

Rail Operations and Safety Update

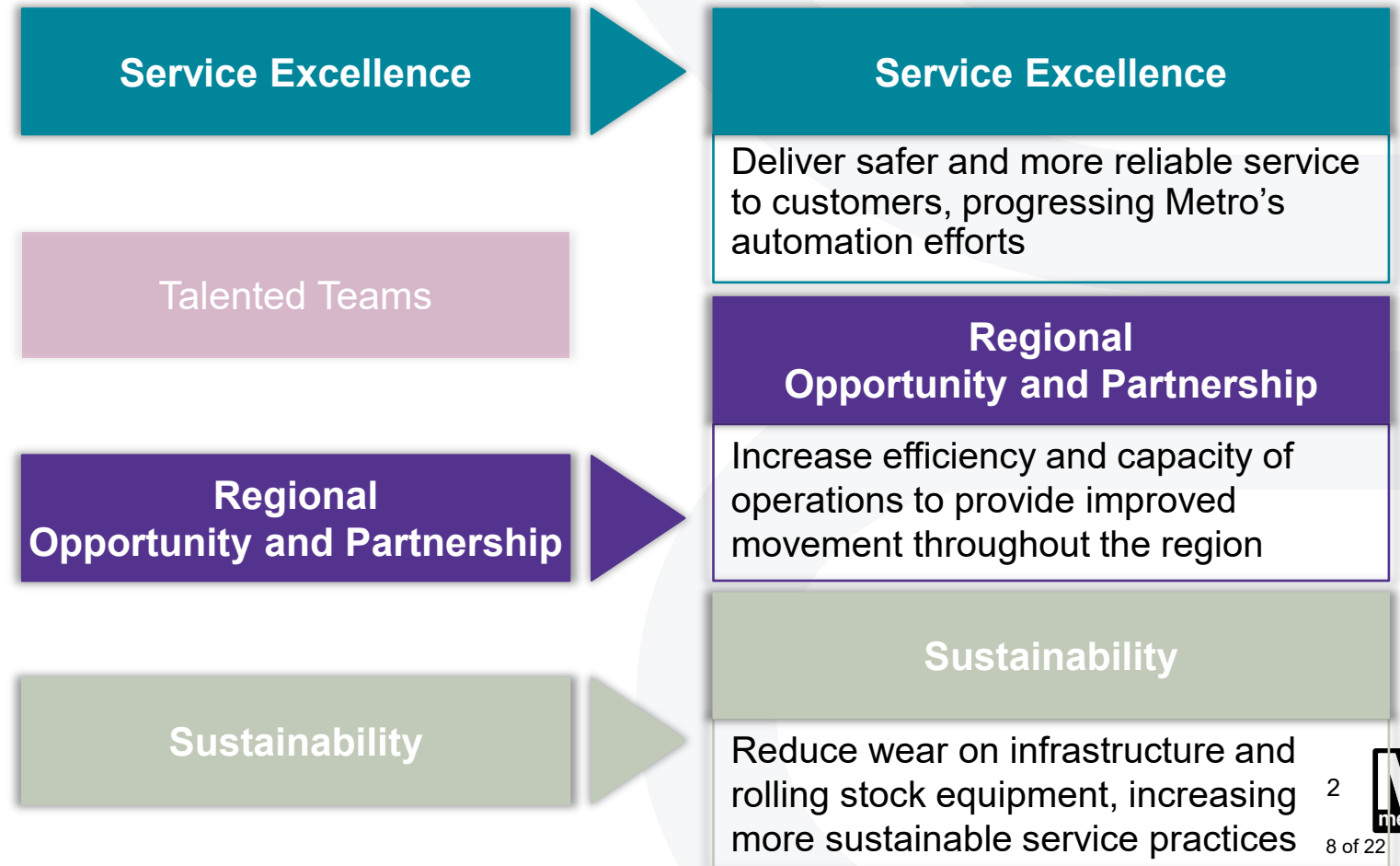
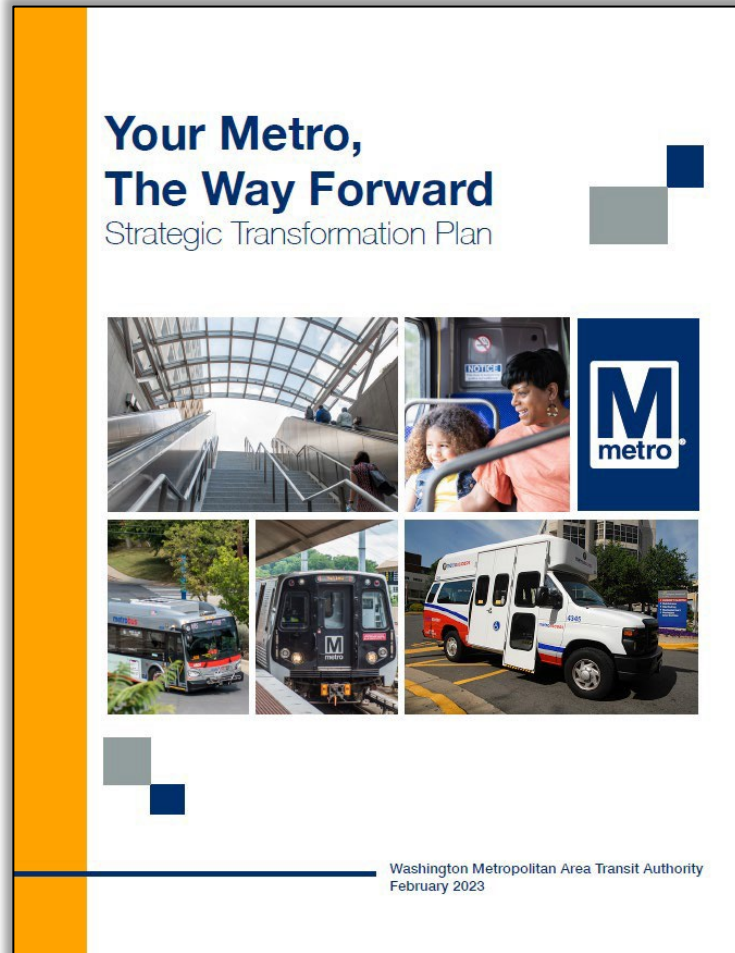
Safety & Operations Committee



