



March 2017

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

Improved Planning of Future Rehabilitation Projects Could Prevent Limitations Identified with SafeTrack

Accessible Version

GAO Highlights

Highlights of [GAO-17-348](#), a report to congressional requesters

Why GAO Did This Study

Recent inquiries into WMATA's Metrorail system have revealed a range of serious safety issues. In response to some of these issues, as well as a backlog of track maintenance, WMATA announced in May 2016 that it was undertaking SafeTrack, a large-scale rehabilitation project. The SafeTrack project is overseen by FTA.

GAO was asked to review a range of safety and oversight issues regarding WMATA. This report examines the extent to which WMATA's (1) planning and (2) implementation of SafeTrack was consistent with leading project management practices as well as (3) the steps taken by FTA to oversee SafeTrack.

GAO reviewed documentation on WMATA's planning and project implementation, and FTA's oversight of SafeTrack. GAO also interviewed officials from WMATA, FTA, and local jurisdictions, and compared WMATA's planning and implementation of SafeTrack to leading project management practices developed by professional organizations.

What GAO Recommends

GAO recommends that WMATA develop a policy that requires and includes procedures for it to, prior to starting future large-scale rehabilitation projects: (1) use asset data to develop project objectives; (2) analyze alternatives; and (3) develop a project management plan for those projects that may not be designated as major capital projects. WMATA agreed with GAO's findings and said that it is working to address the recommendations.

View [GAO-17-348](#). For more information, contact Mark Goldstein at (202) 512-2834 or goldsteinm@gao.gov.

March 2017

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

Improved Planning of Future Rehabilitation Projects Could Prevent Limitations Identified with SafeTrack

What GAO Found

The Washington Metropolitan Area Transit Authority's (WMATA) planning of SafeTrack did not fully align with leading project management practices. While WMATA generally followed leading practices to coordinate with stakeholders, it did not comprehensively collect and use data on the condition of its assets, analyze project alternatives, and develop a project management plan before starting work. WMATA did not follow these practices because it believed it needed to start work immediately to address critical safety issues.

- Although WMATA inspected its track assets when planning SafeTrack, those inspections were not comprehensive and did not collect detailed data on the condition of all track infrastructure, such as all "interlockings," where trains cross from one track to another. As a result, WMATA's decision makers may not have used sufficient information to develop project objectives and to properly prioritize SafeTrack work.
- Though WMATA developed three alternatives for SafeTrack, it did not determine the costs and impacts of each alternative, or assess them to determine which approach may have resulted in greater efficiencies, lower costs, or less disruption for riders and local jurisdictions.
- Before WMATA began SafeTrack, it lacked a comprehensive project management plan, which is a key tool to ensure a project is completed on-time, within-budget, and according to quality standards.

WMATA does not have a policy that requires, and includes relevant procedures for how to carry out, these planning activities for large-scale rehabilitation projects. Without such a policy and procedures, WMATA lacks a framework to plan future rehabilitation projects so that they achieve their objectives.

WMATA's implementation of SafeTrack generally aligned with leading project management practices. Specifically, WMATA officials collected information on the work performed and the condition of assets repaired during SafeTrack. WMATA officials also collect lessons learned during and after each surge, and use those lessons during subsequent maintenance and planning efforts. Additionally, WMATA developed a new organization-wide quality control and assurance framework and is implementing it for the first time through SafeTrack.

The Federal Transit Administration (FTA) has used safety inspections and other tools to oversee SafeTrack and direct WMATA to undertake safety-critical work. FTA has relied on two different authorities to oversee SafeTrack: (1) FTA's public transportation safety oversight authority, and (2) its project management oversight authority. Prior to the start of SafeTrack and during the project, FTA conducted safety inspections and directed WMATA to make repairs to reduce the risk of smoke and fires on the rail system. After SafeTrack work began and estimated project costs exceeded \$100 million, FTA determined SafeTrack to be a major capital project, triggering the statutory requirement that WMATA prepare a project management plan. WMATA did not submit its project management plan until 4 months into SafeTrack. FTA found the plan lacked sufficient detail, and WMATA told GAO it is working to improve the plan.

Contents

Letter	1
Background	4
WMATA Did Not Fully Follow Leading Practices When Planning SafeTrack Because It Wanted to Address Safety Issues Immediately, but Future Projects Could Benefit from Additional Planning	12
WMATA Is Using Several Leading Practices to Implement SafeTrack and Improve the Quality of Completed Work	21
FTA Has Used Inspections and Other Tools to Direct WMATA to Make Safety Repairs and Oversee SafeTrack	29
Conclusions	33
Recommendations	34
Agency Comments	35

Appendix I: Comments from the Department of Transportation	38
Appendix II: Comments from the Washington Metropolitan Area Transit Authority	39
Appendix III: GAO Contact and Staff Acknowledgments	42
GAO Contact	42
Staff Acknowledgments	42

Appendix IV: Accessible Data	43
Agency Comment Letters	43

Tables	
Table 1: Selected Planned and Actual Work Completed under SafeTrack, through December 2016	25
Table 2: Discrepancies Identified by WMATA Quality Officials through Surge 8, as of September 16, 2016	29

Figures

Figure 1: Select Safety Incidents since 2015 on Washington Metropolitan Area Transit Authority’s Metrorail System, and Key Responses 5

Figure 2: Map of Washington Metropolitan Area Transit Authority’s Metrorail System and SafeTrack Surge Events 7

Figure 3: Segment of Metrorail Track 24

Abbreviations

COSO	Committee of Sponsoring Organizations of the Treadway Commission
CTA	Chicago Transit Authority
DOT	Department of Transportation
FAST Act	Fixing America’s Surface Transportation Act
FTA	Federal Transit Administration
FWSO	FTA-WMATA Safety Oversight
MAP-21 Act	Moving Ahead for Progress in the 21st Century Act
MBTA	Massachusetts Bay Transportation Authority
NTSB	National Transportation Safety Board
NYCT	New York City Transit
OIG	Office of Inspector General
PATH	Port Authority Trans-Hudson
PMBOK	Project Management Body of Knowledge
PMI	Project Management Institute
PRIIA	Passenger Rail Investment and Improvement Act

QICO	Quality Assurance, Internal Compliance, and Oversight
QMS	Quality Management System
TCRP	Transit Cooperative Research Program
TQIP	Track Quality Improvement Program
WMATA	Washington Metropolitan Area Transit Authority

This is a work of the U.S. government and is not subject to copyright protection in the United States. The published product may be reproduced and distributed in its entirety without further permission from GAO. However, because this work may contain copyrighted images or other material, permission from the copyright holder may be necessary if you wish to reproduce this material separately.



March 14, 2017

Congressional Requesters

In May 2016, the Washington Metropolitan Area Transit Authority (WMATA) announced it was undertaking SafeTrack, a large-scale rehabilitation project for its rail infrastructure.¹ Recent inquiries into WMATA’s rail system—the nation’s second-busiest—by the National Transportation Safety Board (NTSB) and others have revealed a range of serious safety issues in WMATA’s Metrorail system. In response to some of these issues, as well as its backlog of track work, WMATA intends, through SafeTrack, to complete three years of track infrastructure rehabilitation in approximately one year. According to WMATA, SafeTrack is a unique effort, designed to address urgent safety issues with railroad track assets. SafeTrack will be funded by federal grants, as well as contributions from the three local jurisdictions that are signatories to the interstate compact governing WMATA—the District of Columbia, Maryland, and Virginia.² WMATA’s planning and implementation of SafeTrack is overseen by the Department of Transportation’s (DOT) Federal Transit Administration (FTA).

You asked us to review various safety and oversight issues at WMATA, including how SafeTrack was planned and implemented. We examined:

1. The extent to which WMATA’s planning of the SafeTrack project was consistent with leading project management practices;
2. The extent to which WMATA’s implementation of SafeTrack was consistent with these practices; and,
3. The steps that were taken by FTA to oversee SafeTrack.

To address our first two research questions on SafeTrack’s planning and implementation, we examined documentation on how WMATA planned

¹Throughout this report, we refer to “large-scale rehabilitation projects” as projects that involve extended disruption to normal revenue service for the maintenance or replacement of transit infrastructure.

²Interstate compacts are legal agreements between two or more states that are designed to resolve problems or concerns that transcend state lines. Such compacts enable states to act jointly and collectively to devise solutions for matters that are beyond the authority of an individual state but which are not within the immediate purview of the federal government.

