



FINAL
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VIRGINIA RAILWAY EXPRESS TRANSIT ASSET MANAGEMENT PLAN



VIRGINIA RAILWAY EXPRESS TRANSIT ASSET MANAGEMENT PLAN



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EXECUTIVE SUMMARY

Federal Legislation

Through MAP-21 and the subsequent Fixing America's Surface Transportation (FAST) Act, the FTA has enacted transit asset management (TAM) regulations that require transit service providers to develop a TAM Plan and establish asset management performance measures and targets. The Federal Transit Administration (FTA) issued its Final Rule on July 26, 2016 (effective October 1, 2016) which amends Chapter VI of Title 49, Code of Federal Regulations (CFR) to add Part 625, which addresses TAM and amends 49 CFR Part 630, which contains regulations for FTA's National Transit Database (NTD).

VRE's Approach to Asset Management

VRE has teamed with a consultant partner to develop a transit asset management program that will not only meet Federal requirements but will also allow VRE to improve operational efficiency, maintain assets in a State of Good Repair (SGR), and make data-driven decisions regarding improvements and capital expenditures.

VRE's TAM program has been a multi-year effort, beginning in 2013, and has included a review of federal requirements, an initial asset inventory and condition assessments, a lifecycle maintenance action plan, and a peer review of other transit agency efforts. This work has been the foundation for VRE's current program and TAM Plan development. VRE's TAM program will be an on-going process, and as federal guidance and VRE's needs change, the program will evolve.

TAM Plan Components

The Final Rule requires every transit rail provider receiving federal funds under 49 USC Section 53 to develop an individual TAM Plan. VRE's TAM plan includes each of the required elements.

1. Asset Inventory	2. Condition Assessments	3. Decision Support Tool
4. Prioritized List of Investments	5. TAM & SGR Policy	6. Implementation Strategy
7. List of Key Annual Activities	8. Identification of Resources	9. Evaluation Plan

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VRE's Asset Management and State of Good Repair Policy

VRE developed a TAM and SGR policy that provides a supportive framework for implementing the agency-wide TAM Program.

TAM and SGR Policy

"VRE is adopting this Asset Management and State of Good Repair policy to support VRE's mission, to provide safe, cost effective, accessible, reliable, convenient, and comfortable commuter-oriented rail passenger service. Through this policy, VRE will work to procure, maintain and replace locomotives and railcars, stations, facilities, infrastructure and equipment to meet State of Good Repair goals and to improve operational efficiency, make informed capital spending decisions, increase performance, reduce risk agency-wide, and provide safety benefits to VRE's riders, employees, contractors and member communities.

In order to accomplish the policy, VRE will:

- 1. Develop a formalized transit asset management program.*
- 2. Establish methodologies and procedures for measuring the condition of capital assets.*
- 3. Utilize a third party contractor to perform condition assessments.*
- 4. Formalize procedures for annual reporting to the FTA.*
- 5. Establish methods in order to use compiled data to guide prioritization of VRE's capital investments."*

Asset Management Tool

As part of the asset management program, VRE developed an internet-based tool that houses VRE's asset inventories and facilitates the completion of condition assessments and safety inspections. The internet tool is part of a multi-phase effort, and initial functionality of the internet tool was deployed in 2017. The tool is designed to enable user friendly access to condition assessments and asset inventories in the office and field. Mobile, internet access allows users to input data directly into the database, eliminating duplication of effort and saving time. Using the internet tool the VRE user can:

- View and manage critical and non-critical asset inventories,
- Conduct facility and Maintenance and Storage Facility (MASF) track infrastructure condition assessments,
- Perform monthly station safety inspections,
- Conduct useful life analysis for equipment and rolling stock, and
- Identify State of Good Repair needs and inform decision making using the recently developed executive dashboard.



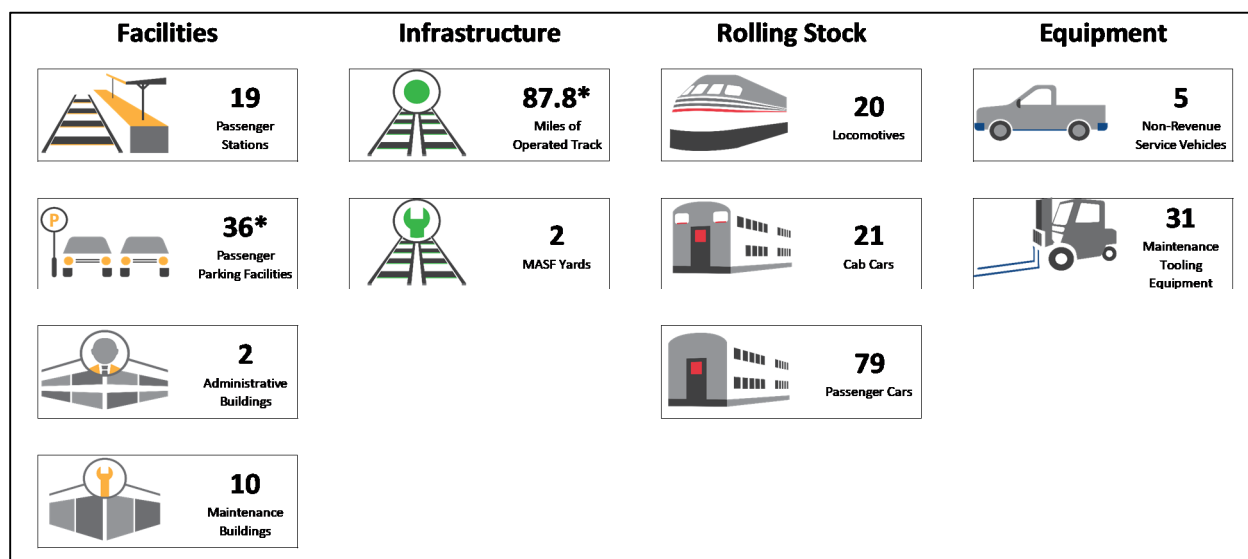
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Asset Inventory

A high-level overview of VRE's asset inventory, including third-party owned assets, is shown in Figure E.1.

Figure E.1. VRE Asset Inventory Overview



Source: VRE 2018

*Includes inventory of VRE owned and third-party owned assets.

Condition Assessments and Ratings

VRE performs condition assessments on four categories of assets: facilities, infrastructure, rolling stock, and equipment. As required by FTA, condition assessments are conducted on all VRE owned assets, as well as on all assets where VRE has direct capital responsibility. Condition assessments are not performed on third-party owned assets, where VRE does not have direct capital responsibility. Figures E.2 through E.5 provide an overview of condition ratings for each asset category. Note that the methodologies differ for asset category; these methodologies are described further in this TAM Plan.

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Figure E.2. VRE Facility Condition Assessment Ratings (2017/2018)
(Number of facilities)

FTA TERM Scale		Passenger Stations	Passenger Parking Facilities*	Administrative Buildings	Maintenance Buildings
5	Excellent	1			
4	Good	15	4	2	10
3	Adequate	3			
2	Marginal				
1	Poor				

Source: VRE 2018

*Condition Assessments conducted on all VRE owned assets, as well as on all assets where VRE has direct capital responsibility

Figure E.3. VRE MASF Infrastructure Condition Assessment Ratings (2017)
(Number of MASF)

FTA TERM Scale		MAIS Infrastructure
5	Excellent	
4	Good	2
3	Adequate	
2	Marginal	
1	Poor	

Source: VRE 2018

Figure E.4. Rolling Stock ULB (2018)

CIP Timeline		Locomotives	Cab Cars	Passenger Cars
5+ Years	20	Average Remaining Useful Life 13 Years (Range: 12 to 13 Years)	21	Average Remaining Useful Life 23 Years (Range: 19 to 29 Years)
4 Years				
3 Years				
2 Years				
1 Year				
Currently Exceeding ULB				

Source: VRE 2018

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Figure E.5. Equipment ULB (2018)

CIP Timeline		Maintenance Tooling Equipment	Non-Revenue Service Vehicles
5+ Years	20	Average Remaining Useful Life 9 Years (Range: -4 to 31 Years)	5
4 Years	2		Average Remaining Useful Life
3 Years	5		6 Years
2 Years			(Range: 5 to 8 Years)
1 Year			
Currently Exceeding ULB	4		

Source: VRE 2018

VRE's attentiveness to the condition of their capital assets and SGR backlog has resulted in the overall good condition of their capital assets. Currently, the overall condition of VRE's facility, infrastructure, and rolling stock capital assets are within a SGR, and 32 of the 36 equipment assets are in a SGR. Despite that, there are still facility, infrastructure, rolling stock and equipment asset components/elements and subcomponents that need repair or replacement to maintain a SGR.

Decision Support Tools and Capital Project Prioritization

VRE has a decision support process as summarized in Figure E.6. VRE's priority for developing projects is to focus on existing assets, i.e. maintaining an existing asset versus expanding assets or implementing new services. VRE's project prioritization hierarchy used in its decision support tool is as follows:

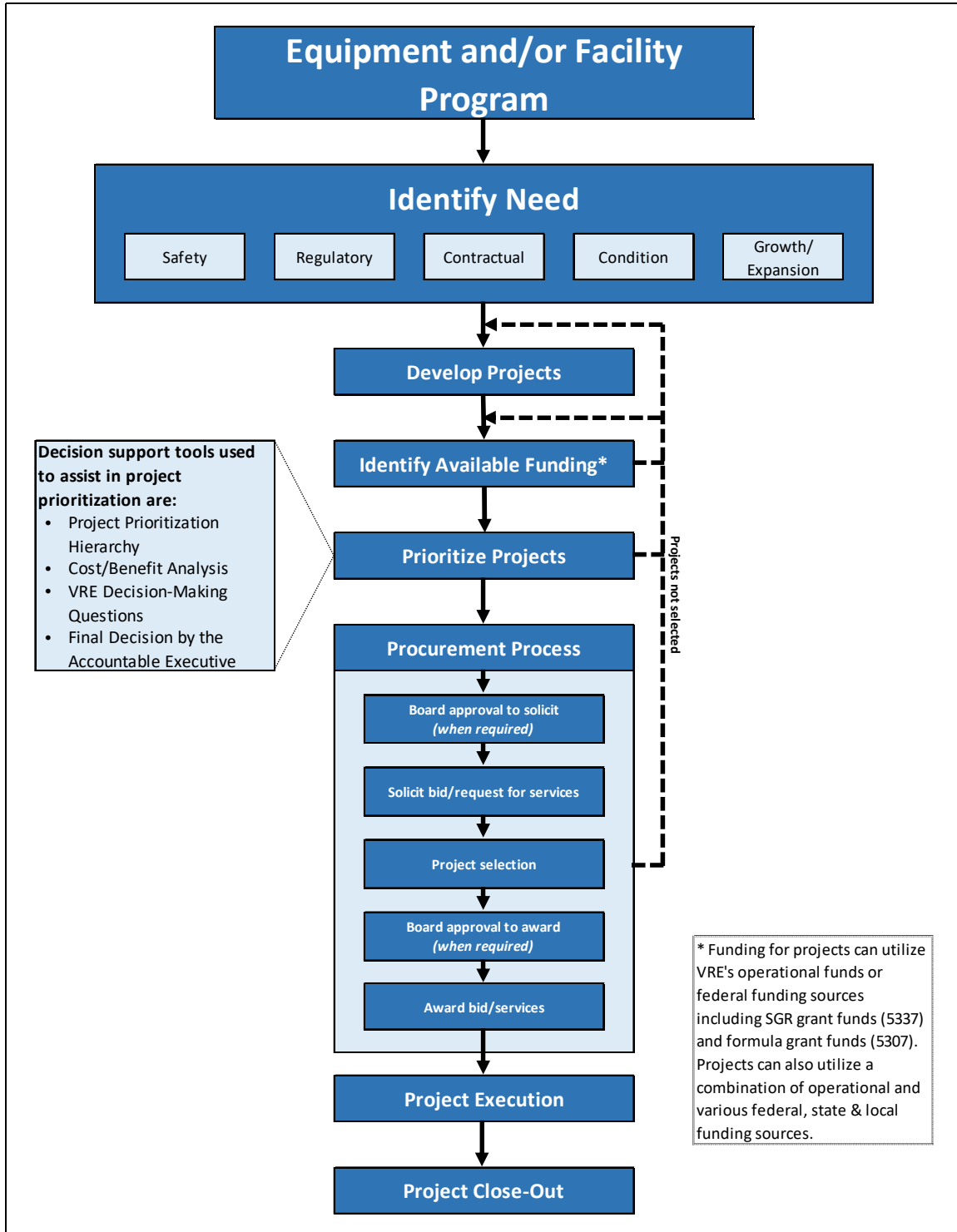
- 1a. Safety Requirements
- 1b. Regulatory Requirements
2. Contractual Obligations
3. Condition (TERM Rating/ULB)
4. Growth/Expansion

The decision support process is used to identify and select projects from the pool of SGR identified needs then program these projects as part of the next Capital Improvement Program (CIP).

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Figure E.6. Decision Support Process



Source: VRE 2018



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Implementation and Continuous Improvement

VRE will continue to implement its TAM program through adherence to FTA and NTD reporting requirements, further development and refinement of its overall TAM program, and efforts within VRE to encourage employees and stakeholders to fully embrace TAM as a practice for maintaining assets in a SGR over the lifecycle of those assets.

Implementation and improvement activities include:

- TAM related updates provided to the VRE Operations Board and VRE Capital Committee
- VRE Operations Board action items for funding of SGR projects
- VRE Operations Board action items for consulting services related to VRE's TAM program
- Updates and coordination with regional MPOs
- Coordination with member jurisdictions that share capital responsibility for VRE assets
- Coordination with host railroads that own infrastructure assets used by VRE for operating service
- Use and further development of VRE Asset Management internet-based tool
- Activities stemming from VRE's Equipment (rolling stock) and Facilities Life Cycle Maintenance programs
- Monthly safety inspections
- TAM condition assessments and any refinement to condition assessment methodologies
- Annual setting and review of adherence to performance targets
- Annual NTD reporting
- CIP updates
- Grant and funding program applications related to SGR projects
- TAM Plan updates

As required by the FTA, a full comprehensive update of the TAM Plan will be conducted every four years before the conclusion of the existing plan's horizon period. The TAM Plan will be reviewed and revised as necessary to incorporate any major improvement or changes within the four year horizon period. Revisions of the TAM Plan will ensure that the TAM Plan meets both VRE's needs and federal requirements.

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1 INTRODUCTION

This Transit Asset Management Plan (TAM Plan) sets forth Virginia Railway Express' (VRE) approach to asset management as required by the Moving Ahead for Progress in the 21st Century (MAP-21) federal transportation act. The Federal Transit Administration (FTA) issued its Final Rule on July 26, 2016 (effective October 1, 2016) which describes the Transit Asset Management (TAM) requirements¹. In addition to the federal requirements, VRE's TAM Plan provides recommendations for capital improvement and maintenance programs to meet service and performance needs, as well as, to achieve a State of Good Repair (SGR) for capital assets.

VRE is a transportation partnership of the Northern Virginia Transportation Commission (NVTC) and the Potomac and Rappahannock Transportation Commission (PRTC). VRE provides commuter rail service from the Northern Virginia suburbs, along the I-66 and I-95 corridors, to Alexandria, Crystal City, and downtown Washington, D.C.

1.1 Federal TAM Requirements

Through MAP-21 and the subsequent Fixing America's Surface Transportation (FAST) Act, the FTA has enacted transit asset management regulations that require transit service providers to develop a TAM Plan and establish asset management performance measures and targets. The Final Rule amends Chapter VI of Title 49, Code of Federal Regulations (CFR) to add part 625, which addresses TAM and amends 49 CFR part 630, which contains regulations for FTA's National Transit Database (NTD).

The Final Rule requires every transit provider receiving federal funds under 49 USC Section 53 to develop an individual TAM Plan or be part of a group plan. Basic requirements of the TAM Plan include:

- The TAM Plan must cover a horizon period of four (4) years and be updated at least once every four (4) years. The TAM Plan can be amended at any time during that period;
- The designation of an Accountable Executive;
- The establishment of SGR performance measures and targets for each asset class; and
- The annual submittal of an asset data report and a narrative report to the NTD.

Transit operators are categorized based on size, Tier I (larger, more complex) requiring nine TAM Plan elements or Tier II (smaller, less complex) requiring only the first four TAM Plan elements². This

¹ Federal Register, Volume 81 Number 143, Department of Transportation, Federal Transit Administration, 49 CFR Parts 625 and 630, National Transit Database; Transit Asset Management; Final Rule; Notices; National Transit Database: Capital Asset Reporting; Transit Asset Management: Proposed Guidebooks, July 26, 2016.

² The Final Rule categorizes transit operators based on size. Tier I operators have larger, more complex systems comprised of rail, 101 or more vehicles across fixed route modes, and/or 101 or more vehicles in one non-fixed route mode. Tier II operators have smaller, less complex systems. An operator is classified as Tier II under the Final Rule if they are a subrecipient of 5311 funds, American Indian Tribe, 100 or fewer vehicles across all fixed route modes, and/or 100 or fewer vehicles in one non-fixed route mode.

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categorization is significant, since it impacts TAM Plan responsibilities and required content. Table 1.1 identifies the nine TAM Plan elements required of VRE, as a Tier I reporting agency.

