a commitment to safety in all WMATA employees and contractor personnel; and
3. To provide for the identification and control of safety hazards, the study of safety requirements, the design, installation, and fabrication of safety equipment, facilities, systems, and vehicles, and a systematic approach to the analysis and surveillance of operational safety for facilities, systems, vehicles, and equipment.

Moving forward, WMATA will want to include statements regarding its commitment to an employee safety-reporting program.

WMATA, like most agencies, maintains an employee hotline and the ability to report safety concerns. WMATA also participates in the rail Close-Call Reporting System managed by the Bureau of Transportation Statistics—this is an effective practice within the transit industry. WMATA has identified events it wants employees to report using the system and the restrictions on taking disciplinary actions.

In addition, WMATA's Safety Measurement System captures concerns reported by employees through various mechanisms such as local safety committee meetings or direct reports to supervisors. Nevertheless, WMATA still needs to establish and support a formal and more comprehensive employee safety-reporting program. This includes explicit WMATA executive-level commitment to develop and implement the employee safety-reporting program and establishing clarity in *what* and *when* to report. WMATA executives indicated that they would make this change in the next iteration.

WMATA will also want to ensure that operational management executives are involved at the tactical level in developing the Safety Management Policy Statement. Their involvement is necessary to achieve consensus commitment to safety objectives, allocation of resources to achieve desired safety performance targets, and the continued commitment to coordinate with the safety department (SAFE) as required in Safety Risk Management and Safety Assurance activities. In addition, WMATA will want to establish criteria for the periodic review of safety performance objectives, including when there are changes in the organization and in the operational environment.

WMATA will also want to print, publish, and post the Safety Management Policy Statement, once revised, to ensure the policy is visible to all relevant employees.

1.1 c - The transit agency has a process for analyzing and allocating resources for achieving their safety objectives and performance targets

Planning

It was not clear in the SSPP, nor in practice, how WMATA allocates its resources to achieve its safety objectives and meet its safety performance targets. To date, safety performance targets are at a high level and WMATA does not appear to have established a formal and structured relationship between safety performance targets and the allocation of resources. Under a mature SMS, there are two approaches for WMATA to define safety objectives, that is, 1) safety management objectives and 2) operational safety objectives. The former approach addresses the items necessary from an organizational level to ensure the SMS is fully operational and effective. The latter approach includes objectives. For example, "reduce rear-end bus collisions by XX% by some point in time."

Currently, WMATA executives consider safety needs during budget planning meetings. However, there is no evidence of prioritization of safety needs or presentation of the evaluation process used to prioritize and consider safety concerns. Under a mature SMS, WMATA will hold meetings with all necessary executives and document in meeting minutes how safety objectives are evaluated and considered when establishing budget priorities.

Further, during WMATA's budget planning process, any reductions or changes in budget for operational elements (service schedules, fleet, personnel, maintenance) are processed through Management of Change activities, which will require an evaluation for potential impacts on safety. If an impact were perceived, WMATA would document its safety risk evaluation of the safety risk associated to the change in budget.

1.1 d - The Safety Management Policy is reviewed annually to ensure it remains relevant and appropriate to the agency's safety objectives and safety performance targets

Planning

WMATA reviews its Safety Management Policy as part of its overall SSPP review and submits its SSPP to the SSOA annually. Moving forward, WMATA will need to revise its Safety Management Policy Statement as noted above and ensure its review by the Accountable Executive and Board.

1.2 Safety Accountabilities and Responsibilities

1.2 a - An Accountable Executive has been appointed with ultimate accountability for the effective implementation and maintenance of the SMS

Implementing

At the time of the SMS Gap Analysis, Mr. Jack Requa was the Acting WMATA GM/CEO. The Acting GM/CEO is charged by the Board with implementing the

system safety program. The WMATA GM/CEO will serve as the Accountable Executive as WMATA further develops and implements its SMS.

Not all management personnel that FTA interviewed were clear as to who in WMATA is ultimately accountable for safety.

1.2 b - If necessary, a qualified person (other than the Accountable Executive) with the appropriate knowledge, skills, and experience has been appointed to manage the day-to-day implementation of the SMS

The WMATA Chief Safety Officer and the Assistant Chief Safety Officer are in charge of the implementation of WMATA's SSPP. Many of these positions' accountabilities and responsibilities are defined; however, these will need to be modified and expanded if the Chief Safety Officer will serve as the SMS Manager. During interviews and reviews, it was clear that SAFE is fully engaged and takes responsibility for SSPP implementation.

1.2 c - There is a direct reporting line between the person who manages the SMS and the Accountable Executive and they meet on a regular basis to discuss the SMS and safety performance

There is a direct reporting line between the Chief Safety Officer and the WMATA Acting GM/CEO President. The WMATA Acting GM/CEO and Chief Safety Officer meet frequently (at least weekly and often daily) with structured meetings as well as impromptu meetings as necessary.

1.2 d - The individual responsible for managing the SMS has access to technical resources and qualified personnel to support SMS implementation

SAFE has access to operations and maintenance expertise from other departments on an as-needed basis. As WMATA builds its SMS, thus strengthening its Safety Risk Management and Safety Assurance processes, increased coordination between specialists from SAFE and subject matter experts (SMEs) from bus and rail operating and maintenance departments will be necessary.

In addition, the identification of safety risk mitigation monitoring activities will require the bus and rail operating and maintenance departments to provide dedicated liaisons and SMEs to SAFE.

1.2 e - The transit agency has identified and documented the safety accountabilities and responsibilities for SMS for management, employees, and contractors

Implementing '

The current WMATA SSPP identifies safety responsibilities for SAFE. The SSPP lists responsibilities under each major function of SAFE. These lists are comprehensive for the implementation of the SSPP and will need revision to identify responsibilities under a mature SMS.

The WMATA SSPP also describes the safety responsibilities for other departments within WMATA. As WMATA begins to document its SMS, it will need to modify the description of current safety responsibilities to include SMS activities not yet developed or mature. In addition, WMATA will need to establish and formally document the roles and responsibilities for the Accountable Executive.

1.2 f - The transit agency has established a safety management committee structure, or other mechanism appropriate for the size and complexity of the agency's operations, to discuss identified safety priorities and deficiencies and review safety performance on a regular basis

Implementing

WMATA has a layered safety committee system. The Executive Safety Committee (ESC), Department Safety Committees (DSC), and Local Safety Committees (LSC) are intended to elevate any unresolved issues up the management hierarchy for attention as required. In addition, there is a Safety and Security Certification Review Committee (SCRC) that adheres to the Safety and Security Certification Plan for managing construction and rehabilitation projects.

ESC meetings are well attended by all levels of WMATA executive leadership and other relevant parties. The meetings discuss topics related to safety performance, safety training, and the status of corrective actions plans. Department Heads make presentations with no substantive discussions on actions items.

Under a mature SMS, additional emphasis will be placed on the discussions of safety priorities. A review of executive level meeting minutes indicated that high-level safety priorities are not always discussed through resolution, and safety performance and assurance is typically limited to a handful of indicators.

Moving forward, WMATA will want to ensure that operational decisions that may affect safety are evaluated, prioritized, and presented at these meetings. This includes an expanded level of safety performance tracking, reviewing effectiveness of safety risk mitigations, and discussion of resource allocation needs to address safety priorities.

1.3 Integration with Public Safety and Emergency Management

1.3 a - The transit agency maintains documentation of how its SMS integrates with public safety and emergency preparedness programs

◑ Planning

As SMS is new to the transit industry, WMATA has not yet documented how its SMS integrates with public safety (security) and emergency preparedness programs. WMATA has an extensive and comprehensive Police Department and Emergency Management Office. WMATA's SSPP, Section 11, addresses emergency management, and WMATA maintains a Security Plan as well. Moving forward, WMATA will need to ensure outputs from those activities are integrated into safety management decisions.