SafeTrack, including the alternative plans it developed, as well as how it carried out work for SafeTrack. We also examined FTA's project construction guidelines and its quality management guidelines for their applicability to SafeTrack work. We also examined WMATA documentation on the quality control and quality assurance frameworks in place for SafeTrack as well as the results of WMATA's own SafeTrack quality reviews. We also obtained and summarized data from WMATA on work tasks planned for and completed during SafeTrack. Based on interviews with WMATA officials, we determined that these data were sufficiently reliable for our purpose of summarizing work planned and completed to date under SafeTrack. Further, we examined the results of FTA's inspections of WMATA track infrastructure. We also reviewed recent investigations and studies regarding WMATA, including those from the American Public Transportation Association, DOT's Office of Inspector General (OIG), NTSB, and WMATA's OIG.

To further address our first two research objectives, we interviewed officials from WMATA and other organizations. Specifically, we interviewed WMATA officials about actions they took to plan and implement SafeTrack. We also interviewed officials from the DOT's OIG, FTA, NTSB, and WMATA's OIG about their work with WMATA and perspectives on SafeTrack. Additionally, we interviewed officials from local jurisdictions (the District of Columbia; Montgomery County, Maryland; and Fairfax County, Virginia) about the coordination and communication between them and WMATA officials concerning SafeTrack. We also interviewed officials from the Chicago Transit Authority (CTA), Massachusetts Bay Transportation Authority (MBTA), New York City Transit (NYCT, part of the Metropolitan Transportation Authority), and Port Authority Trans-Hudson (PATH, part of the Port Authority of New York and New Jersey) about their experiences planning and implementing large-scale rehabilitation projects. We selected these transit agencies based on their similarity to WMATA in terms of total ridership, heavy rail track and passenger miles, as well as whether they have carried out or are currently undertaking large-scale rehabilitation projects akin to SafeTrack. In selecting these transit agencies we also considered geographic diversity and the views of the American Public Transportation Association officials on WMATA's "peers." Though we believe these transit agencies provided relevant and diverse perspectives on carrying out transit rehabilitation projects, the information gathered from these entities is not generalizable to all transit agencies. We did not evaluate or compare the number or type of safety incidents at these other transit systems to those at WMATA.

For the first two research questions, we compared WMATA's planning and implementation of SafeTrack to leading project management practices identified by the Project Management Institute (PMI) in its *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)*,³ and by the Transit Cooperative Research Program (TCRP) in its *Report 157*, which focuses on rehabilitation of transit assets.⁴ We compared WMATA's SafeTrack project to those leading practices identified by PMI and TCRP that we determined were most relevant to the planning and implementation of large-scale rehabilitation projects, such as SafeTrack. We consider these documents to be relevant summaries of leading project management practices for transit agencies and appropriate to large-scale rehabilitation projects, such as SafeTrack. Further, WMATA indicated to us that the PMI *PMBOK® Guide* and the TCRP report are appropriate references for the future state of good repair work. We also evaluated WMATA's efforts based on internal control frameworks published by the Committee of Sponsoring Organizations of the Treadway Commission (COSO), which WMATA uses as criteria for its internal control evaluations.⁵

To address our third research objective on FTA's oversight of SafeTrack, we examined FTA and WMATA documents and interviewed various officials. We examined: (1) FTA documents related to its oversight of major capital projects and SafeTrack specifically, (2) relevant federal statutes and FTA regulations governing transit agencies and projects, and (3) WMATA documents related to FTA's oversight of SafeTrack. Additionally, we interviewed FTA and WMATA officials about FTA's oversight of WMATA and SafeTrack.

³Project Management Institute, Inc., *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)*, Fifth Edition, 2013. *PMBOK* is a trademark of Project Management Institute, Inc. PMI is a not-for-profit association that provides global standards for, among other things, project and program management. These standards are utilized worldwide and provide guidance on how to manage various aspects of projects, programs, and portfolios.

⁴TCRP, *State of Good Repair: Prioritizing the Rehabilitation and Replacement of Existing Capital Assets and Evaluating the Implications for Transit, Report 157* (Washington, D.C.: 2012). The FTA sponsored this report.

⁵Internal control involves the plans, methods, policies, and procedures that an entity uses to fulfill its mission, strategic plan, goals, and objectives. COSO guidance has been adopted as the generally accepted framework for internal control and is recognized as the standard against which organizations can measure the effectiveness of their systems of internal control. See COSO, *Internal Control – Integrated Framework* (New York: American Institute of Certified Public Accountants, 2013).

We conducted this performance audit from August 2016 to March 2017 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

WMATA's Metrorail system has experienced a variety of serious safety incidents in recent years (see fig. 1 below). On June 22, 2009, one Metrorail train struck the rear of a second train stopped near the Fort Totten station on the Red Line, resulting in nine deaths and over 50 injuries. The NTSB report on the incident found that WMATA failed to institutionalize, and employ system-wide, an enhanced track-circuit verification test procedure that was developed following near-collisions in 2005. NTSB also found evidence of an ineffective safety culture within WMATA.⁶ More recently, WMATA has experienced smoke and fire incidents involving the electrical cables and other components supporting its third-rail system. On January 12, 2015, a Metrorail train stopped after encountering heavy smoke in the tunnel between the L'Enfant Plaza station and the Potomac River Bridge on the Yellow Line caused by electrical arcing⁷ resulting from a short circuit on the third rail⁸ power system, causing one passenger's death and numerous injuries. In a

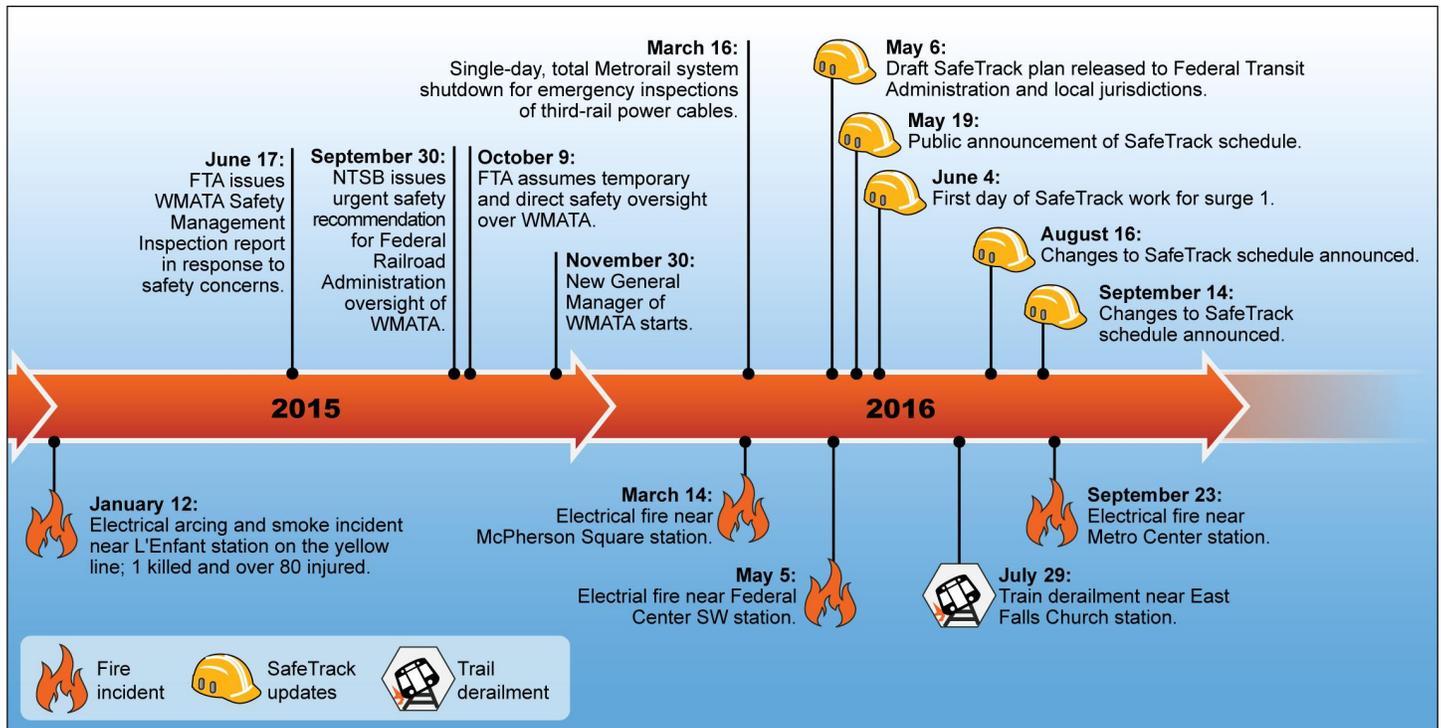
⁶NTSB, *Collision of Two Washington Metropolitan Area Transit Authority Metrorail Trains Near Fort Totten Station*, NTSB/RAR-10/02. According to NTSB, organizations with effective safety cultures are generally described as having a commitment to safety that permeates the entire organization; that is, senior management demonstrates a commitment to safety and a concern for hazards that are shared by employees at all levels within the organization.

