

**UNITED STATES DEPARTMENT OF TRANSPORTATION**

**Federal Transit Administration**

**[Safety Directive No. 16-5, Notice No. 1]**

**Safety Directive Under 49 U.S.C. § 5329  
Required Actions to Address Findings from Stop Signal Overrun Investigation  
Conducted at the Washington Metropolitan Area Transit Authority**

**AGENCY:** Federal Transit Administration (FTA), U.S. Department of Transportation (DOT).

**SUMMARY:** The FTA issues Safety Directive 16-5 to require the Washington Metropolitan Area Transit Authority (WMATA) to address findings resulting from FTA's investigation into stop signal overruns occurring on the Metrorail system between January 1, 2012 and July 31, 2016. This Safety Directive is being released concurrently with the FTA's Stop Signal Overrun Investigation Final Report (August 15, 2016). The Safety Directive requires WMATA to address 11 required actions and to expedite efforts underway to complete a number of in-progress corrective actions plans previously approved by the FTA. The FTA finds that, collectively, these actions will reduce the likelihood of stop signal overruns resulting from three (3) prevalent and recurring contributing factors: (1) lack of train operator familiarity with mainline and yard territory, (2) train operator inattention or confusion when departing from a station or terminal or moving under zero speed commands and (3) deficient communications between the train operator and the Rail Operations Control Center (ROCC) or others (*e.g.*, rail transportation supervisor).

**FOR FURTHER INFORMATION CONTACT:** For program matters, Sean Thompson, Director, Office of Safety Review, Office of Transit Oversight and Safety, telephone (202) 366- 3616 or [Sean.Thompson@dot.gov](mailto:Sean.Thompson@dot.gov); for legal matters, Candace Key, Attorney Advisor, FTA, telephone 202-366-9178 or [Candace.Key@dot.gov](mailto:Candace.Key@dot.gov).

**SUPPLEMENTARY INFORMATION:**

This Safety Directive issues findings and required actions resulting from an investigation conducted by the Federal Transit Administration (FTA) into stop signal overruns occurring on the Washington Metropolitan Area Transit Authority (WMATA) Metrorail system. A stop signal overrun occurs when a train fails to stop as required in advance of a stop signal, flag, or other indicator. The FTA considers stop signal overruns significant safety events that can potentially result in derailment, collision of passenger trains, and striking of workers or equipment on the rail transit right-of-way.

The FTA WMATA Safety Oversight (FWSO) Office initiated this investigation because, in calendar year 2015, the Metrorail system experienced more stop signal overruns than in either of the previous two years. In addition, FWSO's review of individual stop signal overrun incidents, occurring after FTA assumed direct oversight responsibility in October 2015, identified potential issues related to communications, training, signal identification, and the enforcement of train

speeds that required systemwide analysis and evaluation.

Finally, a near-miss collision with a passenger train at Smithsonian on February 3, 2016 highlighted the potential consequences associated with stop signal overruns and their priority for the safety of the riding public.

FWSO's investigation focused on four main areas:

- Determining the frequency of stop signal overruns on the Metrorail system,
- Identifying the potential consequences of these events,
- Clarifying contributing factors to these events, and
- Assessing the adequacy of WMATA's actions and programs currently underway to prevent these incidents.

FWSO initiated its investigation on March 16, 2016 and concluded it on July 31, 2016.

During the course of this investigation, concerns raised regarding these events at WMATA led the FTA to issue an industry-wide safety advisory on April 8, 2016.<sup>1</sup> The FTA also requested additional information from state safety oversight agencies and rail transit agencies regarding how they define, track and investigate these events. The FTA is currently reviewing this information to determine if additional action is needed to improve investigation of stop signal overruns, industry-wide, and to standardize mitigations put in place to prevent these events.

Working cooperatively with WMATA, FWSO documented 68 stop signal overruns that occurred during the 55-month period between January 1, 2012 and July 31, 2016. FWSO identified several contributing factors associated with stop signal overruns in the WMATA system:

- Lack of train operator familiarity with mainline and yard territory,
- Train operator inattention or confusion when departing from a station or terminal or moving under zero speed commands, and
- Poor or incomplete communication between the train operator and the Rail Operations Control Center (ROCC) regarding unusual train movements.

