



Safety and Operations Committee

Action Item III-A

December 13, 2018

Preventive Maintenance Update

Washington Metropolitan Area Transit Authority
Board Action/Information Summary

Action Information

MEAD Number:
202040

Resolution:
 Yes No

TITLE:

Program Update for Preventive Maintenance Programs

PRESENTATION SUMMARY:

The purpose of this presentation is to seek Board approval to continue Preventive Maintenance and capital work during current hours and provide the Board with a comprehensive report on the progress and results of the Preventive Maintenance Program, in accordance with Resolution 2016-52.

PURPOSE:

In accordance with Resolution 2016-52, staff will seek Board approval to continue Preventive Maintenance and capital work during current hours and provide the Board with a comprehensive report on the progress and results of the Preventive Maintenance Program to improve wayside work efficiency and service reliability.

DESCRIPTION:

In 2016, WMATA launched a new robust Preventive Maintenance Program. To accommodate the track access needed to conduct the work, passenger service hours were reduced by eight hours per week. In addition, many other efforts were undertaken to shift WMATA from a paradigm of primarily reactive, corrective maintenance to one that focus on planned preventive maintenance and capital renewal. The combined focus on preventive maintenance and capital renewal has led to a significant decline in emergency work and improvements in service reliability and Customer On Time Performance.

Key Highlights:

The combination of preventive maintenance and capital investments have led to:
- 86 percent reduction of Track incidents, FY19Q1 vs FY17Q1
- 76 percent reduction of emergency work, FY19Q1 vs FY17Q1

As a result, Rail Service is improving, with Customer On-Time Performance reaching 90 percent in September 2018, the highest recorded OTP in seven years. As service improves, the Rail Customer Satisfaction is also rising, from 66 percent to 79 percent (FY16Q4 vs. FY18Q4).

Background and History:

In 2016, the lesson learned from SafeTrack was that in order to deliver safe, reliable

service, WMATA needed to implement a strong preventive maintenance program in addition to an expanded capital program. Six preventive maintenance programs were developed to target the top causes of delays, considering both incident severity and frequency.

Discussion:

The overall PM results are cumulative from program inception (July 1, 2018) through Sept 30, 2018 (FY19-Q1). The comprehensive program is comprised of six sub-programs

Traction Power Cable Meggering: This program is based on meggering cables seven years after installation and then every four years thereafter. Meggering tests the insulation resistance of cables and identifies high voltage cables that no longer maintain the ability to adequately insulate electrical current, reducing the risk of cable fires. The goal of the program is zero cable fires per year due to age-related degradation of the insulation of the high voltage cables. There have been no such fires in FY18 and FY19 year to date, although there have been other wayside electrical fires. To date, 2541 cables have been meggered, 30 percent of the system.

Earth to Ground Stray Current Testing: The testing is intended to identify components that no longer provide sufficient electrical isolation and therefore, allow stray current to escape and degrade track components, such as direct fixation fasteners along with their rail clips and anchor bolts. Stray current is also a primary cause of track circuit failures and direct fixation fastener fires. The testing and resulting remediation work reduces risk of fire incidents and extends the life of track components by reducing corrosion, to eventually get to zero stray current incidents per year. This program will take five years to complete testing on the whole system. To date, 46 segments have been tested, 22 percent of the system.

Trackbed Cleaning: Cleaning of the underground portions of the trackbed reduces the risk of arcing insulators and fire/smoke events. The trackbed is also cleaned prior to the underground stray current testing (described above) as it improves the quality of the test results. This PM program for FY18 was to clean the underground portions of the Red Line, plus segments that were being tested for stray current. Starting in FY19, this program is being expanded to include all the underground track. As the Red Line is the most susceptible to leakage and filling with debris, the entire Red Line will continue to be cleaned annually, and the balance of the underground system will be cleaned every two years. To date we have completed one round of cleaning on 222,071 linear feet of trackbed, 37 percent of the underground tracks systemwide.

Switch Maintenance: Due to the differential wear across interlockings and the need to continually prioritize the interlockings by condition, this program involves a quarterly inspection in which each interlocking is graded as "poor", "fair" or "good". After each quarterly inspection, the interlockings are scheduled for repairs. The progress of this program is measured by the percentage of interlockings rated "good" in the quarterly inspection. Based on progress to date, the PM program duration has been reduced from five years to three years to achieve the goal of 100 percent of the interlockings rated "good". As of September 30, 43 interlockings are rated good, 61 percent of the system.