⁷According to an FTA report, electrical arcing occurs when high voltage current leaks from a power cable and flows along track component surfaces contaminated with carbon dust, rust particles, dirt, and grime, to find a path to the ground. Electrical arcing can burn cables and track components, cause flashovers and explosions, damage railcar components, and ignite fires to debris located in track beds. The smoke from these events, especially in the tunnel environment, may also expose passengers, employees, and emergency responders to potentially toxic fumes. DOT, *Final Report: Traction Power Electrification System Investigation Washington Metropolitan Area Transit Authority*, (Washington, DC, Dec. 9, 2016).

⁸The third rail is a high voltage rail bar along the track that carries electrical energy to run the trains on that track.

report on this incident, the NTSB again found a lack of a safety culture within WMATA.⁹ NTSB specifically noted deficiencies in WMATA’s response to smoke reports, tunnel ventilation, railcar ventilation, emergency response, as well as the oversight and management of WMATA. In November 2015, WMATA’s new General Manager began his tenure and initiated a variety of efforts to address WMATA’s Metrorail safety issues. On March 14, 2016, an electrical fire occurred near the McPherson Square station involving the same kind of power cable that caused the L’Enfant Plaza smoke incident. Following this fire, WMATA closed the entire Metrorail system for a day for emergency inspections of the system’s third-rail power cables.

Figure 1: Select Safety Incidents since 2015 on Washington Metropolitan Area Transit Authority’s Metrorail System, and Key Responses



Source: GAO analysis of Federal Transit Administration (FTA), Washington Metropolitan Area Transit Authority (WMATA), and National Transportation Safety Board (NTSB) information. | GAO-17-348

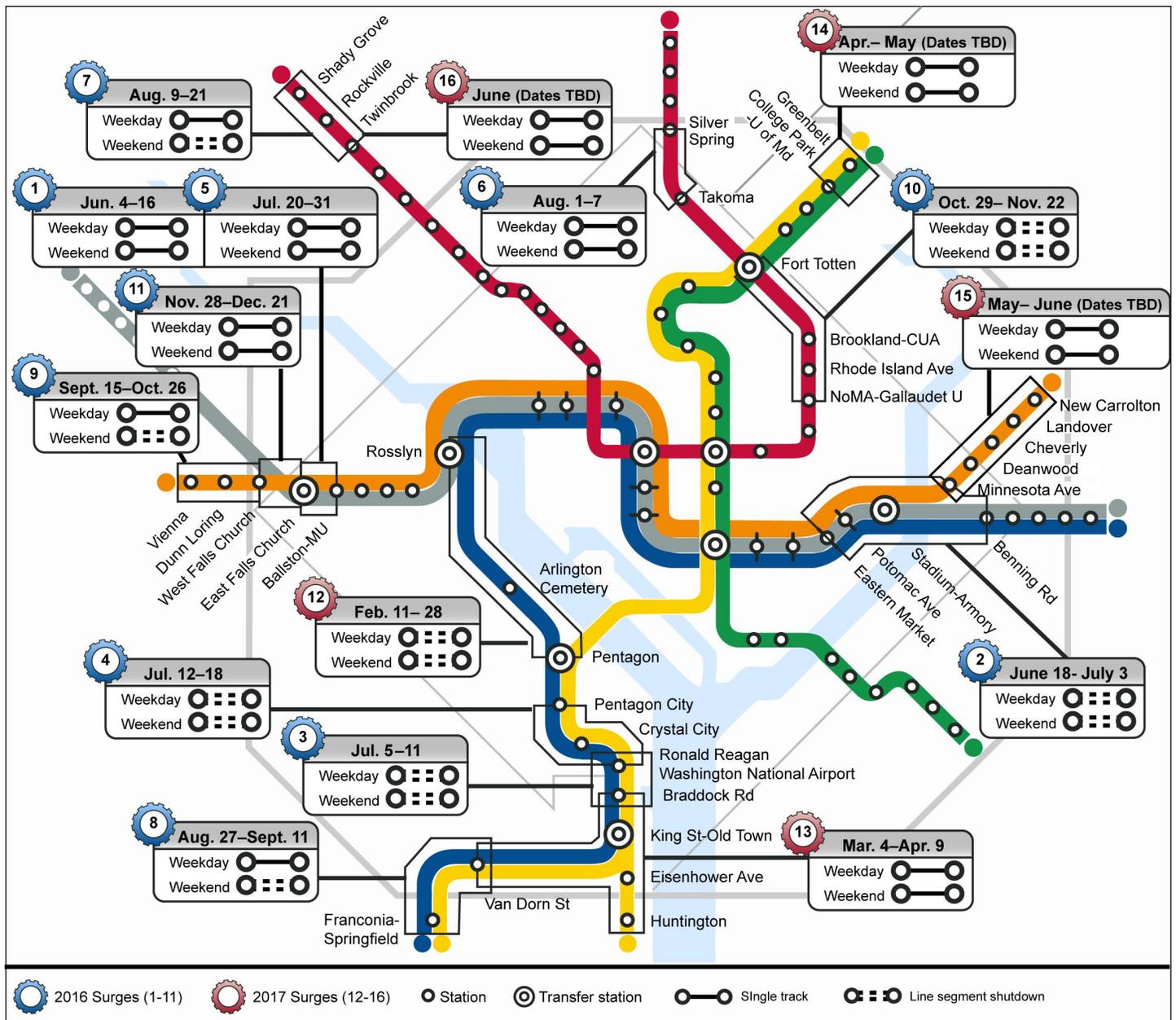
On May 19, 2016, WMATA announced SafeTrack, “a massive, comprehensive, holistic effort to address safety recommendations and

⁹NTSB, *Washington Metropolitan Area Transit Authority L’Enfant Plaza Station Electrical Arcing and Smoke Accident*, NTSB/RAR-16/01.

rehabilitate the Metrorail system on an accelerated basis by expanding all available maintenance windows.” The primary focus of SafeTrack is rehabilitating Metrorail’s track infrastructure by replacing over 45,000 crossties, which are the wooden beams that lay across the railroad bed on above ground sections of the track, and 35,000 fasteners, which secure rails directly to concrete on underground or aerial sections of the track where wooden crossties are not used. SafeTrack is being carried out through a series of “surges” that involve intensive work on specific areas of track that are either shut down to normal traffic or have only one of the two tracks open, a type of operation known as “single tracking” (see fig. 2 below). SafeTrack also involves the reduction of operating hours to allow additional work to be carried out overnight and on weekends in non-surge areas. Although the primary focus of SafeTrack is track assets, WMATA is also using the extended outages to address other safety concerns, such as concerns regarding power cables and other electrical components raised by NTSB and FTA. According to WMATA’s initial announcement, the project was designed to bring Metrorail’s track infrastructure to a “state of good repair,” which WMATA defines as the condition at which individual railroad assets can be sustained at ongoing, annual replacement rates under normal maintenance cycles.¹⁰

¹⁰For example, WMATA’s definition for a state of good repair for track crossties is when no more than 15,000 ties need to be replaced in a given year, which is the amount WMATA can generally replace in normal maintenance cycles each year. FTA published its definition of state of good repair in its Transit Asset Management final rule in July 2016, which became effective October 1, 2016. FTA defines “state of good repair” as “the condition in which a capital asset is able to operate at a full level of performance.” 49 C.F.R. § 625.5. FTA’s definition of state of good repair applies to WMATA’s capital assets now and in the future, though FTA officials told us the SafeTrack project is not impacted by the rule since it was already established as a project prior to the rule’s publication.

