

Washington Metropolitan Area Transit Authority

Board Action/Information Summary

☒ Action ☐ Information

MEAD Number:
201862

Resolution:
☐ Yes ☒ No

TITLE:

Open NTSB Safety Recommendations Update

PRESENTATION SUMMARY:

The Department of Safety and Environmental Management (SAFE) will be providing an update on the 16 open National Transportation Safety Board (NTSB) recommendations which are hazard rated I and II (unacceptable and undesirable) by WMATA. These items stem from previous incidents in which the NTSB investigated and provided recommendations.

PURPOSE:

This update informs the Safety Committee regarding the current status of the 16 open NTSB safety action items (hazard rated I & II) as requested by a Board Safety Committee Member. This briefing will publicly communicate the status of the hazard rated I and II items as Metro continues to close these and all other recommendations as part of improving the safety culture.

DESCRIPTION:

Upon receipt of a recommendation, the Authority has 90 days to develop a corrective action plan including the hazard ratings for the recommendation and mitigation. All documentation including the estimated completion date is provided to the NTSB for review and approval, and once approved would be listed as "open, acceptable". Once the corrective action is completed, WMATA's internal Quality Assurance, Internal Compliance and Oversight validates the completion and all documentation is submitted back to the NTSB for review, validation and approval. Upon receipt of approval from the NTSB, the specific action is considered closed.

Key Highlights:

- There are a total of 30 open NTSB recommendations, of which one is rated as "unacceptable" (category I - red) and 15 additional are rated "undesired" or category II (yellow) with the remaining following into category III or IV;
- Two are from incidents prior to the L'Enfant Plaza incident; the remaining items are from the L'Enfant Plaza incident of January 12, 2015;
- Two of the 16 category I or II have been submitted to the NTSB for review and closure and are awaiting a determination;
- The status of all of the recommendations are publicly available at <https://www.wmata.com/about/leadership/general-manager/upload/NTSB-Detailed-Tracker.pdf>

Background and History:

The NTSB is an independent agency with the authority to investigate transportation incidents. As a result of NTSB investigations that have occurred over the years, they have issued recommendations for corrective actions to WMATA. Presently there are 30 safety recommendations open with 16 rated by WMATA as the most severe (category I and II). Two of the recommendations (R-04-004 and R-10-20) are from previous incidents. The remaining 14 open recommendations stem from the January 12, 2015 L'Enfant Plaza Smoke and Electrical Arcing incident.

Discussion:

The management of identified hazards is a vital component of WMATA's safety culture. Accidents and incidents are prevented or risks minimized by identifying the hazards and associated risks, developing appropriate mitigating measures, and tracking implementation to closure. These would include recommendations from external agencies like the NTSB. The 16 open NTSB safety recommendations (category I and II) were all subjected to Military Standard 882C methodology to determine the hazard rating as well as the development of a detailed safety action plan which was transmitted to the NTSB for review and acceptance.

FUNDING IMPACT:

Define current or potential funding impact, including source of reimbursable funds.	
Project Manager:	CSO/SAFE - Pat Lavin
Project Department/Office:	17210 - SAFE

Funding for these items is already in an approved funding source.

TIMELINE:

Previous Actions	<ul style="list-style-type: none">February 25, 2016, Status of NTSB and FWSO Corrective Actions.
Anticipated actions after presentation	<ul style="list-style-type: none">Continue to fully implement all NTSB and FTA CAPsContinue to implement programs and activities to strengthen the safety cultureContinue to fully investigate accidents and incidents

RECOMMENDATION:

To inform the Board's Safety Committee of the status of the remaining NTSB category I & II items.

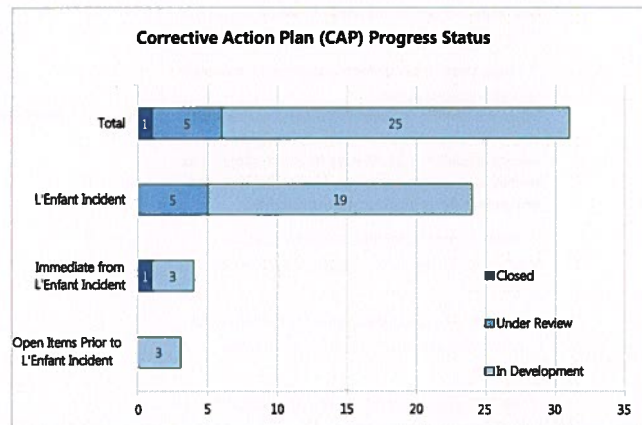


WMATA Hazard Risk Category*	Description	CAP #s
I	Unacceptable: The hazard must be mitigated in the most expedient manner possible.	1
II	Undesirable w/ Executive Safety Committee (ESC) decision required: The hazard must be mitigated. If necessary, the Chief Safety Officer may develop interim mitigations in coordination with the ESC, subject to FTA approval.	16
III	Acceptable w/ review: The Chief Safety Officer must determine if the hazard is adequately controlled or mitigated as is.	9
IV	Acceptable w/o review: The hazard does not need immediate mitigation, but corrective actions are monitored.	5

