October 2023

Quality Management System Plan (QMSP)

M metro®

Washington Metropolitan Area Transit Authority

Quality Assurance, Internal Compliance & Oversight (Quality)

Promoting Transparency, Accountability & Public Confidence

REVISION HISTORY

Revision No.	Revision Date	Description of Changes
0.1	06.13.17	Draft
0.2	07.14.17	Re-outlined and re-formatted per June 2017 QICO input
0.3	08.04.17	Updates and corrections to body text, visual aids, and attachments; additional format enhancements for consistency and clarity
1.0	08.11.17	First Production Version
1.1	01.26.18	Updates to responsibility matrix and organization charts based on organizational changes; Enhancements to visual aids; Additions to text regarding the approach to Internal Reviews and Quality Assessments and associated appended procedures as well as terms in the Definitions section
1.2	06.01.18	Updates to QMS documentation hierarchy in Section 2.2.3 and changed "Forms" to "Forms and Records"; addition of General Counsel as a chief level department to Section 2.3.2.1 org chart, and QICO org chart as well as QICO responsibilities. Addition of "discrepancies" to definition section; modified attached QMP template (Appendix 4.6)
1.3	08.07.18	Added customer satisfaction component to Quality Policy on approval page and 2.2.1.2; Section 3.10 – re-defined "Quality Records" to improve applicability throughout WMATA; Added list of all Core QMS Procedures to Section 4.5; In Section 2.1 Core QMS Standards, added detail to indicate that the top level Core QMS Standards Procedures do not require separate signatures from the GM, the Chief of INCP, and the Managing Director of QICO; Added relevance/integration of existing WMATA documents to this QMSP in Document Control Section 3.2.7
2.0	08.18.21	Revised QMSP to include safety language/verbiage in order to account for the Safety Management System (see Section 1.2.3), as per FTA guidelines (49 CFR Part 673); this includes the addition of relevant acronyms and definitions, changes in roles and responsibilities, updates to relevant graphics, etc.; updated org chart in Section 2.3.2.1; Section 2.3.3 responsibility matrix updated with new departments and responsibilities; Section 2.4.1 QICO org chart updated; Section 2.4.2.2 added internal safety reviews and safety compliance; Section 3.5 added statement on control of process changes; Section 3.11.2 revised for addition of definitions related to audits and assessments; added 9th Chief Level Dept.; added roles of quality in design (Section 3.1) and procurement (Section 3.3) activities; Section 3.12 extended requirements for QMS training and familiarization to consultants and contractors; revised overall QMSP to meet requirements of the FTA's Quality Management System Guidelines (October 2019); replaced "SSPP" with "ASP" throughout the document. Updated WMATA Context statistics, updated all references to Core standards to "15 Core QMS Standards", added digital signature requirement and definition, added supervisor

		definition and QMSP CBT training requirements, Added ROCC to QMSP implementation departments, updated CAPD in responsibility matrix, added information on self-assessments, added Risk Management Matrix, and ASP reference. Removed document status under refence documents and added verbiage about WMSC CAP process.
3.0	10/31/23	Updated for new Quality Policy. Updates for alignments with Strategic transformation Plan and Realignment. Updates to Core Standards sections based on revisions to Core Standards. Updates were made to show QICO is now known as Quality. Updated WMATA to Metro

METRO QUALITY POLICY

Metro's Strategic Transformation Plan, "Your Metro, The Way Forward," prioritizes **Service Excellence** with goals of improving safety, reliability, and customer experience throughout our system. As Metro continues to be the DMV's trusted way to move more people, we must ensure all work and services performed by or on behalf of Metro are safe, meet established requirements, enhance customer convenience, and apply a risk-based approach to focus resources on high-priority challenges and opportunities.

LEADERSHIP COMMITMENT

- Complete **implementation** of the Quality Management System Plan (QMSP) and continue to monitor outcomes to better coordinate and direct activities.

- Ensure **communication** of this Quality Policy throughout Metro, and externally among our contractors, regional partners, and stakeholders.

- Invest in employee **training, coaching,** and **support resources** needed to help align Metro's processes and practices with this Quality Policy and the QMSP.

All Metro employees, senior executives to front-line staff, as well as contractors and suppliers, are expected to adhere to the principles, guidelines, and requirements identified in the Quality Management System Plan (QMSP). To verify implementation and compliance, the Department of Quality Assurance, Internal Compliance & Oversight (Quality) is granted access and cooperation from all Metro organizations and contractors in support of on-going internal reviews, quality assessments, and associated activities.

Randy Clarke General Manager & Chief Executive Officer	Theresa M. Impastato Executive Vice President & Chief Safety and Readiness Officer	Brian P. Dwyer Executive Vice President & Chief Operations Officer	Andrew B. Off Executive Vice President & Chief Infrastructure Officer
Sherri Dickerson Executive Vice President & Chief People Officer	Kimberly J. Felbauer Director of Strategic Transformation and Enterprise Collaboration	Sarah Meyer Executive Vice President & Chief Experience and Engagement Officer	Yetunde Olumide Executive Vice President & Chief Financial Officer	Thomas J. Webster Executive Vice President & Chief Planning and Performance Officer
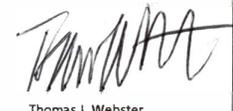
Hakim Davis
Vice President
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Compliance & Oversight

October 2023

TABLE OF CONTENTS

PREFACE

The Department of Quality Assurance, Internal Compliance, and Oversight (Quality) developed this Quality Management System Plan (QMSP) for the Washington Metropolitan Area Transit Authority (Metro) to describe how the agency defines and approaches quality.

The QMSP represents a governing document and guiding vision to comprehensively implement a Metro Quality Management System (QMS). This document lays out the structure and responsibilities for managing quality in every Organization and for each process.

This document provides a brief introduction to the Quality Management System and its importance to Metro, followed by a detailed overview of Metro's plan and framework to implement it. Subsequent sections provide specific guidance on Core QMS standards.

Hakim Davis
Vice President
Department of Quality Assurance, Internal Compliance, and Oversight
Washington Metropolitan Area Transit Authority (Metro)

1 QUALITY MANAGEMENT: PURPOSE AND NEED

1.1 METRO CONTEXT

Every day, a vast number of people and assets come together at Metro to operate Washington, DC's regional public transportation system as shown in <u>Figure 1</u> below:

Figure 1
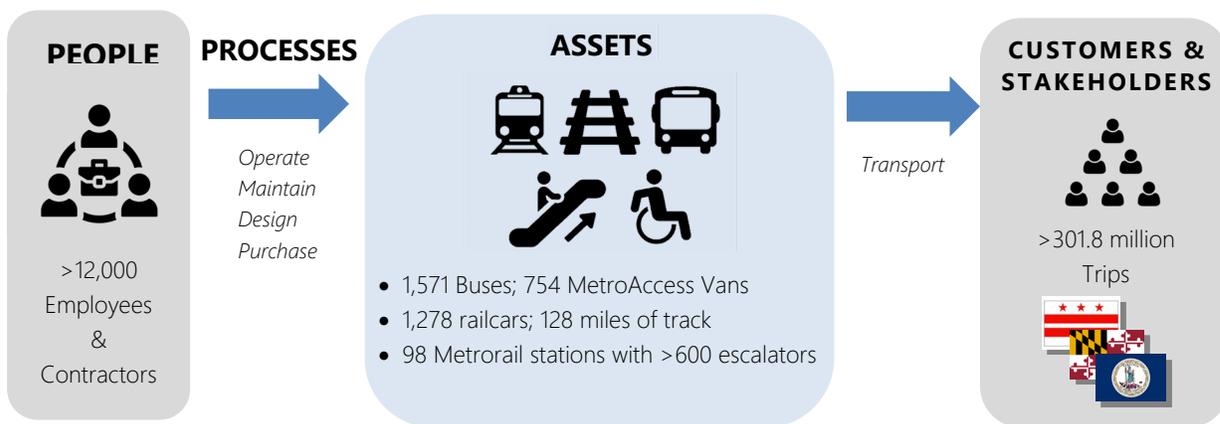
Additionally, Metro's Capital Improvement Program expends roughly $1 billion dollars per year to rehabilitate, replace, and expand the asset base.

An organization as large, complex, and critical as Metro, with countless daily interactions and handoffs between thousands of people and thousands of assets, justifies a comprehensive and coordinated Quality Management System to assure it is meeting the requirements of its stakeholders, particularly those of its riding customers, member jurisdictions, and the regulations established by oversight bodies.

1.2 QUALITY MANAGEMENT

A quality management system (QMS) is a formalized system that documents processes, procedures, and responsibilities for achieving quality policies and objectives. A QMS helps coordinate and direct an organization's activities to meet customer and regulatory requirements and improve its effectiveness and efficiency on a continuous basis.

- American Society for Quality

1.2.1 QMS Overview

An effective quality management system:

- Promotes reliability, with quality assets and services performing consistently

- Reduces wasted time and materials

- Defines and controls processes

- Promotes continuous process improvement

- Maximizes overall efficiency in providing assets and services

- Forms and communicates expectations, engaging employees

- Identifies and prioritizes training opportunities and requirements

- Shifts focus from reactive (correcting failures) to proactive (preventing failures)

The QMS affects every aspect of an organization's operations and performance. The QMS integrates the Quality Policy throughout the organization by creating a common language and describing common quality principles for use by the entire organization. The QMS specifies quality requirements, resources, and practices, including the activities and processes necessary to deliver assets, services, projects, contracts, and tasks.

The QMS comprises documents with increasing levels of specificity as depicted below in Figure 2:

Figure 2

Strategic Documents	Tactical Documents	Directive Documents	Objective Evidence
Deciding what to do	Deployment using best methods	What is to be done, by whom and how	What has been done and by whom
Quality Management System Plan (QMSP)	Quality Management Plans (QMPs)	Procedures and Work Instructions	Forms and Records
This Document	*See Section 2.3*		
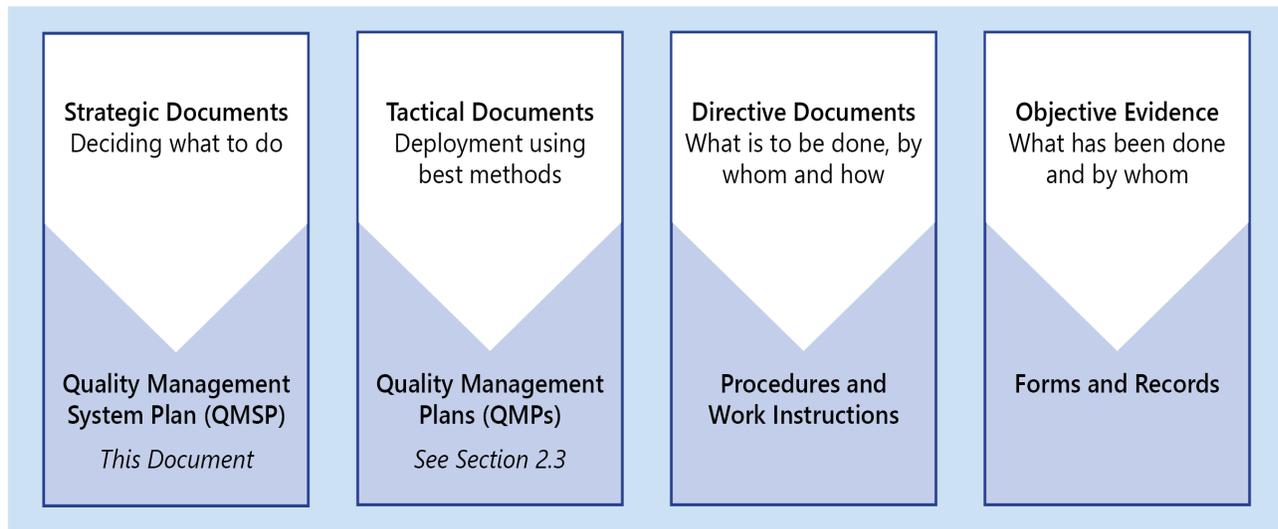
1.2.2 The Applicability of Quality at Metro

In recent decades, large U.S. transit systems have successfully adopted and implemented Quality Management Systems for major federally funded capital projects, as per Federal Transit Administration (FTA) requirements and guidance. The quality management framework can be applied not only to major expansion projects, but also to the ongoing operation and maintenance of the transportation system.

Quality is in every aspect of the business at Metro and impacts all processes within the organization. For instance, there are several components or perspectives of quality throughout Metro, including:

- Asset Quality: Ensuring that Metro's assets meet the requirements of policies, procedures, specifications, contract documents, industry practices, regulations, and other applicable documents.

- Construction Quality: The organization, procedures, inspections, tests, and documentation implemented by Metro, construction management consultants, and/or contractors to ensure that construction work, materials, and services meet the design, contract, and regulatory requirements.

- Customer Service Quality: The collection and analysis of customer feedback, internal communication, and adoption of strategies to enhance customer service and satisfaction.

- Design Quality: The organization, procedures, and documents used to control and verify that designs meet the specified design criteria, contractual requirements, and agency regulations.