Figure 2: Map of Washington Metropolitan Area Transit Authority's Metrorail System and SafeTrack Surge Events



Source: Washington Metropolitan Area Transit Authority information. | GAO-17-348

WMATA estimates that SafeTrack will cost approximately \$120 million.¹¹ According to WMATA and FTA officials, these costs will be covered by about \$48 million in federal funding, which includes two FTA formula grants¹² as well as funding authorized by the Passenger Rail Investment and Improvement Act of 2008 (PRIIA).¹³ The PRIIA funding is also matched by over \$30 million in local funds from the three jurisdictions that help fund WMATA. Beyond the almost \$80 million in federal and local matching funds, SafeTrack will require an additional \$40 million in fiscal year 2017 funding; according to WMATA, the sources of this funding are yet to be finalized. Although SafeTrack was not specifically included in WMATA's approved fiscal year 2016 or 2017 budgets, WMATA amended and its board approved its fiscal year 2017 budget, in November 2016, to include additional funding for the project. WMATA's track rehabilitation projects and other capital investments are made through a 6-year Capital Improvement Program, with the current version covering fiscal years 2017 through 2022.

Other transit agencies with aging infrastructure like WMATA have also undertaken, or plan to carry out, large-scale rehabilitation projects that involve extended disruptions to normal revenue service. For example, in 2013 CTA shut down the southern half of one of its lines for 5 months to completely rebuild the railroad and renovate rail stations on the branch. Additionally, NYCT is planning to shut down the Canarsie subway tunnel connecting Manhattan and Brooklyn to facilitate extensive repairs from damage caused by Hurricane Sandy in 2012. Similarly, the Port Authority of New York and New Jersey is rehabilitating tunnels used by its PATH service between New Jersey and Manhattan and installing positive train control technology, which can reduce the risk of accidental collision between trains on the same track.

In recent years, FTA has been provided with an expanded role in overseeing public transportation safety within WMATA and in other transit agencies. The Moving Ahead for Progress in the 21st Century Act (MAP-21) expanded FTA's safety oversight role over public transportation systems and established the public transportation safety program,

¹¹This \$120 million estimate does not include non-track work completed during SafeTrack, such as repairs to WMATA's third-rail, electrification system.

¹²The two FTA formula grant programs are the Urbanized Area Formula Grants, 49 U.S.C. § 5307, and the State of Good Repair Grants, 49 U.S.C. § 5337.

¹³Pub. L. No. 1110-432, Div. B., 112 Stat. 4907 (2008).

providing FTA with new authority to inspect and audit a public transportation system.¹⁴ This new authority also required FTA to promulgate regulations requiring states to establish state safety oversight programs and agencies for states' public transportation systems.¹⁵ Additionally, MAP-21 provided FTA with more safety oversight authority and more options for enforcement when transit agencies were found to be out of compliance with federal safety laws.¹⁶ For example, in response to concerns regarding WMATA's safety performance over the last decade, FTA conducted a Safety Management Inspection of the WMATA rail and bus systems.¹⁷ The Safety Management Inspection evaluated WMATA's operations and maintenance programs, safety management capabilities, and organizational structures. FTA found that, in recent years, WMATA has implemented new management initiatives and programs to address safety concerns, but organizational deficiencies and operational concerns continue to limit WMATA's effectiveness in recognizing and resolving safety issues. For example, FTA found that WMATA work crews do not have sufficient access to the rail right-of-way to perform critical inspection, testing, and maintenance activities. FTA also found serious safety lapses in the rail operations control center. More broadly, FTA also reported that in key areas, WMATA's organization is not effectively balancing safety-critical operations and maintenance activities with the demand for passenger service.

In response to WMATA safety incidents, FTA assumed temporary and direct safety oversight of WMATA in October 2015. Specifically, as part of its investigation of the January 2015 smoke and fire incident near the L'Enfant station, NTSB found that the Tri-State Oversight Committee's¹⁸ safety oversight of WMATA was deficient and recommended that DOT seek an amendment to federal law so that the Federal Railroad Administration within DOT could exercise regulatory oversight over the

¹⁴Pub. L. No. 112-141, § 20021, 126 Stat. 405, 709 (2012) (codified at 49 U.S.C. § 5329).

¹⁵49 U.S.C. § 5329(e)(3)-(4).

¹⁶49 U.S.C. § 5329(f)-(g).

¹⁷FTA, *Washington Metropolitan Area Transit Authority Safety Management Inspection*, June 17, 2015.

¹⁸The Tri-State Oversight Committee was created in 1997 by state-level agencies in the District of Columbia, Maryland, and Virginia to oversee rail safety and security at WMATA. Later, the Tri-State Oversight Committee became the state safety oversight agency required by the public transportation safety program. 49 U.S.C. § 5329(e)(4).

WMATA rail system.¹⁹ DOT agreed that the Tri-State Oversight Committee was deficient and ineffective, but disagreed with NTSB that the most urgent and effective solution was to transfer safety oversight of WMATA's rail transit system to the Federal Railroad Administration.²⁰ Instead, in October 2015, DOT directed FTA to take direct and temporary control of safety oversight at WMATA from the Tri-State Oversight Committee.²¹ To perform direct safety oversight of WMATA, FTA established the FTA WMATA Safety Oversight (FWSO) office, which is currently comprised of FTA personnel, inspectors on detail from FRA, and contractor support staff, according to FTA officials. In February 2016, FTA found the Tri-State Oversight Committee was incapable of enforcing its safety findings and thus, using new authority provided by the Fixing Americas Surface Transportation (FAST) Act, FTA determined that it would continue with its direct safety oversight of WMATA.²²

FTA's FWSO and region three office, which includes the Washington metropolitan area, have jointly managed oversight of SafeTrack. When WMATA announced SafeTrack in May 2016, the FWSO was in place and performed initial safety oversight of the project. However, FTA's various regional offices exercise project management oversight over "major capital projects," which include, among other things, projects that involve

¹⁹NTSB, Safety Recommendation, R-15-31 and -32 (Urgent) (Washington, D.C.: Sept. 30, 2015).

²⁰DOT, Correspondence to NTSB Regarding Urgent Safety Recommendation R-15-31 and 32 (Washington, D.C.: Oct. 9, 2015). We have work planned to examine FRA and FTA safety oversight programs.

²¹MAP-21 provided FTA with the authority to "oversee the implementation of each State safety oversight program" and "make reports and issue directives with respect to the safety of the public transportation system of a recipient." Pub. L. No. 112-141, § 20021, 126 Stat. 405, 714-15 (2012). FTA officials told us it was this authority that permitted FTA to take direct and temporary control of safety oversight of WMATA from the Tri-State Oversight committee. According to FTA officials, the Tri-State Oversight Committee remains the state safety oversight agency of record for purposes of compliance with FTA's State Safety Oversight regulation, and FTA directed WMATA to address the Committee's open safety findings.

²²Pub. L. No. 114-94, § 3013, 129 Stat. 1312, 1476 (2015). The FAST Act amended the public transportation safety program to allow the Secretary of Transportation to administer the state safety oversight program for a transit agency if the Secretary determines that the state safety oversight program is not being carried out in accordance with 49 U.S.C. § 5329, has become inadequate to ensure enforcement of federal safety regulation, or is incapable of providing adequate safety oversight consistent with the prevention of substantial risk of death or personal injury. 49 U.S.C. § 5329(e)(8). The Secretary of Transportation has delegated this authority to the FTA Administrator.

the rehabilitation or modernization of an existing fixed guideway with a total project cost in excess of \$100 million.²³ Using this project management oversight authority for major capital projects, FTA can monitor the project's progress to determine whether a project is on time, within budget, in conformance with design criteria, constructed to approved plans and specifications, and is efficiently and effectively implemented.²⁴ According to FTA officials, FTA designated SafeTrack as a major capital project based upon WMATA's decision to group together funding from multiple FTA formula grants, as well as funding authorized by PRIIA, and to manage those activities as a discrete project estimated to cost more than \$100 million. FTA's region three office provides project management oversight of SafeTrack.

FTA has other efforts to improve the safety and performance of public transportation systems. For example, in July 2016, FTA issued its final rule establishing a National Transit Asset Management System in accordance with section 20019 of MAP-21.²⁵ Transit agencies are required to have an initial transit asset management plan completed by October 2, 2018.²⁶ Transit agencies' plans must include an inventory of the number and type of capital assets and a condition assessment of those inventoried assets for which a provider has direct capital responsibility, among other elements.²⁷ In August 2016, FTA also issued a Public Transportation Safety Program final rule establishing rules to support its administration of the public transportation safety program.²⁸ The rule provides the framework for FTA to monitor and enforce transit safety.