Torqueing: Torqueing involves tightening the nuts that hold the rail fasteners in place in direct fixation track. While the FY18 goal of the program was to tighten (torque) every fastener nut, 70 percent was achieved. In late FY18, further analysis of the program by Track Engineering determined that annual torqueing was not advisable unless nuts had loosened. As a result, the program was adjusted to focus on more thorough inspection prior to torqueing to better identify specifically where torqueing is required and develop better data on when and why nuts loosen. As of September 30, 1,178,998 linear feet of rail, 82 percent of the system, has been torqued or confirmed to be adequately torqued. The goal of the program is to check, and torque as needed, the whole system on an annual basis; as better data is collected the frequency of this program may be reduced.

Track Geometry: This program involves tamping, surfacing and joint maintenance for all ballasted track every two-years. These actions improve ride quality and extend the life of ties and other components. Due to prioritization of capital work during the major trackwork events this summer, the schedule shifted for this work. As of September 30, 229, 231 LF of track have been tamped and surfaced, 43 percent of the system.

FUNDING IMPACT:

There is no funding impact for this information item. The work is included in approved FY19 budget.	
Project Manager:	Joseph Leader
Project Department/Office:	Chief Operating Officer

TIMELINE:

Previous Actions	<p>December 2016: Board approval of reduced passenger service hours to launch PM with objective of reducing unscheduled track delays by 50 percent by the end of FY19</p> <p>July 2017: Service hours reduced to match ridership and improve reliability</p> <p>May 2018: Program on track with two-year target for FY19; Board approved continuation through FY19</p>
Anticipated actions after presentation	<p>Provide a comprehensive progress report December 2019 with periodic updates</p> <p>Continue life-line night bus service</p> <p>Pursue late night Transportation Network Company (TNC) partnerships</p> <p>Continued execution and refinement of PM programs</p>

RECOMMENDATION:

Board approval to continue Preventive Maintenance and capital work during current hours.

Preventive Maintenance Progress Report

(Month 15 of 24)