An SMS applies to external agency relationships, especially those involving emergency management and first responders. Transit relies on first responders during emergencies; therefore, changes to agency practices, technology, and equipment can potentially affect the safety of those responding to transit emergencies. Thus, it is critical that WMATA integrate SMS into external relationships and that the channels of communication between a transit agency, emergency management, and first responders are open and effective.

As with its rail and bus technical safety program, WMATA will also need to document how its SMS integrates with its public safety and emergency preparedness programs.

1.3 b - The transit agency has Memoranda of Understanding (MOU) or agreements with other organizations for mutual aid and the provision of emergency services, as needed

● Managing & Monitoring '

The Metropolitan Washington Council of Governments (MWCOG), a regional organization, has a number of committees focused on emergency management coordination in the D.C. region in which WMATA representatives are involved. This group developed the "Metro Rail Transit Fire/Rescue Emergency Procedures Policy Agreement" MOU. In addition, interviews with the Metro Transit Police Department (MTPD) and the Office of Emergency Management (OEM) indicated WMATA involvement with MWCOG through the Fire Chief Committee, Fire Chief Safety Subcommittee, Senior Operations Committee, and Metro specific committee. In addition, interviews with SAFE staff, MTPD, and OEM staff indicated the existence of an MOU on emergency management between WMATA and first responders.

1.3 c - The transit agency has developed plans for emergency preparedness and response that also address the delegation of authorities and responsibilities during an emergency

Implementing '

There are multiple emergency operations plans developed by jurisdictions within the WMATA service area. WMATA has its own Emergency Operations Plan (EOP); however, there is a regional emergency plan that MWCOG has developed. WMATA is a player in that emergency plan and is comfortable with the role it is assigned. The regional EOP is presently being updated.

WMATA also develops emergency operation plans to address major special events as may be required, which outlines bus and rail organizational responsibilities during emergencies and includes hazard assessment and analysis during those emergencies. The EOP has multiple annexes, including one that addresses responding to potential terrorist attacks.

OEM has managed the development of rail station emergency response and evacuation plans with plans completed for approximately one-third of the stations. The remainders are to be completed over the next year and a half.

WMATA's goal is to operate under the National Incident Management System (NIMS) structure during major emergencies; however, OEM indicated that many WMATA bus and rail operations leaders are not presently NIMS certified, and a roster of who has received NIMS training is not maintained.

WMATA has its own organizational emergency operations center, but for larger events may send representatives to the jurisdictional emergency operations centers within WMATA's service area.

As WMATA begins to integrate its safety, public safety, and emergency response programs into its SMS, it should review its emergency preparedness and response procedures, including the delegation of authorities and responsibilities.

1.3 d - The transit agency's emergency preparedness and response plans are periodically reviewed

Implementing

The WMATA EOP is reviewed on an annual basis and updated every three years.

As per the SSPP, the bus and rail operations Continuity of Operations Plans (COOP) are to be updated annually. When FTA was on-site at WMATA, the bus COOP was in a draft stage and did not meet this standard.

As WMATA moves forward in implementing its SMS, it will be important that it have a formal procedure or mechanism to ensure periodic reviews and updates of emergency plans and procedures.

1.3 e - The transit agency's emergency response plan includes, or references, procedures for the safe transition between normal and abnormal or emergency operations

Implementing '

The WMATA SSPP, Section 11 Emergency Management, states, "When events or incidents occur that impede WMATA's normal transit operations, the impact can cause transportation issues from a very localized to a regional scale."

The WMATA EOP addresses concerns related to the safe transition between normal and abnormal or emergency operations. The WMATA COOP also includes procedures for the safe transition between normal and abnormal or emergency operations.

In addition to the EOP and COOP, WMATA has other plans that affect the safe transition between normal and abnormal or emergency operations, including the SSPP, the Security and Emergency Preparedness Plan, Severe Weather Plans, Pandemic Flu Plan, Chemical/Biological Sensor Plan, rail station emergency evacuation plans presently under development, and others.

WMATA has developed Code Black procedures that address shut down and restoration. SAFE was involved in developing these procedures, as were SMEs from WMATA operating departments. The procedures have been vetted through a tabletop exercise activity.

1.3 f - The transit agency conducts internal exercises and/or drills using established emergency response procedures

Planning

WMATA is in the process of creating a schedule of periodic internal exercises or drills involving established emergency response procedures. OEM indicated that it hopes to do quarterly full-scale exercises, but those exercises are not presently planned out. It is also hoping to do one tabletop exercise on a quarterly basis.

In the past, WMATA's rail and bus operations training departments do not appear to have been consistently represented during the emergency planning process. OEM does not have a formal review role in emergency training developed by bus and rail operations departments and has limited knowledge if information on emergency management has been effectively communicated to frontline employees.

At the time FTA was on-site, WMATA was making plans to carry out an exercise in April 2015 involving response to smoke in a Metrorail tunnel.

WMATA carried out a full shut down exercise in October 2014 that addressed a terrorist incident and involved explosive and chemical, biological, and radiological event scenarios. This exercise was designed to assist Metrobus and

Metrorail operations in developing procedures and communication methodologies to address an actual event.

Moving forward, it is important that WMATA continue with plans to establish a formal and consistent schedule of internal emergency response exercises or drills.

1.3 g - The transit agency participates in or solicits future participation in external community emergency response drills, simulations, and/or exercises

◕ Implementing

The WMATA SSPP, Section 11.10 Emergency Exercises of the SSPP, specifies that a minimum of one large-scale inter-agency exercise is conducted annually and adds, "Occasionally, one or several agencies approach Metro about hosting an exercise on Metro infrastructure or at Metro facilities. Metro works to accommodate such requests as best as possible, acknowledging the benefit for all involved."

WMATA carried out a rail full-scale exercise last year involving Virginia jurisdictions. It also carried out five exercises with the Silver Line involving Metrobus, Metrorail, MetroACCESS, and local bus partners. A bus tabletop took place last year that led to a draft MOU between Metrobus and the Fairfax Connector.

WMATA works with the Transit Security Administration on exercises that involve Federal components, the Park Service, Capitol Police, the Pentagon Protection Task Force, and others.

WMATA's overall strategic business plan speaks to the number of internal and external emergency drills and exercises to be carried out.

1.3 h - The transit agency evaluates outputs from public safety and emergency response activities for possible entry into Safety Risk Management activities

◑ Planning

The SSPP, Section 11.10 Emergency Exercises of the SSPP, explains that a 'hot wash' or debriefing is held immediately or soon after the exercise. In addition, the agency leading the drill is typically responsible for creating the After Action Report and sharing it with participants. Metro reviews the After Action Report in search of pertinent 'strengths' and 'areas for improvement.' Metro's identified 'areas for improvement' will become corrective actions if they have not yet been corrected. These corrective actions will be submitted to the Tri-state Oversight Committee (TOC) for review and adoption and tracked through the TOC Security Corrective Action Plans matrix by MTPD.

Although WMATA documents lessons learned from internal and external exercises to inform its emergency response procedures, there does not appear to

be a formal, comprehensive, and documented process where outputs from exercises are directly entered into SAFE's Safety Risk Management activities. For example, FTA found serious lapses in the quality of the radio system and radio communications, which significantly affect the ability of the Metrorail system to manage abnormal and emergency events, and to ensure the safety of trains and personnel on the right-of-way. Under a mature SMS, the issue of radio communication would be evaluated through the Safety Risk Management process and prioritized for resource allocation to mitigate potential consequences.

WMATA should make certain this is accomplished as it moves into development of its SMS.

1.4 SMS Documentation and Records

1.4 a - The transit agency has developed and maintains appropriate documentation of its SMS and the interrelationship of its processes, activities, and tools

Planning

While WMATA has documented its safety management processes and practices within its SSPP, it will need to revise and incorporate key SMS elements.