Table 1.1. TAM Plan Elements

Tier	TAM Plan Element	Description
Tier I & II	1. An asset inventory	A register of capital assets and related data on those assets
	2. Condition assessments for inventoried assets	A rating of the asset's physical state to be completed for those assets over which an agency has direct capital responsibility; should be at a level of detail sufficient to monitor and predict performance of inventoried assets
	3. Description of a decision support tool	An analytic process or tool that (1) assists in capital asset investment prioritization and/or (2) estimates capital needs over time; not necessarily a software tool
	4. A prioritized list of investments	A prioritized list of projects or programs to manage or improve the SGR of capital assets
Tier I Only	5. TAM & SGR policy	A TAM policy is the executive-level direction regarding expectations for transit asset management; a TAM strategy consists of the actions that support the implementation of the TAM policy
	6. Implementation strategy	The operational actions that a transit provider decides to conduct in order to achieve its TAM goals and policies
	7. List of key annual activities	The actions needed to implement a TAM plan for each year of the plan's horizon
	8. Identification of resources	A summary or list of resources, including personnel, that a provider needs to develop and carry out the TAM plan
	9. Evaluation plan	An outline of how a provider will monitor, update, and evaluate its TAM plan and related business practices, as needed, to ensure continuous improvement of the TAM system as a whole

Source: FTA 2017

1.2 Purpose and TAM Plan Organization

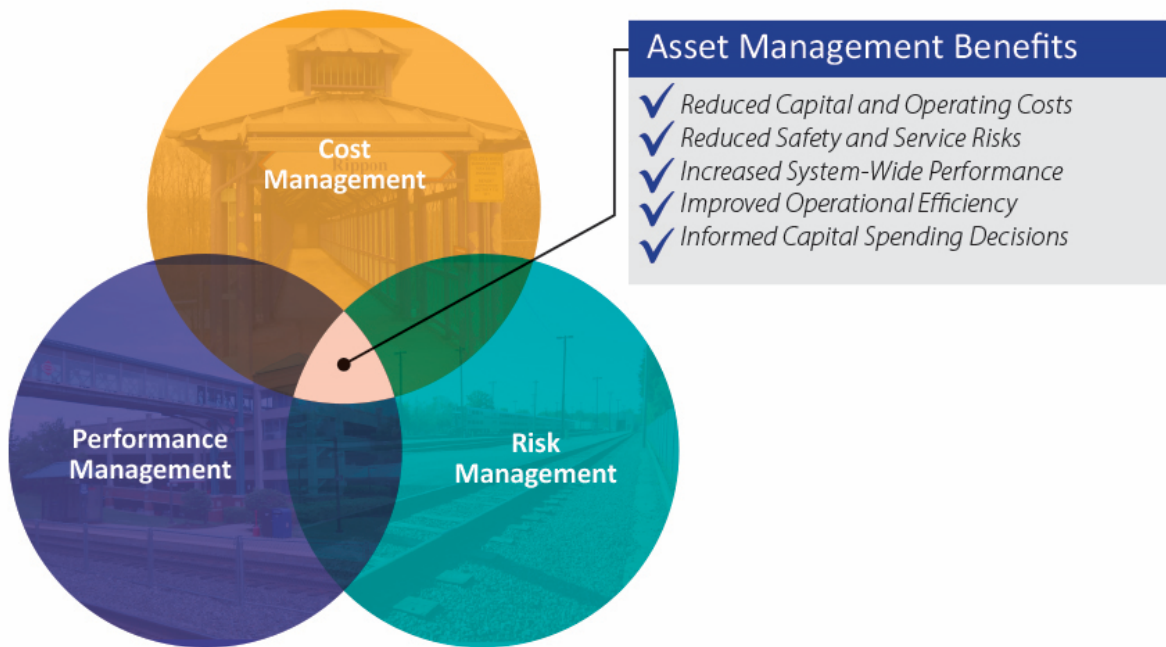
Asset management is an emerging practice by which agencies use data to make better business decisions. Recent federal legislation established requirements for transit agencies to develop an asset management plan, and track and report on the condition of their assets. At VRE, asset management is an optimized approach to managing critical assets throughout their life cycle, to deliver our organization's strategic objectives. As illustrated in Figure 1.1, asset management can be described as a better way of doing

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business to balance agency costs, performance, and risks through better integration of all tools and disciplines in an ongoing planning effort.

Figure 1.1 Asset Management to Optimize Cost, Performance, and Risk



Source: STV, 2017

VRE's transit asset management program will meet Federal requirements and assist VRE in improving operational efficiency, maintaining assets in a SGR, and making data-driven decisions regarding improvements and capital expenditures. VRE's asset management program includes the following:

- An inventory of VRE's assets
- Asset management guidelines, methodologies, and forms
- Condition assessments of assets
- Performance targets, set annually
- Implementation strategies for meeting targets
- A Transit Asset Management and State of Good Repair policy
- A formal Transit Asset Management Plan, updated every 4 years
- A prioritization process for guiding SGR improvements
- A prioritized list of investments
- Methods for tracking performance and measuring progress

This TAM Plan has been structured to address all nine of FTA's required TAM elements (Table 1.1), consisting of an executive summary, seven chapters, and numerous appendices. Table 1.2 provides a brief description of the section and the location of content relating to each TAM element. Within the TAM Plan, each TAM element is highlighted in its corresponding section including language from the federal regulation and a summary of VRE's achievements related to that particular element.

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Table 1.2. VRE's TAM Plan Outline

Section	Description	TAM Element
Executive Summary	Overview of the TAM Plan.	
<u>Chapter 1: Introduction</u>	An introduction to the TAM Plan, including FTA regulation, purpose, and description of plan development and organization.	8
<u>Chapter 2: Asset Management and State of Good Repair Policy</u>	VRE's TAM and SGR policy, goals, and objectives, all consistent with FTA direction. This section includes description of the roles and responsibility of key staff for the TAM program.	5
<u>Chapter 3: Asset Inventory</u>	A comprehensive list of VRE's asset inventory, including assets owned by VRE as well as third-party assets.	1
<u>Chapter 4: Condition Assessment</u>	A description of the methodologies utilized to conducting condition assessments for each asset category. An overview of VRE's Asset Management and NTD Reporting tool. This section includes details from the most recent condition assessment of VRE's capital assets, and identification of the SGR backlog.	2
<u>Chapter 5: Reporting</u>	A summary of the NTD reporting requirements and processes, and VRE's performance measures and targets for each asset category.	
<u>Chapter 6: Decision Support Tools and Capital Project Prioritization</u>	Identification of VRE's decision support tools and capital project prioritization approach, including analysis of VRE's capital asset SGR backlog.	3 and 4
<u>Chapter 7: Implementation Program</u>	A narrative of VRE's implementation strategy, including an implementation schedule and key activities for VRE's TAM program. A description of VRE's continuous improvement process, including coordination with MPOs and other stakeholders.	6, 7 and 9
Appendices	<u>A – References</u> <u>B – Asset Category Condition Assessment SOPs</u>	

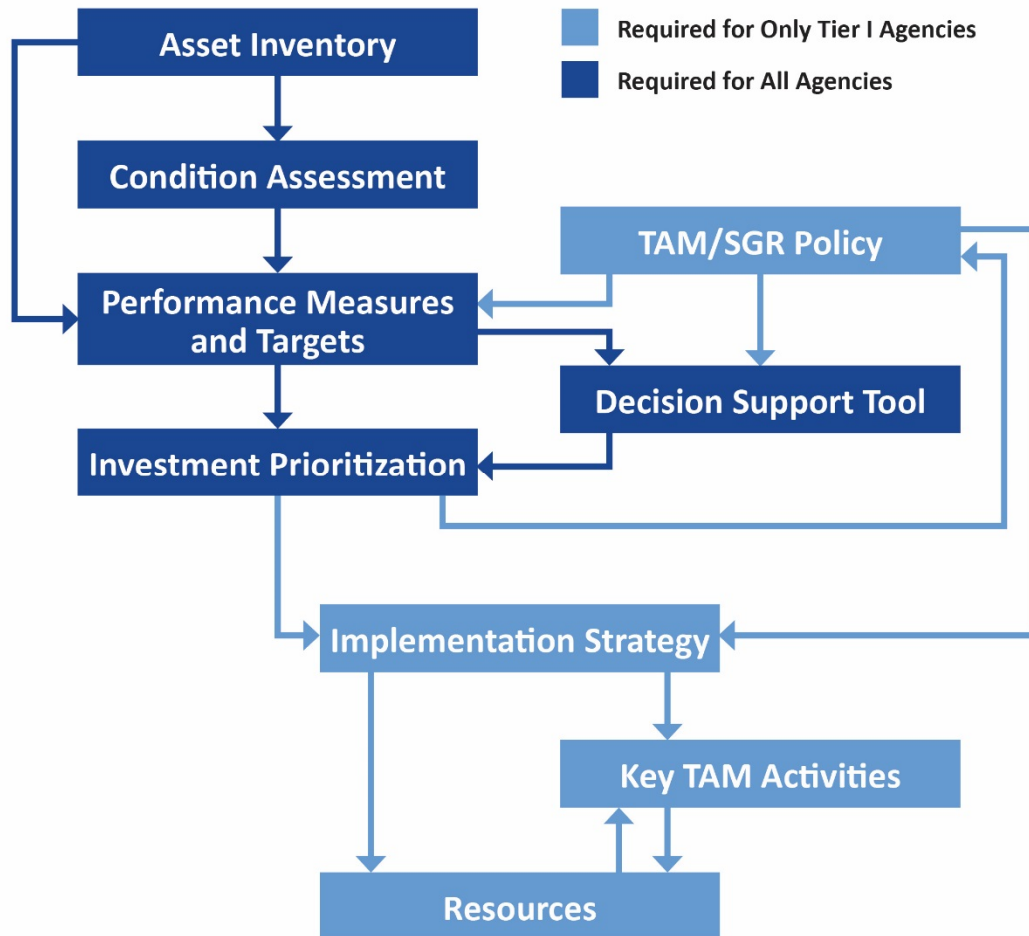
1.3 TAM Plan Development

VRE has engaged a consultant to assist in developing the appropriate information, methodologies, and processes for creating the TAM Plan and reporting to NTD as required by the Final Rule. Figure 1.2 illustrates the potential relationship between TAM Plan elements. VRE utilized the process flow depicted in this graphic during the development of its TAM Plan to ensure consistency and inclusion of FTA's required TAM elements.

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Figure 1.2 VRE TAM Plan Element Flow Chart



Source: VRE (2018) based on FTA's Compliance Checklist (December 2017)

The foundation for VRE's TAM program has been a multi-year effort that has included an initial asset inventory and condition assessments, a review of federal requirements, and a peer review of other transit agency programs. VRE's TAM program will be an on-going process, and as federal guidance and VRE's needs change, the program will evolve to match. Further discussion is detailed in *section 7.3 – Continuous Improvement*. The development of VRE's TAM Plan began with the enactment of the Final Rule. VRE has established a solid foundation for implementing their TAM program, and a summary of the initial steps in developing this TAM Plan are provided below:

- **Establish VRE's Baseline** – VRE established the framework for and conducted baseline condition assessments of their facility and infrastructure assets. This effort helped identify and organize VRE's assets, as well as establish a foundation for the future TAM Plan efforts.

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- **Review FTA Asset Management Requirements** – VRE conducted a review of MAP-21, the FAST Act, and the Final Rule to understand the requirements for a Tier I agency. A white paper and technical memorandum was prepared outlining each requirement.
- **Define VRE’s Goals and Objectives, and Formulate VRE’s TAM and SGR Policy** – VRE utilized the TAM guidance to define their goals and objectives. VRE then developed its Asset Management and SGR Policy to reinforce the TAM goals and objectives, supporting VRE’s overall mission, vision, and organizational goals.
- **Establish Performance Measures and Targets** – Using FTA guidance, VRE developed a methodology for setting targets and measuring capital asset performance. A technical memorandum was prepared describing the methodologies used to develop the 2017 performance targets for each asset category. This effort was used to establish the existing performance/condition measures of capital assets and represents the baseline for establishing targets for future years.
- **Develop Quantitative Methodologies for Tracking Assets and Supporting Standard Operating Procedures for Conducting Condition Assessments** – VRE developed methodologies and Standard Operating Procedures (SOPs) to define the processes for conducting condition assessments. These processes include condition rating scales and criteria used for each capital asset category, as well as methods for aggregating the ratings for facilities and non-revenue service infrastructure. A technical memorandum was prepared detailing the procedures for conducting facility condition assessments.
- **Develop Internet Based Tool** – As part of a multi-phase effort, VRE is developing an internet based tool to serve as a home for “all things” asset management. The tool’s initial features included an asset inventory, forms for conducting condition assessments, and the ability to calculate a SGR backlog. Continuing development efforts include an executive dashboard and a NTD reporting module.
- **Conduct Condition Assessments** – VRE conducted condition assessments in 2017 and 2018, which were aligned with the Final Rule requirements. VRE developed SOPs to provide guidelines for conducting assessments, including required documentation, assessment tasks, and lists of relevant components or elements for each asset type. The SOPs are used as a field reference when conducting condition assessments.
- **Review NTD Reporting Procedures** – VRE conducted a review of NTD reporting requirements and processes, and developed a SOP outlining the procedures for reporting asset data and the inventory narrative to NTD.
- **Establish SGR and Capital Project Prioritization Process** – VRE’s current Capital Improvement Program (CIP) was reviewed and a technical memorandum was developed. VRE examined their Equipment and Facilities Programs to determine project development steps and identify the decision support tools utilized in project prioritization.
- **Develop TAM Plan and Implementation Program** – The TAM Plan incorporates methods, processes, and findings from all of the prior initiatives. VRE’s implementation program identifies the sequence of required actions for VRE to reach their TAM goals and objectives.

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1.4 Resources

VRE's TAM Plan development included review of federal regulations/documents and a peer review of other agencies' TAM Plans. References to all of these resources are provided in Appendix A. During the development of VRE's TAM Plan numerous internal documents were produced in support of this effort.

- Long Range Life Cycle Maintenance Action Plan (February 2013)
- VRE Station and Maintenance Facilities Transit Asset Management Assessment Final Report (March 2015)
- An Introduction to Transit Asset Management (July 2016)
- Overview of FTA Asset Management Requirements White Paper (August 2016)
- MPO Coordination Technical Memorandum (November 2016)
- Performance Measures for Capital Assets Technical Memorandum (February 2017)
- Quantitative Methodologies for Conducting Facility Condition Assessments Technical Memorandum (February 2017)
- Standard Operating Procedure: Equipment Condition Assessments (April 2017)
- Standard Operating Procedure: Vehicles (Rolling Stock) Condition Assessments (April 2017)
- Standard Operating Procedure: Infrastructure Condition Assessments (June 2017)
- Standard Operating Procedure: Monthly Safety Inspections (August 2017)
- Prioritization of State of Good Repair Improvements Technical Memorandum (September 2017)
- Standard Operating Procedure: Facility Condition Assessments (October 2017)
- VRE Transit Asset Management pamphlet (November 2017)
- 2017 Facility Condition Assessment Report (December 2017)
- Overview of FTA Asset Management Plan Requirements Technical Memorandum (January 2018)
- Standard Operating Procedure: NTD Reporting (January 2018)
- Peer TAM Plan Review Technical Memorandum (February 2018)

49 CFR Part 625 Subpart C Section 625.25(b)(8) "...a TAM plan must include ... (8) A summary or list of the resources, including personnel, that a provider needs to develop and carry out the TAM plan."

VRE's TAM Plan includes a list of internal resources (Chapter 1.4), external resources (App. A), and summary of key personnel (Chapter 2.2).

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2 ASSET MANAGEMENT AND STATE OF GOOD REPAIR POLICY

This chapter provides a description of VRE's Asset Management and State of Good Repair Policy, to integrate TAM concepts throughout the agency. The following policy, objectives, and responsibilities were specified as a supportive framework to implement an agency-wide TAM Program. This chapter addresses FTA TAM element 5 (TAM and SGR policy).

2.1 TAM and SGR Policy

"VRE is adopting this Asset Management and State of Good Repair policy to support VRE's mission, to provide safe, cost effective, accessible, reliable, convenient, and comfortable commuter-oriented rail passenger service. Through this policy, VRE will work to procure, maintain and replace locomotives and railcars, stations, facilities, infrastructure and equipment to meet State of Good Repair goals and to improve operational efficiency, make informed capital spending decisions, increase performance, reduce risk agency-wide, and provide safety benefits to VRE's riders, employees, contractors and member communities.

In order to accomplish the policy, VRE will:

- 1. Develop a formalized transit asset management program.*
- 2. Establish methodologies and procedures for measuring the condition of capital assets.*
- 3. Utilize a third party contractor to perform condition assessments.*
- 4. Formalize procedures for annual reporting to the FTA.*
- 5. Establish methods in order to use compiled data to guide prioritization of VRE's capital investments."*

49 CFR Part 625 Subpart C Section 625.25(b)(5) "...a TAM plan must include ... (5) A provider's TAM and SGR policy."

VRE established an Asset Management and State of Good Repair Policy.

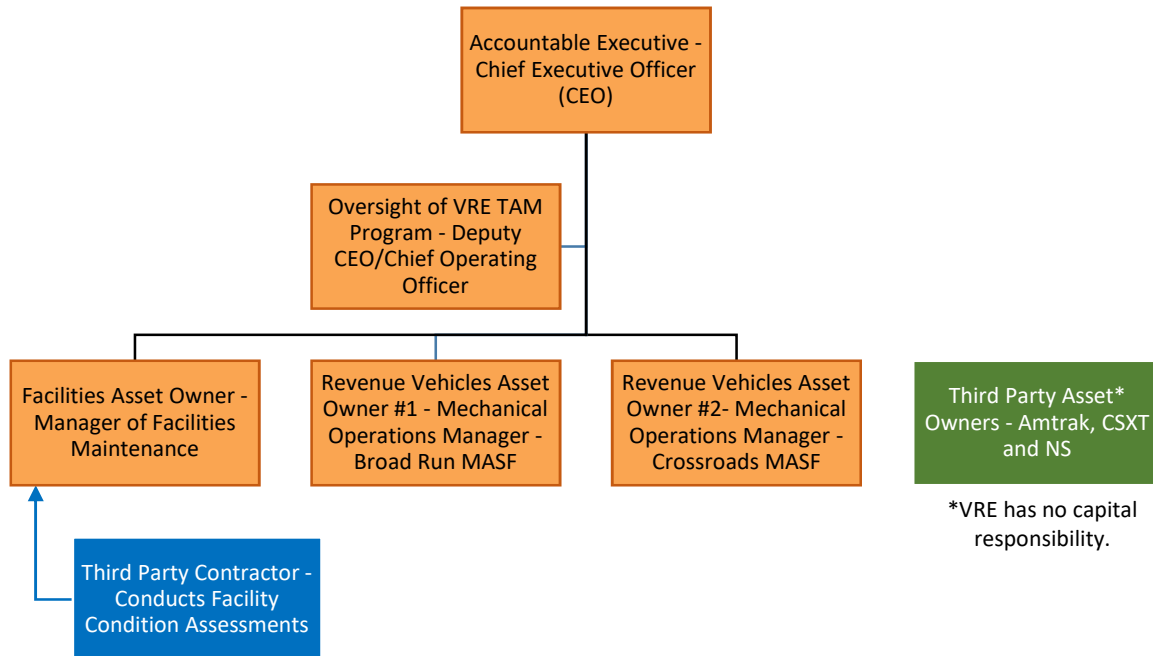
2.2 Roles and Responsibilities

Key VRE and third party personnel responsible for asset management are illustrated in an organization chart (Figure 2.1) and details of their roles and responsibilities are described below. These roles are vital for accomplishing the goals of this policy.

VIRGINIA RAILWAY EXPRESS TRANSIT ASSET MANAGEMENT PLAN



Figure 2.1. VRE Asset Management Organizational Chart



Chief Executive Officer (CEO) – is VRE’s designated **accountable executive** for asset management, per the FTA Transit Asset Management Final Rule. The accountable executive is the single, identifiable person who has ultimate responsibility for carrying out VRE’s safety management system, TAM practices, and has control or direction over the human and capital resources needed to develop and maintain both the safety plan and TAM plan. The accountable executive must establish and approve the SGR performance targets that are set each year and is responsible for ensuring that a TAM plan is developed and carried out in accordance with FTA TAM requirements.

49 CFR Part 625 Subpart C Section 625.25(a)(3) “A provider’s Accountable Executive is ultimately responsible for ensuring that a TAM plan is developed and carried out in accordance with this part.”

The designated accountable executive for VRE is the CEO.

Deputy CEO/Chief Operating Officer (COO) – oversees VRE’s asset management program and development of policies and procedures related to asset management. This individual ensures that the asset management program meets VRE’s needs related to keeping assets in a State of Good Repair, as well as ensuring that VRE’s asset management program meets FTA requirements. The Deputy CEO/COO currently has responsibility for asset management related NTD reporting, once certified by the accountable executive.

Mechanical Operations Manager - Broad Run Maintenance and Storage Facility (MASF) – is VRE’s asset owner responsible for locomotives and passenger coaches stored and maintained at the Broad Run MASF. This individual is also responsible for maintenance tooling equipment located at Broad Run. This asset owner reports the condition of assets to the CEO and Deputy CEO/COO to identify capital programming needs and provides input to the Deputy CEO/COO for development of asset management policies and procedures.