Strategic Transformation Plan

Rail Operations and Safety Update

- Rail program rule changes and automation utilization advance the following goals:



Metro continues to optimize rail operations to improve safety, save money and deliver better customer service

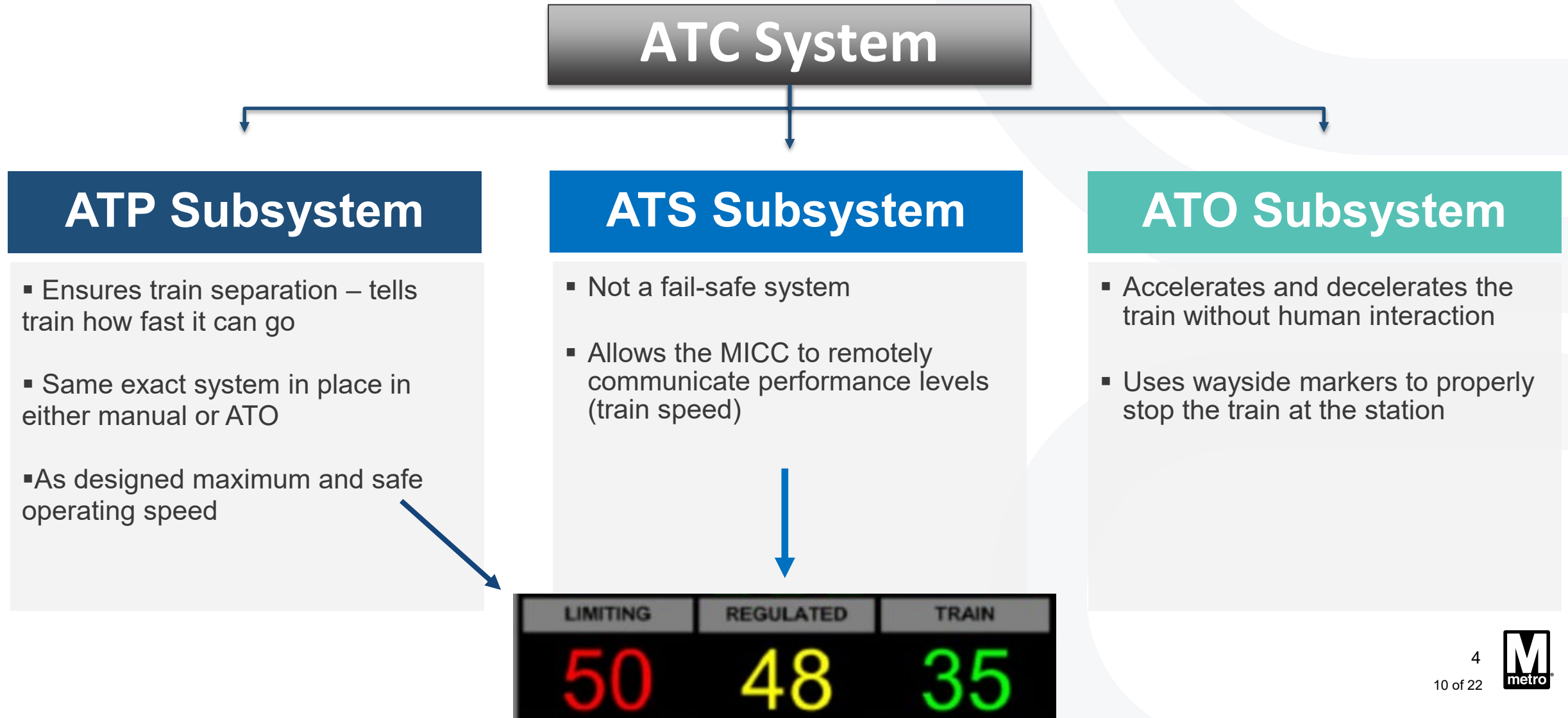
Rail Operations and Safety Update

- ✓ Improve Signal Maintenance practices
- ✓ Returned to Automatic Door Operations
 - Return to Design Speeds
 - Return to Automatic Train Operations



Automatic Train Control System Overview

Rail Operations and Safety Update



How to deliver safer, more cost effective and better service

Rail Operations and Safety Update

Automatic Train Control Maintenance	Automatic Door Operations (ADO)	Return to Design Speeds	Automatic Train Operations (ATO)
<ul style="list-style-type: none">• Aligned Preventative Maintenance Procedures with Manufacturer Procedures• Replaced GEN2 track circuits with a newer reliable model• Adjusted marker coils to track train location more precisely	<ul style="list-style-type: none">• Returned to ADO systemwide in July 2024• Improvement in on-time performance on the Red Line• More than 2.0M safe automatic door operations	<ul style="list-style-type: none">• Maintains and offers enhancement of the current level of safety• Requires 2 fewer trains in service• Reduces runtimes by up to 2.2 minutes (Red Line)	<ul style="list-style-type: none">• 2022 APTA Peer review identified system safety is enhanced with Automatic Train Operations• ATO utilization on the Red Line by December 2024• Systemwide ATO utilization by Spring 2025

Safer, More Reliable, Metro

Approximately 10% overall runtime savings possible