- Maintenance Quality: The organization, procedures, inspections, tests, and documentation implemented by Metro, its consultants, and its contractors to ensure the safety and reliability through proper maintenance of assets.

- Manufacturing Quality: The procedures, inspections, tests, and documentation used by manufacturers to ensure that purchased assets meet Metro's specified requirements.

- Service Delivery Quality: The structure, procedures, inspections, tests, and documentation implemented by Metro, its consultants, and its contractors to ensure the safety and reliability of its facilities and operations.

- Procurement Quality: The procedures employed ensure that purchased assets and services meet Metro's specified requirements.

1.2.3 Metro Safety Management System (SMS) and Metro QMS

Metro's Safety Management System (SMS) is a comprehensive and collaborative management decision support system that brings management and labor together to build on the existing safety focus and foundation. As part of Metro's commitment to providing an environment where safety is the most critical component of how business is conducted, this QMSP aligns with the SMS. The QMS

and all quality documentation have effective communication practices in place, including adequate quality and safety training to ensure quality and safety in the workplace. It further aligns with the SMS with its focus on risk management and corrective actions.

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2 **METRO QUALITY MANAGEMENT SYSTEM PLAN**

This Quality Management System Plan is used both internally and externally. It guides employees through Metro's expectations and standards that are met and maintained to ensure compliance with requirements. The responsibilities, procedures, and documents comprising the QMS, including this QMSP, apply to all Organizations within Metro. The QMSP is also used externally to introduce the QMS to Metro's customers, stakeholders, contractors, suppliers, and vendors.

2.1 CORE QMS STANDARDS

Metro developed the Core QMS Standards shown below in Figure 3 to address the 15 Core QMS elements identified in the Federal Transportation Administration (FTA) Quality Management System Guidelines and elements from ISO 9001 tailored to a transit-specific context. This QMSP is based on those 15 Core QMS Standards in conjunction with the requirements of the agency's Safety Management System (SMS).

Figure 3

#	Standard	#	Standard
1	**Management Responsibility** Commitment of senior management to implement, maintain,and continually improve upon WMATA's Quality Management System	8	**Inspection, Testing & Status** Verification and documentation that practices, processes, assets, and materials comply with applicable procedures, specifications, etc. and are fit for service
2	**Documented Quality Management System** The combined set of quality documents, including a Quality Management System Plan, subordinate QMPs, Policies & Procedures, Work Instructions, Forms, etc.	9	**Inspection, Measuring & Test Equipment** Identification and periodic testing and calibration of measuring and test equipment to assure readiness for use
3	**Design Control** Processes to ensure the consistent development and maintenance of quality design documentation for projects and assets based on requirements, standards, criteria, etc.	10	**Non-Conformance** Systematic tracking of work performed or material that does not meet procedures, specs, contract requirements, etc.
4	**Document Control** Managing information to ensure the most current approved documents are in use	11	**Corrective & Preventive Actions** Measures taken to modify processes/procedures to correct and prevent recurrence of non-conformances and failures
5	**Purchasing** Providing for timely procurement of the right items/ assets and services required for proper performance	12	**Quality Records** Documents generated by Quality functions that provide objective evidence of fulfillment of requirements
6	**Identification & Traceability of Assets & Material** The ability to track the unique history, location, performance, and configuration of any asset over its life-cycle	13	**Internal Reviews & Quality Assessments** Independent, objective review of conformance to quality standards and/or the overall effectiveness of processes in delivering acceptable levels of quality
7	**Process Control** Management and documentation of interrelated resources and activities to turn inputs into outputs/ outcomes	14	**Training** Providing skills and knowledge required for staff to successfully perform a job
		15	**Customer Focus** Proactively addressing the needs and wants of internal and external customers, always

2.2 METRO QMS FRAMEWORK

Successfully incorporating the 15 Core QMS Standards identified in section 2.1 into Metro's practices, requires a commitment from management, a roadmap for what documentation and elements to develop, and the development of an assurance and oversight plan by the Organizations and individuals accountable for the QMS.

2.2.1 MANAGEMENT RESPONSIBILITY

The Metro Quality Policy (Quality Policy) demonstrates the uniform commitment of Metro's Senior Executive Team (SET) to the adoption and success of the Quality Management System. Management ensures that qualified personnel are involved in all quality-related processes.

The Vice President of Quality Assurance, Internal Compliance, and Oversight (Quality) serves as the designated management representative responsible for ensuring that the Quality Policy is implemented and maintained.

The Quality Vice President or designee conducts formal reviews of the QMSP at regular intervals to ensure that it remains applicable to Metro's work, is effective at all levels of Metro, and maintains a direct reporting relationship with Metro's Chief Safety and Readiness Officer.

2.2.1.1 Quality Program Objectives

Metro has adopted the Quality Policy and has established a supporting Quality Management System to achieve the following primary quality objectives:

- Safe, reliable, and efficient delivery of services in compliance with all applicable regulations and requirements.

- Effective, responsive, and in-line performance with industry best practice.

- Reduction of Metro's risk, and improvement of its risk management.

- Value added to Metro's assets, resources, and the greater Washington region.

- Continuous improvement of, and dedication to, the quality of Metro's public services and facilities.

2.2.1.2 Quality Principles

Metro employees', consultants', contractors', and vendors' adherence to the following quality principles inherent in the Quality Policy, is critical to achieving the quality objectives:

- <u>Customer Focus</u> - determines customer needs and expectations, converts them to requirements, and meets these requirements to enhance customer satisfaction.

- <u>Effective Leadership</u> - instills a "culture of quality" by promoting the Quality Policy, affirming management commitment, and fully implementing the Quality Management System.

- Process Approach - to plan, coordinate, supervise, monitor, and direct Metro's maintenance of assets and operations through checking, testing, documenting, periodically reviewing, assessing, and auditing.

- Participation and Cooperation - working collaboratively with all Metro personnel in the implementation and maintenance of the QMS.

- Fact-Based Decision Making - considers work responsibilities and deliverables based on evidence, through a careful understanding of a problem, its stakeholders, and the applicable contractual and regulatory requirements.

- Continuous Improvement - consistently strive to enhance Metro's processes, products, and services.

- Risk Mitigation – identify and mitigate risks before problems arise from preventable situations.

2.2.2 QMS Organizational Role

As shown in Figure 4, Metro's Core business units are those that directly deliver service to customers, in particular the transportation departments (operating vehicles and stations), the maintenance departments (ensuring vehicles and stations are fit for safe and reliable service on a daily basis), engineering groups (ensuring designs and modifications conform to requirements), and the capital programs groups (delivering new assets for service). Metro's customer feedback and stakeholder requirements inform and prioritize Metro management initiatives and decisions.

Quality Management represents one of several key supporting management functions and approaches that Metro applies to support the Core business units to deliver safe, reliable, and financially responsible service to its riders and the region.

Figure 4

2.2.3 QMS Hierarchy

The collection of documents which comprise Metro's QMS is organized in a hierarchical manner in accordance with *P1.1/XX* (*hereinafter *XX denotes latest revision.)*, *Document Governance and Hierarchy*, with different types of QMS documentation corresponding to levels of accountability within Metro. This relationship is illustrated on the following page in Figure 5:

Figure 5
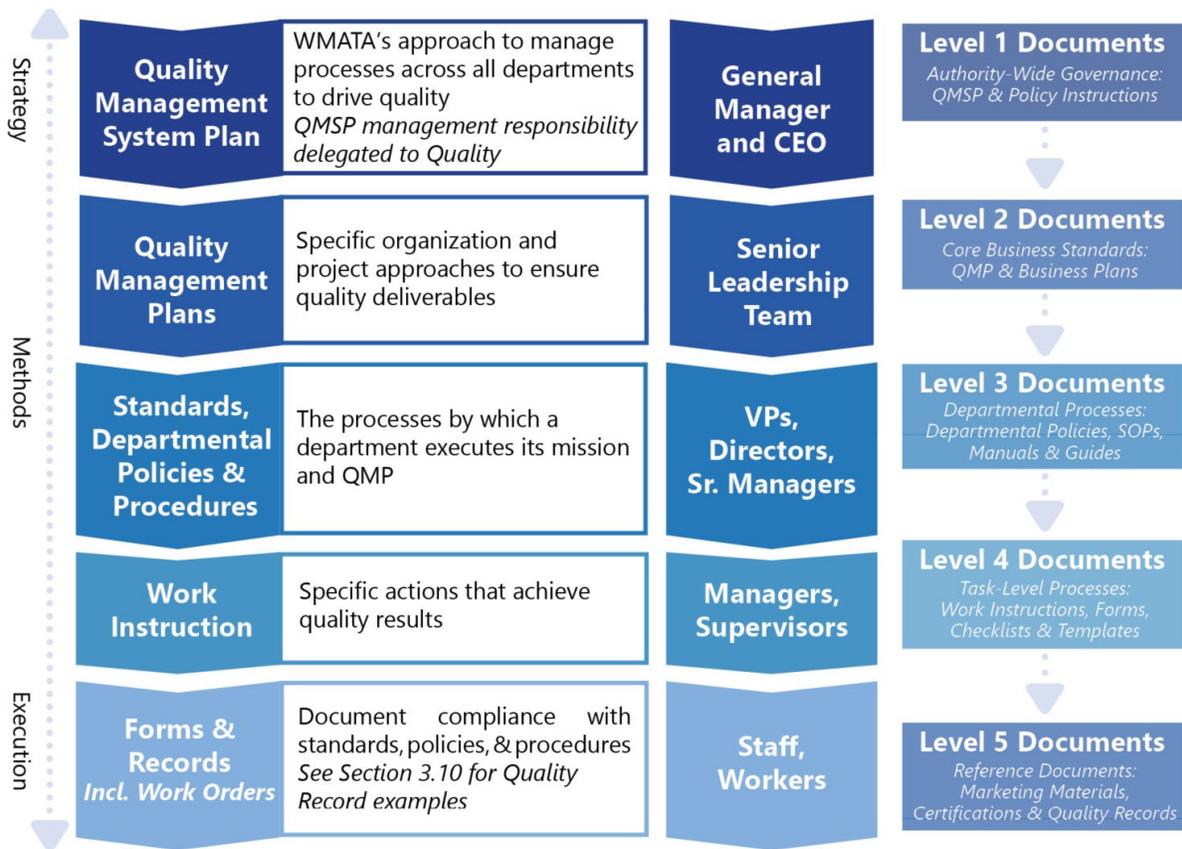
Just as the General Manager and CEO specifies strategy and direction for the Metro Chiefs to delegate and execute, so too does the Quality Management System Plan. The QMSP is an enterprise governance document, which provides strategy and direction for the development of Quality Management Plans comprised of appropriate standards, policies, and procedures that reflect the implementation of the Core QMS Standards identified in this QMSP.

2.3 QMP DEVELOPMENT

Quality Management Plans (QMPs) compiles the components of the QMS, by organizing and connecting the work instructions, forms, and procedures executed daily by staff into a consistent quality framework across Metro.

In some cases, the development of QMPs means gathering, organizing, and refreshing existing documentation to conform to Metro's QMS. Where gaps or deficiencies in procedures, work instructions, or quality processes are identified, new or revised QMPs reflect the development of new documentation and training, as applicable, to improve processes.

Quality partners with and supports organizations within Metro in developing, training, and implementing QMPs. Quality developed a QMP Template to facilitate the gathering and development of essential Core QMS Standards and components.

2.3.1 QMP Description

QMPs describe an organization or a project's procedural approach to align with the QMSP requirements and Core QMS Standards. They define activities to ensure delivery of services and assets.

Quality Management Plans include:

- Process steps to capture practices, and procedures

- Assignment of responsibility and authority

- References to specifications, standards

- Inspection and testing requirements

- Documented procedures for capturing and approving changes and modifications

- Metrics to capture achievements

- Minimum frequency of review or updates appropriate to ensure the department or project remains adaptive to changing conditions and priorities.

The QMPs and supporting documents (procedures, work instructions, etc.) integrate the requirements of the QMSP. Therefore, each Organization develops its own QMP, contributing to the safety, reliability, and fiscal responsibility of Metro. Specific quality procedures translate requirements into the actions producing desired outcomes. The QMPs with supporting documents describe the practices, assign personnel (by position), define the inspection and testing requirements, and outline the acceptance criteria. It includes any legal requirements, regulations, industry standards, organizational policies, internal guidelines, and best practices, to provide the desired outcome.

The QMPs ensure or provide:

- Conformance to internal and external requirements

- Traceability

- Objective evidence

- Basis for training

2.3.2 Planned QMPs

The Metro QMS is comprised of three types of supporting and conforming QMPs:

- Organizational QMPs

- Project QMPs

- 3rd Party (i.e., contractors and vendors) QMPs

The requirements to develop and maintain a QMP for each of the above types are described below.

2.3.2.1 Organizational QMPs

Metro Organizations develop and maintain QMPs to assure the quality of ongoing operations. The following Metro organizational chart indicates the Organizations required to develop QMPs, with the intent of defining the Quality Management Plan structure based on the organization reporting directly to the General Manager and CEO as shown in <u>Figure 6</u>:

Figure 6

Note: Digital Modernization is ISO 9001:2015 certified and complies to this requirement with IT ISO Quality Manual. Legal & Compliance is not required to develop a QMP.