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Mechanical Operations Manager - Crossroads MASF – is VRE’s asset owner responsible for locomotives and passenger coaches stored and maintained at the Crossroads MASF. This individual is also responsible for maintenance tooling equipment located at Crossroads. This asset owner reports the condition of assets to the CEO and Deputy CEO/COO to identify capital programming needs and provides input to the Deputy CEO/COO for development of asset management policies and procedures.

Manager of Facilities Maintenance – is the asset owner within VRE responsible for all assets owned by VRE other than the locomotives, passenger coaches, maintenance tooling equipment which are under the responsibility of the two Mechanical Operations Managers. These assets include passenger, maintenance, and administrative facilities, building systems (HVAC, electrical, plumbing), communications systems, safety and security systems, lighting, office vehicles, and track within the Broad Run and Crossroads MASFs. This asset owner reports the condition of assets to the CEO and Deputy CEO/COO to identify capital programming needs and provides input to the Deputy CEO/COO for development of asset management policies and procedures.

Third Party Asset Owners – are asset owners, including the National Railroad Passenger Corporation (Amtrak), CSX Transportation (CSXT) and Norfolk Southern (NS) that are responsible for assets critical to VRE’s operation, including track and signal systems, where the assets are not owned by VRE. Third party asset owners also include VRE member jurisdictions that own the majority of parking facilities at VRE’s stations.

Third Party Contractor – are consulting firm(s) who provide technical support in developing VRE’s asset management program and this TAM Plan. Technical support includes development of technical memorandums and standard operating procedures, review of federal regulations, and completion of condition assessments.

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3 ASSET INVENTORY

This chapter provides a summary of VRE's asset inventory, including: VRE owned, leased, and third-party assets. Where applicable, inventory data includes replacement value, size, and quantity. This chapter addresses FTA TAM element 1 (Asset Inventory).












VRE provides commuter rail service from the Northern Virginia suburbs to Alexandria, Crystal City, and downtown Washington, D.C., through two (2) rail lines, the Manassas Line and the Fredericksburg Line, running along the I-66 and I-95 corridors, respectively. Together both lines account for nearly 88 miles of revenue service track, with nearly all track owned by third-party entities. The Manassas Line terminates at the Broad Run MASF and the Fredericksburg Line terminates at the Crossroads MASF.

VRE's weekly commuter service includes eight round trips daily, from each line's terminus to Union Station in Washington, D.C. and back. In total, VRE's service stops at 19 passenger stations throughout the corridor; six on the Manassas Line, nine on the Fredericksburg Line, and the remaining four running on a shared line between Alexandria and Union Station. Figure 3.1 provides an overview of VRE's assets.

49 CFR Part 625 Subpart C Section 625.25(b)(1) "...a TAM plan must include ... (1) An inventory of the number and type of capital assets. The inventory must include all capital assets that a provider owns, except equipment with an acquisition value under \$50,000 that is not a service vehicle. An inventory also must include third-party owned or jointly procured exclusive-use maintenance facilities, passenger station facilities, administrative facilities, rolling stock, and guideway infrastructure used by a provider in the provision of public transportation. The asset inventory must be organized at a level of detail commensurate with the level of detail in the provider's program of capital projects."

VRE will report its asset inventory to NTD in 2018.

Figure 3.1. VRE Asset Inventory Overview

Facilities	Infrastructure	Rolling Stock	Equipment
 19 Passenger Stations	 87.8* Miles of Operated Track	 20 Locomotives	 5 Non-Revenue Service Vehicles
 36* Passenger Parking Facilities	 2 MASF Yards	 21 Cab Cars	 31 Maintenance Tooling Equipment
 2 Administrative Buildings		 79 Passenger Cars	
 10 Maintenance Buildings			

Source: VRE 2018

*Includes inventory of VRE owned and third-party owned assets.

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3.1 VRE Owned Assets

VRE's capital asset inventory is organized into four categories: facilities, infrastructure, rolling stock and equipment. Each category encompasses several unique asset classes. Details on the individual assets within each category are provided in the sections below.

3.1.1 Facilities

VRE owns and operates 35 facility assets within Northern Virginia, including two (2) administrative buildings, ten (10) maintenance buildings, nineteen (19) passenger stations, and four (4) passenger parking facilities. Details on these facility assets are provided in Table 3.1.

Table 3.1. Facility Asset

Quantity	Facilities	Size
Administrative Building		Square Feet
2	Alexandria Headquarters (Suite 201/202)	4,148/11,500
	Fredericksburg Office	2,500
Maintenance Building		Square Feet
10	Broad Run MASF	185,000
	Broad Run Crew Building (B1)	1,350
	Broad Run Trailer (B2)	750
	Broad Run Service & Inspection (S&I) Facility (B3)	11,000
	Crossroads MASF	263,000
	Crossroads Warehouse Offices (C1)	1,350
	Crossroads Warehouse (C2)	6,000
	Crossroads Crew Building (C3)	1,350
	Crossroads S&I Facility (C4)	11,300
	Crossroads Vehicle Wash (C5)	3,488
Passenger Stations		Total Platform Length (FT)
19	Alexandria ¹	742
	Backlick Road	400
	Broad Run/Airport	600
	Brooke	400
	Burke Centre	680
	Crystal City	400
	Franconia/Springfield	550
	Fredericksburg ¹	520
	Leeland Road	400
	L'Enfant	556

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Quantity	Facilities	Size
	Lorton	700
	Manassas ¹	654
	Manassas Park	705
	Quantico ²	420
	Rippon	400
	Rolling Road	400
	Spotsylvania	700
	Union Station ³	N/A
	Woodbridge	1,010
Passenger Parking Facilities		Spaces
4	Broad Run Main Lot	387
	Fredericksburg – Lot G/Gravel Lot	250/182
	Manassas Garage	421
	Quantico – South Lot	196

¹ The historic station buildings at Alexandria, Fredericksburg, and Manassas are owned and maintained by third-party entities.
² VRE maintains the asset, however; the Quantico Station building is owned by CSX.
³ VRE owns and operates several subcomponent level assets, however; Union Station is owned by Amtrak.

Source: VRE 2018

3.1.2 Infrastructure

The majority of revenue service track (87.8 miles) that VRE operates on is owned by CSXT, NS, and Amtrak. VRE owns only 0.11 mile of revenue service siding track through the Broad Run/Airport Station and into the Broad Run MASF, as well as, the non-revenue track located at both the Broad Run and Crossroads MASFs. Details on these assets are provided in Table 3.2.

Table 3.2. Infrastructure Asset

Asset Class	Location	Size
Commuter Rail (Revenue Service)	Broad Run/Airport Station	0.11 mile
MASF	Broad Run MASF	8,768 linear feet
	Crossroads MASF	11,241 linear feet

Source: VRE 2018

3.1.3 Rolling Stock

VRE owns and operates 120 rolling stock assets, including: commuter rail locomotives, and three (3) types of passenger cars: cab cars (with toilets), and trailer cars (with and without toilets). Details on these assets are provided in Table 3.3.

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Table 3.3. Rolling Stock Assets

Asset Class	Manufacturer	Model	Asset Name	ULB ³	Quantity	Vehicle Numbers
Commuter Rail Locomotives	MotivePower, Incorporated (MPI)	MP36PH-3C	Locomotives	20 Years	20	V50-V69
Commuter Rail Cab Cars	Nippon Sharyo	Gallery IV Cab Car (with toilet)	Cab Car-T	30 Years	21	V710-V730
Commuter Rail Trailer Cars	Nippon Sharyo	Gallery IV Trailer Car (with toilet)	Passenger Car - T	30 Years	49	V800-V848
	Nippon Sharyo	Gallery IV Trailer Car	Passenger Car	30 Years	30	V850-V879

Source: VRE 2018

3.1.4 Equipment

VRE owns and operates non-revenue service vehicles, as well as many different types of maintenance tooling equipment including forklifts, scissor lifts, Taylor Dunn carts, maintenance jacks, and overhead cranes. All of the maintenance tooling equipment are located at the Broad Run or Crossroads MASFs. Details on these assets are provided in Table 3.4.

Table 3.4. Equipment Assets

Name	Location	ULB	Quantity
Maintenance Tooling Equipment			
Forklift – Nissan 100	Crossroads S&I	7 Years	1
Forklift – Hyster H60XM 6,000lb	Crossroads S&I/Warehouse	7 Years	2
Forklift – Caterpillar GP45K1 10,000lb	Broad Run S&I	7 Years	1
Taylor Dunn Cart – T48-48	Crossroads MASF	10 Years	2
Taylor Dunn Cart – T48-48	Broad Run MASF	10 Years	2
2007 Crown RD5200 Standup Forklift	Crossroads Warehouse	7 Years	1
Genie GS-2032 Scissor Lift	Broad Run MASF	12 Years	1
Genie GS-3268RT Scissor Lift	Crossroads MASF	12 Years	1
Sanding Cart	Broad Run MASF	10 Years	1
Sanding Cart	Crossroads MASF	10 Years	1
Macton 50 Ton Loco Lifts (quantity 4)	Crossroads MASF	20 Years	4
Macton 50 Ton Loco Lifts (quantity 4)	Broad Run MASF	20 Years	4
Whiting 20 Ton Car Lifts (quantity 4)	Crossroads MASF	25 Years	4

³ ULB – Useful Life Benchmark

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Name	Location	ULB	Quantity
Whiting 20 Ton Car Lifts (quantity 4)	Broad Run MASF	25 Years	4
DeShazo TR-SG-DM 10 Ton Crane	Crossroads MASF	40 Years	1
DeShazo TR-SG-DM 10 Ton Crane	Broad Run MASF	40 Years	1
Non-Revenue Service Vehicles			
2016 Ford Van (Transit Van)	Alexandria Headquarters	8 Years	1
2015 Ford F-250	Alexandria Headquarters	8 Years	1
2017 Ford F-150	Alexandria Headquarters	8 Years	1
2018 Ford Transit Connect Wagon	Alexandria Headquarters	8 Years	1
2018 Ford Explorer	Alexandria Headquarters	8 Years	1

Source: VRE 2018

3.2 Replacement Values

The replacement value of VRE's total asset inventory is estimated to be over \$390,041,690 (2018 dollars). Table 3.5 provides a summary of VRE's owned assets and replacement values.

Table 3.5. Asset Inventory Replacement Cost (VRE Owned)

Asset Category	Asset Class	Number of Asset Records	Estimated Replacement Cost	% of Asset Base
Rolling Stock	Commuter Rail Locomotives	20	\$78,919,358	20.23%
	Commuter Rail Cab Cars	21	\$38,200,903	9.79%
	Commuter Rail Passenger Cars	79	\$202,845,667	52.01%
Equipment	Non-Revenue Vehicles	5	\$162,127	0.04%
	Maintenance Tooling	31	\$1,302,972	0.33%
Infrastructure	Commuter Rail	0.11 mile	\$76,666	0.02%
	MASFs	2	\$3,201,188	0.82%
Facilities	Administrative Buildings	2	\$1,883,071	0.48%
	Maintenance Buildings	10	\$15,434,711	3.96%
	Passenger Stations	19	\$35,000,027	8.97%
	Passenger Parking Facilities	4	\$13,015,000	3.34%
TOTAL			\$390,041,690	100.00%

Source: VRE 2018

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Nearly all of VRE's assets will require replacement as they reach the end of their useful life. Assets such as rolling stock, will require overhauls or annual capital maintenance to renew asset performance. Exceptions include the Alexandria, Fredericksburg, Manassas, Quantico, and Woodbridge passenger stations, which have been deemed historic and unreplaceable, and are assumed to be rehabilitated indefinitely. VRE is directly responsible for maintaining the Quantico and Woodbridge historic station buildings. The historic station buildings at Alexandria, Fredericksburg, and Manassas; while used by VRE, are owned and maintained by third parties.

3.3 Third-Party Owned Assets

VRE will work with the freight railroads and other third-party owners to determine a reasonable method to inventory non-VRE-owned assets used in the provision of its transit services. VRE leases the rights to operate on track owned by CSXT, NS, and Amtrak. VRE's Manassas Line operates on track owned by NS, while the Fredericksburg Line operates on CSXT owned track. The majority of the shared line portion of track is also owned by CSXT, except for a small portion into Union Station which is owned by Amtrak. Details on the third-party infrastructure asset inventory are provided in Table 3.6.

Table 3.6. Third Party Infrastructure Asset Inventory

Asset Class	Name	Third-Party Owner	Quantity (Miles)
Commuter Rail	Manassas Line	NS	27.6
	Fredericksburg Line	CSXT	51.9
	Shared Line	CSXT	7.0
		Amtrak	1.3
Total			87.8

Source: VRE 2018

In addition to the four (4) VRE-owned passenger parking facilities, VRE leases parking spaces or has availability to use parking spaces at the majority of their passenger stations. Although VRE does not directly own these passenger parking facilities, VRE provides maintenance (regular and seasonal) and resurfacing/painting services to many of these facilities. Details on the passenger parking facilities leased by VRE and passenger parking facilities used by VRE are provided in Table 3.7 and Table 3.8., respectively.

Table 3.7. Third Party Passenger Parking Facilities (Leased)

Name	Lessor	Spaces
Broad Run Parking (Barn Lot)	Prince William County	113
Broad Run Airport Lot (Manassas Airport Lease)	City of Manassas	81
Fredericksburg – Lot A	Tommy Mitchell	23
Fredericksburg – Lot C	AFM LLC (Thomas J. Wack Co.)	30
Fredericksburg – Lot D	Wilson Realty	19
Fredericksburg – Lot E	Jack and Mona Albertine	40

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Name	Lessor	Spaces
Fredericksburg – Lot H	New City Fellowship of Fredericksburg	127
Fredericksburg ADA Parking Lot	Fredericksburg City Council	13
Rippon Parking Lot	KP Big Crest Lane, LLC	320
Total		766

Source: VRE 2018

Table 3.8. Third Party Passenger Parking Facilities (Utilized)

Name	Owner	Spaces
Backlick Road Surface Lot	Fairfax County	217
Broad Run Middle Lot	Prince William County	314
Broad Run Expansion Lot	Prince William County	180
Brooke Station Surface Lots (2)	VDOT	727
Burke Centre Surface Lots (2)	Fairfax County	239
Burke Centre Garage	Fairfax County	1,265
Fredericksburg - Lot B	City of Fredericksburg	107
Leeland Road Station Surface Lot	Stafford County	1,029
Lorton Station Surface Lot	Fairfax County	683
Manassas Surface Lot	City of Manassas	265
Manassas Park Surface Lots (2)	City of Manassas Park	616
Quantico Lot	Prince William County	93
Rippon Parking Lot - Main	Prince William County	336
Rolling Road Surface Lot	Fairfax County	368
Spotsylvania Surface Lots (3)	VDOT	1,475
Woodbridge Station Surface Lot	Prince William County	150
Woodbridge Station Garage	Prince William County	588
Total		8,652

Source: VRE 2018

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4 CONDITION ASSESSMENT

This chapter provides a description of VRE’s methodologies and processes for performing condition assessments, as well as a summary of the most recent condition assessments within each asset category. Details on the SGR backlog for each asset category are also provided. This chapter addresses FTA TAM element 2 (Condition Assessments).

VRE performs condition assessments on four categories of assets: facilities, infrastructure, rolling stock, and equipment. As required by FTA, condition assessments are conducted on all VRE owned assets, as well as on all assets where VRE has direct capital responsibility. Consequently, condition assessments were not performed on third-party owned assets, where VRE does not have direct capital responsibility.

Condition data for each asset category is collected using different methodologies. VRE’s assets and their components or elements deteriorate at different rates, thus requiring assessments conducted in varying timeframes. Given these differences, condition data is not easily comparable across asset categories, even when similar condition rating scales are used; consequently, this section highlights the assessment methodology and asset condition within each asset category.

49 CFR Part 625 Subpart C Section 625.25(b)(2) “...a TAM plan must include ... (2) A condition assessment of those inventoried assets for which a provider has direct capital responsibility. A condition assessment must generate information in a level of detail sufficient to monitor and predict the performance of the assets and to inform the investment prioritization.”

VRE completed facility and infrastructure condition assessments in 2014 and 2017, while equipment and rolling stock condition assessments were only performed in 2018.

4.1 Methodology

Using the performance measures identified by FTA’s Final Rule, VRE has developed quantitative methodologies for calculating the performance or condition of each transit asset. The different methodologies applicable for each asset category are described in the sections below.

4.1.1 Facilities and Infrastructure (Non-Revenue Service)

The overall condition for facilities and infrastructure (maintenance yards only) is reported using the five-point scale used by FTA’s Transit Economic Requirements Model (TERM), outlined in Figure 4.1. While the TERM scale is prescribed for facility assets, VRE adopted this methodology for assessing its non-revenue service infrastructure located at the two MASFs (Broad Run and Crossroads). VRE uses integer ratings to align with the FTA Facility Performance Measure Reporting Guidebook: Condition Assessment Calculation⁴.

VRE’s approach is to divide the facility and infrastructure assets into major components and subcomponents. Each relevant subcomponent is assessed and rated using the TERM scale. Table 4.1 provides further details on the condition rating scales established by FTA. Data from these assessments is aggregated using

Figure 4.1. FTA
TERM 5-Point Scale

FTA TERM Scale

5	Excellent
4	Good
3	Adequate
2	Marginal
1	Poor

⁴ FTA TAM Facility Performance Measure Reporting Guidebook: Condition Assessment Calculation, April 2017.

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FTA's Median Value Method⁵ to provide an overall facility and infrastructure rating. Assets with condition ratings at 3-Adequate or above are considered to be in a state of good repair. Whereas, condition ratings of 1-Poor or 2-Marginal are considered to not be in a state of good repair.

Table 4.1. General Condition Assessment Rating Scales

Rating	Condition	Description
5	Excellent	No visible defects, new or near new condition, may still be under warranty if applicable.
4	Good	Good condition, but no longer new, may have some slightly defective or deteriorated system(s), but is overall functional.
3	Adequate	Moderately deteriorated or defective system(s); but has not exceeded useful life.
2	Marginal	Defective or deteriorated system(s) in need of replacement; exceeded useful life.
1	Poor	Critically damaged system(s) or in need of immediate repair; well past useful life.

Source: FTA Facility Performance Measure Reporting Guidebook: Condition Assessment Calculation

VRE has developed comprehensive condition assessment Standard Operating Procedures (SOPs) for both the facility and infrastructure assets (Appendix B), outlining the requirements and procedures to be followed when conducting an assessment.

4.1.2 Infrastructure (Revenue Service)

The infrastructure condition (revenue service) is determined by the impact of performance restrictions (slow zones)⁶ on in-service operation, as a percentage of slow zone miles compared to total miles traveled by VRE trains. Annual values are based on 244 days of standard operation, which excludes weekends and holidays when VRE is not operating in revenue service and also excludes "S" schedule operations, when only half of trains are running. However, the only revenue service track that VRE owns is considered siding track and the slow zone calculation is not required.

4.1.3 Rolling Stock and Equipment

The overall condition of rolling stock and equipment is evaluated based on their Useful Life Benchmarks (ULBs). The Final Rule allows a transit provider to determine its own ULBs, based on knowledge of its operating environment and the performance of its individual assets. Regular maintenance of these assets can assist in the extension of the assets' ULB. Each transit provider will need to determine what investments should be made in order to improve the performance of its transit system. ULB is used for performance measure metrics not for investment prioritization.