1.4 b - There are criteria and a procedure to periodically review SMS documentation to ensure its continuing suitability, adequacy, and effectiveness

Planning

WMATA already has a process in place for the review of its SSPP. When WMATA documents its SMS, it will need to include criteria for the review of key documentation (such as an SMS manual or Agency Safety Plan), as well as detail the WMATA Board review and approval.

1.4 c - The transit agency has a document control program to manage and maintain, including any changes to, SMS-related documents

Implementing

WMATA has an effective document control program for its current SSPP, which it will need to extend for its SMS documents. This must include changes to critical documents such as procedures related in any way to the safety performance of WMATA.

1.4 d - SMS documentation includes and makes reference to, as appropriate, all relevant and applicable Federal and state standards and/or regulations

Planning

WMATA will accomplish this as it furthers its development and documentation of its SMS.

1.4 e - The transit agency maintains records pertaining to outputs of processes and activities contained within the SMS

Implementing '

WMATA maintains its Safety Measurement System, which serves as the primary method for storing and managing records related to many SMS activities (such as hazard, risk analysis, mitigation tracking, and so forth). As WMATA moves forward in implementing its SMS, all sources of information for Safety Risk Management and Safety Assurance activities will need to be identified and managed.

1.4 f - The transit agency has a process to identify when organizational changes may affect SMS documentation

Initiating

WMATA will accomplish this as it furthers development of its SMS.

2.0 Safety Risk Management

This section of the WMATA SMS Gap Analysis Report evaluates the level of SMS implementation for the following SMS sub-elements:

- Hazard Identification and Analysis
- Safety Risk Assessment and Mitigation

2.1 Hazard Identification and Analysis

2.1 a - The transit agency has established a formal program for proactive identification and analysis of hazards

Implementing

Given WMATA's experience in implementing 49 CFR Part 659 requirements for rail, the agency has a documented and formal program for hazard identification and analysis activities in its SSPP. As will be discussed below, WMATA (as with most of the industry) will need to shift part of its hazard identification focus to more proactive activities. In addition, WMATA will need to consider its definition of "hazard" to ensure that it can provide training to employees for proper recognition and reporting.

During interviews, WMATA personnel indicated that prior to the training provided by FTA on SMS and hazard identification, they thought they were reporting hazards properly. After the training, they realized that they typically were reporting "consequences" and not hazards.

2.1 b - Hazard identification sources and activities have been identified and documented by the transit agency

Implementing

WMATA has identified various sources to support hazard identification activities in its SSPP. WMATA's Safety Measurement System is an extremely valuable tool and WMATA is commended for the work and effort in developing this system to support safety activities.

As its SMS is further developed, however, WMATA must shift its focus to increasing the use of sources and activities to obtain more proactive information on safety concerns and hazards. As WMATA identifies and formalizes the sources and activities, it should consider implementing all its hazard identification strategies and activities consistently and in an ongoing manner, in all areas of operations and maintenance, for both service modes.

2.1 c - The transit agency has a formal process or system for the capture of data and information related to the proactive and reactive identification of hazards

Implementing '

WMATA relies on its Safety Measurement System as the repository for safety data and information. The system collects and supports management of compliance data, incident data, the safety hotline, risk mitigation, environment and industrial hygiene information, and its return to work program. WMATA uses Cognos to support business intelligence.

The existing Safety Measurement System software is an industry best practice and an extraordinary tool for documenting, tracking, and analyzing accident and incident data. It provides a strong database for accident and incident risk mitigation development. However, currently, it is used more as a reactive tool that is implemented fully after an accident occurs and does not serve as effectively as it could as a proactive tool in non-event hazard identification and analysis.

2.1 d - The transit agency uses its employee safety-reporting program to capture hazards and safety concerns

Implementing

The key to WMATA's success of its hazard identification program will be the maturity of its current Close-Call Reporting System and employee hotline into a comprehensive employee safety-reporting program. As mentioned earlier, WMATA is on the cutting edge in transit for its non-punitive Close-Call Reporting System.

Moving forward, WMATA will want to consider additional criteria and guidelines for an expanded safety-reporting program. This will include detailing who may report, what is to be reported (e.g., safety concerns, workplace conditions and situations that may deviate from established procedures, and so forth), means for reporting, and the expectation for employees as to what they can expect WMATA will do with reported information.

In addition, WMATA will want to explicitly identify how it will manage its data analysis, storage, and retrieval for effective hazard analysis. Finally, under a mature SMS, WMATA will clearly define principles for safety data protection as well as for exemptions to this protection.

2.1 e - The transit agency employee safety-reporting program also applies to contractors

Initiating

WMATA's SSPP provides contractors as a source for safety concerns and information; however, currently it does not capture this data through the Safety Measurement System or provide training to contractors (outside of contractors that work directly for SAFE) on reporting safety concerns.

2.1 f - The transit agency has documented its process and procedure for conducting hazard analysis

Implementing '

The WMATA SSPP includes a section on its Hazard Management Program (Section 6), which provides an overview of how WMATA assesses hazards in terms of the severity and probability of safety risk associated with the hazard. WMATA uses its Hazard Management application within the Safety Measurement System to analyze hazards and assess their risk. Upon viewing the severity/probability matrix used by WMATA for hazard analysis, FTA found a concern in the risk index rankings.

FTA recommends that WMATA revise its severity/probability matrix risk index to ensure that a ranking of "Unacceptable" (3A) is not adjacent to a ranking of "Acceptable with ESC review" (4B).

2.1 g - Hazard analysis is carried out to identify underlying causal/contributing factors, and this process is documented

Implementing

WMATA has not yet implemented this activity in a wide-scale manner for all safety events and incidents, and it rarely uses it in a proactive manner. Current accident investigation efforts often yield the identification of contributing factors; however, WMATA has not always identified the underlying causal factors that may include system-wide or organizational safety deficiencies.

Although SAFE pursues root cause analysis of accidents that reach a Level 1 rating, analyses are often not conducted on lower level accidents. Equally, root cause analysis for lower level events at the division level is limited. A lower level accident has the potential to become a Level 1 accident if risk is not assessed and proactive risk mitigation strategies go unexplored.

As WMATA moves forward in its SMS development and implementation, it should consider ensuring that it identifies the actual or real hazard for analysis (often, as is with current trends in public transportation across the country, the consequence of a hazard is stated as the hazard itself). WMATA's commitment to support safety management activities, clarification and training in the definition of hazard, combined with coordinating with SMEs from operating and maintenance departments, will strengthen WMATA's approach to causal analysis.

2.1 h - Hazard analysis is carried out in coordination with SMEs as necessary

Planning

In a mature SMS, a qualified individual or team ensures the correct identification of hazards and evaluation of potential safety risk. It is critical that WMATA identify and coordinate with SMEs, as necessary, during hazard analysis activities. WMATA coordinates well with its in-house SMEs during accident investigations and other reactive activities. WMATA should consider identifying

criteria and a review mechanism that assures necessary personnel are also involved during non-event hazard analyses. This would include identified individuals from operations, maintenance, training, and so forth.

2.1 i - When analyzing hazards, the transit agency considers human factors, environment, supervision, and organizational elements

◑ Planning

Currently, WMATA is on the forefront in transit for looking at and capturing data related to fatigue and its potential role in errors and accidents. WMATA has undertaken an aggressive management program to attempt to limit the effects of fatigue on the safe delivery of services. The challenge facing this program is to balance the requirement of fully delivering services on time with the risks that accompany operator hours of service concerns. WMATA plans to add a Fatigue Management module to its Safety Measurement System.

With respect to analyzing supervision and organizational elements as potential sources for deficiencies or contributing factors, WMATA will need to expand its practices as it builds its SMS. WMATA indicated that it would begin to look beyond single-point failures or employee error during hazard identification and analyses, as well as look at causal factors related to the organizational elements themselves.