Safety and Operations Committee
December 13, 2018

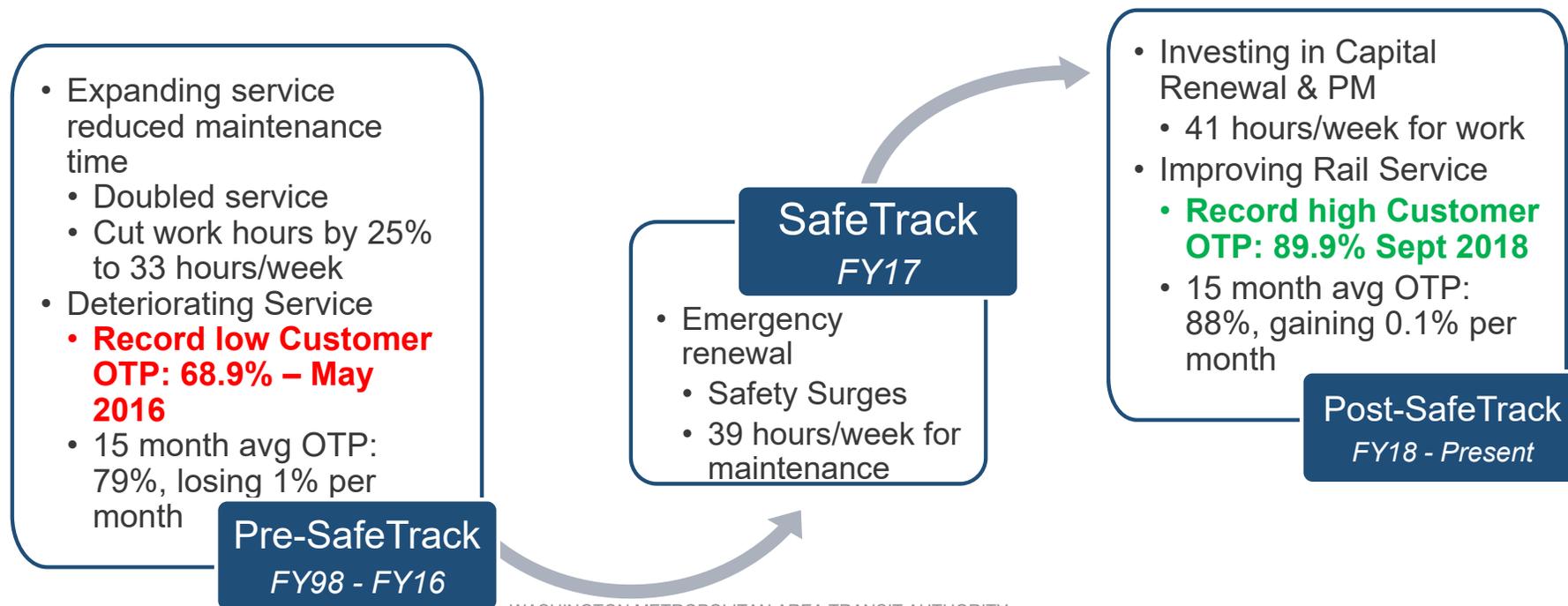


Purpose

- Provide a comprehensive report on the progress and results of the Preventive Maintenance Program, in accordance with Resolution 2016-52
- Seek Board approval to continue PM programs and capital work during current hours, to continue to improve rail service safety and reliability

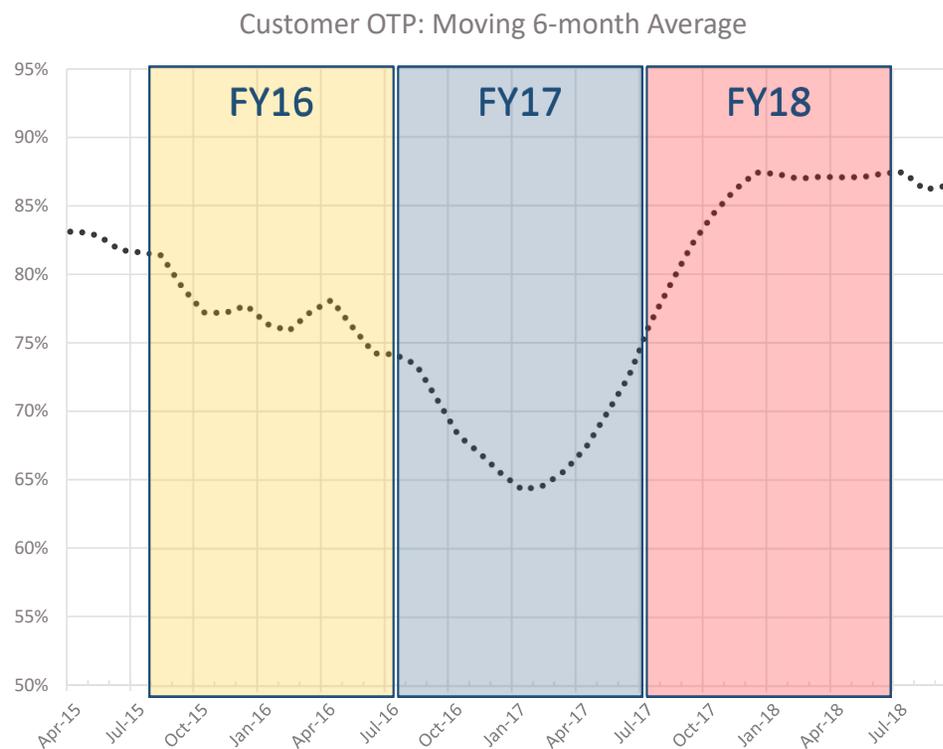
Background

Safe, reliable rail service requires sufficient time for maintenance & capital renewal