FWSO also found the need for more effective event reporting and analysis regarding stop signal overruns. Encouraging more open and complete reporting of stop signal overrun incidents and performing additional field and even simulator-based research will allow WMATA to better understand why stop signal overruns occur and identify more effective and targeted corrective actions to address them.

Since the FTA's Safety Management Inspection (SMI) in June 2015, and even more recently under the FTA's direct safety oversight, WMATA has taken a number of critical steps to improve the safety of its train operations. WMATA has made considerable progress in addressing findings previously issued by the FTA and recommendations resulting from WMATA's own internal assessments and evaluations. Many of these actions also address factors commonly considered to contribute to stop signal overruns, such as speeding, lack of familiarization with the location of stop signals, lack of operational testing, and ineffective

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<sup>1</sup> See Safety Advisory 16-1, "Stop Signal Overruns in 2015" (April 6, 2016).

communications between supervisors and train operators regarding safety rules and performance. For example, WMATA has revised operating rules, expanded training and supervision for train operators and rail traffic controllers, improved adherence to radio protocol, installed new signage in rail yards, and investigated options for modifying the signal system to automatically stop trains at red signals, even when they are operating in manual modes.

However, there is more that must be done. To build on WMATA activities already underway, this Safety Directive identifies six (6) additional findings and 11 required actions that WMATA must take to further reduce the risk of stop signal overruns in the Metrorail system.

Additionally, the FTA intends to work with WMATA to review and revise pre-existing corrective action plans (including corrective action plans relating to stop signal overruns) as appropriate to ensure that WMATA continues to make timely progress towards meeting its safety improvement goals and fulfilling FTA’s requirements.

**DIRECTIVE AND REQUIRED ACTIONS:**

In accordance with 49 U.S.C. § 5329 and the authority delegated to the FTA Administrator by the Secretary of Transportation, 49 C.F.R. § 1.91, the FTA directs WMATA to take the following actions:

<b>Stop Signal Investigation Category 1: Mainline and Yard Familiarity</b>	
<b>Finding</b>	<b>Required Actions</b>
FTA-RED-16-001 WMATA does not ensure train and equipment operator familiarity with mainline and yard characteristics, including signal placement, interlocking locations, and track numbers.	FTA-RED-16-001-A To support train and equipment operator identification of signals, WMATA must improve the visibility of signal markers. (Example actions include replacing existing black and white markers with retro-reflective markers, and taking steps to ensure that the color of the marker cannot be mistaken for signal aspect.)
	FTA-RED-16-001-B To support train and equipment operator orientation on the Metrorail system, WMATA must increase the availability of location information. (Examples actions include the provision of additional detail on wayside signage at the end of station platforms, including the direction of travel, line, and location of any interlockings prior to the next station.)

	FTA-RED-16-001-C	To enhance train and equipment operator familiarity with the Metrorail system, WMATA must increase opportunities for visual observation of the system as part of its program to address FTA-RED-15-004. (Examples include, as part of the new physical characteristics training program, incorporating the use of video or simulation technologies for each line and yard.)
<b>Stop Signal Investigation Category 2: Departure from Stations and Terminals and Movement with Zero Speed Commands</b>		
	<b>Finding</b>	<b>Required Actions</b>
FTA-RED-16-002	WMATA train operators do not consistently verify lunar signal aspect and speed commands prior to taking a point of power.	FTA-RED-16-002-A WMATA must increase rules checks, including random testing for conformance with stop signals, to ensure WMATA operators are complying with Rule 3.67 and 3.79, and must incorporate these additional checks and random testing program into the agency's response to FTA-RED-15-001.
		FTA-RED-16-002-B WMATA must formalize its program for conducting a dedicated review of signal system downloads to monitor train operator performance and must incorporate this program into the agency's response to FTA-RED-15-001.
FTA-RED-16-003	WMATA has not fully implemented sufficient protections against the unauthorized movement of trains with zero speed commands	FTA-RED-16-002-C WMATA must review its Fatigue Risk Management System (FRMS), available to all WMATA employees via the Metroweb, to ensure that this program provides train operators with sufficient information and training to assist them in the managing of their mental state and attention as required when engaged in train operations, including topics such as personal readiness and the use of the point-of-power stickers installed on the consoles of the operating cabs.
		FTA-RED-16-002-D WMATA must complete and perform a hazard analysis regarding the positive stop option, and any other options, currently under review to prevent trains from