Organizational QMPs address the QMS standards that are applicable to the operation and the responsibilities of that Organization. In Section 2.3.3, Quality has provided an analysis of the Core QMS Standards to be addressed for each Organization.

To better accommodate the documentation of quality management processes in larger Organizations with a broad variety of departments, Organizational QMPs may be segmented into sub-sections as appropriate. However, when practicable, the standardization of quality practices and processes across functions is desirable.

2.3.2.2 Project QMPs

Major capital projects must have project Quality Management Plans. Per federal regulation, 49 CFR 633.5 a major capital project is defined as:

1. Involves the construction, expansion, rehabilitation, or modernization of a fixed guideway that:

(i) Has a total project cost of $300 million or more and receives Federal funds of $100 million or more; and

(ii) Is not exclusively for the acquisition, maintenance, or rehabilitation of vehicles or other rolling stock; or

2. The Administrator determines to be a major capital project because project management oversight under this part will benefit the Federal government or the recipient, and the project is not exclusively for the acquisition, maintenance, or rehabilitation of rolling stock or other vehicles. Typically, this means a project that:

(i) Involves new technology;

(ii) Is of a unique nature for the recipient; or

(iii) Involves a recipient whose past record indicates the appropriateness of extending project management oversight under this part.

The Vice President of Quality, with the consent of the General Manager and CEO, may identify and designate additional capital projects as requiring a project-specific Quality Management Plan, if not meeting any of the above criteria. If the designation is made that a QMP is required, the Vice President of Quality will discuss with the Executive VP and Chief Infrastructure Officer regarding the creation and implementation of the project QMP.

> *Quality in Practice*
>
> With an estimated project cost of over $250 million, the Potomac Yards Station in Alexandria is an example of a major capital project requiring a conforming Quality Management Plan.

2.3.2.3 3rd Party QMPs

Metro contractors are required to maintain and provide their conforming QMPs to assure the quality of services or materials provided to Metro. Such QMPs are explicitly identified as contractual deliverables or may be a requirement subject to review on-demand, by Metro's assigned quality representative.

2.3.3 Organization Responsibility Matrix

The specific requirements of QMPs vary depending on the context of the organization. Quality has prepared the Organizational QMS Responsibility Matrix, shown below. This matrix indicates which of the QMS standards identified in Section 2.1 above are applicable to the business processes and responsibilities of each Metro Organization The matrix uses "R" to signify that an organization is responsible for how the Core QMS Standard is addressed by their Organization. "I" in the matrix is used to signify an organization is impacted by a process owned by another Organization and must be addressed in their QMP.

This matrix, shown in Figure 7, is regularly updated as needed to reflect Metro's business needs and functionality of each Organization. The matrix is the basis of a continual gap assessment to target potential weak areas in Metro's QMS, and to target QMP development efforts.

Figure 7

QMS Organization Responsibility Matrix

QMS Core Standards
R= Responsible I= Impacted

Organization	Management Responsibility (1.)	Documented Quality Management System (2.)	Design Control (3.)	Document Control (4.)	Purchasing (5.)	Identification and Traceability of Assets and Materials (6.)	Process Control (7.)	Inspection, Testing and Status (8.)	Inspection, Measuring, and Test Equipment (9.)	Non-Conformance (10.)	Corrective and Preventive Action (11.)	Quality Records (12.)	Internal Reviews and Quality Assessments (13.)	Training (14.)	Customer Focus (15.)	Total Applicable Standards
Operations	R	R	R	R	I	R	R	R	R	R	R	R	I	R	R	15
Digital Modernization	R	R	R	R	I		R	R	R	R	R	R	R	R	R	14
Infrastructure	R	R	R	R	I	R	R	R	R	R	R	R	I	R	R	15
Finance	R	R		R	R	R	R			R	R	R	I	R	R	12
Planning and Performance	R	R		R	R		R			R	R	R	I	R	R	11
Safety and Readiness	R	R	I	R	I	R	R	R	R	R	R	R	I	R	R	15
People, Culture, and Inclusion	R	R		R	I		R			R	R	R	I	R	R	11
Customer Experience and Engagement	R	R		R	I		R			R	R	R	I	R	R	11
Legal and Compliance	R	R		R	I		R			R	R	R	R	R	R	11
Your Metro Transformation	R	R		R	I		R			R	R	R	I	R	R	11

Metro Organizational Structure

This matrix is a preliminary depiction of organization responsibilities and subject to change. Organizational Structure data as of 12/14/2022

2.3.4 Prioritization of QMP Development

It is necessary to prioritize QMP development, review, and adoption efforts to the needs of Metro. QMP development efforts are focused first on those Organizations that are subject to the highest priority and/or greatest number of open regulatory findings and active Corrective Action Plans and internal Corrective and Preventive Action plans. As these findings are focused on safety-critical operational, maintenance, and engineering functions that also have direct impact on service reliability, this focus ensures a risk-prioritized approach to QMS implementation.

2.3.5 QMP Review Process

Approval and maintenance of quality management plans follow a general cycle that is established, administered, and documented by Quality:

1. <u>Submittal</u>: Responsible organizations or departments draft QMPs and submit them to Quality.

2. <u>Review, Comment, and Revision</u>: Quality reviews the draft QMP and returns comments to the responsible organization. The responsible Organization revises and re-submits the QMP as warranted.

3. <u>QMP Approval</u>: Quality provides written approval of the QMP to the responsible Organization and publishes the approved and adopted QMP as part of the documented Quality Management System.

The size and composition of the Quality Management Team is determined by the Quality Vice President, or designated Metro Quality Manager (Metro employee or consultant representative) for the given program, project, contract, or procurement. For departmental or office QMPs and projects without designated quality managers, the Quality Vice President appoints appropriate review teams.

For some projects, third party representatives (e.g., utilities, adjacent property owners, public safety, municipalities, etc.) may be required to participate in QMP reviews as specified in a Memoranda of Agreement (MOA) or other agreements. The Quality Vice President, or designated Metro Quality Manager for the project, determines the level of QMP review participation required.

2.3.6 QMS Training

Quality has developed a QMS training curriculum and training plan to support Metro departments, not only in the development of QMPs, but also in the adoption of a quality management perspective in day-to-day activities. All Metro employees and contractors are familiarized with and/or trained on the QMS as a requirement of their job roles. This is accomplished through Computer-Based Training (CBT) within the first ninety days of hire. QMSP CBT training is required for all Metro personnel classified under a supervisor job code and above on a biennial basis.

2.4 QMS OVERSIGHT AND MONITORING

Quality Assurance, Internal Compliance and Oversight, is Metro's corporate quality assurance function responsible for ensuring the Quality Management System's Core Standards, hereinafter referred to as Core QMS Standards, are established, communicated, and implemented throughout Metro and its QA/QC and compliance offices. Integrating the Core QMS Standards into our business processes ensures consistency in Metro's delivery of safe and reliable services to customers in alignment with the Strategic Transformation Plan's Service Excellence goals and objectives.

To best achieve integration of the Core QMS Standards throughout the organization, Metro established a Lines of Defense Framework. Figure 8 shown on the following page illustrates the Framework's three-tiered approach to quality assurance and quality control. Each tier is responsible for a set of activities intended to manage and control quality within each respective organization or department.

The First Line of Defense: The first line requires frontline supervisors, as process owners, to own and manage quality and risk through quality control (QC) activities. Over time, consistent application of these QC processes will mitigate risk, reduce non-conformances, and improve reliability to ensure service excellence.

The Second Line of Defense: The second line is a blended approach of QC and quality assurance (QA) that is overseen by management such as assistant superintendents, superintendents, and managers. This group is responsible for providing oversight of first-line activities. They also sample first-line activities and documentation to ensure compliance with the departmental quality and safety framework, Quality Management Plans, policies, standard operating procedures (SOPs), work instructions and similar controls. Additionally, this level oversees development, implementation, tracking and management of all corrective actions.

The Third Line of Defense: The third line functions as Metro's independent assurance group whose responsibility is to assess the first- and second line responsibilities, effectiveness, and compliance to governing regulatory and organizational requirements and standards as shown in Figure 9 on page 19. The third line quality group will engage and partner with both the first- and second-lines QA/QC and compliance offices to provide guidance, training, and support to assure consistent development and delivery of effective quality programs.

Figure 8

Quality Lines of Defense Framework

Deliver Safe and Reliable Services Improving Customer Experience and Confidence

3rd Line of Defense

Corporate Level

Quality Management System Plan

Quality & Safety

Corporate Quality Assurance

- Quality Management
- Internal Reviews
- Internal Corrective Actions
- Assessments
- Follow Up Activities
- Closed CAP/iCAPA Activities
- Quality Investigations
- Policy Assurance
- MetroDocs

Corporate Safety Assurance

- Internal Safety Reviews
- internal Corrective Actions
- Hazard/Risk Assessment
- ASP Compliance Checks

Organization or Department Level

2nd Line of Defense

Department Level Superintendents & Managers

Verification & Validation - Quality Control & Assurance
Field & Office Activities

- Visual Inspection
- Self-Check
- Document Verification
- Document Sign Off
- CAP/iCAPA Development & Tracking
- CAP/iCAPA Fulfilment
- Record Capture
- Document Control

1st Line of Defense

Office Level Supervisors & Inspectors

Engineering, Projects, and Maintenance - Quality Control
Field Activities

- Overhaul/Rehab
- Substantial Complete Inspection
- Install/Commission
- Periodic Maintenance
- Periodic Inspection & Testing
- Corrective Maintenance

Figure 9

### 2.4.1 Quality Roles and Responsibilities

The Quality Vice President bears the ultimate responsibility for the Department of Quality's duties regarding the QMS, with the support of a team of accountable and empowered managers who administer components of the QMS.

Table 1 illustrates the Quality Department organization and the roles and responsibilities of key Quality staff with respect to the QMS.

Table 1

Position	Quality Role	QMS Responsibility
Quality Vice President	Reports to the Chief Safety and Readiness Officer and the General Manager and CEO on issues pertaining to quality	Overall accountability for QMS
Quality Director	Reports to the Quality Vice President and serves as primary advisor for all matters pertaining to quality.	Supporting the QMS assurance and oversight, as delegated by the Quality Vice President
Program Manager - Rolling Stock and Passenger Service Assurance Programs	Manages Quality Assurance Programs for railcar (including new rail car commissioning), bus, MetroAccess, rail-borne equipment and other non-revenue vehicle maintenance, and engineering	Monitor and assess compliance with quality requirements for rolling stock maintenance, , and engineering
Program Manager - Infrastructure and Capital Projects Assurance Programs	Manages Quality Assurance Programs for Infrastructure maintenance, engineering, and asset management, as well as capital improvement projects	Monitor and assess compliance with quality requirements for infrastructure maintenance, engineering, and capital improvement projects (management and execution)
Program Manager - Regulatory and Internal Compliance Programs	Monitors and ensures compliance with required actions and findings resulting from internal reviews and from external oversight authorities (e.g., WMSC, FTA, NTSB, etc.)	Advises on the status of Corrective Action Plans (CAPs)
Program Manager – Continuous Improvement, Policy, and Performance	Manages Quality Management System (QMS) implementation Metro-wide; Leads quality oversight of Policy/Instruction creation, review, and rescission process; and manages P/I document control	Assures policies conform to all established requirements, are aligned to QMSP, and gain appropriate approvals before issuance

2.4.2 QMS Surveillance Plan

Quality deploys several processes to assure continued progress on QMS implementation; some of these processes occur on a scheduled or periodic basis, while others are conducted as-needed, on a risk-prioritized basis.

In all instances, the success of this surveillance depends on Quality having unrestricted access and full cooperation from all applicable departments during all quality-related activities, under the delegated authority and direction of the Metro General Manager and CEO, along with Senior Executive Team members.

2.4.2.1 Triennial QMS Review

At least once every three years, the Quality Vice President is responsible for conducting a review of the Metro QMS framework and requirements outlined in this QMSP. The comparison and review are based on a variety of inputs, including:

- Results of internal and external audits, quality assessments, and internal reviews

- Non-conformance data

- Status of corrective and preventive actions

- Evaluation on the suitability, adequacy, and effectiveness of the current QMS

A draft QMSP is presented to the Metro General Manager and CEO for comments and approval prior to finalization and issuance of the revised QMSP.

The QMS review provides recommendations and/or required actions for maintaining and improving the QMSP and informs priorities in Quality's annual internal review and assessment plans described below.

2.4.2.2 Internal Reviews and Quality Assurance

In its role overseeing the development and implementation of the Metro QMS described in this plan, Quality performs two related types of internal assessments:

- **Internal Reviews** are comprehensive assessments of functional areas of Metro's operations - Engineering and Maintenance; Service Delivery; and Capital Program Management and Execution. These reviews may span multiple departments, have broad scopes, and are intended to provide Metro senior management with an assessment of the current practices associated with the specific subject area being examined.