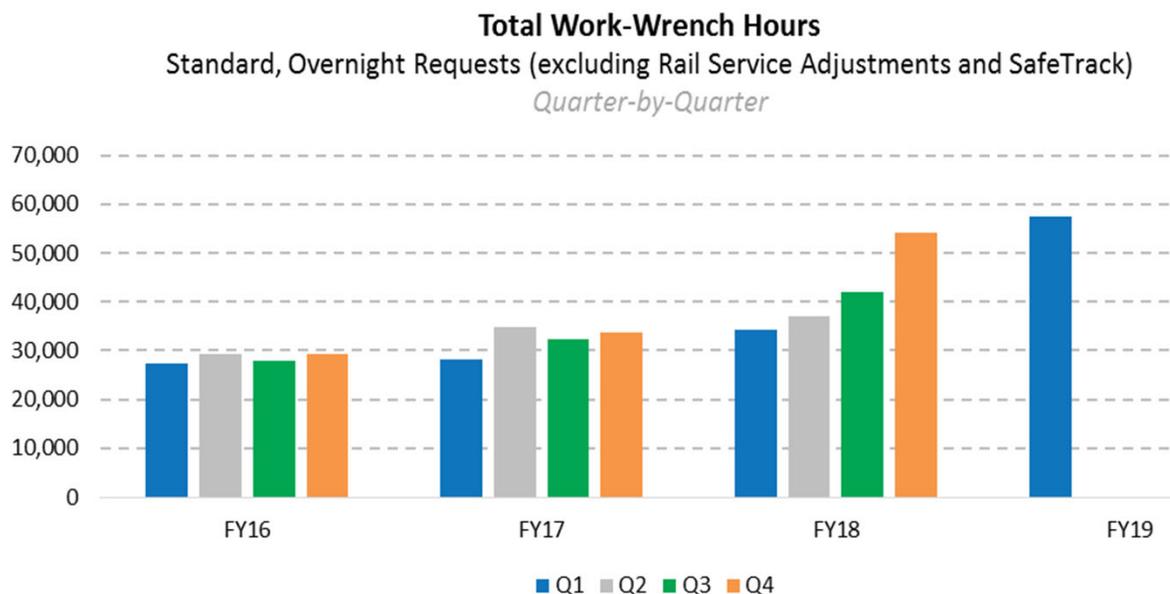
History of Current PM Program & Service Hours

- June 2016: Started SafeTrack Program and recognized need to sustain increased maintenance to avoid SafeTrack 2
- December 2016: WMATA developed comprehensive preventive maintenance program and obtained board approval to change service hours to support PM program
- July 2017: New service hours went into effect to improve reliability
- May 2018: Program on track for FY19; Board approved continuation through FY19



Shifting from Reactive to Proactive Maintenance

More than doubled work wrench hours during non-passenger hours FY16Q1 vs FY19Q1



- Unplanned work declining, FY17Q1 vs FY19Q1:
 - Track incidents down 86%
 - Emergency work down 76%

- Rail Service Improving
 - September 2018 Rail Customer On-time Performance was 90%, best ever
 - Rail Customer Satisfaction is rising 66% to 79% (FY16Q4 vs. FY18Q4)



Progress of Six PM Programs

	PM Program	Purpose	Frequency	% complete <i>As of 9/30/18</i>
Electrical Fires	Trackbed Cleaning	Reduces fire risk & deterioration caused by water	1 year Red Line 2 year balance	37%
	Cable Meggering	Reduce number of power cable faults	4 years	30%
	Stray Current Testing	Improve electrical isolation of the track	5 years	22%
Track Defects	Torqueing	Reduce excessive strain and loading in Direct Fixation track	1 year	82%
	Tamping	Stabilize ballasted track structure and correct alignment	2 years	43%
	Switch Maintenance	Inspect, weld & grind interlocking components	3 years (reduced from 5 yrs)	62%

Result: Overall Track Infrastructure Incidents

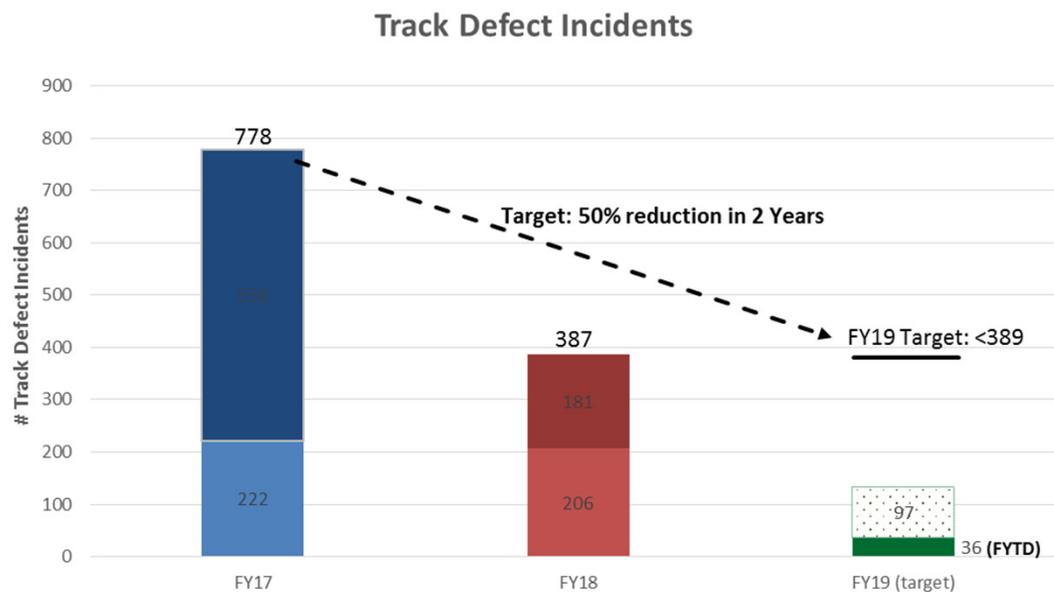
Intent of PM program achieved: 50% reduction in number of infrastructure-related delays