*In accordance with FTA requirements, WMATA's Hazard Risk categories are expressed in terms of severity and probability of occurrence. This is used as a safety management tool for mitigating hazards to the lowest practicable level.

Metro Actionable Item Status		
■ Closed	■ Under Review	■ In Development



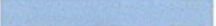
NTSB Status Index			
O Open	AI Awaiting NTSB's Inspection		
O/PD Open / Past Due	AC Addressing NTSB Comments		
UR Under NTSB Review	C Closed		



NTSB Progress Status							
CAP #	Metro Actionable Items	WMATA Hazard Risk Category	Original Estimate to Request Closure	CAP Status	Total Action Items	Action Items Submitted	Status Bar
NTSB Corrective Action Plan (31 CAPs)					92	20	22%
Open Items Prior and Immediate to L'Enfant Incident (7 CAPs)					7	1	14%
NTSB R-08-004	Open Items Prior to L'Enfant Incident: • WMATA is developing technology to notify train operators when approaching work areas.	I	December 2017	O	3	0	0%
NTSB R-10-20	• WMATA is removing 1000-series railcars from service as new 7000-series railcars are commissioned and placed in-service.	II		O			
NTSB R-10-22	• WMATA is developing a program to monitor railcar event recorders. • Finally, WMATA will perform a quality assurance audit to review actionable items.	IV		O			
NTSB R-15-8	Immediate from L'Enfant Incident: • WMATA assessed the state of good repair of tunnel ventilation systems in accordance with industry best practices.	II	September 2017	C	4	1	25%
NTSB R-15-9	• WMATA is developing operational procedures for tunnel ventilation to provide optimal configuration for smoke emergencies.	II		O			
NTSB R-15-10	• WMATA will develop training programs for control center staff on updated ventilation procedures and configurations.	II		O			
NTSB R-15-25	• WMATA is inspecting all cable connector assemblies for proper construction, including weather-tight seals, & making any necessary repairs. • Finally, WMATA will perform a quality assurance audit to review actionable items.	III		O			
NTSB twenty-four (24) safety recommendations					85	19	22%
NTSB R-16-08	Review and revise WMATA's tunnel inspection, maintenance, and repair procedures to mitigate water intrusion into tunnels.	II	February 2018	O	2	0	0%

CAP #	Metro Actionable Items	WMATA Hazard Risk Category	Original Estimate to Request Closure	CAP Status	Total Action Items	Action Items Submitted	Status Bar
	<ul style="list-style-type: none"> WMATA is developing maintenance/inspection procedures to identify and mitigate water intrusion into the tunnels. Finally, WMATA will perform a quality assurance audit to review actionable items. 						
NTSB R-16-09	<p>When the revision of tunnel inspection, maintenance, and repair procedures recommended in Safety Recommendation R-16-08 have been completed, train maintenance employees on the new procedures, and ensure that the procedures are implemented.</p> <ul style="list-style-type: none"> WMATA is developing maintenance/inspection procedures to identify and mitigate water intrusion into the tunnels. WMATA will incorporate a revised tunnel inspection, maintenance, and repair procedures into training curriculum. WMATA will rollout a new curriculum and training program. WMATA will create an audit plan and schedule to verify implementation. Finally, WMATA will perform a quality assurance audit to review actionable items. 	II	March 2019	O	5	0	
NTSB R-16-10	<p>Improve the capacity of tunnel ventilation fans to conform to the requirements of National Fire Protection Association (NFPA) 130.</p> <ul style="list-style-type: none"> WMATA is reviewing existing ventilation studies that have been completed while also developing a recommended approach to analyzing the entire underground ventilation system for compliance with NFPA 130. WMATA will issue a contract for ventilation analysis. WMATA will recommend infrastructure improvements. WMATA will develop an action plan for recommended improvements. Finally, WMATA will perform a quality assurance audit to review actionable items. 	III	September 2021	O	5	0	
NTSB R-16-11	<p>Develop location-specific emergency ventilation config based on engineering studies of the WMATA tunnel ventilation system.</p> <ul style="list-style-type: none"> WMATA is writing tunnel ventilation procedures in conjunction with NTSB R-15-9. WMATA is analyzing potential tunnel ventilation system improvements. WMATA will develop location-specific emergency ventilation configurations. Finally, WMATA will perform a quality assurance audit to review actionable items. 	II	July 2017	O	4	0	
NTSB R-16-12	<p>Develop and implement procedures for actions to be taken by Rail Operations Control Center (ROCC) personnel when smoke detectors alarm.</p> <ul style="list-style-type: none"> WMATA is writing tunnel ventilation procedures in conjunction with NTSB R-15-9. WMATA will set a specific set of steps and responsibilities for smoke detector alarms. Finally, WMATA will perform a quality assurance audit to review actionable items. 	II	October 2017	O	3	0	
NTSB R-16-13	<p>Once action to address Safety Recommendation R-16-12 is completed, train all ROCC personnel on the new procedures for responding to smoke alarms. This training should include regular refresher training.</p>	II	May 2018	O	4	0	