⁵ FTA TAM Facility Performance Measure Reporting Guidebook: Condition Assessment Calculation, Alternative 2: Median Value (pg. 22-23), April 2017.

⁶ FTA TAM Infrastructure Performance Measure Reporting Guidebook: Performance Restriction (Slow Zone) Calculation, April 2017.

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Condition and SGR backlog of rolling stock and equipment assets are not based solely on the ULB. VRE gives consideration to safety issues, regulation changes, performance measures, and customer comfort that may influence the SGR condition of the assets. Individual rolling stock and equipment asset components may not be in a SGR, even before the asset reaches its ULB (i.e. malfunctioning HVAC in a passenger car).

VRE has developed a comprehensive condition assessment SOP (Appendix B) for both the rolling stock and equipment assets, outlining the requirements and procedures to be followed when conducting an assessment.

4.2 Asset Management and NTD Reporting Tool

VRE has developed an internet-based tool that houses VRE's asset inventories and facilitates the completion of condition assessments and safety inspections. The internet tool is part of a multi-phase effort, and initial functionality of the internet tool was deployed in 2017. The tool is designed to enable user friendly access to condition assessments and asset inventories in the office and field. Mobile, internet access allows users to input data directly into the database, eliminating duplication of effort and saving time. Currently, forms can be exported to Adobe PDF or Microsoft Excel files for use in reports and further analysis. The initial functionality of the tool included: an inventory of assets, procedures and forms for conducting condition assessments, and the ability to calculate the SGR backlog of assets. Using the internet tool the VRE user can:

- View and manage critical and non-critical asset inventories,
- Conduct facility condition assessments,
- Perform monthly station safety inspections,
- Conduct useful life analysis for equipment and rolling stock, and
- Perform non-revenue infrastructure condition assessments at the Broad Run and Crossroads MASFs.



Using a tablet computer, VRE has access to the new internet tool in the field. When conducting the TERM based facility and non-revenue infrastructure assessments, VRE's inspector schedules the assessment to be conducted, and once on site, accesses the planned assessment. A dropdown menu displays the relevant components to that facility and the tool provides the availability to "tab" through the different components and complete the assessment in any order. Once a component is selected the relevant subcomponents are displayed. Ratings and comments can then be added to each individual subcomponent. The inspector can then select the calculate button to aggregate all subcomponent ratings into a component rating, then aggregate the component ratings into an overall facility rating.



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Conducting ULB age-based condition assessments for rolling stock and equipment assets can be done at any time. Each piece of equipment or vehicle inventoried in the tool, includes its original “in service” date and/or manufactured year. A report can be generated that includes a countdown indicating when each piece of equipment or vehicle will reach its ULB or how long they have exceeded their ULB.

In future development phases, VRE’s internet tool will continue to evolve to align with their specific goals and meet future needs. Additional features in development include an executive dashboard and the incorporation of the NTD reporting requirements. The executive dashboard will provide the user with a high level view of VRE’s current asset inventory, condition of assets, and SGR backlog. The user would have the capability to “drill down” to specific sections for more detailed information. Initial functionality of the executive dashboard was deployed in the spring of 2018 with full functionality planned by the end of the year. The internet tool’s future NTD reporting module will align with NTD reporting requirements and provide a single location for asset management information, link related databases, and streamline reporting processes.

4.3 Facilities

The initial condition assessments of VRE’s facility assets were performed in 2014. After the Final Rule was published in July 2016, VRE aligned their assessment procedure to better match FTA guidance. Condition assessments were again performed on VRE’s facility assets in the summer of 2017. Condition assessments were performed on a total of 34 facility assets including; two (2) administrative buildings, ten (10) maintenance buildings, nineteen (19) passenger stations, and three (3) passenger parking facilities⁷. The assessments were completed using the newly developed internet tool.

In addition to following FTA requirements, conducting condition assessments for VRE’s facility assets provides the opportunity to inspect and ensure subcomponents are maintained in a SGR and safety goals are met. Assessment of the individual subcomponents allowed VRE to identify the asset condition and assist in evaluating whether assets will require replacement or continued maintenance.

Results of VRE’s 2017 condition assessment identified that the overall condition rating for each of the 34 facilities is in a SGR⁸. The majority (30 of 34) of VRE’s facility assets received an overall rating of 4-Good. As depicted in Figure 4.2, only four passenger stations received a rating other than 4-Good; the Spotsylvania passenger station, which opened in 2015, received an overall rating of 5 Excellent, and the Alexandria, Lorton, and Quantico passenger stations received overall ratings of 3 Adequate. At the time of the 2017 assessments, the Alexandria passenger station, a historical station, had numerous subcomponents in need of maintenance or repair. The Lorton passenger station was under construction for a facility upgrade and expansion, and the Quantico passenger station was awaiting scheduled upgrades as part of larger adjacent projects.

⁷ The condition assessment for the Manassas Parking Garage was completed in the spring of 2018. This facility received an overall TERM rating of 4.

⁸ VRE 2017 Facility Condition Assessment Report, December 2017.

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Figure 4.2. VRE Facility Condition Assessment Ratings (2017/2018)
(Number of facilities)

FTA TERM Scale		Passenger Stations	Passenger Parking Facilities*	Administrative Buildings	Maintenance Buildings
5	Excellent	1			
4	Good	15	4	2	10
3	Adequate	3			
2	Marginal				
1	Poor				

Source: VRE 2018

*Condition Assessments conducted on all VRE owned assets, as well as on all assets where VRE has direct capital responsibility

While the overall condition of VRE's facility assets is within a SGR, twenty-three of VRE's facilities have at least one subcomponent that is not within a SGR. Depending on the level of deterioration or useful life, the subcomponent could require general maintenance or a capital replacement to return to a SGR. Based on the 2017/2018 condition assessments, SGR backlog included:

- Deficient communications cabinets at all passenger stations - Communications cabinets lack rear access panels for attending to the equipment components. This complicates the required maintenance activities and replacement/upgrade of equipment, increasing the time required and subsequently, cost of the repairs/installations.
- Inadequate/outdated lighting at several passenger stations - Stations without LED lighting, broken fixtures, inadequate lighting under platform.
- Deficient drainage at several passenger stations - Poor drainage at several stations has resulted in the accelerated deterioration of the platform and other structural subcomponents.
- Deterioration of concrete platforms at the Crystal City and L'Enfant passenger stations - Damage to concrete surface of the platform at these passenger stations include cracks, spalls, delamination, and rust stains. These damages pose potential safety (trip) hazards to riders and personnel, as well as superficial degradation of the station.
- Water damage and inadequate "patching" on exterior stairs at L'Enfant passenger station - Evidence of water damage on stairs has resulted in concrete cracking and rust. Several nosings on the south stair are loose and an asphalt patch at the base of the north stair is a possible trip hazard.
- Deficient/inadequate finishes (all painting and masonry) and signage at several passenger stations - Paint work at several passenger stations was done poorly, resulting in extensive chipping and poor application. Signage at several passenger stations was faded, broken, or missing.

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4.4 Infrastructure

4.4.1 Revenue Service

VRE trains travel on CSXT, NS or Amtrak -owned track for the majority of revenue service. VRE only owns 0.11 mile of revenue service track that passes through the Broad Run/Airport Station and into the Broad Run MASF. This portion of revenue service track is considered siding track and a slow zone calculation is not required.

4.4.2 Non-Revenue Service

VRE performed assessments of non-revenue track, switches, derails, ties, switch ties, and bumper blocks in the Broad Run and Crossroads MASFs in the summer of 2017⁹. VRE recorded the visual condition of the yard track elements according to the TERM condition criteria. The results of the 2017 infrastructure condition assessments identified the overall condition rating for both MASFs as in a SGR (Figure 4.3).

Figure 4.3. VRE Infrastructure
Condition Assessment Ratings (2017)
(Number of MASF)

FTA TERM Scale		MASF Infrastructure
5	Excellent	
4	Good	2
3	Adequate	
2	Marginal	
1	Poor	

Source: VRE 2018

While the overall rating for both MASF tracks and their elements are rated a 4-Good, there are some sections that require replacement or maintenance to remain within a SGR. Specifically, the 1/0 N switch at the Crossroads MASF has major damage to the frog, requiring replacement. At both MASFs, several track segments require the renewal of a percentage (5 to 50%) of ties and switch ties to maintain a SGR.

4.5 Rolling Stock

The ULB for VRE rolling stock is detailed in the technical specifications for each vehicle (revenue service) type. VRE's rolling stock assets include twenty (20) locomotives, twenty-one (21) cab car-T, thirty (30) passenger cars, and forty-nine (49) passenger car-T. The ULB for each vehicle type are compared with in-service dates to determine if the vehicles have exceeded their ULB and; therefore, are not within a SGR.

Using the ULB, all of VRE's rolling stock assets are considered to be within a SGR. Locomotives have a 20 year ULB and cab/passenger cars have a 30 year ULB. The oldest locomotive went into service in 2010 and

⁹ VRE 2017 Facility Condition Assessment Report, December 2017.

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will reach its ULB in 2030. The oldest cab/passenger car went into service in 2007 and will reach its ULB in 2037. The average remaining years of useful life for VRE's rolling stock assets is 20 years. Detail for each rolling stock asset class: locomotives, cab cars, and passenger cars, is provided in Figure 4.4.

Figure 4.4. Rolling Stock ULB (2018)

CIP Timeline		Locomotives	Cab Cars	Passenger Cars
5+ Years	20	Average Remaining Useful Life 13 Years (Range: 12 to 13 Years)	21	Average Remaining Useful Life 23 Years (Range: 19 to 29 Years)
4 Years				
3 Years				
2 Years				
1 Year				
Currently Exceeding ULB				

Source: VRE 2018

Procurement of rolling stock is a capital expense and typically purchased in "lots" (groups). Planning for new and replacement vehicles will be included in VRE's Capital Improvement Program (CIP). The CIP is developed annually with a horizon period of six years. Currently all rolling stock assets are outside of the horizon period, and no planning for vehicle replacement is required.

4.6 Equipment

VRE's thirty-six (36) equipment assets consist of thirty (31) pieces of maintenance tooling equipment and five (5) non-revenue service vehicles. The condition for equipment primarily takes an age-based approach. The ULB of each piece of equipment is determined by manufacturer expected useful life data or by VRE-defined ULB related to cost prohibitive maintenance benchmarks. The in-service or manufacturing date is compared to this ULB to determine whether the piece of equipment has exceeded its ULB. The manufacturing date is used when the purchase or in-service date is not available.

There is a variety of equipment included within the maintenance tooling category and the ULB for these ranges between seven (7) and forty (40) years. VRE uses FTA's eight (8) year ULB recommendation for their non-revenue service vehicles. In 2018, VRE has four pieces of maintenance tooling equipment that have exceeded their useful life:

- Forklift – Nissan 100 (Crossroads S&I)
- Forklift – Hyster H60XM 6,000lb (Crossroads S&I)
- Forklift – Hyster H60XM 6,000lb (Crossroads Warehouse)
- Forklift – Caterpillar GP45K1 10,000lb (Broad Run S&I)

Details for the maintenance tooling equipment and non-revenue service vehicles is provided in Figure 4.5.

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Figure 4.5. Equipment ULB (2018)

CIP Timeline		Maintenance Tooling Equipment	Non-Revenue Service Vehicles
5+ Years	20	Average Remaining Useful Life 9 Years (Range: -4 to 31 Years)	5
4 Years	2		Average Remaining Useful Life 6 Years (Range: 5 to 8 Years)
3 Years	5		
2 Years			
1 Year			
Currently Exceeding ULB	4		

Source: VRE 2018

Purchase of new and replacement equipment is included within VRE's CIP. The CIP is developed annually with a horizon period of six years. In addition to the four pieces of equipment that have exceeded their useful life, there are seven additional pieces of maintenance tooling equipment that will meet or exceed their ULB during the current CIP's horizon period:

- Taylor Dunn Cart 1 – T48-48 (Crossroads MASF)
- Taylor Dunn Cart 2 – T48-48 (Crossroads MASF)
- Taylor Dunn Cart 1 – T48-48 (Broad Run MASF)
- Taylor Dunn Cart 2 – T48-48 (Broad Run MASF)
- 2007 Crown RD5200 Standup Forklift (Crossroads Warehouse)
- Genie GS-2032 Scissor Lift (Broad Run MASF)
- Genie GS-3268RT Scissor Lift (Crossroads MASF)

Consideration for replacement of these pieces of equipment, will be discussed during the development of VRE's next CIP.

4.7 Summary

VRE's attentiveness to the condition of their capital assets and SGR backlog has resulted in the overall good condition of their capital assets. Currently, the overall condition of VRE's facility, infrastructure, and rolling stock capital assets are within a SGR, and 32 of the 36 equipment assets are in a SGR. Despite that, there are still facility, infrastructure, rolling stock and equipment asset components/elements and subcomponents that need repair or replacement to maintain a SGR.

VRE will perform condition assessments every 4 years and update condition information for their capital assets in future revisions of the TAM Plan.



5 REPORTING

This chapter provides a summary of the NTD reporting requirements and the applicable information for VRE, including reporting schedules, performance measure methodologies, and current performance targets. This chapter addresses FTA's TAM requirements for NTD reporting and performance measures.

5.1 Annual NTD Reporting

The Final Rule requires transit properties to report additional information related to TAM and SGR to the NTD. FTA initially developed a draft asset inventory module (as Microsoft Excel files) for agencies to report their TAM inventory and SGR information, as well as their annual performance targets.

Along with the module, FTA prepared a user guide, *2017 Asset Inventory Module Reporting Manual* and corresponding presentation¹⁰ which provides instructions and guidance on using the TAM reporting module.

VRE will submit data reports and a narrative report to the FTA. The data report information is to be input into NTD's Asset Inventory Module (AIM). Data collected for NTD reporting will overlap some of the required information within the TAM Plan, however; there are several differences, as identified in Table 5.1. The narrative report will summarize progress towards the prior set of performance targets. Required reporting elements include:

- Data reports:
 - Establishing annual performance targets
 - Facilities condition assessment ratings
 - Performance restrictions (infrastructure slow zone measure)
 - Rolling stock and equipment ULB
- Narrative report:
 - Change in condition
 - Progress toward targets

49 CFR Part 625 Subpart E Section 625.55(a) "Each provider must submit the following reports:

(1) An annual data report to FTA's National Transit Database that reflects the SGR performance targets for the following year and condition information for the provider's public transportation system.

(2) An annual narrative report to the National Transit Database that provides a description of any change in the condition of the provider's transit system from the previous year and describes the progress made during the year to meet the performance targets set in the previous reporting year."

VRE's first data report will be submitted to NTD by October 31, 2018. VRE's first narrative report will be submitted to NTD by October 31, 2019.

¹⁰ <https://www.transit.dot.gov/ntd/ntd-asset-inventory-modules-and-information>

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Table 5.1. Summary of TAM Plan and NTD Reporting Differences

Assets	TAM Plan Inventory	NTD Inventory	TAM Plan Condition Assessment	SGR Target
Revenue Vehicles				
Owned	Yes	Yes	Yes	Yes
Direct capital responsibility	Yes	Yes	Yes	Yes
3 rd party owned (direct capital responsibility)	Yes	Yes	Yes	Yes
3 rd party owned (NO direct capital responsibility)	Yes	Yes (Representative vehicles)	No	No
Equipment: Non-Revenue Vehicles (regardless of cost)				
Owned	Yes	Yes	Yes	Yes
Direct capital responsibility	Yes	Yes	Yes	Yes
3 rd party owned	No	No	No	No
Equipment: Over \$50,000 Acquisition Value				
Owned	Yes	No	Yes	No
Direct capital responsibility	Yes	No	Yes	No
3 rd party owned	No	No	No	No
Equipment: Under \$50,000 Acquisition Value	No	No	No	No
Facilities:				
Owned	Yes	Yes	Yes	Yes
Direct capital responsibility	Yes	Yes	Yes	Yes
3 rd party owned (direct capital responsibility)	Yes	Yes	Yes	Yes
3 rd party owned (NO direct capital responsibility)	Yes	Yes (Only for passenger facilities)	No	No
Infrastructure: Rail Fixed Guideway				
Owned	Yes	Yes	Yes	Yes
Direct capital responsibility	Yes	Yes	Yes	Yes
3 rd party owned (direct capital responsibility)	Yes	Yes	Yes	Yes
3 rd party owned (NO direct capital responsibility)	Yes	Yes	No	No

Source: FTA 2018

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Mandatory reporting of TAM to FTA will begin in 2018. Agency's reporting will be based on when their fiscal year ends. With a fiscal year between July 1 and June 30, VRE's reports will be due annually to FTA on October 31. Figure 5.1 shows the timeline for VRE submittals to NTD.

Figure 5.1. Submittal Timeline



Source: VRE 2017

5.2 Performance Measures and Targets

The FTA Final Rule defines the performance measures for asset categories to be used by transit properties in development of their TAM plans. As required, VRE developed performance targets for each asset class under each of the four asset categories. VRE provided these performance targets to FTA before the optional January 1, 2017 deadline and will update performance targets and submit by the initial required deadline (October 31, 2018). A brief summary of the methodology used to develop the performance targets is listed below.

- The methodology for determining performance targets for Rolling Stock and Equipment is exclusively age-based and requires determining the ULB of each piece of equipment.
- The methodology for determining performance targets for Infrastructure (revenue service) is the percentage of miles of slow zone areas that affect the total miles traveled by VRE trains. However,

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the only revenue service track that VRE owns is considered siding track and the slow zone calculation is not required.

- The methodology for determining performance targets for Facilities and Infrastructure (non-revenue service) is based on the results of facility condition assessments using FTA's TERM, as described in 4.1.1. *Facilities and Infrastructure (Non-Revenue Service)*.

Table 5.2 lists the developed performance targets for each asset class.

Table 5.2. VRE 2018 Transit Asset Performance Targets

Asset Category	Asset Class	Performance Measure	Performance Target
Rolling Stock	Commuter Rail Locomotive	Percentage of revenue vehicles within a particular asset class that have met or exceeded their Useful Life Benchmark (ULB)	0%
	Commuter Rail Cab Car		0%
	Commuter Rail Passenger Coach		0%
Equipment	Non-Revenue Service Vehicles	Percentage of equipment and (non-revenue service) vehicles that have met or exceeded their ULB	0%
Infrastructure	Commuter Rail	Percentage of track segments, signals, and systems with performance restrictions	N/A ¹
Facilities	Administrative Facilities	Percentage of facilities with a condition rating below 3.0 on the FTA Transit Economics Requirements Model (TERM) scale (1=Poor to 5=Excellent)	0%
	Maintenance Facilities		0%
	Passenger Facilities		0%
	Passenger Parking Facilities		0%
¹ VRE's owned portions of revenue service track are considered sidings and performance targets are not required.			

Source: VRE 2018



6 DECISION SUPPORT TOOLS AND CAPITAL PROJECT PRIORITIZATION

This chapter provides a description of VRE's decision support tools for both capital and operational/maintenance project planning, as well as, a summary of the capital improvement program and life cycle maintenance program. Details on how these programs and tools are utilized to address the SGR backlog is also provided. This chapter addresses FTA TAM elements 3 (Decision Support Tools) and 4 (Investment Prioritization).