- **Internal Safety Reviews** assess compliance with Metro's Public Transportation Agency Safety Plan. This safety plan is a Metro-wide plan created by the Department of Safety in accordance with the Public Transportation Agency Safety Plan, 49 CFR Section 673 to ensure system safety and security.

- **Quality Assessments** are performed to evaluate conformance to the procedures and actions that are documented in Quality Management Plans, as well as success towards achieving identified quality targets. Quality Assessments are focused on determining the existence and effectiveness of quality management practices in day-to-day business (for departments) or during delivery (for projects).

- **Self-Assessments** are performed a year after successful implementation of the QMS by each department to review their Core business functions to ensure compliance to their documented processes. Corrective Actions will be assigned to any findings during the self-assessment to resolve any discrepancies. After the completion of the first Self-Assessment, assessments occur on a biennial basis.

The results of these internal reviews and quality assessments are score based on pre-defined quality management practice measures (see section 3.11.4); the results are aligned with Metro's SMS, and are safety compliant (i.e., adhere to any safety requirements of the area being assessed).

The Quality Vice President identifies and approves an Annual Review Plan, which considers the scoring results of prior year Internal Reviews and Quality Assessments, to drive the identification of focus areas, the scope of examinations, and schedule for the following year's plan. This Annual Review Plan identifies and describes planned Internal Reviews and major Quality Assessments for the coming calendar year. Upon approval, the Annual Review Plan is shared with all Metro Organization Chiefs to communicate scheduled major Internal Reviews.

Quality Program Managers (see Section 2.4.1) are responsible for planning, scheduling, and coordinating systematic assurance programs, including regular Internal Reviews and Quality Assessments, in their respective assigned areas. Quality Program Managers contribute to the development of the Annual Review Plan based on their ongoing observations, and the results of the Internal Reviews and Quality Assessment.

In addition to scheduled reviews and assessments, Quality may from time to time perform unscheduled assessments on an as-needed basis, as determined by the Quality Vice President, Senior Executive Team, and/or the Metro General Manager and CEO. Such assessments may or may not be announced prior to issuance of the resulting draft report, depending on the requirements of the assessment.

Additional characteristics of Quality Assessments (pertaining to those performed by Quality, and those by other departments) are described in Section 3.11.

2.4.3 Documenting the QMS

The Metro documented Quality Management System (QMS) is composed of this governance document, the Quality Management System Plan (QMSP), and all supporting Quality Management Plans (QMPs) developed by Metro for its Organizations, projects, and other definable scopes of work requiring quality oversight.

The most up-to-date, distributed version of the QMSP and associated QMPs, inclusive of procedures, work instructions, and quality records, are made available to all Metro staff, contractors, consultants, and vendors, in accordance with document control requirements.

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3 QUALITY MANAGEMENT SYSTEM STANDARDS

This chapter provides greater specificity regarding the Core QMS Standards as enumerated in Section 2.1 above. These standards are categorized below with their corresponding QMSP Section number:

3.1	**Design Control** Processes to ensure the consistent development and maintenance of quality design documentation for projects and assets based on requirements, standards, criteria, etc.		**3.7**	**Inspection, Measuring & Test Equipment** Identification and periodic testing and calibration of measuring and test equipment to assure readiness for use
3.2	**Document Control** Managing information to ensure the most current approved documents are in use		**3.8**	**Non-Conformance** Systematic tracking of work performed or material delivered that does not meet procedures, specs, contract requirements, etc.
3.3	**Purchasing** Providing for timely procurement of the right items/ assets and services required for proper performance		**3.9**	**Corrective & Preventive Actions** Measures taken to modify processes/procedures to prevent recurrences of non-conformances and failures
3.4	**Identification and Traceability of Asset & Materials** The ability to track the unique history, location, performance, and configuration of any asset over its life cycle		**3.10**	**Quality Records** Documents generated by quality functions that provide objective evidence of fulfillment of requirements
3.5	**Process Control** Management and documentation of inter-related resources and activities to turn inputs into outputs/ outcomes		**3.11**	**Internal Reviews & Quality Assessments** Independent, objective review of conformance to quality standards and/or the overall effectiveness of processes in meeting quality requirements
3.6	**Inspection, Testing & Status** Verification and documentation that practices, processes, assets, and materials comply with applicable procedures, specifications, etc., and are fit for service		**3.12**	**Training** Providing skills and knowledge required for staff to perform a job
			3.13	**Customer Focus** Proactively addressing the needs and wants of internal and external customers, always

These Core QMS Standards are the foundation of the Metro QMS, along with the requirements of the FTA Quality Management System Guidelines and the Safety Management System.

Applicability of Core QMS Standards - these sections comprise requirements and principles, which are codified through policies, procedures, training, and review/assessment.

These QMS standards are applicable to:

- Organizational QMPs
- Project QMPs
- Third Party QMP

Organization QMPs and Project QMPs at a minimum address all applicable Core QMS Standards. The Organizational Responsibility matrix depicts which Core QMS Standards are applicable for each organization and is provided in Section 2.3.3.

Where applicable, policies and procedures to govern these practices are referenced in the Appendices.

The application and implementation of the Core QMP standards for every quality situation at Metro are expected to be devised by the appropriate subject matter expert. Organizations must incorporate quality into core business functions for all departments and offices to ensure that customer satisfaction and continuous improvement are embedded within the Metro culture.

3.1 DESIGN CONTROL

Design control includes planning, execution, and monitoring or controlling components as shown in Figure 10:

- Identification and understanding of design requirements

- Planning and scheduling activities (e.g., testing, piloting) to verify that the design meets requirements

- Executing and documenting design verification

- Controlling design changes

Metro designers and consultant designers develop and submit Design Quality Plans (DQPs) that comply with the requirements or design input specific to each project, and this QMSP.

Figure 10
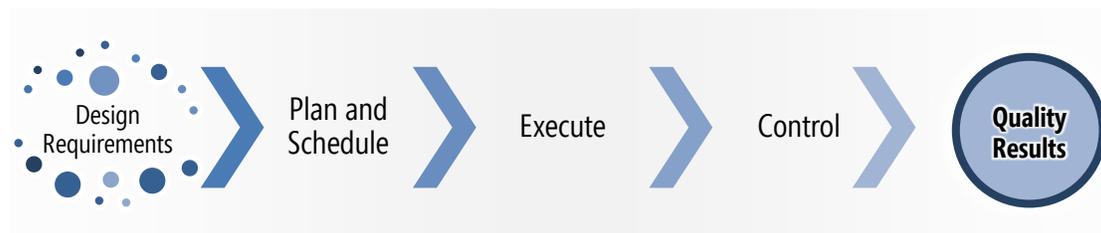
3.1.1 Design Requirements

The Metro Organizations or project designer understands all relevant design criteria, inclusive of Metro interpretations of design criteria for specific projects, to deliver high-quality designs to Metro. Applicable design requirements and criteria may include or be found in the following:

- Contract documents

- Preliminary engineering studies and drawings

- Metro general technical requirements

- Codes, specifications, Metro standards, international standards, member jurisdictions and their respective Department of Transportation offices, utilities, etc.)

- Performance criteria

The Metro designer or consultant designer compiles all applicable requirements for the design and submits them to Metro for design review and concurrence prior to engaging in design activity. Depending on the size and scope of the work or project, the designer may elect to submit multiple design requirements by discipline or geographic area.

3.1.2 Design Quality Plan

The Metro designer, or consultant designer provides to Metro for design review and approval, a comprehensive DQP in compliance with this QMSP and any project-specific quality management requirements that contain written, detailed quality control and quality assurance procedures for all disciplines (power, track, structures, signals, etc.).

Design Quality Control activities include:

- Checking drawings and calculations,

- Risk management processes including analyses, assessments, and mitigation strategies,

- Verifying correct application of specifications, and

- Resolving discrepancies or comments from reviewers.

Design Quality Assurance activities include:

- Review of quality control records,

- Surveillances, audits, and

- Over-the-shoulder reviews to ensure that disciplines and design teams execute and document QC activities in accordance with the DQP, applicable standards, and the design contract.

The DQP also provides a clear understanding of quality procedures performed by design sub-consultants. Depending on the scope of work and contract agreement, a sub-consultant may submit their own plan and procedures for review, approval, and incorporation in the project DQP, or they may elect to adopt the prime consultant's plan.

The DQP includes support of audit activities and resolution of potential audit findings for audits conducted by Metro or its representative at any time throughout project delivery.

3.1.2.1 Interfaces

Identification and understanding of the internal and external design interfaces are critical to Design Quality. The DQP includes processes to ensure effective design coordination and integration between disciplines, sub-consultants, and potential adjacent projects that result in designs ready for construction. This includes, as applicable:

- Identifying organization's external to the design team who review and approve the design, and

- Providing procedures for submitting, reviewing, revising, and approving design deliverables.

Design interfaces with the project following the completion of design are also included in the DQP. This may include, as applicable:

- Post-design reviews and responses to requests for information, design changes, or non-conformances, and

- Procedures for hand-off to operations and maintenance. These procedures will include sufficient information to ensure assets can be maintained to design standards and configurations.

3.1.2.2 Documentation

The DQP describes how design and design quality documents are generated, stored, and transmitted throughout the project. This includes both hard copy and electronic documents.

All procedures described in a DQP have corresponding sample or template documents that are used to accurately and comprehensively record the results, or output, of design quality activities. Such documents may include, but are not limited to:

- Drawing and calculation check-prints

- Failure Mode and Effects Analyses (FMEAs)

- QA/QC certification forms

- Design criteria checklists

- Audit checklists

- Document logs

- Comment disposition forms

- Design deviation/waiver request forms

- Design change forms

3.1.3 Control of Design Changes

Procedures for controlling design changes following completion of design or during maintenance or construction work are included in the DQP. Types of design changes that can occur following design completion or design release for construction include:

- <u>Designer-initiated changes</u>: Design changes that are identified by the design team and are submitted to maintenance, construction, or construction management teams.

- <u>Field-initiated changes</u>: Design changes requested by a maintenance team, construction contractor or manager for constructability, efficiency, or safety purposes.

- <u>Specification deviations or variances</u>: Field-initiated requests to change the construction and material specifications released by the designer.

- <u>Requests for Information</u>: Field-initiated requests to clarify the design or provide information missing from the design.

The DQP procedures for these changes include design review and approval processes, the definition of quality roles and responsibilities, timeframes for review and response, request forms, systems for logging and tracking change requests, and processes for revising and transmitting design drawings and specifications.

3.2 DOCUMENT CONTROL

Metro Organizations and projects include procedures for receiving, transmitting, reviewing, approving, disseminating, and archiving critical documents in their respective QMPs. These procedures are reviewed and revised in accordance with the Organizational Document Control Procedures or at least every two years unless there are process changes that necessitate an earlier review. This applies to both hardcopy and electronic documents.

Document management and control activities are covered by procedures, as part of a QMP include, as applicable:

3.2.1 Standardization

- Common rules for nomenclature, numbering, and pagination of documents

- Form templates, color and graphics standards, and branding guidelines

- References and style guides for writing and correspondence

3.2.2 Receiving/Transmitting

- Rules for numbering and logging inbound and outbound documents

- Guidelines for transmittal media (e.g., hard copy, disks, electronic transfer, number of copies, etc.)

3.2.3 Reviewing and Approving

- Routing and approval chains for documentation and documents required by this QMSP

- Signatures and/or seals required to release or certify documents (e.g., "Released for Construction" drawings)

In accordance with *P/I 1.1/XX*, Document Governance and Hierarchy*, for controlled documents, digital signatures are required unless otherwise authorized by the VP of Quality and/or Metro GM and CEO. Metro IT Digital Signature Certificates (DSC) are available to all Metro employees for signing key electronic documents such as PDFs, Word documents, and Excel spreadsheets. To obtain a digital signature certificate, employees follow the instructions provided on the IT Metroweb page.

3.2.4 Controlling

- Processes to establish a baseline set of working or approved documents (policies, procedures, drawings, specifications, etc.)

- Rules for revising baseline documents due to changes, to include revision numbering and dating, depiction of changes on baseline set (e.g., redlines, clouds), and revision history or change summary documents

- Approvals required to revise current documents; revised documents are reviewed and approved by the same authorities involved in their original review and approval

- Processes to ensure only current revisions of documents are available for use, and that obsolete or superseded documents are prevented from unintended use

- Maintenance of a master document list, including current revision level or date

- Storage of controlled governing documents in Metro's centralized document repository, MetroDocs, or other approved repository.

3.2.5 Disseminating

- Lists of personnel by office/department or other category required for distribution of documents

- Timeframes for document distribution

- Identification of centralized electronic repositories from which documentation is accessed

3.2.6 Archiving

- Document and data storage procedures, both during execution and upon completion

- Document accessibility to Metro and other agencies throughout the project or system lifecycle

- Guidelines for removing, superseding, or eliminating obsolete documents

- Handover procedures to Metro and/or the operating Organization for asset management

3.2.7 Existing Metro Documentation

- Metro has a library of quality documentation that predates implementation of this Quality Management System; these documents are integrated with the QMS.