2.1 j - The transit agency documents the results of its hazard identification and analysis activities

◕ Implementing

WMATA collects and stores hazard analysis results in its Safety Measurement System. Independent of the Safety Measurement System, hazard identification data is often not captured or the documentation of data is not centralized. Individual employees often identify hazards and respond to them unilaterally without collecting data about the hazard and the mitigation in a centralized data pool. This lack of information and centralized documentation limits WMATA's ability to be proactive in its hazard and risk mitigation activities and negatively affects the monitoring of risk mitigation strategies.

With respect to reporting results from hazard analysis activities, under a mature SMS, WMATA would define the different levels of management that should receive information on hazard analyses as a function of its responsibilities of the agency's service delivery as well as their respective level of participation in the SMS. This is especially important when considering allocating resources necessary for mitigation of potential safety risk. This is an area where increased definition of this process will support more consistent communication of safety risk at WMATA, assuring the right level of management is informed on safety priorities and the resources necessary for mitigation.

2.2 Safety Risk Evaluation and Mitigation

2.2 a - The transit agency has activities and tools to evaluate and prioritize safety risk associated with the consequences of identified and analyzed hazards

Implementing '

WMATA has intermittently performed activities for evaluating and prioritizing safety risks; however, WMATA typically limits this type of evaluation to reactive events. Thus, safety risks are not always captured, evaluated, and prioritized. There are limits to the capabilities of the Safety Measurement System or existing processes to elevate and prioritize safety risk associated with the consequences of identified and analyzed hazards.

2.2 b -At a minimum, safety risk evaluation activities include evaluating safety risk in terms of probability and severity and take into account any mitigation measures that are currently in place

Implementing

WMATA currently evaluates safety risk in terms of both probability and severity of consequences for identified hazards that have been entered into the Safety Measurement System. WMATA also began evaluating its corrective action plans (CAPs) and prioritizing them based on indexed safety risk. FTA did not find evidence that current mitigations are taken into account in their safety risk evaluation.

There is currently an assumption that proposing additional mitigation lowers both probability and severity. However, a review of WMATA's safety risk evaluation and mitigation development shows that often the additional proposed mitigations mainly lower probability but do not significantly address severity. As WMATA moves forward in SMS implementation, it should strive for a more concise understanding of the effect of mitigations on safety risk.

2.2 c - There are criteria and a mechanism for elevating evaluated safety risks to the attention of senior management

Planning

At the current time, WMATA relies on its safety committee structure to elevate results from safety risk evaluations. However, WMATA is not currently practicing the use of strict criteria to ensure that safety risks are elevated to key decision-makers. As mentioned previously, review of ESC meeting minutes indicate that key issues with higher safety risk are not consistently prioritized, communicated, and managed through the committee structure.

Interviews with members of several different departments confirmed that the LSC to DSC to ESC structure serves as a channel to move safety concerns up to the executive level, if necessary. Interviewees also stated that most issues are

managed at the LSC level. If the issue cannot be resolved there, it is elevated to the DSC. If unresolved there, it is moved to the ESC level.

Moving forward, as a component of its SMS, WMATA will need to establish and follow criteria for elevating safety risk evaluation to the attention of senior management.

2.2 d - The transit agency has documented safety risk mitigation strategies that include corrective/preventative actions to prevent recurrence or hazard potential

Implementing

WMATA documents much of its safety risk mitigation strategies using its Safety Measurement System and stores this information so that all relevant parties can access it. However, some safety risk mitigation strategies are put into place at the local operational level with limited documentation, meaning this information is not captured within the Safety Measurement System.

WMATA has an extensive CAP documentation system and manages this monthly with its SSOA.

For hazards (and evaluated safety risks) that WMATA rates as undesirable or unacceptable, SAFE works with each relevant WMATA department to develop and implement a CAP. As WMATA moves to further the development and implementation of an SMS, it will want to ensure that mitigations are discrete and reduce the severity and/or probability of the safety risk and are tracked through the Safety Assurance function.

2.2 e - There are criteria and a procedure that define mitigation actions, which require senior management approval

Planning

Currently, WMATA elevates corrective actions on a case-by-case basis without using pre-defined criteria. Moving forward in SMS development, WMATA should establish and consistently use criteria to indicate when senior management approval is required.

2.2 f - Safety risk mitigation plans/risk mitigations are documented, prioritized, and include timelines and responsibilities

Implementing

The SSPP states in Section 6.2.8.1 Development of Corrective Action Plans "Each CAP must include the following information:

- Identify noted finding and its source
- Process, plan, or mechanism to address and resolve finding or recommendation
- Target date for implementation of plan of action

- Department(s) and specific person(s) who will be responsible for implementation
- Hazard rating"

When mitigations are included in CAPs, they are documented and include the action to be performed, the responsible party, and dates for mitigation implementation. WMATA ranks and prioritizes its corrective actions. Within an SMS structure, WMATA should consider ensuring that a part of its Safety Risk Management process includes the necessary prioritization of all mitigations, both for resource allocation as well as for implementation practical purposes.

2.2 g - There is a procedure for periodic review of the Safety Risk Management process and safety risk evaluation records

The WMATA SSPP includes an internal safety audit process to evaluate the effectiveness of WMATA's hazard assessment process.

2.2 h - The transit agency maintains records pertaining to the output of the Safety Risk Management process (perhaps in a tracking log or safety risk register, for example)

WMATA maintains records of a portion of its hazards in the Safety Measurement System. This does depend, of course, on whether or not a local concern/hazard was entered into the system. WMATA also maintains hazard-tracking logs, which are communicated to its SSOA.

WMATA will need to improve the hazard communication and documentation process involving SAFE and bus and rail operations and maintenance functions if the Safety Measurement System database is to be comprehensive in terms of hazard identification, analysis, safety risk evaluation, and mitigation.

3.0 Safety Assurance

This section of the WMATA SMS Gap Analysis Report evaluates the level of SMS implementation for the following SMS sub-elements:

- Safety Performance Monitoring and Measurement
- Management of Change
- Continuous Improvement

3.1 Safety Performance Monitoring and Measurement

3.1 a - The transit agency implements a formal, documented process to monitor and measure the transit agency's safety performance, both proactively and reactively

◑ Planning

WMATA has established numerous activities that monitor the implementation of its SSPP, operating and maintenance activities (for compliance) and, to partial extent, its safety performance. These include internal safety audits, facilities and equipment inspections, maintenance audits, inspections, and training, and certification reviews. For rail, these activities are required under 49 CFR Part 659.

Under an SMS, safety performance is an indication of the achievement of pre-specified safety standards. Information that supports the evaluation of safety performance comes from activities an organization engages in to deliver its services. These activities include:

- Operations activities
- Maintenance activities
- Monitoring/Inspection/Oversight activities

Safety performance monitoring activities should include both reactive (i.e., accident investigations) and proactive (i.e., field monitoring of service delivery activities) and focus on more than compliance.

WMATA conducts limited monitoring of safety performance activities (some of these are covered in rules compliance checks) and normal operations. There are operations and maintenance compliance gaps that have not been identified by respective departments or internal safety audits—WMATA's primary tool for measuring the effectiveness of its safety program. Without a baseline of compliance, WMATA will find it difficult to implement an effective SMS.

However, WMATA does conduct safety observations through its bus services. This includes "observations and conversations" and yields very valuable data regarding safety performance activities for the bus mode. Monitoring service delivery is a key focus under a mature SMS because it helps identify where there

has been a drift away from established policies and procedures. This drift has the potential to create safety risk. In addition, field observations can lead to identifying previously unnoticed or unreported safety hazards.

WMATA's practice of safety observations and conversations is a good practice that WMATA should institute agency wide. These are essential elements of a mature SMS and WMATA will want to pursue implementation of these practices moving forward.