6.1 Decision Support Process

VRE utilizes a top-down management approach and bottom-up analysis within their decision support process. VRE has an Equipment Program (supporting their equipment and rolling stock assets) and a Facility Program (supporting their facility and infrastructure assets). Each program is supported by a maintenance program (i.e. life cycle management) where operational/maintenance funds are utilized to maintain assets at the component/subcomponent level. These maintenance programs help identify maintenance gaps resulting in capital needs and VRE's SGR backlog.

49 CFR Part 625 Subpart C Section 625.25(b)(3) "...a TAM plan must include ... (3) A description of analytical processes or decision-support tools that a provider uses to estimate capital investment needs over time and develop its investment prioritization."

VRE utilizes a top-down management approach and bottom-up analysis within their decision support tool process.

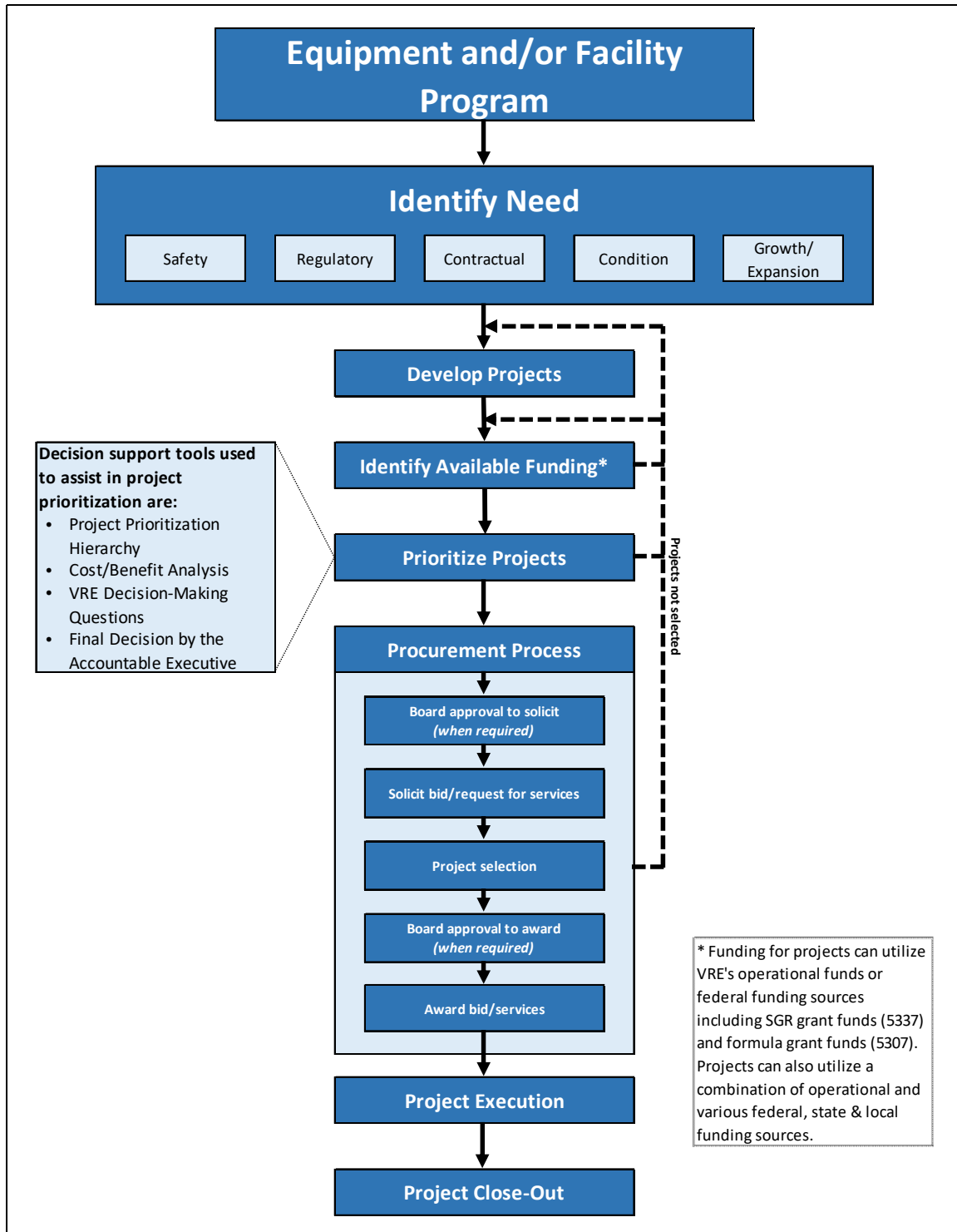
VRE, along with the Washington Metropolitan Area Transit Authority (WMATA) and Maryland Area Regional Commuter (MARC) systems, receives a regional split of federal funding sources including Urbanized Area Formula Grant (5307) and State of Good Repair Grant (5337) funds. The 5337 funds can only be used for SGR projects, while the 5307 funds can be utilized to support any aspect of the Equipment and/or Facility Programs. In unique situations, a single project can utilize both 5307 and 5337 funds.

Within the Equipment and Facility Programs, needs are identified and funding sources allocated to develop projects, supporting the respective programs. Projects that can be funded as part of VRE's operational/maintenance budget will be included within the Equipment or Facility Program's maintenance program. Capital project funding is distributed amongst the appropriate funding sources, including projects solely funded through 5337 or 5307, or projects utilizing a combination of funding sources. As assets within VRE's maintenance programs approach the end of their life cycle, they can be included in the Capital Improvement Program (CIP) to access additional funding sources (local, state, or federal), outside of VRE's operational/maintenance budget. VRE developed a decision support tool (Figure 6.1), which illustrates the process for developing and funding projects.

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Figure 6.1. Decision Support Process



Source: VRE 2018

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6.1.1 Prioritization

VRE's priority for developing projects is to focus on existing assets, i.e. maintaining an existing asset versus expanding assets or implementing new services. VRE's project prioritization hierarchy used in its decision support tool is as follows:

- 1a. Safety Requirements
- 1b. Regulatory Requirements
2. Contractual Obligations
3. Condition (TERM Rating/ULB)
4. Growth/Expansion

In VRE's project prioritization process, the highest priority is given to both safety and regulatory requirements, to ensure passenger and staff safety throughout VRE's service. The next project priority is given to contractual obligations, where VRE has an agreement with another agency (CSXT, NS, et. al.) to complete portions of or entire projects. The final priority for existing assets is projects developed based solely on asset condition, i.e. assets not in a SGR and not already covered under a higher priority level project. Additionally, VRE develops projects relating to growth or expansion of assets, services, and facilities. VRE's growth/expansion projects consider the capacity of its trains (seats), platforms, and parking lots (spaces). Projects can fall into multiple categories, for example, Positive Train Control (PTC) requirements are both a regulatory and safety mandate. Projects within multiple categories will be "ranked" based on the higher applicable category.

49 CFR Part 625 Subpart C Section 625.25(b)(4) "...a TAM plan must include ... (4) A provider's project-based prioritization of investments developed in accordance with § 625.33 of this part."

VRE's priority is focused on existing assets. VRE prioritizes its investments based on (1a-b) safety and regulatory requirements, (2) contractual obligations, (3) condition of assets, and (4) growth/expansion.

A benefit-cost analysis and VRE's Decision-Making Factors (details provided below in 6.2 *Capital Improvement Program*) can also be applied to assist in the project prioritization process. However, the Accountable Executive will make an informed, final decision on which projects get selected using the available funds. Subsequently, projects selected will be completed and assets returned to a SGR. Projects not selected within the current cycle will be returned to the project development phase to await prioritization within the next cycle.

6.2 Capital Improvement Program (CIP)

The CIP is a comprehensive inventory of VRE's capital needs, and the capital funding sources that have been identified for the six years of the plan. The primary purpose of the CIP is to provide a realistic picture of the funding outlook and the challenges VRE faces in securing adequate funding to pay for capital improvement projects. These projects are designed to maintain and enhance VRE's service by:

- Renovating and strengthening the core system;
- Improving the system's security and reliability; and
- Modernizing and expanding the system to accommodate increasing ridership demand.

In order to address funding challenges, VRE's CIP centers on the fundamental need to prioritize the most vital initiatives and investments necessary to achieve key safety, reliability, capacity, and sustainability goals. The capital budget is driven primarily by the need to meet established programmatic commitments and maintain the necessary financial capacity to address the most acute emerging and longstanding needs

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required to maintain the safety and reliability of essential capital assets. As a result, the majority of VRE's FY 2019 planned capital investment is programmed for asset management and ensuring that assets are in a SGR.

In an effort to organize capital improvement projects in a logical manner, VRE has identified seven different project improvement categories for both SGR and expansion project implementation (Figure 6.2). Projects are organized within the CIP by their project improvement category.

Figure 6.2. Project Improvement Category

Asset Management/ State of Good Repair (AM)	<ul style="list-style-type: none"> Refers to projects that ensure that assets perform at their highest level throughout their service life, and to the formal effort to consistently address, evaluate, analyze and prioritize the condition of VRE's rolling stock and facilities.
Passenger Station Facilities (ST)	<ul style="list-style-type: none"> Includes projects that lengthen or widen existing station platforms, construct new platforms at current stations or add new stations to the system.
Rolling Stock Equipment (RS)	<ul style="list-style-type: none"> Refers to the purchase of replacement or expansion locomotives and coaches; coaches may be either cab cars or trailers.
Station Parking (PK)	<ul style="list-style-type: none"> Includes projects that modify or expand parking at specific VRE station locations. Parking may be provided in surface lots or as structured parking. Parking at a station can exclusively serve VRE riders but may also serve other users such as bus transit riders at multi-modal stations.
Track and Signal Infrastructure (TS)	<ul style="list-style-type: none"> Refers to the installation of rail, ties, rail fastenings, hardware and road-bed over which trains operate; the electrical or mechanical signal devices used to control train movements; and other railroad infrastructure such as interlockings, crossovers, switches, or turnouts.
Train Maintenance and Storage Facilities (MS)	<ul style="list-style-type: none"> Includes midday or overnight storage tracks and related switches, signals, or power sources; buildings, structures or equipment used to inspect, repair or maintain rolling stock; warehouse facilities; crew buildings; and other facilities or equipment such as employee parking or exterior fencing or lighting.
Other (OT)	<ul style="list-style-type: none"> Projects that are unique because they span multiple categories; will be primarily funded by other stakeholders; or represent reserve contributions. Their inclusion with other categories could lead to a distorted understanding of funding needs.

Source: VRE Recommended Budget for Fiscal Year 2019, Amended Budget for Fiscal Year 2018, Six-Year Financial Forecast and Capital Program (December 15, 2017)

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As described above, projects are broken down into the seven improvement categories. To further categorize these capital improvement projects, VRE has established three different project types: asset management, replacement and rehabilitation, and expansion. These project types are described in Figure 6.3.

Figure 6.3. Project Type

Asset Management	<ul style="list-style-type: none">• Improvements or repairs to prolong the useful life of an existing asset; meet mandated requirements or otherwise modernize the asset or system; or to enhance safety and security.
Replacement and Rehabilitation	<ul style="list-style-type: none">• Replacement or major rehabilitation of an existing asset.
Expansion	<ul style="list-style-type: none">• Improvements implemented primarily for the purpose of increasing capacity

Source: VRE Recommended Budget for Fiscal Year 2019, Amended Budget for Fiscal Year 2018, Six-Year Financial Forecast and Capital Program (December 15, 2017)

The CIP is a snapshot of the current outlook, and is updated periodically as projects are further developed and the funding picture evolves. In addition to the priority hierarchy listed in section 6.1.1 *Prioritization*, VRE considers a number of decision-making factors when determining which capital projects will be allocated with the limited available funding (Figure 6.4). These decision-making factors are presented in the form of questions, where a favorable response (Yes) indicates the priority of the expenditure, and whether the project would establish a SGR, benefitting VRE, or require additional funding justification.

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Figure 6.4. VRE Decision-Making Factors

Maintenance	<ul style="list-style-type: none"> Does the expenditure maintain the system in a state of good repair?
Risk	<ul style="list-style-type: none"> Does this expenditure help VRE manage risk? Does this expenditure address VRE's biggest identified sources of risk?
Service Level	<ul style="list-style-type: none"> Does this expenditure close an identified need (i.e., a gap between target and actual service levels)?
Life-Cycle Cost	<ul style="list-style-type: none"> Does this expenditure minimize life-cycle cost?
Operational Cost	<ul style="list-style-type: none"> Does this expenditure yield ongoing operational cost savings either through efficiency or reduced risk?
Project Continuity	<ul style="list-style-type: none"> Is this project already underway and does it need ongoing funding to continue implementation from a prior year?
Project Inter-dependence	<ul style="list-style-type: none"> Are other projects dependent on this project? Is this project dependent on others?

Source: VRE Recommended Budget for Fiscal Year 2019, Amended Budget for Fiscal Year 2018, Six-Year Financial Forecast and Capital Program (December 15, 2017)

6.3 Life Cycle Management Program

VRE's Equipment and Facility Programs both include routine maintenance programs for the upkeep of assets. The Facility Program typically utilizes an informed process for maintaining assets, while the Equipment Program utilizes a systematic life cycle maintenance program. These programs look at the lowest replaceable unit (i.e. subcomponents) for project development to maintain assets.

6.3.1 Equipment Life Cycle Maintenance Program

The Equipment Program utilizes a full life cycle maintenance program, which includes routine maintenance activities, rehabilitation at quarterly intervals of asset life, and replacement at the end of an asset's life cycle. Each subcomponent of rolling stock vehicles has an estimated life cycle, determined by VRE's Long Range Life Cycle Maintenance Action Plan Report (2013) or subsequent updates or as specifically regulated by CFRs. In addition to structured life cycle maintenance, VRE also tracks and evaluates the failure of subcomponents and examines technology changes, both formally and informally, to inform the need for project development.

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The key interval for VRE's life cycle maintenance program is a four (4) year threshold, mandated by the Federal Railroad Association (FRA). If the frequency of change-out and/or maintenance is within four (4) years then projects are developed and completed with operational funds. Once the frequency of change-out exceeds the four (4) year threshold, the project can be included within the CIP and utilize additional funding outside of VRE's operations and maintenance budget.

6.3.2 Facility Maintenance Program

The Facility Program utilizes an informed maintenance program, using data collected from condition assessments, safety inspections, and reports from facility staff and passengers to inform the program manager on the status of the facilities and the condition of various components and subcomponents. Projects are developed when subcomponents are found not within a SGR, or other facility needs are identified. These projects can be completed by VRE directly through operational funds or may require application of outside funds, and subsequently, included in the CIP.

VRE is planning to develop a life cycle maintenance program, for select subcomponent level assets (i.e. elevators and generators). These assets will undergo a more detailed and systematic approach for rehabilitation and replacement, similar to the equipment's life cycle maintenance program. VRE plans to apply this approach to all its facility assets in the future.

6.4 SGR Backlog

State of Good Repair is the designation that an asset is; (1) able to perform its manufactured design function; (2) is in a condition sufficient to operate at its full level of performance and does not pose an identified safety risk and/or deny accessibility; and (3) its life cycle maintenance needs have been met. When these standards are not met the asset is identified as not in a SGR and included in the SGR backlog.

At the asset class level, the majority of VRE's assets are identified as in a SGR, except for four maintenance tooling equipment assets; however, there are component/subcomponent level assets included in VRE's SGR backlog. VRE's most recent CIP document provides a description of the SGR backlog projects currently programmed.

The majority of VRE's assets have been acquired/replaced in bulk during similar time frames. Since these assets have similar maintenance and replacement schedules, they are typically maintained/replaced system-wide at the component/subcomponent level. For example, VRE could develop a single project to replace pole lighting at multiple station platforms, or replace the HVAC units within passenger cars.

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7 IMPLEMENTATION PROGRAM

This chapter provides a description of VRE's implementation strategy, including key activities, to incorporate the transit asset management program into its operational and management practices. To ensure both the TAM Plan and TAM program are meeting the needs of VRE and federal requirements, a continuous improvement plan is also provided. This chapter addresses FTA TAM element 6 (Implementation Strategy), element 7 (Key TAM Activities), and element 9 (Continuous Improvement Plan).

7.1 Implementation Strategy

The foundation for VRE's TAM program has been a multi-year effort that has included an initial asset inventory and condition assessments, a review of federal requirements, and a peer review of other transit agency efforts. The development of this TAM Plan began with the enactment of the Final Rule and includes all VRE's foundational program elements. VRE will continue to integrate asset management into all facets of its operations.

VRE's Asset Management internet-based tool will act as the "home for all things asset management", supporting both this TAM Plan and VRE's TAM program. This internet tool is a multi-phase effort that will continue to evolve to match the needs of VRE's TAM program and align with federal regulations. The initial functionality, includes VRE's asset inventories, facilitates the completion of condition assessments and safety inspections, and helps incorporate the TAM program into VRE's operational practices. Currently in development is an executive dashboard, which provides a "snapshot" of VRE's TAM program elements and activities. The executive dashboard will be fully functional by the end of 2018. Future development efforts will incorporate a NTD Reporting Tool to align with applicable federal requirements. Additional details are provided in section 4.2 *Asset Management Tool*.

49 CFR Part 625 Subpart C Section 625.25(b)(6) "...a TAM plan must include ... (6) A provider's TAM plan implementation strategy."

VRE established a solid foundation for their TAM program and will continue to integrate asset management into all facets of the agency.

VRE's Board of Directors holds monthly meetings and is provided regular updates during TAM Program development and TAM Plan progress. VRE's management team will continue to provide updates to the Board to ensure that TAM activities and needs are considered in the Board's decision-making process.

7.2 Key Activities

During the four-year horizon period of this TAM Plan, VRE will perform key activities in support of the TAM program, illustrated in Figure 7.1 and discussed below. This will include regularly scheduled activities, as well as, more informal reviews.

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Figure 7.1 VRE's Key Activities

Key TAM Activity	2017				2018				2019				2020				2021				2022															
	1st Q	2nd Q	3rd Q	4th Q	1st Q	2nd Q	3rd Q	4th Q	1st Q	2nd Q	3rd Q	4th Q	1st Q	2nd Q	3rd Q	4th Q	1st Q	2nd Q	3rd Q	4th Q	1st Q	2nd Q	3rd Q	4th Q												
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Board of Directors Update*	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Life Cycle Maintenance Program																																				
Monthly Safety Inspection	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
NTD Reporting												X												X										X		
Data Report (performance targets)												X												X										X		
Narrative Report												X												X										X		
CIP Update							X																	X									X			
Condition Assessments																																				
TAM Plan Update												X																							X	
*Board Meetings are subject to change.																																				

*Board Meetings are subject to change.

	Continuous Effort / Range of Effort
X	Optional Submittal
X	Required Submittal / Specific Occurrence

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7.2.1 Life Cycle Maintenance Programs

VRE's Equipment and Facilities Programs, include both a formal and informal approach to tracking and evaluating the failure of subcomponents and review of technology changes. The formal structure of the program includes a process of routine maintenance activities, rehabilitation at quarterly intervals of asset life, and replacement at the end of an asset's life cycle. These programs include both routine daily checks of assets, as well as, more specific asset inspections/testing. Maintenance activities are typically coordinated sequentially, aligning with federally mandated thresholds and FRA inspection intervals. However, all of these activities within the life cycle maintenance program help ensure assets are within a SGR and support the goals of VRE's TAM program. Additional detail on VRE's life cycle maintenance programs is provided in this document in section 6.3. *Life Cycle Management Program*, as well as, in VRE's 2013 Long Range Life Cycle Maintenance Action Plan.