	Scheduled Runtime (min)	Estimated Runtime Savings (min)			Total Est. Savings (min)	Percent Savings
		Automatic Door Operation	Automatic Train Operation	Original Design Speed		
YL	26	0.6	3.3	0.1	4.0	15%
GR	50	1	3.3	N/A	4.3	9%
SV	93	1.7	4.9	1.8	8.4	10%
OR	62	1.3	4.9	1.4	7.6	12%
BL	68	1.4	4.7	1.4	7.5	11%
RD	70	1.3	3.9	2.2	7.4	11%

Analysis based on manual operations run time analysis, regulated speed segment analysis, Red Line test runs, and historic run times in automatic operation

Return to Design Speeds

- 1986 top speed limited to 59mph
- Green Line exception to 65mph
- All rail vehicles were tested, accepted and safety certified based on design speed specifications (up to 75 mph)
- All new rail extensions and new signaling equipment, including Silver Line Phase 2 and Potomac Yard, were safety certified based on design speed specifications
- Comprehensive evaluation of rail vehicles and infrastructure to ensure returning to original design speed is safe
- Operating at design speed will increase the average speed across the Metrorail system by 8%
 - Current average speed 50 MPH
 - Future average speed will be 54 MPH

Rail Operations and Safety Update



Auto Door Performance Impacts

- Auto Doors rolled out systemwide on July 8, 2024
 - Red Line launched first on Dec. 5, 2023
- Auto Doors makes train performance **more consistent**
 - Reduces variation in door opening time due to manual operations
 - Legacy and 7K trains open doors in roughly same amount of time, but a significant improvement from the process of manual door operations
- Time savings incorporated into June schedules
 - Most lines save about two minutes end-to-end
 - Green and Yellow Lines save less time due to shorter length