²³49 C.F.R. § 633.5. "Fixed guideway" is defined as "any public transportation facility which utilizes and occupies a separate right-of-way or rails. This includes, but is not limited to, rapid rail, light rail, commuter rail, automated guideway transit, people movers, and exclusive facilities for buses and other high occupancy vehicles."

²⁴49 C.F.R. § 633.5.

²⁵A transit asset management system is "a strategic and systematic process of operating, maintaining, and improving public transportation capital assets effectively throughout the life cycle of such assets." 49 U.S.C. § 5326(a)(3).

²⁶49 C.F.R. § 625.31(a).

²⁷49 C.F.R. § 625.25(b)(1)-(2).

²⁸81 Fed. Reg. 53,046 (Aug. 11, 2016).

WMATA Did Not Fully Follow Leading Practices When Planning SafeTrack Because It Wanted to Address Safety Issues Immediately, but Future Projects Could Benefit from Additional Planning

WMATA's planning of SafeTrack did not fully align with leading project management practices, including some that are focused on projects for rehabilitating transit assets. Specifically, while WMATA's efforts to coordinate with local stakeholders after SafeTrack began have generally been in line with such practices, WMATA did not (1) comprehensively collect and assess data on its assets, (2) analyze alternatives, or (3) develop a project management plan before starting work. WMATA did not follow these practices because it believed it needed to start work immediately to address critical safety issues. However, by not following these leading practices, WMATA lacks assurance that the accelerated approach taken with SafeTrack is the most effective way to identify and address safety issues. WMATA also lacks a policy that requires, and relevant procedures specifying how, it follow these leading planning practices for large-scale rehabilitation projects. Without such a policy and procedures in place, WMATA lacks a framework to comprehensively plan future large-scale rehabilitation projects to meet their objectives.

WMATA's Collection and Use of Data in Planning SafeTrack Did Not Align with Leading Practices, Though New Asset Inventory Is Being Developed

Leading management practices for transit rehabilitation projects state that transit agencies should collect and use data on assets when planning projects. Public transit agencies have a wide variety of assets to maintain, including track and third rail infrastructure. The TCRP report on prioritizing the rehabilitation of capital assets states that transit agencies should collect detailed information on assets, including data on the age and condition of infrastructure.²⁹ The TCRP report also states that agencies should use data to assess the conditions of assets. This assessment should then form the basis of prioritizing rehabilitation work. Indeed,

²⁹TCRP, 2012.

according to TCRP, “the process of evaluating and prioritizing rehabilitation and replacement work starts with collecting data on existing transit capital assets.”³⁰

Though WMATA collected data on its track assets through inspections when planning SafeTrack, those inspections were not comprehensive because they focused on specific items like rail crossties and did not cover all track-related infrastructure. Specifically, in 2015, WMATA conducted inspections of its Metrorail track to collect data on the condition of its track infrastructure and identify the work necessary to bring the track to a state of good repair. The inspections were carried out by a contractor for WMATA’s Track and Structures department as part of WMATA’s Track Quality Improvement Program (TQIP).³¹ According to WMATA officials we spoke with, these inspections were necessary under TQIP because they could not rely solely on track condition data in WMATA’s existing asset database. Indeed, WMATA’s OIG recently found that WMATA’s asset database does not have adequate controls and oversight in place to properly manage assets, among other concerns.³² WMATA used the data collected in its 2015 inspections as the primary source for identification of the most degraded areas of track, which would be subject to SafeTrack surges. However, the data collected during the inspections focused on the rail crossties and did not cover all infrastructure in the Metrorail track area. For example, according to WMATA officials, the inspections did not include an examination of all interlockings³³ or of all track power systems, including the electrical cables that power the third rail system. According to WMATA officials we spoke with, these systems were not included in the inspections because the Track and Structures department leading the TQIP effort is not responsible for the maintenance of other systems. Electrical cables, for example, are managed by WMATA’s Power Engineering department. Data on the condition of

³⁰TCRP, 2012, page 35.

³¹As the schedule for undertaking the track’s state of good repair work was developed, WMATA “branded” the portion of the TQIP associated with the accelerated rehabilitation of track assets as SafeTrack.

³²WMATA OIG, *Review of WMATA’s MAXIMO Asset Management System*, December 22, 2015.

³³“Interlockings” are the parts of the railroad where tracks can cross each other or change to direct trains along different routes. The interlocking itself is an arrangement of track signals and signal appliances that permit train movements over controlled routes only if safe conditions exist.

assets in non-track systems has generally been collected by the responsible department, but according to WMATA officials, these data were not used to identify areas for SafeTrack work.

Officials with other transit agencies we spoke with said that accurate and comprehensive data on assets are crucial to identifying and prioritizing rehabilitation efforts. For example, NYCT officials told us that they rely on data from their transit asset management database to identify track sections with the greatest number of defects, or areas in need of repair, to prioritize sections of tracks for rehabilitation activities. MBTA officials we spoke with said that their agency has developed a state-of-good-repair database that includes an inventory of the age of assets that managers can use to prioritize rehabilitation and replacement projects. Officials from CTA said they use a new asset management system, which has detailed information on the condition of CTA's assets, to better identify and prioritize capital projects.

WMATA's planning of SafeTrack relied on limited data regarding the condition of Metrorail assets, in part because the agency lacks internal requirements governing the collection and use of asset information in planning projects. More specifically, WMATA does not have a policy or procedures requiring it to collect and use asset data, and coordinate with other departments on the collection of such data when planning large-scale rehabilitation projects. To ensure that such proper management practices are consistently carried out, the COSO internal control framework used by WMATA states that management should set policies establishing what is expected and relevant procedures specifying the necessary actions to carry out the policy.³⁴ As we reported recently, asset management can help transit agencies optimize limited funding so that they receive the "biggest bang for their buck" when rehabilitating and replacing assets.³⁵ By not gathering and using detailed data on all aspects of the track infrastructure when planning SafeTrack, WMATA decision-makers may not have had sufficient information to develop project objectives and properly prioritize SafeTrack work. Indeed, serious safety incidents have continued to occur on the Metrorail system during SafeTrack on assets that were not being addressed in the project. On

³⁴COSO, 2013.

³⁵GAO, *Transit Asset Management: Additional Research on Capital Investment Effects Could Help Transit Agencies Optimize Funding*, [GAO-13-571](#) (Washington, D.C.: July 11, 2013).

July 29, 2016, a train derailed near the East Falls Church station.³⁶ This derailment occurred on an interlocking, a part of track not scheduled at that time for rehabilitation under SafeTrack. As a result of this incident, WMATA modified the scope of future SafeTrack surges to include the rehabilitation of interlockings.³⁷ Additionally, FTA has directed WMATA to complete safety critical work both prior to starting and during SafeTrack, resulting in changes to the scope and schedule of SafeTrack, as discussed later in this report.

Though WMATA did not utilize comprehensive asset information in planning SafeTrack, it is developing a new inventory, as required by FTA's 2016 Transit Asset Management final rule.³⁸ More specifically, WMATA is currently conducting a Transit Asset Inventory and Condition Assessment, and is working with FTA to develop its new transit asset inventory. According to WMATA, this effort will help ensure that it has a complete, consistent, accurate, and centralized repository of relevant asset-related data. A reliable repository of asset data can then facilitate data-driven maintenance and capital investment decision making. WMATA has completed the first of two phases for this assessment. In the first phase, WMATA sought to conduct an initial asset inventory and condition assessment. In the second phase, WMATA plans to further develop how it will manage its assets and collect additional data, among other things.

WMATA's Analysis of Alternatives for Improving the State of Repair of the Track Did Not Align with Leading Practices

Leading management practices for transit rehabilitation projects state that transit agencies should have a policy in place for evaluating project alternatives. The TCRP report on prioritizing the rehabilitation of capital

³⁶NTSB reported that the probable cause of this accident was the sustained use of deteriorating wooden crossties, and that the condition of these crossties was due to WMATA's ineffective inspection and maintenance practices and inadequate safety oversight. See NTSB, *Railroad Accident Brief Derailment of WMATA Metrorail Train in Interlocking Falls Church, Virginia*, NTSB/RAB-16/06.