WMATA has developed a limited set of safety performance measures, primarily reactive in nature, including lagging indicators that monitor occurrences, accidents, and safety violations. However, WMATA does include leading indicators such as inconsequential station overruns, red signal violations, and wrong-side door openings in rail service that support a more proactive approach to monitoring safety performance. As mentioned above, for bus service, WMATA captures and tracks measures based on safety observations.

As WMATA moves to further develop its SMS, it should develop additional proactive safety performance indicators, including indications of the effectiveness of safety risk mitigations and safety performance activities.

The two common observations on which WMATA will need to focus as it builds its SMS are 1) current efforts are not yet sufficiently comprehensive and consistent to include all necessary Safety Assurance elements and 2) WMATA will want to push toward more proactive measures and monitoring activities.

3.1 b - Data and information collected through safety performance monitoring activities is examined for hazards

WMATA examines rail accident data for hazards, though currently this is an inconsistent practice. WMATA examines failures (in systems such as signals, track, and vehicles) for hazards.

WMATA has a comprehensive bus accident and incident investigation procedure that is consistent with national transit industry standards. Data collected from these investigations are used primarily to determine if the accident or incident was preventable or non-preventable so that the behavior of employees involved in accidents can be potentially managed through discipline and retraining processes. Deeper analysis of accident and incident data for organizational causal factors that would assist in identifying hazards whose consequences dictate the need to develop risk mitigation strategies occurs on a limited basis and is not consistently applied.

Bus operator performance monitoring through field observations is limited; therefore, the ability of that monitoring process to identify hazards is not consistent throughout bus operations. Bus maintenance more consistently

monitors both mechanic and overall maintenance performance so hazard identification is generally carried out. The documentation of hazards within bus operations and maintenance varies depending on circumstances.

3.1 c - The transit agency implements formal activities to measure and monitor the effectiveness of safety risk mitigations

Initiating

WMATA expects to develop more formal and comprehensive safety monitoring activities as it develops its SMS.

3.1 d - If safety risk mitigation strategies are deemed ineffective, the transit agency uses the Safety Risk Management process to resolve the ineffective mitigation strategies

Planning

In a few cases, WMATA has reevaluated mitigation strategies. This is not a consistent practice, however, and moving forward, WMATA has indicated that operating and maintenance departments intend to involve SAFE in the reevaluation of mitigations.

3.1 e - The agency has a process in place to evaluate the effectiveness of the activities that are used to monitor safety performance

Planning

WMATA currently uses its internal safety audit process to carry out this practice. WMATA will need to enhance its assessment activities as it furthers its implementation of SMS.

3.1 f - The transit agency periodically reviews its data collection and analysis activities to ensure they are effective

Planning

SAFE reviews data collection and analysis activities, but those reviews are not necessarily carried out as a formal or periodically scheduled and documented activity.

3.1 g - Results from safety performance monitoring are reviewed frequently by management and reported to executive management as necessary

Implementing

WMATA representatives meet regularly to discuss results from safety performance monitoring activities. As WMATA further develops its SMS and expands its safety performance monitoring activities, it will be able to better report leading safety performance indicators.

3.1 h - The transit agency evaluates the effectiveness of its employee safety-reporting program

Initiating

To be addressed in conjunction with further SMS development and implementation.

3.1 i - The transit agency conducts investigations into safety events, incidents, and occurrences following a formal procedure that ensures causal factors are identified, analyzed, and reported

Implementing

WMATA conducts investigations into bus and rail accidents that have occurred within the system. Established accident investigation procedures exist and are utilized. A gap in some investigations reviewed by FTA is the additional analysis necessary to ensure the causal factors have been appropriately recognized and evaluated. WMATA has requested additional instructions from FTA and has committed resources to SAFE to improve its analysis efforts.

3.1 j - Results from investigations are evaluated through the Safety Risk Management process as necessary to determine appropriate mitigations

Implementing

Currently, the Safety Risk Management process is not consistently engaged in evaluating investigation determinations and results. The extent of mitigation development also differs from department to department. For certain system failures, personnel conduct hazard analyses or engineering analyses to determine the appropriate mitigation. The Safety Risk Management process is not yet consistent in its application.

As WMATA enhances its ability to better identify causal factors, the development of appropriate mitigations will improve. In addition, WMATA can incorporate its safety committee structure to enhance its ability to ensure greater consistency among departments in the identification of mitigation strategies.

3.1 k - The transit agency has established safety objectives and safety performance targets

Planning

WMATA has established its safety objectives. WMATA management indicated that after the successful analysis of current data, the agency would move to identify more detailed safety performance targets.

3.1 l - Safety performance indicators include both reactive and proactive measures

Planning

WMATA expects to add more comprehensive and proactive safety performance indicators as it develops its SMS.

3.1 m - Safety performance objectives, targets, and indicators have been formally communicated throughout the agency as appropriate

◑ Planning

Current WMATA safety performance indicators are discussed at the executive level. From there, each department works safety targets into its business plans. WMATA will need to expand that communication as it furthers its SMS development and creates additional proactive safety performance measures.

3.1 n - Safety performance objectives, targets, and indicators are reviewed and updated periodically

◑ Planning

WMATA has a process in place that it utilizes to ensure that its current indicators are reviewed. This occurs at least quarterly at the executive level and annually with the Board of Directors.

3.1 o - Safety performance indicators are used to inform the allocation of resources

◑ Planning

The WMATA Board is provided information on the achievement of safety performance objectives and targets. There is no formal documentation that would indicate a direct relationship between safety objective and target achievement and the allocation of resources by the CEO or Board to address under performance in achieving safety objectives and targets.

3.1 p - Failures to meet safety performance objectives and targets are reviewed and remedial actions are identified

◑ Planning

SAFE has indicated the desire to place more emphasis on developing documented and comprehensive remedial actions in instances when there are failures to meet safety performance objectives and targets. It is anticipated that through the implementation of an SMS, this process will enhance significantly.

3.2 Management of Change

3.2 a - The transit agency has identified the potential sources for changes that would be examined for potential impact on safety performance

◑ Planning

For WMATA, as indicated in its SSPP, the identification of potential sources for change primarily relate to system modifications and major capital projects. In its SSPP (Sections 7.0, 7.2, and 8.0), WMATA specifies processes it should implement for system modifications, new systems, and safety certification activities.

For major capital projects, WMATA does examine the changes for potential effects on safety performance. For these efforts, typically, contractors are required

to conduct hazard analysis for deviations from design or specifications documents and report this information in an ongoing manner through the safety certification process.

Under a mature SMS, all changes (organizational and operational) encountered need to be initially evaluated to determine if there is a potential impact on safety. Changes can be either internal or external. Examples of major internal and external transit changes include:

- Internal
  - Renovation of infrastructure
  - Introduction of new technology
  - Introduction of new services
  - Redesign of existing services
  - Fluctuation in staffing levels
  - Implementation of new or revised policies and procedures
  - Modification of organizational structure

- External
  - New or revised safety regulatory requirements
  - New or revised security requirements
  - Transformation of the surrounding operating environment

Moving forward, WMATA will need to expand its criteria for identifying change and ensure that each change is evaluated for potential safety impact. If WMATA concludes that a change may affect safety, then it would evaluate it through its Safety Risk Management process. WMATA will need to formulate explicit procedures for ensuring that it identifies changes, including the criteria for review, and assurances that it evaluates changes for safety purposes.

3.2 b - The transit agency has a formal methodology in place that specifies how potential changes are evaluated for possible safety impacts

◑ Planning

As mentioned above, the WMATA SSPP indicates that during system modifications and major capital projects, changes are evaluated through its safety certification process. Additionally, WMATA discusses its approach to configuration management and its process for identifying and managing changes to system elements. It is also evident that coordination between SAFE and other operating departments is increasing. WMATA should continue to increase this coordination to help facilitate increased identification and evaluation of changes.