49 CFR Part 625 Subpart C Section 625.25(b)(7) "...a TAM plan must include ... (7) A description of key TAM activities that a provider intends to engage in over the TAM plan horizon period."

VRE performs both regularly scheduled and informal activities to check/maintain status of the TAM program.

7.2.2 Monthly Safety Inspections

VRE performs monthly safety inspections at all passenger stations and passenger parking facilities in which VRE operates. These inspections are conducted to identify deficiencies and ensure the proper upkeep of these facilities. Safety inspections will help support project decisions within the facilities program, and provide maintenance tracking information for the condition assessments.

7.2.3 NTD Reporting

As previously discussed in chapter 5: *Reporting*, VRE is required to submit both a data and a narrative report to the FTA through the NTD. These reports will establish annual performance targets, provide detail on existing condition/ULB of assets, and summarize progress towards performance targets and any change in condition.

7.2.4 Capital Improvement Program (CIP)

VRE updates their CIP annually to cover a six year horizon period. The CIP is a comprehensive inventory of VRE's capital needs, and the capital funding sources that have been identified for the six years of the plan. The primary purpose of the CIP is to provide a realistic picture of the funding outlook and the challenges VRE faces in securing adequate funding to pay for capital improvement projects. VRE's most recent CIP document provides a description of the asset management projects currently programmed.

7.2.5 Condition Assessments

VRE performed condition assessments for all assets in 2017/2018 to support the development of this TAM Plan. Condition assessments will be performed every four years to provide updated condition information of capital assets in future revisions of the TAM Plan.

7.2.6 TAM Plan Update

All of the previously identified activities will be utilized to support the development of future revisions of this TAM Plan. The TAM Plan will be revised/updated every four years at the conclusion of the current

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plan's horizon period. Further discussion of the TAM Plan updates and continuous improvement is included in the following section.

7.3 Continuous Improvement

VRE's TAM program will require a continuous effort to integrate asset management into all facets of its operations. This continuous improvement strategy may include:

- Engagement of the staff on asset management procedures and initiatives,
- Technical training sessions,
- Integration of asset management into routine activities,
- Regular review and improvement of SOPs and forms,
- Utilization of, and improvement to, the internet tool,
- Monitoring of regulatory changes requiring updates to the TAM Program, and the TAM and SGR Policy,
- Self-assessment of VRE's TAM Program and TAM Plan implementation, and
- Employee and or stakeholder surveys, and subsequent improvement to employee and stakeholder engagement methods.

Revisions of the TAM program and subsequent TAM Plan will ensure that both VRE's needs and federal requirements are still being met. This TAM Plan will be reviewed and revised as necessary to incorporate any major improvement or changes within the four year horizon period. As required by the FTA, a full comprehensive update of the TAM Plan will be conducted every four years before the conclusion of the existing plan's horizon period. Revisions of the TAM Plan will ensure that the TAM Plan meets both VRE's needs and federal requirements.

These revisions will require review/implementation of VRE's key activities, evaluation of TAM related business practices, and input from various internal and external stakeholders. This input will be coordinated through internal meetings with all of the personnel identified within 2.2 *Roles and Responsibilities*. Coordination with external stakeholders will include informative briefings and/or letters, and sharing of TAM Program and TAM Plan documents and initiatives.

49 CFR Part 625 Subpart C Section 625.25(b)(9) "...a TAM plan must include ... (9) An outline of how a provider will monitor, update, and evaluate, as needed, its TAM plan and related business practices, to ensure the continuous improvement of its TAM practice."

A full comprehensive update of the TAM Plan will be conducted every 4 years.

7.4 Stakeholder Involvement

The ability to efficiently manage VRE's transit assets depends on more than just VRE employees and personnel, but on various external stakeholders as well. Member agencies, elected officials, customers/community, regulators, vendors, all have their own expectations for the transit system.

This TAM Plan was written with an understanding of what each stakeholder expects from the transit system and is designed to help meet those expectations, while simultaneously balancing VRE's internal priorities. Stakeholders will be engaged in meaningful ways in the implementation of the actions from this Plan.

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7.4.1 Member Agencies

VRE is a transportation partnership of the Northern Virginia Transportation Commission (NVTC) and the Potomac and Rappahannock Transportation Commission (PRTC). The NVTC is comprised of Arlington, Fairfax, and Loudon counties, and the cities of Alexandria, Falls Church and Fairfax. PRTC encompasses Prince William, Stafford and Spotsylvania counties and the cities of Manassas, Manassas Park and Fredericksburg. VRE depends on these member agencies for funding, especially with respect to communicating current and future investment needs.

7.4.2 Customer/Community

VRE would not exist if not for the customers that use its transit service. VRE's customers depend on transit for commute to jobs, education, healthcare, etc., and trust that the equipment and operators will get them to their destination safely. VRE strives to ensure that their assets remain in a SGR to minimize the occurrence of asset failures during operation, thus maintaining the confidence of VRE's most important stakeholder.

Each neighborhood in VRE's service area has its own unique transit needs based on their demographics, business, services, and culture. In addition, residents of these communities that do not currently ride transit have their own expectation and influence on the transit system through community organizations and their legislative representatives.

7.4.3 Metropolitan Planning Organizations (MPOs)

The VRE service area lies within two MPOs namely, the National Capital Region Transportation Planning Board (TPB), operating under the Metropolitan Washington Council of Governments (MWCOG), and the Fredericksburg Area MPO (FAMPO). In order to integrate VRE's TAM plans into statewide and metropolitan planning processes, FTA requires that transit providers share information regarding transit system condition, targets, investment priorities, and strategies. As VRE takes steps to assess system condition, set SGR performance targets, and develop investment priorities, this information will be compiled and made available to TPB and FAMPO. Additionally, TPB and FAMPO are legislatively empowered to authorize the use of federal funds on transit projects, and since the inception of MAP-21, are also required to coordinate their state of good repair performance measures with VRE.

7.4.4 Regulators

The Federal Transit Administration (FTA), Federal Railroad Administration (FRA), Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA), and other agencies all directly influence how VRE's transit assets are managed, through rulemaking and oversight. VRE will monitor regulatory changes and implement future TAM Program updates as warranted.

7.4.5 Vendors

The performance and pricing of service providers, contractors, consultants, material supplies, and other vendors directly affect VRE's ability to deliver projects on-time and on-budget. Issues with vendor performance and/or pricing may have a profound impact on the performance of the transit system at large.

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7.5 Summary

VRE will continue to implement its TAM program through adherence to FTA and NTD reporting requirements, further development and refinement of its overall TAM program, and efforts within VRE to encourage employees and stakeholders to fully embrace TAM as a practice for maintaining assets in a SGR over the asset's lifecycle.

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Appendix A

References

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Appendix B

Asset Category Condition Assessment SOPs

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 <p style="text-align: center;"> Virginia Railway Express Standard Operating Procedure 49 CFR Parts 625 and 630 Transit Asset Management Facility Condition Assessments </p>	VRE SOP#: TAM-001
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Rev	Date	Descriptions	Approvals	
Draft	05/22/2017		Issued By:	STV Incorporated
Final	10/23/2017		Approved By:	
			Approved By:	
			Approved By:	

Subject:

Facility Condition Assessments

Purpose:

This Standard Operating Procedure (SOP) and corresponding forms provided in **Appendix A**, prescribe the approach and methodology for performing facility condition assessments.

Related Documents:

Federal Register, Volume 81, No. 143

49 CFR Parts 625 and 630

National Transit Database: Transit Asset Management; Final Rule; Notices

National Transit Database: Capital Asset Reporting; Transit Asset Management; Proposed Guidebooks

FTA's Facility Condition Assessment Guidebook

VRE Task 8 – Quantitative Methodologies for Conducting Facility Condition Assessments

Technical Memorandum (latest revision)

VRE Task 11 – Performance Targets for Capital Assets Technical Memorandum, (latest revision)

Drawings Required:

None

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Equipment Affected:

All capital assets located at Administrative Facilities, Maintenance Facilities, Passenger Stations, and Passenger Parking Facilities.

Location(s) Affected:

Asset Class	Number of Facilities	Facilities	
Administrative Facilities	2	Alexandria Headquarters	Fredericksburg Office
Passenger Parking Facilities	3	Broad Run Main Lot Quantico South Lot	Fredericksburg Lot G
Maintenance Facilities	9	Broad Run Miscellaneous Yard Broad Run S&I Facility Broad Run Trailer Broad Run Crew Building	Crossroads Miscellaneous Yard Crossroads S&I Facility Crossroads Vehicle Wash Crossroads Warehouse Crossroads Crew Building
Passenger Facilities	19	Alexandria Backlick Road Broad Run Brooke Burke Centre Crystal City Franconia/Springfield Fredericksburg L'Enfant Leeland Road	Lorton Manassas Manassas Park Quantico Rippon Rolling Road Spotsylvania Union Station Woodbridge

Special Tools and/or Equipment Required:

None

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Inspector(s) Qualifications:

These condition assessments are primarily intended to assess the overall physical condition of the facility to support capital investment decisions. However, inspectors must also note and report any defects that may constitute a safety concern or potential service delay as these types of defects may require immediate attention.

VRE's policy is to use a third party contractor to perform the condition assessments. The inspectors will be required to be competent persons and have general knowledge on the component and sub-component systems to be assessed.

Components with a portion or all of their quantity assigned a rating of 1 may have issues warranting a structural or detailed review. The terms "structural review" and "detailed review" are defined as **review by a person qualified to evaluate the field observed conditions and make a determination of the impacts of the conditions on the performance of the component.** Such reviews may include examination of the field inspection results, as well as any notes or photos of the component from the inspection, review of as-built plans, and/or supplemental analysis as deemed appropriate to evaluate the performance of the component.

VRE may establish additional guidance to aid the inspector in determining field circumstances where structural or other detailed review is warranted, taking into consideration the education, training and experience of their inspection staff.

Contractor Safety:

Inspectors will be expected to familiarize themselves with VRE's operating environment as well as follow VRE's [Rules to Live By](#) when conducting work on or about VRE property. All contracted employees will need to follow strict adherence to these rules for their own personal safety and as required for authorization to access the premises.

Inspectors are also required to watch the Safety and Security Orientation video, provided on the [VRE website](#), before arriving for the first day of work.

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Pre-Assessment Procedures

An assessment schedule will be established to provide ample time for inspections and to ensure that all reporting timelines are met. Prior to a facility condition assessment, the inspector will gather and review the following information:

- Results of any previous facility condition assessments including records of past defects found and/or corrected;
- This facility condition assessment SOP and all other applicable facility inspection and maintenance SOPs;
- All pertinent warranty status and/or additional information regarding the age of systems and building materials;
- All other known issues, including adherence to current construction standards;
- Applicable inspection records and/or certificates for HVAC and Conveyance components; and
- Supplies needed: Digital camera, facility condition assessment SOP and forms (**Appendix A**).

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General Procedures

During the on-site assessment, the inspector will have all pertinent records on hand to be used as references and will observe the condition of all the components and sub-components. Each component and sub-component will require different tasks for proper inspection as outlined in the Standard Operating Procedures – Assessment Tasks section.

Components and sub-components are expected to be readily accessible and visible for the inspection. Inspectors will not be required to enter limited access areas such as crawl spaces, utility pits, or sloped roofs. All condition assessments should be observed from an easy point of access location.

As part of the inspection/assessment the condition of each sub-component will be rated and recorded using the FTA's Transit Economic Requirements Model (TERM) 5 point scale, which can be applied using the sub-component condition rating descriptions in the table below.

1-Poor	2-Marginal	3-Adequate	4-Good	5-Excellent

Rating	Condition	Description
5	Excellent	No visible defects, new or near new condition, may still be under warranty if applicable.
4	Good	Good condition, but no longer new, may have some slightly defective or deteriorated system(s), but is overall functional.
3	Adequate	Moderately deteriorated or defective system(s); but has not exceeded useful life.
2	Marginal	Defective or deteriorated system(s) in need of replacement; exceeded useful life.
1	Poor	Critically damaged system(s) or in need of immediate repair; well past useful life.

Source: FTA Facility Condition Assessment Guidebook

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Standard Operating Procedures – Assessment Tasks

Component	Sub-Component Assessment Tasks
Substructure	<ul style="list-style-type: none"> Inspect foundations including walls, columns, pilings, concrete precast, and other structural components for signs of decay. Inspect basement including non-foundation and structural components such as facing materials
Shell	<ul style="list-style-type: none"> Inspect superstructure / structural frame, including columns, pillars, beams, trusses, base plates, concrete masonry units, cast-in-place, precast, bricks, grout, and walls. Inspect building envelope including façade, curtain wall system, glazing system, vinyl insulation blankets, exterior sealants, exterior balconies, canopies, doors, louvers, walkways, parapets, and fire escapes. Inspect windows, aluminum windscreens, doors, and all finishes (paint and masonry). Inspect roof, including roof surface (tiles, membrane, shingles, gravel etc.), gutters, downspouts, eaves, skylights, flashing, chimney surrounds, and sealants, hardware and painted or coated surfaces. Note evidence of ponding, or roof leaks, significant age – and other indicators that repair may be necessary. Note age of roof(s) and whether warranty is still in effect.
Interior	<ul style="list-style-type: none"> Inspect soundness and finish of drywall, gypsum wallboard, partitions, interior doors, fittings, ceiling tiles, and signage. Inspect passenger areas including access tunnels, passageways, and platforms. Inspect stairs and balusters, including fire and access issues. Inspect interior finishes, including millwork and materials used on walls, floors, and ceilings, such as tile, paint, epoxy and other coatings. Look for roughness and damage. Inspect site furnishings, including entrance mats, lockers, shelving, window treatments, and towel/waste combos.
Conveyance	<ul style="list-style-type: none"> Inspect condition, function, and code compliance of elevators, escalators, lifts, exit ladders/hatch and any other fixed apparatuses for the movement of goods or people. Confirm a current state inspection certificate is on file at the facility or VRE's headquarters for applicable conveyance subcomponents.

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Component	Sub-Component Assessment Tasks
Plumbing	<ul style="list-style-type: none"> Inspect fixtures and pipes for water distribution, water heaters, sanitary waste systems, and Murdock hydrants for damage or leaks including any drainage.
HVAC	<ul style="list-style-type: none"> Note apparent or reported age of the equipment, past material component replacements/upgrades, and the apparent level of maintenance exercised. If heating equipment is shut down or not operational at the time of the walk-through survey, provide an opinion of the condition to the extent observed. Confirm records for a routine inspection by HVAC specialist.
Fire Protection	<ul style="list-style-type: none"> Inspect sprinklers, standpipes, hydrants, fire alarms, emergency lighting, smoke evacuation, stairwell pressurization, and any other specialized components relating to overall protection system and compliance.
Electrical	<ul style="list-style-type: none"> Examine other electrical system-related pieces such as lightning protection, generators, emergency lighting, and components related to electrical service and distribution such as conduit, boxes, solar panels and mountings for any damage wire chaffing or loose or corroded connections. Evaluate overall performance of the system. Inspect security cameras for apparent damage or deficiencies. Confirm proper camera operation through contact with VRE communications staff during inspection. Confirm routine operation (monthly) of emergency generator (for a minimum ½ hour), if applicable.
Equipment	<ul style="list-style-type: none"> Inspect equipment (major pieces of equipment integral to the function of the facility), noting age, condition, and functional deficiencies.
Fare Collection	<ul style="list-style-type: none"> Inspect fare collection system(s) and any associated components, noting age, condition, and functional deficiencies

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Component	Sub-Component Assessment Tasks
Site	<ul style="list-style-type: none"> Inspect roadways/driveways and associated signage, markings, and equipment. Look for cracking or settling of the concrete or asphalt. Inspect parking lots and associated signage, markings, and equipment. Look for cracking or settling of the concrete or asphalt. Inspect pedestrian areas and associated signage, markings, and equipment. Inspect the curbing and ramps for cracking, settling, holes, uneven surfaces and trip hazards. Pay special attention to wheelchair ramp areas and other ADA / access considerations. Inspect site development subcomponents, including fences, walls, and miscellaneous structures. Look for corrosion, structural integrity and condition of paint. Inspect landscaping and site utilities. Look for signs of drainage problems such as flooded areas, eroded soil and water damage to the asphalt and clogged storm drain inlets. Inspect irrigation systems, if installed. Look for signs of leaks, such as sagging areas in grass and/or pooling water. Look for dead spots in the grass indicating lack of water possibly caused by a mechanical failure. Inspect passenger huts and benches for corrosion, paint condition, glass condition and damage.

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Overall Condition Rating – All Components


Upon completion of the facility condition assessments the condition ratings recorded for each of the sub-components will be aggregated to provide a component condition rating. In turn, the component condition ratings will be used to calculate an overall condition rating for each VRE facility. VRE will use the FTA's Median Value Method to aggregate the assessment condition ratings, as described below.

Step	Description
Step 1	Determine median value of each component. Calculate this by tabulating the component quantity inspected at each condition rating, and use as the overall component rating the lowest rating achieved by at least half of the component quantity . For instance, if 60% of a component quantity has a rating of 2, 20% has a rating of 3, and 20% has a rating of 4, then the overall rating would be 2, as over half of the component quantity has a rating of 2 or less. Likewise, if half of the quantity has a rating of 1 and half has a rating of 5, then the overall rating would be 1.
Step 2	Determine median value across components. Calculate this by tabulating the number of components inspected at each condition rating, and use as the overall rating the lowest rating achieved by at least half of the components . For instance, if 10 components were inspected and the results were evenly distributed between ratings (2 components with each of the 5 rating values), the overall rating would be 3 as at least half of the ratings would have a value of 3 or less.

Source: FTA Facility Condition Assessment Guidebook

 <p>Virginia Railway Express Standard Operating Procedure</p> <p>49 CFR Parts 625 and 630 Transit Asset Management Facility Condition Assessments</p>	VRE SOP#: TAM-001
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APPENDIX A: VRE FACILITY CONDITION ASSESSMENT FORMS

	Facility Condition Assessments		Overall Facility Rating	
	Inspection Date:			
	Inspector(s) Name(s):			
	Facility Type:			
	Facility Name:			
Address/Location:				

Component (Substructure)		Component Rating =				
Sub-Component Category	Sub-Component	Sub-Component Rating				
		1	2	3	4	5
Basement	Materials					
	Slab					
Foundations	Columns - Concrete					
	Concrete - Cast-in-Place (CIP)					
	Concrete - Precast					
	Footings					
	Other Structural Components					
	Pier Caps					
	Pilings					
	Walls					

Assessment Tasks / Notes

Inspect foundations including walls, columns, pilings, concrete precast, and other structural components for signs of decay

Inspect basement including non-foundation and structural components such as facing materials
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	Facility Condition Assessments		Overall Facility Rating	
	Inspection Date:			
	Inspector(s) Name(s):			
	Facility Type:			
	Facility Name:			
Address/Location:				

Component (Shell)		Component Rating =				
Sub-Component Category	Sub-Component	Sub-Component Rating				
		1	2	3	4	5
Exterior	Aluminum Windscreens					
	Bricks					
	Canopies					
	Concrete Masonry Units					
	Doors (Garage)					
	Doors (Shell)					
	Finishes (all paint and masonry)					
	Grout					
	Louvers					
	Windows					
Roof	Chimney Surrounds					
	Downspouts					
	Eaves					
	Gutters					
	Roof Surfaces					
	Skylights					
Shell Appurtenances	Balconies					
	Elevated Walkways - Concrete					
	Elevated Walkways - Roof Surfaces					
	Elevated Walkways - Structural Steel					
	Fire Escapes					
Superstructure / Structural Frame	Base Plates - Structural Steel					
	Beams - Structural Steel					
	Columns - Structural Steel					
	Columns - Wood					
	Concrete - Cast-in-Place (CIP) - Shell					
	Concrete - Precast - Shell					
	Joint Sealants					
	Truss - Wood					
	Vinyl Insulation Blanket					
	Wall Panels - Metal					
	Walls (Shell)					

Assessment Tasks / Notes
Inspect superstructure/structural frame, including columns, pillars, beams, trusses, base plates, concrete masonry units, cast-in-place, precast, bricks, grout, and walls.
Inspect building envelope including façade, curtain wall system, glazing system, vinyl insulation blankets, exterior sealants, exterior balconies, canopies, doors, louvers, walkways, parapets, and fire escapes.
Inspect windows, aluminum windscreens, doors, and all finishes (paint and masonry).
Inspect roof, including roof surface (tiles, membrane, shingles, gravel, etc.), gutters, downspouts, eaves, skylights, flashing, chimney surrounds, and sealants, hardware and painted or coated surfaces. Note evidence of ponding, or roof leaks, significant age-and other indicators that repair may be necessary. Note age of roof(s) and whether warranty is still in effect.