- Examples of pre-existing Metro documentation may include Metro-wide Policy Instructions (PIs), manuals, handbooks, Standard Operating Procedures (SOPs), Departmental Policies, existing templates, guides, guidelines, technical documentation (e.g., drawings and specifications), and instructions.

- Reference each department's list of controlled documents, to review the pre-existing Metro documents, which are relevant to the activities of their department. In many cases, such documents are accessible for internal employees via the Metro intranet site.

3.2.8 Controlled Document Required Elements

- Refer to the Controlled Document Required Elements document for a detailed list of all elements that need to be addressed in controlled documents.

Quality in Practice

Maintaining a system of controls governing key documents is an essential Quality Management System practice for every department and function at WMATA.
For example, Document Control assures that:

Technicians receive and use the most up-to-date inspection procedures and checklists/forms for safety-critical assets.

Engineers and mechanics can find the correct technical specifications and documentation for unique, complex, configurable assets.

Managers, auditors, and others can verify whether, when, and by whom new procedures, directives, and other management documents were reviewed and approved.

3.3   PURCHASING

Metro managers ensure that all purchased services, assets, and materials meet Metro's requirements per the Procurement Best Practices Manual.

An Organization's project, maintenance, and operations' teams deploy procurement management and supplier quality requirements appropriate to the Scope of Work (SOW) to be performed. SOWs define minimum quality standards, referring to or attaching this QMSP, associated QMPs and applicable quality procedures. Procurement documents are reviewed and approved by a party (i.e., Contracting Officer (CO)) independent of the development of such documents, for adequacy and consistency of specified requirements prior to release.

Vendors, suppliers, and contractors are qualified to perform work and/or provide products, and their performance is regularly monitored through Metro's documented inspections, as well as its external audit programs. Only qualified and approved vendors, suppliers, and contractors may be used by the Metro, as listed on an approved vendor/supplier list. Lastly, vendors, suppliers and contractors are also subject to Metro's non-conformance and corrective action processes, in the event of non-conforming products and services.

For many construction and maintenance projects, the scope and complexity of the work is such that managers can utilize Metro's existing procurement resources and procedures. Large scale, long-term, and highly complex programs or projects may require separate procurement and contract management personnel who establish purchasing procedures as part of the project specific QMPs.

Metro purchasing procedures adopted or established for an Organization or project are referenced in the appropriate QMP and apply to all contractors, suppliers, manufacturers, and vendors in that Organization or project.

Procurement documents and records that demonstrate verification of purchased assets, materials or services are maintained. The Department of Quality conducts periodic assessments to ensure that both procurement personnel and contracted parties comply with contract requirements and the specifications of this QMSP.

Quality in Practice

Maintaining quality purchasing processes means not only conducting procurements in accordance with all applicable federal and WMATA regulations and procedures, but also having procedures and practices in place to ensure that materials and services meet WMATA's needs:

Are replacement parts available when needed? Do all materials fit their intended function and purpose?

Did a contractor adhere to all contractual requirements and procedures in delivering new assets for WMATA?

3.4 IDENTIFICATION AND TRACEABILITY OF ASSETS AND MATERIAL

Metro's assets, including the materials, assemblies, and components installed on those assets, are compliant with specifications and they are identified and tracked as compliant through all stages of their lifecycle.

Metro QMPs include or reference policies and procedures that ensure that all assets installed or maintained within the existing system by the respective Organization or project, are identified and traceable through all stages of delivery, installation, and operation.

Types of material and their traceability documents include:

- Assets are uniquely identified, and physically marked in accordance with project contract documents, or the Metro Transit Asset Management Plan.

   o Conformance verification documents for individual assets are maintained, including component lists, performance tests, physical inspections, and certifications, etc.

   o As applicable for reliability or safety needs, individual components also have verification documents, such as source certifications, test reports, and inspection reports. Metro or its representative may elect to inspect the assembly at its point of manufacture in accordance with the procedures, specifications, or contract documents. Assemblies may also require follow-up or subsequent testing at separate laboratories or test facilities, which are also documented and traceable.

- Raw Materials are identified with physical identification, by batch or heat number, delivery or weigh ticket, invoice number, date, packing slip, etc. Conformance is typically verified through test reports and material certifications from the source (e.g., foundry, quarry, etc.).

Quality in Practice

Being able to trace assets and raw materials is essential to ensure that WMATA delivers quality, safe, and reliable service to the public. Strategically and effectively identifying and tracing material and assets supports critical asset management needs such as:

Identifying unreliable and failing components to remove from service for repair or replacement.

Ensuring inspection & maintenance of every single one of thousands of critical assets throughout the system

3.5 PROCESS CONTROL

Each Organization and project include and describes in its QMP the processes that bring together resources, equipment, and activities, resulting in work products, assets, and services. In the context of the Metro Quality Management System. This primarily means the comprehensive and consistent development and documentation of Standard Operating Procedures (SOPs) and/or Organizational policies that specify the work performed by an Organization. Policies and procedure instructions are maintained in accordance with Section 3.2 above. Records of Process Control are maintained in accordance with Section 3.10 below.

Processes are analyzed and verified prior to being formalized and fully implemented to ensure efficiency and effectiveness. Changes to processes, and their corresponding controlled documentation are also monitored to ensure their efficiency and effectiveness; this includes analyses of upstream and downstream effects on other processes.

3.5.1 Organizational Processes

Operations, maintenance, engineering, and support departments provide processes, including applicable parameters, required to directly maintain and operate the transit system or support operations, as appropriate. Many such processes are documented in various forms, such as:

- Standard Operating Procedures (SOPs)
- Departmental Policies
- Maintenance Control Policies
- Manuals (e.g., Public Transportation Agency Safety Plan, Roadway Worker Protection Manual, ATC-1000, etc.)
- Continuity of Operations Plan (COOP)

Applicable parameters and constraints are identified in the respective process documentation. Examples of such parameters include:

- Work and operating schedule thresholds
- Applicable safety requirements
- Communication methods/media

> **Quality in Practice**
>
> Maintaining and controlling a set of processes is readily recognized as an essential activity for departments that perform inspections and maintenance or directly operate transit service. Likewise, for departments subject to strict regulatory requirements (e.g., Procurement).
>
> **However, the need to document and control processes extends beyond, for example:**
>
> Have press releases, website content, and press statements passed through applicable review/approval channels prior to issuance?
>
> Has a standard process been followed to both select a preferred candidate and negotiate salary requirements prior to extending a formal written job offer?

3.5.2 Project Processes

Project QMPs include or reference procedures to ensure the use of suitable production and installation equipment, a suitable work environment, the qualification/certification of personnel, and conformance with contractually required standards and codes to ensure quality of the work. Examples of controlled process components include:

- establishing the sequence of installation/fabrication

- safety requirements

- equipment required to perform the work

- materials required to perform the work

- environmental requirements during production or installation (e.g., minimum/maximum ambient temperatures, evaporation rate, time of day or time of year restrictions)

- crew size and craft/discipline requirements

- required qualifications/certifications of personnel performing the work

- required monitoring processes

- required inspections and tests

- applicable codes and standards

3.6 INSPECTION AND TESTING

All work performed on Metro assets and inventory (e.g., individual parts, components, and raw materials) by Metro or contracted organizations are subjected to appropriate testing to verify that purchased items, work, or services delivered meet Metro's specifications and compliance to applicable federal, state, and local laws and regulations.

Each Metro QMP incorporates appropriate documentation of inspection and testing requirements consistent with the needs of the project, program, or asset.

- **Inspection:** the act of observing, documenting, and reporting the work, task, or maintenance procedure to verify whether the practices, processes, materials, and assets comply with the contract documents and safety requirements. This includes at-the-source inspections, receiving inspections of purchased assets, first article inspections, in-process inspections, and final inspections to verify compliance with contract- and project-specific QMP requirements.

- **Testing:** subjecting an item to a set of physical, chemical, environmental, or operating conditions to validate the item meets quality and safety requirements. This includes testing of purchased assets and raw materials (if required), in-process testing, and final testing to ensure compliance with contract- and project-specific QMP requirements.

Inspection and testing procedures are performed and documented by qualified individuals with knowledge of the specific asset or raw material, and the procedures defined by the corresponding specific quality plan, documented procedures, or industry standard procedures.

Documents include, where appropriate, specifications for inspection or testing procedures, frequency and location of inspections or tests, requirements for witnessing inspection or testing, and instances in which inspection or testing at the source is required prior to shipping.

3.6.1 Inspection and Testing Procedures

Appropriate inspection and testing procedures are developed as part of each QMP to ensure the safety, quality, system reliability, service life, and regulatory compliance of each item or element. Procedures reference the appropriate code or standard to be used for each test or inspection; sampling plans and Acceptable Quality Levels (AQLs are also established and utilized as inspection requirements throughout Metro. To ensure these requirements are met, inspection and testing procedures and documentation of these procedures are performed by separate, tiered entities: Quality Control (QC), Quality Assurance (QA), and Quality Oversight (QO). The specific responsibilities of each entity are defined in, and/or referenced by, each QMP.

3.6.1.1 Quality Control (QC)

QC is the processes of measuring, inspecting, or testing of characteristics of a product or service to ensure that said product or service comply with a specified requirement. Typically, it is

performed within a determined sample size to verify the process prior to the product or service reaching the customer.

3.6.1.2 Quality Assurance (QA)

QA inspection and testing procedures are intended to directly improve QC procedures and outcomes through independent management actions. Metro's designated QA representatives are responsible for verifying that QC acceptance of the work conforms to specifications, and that only work that has been accepted by documented observations, quality control inspections, verifications, and testing is incorporated into the final product. QA representatives are organizationally independent from QC functions, the latter being the direct responsibility of the process owner.

3.6.1.3 Quality Oversight (QO)

QO is any inspection, testing, or auditing performed by a third party completely independent of both the QC and QA processes. Quality may independently perform random inspections and testing as well as auditing of QC and QA procedures to ensure a consistent and quality product, and compliance with the applicable QMP.

3.6.2 Inspection and Testing Documentation

All inspections and testing performed by Metro, or its agents are recorded, with quality records maintained by the corresponding department, or project, to serve as documentation that each item has been accepted and meets the specified requirements.

Each defined inspection and test that is performed on a Metro asset:

- is recorded in a traceable report,

- documents a uniquely identified asset or (raw) material,

- identifies the Metro employee(s) and/or contractor(s) performing the inspection/test, and

- identifies whether the item has met specifications or has any identified non-conformances during the reporting period.

All reports are reviewed and approved by the direct supervisor of the Metro representative performing the inspection/testing, or the Metro representative responsible for overseeing inspection and testing performed by consultants, contractors, or vendors. The Quality Manager of the respective project or operations department ensures that all required inspection and testing has been performed and documented, prior to placing a product into service.

QMPs reference software or data systems used to assist in the creation and organization of inspection and test documentation. The QMPs include or reference guidelines for electronic file-naming and archiving and include provisions for Metro representatives to access electronic documents.

3.6.3 Inspection and Testing Status

Metro and its designated agents identify the inspection and test status of work, tasks, assets and materials to ensure that only a work product, asset, or material that have successfully passed the specified inspections and tests is accepted and put into service, and that all work is performed according to applicable procedures or work instructions.

QMPs include and/or reference procedures for identifying inspection and test status for work items throughout production and installation processes, as well as inspection and test status for existing assets or materials in service, as applicable.

3.6.3.1 Procedures

Procedures for identifying the asset or work item status include, at a minimum:

- description of the work item and unique asset identification, as applicable

- list of required inspections and tests, referencing regulatory standards when applicable

- method for identifying the status of each item (i.e., conformance or non-conformance)

Status During Production (if applicable)

QMPs establish or reference procedures to verify and document that specified inspections and tests have been performed on materials and equipment of a work item, task, or asset during production or maintenance, and that these components conform to contract documents. Established procedures ensure that at the time of receiving purchased assets, the status of inspection and testing of that product is clearly identified physically on the item, and that documentation verifying the product conforms to contract documents, is in possession of Metro or its agent(s).

Status During Installation (if applicable)

Appropriate procedures to track the inspection and test status of a work item, task, or existing asset are provided in order to ensure a product that does not conform to the inspection and testing specified in the QMP is not installed or put into service, including not being placed into inventory.

No asset or item is placed in service until the status of all testing and inspection(s) required by the specified QMP is completed and documented as meeting contract requirements or Metro's internal procedures, standards, and specifications.

3.6.3.2 Status Documentation

Proper documentation is critical to tracking the inspection and testing status of a product. Documented procedures for inspection and test status are in place to provide identification and

traceability for conforming and nonconforming assets as well as items during production, installation, or maintenance.

Physical Identification of Items or Assets

When physically possible, the test and inspection status of an asset is identified by means of unique markings, stamps, labels, or other suitable means on the product itself.

Inspection and Test Reports

For assets that require material testing, reports that indicate conformance or non-conformance to applicable standards or targets are produced and maintained. Raw materials or components received from suppliers are accompanied by certificates of compliance/conformance, as required. QMPs identify or reference the database for tracking material test status, where appropriate.