As WMATA develops its SMS further, it plans to formalize a process through which a methodology and criteria can be established so that changes can be assessed for potential safety impact.

3.2 c - When the proposed change may have a safety impact, the transit agency uses the Safety Risk Management process to evaluate for safety risk and mitigate the safety risks as necessary

Initiating '

Currently, WMATA does this for major changes. Moving forward, as WMATA increases its activities to identify and manage changes, it will need to ensure that if one passes an established threshold based on established criteria, there is assurance that the proposed change moves through the Safety Risk Management process.

3.2 d - The transit agency holds meetings with key stakeholders to discuss the anticipated or identified change(s)

Planning

For those changes that are associated with large system modifications, capital projects, or as a result of accident investigations or mechanical failures, WMATA meets to discuss the change. Representatives from SAFE participate in some (but not all) of these meetings. Individual department managers discuss changes to operations, maintenance systems, activities, etc.; however, managers do not consistently communicate this to SAFE.

WMATA transportation managers indicated their understanding of the value in ensuring SAFE participation during these meetings. In addition, they indicated that moving forward they would welcome the development of criteria for determining which stakeholders should participate during discussions regarding change.

3.2 e - A procedure is in place to document the change and update any associated documents or records

Initiating

WMATA will want to update its policies and procedures after fully defining its management of change process, activities, and tools.

3.3 Continuous Improvement

3.3 a - The transit agency has established criteria and procedures for the ongoing evaluation of the effectiveness of its safety management activities

Planning

Currently, WMATA relies on its internal safety audits to satisfy this activity. However, as mentioned earlier, WMATA understands that it must move beyond the limited scope of internal safety audits and implement more comprehensive and consistent safety management evaluation activities as it furthers its SMS development.

3.3 b - The transit agency has formal activities and procedures to correct identified deficiencies in the SMS

To be addressed in conjunction with SMS development and implementation.

3.3 c - SMS-related lessons learned are incorporated into organizational policies and procedures

To be addressed in conjunction with SMS development and implementation.

3.3 d - The transit agency reaches out to peer agencies to gather information on effective safety practices that could be incorporated into the SMS

To be addressed in conjunction with SMS development and implementation.

4.0 Safety Promotion

This section of the WMATA SMS Gap Analysis Report evaluates the level of SMS implementation for the following SMS sub-elements:

- Safety Communication
- Competencies and Training

4.1 Safety Communication

4.1 a - The transit agency has formal safety communications to ensure all employees are aware of the SMS Safety Management Policy, as well as processes, activities, and tools that are relevant to their responsibilities

◑ Planning

Many WMATA rail and bus supervisory and frontline employees indicated they are not aware of the WMATA System Safety Policy Statement that is contained in the SSPP. WMATA has indicated that as it moves forward with SMS implementation it will ensure the System Safety Policy Statement will be revised and distributed to ensure it is visible to all employees.

As a means of communication, WMATA currently uses a network of safety committees that address safety issues related to rail and bus operations and maintenance. WMATA management addresses issues uncovered during committee meetings, as reasonable and practical.

Safety issues are formally and informally discussed during bus and rail operations and maintenance safety meetings and briefings. There appears to be limited shared documentation that summarizes the output of safety discussions during safety meetings and safety briefings. This limits organization-wide communication on specific items of safety concern within bus and rail operations and maintenance.

Information technology (IT) and computer-based applications established at WMATA to improve efficiency, transparency, communication, and effectiveness of operations and maintenance activities face numerous challenges in working towards an enterprise-based approach where all WMATA departments use the same IT applications in the same manner and can share and communicate data across the organization.

4.1 b - The transit agency communicates hazard information relevant to employees' responsibilities

◑ Planning

Safety communication must be a constant, two-way loop within a transit agency. This aims at fostering a broad understanding of the hazard identification process

and how the SMS helps to reduce the safety risk presented by the potential consequences of hazards.

The frequency and length of safety meetings varies depending on the department and facility location. Supervisory and frontline employees expressed concerns about the effectiveness of the WMATA safety meetings program. There appears to be an absence of consistent scheduling across all shifts and at standardized periodic intervals. Furthermore, there is room for improvement in the documentation of the content and results of these safety meetings.

As WMATA moves forward in its SMS implementation, it must ensure that workers are aware of key safety priorities and any "hot items" related to safety. An effective SMS would ensure that, if asked, each employee could articulate key WMATA safety priorities. This will require not only a more formal, structured, and documented safety meetings program across all WMATA departments, it will also be dependent on a consistent delivery mechanism of top safety priorities to the WMATA workforce.

4.1 c - The transit agency explains why safety actions have been taken and why safety procedures are introduced or changed

WMATA issues safety bulletins, notices, and memos that address urgent safety management topics and concerns. WMATA may also address the reasons for safety actions and changed safety procedures during departmental safety committee discussions and safety meetings with rail and bus operations and maintenance frontline employees. However, currently, the dissemination of safety information throughout WMATA is not well organized.

As WMATA moves forward with its SMS development, it should consider greater involvement of frontline employees through its safety meetings, focus groups, or other means. This will encourage their involvement in identifying and evaluating safety concerns, as frontline employees represent SMEs for their respective jobs, and ensure their involvement in safety actions or changes to safety procedures.

4.1 d - Significant accident and incident investigation outcomes are communicated to appropriate employees and to contracted organizations

Currently within WMATA, certain employee groups discuss accident and incident investigation information informally during safety meetings. In addition, this information is often the subject of safety bulletins, notices, and memos. However, WMATA does not have a formal and comprehensive procedure for communicating significant accident and incident investigation outcomes to appropriate employees.

As WMATA moves into the development of its SMS, it is recommended that the agency implement a process to ensure that accident and incident investigation outcomes are communicated to appropriate employees and to contracted organizations.

4.2 Competencies and Training

4.2 a - The transit agency has a safety management training program to ensure that relevant personnel are trained and competent to perform their SMS duties

Initiating

As WMATA furthers the development of its SMS and fully defines required roles and responsibilities, SAFE and bus and rail operations and maintenance training functions will play a critical role. In partnership, they must ensure that relevant, dedicated personnel are trained and competent to perform their safety management related duties, and all employees, as appropriate, are aware of their roles in the SMS and their individual contributions through employee safety reporting.

WMATA will want to ensure that all appropriate employees receive training on SMS fundamentals and applicable skills, including an understanding of WMATA safety objectives, employee safety reporting procedures, and specific safety management topics related to particular job functions.

4.2 b - Formal training needs analyses are conducted for all safety related job functions and training gaps are addressed, as necessary

Implementing

The depth and frequency of the training needs analysis processes at WMATA varies greatly from department to department. For example, bus maintenance conducts a formal needs analysis of mechanic skills on a periodic basis and adjusts their mechanic-training curriculum accordingly. Bus operations, on the other hand, relies more on industry standards as to what should be included within new-hire and refresher bus operator training. Rail operations and maintenance training equally varies in the frequency and depth of the training needs analysis process. SAFE does not appear to be active in reviewing training needs analyses activities that support bus and rail operations and maintenance skill development curriculum.

As WMATA moves forward with the implementation of its SMS, it is clear that a comprehensive overhaul of all training needs analysis processes must be applied to all bus and rail operations and maintenance training efforts. Equally, SAFE must be much more active in ensuring that the needs analysis process addresses identified bus and rail safety hazards and the skills within each job function that is required to mitigate the consequences of those hazards. Presently, this kind of

comprehensive and crosscutting training needs analysis process is not in place at the level it needs to be at WMATA.