CAP #	Metro Actionable Items	WMATA Hazard Risk Category	Original Estimate to Request Closure	CAP Status	Total Action Items	Action Items Submitted	Status Bar
	<ul style="list-style-type: none"> WMATA is developing and implementing procedures for actions to be taken by ROCC personnel when smoke detectors alarm. WMATA will incorporate procedures into the ROCC curriculum, to include refresher training. WMATA will provide documentation of training. Finally, WMATA will perform a quality assurance audit to review actionable items. 						
NTSB R-16-14	<ul style="list-style-type: none"> Incorporate smoke alarms in periodic emergency drills and exercises. WMATA conducted quarterly emergency drills. WMATA developed a drill and coordination plan for the drill scheduled for October 2016. Finally, WMATA performed a quality assurance audit to review actionable items. 	II	December 2016	UR	3	3	100% 
NTSB R-16-15	<ul style="list-style-type: none"> Include in your efficiency testing program (rules compliance testing program) a specific test to ensure appropriate emergency actions are taken by ROCC supervisors and control operators in response to an alarm. WMATA conducted efficiency testing. WMATA conducted specific tests for ROCC personnel's response to alarms. Finally, WMATA performed a quality assurance audit to review actionable items. 	III	January 2017	UR	3	3	100% 
NTSB R-16-16	<ul style="list-style-type: none"> NTSB R-16-16 - Install and maintain a system that will detect the presence and location of fire and smoke throughout the WMATA tunnel and station network. WMATA is evaluating and testing potential smoke detection solutions. WMATA will develop an implementation plan for selected smoke detection solution. Finally, WMATA will perform a quality assurance audit to review actionable items. 	II	August 2020	O	3	0	0% 
NTSB R-16-17	<ul style="list-style-type: none"> Develop procedures for regular testing of all smoke detectors. WMATA is developing procedures for smoke detection systems. Finally, WMATA will perform a quality assurance audit to review actionable items. 	III	January 2018	O	2	0	0% 
NTSB R-16-18	<ul style="list-style-type: none"> Conduct a risk assessment before any preventive maintenance program is initiated, changed or discontinued. WMATA will revise System Safety Program Plan (SSPP) to state that changes in preventative maintenance procedures are subject to formal approval. WMATA will revise policy instructions to state that changes in preventative maintenance procedures that are subject to formal approval. WMATA will review existing policies to identify needs for revision. WMATA will develop or revise policies to state that changes in preventative maintenance procedures must be approved as described. Finally, WMATA will perform a quality assurance audit to review actionable items. 	III	August 2018	O	5	0	0% 
NTSB R-16-19	<ul style="list-style-type: none"> Ensure that all train operators are trained and regularly tested on the appropriate procedure for emergency shutdown of railcar ventilation. WMATA will update procedure for shutting down railcar ventilation. WMATA will update the new train operator training curriculum. Finally, WMATA will perform a quality assurance audit to review actionable items. 	III	March 2017	O	3	1	33% 