3.7 INSPECTION, MEASURING, AND TEST EQUIPMENT

All inspection, measuring, and testing equipment utilized by Metro employees and contractors on assets, purchased materials, work, or services are uniquely identified, calibrated (if necessary), verified, and maintained. Any third party (i.e., external) calibration services used by Metro must be accredited.

Metro maintains master equipment logs and records that include, at a minimum:

- equipment type
- manufacturer
- model and/or serial number
- calibration date and frequency required
- calibration method or procedure
- results of calibration/verification
- service records

Inspection, measuring, and testing equipment used have a visible label, when physically possible, that displays the latest calibration date, as well as the upcoming due date for calibration of the equipment.

QMPs establish or reference calibration documents which identify any applicable equipment under the purview of the respective department or project. Calibration or verification is performed in accordance with applicable national standards, such as the American section of the ASTM (American Society for Testing and Materials) international standards, or defined standards within the QMP (for cases in which national standards do not exist) on pre-set master schedules. Individuals performing calibration or verification activities must be qualified in the appropriate calibration methods.

All testing equipment is only used as per the manufacturer's instructions and recommendations and in a safe manner by personnel trained and certified, when required, to operate it.

3.7.1 Equipment Licenses and Regulations

Ownership and use of testing equipment may require a license from the jurisdiction in which the equipment is operating or stored. Neither Metro nor any of its contractors own, transport, or operate such equipment without proper and current licensure.

3.7.2 Material Testing Laboratory

When required by procurement documents, contracts, specifications, QMPs, procedures, policies, or other documents, a Metro approved material testing laboratory confirms that the material meets required specifications prior to installation and placement into service, or to confirm that in-place materials meet specifications. Any third party (i.e., external) material testing labs used by the Metro must be accredited.

3.8 NON-CONFORMANCE

Metro QMPs establish or reference procedures to:

1. identify when a work item, existing asset, or task does not conform to requirements (whether contractual, technical, or procedural)

2. ensure that work items or existing assets that do not conform to contract documents and specifications are immediately identified and, if applicable, removed or prevented from being placed into service until an appropriate disposition is determined and approved

3. report upon such non-conformances and determine the appropriate mitigation, which may include replacement, rework, repair, or use as-is, as determined by qualified personnel

4. document non-conformances in reports, forms, logs, as applicable, to verify that only work that meets requirements is accepted, and to facilitate trend (i.e., for continual improvement) and root cause analysis

5. reject or dispose of items determined unsuitable for intended purpose and economically or physically incapable of being either reworked or repaired.

In the case of QMPs for Organizations that perform maintenance, it is expected that most non-conformance tracking is satisfied using the work order functionality of Metro's Asset Management System, MAXIMO. Where applicable, such QMPs would therefore present the procedures and instructions that ensure the correct documentation of each required step in the asset management system.

> *Quality in Practice*
>
> Processes and methods for identifying and tracking non-conformances are specific to the subject matter and work of each department or project. Regardless of exactly how a department or project performs these QMS requirements, they are essential as part of proactively preventing failures in service and establishing a continual improvement process.
>
> Track inspectors identify non-conformances in track assets and log them via the appropriate forms and systems, where they are tracked until resolution.
>
> Transportation supervisors and the Operations Control Center log instances in which standard procedures are not followed, and follow-up with re-training.
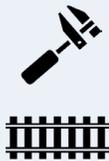
3.9 CORRECTIVE AND PREVENTIVE ACTION

Metro QMPs establish or reference document corrective action procedures to evaluate, mitigate, and prevent recurrence of non-conforming work or assets. These procedures investigate the root cause of non-conforming work and implement corrective actions to address the root cause and prevent recurring non-conformance.

Organizations must maintain their own internal processes for undertaking internal or external corrective and preventive actions, as part of instilling a culture of continual improvement. Additionally, internal reviews or quality assessments performed by Quality, internal audits, self-assessments performed by individual departments and offices, safety investigations, or external audits performed by oversight authorities such as the FTA or WMSC, may result in findings and required internal or external corrective action(s).

Corrective actions are also applicable to findings related to the Safety Management System as denoted in the Public Transit Agency Safety Plan (sometimes referred to as PTASP or ASP). Effective safety risk management through the implementation of defined and documented corrective and preventive measures, minimizes the potential for safety-related incidents throughout Metro.

3.9.1 Elements of Corrective Action

When a work item or existing asset is determined to be non-conforming, corrective action procedures are in place to identify the root cause of this condition so that it can be addressed to both rectify the non-conformance and prevent recurrence. These procedures include:

- <u>Identifying the root cause of the non-conformance</u>. The root cause of a non-conformance is identified and documented prior to the responsible party proposing or implementing an effective corrective action.

- <u>Determining a corrective action sufficient to address the root cause and prevent recurrence of the non-conformance</u>. Upon identification of the root cause, the responsible party determines and proposes a corrective action that addresses the root cause and prevents future occurrence of the non-conformance.

- <u>Assessing and prioritizing risk</u>. Risk analysis and assessment processes are in place for the purpose of risk mitigation. Corrective actions are also implemented to mitigate risk, and more effectively assess and identify (potential) hazards, as a function of safety risk management.

- <u>Evaluating effectiveness of the corrective action performed</u>. The corrective action is implemented by an agreed upon date, and subsequently reviewed to ensure it is effective in addressing the root cause and preventing the recurrence of the non-conformance. If found to be ineffective, actions are taken to determine if

either the action was not implemented as planned, or the root cause has not been effectively identified and/or addressed.

- <u>Closeout.</u> In circumstances where the source of the corrective action is an issuing authority external to the department, evidence of corrective action completion must be submitted to that authority to approve and close or reject and leave open.

- <u>Document and maintain records of the root cause and corrective actions taken</u>. Corrective actions, including root cause analysis, performed to address non-conformance(s) are documented on a traceable report by Metro's quality representative, and maintained as a quality record in accordance with the QMSP.

3.9.2 Risk Mitigation or Preventive Action

Continuous risk assessments are imperative to identifying potential risks before they occur. When a potential risk is identified, corrective action procedures are in place to mitigate the risks found in an assessment. These procedures include:

- <u>Identifying a risk.</u> During a risk assessment, any potential occurrence must be recorded, and scored based on the probability of occurrence, and the potential impact that it would have. Based on the risk assessment, the department then decides if the risk is accepted or if corrective action is needed to mitigate the risk.

- <u>Determining a corrective action sufficient to address the root cause and prevent occurrence of the non-conformance.</u> Upon identification of the root cause, the responsible party determines and proposes an action plan that addresses the root cause and prevents future occurrence of the non-conformance.

- <u>Re-assessment of risk to determine effectiveness of mitigation action</u>. Once the new risk score is calculated, the department decides if the resulting risk is accepted or if further corrective action is required.

- <u>Document and maintain records of the root cause and corrective actions taken.</u> Corrective actions, including root cause analysis, performed to address non-conformance(s) are documented on a traceable report by Metro's quality representative, and maintained as a quality record in accordance with the QMSP.

Departmental self-assessments must be done at the completion of QMS implementation and then biennially. The assessment should be a comprehensive, systematic, and regular review of the department's/individual's activities to:

- ensure compliance to the QMSP,
- ensure compliance to the department's QMP,
- identify any issues (findings, non-conformances, risks, etc.), and

- assess the effectiveness of implemented processes.
- Quality is available to provide guidance for audits, assessments, and determining and implementing corrective and preventive actions.

3.10 QUALITY RECORDS

Quality records are the documents that provide objective evidence that procedures, work instructions, policies, processes, etc., were executed as required. They are the documented evidence that work was performed in accordance with the specifications, policies, procedures, requirements of Organization QMPs, project specific QMPs, and this QMSP.

Metro QMPs establish or reference procedures for the filing, archiving, maintaining, and disposition of quality records. External quality records created and maintained by suppliers and contractors are also governed by controlled quality records procedures. Established procedures outline the following processes for the quality records:

- Identification: QMPs define or reference the quality records for the Organization and project. Documents considered quality records include, but are not limited to:

  - design reviews
  - material certifications
  - material test reports
  - asset inspection reports
  - equipment calibration and service records (when required by policy or regulatory mandate)
  - maintenance work orders

  - personnel training and qualification records
  - assessment, review, and audit reports
  - shipment authorization and acceptance forms
  - non-conformance reports
  - corrective action reports
  - dispatch records
  - operations center video records

- Collection: QMPs identify or reference Metro's representative responsible for ensuring that quality records are comprehensive, completed, and collected within the specified timeline.

- Filing: QMPs establish or reference a process for organizing and indexing quality records. The established filing system of quality records allows for the ability to readily retrieve documents as needed for review and use. The filing process may also include the use of metadata or file naming conventions to facilitate ready retrieval.

- Storage: QMPs describe or reference the method by which quality records are stored to prevent damage or loss. This includes the security and back-up of electronic data off-site to allow for the ability to readily retrieve documents as needed for review and project use.

- Disposition: QMPs specify or reference retention times, in accordance with contract requirements, of quality records, as well as establish the process for final disposition. Quality records that are associated with on-going litigation or claims

are maintained, as directed by Metro's Office of Legal and Compliance. Quality records related to the safety of a work item are maintained while that work item is in service.

3.11 INTERNAL REVIEWS AND QUALITY ASSESSMENTS

Internal reviews, safety reviews, and quality assessments are key components of the Metro assurance programs and are fundamental to the successful implementation of the QMS.

QMPs designate the quality representative(s) responsible for the Organization or project QMP, operations, or maintenance activity. To ensure the integrity and objectivity of the process, only qualified personnel, independent of those having direct responsibility for the activities being reviewed, carry out internal reviews, quality audits, and quality assessments. Qualification involves training and/or certification, as defined by the quality function responsible for the review, audit, or assessment.

Internal reviews, quality audits, and quality assessments, along with other processes as shown in Figure 11 are conducted throughout Metro. These may include, but are not limited to routine tasks, work instructions, procedures, and plans. Areas of focus include Engineering and Maintenance; Service Delivery; Capital Programs – Management and Execution; and Safety.

Figure 11

Review Inputs
- Schedule
- Procedures, Checklists
- Meetings
- Observations

Review Outputs
- Efforts
- Findings
- Recommendations
- Reports

Review Outcomes
- Activities Conform
- Failures Prevented
- Continuous Improvement
- Quality Work Products
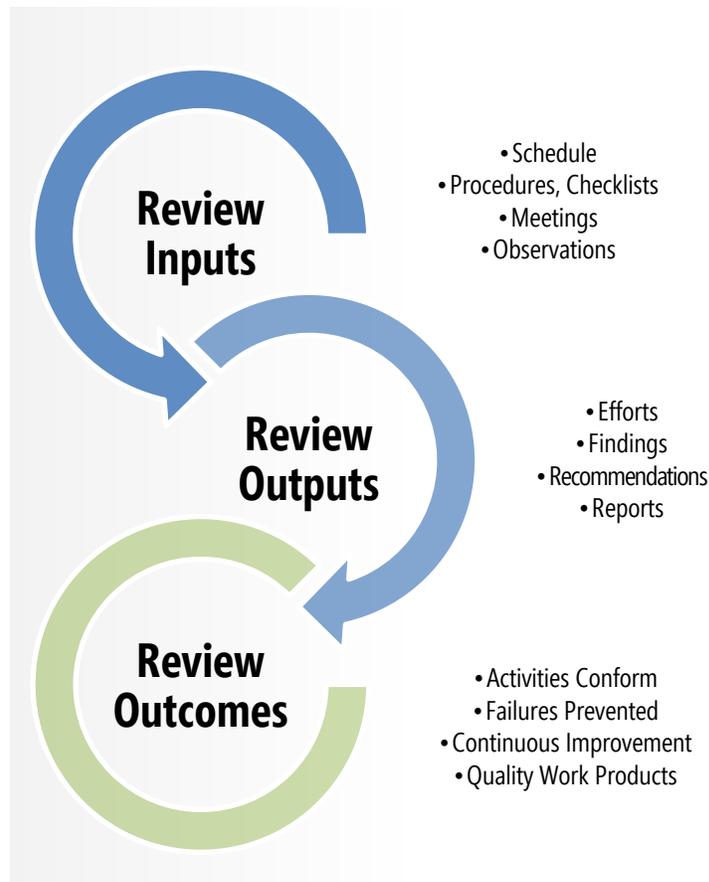
3.11.1 Planning

Reviews, audits, and assessments are scheduled at a frequency commensurate with the importance, risk profile, previous assessment and performance of the activity, findings, and existing safety history/record. Safety reviews are performed on a three-year schedule. Frequencies may be increased as needed to identify hazards, assess risks, and develop effective risk mitigation strategies more closely.

In preparation for a review, audit, or assessment, the lead reviewer/auditor/assessor notifies the reviewee(s) of the upcoming activity and develops a review plan to include opening and closing meetings, scope, methodology, and schedule. The lead may designate a team to include any subject matter experts who can provide specific insight into the areas under review. The lead also identifies potential participants from the department or office under review, audit/assessment locations (e.g., office, field, off-site), and any associated logistical requirements such as software access, travel, and site safety considerations.