4.2 c - The transit agency has criteria to identify and provide skill training related to safe job performance, including initial and refresher training, for all relevant job functions, to the level that all employees are competent to perform their safety-related duties

As WMATA moves forward with its SMS implementation, it will need to address current specific initial and refresher/recertification training challenges in the following job functions:

- Train operators
- Rail operations supervisors
- Rail control center staff
- Rail maintenance workers
- Rail maintenance supervisors
- Other rail technical skill areas
- Bus operators
- Bus operator supervisors
- Bus control center staff
- Bus maintenance workers
- Bus maintenance supervisors
- MetroACCESS staff at all levels
- Other bus technical skill areas

These challenges include not only content of instructional curriculum for all job categories, but the length of time allotted for new-hire training and the intervals and length of refresher/recertification training.

There is not an enterprise-wide strategy for technical training to ensure the proficiency of WMATA personnel, and many gaps exist for rail and bus operations and maintenance departments. Training is under-resourced and fractured. Some departments rely on informal, on-the-job initial training that is not standardized or overseen.

Rail and bus operations training functions are understaffed, do not have adequate training facilities or equipment, and face significant challenges in establishing professional service standards, adult learning strategies, and taking advantage of technology to bring the field into the classroom.

Bus maintenance training is comprehensive and well structured in its delivery of new-hire mechanic training. Great strides have been made in rail maintenance initial training in certain areas, but the limits on the amount of training remains a major concern for WMATA.

Refresher/recertification training in bus and rail operations appear to be lagging well behind standards for how often employees should receive this training. Bus maintenance presently does not have a refresher/recertification training program for mechanics but is well underway in developing such a training program. The level of refresher/recertification training in rail maintenance varies from function to function and is generally limited in nature.

4.2 d - Employees are trained on the employee safety-reporting program and are encouraged to use the identified mechanisms to report safety hazards, near misses, concerns, and issues

◑ Planning

Employee safety-reporting programs are critical to the success of SMS. Data are the lifeline of SMS and, if there are no data, there is no SMS. An employee safety-reporting program is an important and effective means for identifying hazards within service delivery operations.

WMATA bus and rail employee safety-reporting programs are currently underutilized. WMATA bus operations employees are encouraged to utilize the safety hotline; however, the number of reports received through the safety hotline is very low compared with the total employee population numbers. WMATA rail employees are encouraged to use the Close-Call Reporting System, but there appears to be underutilization of this reporting mechanism, as well. Rail and bus operations employees also report safety issues directly to the Control Center. Often employees communicate safety issues either verbally to supervisors or through e-mail.

As WMATA moves into the development of its SMS, it will need to develop a more productive employee safety-reporting program that takes into consideration ease of reporting, feedback, and protection of information. Employees will need to be trained on using the program.

4.2 e - All safety-related classroom and on-the-job training is appropriately documented and individual employee safety training records are kept up to date

◑ Planning

All training is being transitioned to the Enterprise Learning Management (ELM) module, which is a delivery platform that tracks all employee training throughout the agency. Employees will also register for training using this module. This module will track whether or not courses have been completed. Full implementation is expected within the next 60 days.

Refresher training will also eventually be tracked and the system will alert managers when employees need recertification training. Training documentation used to be decentralized, but ELM is providing the ability to centralize all training

documentation. ELM will eventually meet the requirement for SMS documentation.

4.2 f - There are formal criteria to measure the effectiveness of safety-related training and improve training when necessary

◑ Planning

Training evaluation must not only involve performance checks but also the opportunity for participants to provide feedback on courses and instructors. Checks and observations are very important to understanding whether training is properly providing the knowledge and skills employees need for carrying out their job functions.

Criteria to measure the effectiveness of skill training currently delivered at WMATA vary greatly from bus to rail and operations to maintenance. WMATA staff indicated an understanding of the need to do a more effective job in measuring the effectiveness of its skill training efforts for both initial new-hire and refresher/recertification.

WMATA will need to ensure that it regularly and consistently measures and formally documents the effectiveness of safety-related training as part of the supporting measures necessary for SMS development and implementation.

4.2 g - Training curriculum for all safety-related employees is updated to reflect new techniques, technologies, and results of investigations, corrective actions, and regulatory changes

◑ Planning

WMATA actively attempts to support rail and bus operations and maintenance training by trying to ensure training staff is aware of changes and updates to policies, processes, and new technologies so that this information is properly updated in training programs, which then will help synchronize training programs to current practices. However, there is no quality control mechanism to ensure that this transfer of information occurs, or that it is incorporated into rail and bus training programs.

WMATA understands the need to ensure that all training curriculum is up-to-date to reflect new policies, procedures, and technologies, and the results of investigations, corrective actions, and regulatory changes. WMATA will need to accomplish this as it moves into the implementation of its SMS.

5.0 SMS Maturity Table

The table below provides a summary level depiction of WMATA's level of SMS implementation maturity for each topic within the major areas of SMS.

SMS Element		Maturity Level
1.0	Safety Management Policy	2.8
1.1	**Safety Management Policy Statement**	2.8
1.1 a	The Safety Management Policy Statement is documented and signed by the Accountable Executive	(4) Managing & Monitoring
1.1 b	Contents and Attributes of the Safety Management Policy Statement	(3) Implementing
1.1 c	The transit agency has a process for analyzing and allocating resources for achieving their safety objectives and performance targets	(2) Planning
1.1 d	The Safety Management Policy Statement is reviewed annually to ensure it remains relevant and appropriate to the agency's safety objectives and safety performance targets	(2) Planning
1.2	**Safety Accountabilities and Responsibilities**	**3.2**
1.2 a	An Accountable Executive has been appointed with ultimate accountability for the effective implementation and maintenance of the SMS	(3) Implementing
1.2 b	If necessary, a qualified person (other than the Accountable Executive) with the appropriate knowledge, skills, and experience has been appointed to manage the day-to-day implementation of the SMS	(3) Implementing
1.2 c	There is a direct reporting line between the person that manages the SMS and the Accountable Executive and they meet on a regular basis to discuss the SMS and safety performance	(4) Managing & Monitoring
1.2 d	The individual responsible for managing the SMS has access to technical resources and qualified personnel to support SMS implementation	(3) Implementing
1.2 e	The transit agency has identified and documented the safety accountabilities and responsibilities for SMS for management, employees, and contractors	(3) Implementing

SMS Element		Maturity Level
1.2 f	The transit agency has established a safety management committee structure, or other mechanism appropriate for the size and complexity of the agency's operations, to discuss identified safety priorities and deficiencies and review safety performance on a regular basis	(3) Implementing
1.3	**Integration with Public Safety and Emergency Management**	**2.8**
1.3 a	The transit agency maintains documentation of how its SMS integrates with safety, public safety, and emergency preparedness programs	(2) Planning
1.3 b	The transit agency has Memoranda of Understanding (MOU) or agreements with other organizations for mutual aid and the provision of emergency services, as needed	(4) Managing & Monitoring
1.3 c	The transit agency has developed plans for emergency preparedness and response that also address the delegation of authorities and responsibilities during an emergency	(3) Implementing
1.3 d	The transit agency's emergency preparedness and response plans are periodically reviewed	(3) Implementing
1.3 e	The transit agency's emergency response plan includes, or references, procedures for the safe transition between normal and abnormal or emergency operations	(3) Implementing
1.3 f	The transit agency conducts internal exercises and/or drills using established emergency response procedures	(2) Planning
1.3 g	The transit agency participates in or solicits future participation in external community emergency response drills, simulations, and/or exercises	(3) Implementing
1.3 h	The transit agency evaluates outputs from public safety and emergency response activities for possible entry into Safety Risk Management activities	(2) Planning
1.4	**SMS Documentation and Records**	**2.2**
1.4 a	The transit agency has developed and maintains appropriate documentation of its SMS and the interrelationship of its processes, activities, and tools	(2) Planning
1.4 b	There are criteria and a procedure to periodically review SMS documentation to ensure its continuing suitability, adequacy, and effectiveness	(2) Planning