CAP #	Metro Actionable Items	WMATA Hazard Risk Category	Original Estimate to Request Closure	CAP Status	Total Action Items	Action Items Submitted	Status Bar
NTSB R-16-20	<p>Incorporate a specific test in your efficiency testing program to ensure that train operators understand the procedure for emergency shutdown of railcar ventilation.</p> <ul style="list-style-type: none"> • WMATA implemented an efficiency testing program for Rail Traffic Controllers (RTCs). • WMATA testED train operators in emergency shutdown of railcar ventilation. • Finally, WMATA performed a quality assurance audit to review actionable items. 	III	February 2017	UR	3	3	100% 
NTSB R-16-21	<p>Revise Standard Operating Procedure (SOP) #6 to clarify which trains should be stopped until the source of smoke is identified.</p> <ul style="list-style-type: none"> • WMATA is updating SOP #6 to state all trains that must be stopped in the event of a smoke incident. • Finally, WMATA will perform a quality assurance audit to review actionable items. 	IV	December 2016	O/PD	2	0	0% 
NTSB R-16-22	<p>Revise your SOP to require that: (1) suitably trained, qualified, and properly equipped personnel investigate reports of wayside fire or smoke, and (2) these reports are not investigated using trains with revenue passengers.</p> <ul style="list-style-type: none"> • WMATA is creating procedural checklists. • WMATA will develop an SOP for smoke investigation. • Finally, WMATA will perform a quality assurance audit to review actionable items. 	IV	February 2017	O	3	0	0% 
NTSB R-16-23	<p>Review and revise as necessary your ROCC emergency response procedures for smoke and fire.</p> <ul style="list-style-type: none"> • WMATA is developing tunnel ventilation procedures for Operations Control Center staff. • WMATA is developing procedural checklists for SOPs. • WMATA developed drills to assess Metro's response to smoke and fire. • WMATA will review and revise existing SOPs for ROCC response to fire and smoke emergencies. • Finally, WMATA will perform a quality assurance audit to review actionable items. 	IV	February 2018	O	5	1	20% 
NTSB R-16-24	<p>Retrain ROCC supervisors on all standard operating procedures for emergencies.</p> <ul style="list-style-type: none"> • WMATA will establish SOP procedural checklists. • WMATA will retrain ROCC supervisors on procedural checklists. • Finally, WMATA will perform a quality assurance audit to review actionable items. 	III	February 2017	O	3	0	0% 
NTSB R-16-25	<p>Develop and incorporate a comprehensive program for training ROCC control operators in emergency response procedures including regular refresher training.</p> <ul style="list-style-type: none"> • WMATA is developing annual recertifications for RTCs. • WMATA is updating emergency response training. • WMATA is developing and implementing procedures for smoke detector alarms. • WMATA is training all ROCC personnel on the new procedures for smoke detector alarms. • Finally, WMATA will perform a quality assurance audit to review actionable items. 	II		O	5	0	0% 
NTSB R-16-26	<p>Conduct regular emergency response drills and develop a program to test the efficiency of the ROCC to ensure that standard operating procedures are properly followed during emergencies.</p> <ul style="list-style-type: none"> • WMATA is updating emergency response training. 	II	October 2018	O	4	1	25% 

CAP #	Metro Actionable Items	WMATA Hazard Risk Category	Original Estimate to Request Closure	CAP Status	Total Action Items	Action Items Submitted	Status Bar
	<ul style="list-style-type: none"> WMATA conducted drills to assess Metro's response to smoke & fire. WMATA will develop an audit plan to verify compliance with emergency procedures during drills. Finally, WMATA will perform a quality assurance audit to review actionable items. 						
NTSB R-16-27	<p>Install line identification and direction signage at tunnel entrances and inside tunnels.</p> <ul style="list-style-type: none"> WMATA will determine appropriate signage locations. WMATA will survey tunnels to map proposed locations. WMATA will develop proposed improvements and a tentative implementation plan for jurisdictional review. WMATA will develop and implement a final implementation plan when improvements are accepted by jurisdictional fire chiefs. Finally, WMATA will perform a quality assurance audit to review actionable items. 	III	April 2018	O	5	0	<div>0%</div> <div>0%20%40%60%80%100%</div>
NTSB R-16-28	<p>Implement a regular schedule for the inspection and removal of obstructions from safety walkways and track-bed floors to ensure safe passageways for passengers to use during a tunnel evacuation.</p> <ul style="list-style-type: none"> WMATA is removing obstructions from safety walkways. WMATA is developing formal written procedures for inspection, reporting, clearing, and recording of obstructions in the roadway and on safety walkways. Finally, WMATA will perform a quality assurance audit to review actionable items. 	II	October 2017	O	3	0	<div>0%</div> <div>0%20%40%60%80%100%</div>
NTSB R-16-29	<p>Conduct emergency response drills with local emergency response agencies in accordance with NFPA 130, document lessons learned, and develop and implement additional procedures as necessary to effectively respond to emergencies.</p> <ul style="list-style-type: none"> WMATA conducted quarterly emergency drills. WMATA outlined the standard approach for documenting drills in accordance with industry guidelines. Finally, WMATA performed a quality assurance audit to review actionable items. 	II	February 2017	UR	3	3	<div>100%</div> <div>0%20%40%60%80%100%</div>
NTSB R-16-30	<p>Revise your standard operating procedures to require that an after-action review be conducted of all emergency responses to events with passenger or employee fatalities, and publish the results, including both the successes and the potential deficiencies of your responses, to help ensure that deficiencies are appropriately remediated.</p> <ul style="list-style-type: none"> WMATA developed an SOP detailing requirements for performing an After-Action Review (AAR). Finally, WMATA performed a quality assurance audit to review actionable items. 	IV	April 2017	UR	2	2	<div>100%</div> <div>0%20%40%60%80%100%</div>
NTSB R-16-31	<p>Review and revise your quality assurance program to ensure that regular quality assurance audits are included to identify and correct any elements of procedural noncompliance.</p> <ul style="list-style-type: none"> WMATA developed an overview of the Quality 	II	May 2017	O	5	2	<div>40%</div> <div>0%20%40%60%80%100%</div>