³⁷WMATA officials told us that following this derailment they instituted the requirement that the interlockings governing train movement to facilitate SafeTrack work be pre-inspected to support the planned service pattern before the next surge commenced.

³⁸81 Fed. Reg. 48,890 (July 26, 2016) (codified at 49 C.F.R. §§ 625, 630).

assets states that agencies should generate alternative plans for achieving a state of good repair and quantify the costs and impacts of those alternatives.³⁹ As noted above, the COSO internal controls framework used by WMATA also states that management should establish policies and procedures to help ensure that proper practices are carried out.

Though WMATA considered different plans for improving the state of repair of its track infrastructure, it did not quantify the costs and impacts of each alternative. WMATA currently lacks a policy requiring alternatives analysis for large-scale rehabilitation projects. After collecting data from track inspections in 2015, WMATA developed three alternatives for improving the state of repair of its track infrastructure. These alternatives included 8, 10, and 22-month work schedules. According to WMATA officials, these alternatives included different levels of service disruptions, including extensive single-tracking and track section closures, but generally included the same work tasks. According to WMATA officials, they ultimately settled on the initially announced 10-month plan, dubbed SafeTrack, because it best balanced rider disruption with addressing the urgent safety needs of the system. Additionally, they said that WMATA's ability to make effective and efficient use of time on the track was also a primary consideration. However, WMATA did not fully assess the alternatives to improving the state of its track infrastructure. In particular, WMATA did not quantify the effects of the various alternatives on extending the life of the track assets, on reducing maintenance costs, and on Metrorail ridership. WMATA also did not quantify the costs or establish a detailed budget for its alternatives and still has not determined the final funding sources for its selected alternative. Although WMATA estimates that the SafeTrack project will cost approximately \$120 million to complete, it has identified funding sources for about \$80 million of these costs and has yet to determine how it will fund the remaining \$40 million.

Other transit agencies we spoke with described detailed considerations of alternatives to carrying out large-scale rehabilitation projects. For example, CTA officials we spoke with said they developed and assessed different plans to rehabilitate its Red Line South track, including estimates of the costs and impacts of each alternative. Further, officials at PATH told us that they selected a particular approach to upgrading a tunnel they use for trains that travel from New Jersey to Manhattan, New York,

³⁹TCRP, 2012.

because it balanced rider disruption and work efficiency. The PATH officials told us that they conducted approximately one year of planning in advance of this project and developed seven different scenarios before finally settling on the current approach.

WMATA did not fully assess alternatives to rehabilitate its track assets because it believed it needed to start work immediately to address critical safety issues. At the time SafeTrack was planned, according to officials we spoke with, WMATA leadership was making critical decisions on how to address systemic deferred maintenance. Indeed, according to WMATA's Chief Safety Officer, in a call on May 10, 2016, a senior official within FTA's FWSO office notified WMATA that FTA was considering taking action to "shut down" the entire Metrorail system due to safety concerns.⁴⁰ According to WMATA officials, SafeTrack was conceived as WMATA's unique and necessary response to the state of its track infrastructure. Further, WMATA officials noted that the agency is committed to devoting the resources necessary to bring the track to a state of good repair, and to developing preventative maintenance programs that would prevent similar safety-critical situations in the future.

Nevertheless, by not having a policy and procedures in place requiring analysis of alternatives for future large-scale rehabilitation projects, WMATA lacks a framework to comprehensively plan such projects to meet their objectives. WMATA plans to spend over \$56 million a year on track rehabilitation projects alone starting in fiscal year 2018. If WMATA were to make decisions about the scope and prioritization of these projects without full information about the various alternatives, it may not select an approach that best balances costs and impacts.

SafeTrack Work Began Before Key Elements of a Project Management Plan Were in Place, Inconsistent with Leading Practices

Leading project management practices emphasize the importance of developing project management plans. The PMI *PMBOK® Guide* states that a comprehensive project management plan should be developed before a project begins so that it is clear how the project will be executed,

⁴⁰FTA opted not to close the Metrorail system. As discussed below, FTA provided a letter to WMATA on May 11, 2016, directing WMATA to repair power cables, insulators, and the electrified third-rail system on certain portions of the system, before beginning SafeTrack.

monitored, and controlled.⁴¹ More specifically, the plan should include the critical information for managing a project's scope, schedule, and cost, according to established baselines and in consideration of project risks, quality standards, and other items. As discussed below, federal law also requires that recipients of federal financial assistance for major capital projects prepare a project management plan.⁴²

According to WMATA officials, WMATA did not develop a comprehensive project management plan before beginning SafeTrack because they believed a project management plan was not appropriate for such a project. WMATA considers SafeTrack to consist of accelerated but normal maintenance activities. According to WMATA officials, a project management plan is best suited for new construction projects. WMATA therefore chose to manage SafeTrack using tools that they considered more appropriately suited for managing coordinated maintenance tasks. For example, WMATA uses detailed "march charts"⁴³ to plan and coordinate its various maintenance tasks within surge work areas. However, according to WMATA officials, they did not develop a plan that clearly defined the budget, execution, monitoring, and control of the project before beginning SafeTrack. According to FTA officials we spoke with, FTA has discretion regarding when it determines a project is major and when a project management plan must be submitted.⁴⁴ As discussed later in this report, WMATA developed a project management plan during the initial months of SafeTrack implementation, though FTA has not yet approved WMATA's plan.

Other transit agencies we spoke with said that they generally developed extensive plans for their large-scale rehabilitation projects. For example, CTA officials we spoke with said that they conducted extensive planning, and developed a project management plan, for their Red Line South reconstruction project, even though they did not use federal funds and therefore were not required by FTA to develop such a plan. Additionally, in planning for the shutdown and rehabilitation of the Canarsie tunnel,

⁴¹PMI, 2013. The PMI *PMBOK® Guide* notes that the content of such plans can vary depending upon the application area and complexity of the project.

⁴²49 U.S.C. § 5327(a).

⁴³"March charts" are a method of graphically presenting a time schedule. These charts typically display work crews as a series of lines moving along a right-of-way, such as a railroad track.

⁴⁴49 C.F.R. § 633.21.

NYCT is developing a detailed plan that reflects its risk assessments and analysis of lessons learned from previous work, according to the officials we spoke with.

Though WMATA developed SafeTrack as a unique response to the state of its track infrastructure, future large-scale rehabilitation projects undertaken by the agency would benefit from the development of a comprehensive project management plan prior to the start of the project. As discussed above, WMATA officials told us that they implemented SafeTrack to respond to a critical safety situation and that they could not postpone this track work to develop a project management plan. SafeTrack, though, involves an unprecedented amount of track work performed over an extended period, significantly disrupts ridership, and is estimated to cost well over \$100 million. WMATA currently lacks a policy and procedures requiring the development of a project management plan for large-scale rehabilitation projects like SafeTrack, according to WMATA officials, regardless of whether the work is to be completed in response to an emergency situation or within WMATA's normal state of good repair efforts. The COSO internal controls framework used by WMATA states that management should have policies establishing what is expected of management and employees, to help mitigate risks to achieving goals. Although WMATA told us that it has a manual on project implementation that is focused on the implementation and close-out phases of a project, it does not yet cover the planning phase. Further, although a project management plan is required for public-transportation-related major capital projects receiving federal financial assistance, WMATA may undertake future large-scale rehabilitation projects that do not meet the major capital project definition or that do not use federal funds at all. Such projects could still benefit from having a project management plan in place before beginning the project—consistent with leading practices—to manage the project's scope, schedule, costs, and other factors. Without a policy and procedures that require the development of a plan for future large-scale rehabilitation projects, WMATA lacks a key tool to ensure its projects are completed on-time, on-budget, and according to quality standards.

WMATA Provided Little Notice of SafeTrack to Local Stakeholders but Communication and Coordination during Surges Generally Align with Leading Practices

Leading management practices and other transit agencies we spoke with state that identifying and coordinating with external stakeholders is part of

proper project planning. The PMI *PMBOK® Guide* states that agencies should identify stakeholders for their projects, communicate and work with stakeholders to meet their needs, address issues as they occur, and foster stakeholder engagement in project activities.⁴⁵ FTA project guidelines also note that communication with the public can be crucial for receiving the necessary buy-in to move a project forward.⁴⁶ Other transit agencies we spoke with said that they generally began stakeholder engagement weeks, if not months, prior to the beginning of projects. For example, the PATH officials we spoke with said that they began communicating with government officials and the public about the proposed tunnel weekend shutdowns 2 months before the project started. Similarly, according to NYCT officials, they presented various schedule alternatives for rehabilitating the Canarsie tunnel to the local communities directly affected by the tunnel's closing to explain NYCT's rationale for completing the work, as well as to discuss the benefits and challenges of different plans.