			operating with zero speed commands without authorization from the ROCC system wide.
		FTA-RED-16-002-E	Once the modification at the Grosvenor-Strathmore Station Center Pocket Track is fully implemented, WMATA must establish a program to monitor its performance.
<b>Stop Signal Investigation Category 3: Communication with ROCC and Interlocking Operators</b>			
<b>Finding</b>		<b>Required Actions</b>	
FTA-RED-16-004	WMATA does not ensure consistent understanding among train and equipment operators and the ROCC or Interlocking Controllers.	FTA-RED-16-004-A	WMATA must develop and implement a procedure for auditing radio protocol, radio communications, and for ensuring conformance with Permanent Order T-16-10 Radio Protocols, Modification to General Rule 1.79.
FTA-RED-16-005	WMATA must continue to improve radio quality, as identified previously in the FTA's SMI report.	FTA-RED-16-005-A	WMATA must provide FTA with a quarterly report documenting its assessments and findings regarding radio quality, and planned corrective actions.
<b>Stop Signal Investigation Category 4: Stop Signal Overrun Investigation</b>			
<b>Finding</b>		<b>Required Actions</b>	
FTA-RED-16-006	WMATA does not conduct sufficient investigations into stop signal overruns to identify trends and implement effective mitigations.	FTA-RED-16-005-A	WMATA's Department of Safety and Environmental Management must create, either as a standalone document or as part of its own accident investigation procedure, an enhanced stop signal overrun investigation process with standardized data fields for trending and analysis.

WMATA will have thirty (30) days from the date of this Safety Directive to respond to the required actions set out in this Safety Directive, including providing additional information for consideration and proposing any equivalent alternate actions for consideration by FTA's Acting Administrator.

Sixty (60) days after the date of this Safety Directive, WMATA must submit a corrective action plan(s) to FTA that identifies the specific actions that will be performed to address required action specified in this Safety Directive; the milestone schedule for completing corrective action; the responsible parties for action and their contact information; and the verification strategy for ensuring the completion of required work.

FTA will review and approve (with revisions as necessary) WMATA's corrective action plan(s) and will monitor the agency's progress in resolving each finding and required action.

FTA will continue to conduct monthly meetings with WMATA to review progress until such time as FTA determines that these meetings are no longer needed or may be conducted with less frequency.

### **Petitions for Relief or Reconsideration**

WMATA may petition for special approval to take actions not in accordance with this directive or may petition for reconsideration. Such petitions shall be submitted to the Acting Administrator, who shall be authorized to dispose of those requests without the necessity of amending this directive. In reviewing any petition for special approval, the Acting Administrator shall grant petitions only where WMATA has clearly articulated an alternative action that will provide, in the Acting Administrator's judgment, at least a level of safety equivalent to that provided by compliance with this directive. In reviewing any petition for reconsideration, the Acting Administrator shall grant petitions only where WMATA has clearly articulated material facts not in evidence at the time of this directive.

A petition for special approval or for reconsideration must be filed within thirty (30) days from the date of this directive.

### **Enforcement**

Any violation of this directive or the terms of any written plan adopted pursuant to this directive will be managed in accordance with FTA's authorities under 49 U.S.C. § 5329, including but not limited to (1) withholding up to 25 percent of financial assistance to WMATA under 49 U.S.C. § 5307; (2) issuing restrictions, closures, or prohibitions on service (*e.g.*, mandatory speed restrictions, shutdown of a Metrorail line, complete system shutdown) as necessary and appropriate to address unsafe conditions or practices that present a substantial risk of death or personal injury under 49 U.S.C. § 5329(h); and (3) directing WMATA to use Federal financial assistance to correct safety deficiencies pursuant to 49 U.S.C. § 5329(g)(1)(D).

Issued on: August 15, 2016



**Carolyn Flowers**

Acting Administrator  
Federal Transit Administration  
U.S. Department of Transportation