3.11.2 Performance

Elements selected for review are evaluated against documented requirements and are verified through objective evaluation of evidence either provided by the reviewee or observed by the reviewers. Objective evidence may include certifications, test reports, approved submittals, and other quality records.

The lead reviewer assesses each element according to the requirement, provides objective evidence, and assigns an evaluation using the following terminology:

- **Discrepancy** – inconsistencies between work observed and established work standards. As discrepancies are noted in multiple assessments, they may constitute a finding (e.g., a risk to Metro).
- **Field Observation** – notable site conditions. If possible, these are communicated to supervisors for immediate correction or work order generation; they may result in future discrepancies if left unaddressed, or if conditions deteriorate.
- **Finding** – when the assessed element is non-compliant or clearly violates a requirement such that corrective measures are necessary and addressed through the corrective action process described in Section 3.9. Findings are assessed based on risk and assigned a risk rating; the risk and severity of a finding is one of the primary factors in determining the priority of corrective action(s).
- **Supplemental Guidance** – Quality-observed additional elements not relating to the parameters of its review, where opportunities for applying quality-related standards, programs, and procedures would bring greater safety and efficiency.
- **Win** – evidence of effective business practices.
- **Items Resolved During the Review** – issues identified by Quality during the Internal Review/Internal Safety Review but were immediately resolved by the process owner.

- **Required Actions** – where appropriate actions must take place, as identified by Quality to eliminate the discrepancy or non-conformance.
- **Area for Improvement** – the reviewed element is compliant with requirements; however, the review team identified potential improvements to established procedures or work plans to ensure continued compliance.
- **iCAPA** – an Internal Corrective and Preventive Action issued to offices or groups within the Metro organizations, required to develop an action plan to address the required action(s).

3.11.3 Reporting

QMPs establish or reference guidelines and templates for summarizing, recording, and reporting the results of reviews and assessments. QMPs also include and/or reference methods for reporting and tracking findings resulting from assessments, reviews, and other audits, to include response and resolution in accordance with the corrective action processes defined per Section 3.9.

As warranted, all reports identify activities found to be compliant, include observations and recommendations, and identify any findings of non-compliance that require corrective action. The report must be of sufficient detail to support corrective action investigation and development, if applicable.

Quality classifies the risk associated with their Internal Review findings and required actions on a standardized risk assessment scale (See WMATA-SARE-1.13.XX*) which generates a risk rating as defined below in Table 2.

Table 2

Risk Evaluation	
Major	Major to significant effect on quality, performance, reliability, service, operations, safety, and customer experience
Moderate	Noticeable effect on quality, performance, reliability, service, operations, safety, and customer experience
Minor	Limited to little effect on quality, performance, reliability, service, operations, safety, and customer experience

Quality utilizes a risk evaluation criterion for Safety Reviews based on MIL-STD-882E, which categorizes all identified hazards in terms of severity and probability of safety occurrences. This risk evaluation is applied to the scoring methodology identified in section 3.11.4, below. The risk assessment matrix is shown in Figure 12 on the following page.

Figure 12

RISK ASSESSMENT Matrix				
RISK PROBABLITY	RISK SEVERITY			
	Catastrophic - 1	Critical - 2	Marginal - 3	Negligible -4
Frequent (A)	1A	2A	3A	4A
Probable (B)	1B	2B	3B	4B
Occasional (C)	1C	2C	3C	4C
Remote (D)	1D	2D	3D	4D
Improbable (E)	1E	2E	3E	4E

Completed reports, and checklists are maintained as quality records in accordance with Section 3.10.

3.11.4 Scoring

At the conclusion of each Internal Review, audit, or assessment the results are quantified and scored based on the performance of the processes reviewed, as well as risk evaluation identified above to determine risk rating. This scoring methodology is a component of Metro's overall strategy to drive continual improvement through quantifiable review and assessment results. Figure 13 defines what we examine and use to measure, along with the score category.

Figure 13

What We **EXAMINE**	What We **MEASURE**		What We **FIND**
Function Reviewed ▶	QM & ASP Practices ＋	Risk Evaluation* ＝	Quality Score
Engineering & Maintenance Departments or offices that perform engineering or maintenance of Metro assets – Rolling Stock, Facilities, Guideway and Systems. **Service Delivery** Departments or offices that are directly involved in the transportation of passengers to include the functions that operate revenue vehicles, Metro stations and central communications. **Capital Program Management & Execution** Departments, offices or projects teams that are responsible for managing a capital program or project from the initial planning phase through to project closure and handoff to Operations. **Safety** Departments or offices that are subject to external (federal, state or local) and internal system safety regulations.	**15 Core QMS Standards** A measure of compliance with the applicable QMS core standards as part of the Internal Quality Reviews. **ASP PTASP** A measure of compliance with the ASP PTASP pillars, and the associated applicable components as part of the Internal Safety Reviews.	**Major** Major to significant effect on quality, performance, reliability, service, operations, safety, and customer experience **Moderate** Noticeable effect on quality, performance, reliability, service, operations, safety, and customer experience **Minor** Limited to little effect on quality, performance, reliability, service, operations, safety, and customer experience Note: For Internal Safety Reviews, risk rating is either red, yellow, or green.	**Proficient** Meets or exceeds quality requirements without any "Major" findings. **Satisfactory** Meets the minimal requirements or quality; contains a "Major" finding or several lesser findings. **Unsatisfactory** Inability to meet minimal quality requirements; contains multiple "Major" findings and several lesser findings. Reference the Quality Score Work Instruction (QICO-PRO-W01-XX*) for details on the scoring process

3.12 TRAINING

All personnel who perform work for Metro are qualified based on education, experience, and training, as outlined in the QMPs; this includes contractors that work for Metro.

QMPs establish or reference the applicable training procedures for the identified personnel who perform the work. At a minimum, QMPs outline or reference the following processes for training:

- Establish the process by which project or operations teams are trained in the QMP, and understand the importance of quality, as well as their impact on overall quality.

- Identify the training needs of all staff. Because training needs may vary by role, a training matrix for each project or department is created that identifies each role and the corresponding, relevant training needs for each role, including frequency (e.g., new employee, annually, monthly, etc.).

- Establish a schedule for providing required training. The department procedures identify how often each required training is provided, and when that training is offered to project or department staff.

- Evaluate the effectiveness of the training. QMPs outline or reference a procedure for reviewing the effectiveness of training and determine if revisions or additional training is required.

- Maintain all training and qualification records for required training. This includes documentation associated with each training session (i.e., attendance lists, agendas, test results, etc.). The results of training evaluations are recorded and maintained. Additionally, project staff qualifications, including completed training, certifications, and licenses, are maintained within project or department files.

- All Metro employees and contractors are required to be trained and/or be familiar with the QMSP, and the respective QMPs for their departments.

3.13 CUSTOMER FOCUS

Metro exists to serve our customers and the region; everything Metro does is in the pursuit of better service. Its goal is to deliver safe, reliable, convenient, equitable, accessible, and enjoyable service for customers. The Metro delivery of quality service to the riding public depends also on numerous departments providing quality services to internal customers.

3.13.1 Internal Customers

As shown in the diagram in Section 2.2.2, most Metro departments provide services and support either directly or indirectly to the service delivery business units, which directly provide riders with transit service.

Organizational QMPs identify or reference the department's customers, define how quality can be described or measured, and identify targets or goals for quality. In this way, the Customer Focus standard of the Quality Management System goes hand-in-hand with Metro's programs for business planning and performance measurement programs.

Quality in Practice

The ability to deliver quality transit service depends on numerous other Metro functions, both directly and indirectly. For example:

Human Capital
- Recruits professional staff for…

Procurement
- Contracts for material purchase, to be received and inventoried by…

Supply Chain
- Supplies replacements parts to…

Traction Power Maintenance
- Maintains power supply so that…

Rail Transportation
- Operates trains in revenue service, carrying customers

3.13.2 External Customers

Ensuring Metro meets the needs and expectations of its riders depends on ensuring continuous effort in tracking measures of service quality and customer satisfaction. Figure 14 is an example of a Metro Performance Score Card.

The QMPs for Organizations responsible for the above functions identify and/or reference the processes and methods by which these functions are carried out and scoped, to best reflect what aspects of quality are most important to the riding public, and how that information is delivered to internal customers.

QMPs for Organizations that utilize this information describe and/or reference the processes by which information is obtained and fed back into decision-making and prioritization in a continual improvement process. Where applicable, QMPs emphasize efforts that impact the key drivers of customer satisfaction.

Figure 14

● **Overall Ridership**

91
million riders

FYTD23 forecast | 80.8 million

● **Rail Customer Satisfaction**

79%
satisfied rating

FYTD23 target | no less than 79%

● **Bus Customer Satisfaction**

75%
satisfied rating

FYTD23 target | no less than 76%

● **MyTripTime**
Rail On-Time Performance

90.5%
of customers arrived on time

FYTD23 target | no less than 92%

● **Metrobus**
On-Time Performance

76.5%
of buses departed on time

FYTD23 target | no less than 78%

● **MetroAccess**
On-Time Pick-up Performance

92.4%
of vehicles arrived on time

FYTD23 target | no less than 92%

● **Bus Prediction Availability**

93.2%
of scheduled trips with real-time predictions

Desired performance direction | Up

● **Escalator Availability**

93.0%
of service hours that escalators were available

FYTD23 target | no less than 92.9%

● **Part I Crime Rate**

6.1
crimes per million riders

FYTD23 target | no more than 6.5

LEGEND | ● Target met | ● Near target | ● Target missed | ● No target in FY23

Source: Metro Performance Score Card

4 <u>APPENDICES</u>

4.1 REFERENCES

Federal Transit Administration Circular: Third Party Contracting Guidance: FTA C 4220.1F, Rev. 4, March 18, 2013.

Federal Transit Administration Quality Management System Guidelines: FTA-PA-27-5194-12.1

Federal Transit Administration Quality Assurance and Quality Control Guidelines: FTA-IT-90-5001-02.1

Quality Management Systems – Requirements, International Standards Organization, ISO 9001:2015(E)

Tunnel Security for Public Transit, American Public Transportation Association, Infrastructure Security Working Group, APTA SS-SIS-RP-16-15, March 2015

Department of Defense Standard Practice, System Safety, MIL-STD-882E, May 11, 2012

Quality Document Governance and Hierarchy: Document P/I 1.1/XX*

Transit Asset Management Plan

Procurement Best Practices Manual

4.2 ACRONYMS

APTA	American Public Transportation Association
ASP	Agency Safety Plan
ASTM	Association for Testing Materials
CFR	Code of Federal Regulations
DQP	Design Quality Plan
FMEA	Failure Mode and Effects Analysis
FTA	Federal Transit Administration
GAO	Government Accountability Office
ISO	International Organization for Standardization
MARC	Management Audits, Risk and Compliance
MOA	Memoranda of Agreement
NTSB	National Transportation Safety Board
OIG	Office of Inspector General
OQO	Owner's Quality Oversight

QA	Quality Assurance
QC	Quality Control
Quality	Quality Assurance, Internal Compliance and Oversight
QMSP	Quality Management System Plan
QO	Quality Oversight
SAFE	Office of System Safety and Environmental Management
SOP	Standard Operating Procedure
WMSC	Washington Metrorail Safety Commission
WMATA	Washington Metropolitan Area Transit Authority (interchangeable with "Metro")

4.3 DEFINITIONS

Assessment – see "Quality Assessment" below.

Assessment Finding or Issue – record of evidence that a criterion for audit, assessment, or review is being met (compliance/conformance) or that is not being met (non-compliance/non-conformance).

Assets – an asset is fixed infrastructure, stations, facilities, systems and equipment that make up a transit system. Metro considers a tangible entity (or system of entities) an asset if it is owned or leased by Metro, is repairable and/or replaceable, requires management intervention to mitigate risk of service failure, and when one or more of the following apply:

> (a) It requires a preventive maintenance schedule;
>
> (b) It requires inspection;
>
> (c) It requires calibration; and
>
> (d) It requires tracking

Calibration – a comparison of measurement values delivered by a device under test with those of a calibration standard of known accuracy. Such a standard could be another measurement device of known accuracy or a device generating the quantity to be measured. Calibration is performed to detect, correlate, eliminate, and report by adjustments any variation in accuracy of the instrument or measuring device.

Closeout – the process of completing the actions required under a corrective action plan.

Closing Meeting – signifies the end of fieldwork phase of an audit and provides opportunity for management to discuss audit results with the auditors prior to issuance of reports.

Compliance – an affirmative indication or judgment that a product or service has met the requirements of the relevant specification, contract, or regulation.

Conformance – fulfillment by a product, process, or service of specified requirements.

Corrective Action – action to eliminate the cause of a nonconformity and to prevent recurrence.

Contract Documents – refers to the documents included in a contract or purchase order that detail the requirements, specifications, final design, and operating procedures of a procured product or service; contract documents are used to determine a product's compliance or conformance with the contract agreement.