■ Definition:

- Track infrastructure defect that affects passenger service

■ Example:

- Speed restriction for loose fasteners



Challenges Remain: Electrical Fire Incidents

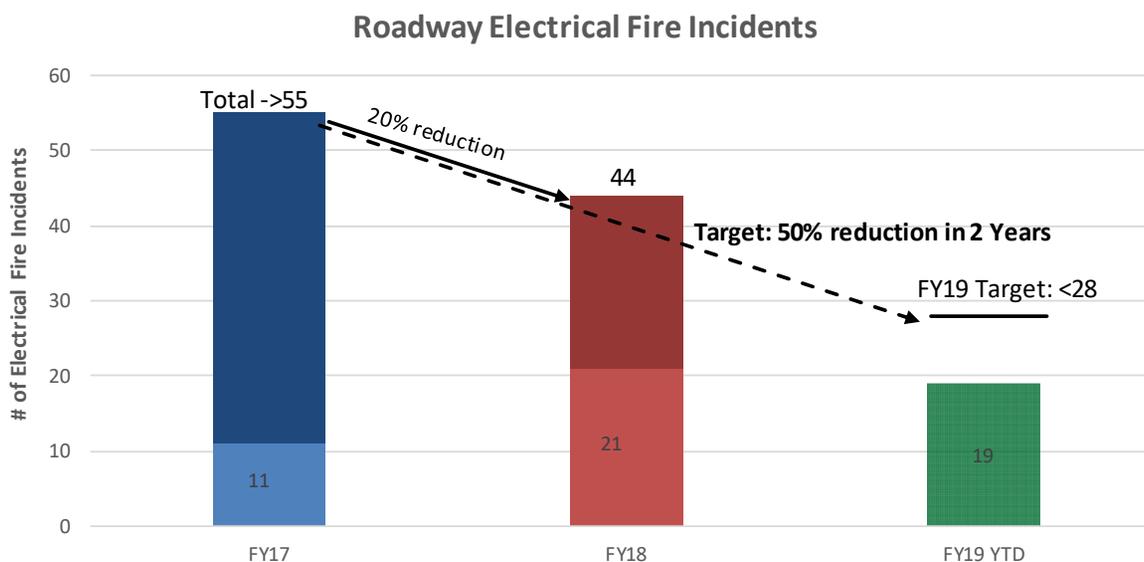
20% reduction in Roadway Electrical Fires FY17 vs FY18

■ Definition:

- Electrical fire on wayside that affects passenger service

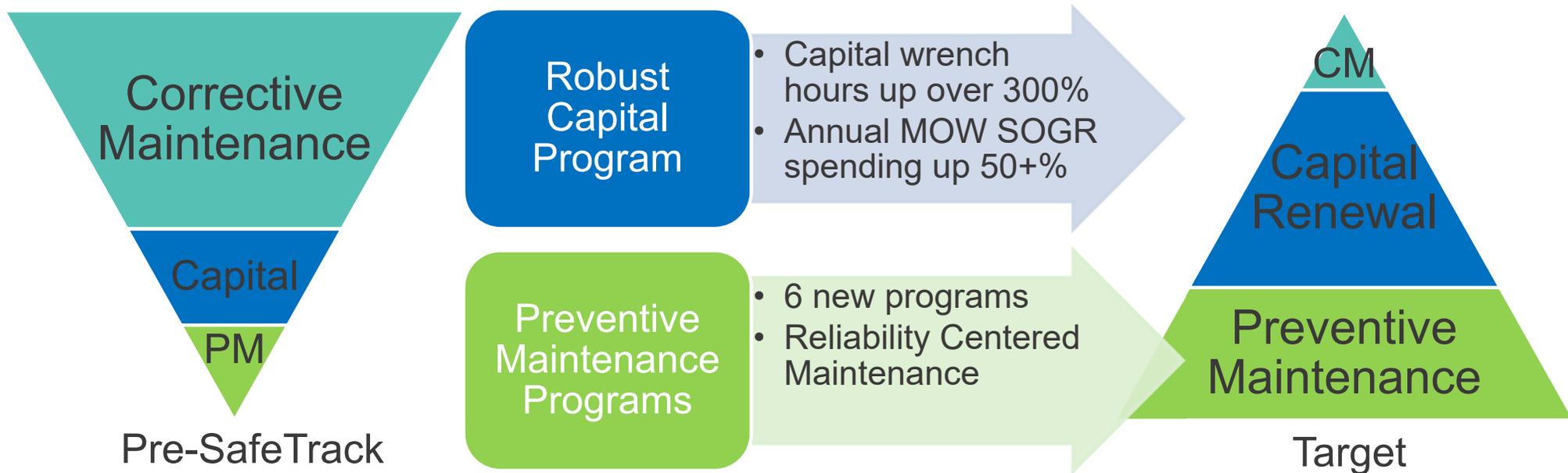
■ Example:

- Arcing insulator



Good Service Requires a State of Good Repair

Continue the paradigm shift from reactive to proactive work to sustain safe, reliable service



Capital Program Use of Non-Passenger Window

Current service hours are vital for advancement of capital program, beyond MOW

- Radio Infrastructure Replacement
- 100% 8-car train Power Upgrades
- Tunnel Ventilation Construction
- Standpipe Replacement
- Installation of Smoke detection in WMATA Underground tunnel
- Energy Efficient Tunnel Lighting
- Tunnel Shaft Repairs

Next Steps



- Recommend board approval to continue PM and capital work during current hours
- Management will:
 - Provide a comprehensive progress report December 2019 with periodic updates
 - Continue Life-line night bus service
 - Pursue late night TNC partnerships

SUBJECT: CONTINUATION OF REDUCED METRORAIL SPAN OF SERVICE AND SUPPLEMENTAL BUS SERVICE

RESOLUTION
OF THE
BOARD OF DIRECTORS
OF THE
WASHINGTON METROPLITAN AREA TRANSIT AUTHORITY

WHEREAS, In Resolution 2016-52, as amended by Resolution 2017-26, the Board of Directors approved the reduced Metrorail span of service and supplemental bus service, effective June 25, 2017, and directed the General Manager/Chief Executive Officer (GM/CEO) to provide a comprehensive report of the Preventive Maintenance Program (PM Program) progress in May 2018; and

WHEREAS, In Resolution 2018-18, the Board of Directors approved continuation of the reduced span of service and supplemental bus service for Fiscal Year (FY) 2019; and

WHEREAS, The GM/CEO's quarterly December 2018 PM Program report shows progress, including an 86 percent (%) reduction in track incidents and a 76% reduction in emergency track requests;

WHEREAS, Four of the six component preventive maintenance programs have not yet reached 50% completion and work must continue to reach the goal of reducing electrical fires; NOW, THEREFORE, be it

RESOLVED, That the Board of Directors approves continuation of the reduced span of service and supplemental bus service for FY2020; and be it further

RESOLVED, That on July 1, 2020, the Metrorail operating hours shall revert to Monday – Thursday: 5:00 a.m. to 12:00 a.m.; Friday: 5:00 a.m. to 3:00 a.m.; Saturday: 7:00 a.m. to 3:00 a.m.; and Sunday: 7:00 a.m. to 12:00 a.m., unless the Board of Directors takes further action; and be it further

RESOLVED, That the GM/CEO is directed to provide a comprehensive progress report on the PM Program in December 2019 along with quarterly reports prior to that date; and be it further

RESOLVED, That the GM/CEO is directed to explore and develop mutually beneficial partnerships with transportation network companies for late night hours; and be it finally

RESOLVED, That this Resolution shall be effective 30 days after adoption in accordance with § 8(b) of the WMATA Compact.

Reviewed as to form and legal sufficiency,



Patricia Y. Lee
General Counsel

WMATA File Structure No.:
20.5.1 Rail Scheduling

PROPOSED