	Facility Condition Assessments		Overall Facility Rating	
	Inspection Date:			
	Inspector(s) Name(s):			
	Facility Type:			
	Facility Name:			
	Address/Location:			

Component (Interior)		Component Rating =				
Sub-Component Category	Sub-Component	Sub-Component Rating				
		1	2	3	4	5
Finishes	Casework					
	Ceilings					
	Epoxy Coating					
	Floor Covering					
	Lockers					
	Millwork					
	Paint					
	Shelving					
	Site Furnishings					
	Towel/Waste Combo					
	Wall Covering					
	Walls - Gypsum Wallboard					
	Window Treatments					
Partitions	Fittings (such as signage)					
	Doors (Interior)					
	Walls (Interior)					
Stairs	Handrail / Balusters (Interior)					
	Landings					
	Stairs (Interior)					
Assessment Tasks / Notes						

Inspect soundness and finish of drywall, gypsum wallboard, partitions, interior doors, fittings, ceiling tiles, and signage.

Inspect passenger areas including access tunnels, passageways, and platforms.

Inspect stairs and balusters, including fire and access issues.

Inspect interior finishes, including millwork and materials used on walls, floors, and ceilings, such as tile, paint, epoxy and other coatings. Looking for roughness and damage.

Inspect site furnishings, including entrance mats, lockers, shelving, window treatments, and towel/waste combos.

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Overall Facility Rating

Component (Equipment)		Component Rating =					
Sub-Component Category	Sub-Component	Sub-Component Rating					
		1	2	3	4	5	
Equipment related to the function of the facility	Compressed Air						
	Crane Lifts						
	Drip Pans						
	Drop table						
	Maintenance service equipment						
	Vehicle service equipment						
	Wheel truing equipment						
Assessment Tasks / Notes							

Inspect equipment (major pieces of equipment integral to the function of the facility), noting age, condition, and functional deficiencies.

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

	Facility Condition Assessments		Overall Facility Rating	
	Inspection Date:			
	Inspector(s) Name(s):			
	Facility Type:			
	Facility Name:			
Address/Location:				

Component (Site)		Component Rating =				
Sub-Component Category	Sub-Component	Sub-Component Rating				
		1	2	3	4	5
Pedestrian Areas	Benches					
	Bicycle Racks					
	Bug Zappers					
	Platform Boxes (VRE)					
	Recycling Bins					
	Signage - Platform					
	Signage - Station					
	Smoker's Poles					
	Tactile Surfaces					
	Trash Receptacles					
Roadways / Driveways / Parking Lots	Asphalt					
	Bollards					
	Curbs					
	Pavement Striping					
	Signage - Other					
	Signage - Parking					
Site Development	Access Tunnels					
	At-Grade Crossings					
	Bridge Decking					
	Fences					
	Gates					
	Handrail / Balusters (Site)					
	Passageways					
	Pedestrian Bridge					
	Platforms					
	Ramps					
	Retaining Walls					
	Sidewalks					
	Stairs (Site)					
Site Utilities	Culverts					
	Ditches					
	Drainage - General					
	Grates					
	Inlets					
	Manholes					
	Trench Drains					

Assessment Tasks / Notes
Inspect roadways/driveways and associated signage, markings, and equipment. Look for cracking or settling of the concrete or asphalt.
Inspect parking lots and associated signage, markings, and equipment. Look for cracking or settling of the concrete or asphalt.
Inspect pedestrian areas and associated signage, markings, and equipment. Inspect the curbing and ramps for cracking, settling, holes, uneven surfaces and trip hazards. Pay special attention to wheelchair ramp areas and other ADA / access considerations.
Inspect site development subcomponents, including fences, walls, and miscellaneous structures. Look for corrosion, structural integrity and condition of paint.
Inspect landscaping and site utilities. Look for signs of drainage problems such as flooded areas, eroded soil and water damage to the asphalt and clogged storm drain inlets.
indicating lack of water possibly caused by a mechanical failure.
Inspect passenger huts and benches for corrosion, paint condition, glass condition and damage.

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 <p style="text-align: center;"> Virginia Railway Express Standard Operating Procedure 49 CFR Parts 625 and 630 Transit Asset Management Vehicle Condition Assessments </p>	VRE SOP#: TAM-002
	Date: 8/1/2018
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Rev	Date	Descriptions	Approvals	
Draft	3/9/17		Issued By:	
Final	4/21/17		Approved By:	
Rev 1	2/1/2018	Updated Vehicle List & Synchronized format	Approved By:	
Rev 2	8/1/2018	Updated Vehicle List & Synchronized format	Approved By:	

Subject:

Vehicle Condition Assessments

Purpose:

This Standard Operating Procedure (SOP) and corresponding forms prescribe the approach and methodology for performing vehicle condition assessments.

Related Documents:

Federal Register, Volume 81, No. 143

49 CFR Parts 625 and 630

National Transit Database: Transit Asset Management; Final Rule; Notices

National Transit Database: Capital Asset Reporting; Transit Asset Management; Proposed Guidebooks

VRE Task 8 – Quantitative Methodologies for Conducting Vehicle Condition Assessments
 Technical Memorandum (latest revision)

VRE Task 11 – Performance Targets for Capital Assets Technical Memorandum (latest revision)

Drawings Required:

None

 <p style="text-align: center;">Virginia Railway Express Standard Operating Procedure</p> <p style="text-align: center;">49 CFR Parts 625 and 630 Transit Asset Management Vehicle Condition Assessments</p>	VRE SOP#: TAM-002
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Equipment Affected:

All revenue service rolling stock primarily located at VRE's Crossroads and Broad Run Maintenance and Storage Facility (MASF).

Vehicle(s) Affected:

Asset Class	Manufacturer	Model	Asset Name	Quantity	Vehicle Numbers
Commuter Rail Locomotives	Motive Power Industries (MPT)	MP36PH-3C	Locomotive	20	V50 – V69
Commuter Rail Cab Cars	Nippon Sharyo	Gallery IV Cab Car (with toilet)	Cab Car - T	21	V710 – V730
Commuter Rail Trailer Cars	Nippon Sharyo	Gallery IV Trailer Car (with toilet)	Passenger Car - T	49	V800 – V848
	Nippon Sharyo	Gallery IV Trailer Car	Passenger Car	30	V850 – V879

General Condition Assessment Methodology:

Vehicle condition assessments are entirely dependent on age-based criteria. The condition of the vehicle, assuming proper maintenance and overhaul activities are performed on schedule, is determined by whether or not the vehicle has exceeded its useful life as defined by the technical specification for that vehicle.

The underlying assumption in this interpretation of age-based condition assessments is that the maintenance and overhaul procedures are closely monitored by maintenance crews, contracted engineering support, and VRE personnel.

The final condition assessment is determined by calculating the difference between the in-service date of the vehicle and the current date and ensuring that the difference has not exceeded the useful life. As a formula:

 <p style="text-align: center;"> Virginia Railway Express Standard Operating Procedure 49 CFR Parts 625 and 630 Transit Asset Management Vehicle Condition Assessments </p>	VRE SOP#: TAM-002
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Exceed ULB if: "Remaining Years of Useful Life" ≤ 0

$$\begin{aligned}
 &\text{"Remaining Years of Useful Life"} \\
 &= [\text{ULB (years)}] - [\text{Service Life (in years, from date in service)}]
 \end{aligned}$$

The data for calculating the age of the equipment can be referenced below to assist in performing an assessment on a specific vehicle in question.

Vehicle Condition Assessment Data:

Number	Asset Name	Date in Service	Useful Life (Years)	Useful Life Benchmark Date
V50	Locomotive	8/2/2010	20	8/2/2030
V51	Locomotive	1/11/2011	20	1/11/2031
V52	Locomotive	2/8/2011	20	2/8/2031
V53	Locomotive	2/14/2011	20	2/14/2031
V54	Locomotive	2/28/2011	20	2/28/2031
V55	Locomotive	3/21/2011	20	3/21/2031
V56	Locomotive	4/18/2011	20	4/18/2031
V57	Locomotive	4/11/2011	20	4/11/2031
V58	Locomotive	4/11/2011	20	4/11/2031
V59	Locomotive	5/31/2011	20	5/31/2031
V60	Locomotive	5/16/2011	20	5/16/2031
V61	Locomotive	5/31/2011	20	5/31/2031
V62	Locomotive	6/13/2011	20	6/13/2031
V63	Locomotive	7/11/2011	20	7/11/2031
V64	Locomotive	7/18/2011	20	7/18/2031
V65	Locomotive	8/4/2011	20	8/4/2031
V66	Locomotive	8/8/2011	20	8/8/2031
V67	Locomotive	9/28/2011	20	9/28/2031
V68	Locomotive	9/20/2011	20	9/20/2031
V69	Locomotive	10/10/2011	20	10/10/2031
V710	Cab Car - T	2/5/2007	30	2/5/2037
V711	Cab Car - T	2/13/2007	30	2/13/2037
V712	Cab Car - T	1/26/2007	30	1/26/2037
V713	Cab Car - T	1/25/2007	30	1/25/2037

 <p style="text-align: center;">Virginia Railway Express Standard Operating Procedure</p> <p style="text-align: center;">49 CFR Parts 625 and 630 Transit Asset Management Vehicle Condition Assessments</p>	VRE SOP#: TAM-002
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Number	Asset Name	Date in Service	Useful Life (Years)	Useful Life Benchmark Date
V714	Cab Car - T	1/19/2007	30	1/19/2037
V715	Cab Car - T	1/19/2007	30	1/19/2037
V716	Cab Car - T	3/5/2007	30	3/5/2037
V717	Cab Car - T	3/5/2007	30	3/5/2037
V718	Cab Car - T	2/20/2007	30	2/20/2037
V719	Cab Car - T	2/20/2007	30	2/20/2037
V720	Cab Car - T	3/5/2007	30	3/5/2037
V721	Cab Car - T	1/2/2008	30	1/2/2038
V722	Cab Car - T	2/4/2008	30	2/4/2038
V723	Cab Car - T	2/26/2008	30	2/26/2038
V724	Cab Car - T	4/3/2008	30	4/3/2038
V725	Cab Car - T	4/22/2008	30	4/22/2038
V726	Cab Car - T	5/29/2008	30	5/29/2038
V727	Cab Car - T	9/2/2008	30	9/2/2038
V728	Cab Car - T	6/24/2008	30	6/24/2038
V729	Cab Car - T	8/28/2008	30	8/28/2038
V730	Cab Car - T	9/26/2008	30	9/26/2038
V800	Passenger Car - T	12/19/2007	30	12/19/2037
V801	Passenger Car - T	12/19/2007	30	12/19/2037
V802	Passenger Car - T	2/4/2008	30	2/4/2038
V803	Passenger Car - T	2/4/2008	30	2/4/2038
V804	Passenger Car - T	2/26/2008	30	2/26/2038
V805	Passenger Car - T	2/26/2008	30	2/26/2038
V806	Passenger Car - T	3/26/2008	30	3/26/2038
V807	Passenger Car - T	3/28/2008	30	3/28/2038
V808	Passenger Car - T	4/22/2008	30	4/22/2038
V809	Passenger Car - T	4/22/2008	30	4/22/2038
V810	Passenger Car - T	5/21/2008	30	5/21/2038
V811	Passenger Car - T	5/21/2008	30	5/21/2038
V812	Passenger Car - T	6/24/2008	30	6/24/2038
V813	Passenger Car - T	6/24/2008	30	6/24/2038
V814	Passenger Car - T	7/24/2008	30	7/24/2038

 <p style="text-align: center;">Virginia Railway Express Standard Operating Procedure</p> <p style="text-align: center;">49 CFR Parts 625 and 630 Transit Asset Management Vehicle Condition Assessments</p>	VRE SOP#: TAM-002
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Number	Asset Name	Date in Service	Useful Life (Years)	Useful Life Benchmark Date
V815	Passenger Car - T	7/24/2008	30	7/24/2038
V816	Passenger Car - T	8/28/2008	30	8/28/2038
V817	Passenger Car - T	8/28/2008	30	8/28/2038
V818	Passenger Car - T	9/26/2008	30	9/26/2038
V819	Passenger Car - T	9/26/2008	30	9/26/2038
V820	Passenger Car - T	7/22/2014	30	7/22/2044
V821	Passenger Car - T	7/17/2014	30	7/17/2044
V822	Passenger Car - T	7/16/2014	30	7/16/2044
V823	Passenger Car - T	7/21/2014	30	7/21/2044
V824	Passenger Car - T	9/22/2014	30	9/22/2044
V825	Passenger Car - T	9/22/2014	30	9/22/2044
V826	Passenger Car - T	9/22/2014	30	9/22/2044
V827	Passenger Car - T	9/22/2014	30	9/22/2044
V828	Passenger Car - T	3/30/2016	30	3/30/2046
V829	Passenger Car - T	3/30/2016	30	3/30/2046
V830	Passenger Car - T	3/30/2016	30	3/30/2046
V831	Passenger Car - T	3/30/2016	30	3/30/2046
V832	Passenger Car - T	4/18/2016	30	4/18/2046
V833	Passenger Car - T	3/30/2016	30	3/30/2046
V834	Passenger Car - T	4/18/2016	30	4/18/2046
V835	Passenger Car - T	6/21/2017	30	6/21/2047
V836	Passenger Car - T	6/21/2017	30	6/21/2047
V837	Passenger Car - T	6/16/2017	30	6/16/2047
V838	Passenger Car - T	6/16/2017	30	6/16/2047
V839	Passenger Car - T	6/15/2017	30	6/15/2047
V840	Passenger Car - T	10/30/2017	30	10/30/2047
V841	Passenger Car - T	11/6/2017	30	11/6/2047
V842	Passenger Car - T	11/3/2017	30	11/3/2047
V843	Passenger Car - T	11/3/2017	30	11/3/2047
V844	Passenger Car - T	11/6/2017	30	11/6/2047
V845	Passenger Car - T	11/14/2017	30	11/14/2047
V846	Passenger Car - T	11/14/2017	30	11/14/2047

 <p style="text-align: center;"> Virginia Railway Express Standard Operating Procedure 49 CFR Parts 625 and 630 Transit Asset Management Vehicle Condition Assessments </p>	VRE SOP#: TAM-002
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Number	Asset Name	Date in Service	Useful Life (Years)	Useful Life Benchmark Date
V847	Passenger Car - T	11/14/2017	30	11/14/2047
V848	Passenger Car - T	11/14/2017	30	11/14/2047
V850	Passenger Car	12/29/2007	30	12/29/2037
V851	Passenger Car	12/29/2007	30	12/29/2037
V852	Passenger Car	2/4/2008	30	2/4/2038
V853	Passenger Car	2/4/2008	30	2/4/2038
V854	Passenger Car	2/26/2008	30	2/26/2038
V855	Passenger Car	2/26/2008	30	2/26/2038
V856	Passenger Car	3/26/2008	30	3/26/2038
V857	Passenger Car	3/28/2008	30	3/28/2038
V858	Passenger Car	4/22/2008	30	4/22/2038
V859	Passenger Car	4/22/2008	30	4/22/2038
V860	Passenger Car	5/21/2008	30	5/21/2038
V861	Passenger Car	5/21/2008	30	5/21/2038
V862	Passenger Car	6/24/2008	30	6/24/2038
V863	Passenger Car	6/24/2008	30	6/24/2038
V864	Passenger Car	7/24/2008	30	7/24/2038
V865	Passenger Car	7/24/2008	30	7/24/2038
V866	Passenger Car	8/28/2008	30	8/28/2038
V867	Passenger Car	8/28/2008	30	8/28/2038
V868	Passenger Car	9/26/2008	30	9/26/2038
V869	Passenger Car	9/26/2008	30	9/26/2038
V870	Passenger Car	2/2/2010	30	2/2/2040
V871	Passenger Car	2/2/2010	30	2/2/2040
V872	Passenger Car	2/2/2010	30	2/2/2040
V873	Passenger Car	4/8/2010	30	4/8/2040
V874	Passenger Car	6/30/2010	30	6/30/2040
V875	Passenger Car	2/1/2010	30	2/1/2040
V876	Passenger Car	2/1/2010	30	2/1/2040
V877	Passenger Car	2/1/2010	30	2/1/2040
V878	Passenger Car	2/1/2010	30	2/1/2040
V879	Passenger Car	2/1/2010	30	2/1/2040

 <p style="text-align: center;"> Virginia Railway Express Standard Operating Procedure 49 CFR Parts 625 and 630 Transit Asset Management Equipment Condition Assessments </p>	VRE SOP#: TAM-003
	Date: 8/20/2018
	1 of 5
	

Rev	Date	Descriptions	Approvals	
Draft	3/9/17		Issued By:	
Final	4/21/17		Approved By:	
Rev 1	2/1/2018	Synchronized format	Approved By:	
Rev 2	8/20/2018	Update Equipment and Synchronize format	Approved By:	

Subject:

Equipment Condition Assessments

Purpose:

This Standard Operating Procedure (SOP) and corresponding forms prescribe the approach and methodology for performing equipment condition assessments.

Related Documents:

Federal Register, Volume 81, No. 143

49 CFR Parts 625 and 630

National Transit Database: Transit Asset Management; Final Rule; Notices

National Transit Database: Capital Asset Reporting; Transit Asset Management; Proposed Guidebooks

VRE Task 8 – Quantitative Methodologies for Conducting Vehicle Condition Assessments
 Technical Memorandum (latest revision)

VRE Task 11 – Performance Targets for Capital Assets Technical Memorandum (latest revision)

Drawings Required:

None

 <p style="text-align: center;">Virginia Railway Express Standard Operating Procedure</p> <p style="text-align: center;">49 CFR Parts 625 and 630 Transit Asset Management Equipment Condition Assessments</p>	VRE SOP#: TAM-003
	Date: 8/20/2018
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Equipment Affected:

All non-revenue service vehicles, maintenance equipment and tooling located at VRE headquarters in Alexandria and the Crossroads and Broad Run train yards.