SMS Element		Maturity Level
1.4 c	The transit agency has a document control program to manage and maintain, including any changes to, SMS-related documents	(3) Implementing
1.4 d	SMS documentation includes and makes reference to, as appropriate, all relevant and applicable Federal and state standards and/or regulations	(2) Planning
1.4 e	The transit agency maintains records pertaining to outputs of processes and activities contained within the SMS	(3) Implementing
1.4 f	The transit agency has a process to identify when organizational changes may affect SMS documentation	(1) Initiating
2.0	Safety Risk Management	2.8
2.1	**Hazard Identification and Analysis**	**2.6**
2.1 a	The transit agency has established a formal program for proactive identification and analysis of hazards	(3) Implementing
2.1 b	Hazard identification sources and activities have been identified and documented by the transit agency	(3) Implementing
2.1 c	The transit agency has a formal process or system for the capture of data and information related to the proactive and reactive identification of hazards	(3) Implementing
2.1 d	The transit agency uses its employee safety-reporting program to capture hazards and safety concerns	(3) Implementing
2.1 e	The transit agency employee safety reporting program also applies to contractors	(1) Initiating
2.1 f	The transit agency has documented its process and procedure for conducting hazard analysis	(3) Implementing
2.1 g	Hazard analysis is carried out to identify underlying causal/contributing factors and this process is documented	(3) Implementing
2.1 h	Hazard analysis is carried out in coordination with SMEs as necessary	(2) Planning

SMS Element		Maturity Level
2.1 i	When analyzing hazards, the transit agency considers human factors, environment, supervision, and organizational elements	(2) Planning
2.1 j	The transit agency documents the results of its hazard identification and analysis activities	(3) Implementing
2.2	**Safety Risk Evaluation and Mitigation**	**2.9**
2.2 a	The transit agency has activities and tools to evaluate and prioritize safety risk associated with the consequences of identified and analyzed hazards	(3) Implementing
2.2 b	At a minimum, safety risk evaluation activities include evaluating safety risk in terms of probability and severity and take into account any mitigation measures that are currently in place	(3) Implementing
2.2 c	There are criteria and a mechanism for elevating evaluated safety risks to the attention of senior management	(2) Planning
2.2 d	The transit agency has documented safety risk mitigation strategies that include corrective/preventative actions to prevent recurrence or hazard potential	(3) Implementing
2.2 e	There are criteria and a procedure that define mitigation actions, which require senior management approval	(2) Planning
2.2 f	Safety risk mitigation plans/risk mitigations are documented, prioritized, and include timelines and responsibilities	(3) Implementing
2.2 j	There is a procedure for periodic review of the Safety Risk Management process and safety risk evaluation records	(4) Managing & Monitoring
2.2 h	The transit agency maintains records pertaining to the output of the Safety Risk Management process (perhaps in a tracking log or safety risk register, for example)	(3) Implementing
3.0	Safety Assurance	1.7
3.1	**Safety Performance Monitoring and Measurement**	**2.1**
3.1 a	The transit agency implements a formal, documented process to monitor and measure the transit agency's safety performance, both proactively and reactively	(2) Planning

SMS Element		Maturity Level
3.1 b	Data and information collected through safety performance monitoring activities is examined for hazards	(3) Implementing
3.1 c	The transit agency implements formal activities to measure and monitor the effectiveness of safety risk mitigations	(1) Initiating
3.1 d	If safety risk mitigation strategies are deemed ineffective, the transit agency uses the Safety Risk Management process to resolve the ineffective mitigation strategies	(2) Planning
3.1 e	The agency has a process in place to evaluate the effectiveness of the activities that are used to monitor safety performance	(2) Planning
3.1 f	The transit agency periodically reviews its data collection and analysis activities to ensure they are effective	(2) Planning
3.1 g	Results from safety performance monitoring are reviewed frequently by management and reported to executive management as necessary	(3) Implementing
3.1 h	The transit agency evaluates the effectiveness of its employee safety-reporting program	(1) Initiating
3.1 i	The transit agency conducts investigations into safety events, incidents and occurrences following a formal procedure, that ensures causal factors are identified, analyzed, and reported	(3) Implementing
3.1 j	Results from investigations are evaluated through the Safety Risk Management process as necessary to determine appropriate mitigations	(3) Implementing
3.1 k	The transit agency has established safety objectives and safety performance targets	(2) Planning
3.1 l	Safety performance indicators include both reactive and proactive measures	(2) Planning
3.1 m	Safety performance objectives, targets, and indicators have been formally communicated throughout the agency as appropriate	(2) Planning
3.1 n	Safety performance objectives, targets, and indicators are reviewed and updated periodically	(2) Planning

SMS Element		Maturity Level
3.1 o	Safety performance indicators are used to inform the allocation of resources	(2) Planning
3.1 p	Failures to meet safety performance objectives and targets are reviewed and remedial actions are identified	(2) Planning
3.2	**Management of Change**	**1.6**
3.2 a	The transit agency has identified the potential sources for changes that would be examined for potential impact on safety performance	(2) Planning
3.2 b	The transit agency has a formal methodology in place that specifies how potential changes are evaluated for possible safety impacts	(2) Planning
3.2 c	When the proposed change may have a safety impact, the transit agency uses the Safety Risk Management process to evaluate for safety risk and mitigate the safety risks as necessary	(1) Initiating
3.2 d	The transit agency holds meetings with key stakeholders to discuss the anticipated or identified change(s)	(2) Planning
3.2 e	A procedure is in place to document the change and update any associated documents or records	(1) Initiating
3.3	**Continuous Improvement**	**1.5**
3.3 a	The transit agency has established criteria and procedures for the ongoing evaluation of the effectiveness of its safety management activities	(2) Planning
3.3 b	The transit agency has formal activities and procedures to correct identified deficiencies in the SMS	(2) Planning
3.3 c	SMS-related lessons learned are incorporated into organizational policies and procedures	(1) Initiating
3.3 d	The transit agency reaches out to peer agencies to gather information on effective safety practices that could be incorporated into the SMS	(1) Initiating
4.0	Safety Promotion	2.1
4.1	**Safety Communication**	**2.0**

SMS Element		Maturity Level
4.1 a	The transit agency has formal safety communications to ensure all employees are aware of the SMS Safety Management Policy, as well as processes, activities, and tools that are relevant to their responsibilities	(2) Planning
4.1 b	The transit agency communicates hazard information relevant to employees' responsibilities	(2) Planning
4.1 c	The transit agency explains why safety actions have been taken and why safety procedures are introduced or changed	(2) Planning
4.1 d	Significant accident and incident investigation outcomes are communicated to appropriate employees and to contracted organizations	(2) Planning
4.2	**Competencies and Training**	**2.1**
4.2 a	The transit agency has a safety management training program to ensure that relevant personnel are trained and competent to perform their SMS duties	(1) Initiating
4.2 b	Formal training needs analyses are conducted for all safety related job functions and training gaps are addressed, as necessary	(3) Implementing
4.2 c	The transit agency has criteria to identify and provide skill training related to safe job performance, including initial and refresher training, for all relevant job functions, to the level that all employees are competent to perform their safety-related duties	(3) Implementing
4.2 d	Employees are trained on the employee safety-reporting program and are encouraged to use the identified mechanisms to report safety hazards, near misses, concerns, and issues	(2) Planning
4.2 e	All safety-related classroom and on the job training is appropriately documented and individual employee safety training records are kept up to date	(2) Planning
4.2 f	There are formal criteria to measure the effectiveness of safety-related training and improve training, when necessary	(2) Planning
4.2 g	Training curriculum for all safety-related employees is updated to reflect new techniques, technologies, and results of investigations, corrective actions, and regulatory changes	(2) Planning