According to WMATA officials, urgent safety concerns necessitated an accelerated planning process, which precluded advanced notice of SafeTrack to local jurisdictions, other regional transit agencies, and the public. Officials from one local county we spoke with said that they had about a month between when they first heard about SafeTrack and when the first surge began in June 2016. According to local officials we spoke with, little advanced notice of SafeTrack caused some miscommunication between local jurisdictions as well as difficulty identifying funding for mitigation efforts. Specifically, one local county official told us that the county had to quickly develop a plan to bring 25 recently retired buses back into service to provide options to Metrorail riders affected by SafeTrack surges. The county estimated that it incurred approximately \$1 million in bus driver labor and other costs as a result of SafeTrack. The county official told us that it expects to be compensated by the state for these expenses.

Nonetheless, as the SafeTrack project has progressed, WMATA's efforts to coordinate with local stakeholders have generally been in line with leading practices. WMATA officials identified stakeholders for the SafeTrack project, including local transit agencies and elected officials. WMATA utilized a variety of methods to communicate and coordinate with

⁴⁵PMI, 2013.

⁴⁶FTA, *Project and Construction Management Guidelines*, March 2016.

local transit agencies and jurisdictions during SafeTrack. For instance, one local official we spoke with said that WMATA's Joint Coordinating Committee—which brings local officials together to plan for major events affecting regional transportation—is an effective mechanism for sharing information, such as local plans for the use of shuttle buses in areas affected by surges. Local officials also said that communication and coordination between WMATA and jurisdictions has been effective, especially after the first few months of SafeTrack. For example, one local official told us that WMATA has provided the jurisdiction with prompt information about the upcoming surges through weekly planning meetings at WMATA headquarters, as well as through informal coordination with WMATA staff on specific surges.

WMATA has also effectively communicated with the public, according to the local officials we spoke with. WMATA officials told us that they have used a variety of measures to communicate SafeTrack plans to the public including press releases issued to local news media outlets; postings on social media, such as Facebook, YouTube, and Twitter; and a SafeTrack web page that includes details about the overall project and each surge. Officials from one jurisdiction said that WMATA has provided good information on its website and that having additional WMATA staff at SafeTrack-affected stations and bus areas has also been useful. As a result of such efforts, one local official told us that Metrorail riders have demonstrated a high level of awareness about SafeTrack.

WMATA Is Using Several Leading Practices to Implement SafeTrack and Improve the Quality of Completed Work

WMATA's implementation of SafeTrack generally aligns with leading project management practices. Specifically, during the course of each SafeTrack surge, WMATA officials collect and document information about the work performed and the condition of assets. WMATA officials also develop lessons learned during and after each surge period, and use those lessons during subsequent maintenance and planning efforts. Last, WMATA developed a new organization-wide quality control and assurance framework that it is implementing for the first time through SafeTrack.

WMATA Has Consistently Collected and Monitored Work Performance Data and Information

Leading project management practices emphasize the importance of collecting and monitoring work performance data and information. The PMI *PMBOK® Guide* states that throughout the lifecycle of a project, organizations will generate a significant amount of work performance data⁴⁷ and work performance information⁴⁸ that is collected, analyzed, documented, and shared with stakeholders. This data and information is typically created and documented after a project begins, and is a key element in controlling a project's scope, schedule, cost, and risk. Organizations can collect work performance data and information to identify trends and process improvements. Work performance data are also a key factor in an organization's overall quality management for projects, as they provide a foundation for implementing quality control and quality assurance practices, as well as stakeholder engagement, since they inform discussions on project performance.⁴⁹ The TCRP report on prioritizing the rehabilitation of capital assets also states that transit agencies should define data collection and inspection protocols, and ensure the data are detailed and current enough to support decisions on asset rehabilitation or replacement.⁵⁰

Based on procedures WMATA has established, officials have collected and documented information about the work performed and the condition of WMATA's assets in SafeTrack surge areas, consistent with leading project management practices. Prior to each surge, WMATA officials from relevant departments have conducted inspections on the conditions of both the track infrastructure and other non-track assets. WMATA officials

⁴⁷The PMBOK defines "work performance data" as raw observations and measurements identified during activities performed to carry out project work. Examples include reported percentage of work physically completed, quality and technical performance measures, start and finish dates of scheduled activities, number of change requests, number of defects, actual costs, and actual durations.

⁴⁸The PMBOK defines "work performance information" as the performance data collected from various controlling processes, analyzed in context, and integrated based on relationships across areas. Examples of performance information are status of deliverables, implementation status for change requests, and forecasted estimates to complete.

⁴⁹PMI, 2013.

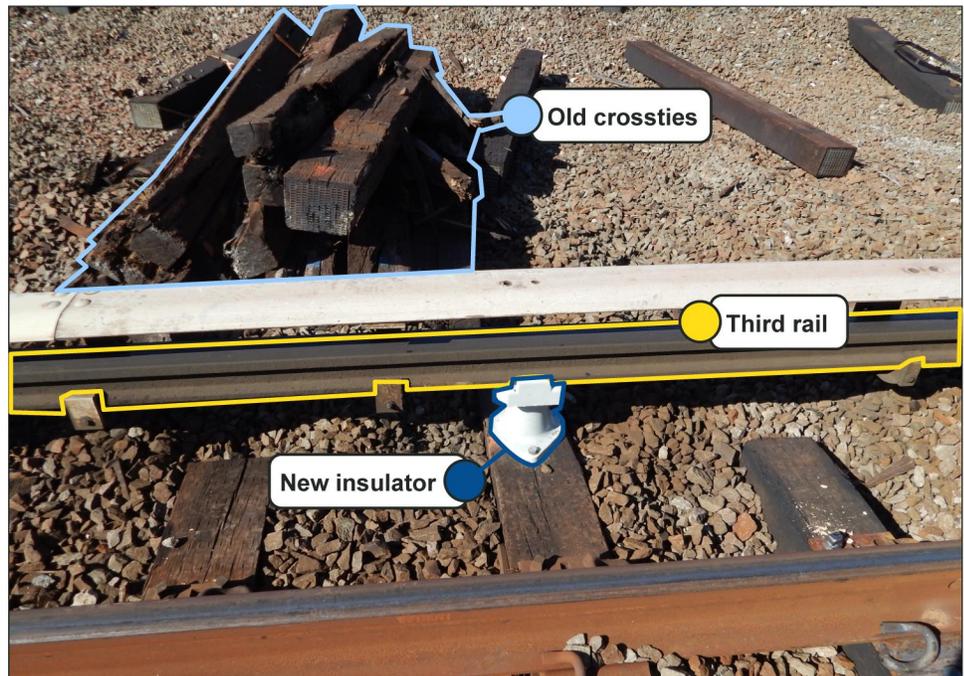
⁵⁰TCRP, 2012.

have used this pre-surge inspection data to develop the overall scope of work for each surge, as well as to identify each component planned for maintenance or replacement. According to WMATA officials, although prior to SafeTrack inspections focused solely on track assets such as the condition of crossties, pre-surge inspections have since included assessments on the condition of both track and non-track assets, such as power cables. However, the number of assets planned for maintenance or replacement in each surge varies depending on the conditions of the assets in question. WMATA officials told us that during each surge, they regularly discuss progress with departments that are responsible for ensuring completion of scheduled work, as well as monitoring teams' work quality and site safety. At the end of each surge, WMATA officials have compiled totals for all work completed, after verification and completion of the various departments' quality control processes. WMATA has then compared the completed work against the pre-surge work plan. WMATA has used the completed work data to develop its surge progress reports, which it issues to stakeholders and makes available to the public at the end of each surge. However, although WMATA is collecting information on the condition of assets repaired through SafeTrack, WMATA does not have a policy or procedures requiring it to use asset data when planning future large-scale rehabilitation projects, as previously discussed.