Equipment	Location	Equipment Type
2016 Ford Van (Transit Van)	Alexandria Headquarters	Non-Revenue Service Vehicle
2015 Ford F-250	Alexandria Headquarters	Non-Revenue Service Vehicle
2017 Ford F-150	Alexandria Headquarters	Non-Revenue Service Vehicle
2018 Ford Transit Connect Wagon	Alexandria Headquarters	Non-Revenue Service Vehicle
2018 Ford Explorer	Alexandria Headquarters	Non-Revenue Service Vehicle
Forklift – Nissan 100	Crossroads S&I	Maintenance Tooling
Forklift – Hyster H60XM 6,000lb	Crossroads S&I	Maintenance Tooling
Forklift – Hyster H60XM 6,000lb	Crossroads Warehouse	Maintenance Tooling
Forklift – Caterpillar GP45K1 10,000lb	Broad Run S&I	Maintenance Tooling
Taylor Dunn Cart 1 – T48-48	Crossroads MASF	Maintenance Tooling
Taylor Dunn Cart 2 – T48-48	Crossroads MASF	Maintenance Tooling
Taylor Dunn Cart 1 – T48-48	Broad Run MASF	Maintenance Tooling
Taylor Dunn Cart 2 – T48-48	Broad Run MASF	Maintenance Tooling
2007 Crown RD5200 Standup Forklift	Crossroads Warehouse	Maintenance Tooling
Small Scissor Lift	Broad Run MASF	Maintenance Tooling
Genie GS-3268RT Scissor Lift	Crossroads MASF	Maintenance Tooling
Sanding Cart	Broad Run MASF	Maintenance Tooling
Sanding Cart	Crossroads MASF	Maintenance Tooling
Macton 50 Ton Loco Lifts (quantity 4)	Crossroads MASF	Maintenance Tooling
Macton 50 Ton Loco Lifts (quantity 4)	Broad Run MASF	Maintenance Tooling
Whiting 20 Ton Car Lifts (quantity 4)	Crossroads MASF	Maintenance Tooling
Whiting 20 Ton Car Lifts (quantity 4)	Broad Run MASF	Maintenance Tooling
DeShazo TR-SG-DM 10 Ton Crane	Crossroads MASF	Maintenance Tooling
DeShazo TR-SG-DM 10 Ton Crane	Broad Run MASF	Maintenance Tooling

 <p>Virginia Railway Express Standard Operating Procedure</p> <p>49 CFR Parts 625 and 630 Transit Asset Management Equipment Condition Assessments</p>	VRE SOP#: TAM-003
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General Condition Assessment Methodology:

Equipment condition assessments are entirely dependent on age-based criteria. The condition of the piece of equipment, assuming proper maintenance and overhaul activities are performed on schedule as appropriate, is determined by whether or not the piece of equipment has exceeded its useful life as defined by the useful life data for that piece of equipment. Useful life data was collected by obtaining manufacturer recommended useful life information or using an expected useful life determined by VRE themselves.

The underlying assumption in this interpretation of age-based condition assessments is that the maintenance and overhaul procedures are closely monitored by maintenance crews, contracted engineering support, and VRE personnel.

The final condition assessment of a piece of equipment is determined by calculating the difference between the in-service date of the piece of equipment and the current date and ensuring that the difference has not exceeded the useful life. As a formula:

*Exceed ULB if: "**Remaining Years of Useful Life**" ≤ 0*

$$\begin{aligned} &\text{"Remaining Years of Useful Life"} \\ &= [\text{ULB (years)}] - [\text{Service Life (in years, from date in service)}] \end{aligned}$$

The data for calculating the age of the equipment can be referenced below to assist in performing an assessment on a specific item in question.

<p style="text-align: center;"> Virginia Railway Express Standard Operating Procedure 49 CFR Parts 625 and 630 Transit Asset Management Equipment Condition Assessments </p>	VRE SOP#: TAM-003
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Equipment Condition Assessment Data:

Equipment	Location	Date in Service	Useful Life (in years)	ULB Date
Non-Revenue Service Vehicle				
2016 Ford Van (Transit Van)	Alexandria Headquarters	6/8/2015	8	6/8/2023
2015 Ford F-250	Alexandria Headquarters	7/3/2016	8	7/3/2024
2017 Ford F-150	Alexandria Headquarters	8/9/2016	8	8/9/2024
2018 Ford Transit Connect Wagon	Alexandria Headquarters	6/1/2018	8	6/1/2026
2018 Ford Explorer	Alexandria Headquarters	7/1/2018	8	7/1/2026
Maintenance Tooling				
Forklift – Nissan 100	Crossroads S&I	12/31/2006	7	12/31/2013
Forklift – Hyster H60XM 6,000lb	Crossroads S&I	12/31/2006	7	12/31/2013
Forklift – Hyster H60XM 6,000lb	Crossroads Warehouse	12/31/2006	7	12/31/2013
Forklift – Caterpillar GP45K1 10,000lb	Broad Run S&I	12/31/2006	7	12/31/2013
Taylor Dunn Cart 1 – T48-48	Crossroads MASF	12/31/2010	8	12/31/2020
Taylor Dunn Cart 2 – T48-48	Crossroads MASF	12/31/2010	8	12/31/2020
Taylor Dunn Cart 1 – T48-48	Broad Run MASF	12/31/2010	8	12/31/2020
Taylor Dunn Cart 2 – T48-48	Broad Run MASF	12/31/2010	8	12/31/2020
2007 Crown RD5200 Standup Forklift	Crossroads Warehouse	8/15/2014	7	8/15/2021
Small Scissor Lift	Broad Run MASF	12/31/2009	12	12/31/2021
Genie GS-3268RT Scissor Lift	Crossroads MASF	1/4/2010	12	1/4/2022
Sanding Cart	Broad Run MASF	9/30/2014	10	9/30/2024
Sanding Cart	Crossroads MASF	8/30/2016	10	8/30/2026
Macton 50 Ton Loco Lifts (quantity 4)	Crossroads MASF	6/2/2011	20	6/2/2031

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Equipment	Location	Date in Service	Useful Life (in years)	ULB Date
Macton 50 Ton Loco Lifts (quantity 4)	Broad Run MASF	6/2/2011	20	6/2/2031
Whiting 20 Ton Car Lifts (quantity 4)	Crossroads MASF	12/31/2006	25	12/31/2031
Whiting 20 Ton Car Lifts (quantity 4)	Broad Run MASF	12/31/2006	25	12/31/2031
DeShazo TR-SG-DM 10 Ton Crane	Crossroads MASF	12/31/2008	40	12/31/2048
DeShazo TR-SG-DM 10 Ton Crane	Broad Run MASF	12/31/2009	40	12/31/2049

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 <p style="text-align: center;"> Virginia Railway Express Standard Operating Procedure 49 CFR Parts 625 and 630 Transit Asset Management Infrastructure Condition Assessments </p>	VRE SOP#: TAM-004
	Date: 8/20/2018
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Rev	Date	Descriptions	Approvals	
Draft	6/20/2017		Issued By:	STV Incorporated
Final	6/29/2017		Approved By:	
Rev 1	8/20/2018	Update terminology	Approved By:	
			Approved By:	

Subject:

Infrastructure (Track, Switches, Derails, Ties, Switch Ties, and Bumper Blocks) Condition Assessments

Purpose:

This Standard Operating Procedure (SOP) and corresponding forms provided in **Appendix A**, prescribe the approach and methodology for performing infrastructure condition assessments.

Related Documents:

Federal Register, Volume 81, No. 143

49 CFR Parts 625 and 630

National Transit Database: Transit Asset Management; Final Rule; Notices

National Transit Database: Capital Asset Reporting; Transit Asset Management; Proposed Guidebooks

VRE NTD and Asset Management Reporting – Task 11 Performance Targets for Capital Assets Technical Memorandum, (latest revision)

Drawings Required:

Broad Run Yard and Maintenance Facility Map

Broad Run Yard Layout

Crossroads Yard and Maintenance Facility Map

Crossroads Yard Layout

Switch Detail Drawings

 <p>Virginia Railway Express Standard Operating Procedure</p> <p>49 CFR Parts 625 and 630 Transit Asset Management Infrastructure Condition Assessments</p>	VRE SOP#: TAM-004
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Equipment Affected:

Track yard infrastructure (Track, Switches, Derails, Ties, Switch Ties, and Bumper Blocks) located at the Broad Run and Crossroads Maintenance and Storage Facilities (MASF).

Location(s) Affected:

Broad Run MASF
Crossroads MASF

Special Tools and/or Equipment Required:

None

Inspector(s) Qualifications:

These condition assessments are primarily intended to assess the overall physical condition of the VRE owned infrastructure to support capital investment decisions. However, inspectors must also note and report any defects that may constitute a safety concern as these types of defects may require immediate attention.

VRE's policy is to use a third party contractor to perform the condition assessments. The inspectors will be required to be competent persons and have general knowledge on the track infrastructure elements which would be assessed.

Track elements with a portion, or all of their quantity, assigned a rating of 1 may have issues warranting a structural or detailed review. The terms "structural review" and "detailed review" are defined as **review by a person qualified to evaluate the field observed conditions and make a determination of the impacts of the conditions on the performance of the component**. Such reviews may include examination of the field inspection results, as well as any notes or photos of the element from the inspection, review of as-built plans, and/or supplemental analysis as deemed appropriate to evaluate the performance of the track element.

 <p>Virginia Railway Express Standard Operating Procedure</p> <p>49 CFR Parts 625 and 630 Transit Asset Management Infrastructure Condition Assessments</p>	VRE SOP#: TAM-004
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VRE may establish additional guidance to aid the inspector in determining field conditions where structural or other detailed review is warranted, taking into consideration the education, training and experience of their inspection staff.

Contractor Safety:

Inspectors will be expected to familiarize themselves with VRE's operating environment as well as follow VRE's [Rules to Live By](#) when conducting work on or about VRE property. All contracted employees will need to follow strict adherence to these rules for their own personal safety and as required for authorization to access the premises.

Inspectors are also required to watch the Safety and Security Orientation video, provided on the [VRE website](#), before arriving for the first day of work.

Pre-Assessment Procedures

An assessment schedule will be established to provide ample time for inspections and to ensure that all reporting timelines are met. Prior to an infrastructure condition assessment, the inspector will gather and review the following information:

- Results of any previous infrastructure condition assessments including records of past defects found and/or corrected;
- This infrastructure condition assessment SOP and all other applicable infrastructure / track inspection and maintenance SOPs;
- Information regarding the age of track infrastructure;
- All other known issues, including adherence to current construction standards;
- Applicable inspection/maintenance records; and
- Supplies needed: Digital camera, infrastructure condition assessment SOP and forms (**Appendix A**).

 <p style="text-align: center;"> Virginia Railway Express Standard Operating Procedure 49 CFR Parts 625 and 630 Transit Asset Management Infrastructure Condition Assessments </p>	VRE SOP#: TAM-004
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General Procedures

During the on-site assessment, the inspector will have all pertinent records on hand to be used as references and will observe the condition of all the track yard elements. Each element will require different tasks for proper inspection as outlined in the Standard Operating Procedures – Assessment Tasks section.

All of the track elements are expected to be readily accessible and visible for the inspection. Inspectors will not be required to enter limited access areas such as utility pits. All condition assessments should be observed from an easy point of access location.

As part of the inspection/assessment, the condition of each element will be rated and recorded using the FTA's Transit Economic Requirements Model (TERM) 5 point scale, which can be applied using the track element condition rating descriptions in the table below.

1-Poor	2-Marginal	3-Adequate	4-Good	5-Excellent

Rating	Condition	Description
5	Excellent	No visible defects, new or near new condition, may still be under warranty if applicable.
4	Good	Good condition, but no longer new, may have some slightly defective or deteriorated system(s), but is overall functional.
3	Adequate	Moderately deteriorated or defective system(s); but has not exceeded useful life.
2	Marginal	Defective or deteriorated system(s) in need of replacement; exceeded useful life.
1	Poor	Critically damaged system(s) or in need of immediate repair; well past useful life.

Source: FTA Facility Condition Assessment Guidebook

 <p>Virginia Railway Express Standard Operating Procedure</p> <p>49 CFR Parts 625 and 630 Transit Asset Management Infrastructure Condition Assessments</p>	VRE SOP#: TAM-004
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Standard Operating Procedures – Assessment Tasks

Element	Element Assessment Tasks
Track	<ul style="list-style-type: none"> The condition of the track will be evaluated based on the different track lanes located within the MASF. Inspect track for wear, engine burns, and overflow. Inspect anchoring, spiking, joints, bolts and conduits within each track lane. Note the condition of any ballast that is substandard.
Switches	<ul style="list-style-type: none"> Switches will be evaluated by the switch number which identifies the two lanes which split at the individual track switch. Inspect switch, switch wedge, and spikes. Inspect frog, noting welding and spalling.
Derails	<ul style="list-style-type: none"> The condition of each derail will be evaluated. Inspect bolts and components. Inspect for wear.
Ties	<ul style="list-style-type: none"> The condition of the ties will be evaluated based on the different track lanes located within the MASF. Inspect the condition of the ties, timber, and bumper block, noting any deterioration or splitting.
Switch Ties	<ul style="list-style-type: none"> Switch ties will be evaluated by the switch number which identifies the two lanes which split at the track switch. Inspect the condition of the switch ties and timber, noting any deterioration or splitting.
Bumper Blocks	<ul style="list-style-type: none"> The condition of each bumper block will be evaluated. Inspect and note condition of components. Inspect for wear.

 <h1 style="text-align: center;">Virginia Railway Express</h1> <h2 style="text-align: center;">Standard Operating Procedure</h2> <h3 style="text-align: center;">49 CFR Parts 625 and 630 Transit Asset Management Infrastructure Condition Assessments</h3>	VRE SOP#: TAM-004
	Date: 8/20/2018
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Overall Condition Rating – All Elements


Upon completion of the infrastructure condition assessments the condition ratings recorded for each of the track elements will be aggregated to provide an overall condition rating for both the Broad Run and Crossroads' MASFs. VRE will use the FTA's Median Value Method to aggregate the assessment condition ratings, as described below.

Step	Description
Step 1	Determine median value of each component. Calculate this by tabulating the component quantity inspected at each condition rating, and use as the overall component rating the lowest rating achieved by at least half of the component quantity . For instance, if 60% of a component quantity has a rating of 2, 20% has a rating of 3, and 20% has a rating of 4, then the overall rating would be 2, as over half of the component quantity has a rating of 2 or less. Likewise, if half of the quantity has a rating of 1 and half has a rating of 5, then the overall rating would be 1.
Step 2	Determine median value across components. Calculate this by tabulating the number of components inspected at each condition rating, and use as the overall rating the lowest rating achieved by at least half of the components . For instance, if 10 components were inspected and the results were evenly distributed between ratings (2 components with each of the 5 rating values), the overall rating would be 3 as at least half of the ratings would have a value of 3 or less.

Source: FTA Facility Condition Assessment Guidebook

 <p>Virginia Railway Express Standard Operating Procedure</p> <p>49 CFR Parts 625 and 630 Transit Asset Management Infrastructure Condition Assessments</p>	VRE SOP#: TAM-004
	Date: 08/20/2018
	Appendix A
	

APPENDIX A: VRE INFRASTRUCTURE CONDITION ASSESSMENT FORMS

	Infrastructure Condition Assessments		Overall MASF Infrastructure Rating	
	Inspection Date:			
	Inspector(s) Name(s):			
	Facility Type:		Maintenance	
	Facility Name:		Broad Run MASF	
Address/Location:		10637 Piper Lane, Bristow, VA 20136		

Track	Element Rating =				
Element Section	Element Rating				
	1	2	3	4	5
Lead Track					
Track 1					
Track 2					
Track 3					
Track 4					
Track 5					
Track 6					
Track 7					
Track 8					

Assessment Tasks / Notes

The condition of the track will be evaluated based on the different track lanes located within the Yard.

Inspect track for wear, engine burns, and overflow.

Inspect anchoring, spiking, joints, bolts, and conduits within each track lane.

Note the condition of any ballast that is substandard.

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	Infrastructure Condition Assessments		Overall MASF Infrastructure Rating	
	Inspection Date:			
	Inspector(s) Name(s):			
	Facility Type:		Maintenance	
	Facility Name:		Broad Run MASF	
Address/Location:		10637 Piper Lane, Bristow, VA 20136		

Switches	Element Rating =				
Element Section	Element Rating				
	1	2	3	4	5
Lead / NS					
8 / 1					
8 / 3					
8 / 4					
8 / 5					
8 / 6					
1 / 2					
6 / 7					

Assessment Tasks / Notes
Switches will be evaluated by the switch number which identifies the two track lanes which split at the individual track switch.

Inspect switch, switch wedge, and spikes.

Inspect frog, note condition of welding and/or any evidence of spalling.
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	Infrastructure Condition Assessments		Overall MASF Infrastructure Rating	
	Inspection Date:			
	Inspector(s) Name(s):			
	Facility Type:		Maintenance	
	Facility Name:		Broad Run MASF	
Address/Location:		10637 Piper Lane, Bristow, VA 20136		

Derails	Element Rating =				
Element Section	Element Rating				
	1	2	3	4	5
Track 1 west of last switch (mechanical)					
Track 2 west of last switch (mechanical)					
Track 3 west of last switch (mechanical)					
Track 4 west of last switch (mechanical)					
Track 5 west of last switch (mechanical)					
Track 6 west of last switch (mechanical)					
Track 7 west of last switch (mechanical)					
Track 8 west of last switch (mechanical)					
Track 2 - 200 feet east of S&I building (mechanical)					

Assessment Tasks / Notes
The condition of each derail will be evaluated.

Inspect bolts and components.

Inspect for wear.

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	Infrastructure Condition Assessments		Overall MASF Infrastructure Rating	
	Inspection Date:			
	Inspector(s) Name(s):			
	Facility Type:		Maintenance	
	Facility Name:		Crossroads MASF	
Address/Location:		9400 Crossroads Parkway, Fredericksburg, VA 22408		

Track	Element Rating =				
Element Section	Element Rating				
	1	2	3	4	5
Lead Track					
Track 0					
Track 1					
Track 2					
Track 3					
Track 4					
Track 5					
Track 6					
Track 7					
Track 8					


Assessment Tasks / Notes

The condition of the track will be evaluated based on the different track lanes located within the Yard.

Inspect track for wear, engine burns, and overflow.

Inspect anchoring, spiking, joints, bolts, and conduits within each track lane.

Note the condition of any ballast that is substandard.

	Infrastructure Condition Assessments		Overall MASF Infrastructure Rating	
	Inspection Date:			
	Inspector(s) Name(s):			
	Facility Type:		Maintenance	
	Facility Name:		Crossroads MASF	
Address/Location:		9400 Crossroads Parkway, Fredericksburg, VA 22408		

Switch Ties	Element Rating =				
Element Section	Element Rating				
	1	2	3	4	5
Lead / CSX					
8 / 5					
8 / 7					
7 / 6					
5 / 0					
5 / 2					
5 / 3					
5 / 4					
3 / 2					
2 / 1					
0 / 1					
Assessment Tasks / Notes					

Switch ties will be evaluated by the switch number which identifies the two lanes which split at the track switch.

Inspect the condition of the switch ties and timber. Noting any deterioration or splitting.

Examine spike pattern, noting any inconsistencies.