CAP #	Metro Actionable Items	WMATA Hazard Risk Category	Original Estimate to Request Closure	CAP Status	Total Action Items	Action Items Submitted	Status Bar
	<p>Management System (QMS), quality objectives and guiding principles.</p> <ul style="list-style-type: none"> • WMATA reviewed the existing manual and identify gaps. • WMATA will revise manual to incorporate input from gap analysis. • WMATA will implement updated QMS • Finally, WMATA will perform a quality assurance audit to review actionable items. 						



Washington Metropolitan Area Transit Authority

Update on Open NTSB Safety Corrective Actions

Safety Committee
April 27, 2017



Hazard Resolution Matrix of 30 Open NTSB Recommendations

Frequency of Occurrence	Hazard Categories			
	Catastrophic 1	Critical 2	Marginal 3	Negligible 4
A = Frequent	0 1A	0 2A	0 3A	0 4A
B = Probable	0 1B	0 2B	0 3B	0 4B
C = Occasional	1 1C	8 2C	3 3C	5 4C
D = Remote	2 1D	2 2D	6 3D	0 4D
E = Improbable	0 1E	1 2E	2 3E	0 4E

1A, 1B, 1C, 2A, 2B, 3A

1

Unacceptable - Executive Leadership with Chief Safety Officer

1D, 2C, 2D, 3B, 3C

15

Undesirable - Executive Safety Committee decision required

1E, 2E, 3D, 3E, 4A, 4B

9

Acceptable with review by Executive Safety Committee

4C, 4D, 4E

5

Acceptable without review



Corrective Actions submitted to NTSB for closure

- Incorporate smoke alarms in periodic emergency drills (R-16-14)
- Conduct emergency drills with jurisdictions with after-action reports (R-16-29)

NOTE: In addition, Hazard Rated III R-16-15, R-16-20 and Hazard Rated IV R-16-22, R-16-30 submitted for closure



Status of Hazard I & II

16 Open NTSB Recommendations

NTSB	Recommendation	Funded	Total	Est. Completion
R-08-04	Develop technology to notify train operators approaching work area	FTA Grant	\$1,600,000	Dec. 2019
R-10-20	Remove 1000 Series Cars from service	Capital (CIP0057)	\$534,368,930	Dec. 2017
R-15-9	Develop written tunnel ventilation procedures for operations control center staff	Operating Budget	Within existing budget	Sep. 2017
R-15-10	Implement Safety Recommendation R-15-009, incorporate the use of the procedures	Operating Budget	Within existing budget	Sep. 2017
R-16-08	Review and revise your tunnel inspection, maintenance, and repair procedures to mitigate water intrusion into tunnels	Operating Budget	Within existing budget	Feb. 2018
R-16-09	Safety Recommendation R-16-08 has been completed, train maintenance employees.	Operating Budget	Within existing budget	Mar. 2019
R-16-11	Develop location-specific emergency ventilation configurations	Capital (CIP0139_S10)	\$515,828	Jul. 2018
R-16-12	Develop and implement procedures for Rail Operations Control Center personnel when smoke detectors alarm	Capital (CIP0139_S1 & S14)	\$2,690,000	Oct. 2017