Core QMS Standards – the 15 distinct categories of characteristics, requirements, and best practices whose development and implementation are essential to Metro's adoption of a Quality Management System that aligns with industry practices.

Corrective Action Plan - a plan or set of tasks that outline corrective measures planned or already taken to address audit recommendations and related deficiencies or findings. CAPs are used as a management tool to identify specific actionable items to be performed, milestone schedules, action coordinators, performance measures and verification strategies to ensure completion of each required action.

Deficiencies – failures associated with internal controls required to meet the desired objective.

Department – a sub-group within an Organization of Metro.

Design Input – criteria, parameters, basis, or other design requirements upon which detailed design is based.

Design Output – drawings, specifications, and other documents defining technical requirements of structures, systems, and components.

Design Review – formal review of existing or proposed designs to detect and remedy design deficiencies that would affect fitness-for-use and environmental aspects of the product, process, or service, and/or the identification of potential improvements of performance, safety, and economic aspects.

Digital Signature - a type of electronic signature process that uses an encrypted digital signature certificate (DSC) to make the document tamper-evident which can be verified with its public key, created upon signing. The process creates an audit trail, to ensure the authenticity of the document, its source, and the signee through the employee's unique digital identify profile through the employee's computer/network account.

Discrepancies – variation between the actual state versus the required state of a process, service or asset.

Engineer of Record – the individual responsible for the development of contract documents, and who, as a registered Professional Engineer endorses (i.e., signs and/or seals) the record drawings.

External Audit – independent and objective appraisal performed by a non-Metro entity or oversight body collectively referred to as "External Assurance Providers." This would include, but is not limited to, actions taken by Metro's Office of Inspector General (OIG); Washington Metrorail Safety Commission (WMSC); Occupational Safety and Health Administration (OSHA), the Federal Transit Administration (FTA); Federal Emergency Management Agency (FEMA); Department of Homeland Security (DHS); Jurisdictional Audits – by the District of Columbia, Maryland, or Virginia; External Financial Auditors; any other External Auditor; and consulting firms commissioned or contracted by Metro management or the Board of Directors; or the National Transportation Safety Board (NTSB).

Failure Mode and Effects Analysis (FMEA) – an activity that helps identify potential failure modes based on experience with similar products and/or processes or based on common physics of failure logic.

First Article Inspection (FAI) – detailed report submitted by the supplier that provides the physical part dimensional inspection and other information that demonstrate adherence to the specification and technical requirements of the part being reviewed for qualification.

Inspection – the act of observing, documenting, and reporting the work in progress to verify whether the practices, processes, and assets or parts comply with the procedures, work instructions, specifications, or contract requirements.

Internal Corrective and Preventive Action (iCAPA) – a formal written strategic plan to address issues of concern, required actions and recommendation resulting from internal reviews or quality assessments.

Internal Review – a type of internal assessment performed by Quality that comprehensively studies and observes functional areas of Metro's operations and may span multiple departments with broad scopes.

Maintenance – Encompasses all Metro departments and offices performing tasks to conserve the original condition of an asset or resource while compensating for normal wear and tear.

Measure – a pre-defined quality or safety and security criterion utilized during an internal review or quality assessment to score card and categorize the results of said review or assessment. Quality has defined a set of quality and safety measures for this purpose.

Memoranda of Agreement - a type of intra-agency, interagency, or other legally binding agreement between two or more parties, which includes specific terms that are agreed to, and a commitment by at least one party to engage in action. It includes either a commitment of resources or binds a party to a specific action.

Non-Compliance – The failure to meet a specific criterion, standard, or regulatory requirement.

Non-Conformance – an indication or judgment that a product or service does not meet the procedure, work instruction, specification, or contract requirements, Non-conformance is documented in a Non-conformance Report (NCR), requiring review of root cause(s), approval, use-as-is, or repair dispositions.

Non-Conforming Work – work performed that does not meet the procedure, work instruction, specification, or contract requirements, and documented by a Non-conformance Report (NCR), requiring review of root-causes and approval for use-as-is or repair dispositions.

Objective Evidence – any statement of fact, information, or record, either quantitative or qualitative, pertaining to a product, process, or service and based on observation, measurement, or test that can be verified.

Observation – a fact of evidence discovered during an audit and substantiated by objective evidence. Failure to act in response to an observation may result in a non-conformance.

Opening Meeting – entrance meetings or discussions that signify the beginning of an assessment, review, or audit, typically include department management and administrative staff involved, and are an opportunity to discuss the scope, available resources, and other concerns.

Operations - Encompasses all Metro departments and offices performing tasks that support the operation of the transit system.

Organization – a group of departments led by a Senior Executive Team member.

Owner – Metro in general, or the Metro department identified as having responsibility for completing a corrective action. This may also include Metro's designated agent or representative.

Preventive Action – a proactive action implemented to ensure a potential non-conformity does not occur.

Procedure – a specified way to perform an activity.

Process – a set of interrelated resources and activities which transform inputs into outputs or outcomes.

Product – the outcome or result of coordinated business activities, which may comprise a tangible and discernible item, a service rendered, or a public facility.

Program – a group of related projects managed in a coordinated way to obtain efficiencies or benefits that would not be realized if the projects were managed individually.

Project –any reimbursable or capital design and/or construction project or program designed and/or implemented by the Department of Project Delivery.

Quality Assurance – all planned and systematic activities necessary to provide confidence to management that a product or service satisfies given requirements for quality. In the Metro QMS context, the Quality Assurance function is performed independently from departments directly performing the work.

Quality Assessment – a type of internal assessment performed by Quality to evaluate conformance to the procedures and actions documented in Quality Management Plans, as well as success towards achieving quality targets. Quality Assessments are focused on determining the existence and effectiveness of quality management standards and practices in day-to-day departmental operations.

Quality Assurance Inspection – the practice of verifying that the appropriate QC processes are followed consistently, through an independent auditing and confirmation program.

Quality Control – the process by which factors involved in the creation and delivery of assets and services are verified against specifications and requirements. In the Metro QMS context, Quality Control is the responsibility of the process owner (the department directly performing work).

Quality Control Inspection – activities which provide a means to control and measure characteristics as they relate to established requirements. This includes techniques and activities that sustain the Quality of an item to satisfy given needs and use of such techniques and activities.

Quality Management System – a system of processes and procedures as defined and identified in the QMSP, comprised of policies, objectives and management plans developed to document requirements for assets, parts, and services.

Quality Record – documented proof that a process was followed, as per its corresponding SOP or work instruction. It typically is in the form of a completed (i.e., filled out) checklist, form, report, etc., and is considered a Level 5 document. Note: Quality records must also be document-controlled by the owners of the established processes within Metro.

Quality Oversight – the act of overseeing the implementation of a Quality Management Plan by Metro or its representative.

Recommendation – a recommended action during an assessment or review, substantiated by objective evidence, suggesting an improvement to a particular operation of the Project.

Reject – disposition indicating the item is unsuitable for its intended purpose and economically or physically incapable of being either reworked or repaired.

Rework – disposition that indicates the deficiency can be brought into conformance with the original requirements through reassembling, reprocessing, reinstallation, or completion of the required operations. It is also an action to restore nonconforming work to bring it into compliance.

Review – see "Internal Review" above.

Risk – potential non-conformance or hazard

Risk Rating – a score card assessed on the combination of the probability of occurrence of risk and the severity of the impact.

Root Cause Analysis – process to identify the primary cause of a non-conformance which, if corrected, prevents reoccurrences of non-conformance, failures, or unacceptable deviations.

Self-Assessment – internal evaluation of a department/oneself actions and, in particular, of the performance at a job/task considered in relation to an objective standard/procedure.

Senior Executive Team – executive and senior level staff supporting the General Manager and Chief Executive Officer in the executive management of the organization.

Senior Leadership Team – All of the General Manager/Chief Executive Officer's direct reports. This includes department leads of the General Manager/Chief Executive Officers direct reports.

Senior Management Team – Directors and persons included in the Senior Executive Team and Senior Leadership Team.

Service – the provision of an intangible benefit, which is usually a significant element of a tangible product.

Surveillance - the unannounced act of monitoring or observing specific acts or activities to verify conformance to the specified requirements.

Supervisor – an individual employed by Metro who has the authority to take, direct others to take, recommend or approve a Personnel Action or direct an Employee to obey an order.

Safety Management System (SMS) – is the formal, top-down, organization-wide approach to managing safety risk and assuring the effectiveness of Metro's safety risk mitigations. SMS includes systematic procedures, practices, and policies for managing safety risks.

Testing - subjecting an item to a set of physical, chemical, environmental, or operating conditions to verify the item meets requirements.

Traceability – the ability to track the history, application, or location of an element, by means of recorded identifications.

Validation – confirmation by examination and provision of objective evidence that the particular requirements for a specific intended use are fulfilled.

Verification – the act of reviewing, inspecting, testing, checking, assessing, or otherwise establishing and documenting whether items, processes, services, or documents, conform to specified requirements.

Work – the act of producing and installing the product or service to be furnished and provided by Metro or its contractors including, design, engineering, construction, supply of vehicles and related systems, utility adjustments, financing services, operations, maintenance, other work of reconstruction, or reinstatement.

4.4   FTA QMS CROSSWALK

The Metro QMSP was developed following the overall framework specified in the FTA publication, FTA-PA-5194-12.1, *Quality Management System Guidelines*, with various modifications to tailor the QMS to Metro's specific context and nomenclature. The following table is provided as a quick reference indicating which sections of the Metro QMSP correspond to the essential elements as specified in the FTA QMS Element guide below.

#	FTA QMS Element	Metro QMSP Section Reference(s)
1	Management Responsibility	Management Commitment in Section 2.2.1 and Management Responsibility Procedure (WMATA-SARE-1.01.XX*)
2	Documented Quality Management System	Sections 2.2.3, 2.3 and Documented Quality Management System Procedure (WMATA-SARE-1.02.XX*)
3	Design Control	Section 3.1 and Design Control Procedure (WMATA-SARE-1.03.XX*)

#	FTA QMS Element	Metro QMSP Section Reference(s)
4	Document Control	Section 3.2 and Document Control Procedure (WMATA-SARE-1.04.XX*)
5	Purchasing	Section 3.3 and Purchasing Procedure (WMATA-SARE-1.05.XX*)
6	Product Identification and Traceability	Section 3.4 and Identification and Traceability of Assets and Material Procedure (WMATA-SARE-1.06.XX*)
7	Process Control	Section 3.5 and Process Control Procedure (WMATA-SARE-1.07.XX*)
8	Inspection and Testing	Section 3.6 and Inspection, Testing and Status Procedure (WMATA-SARE-1.08.XX*)
9	Inspection, Measuring, and Test Equipment	Section 3.7 and Inspection, Measuring, and Test Equipment Procedure (WMATA-SARE-1.09.XX*)
10	Inspection Testing and Status	Section 3.6.3 and Inspection, Testing and Status Procedure (WMATA-SARE-1.08.XX*)
11	Non-Conformance	Section 3.8 and Non-Conformance Procedure (WMATA-SARE-1.10.XX*)
12	Corrective Action	Section 3.9 and Corrective Action Procedure (WMATA-SARE-1.11.XX*)
13	Quality Records	Section 3.10 and Quality Records Procedure (WMATA-SARE-1.12.XX*)
14	Quality Audits	Sections 2.4.2, 3.11 and Internal Reviews and Quality Assessments Procedure (WMATA-SARE-1.13.XX*)
15	Training	Sections 2.3.6, 3.12 and Training Procedure (WMATA-SARE-1.14.XX*)

4.5   CORE QMS STANDARDS

The Core QMS Standard documents listed below are strategic level documents (refer to Section 2.2.3 QMS Hierarchy), and by virtue of association with the QMSP, they, too, are considered approved by the GM, the Chief Safety Officer and EVP of Safety and Readiness (SARE), and the Vice President of Quality, and do not require their additional signatures for approval.

Number	Title
WMATA-SARE-1.01.XX*	Management Responsibility Procedure
WMATA-SARE-1.02.XX*	Documented Quality Management System Procedure
WMATA-SARE-1.03.XX*	Design Control Procedure
WMATA-SARE-1.04.XX*	Document Control Procedure
WMATA-SARE-1.05.XX*	Purchasing Procedure
WMATA-SARE-1.06.XX*	Identification and Traceability of Assets and Material Procedure
WMATA-SARE-1.07.XX*	Process Control Procedure
WMATA-SARE-1.08.XX*	Inspection, Testing and Status Procedure
WMATA-SARE-1.09.XX*	Inspection Measuring and Test Equipment Procedure

Number	Title
WMATA-SARE-1.10.XX*	Non-Conformance Procedure
WMATA-SARE-1.11.XX*	Corrective and Preventive Actions Procedure
WMATA-SARE-1.12.XX*	Quality Records Procedure
WMATA-SARE-1.13.XX*	Internal Reviews and Quality Assessment Procedure
WMATA-SARE-1.14.XX*	Training Procedure
WMATA-SARE-1.15.XX*	Customer Focus Procedure

* where "XX" denotes the current document revision

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