Mitigations for manual mode train operations

Rail Operations and Safety Update

Metrorail has implemented the Point and Call method to support safer operations

■ Manual Operations Incidents

- Increase of red signal violations
- Increase of wrong side door operations

■ Overview and Implementation:

- The Point and Call method is designed to help rail vehicle operators stay focused and attentive during critical tasks
- A Point and Call computer-based training has been established and all rail vehicle operators have completed training
- Rail Transportation implemented the Point and Call method in August 2024

■ Benefits:

- Reduces and prevents errors by ~85%
- Increases blood flow in the front of the brain to stimulate focus
- Studies have shown that pointing to an object and verbalizing your intended action or identified objects increases attention and awareness

Progressing ATO Forward - Infrastructure

Rail Operations and Safety Update

System Performance

- Conduct Red Line system performance demonstration winter 2024
- Continue systemwide engineering test runs

ATO Test Data

- Overall ATO Stopping Performance for the system is above KPI threshold (98%)
- Zero safety issues have been observed during ATO testing
 - No red signal overruns
 - Over 3500 station stops
 - Tested more than 25% of fleet



Progressing ATO Forward – Safety and Readiness

Rail Operations and Safety Update

Safety Certification

- Completed operating rules and procedure updates
 - *Metrorail Operating Rulebook is updated every six months*
- Submitted Concept of Operations and Operational Readiness documents to WMSC
- Metro will have completed three WMSC ATO workshop by October 2024
- Operational Readiness Demonstration by November 2024

Training

- Updated training modules for following teams:
 - Rail Vehicle Operators
 - Signaling Maintenance teams
 - Vehicle Maintenance teams
 - Rail Traffic Controllers
 - Roadway Worker Protection program



ATO Concept of Operations

ATO has minimal impact to operations and will not be used in abnormal conditions.

System Operations with Rail Automation

- ATO is the standard mode of operation
- During Phase 1 of ATO utilization manual operations could be used for certain operational circumstances including:
 - Single Tracking
 - Roadway Worker Protection
 - Low Adhesion Conditions and Severe Weather
 - Movement under Permissive or Absolute Blocks
 - Pocket Track Operations
 - Hazardous Conditions

Roadway Worker Protection with Rail Automation

- Manual mode will be used on tracks occupied by Roadway Workers, maintaining the current level of safety
- Work Zone Operations:
 - Current process
 - AMF at platform prior to work zone indicates that there are workers ahead
 - Operator continues up to 35MPH throughout work zone
 - New Process
 - Operator communicates with RTC for switching to Manual mode
 - Operator requests permission to reengage ATO at the next station after work zone limits

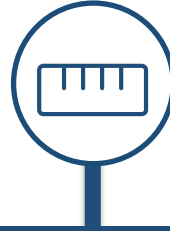
Automatic Train Operations: Training and Qualification

Rail Operations and Safety Update



Classroom – Day 1

- Classroom Training including Tabletop Scenarios
 - Inclement Weather
 - Communications with MICC
 - Changing Mode of Operations
 - Troubleshooting the ATO system
 - Others Scenarios



Simulators – Day 2

- Rail Vehicle Operators will spend 4-hours in the rail simulators emphasizing ATO principles learned in the classroom
- Continue use of scenarios
- Opportunity for Rail Vehicle Operators to ask questions in simulated operating environment



Qualification – Day 2

- Each operator completes an assessment with a passing score of 100%
- Employees will be graded on 8 core ATO competencies for proficiency utilizing the rail simulators

Automatic Train Operations: Timeline to Return to Operations

Rail Operations and Safety Update

- Update of training material and employee engagement

Sept
2024

Oct
2024

- Operational Readiness Demo

Nov
2024

Dec
2024

- Continue ATO training
- Systemwide ATO utilization

Jan
2025

- Start ATO training
- Employee Engagement

- Start of ATO utilization on the Red Line

Metro and WMSC Engagement

- Rail Automation Workshop #3 with WMSC
- Expected concurrence of Concept of Operations, Red Line test results
- Issuance of Temporary Use Notice for Red Line

Metro Employee Engagement

- Planned ATO training briefing to Local 689, Rail Transportation management
- Conduct ATO training pilot with Rail Vehicle Operators and Rail Traffic Controllers in October
 - WMSC and Local 689 will be invited to participate
- Operational Readiness Demonstration on the Red Line in non-revenue window

Metro will continue to progress ongoing ATO actions through our standing review process with WMSC

Appendix

Maximum Allowable speeds