Status of Hazard I & II

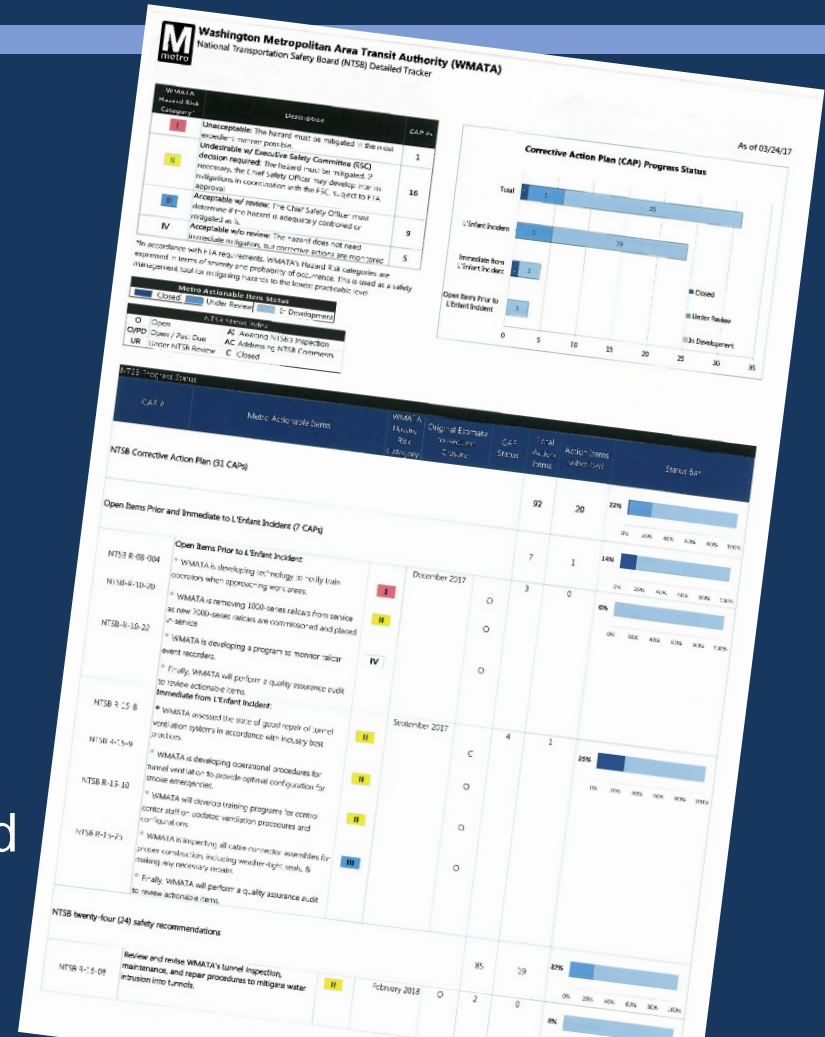
16 Open NTSB Recommendations

NTSB	Recommendation	Funded	Total	Est. Completion
R-16-13	Safety Recommendation R-16-12 is completed, train all Rail Operations Control Center personnel	Capital (CIP0139_S6) & Operating	\$26,809	May 2018
R-16-14	Incorporate smoke alarms in periodic emergency drills and exercises	Operating Budget	Within existing budget	Jun. 2017
R-16-16	Install and maintain a system that will detect the presence and location of fire and smoke.	Capital (CIP0258)	\$23,604,182	Aug. 2020
R-16-25	Develop and incorporate a comprehensive program for training Rail Operations Control Center control operators in emergency response procedures	Operating Budget	Within existing budget	Jun. 2018
R-16-26	Conduct regular emergency response drills properly followed during emergencies	Operating Budget	Within existing budget	Oct. 2018
R-16-28	Program for inspection and removal of obstructions from safety walkways and track-bed floors	Capital (CIP0139_S3) & Operating	\$40,000	Jun. 2017
R-16-29	Conduct emergency response drills with local emergency response agencies	Operating Budget	Within existing budget	Jun. 2017
R-16-31	Review and revise your quality assurance program	Operating Budget	Within existing budget	May 2017



NTSB Recommendations ...

- Have corrective action plans
- Are funded, Capital and/or Operating
- In progress for completion
- Monitored and tracked by the Quality and Internal Control Group
- Reviewed, validated, and approved by NTSB before being closed



<https://www.wmata.com/about/leadership/general-manager/upload/NTSB-Detailed-Tracker.pdf>