WMATA has also used work performance data and information to identify the amount of rehabilitation work that can be performed during a given maintenance window. For example, WMATA is not replacing all crossties within a given SafeTrack segment; rather, its goal is to ensure that 75 percent of the ties in a surge area are in good condition so that it will not need to replace all of them at the same time in the future.⁵¹ WMATA officials stated they believe that this approach will allow them to move to a more sustainable crosstie replacement model, eliminate maintenance backlog, and achieve a state of good repair for those assets. WMATA has also incorporated other types of data, such as logistical constraints for available work crews and equipment, to inform its assessment of how work will be accomplished during each surge. See figure 3 for select track assets that have undergone repair or replacement during SafeTrack.

⁵¹WMATA officials told us typical crosstie renewal practices replace one out of every four crossties.

Figure 3: Segment of Metrorail Track



Source: GAO. | GAO-17-348

The work performance data collected by WMATA demonstrate that WMATA has renewed or replaced a substantial amount of track infrastructure, as well as other non-track assets, during the course of SafeTrack. According to WMATA officials, SafeTrack work crews have been able to complete work more efficiently than is possible during normal, shorter, maintenance windows. For example, WMATA reported that by limiting service for 13 days on the Red Line from Shady Grove to Twinbrook, it was able to replace over 3,500 crossties; this work would have taken more than 2 years to complete if performed only after the end of the rail system's service each day. As shown in table 1, through the first 10 surges, WMATA has replaced more than 26,000 crossties, with its goal being to replace over 45,000 crossties when the project is complete.⁵² Through surge 10, WMATA has also replaced more than 4,300 insulators, which support the third rail. WMATA plans to replace

⁵²WMATA estimates that approximately 107,539 crossties exist within SafeTrack's surge work areas. As previously described, WMATA is not replacing every crosstie within a work area, instead working to ensure that at least 75 percent of ties are in "good" condition based on the results of pre-surge inspections.

more than 11,800 insulators through SafeTrack, and has replaced over 700 power cables as well.

Table 1: Selected Planned and Actual Work Completed under SafeTrack, through December 2016

Work Type	Asset Description	Planned in SafeTrack	Actual to date
Crosstie replacement	Crossties are the wooden beams that lay across a railroad bed to secure the rails.	45,496 crossties	26,515 crossties
Fastener replacement	In sections of track where crossties are not used, fasteners affix rails to the grout pad and concrete structure of the tunnel floor or aerial structure.	35,320 fasteners	12,328 fasteners
Insulator replacement	Insulators (either ceramic, composite fiberglass, or porcelain) physically support the third rail.	11,850 insulators	4,335 insulators
Grout pad renewal	Grout pads are segmented blocks of cement that transfer the load from the fastener to the concrete tunnel floor in underground sections where wooden crossties are not used.	10,000 linear feet	9,501 linear feet
Power cable repair/replacement	Power cables carry electrical current from the power source to the tracks, and then from the tracks back to the power source to complete the electrical circuit.	^a	773 cables
Third rail coverboard maintenance	The third rail is protected by an insulated coverboard to prevent inadvertent contact with the rail and to minimize snow and ice accumulation on it.	^a	18,802 linear feet coverboard
Tamping and surfacing	Tamping and surfacing involves restoring the track to its proper alignment by using computerized equipment to manipulate the rock material between the tracks.	^a	157,506 linear feet

Source: Washington Metropolitan Area Transit Authority data. | GAO-17-348

^aIndicates assets where WMATA did not develop a planned number to be repaired or replaced. SafeTrack's focus is on the repair and replacement of track assets, whereas these assets are non-track infrastructure to be rehabilitated where possible during surges.

WMATA Has Collected and Implemented Lessons Learned throughout SafeTrack

The collection of lessons learned is a key project management step that helps inform an organization's planning and evaluation of its projects, programs, and portfolios, as well as supports process improvements. The PMI *PMBOK® Guide* states that organizations should identify and collect lessons learned during the course of executing a project to complement their overall knowledge base, particularly with respect to project selection, performance, and risk management.⁵³ FTA *Quality Management Systems Guidelines* also state that corrective actions for nonconforming work common to most projects should be recorded as lessons learned and disseminated throughout an organization.

In accordance with leading project management practices, WMATA officials have developed lessons learned during and after each surge period, and have used those lessons during subsequent maintenance and planning efforts. For example, WMATA officials said that over the course of the initial SafeTrack surges, they evaluated their work procedures and refined their approach to replacing rail crossties. In particular, they acquired new machines to remove ties and install rail spikes, and implemented better scheduling of the machines and work crews to facilitate more efficient crosstie replacement. As another example, during the course of the initial SafeTrack surges, WMATA officials learned to define clear work limits prior to each surge to improve work efficiency. More specifically, during the initial planning of SafeTrack, officials did not clearly define surge work areas by specific chain markers⁵⁴ and instead labeled the ends of the surge areas by Metrorail station. Furthermore, WMATA officials recognized the need to make detailed scope and work plan documents available before the start of each surge in order to prevent confusion regarding expectations, work inefficiencies, and unachieved objectives.

WMATA has also used project meetings to capture and disseminate lessons learned among its work teams. Before every surge period, WMATA stakeholders have met to discuss the intended scope of work for

⁵³PMI, 2013.

⁵⁴“Chain markers” are survey markers placed along the rail tracks that identify the distance (in multiples of 100 feet) to the middle of the Metro Center station's center platform.

the surge, prioritize work tasks, and agree upon a work plan. WMATA officials have then incorporated this information into a 90-day “look ahead” schedule that is used to plan material purchases and verify track rights for work crews. According to WMATA officials, once a surge has ended, WMATA holds “closeout” meetings with its internal stakeholders (including quality assurance officials) to discuss the work performed and lessons learned, which are then included in an official closeout report. The use of closeout meetings after a project work period ends is also consistent with leading project management practices.

WMATA Is Establishing and Implementing Policies to Improve the Quality of Work Performed through SafeTrack

Leading project management practices emphasize the importance of the management, assurance, and control-of-quality issues. The PMI *PMBOK® Guide* states that organizations should establish policies and procedures that govern quality management for their projects and deliverables. Quality management refers to key processes that comprise a quality framework, including identifying quality requirements and standards, performing quality audits, and monitoring and recording results of executing quality activities in order to assess performance and recommend necessary changes.⁵⁵ PMI notes that having a quality management framework in place can ensure that project requirements are met and process improvement initiatives are supported.

WMATA has developed an agency-wide quality control and assurance framework that is in line with best practices. According to WMATA officials, the agency is implementing a new quality assurance framework for the first time during SafeTrack. In March 2016, WMATA officials established a new, independent quality team called Quality Assurance, Internal Compliance, and Oversight (QICO) that reports directly to the WMATA General Manager.⁵⁶ In addition to serving as an independent reviewer of the SafeTrack project, the QICO team is responsible for developing and implementing a new quality framework for the entire organization. According to WMATA officials, this framework has three

⁵⁵PMI, 2013.

⁵⁶WMATA officials told us that prior to the establishment of QICO, WMATA’s infrastructure groups were responsible for quality assurance operations and no agency-wide quality policy existed.

levels of review for work performed by maintenance groups. Maintenance groups are to provide the first level of review, with managers assessing the quality of the work completed by crews, such as installation and maintenance of assets, and documenting their findings on quality control checklists. Second, QICO is responsible for assessing the overall quality of completed work by reviewing a sample of work tasks completed during the surge, and providing feedback for work teams on quality and safety concerns. This feedback includes preparing surge closeout reports that document any quality, safety, or other concerns and reporting them to WMATA leadership and the relevant work teams involved. The work teams must then address and close out any quality deficiencies through ongoing maintenance activities. Last, the WMATA OIG and Board of Directors are responsible for monitoring internal performance at the agency and approving manager-level decisions regarding quality control and assurance. In addition to this review structure, the QICO team is also developing an enterprise-wide Quality Management System, in accordance with the FTA's *Quality Management Systems Guidelines*, that is intended to clearly define WMATA's organizational objectives with respect to quality assurance. The QICO team has also developed training programs for maintenance supervisors as well as certification requirements for quality assurance staff.

In implementing procedures, WMATA's QICO team has identified a number of work-related issues (referred to as "discrepancies") during its quality control and quality assurance inspections of SafeTrack work, discrepancies that WMATA is working to address. Specifically, according to SafeTrack surge's closeout reports through the first eight surges, QICO inspectors identified a total of 413 discrepancies for WMATA teams to address. Officials are to document these discrepancies in "punch lists" of work tasks that WMATA workers must complete during the course of upcoming routine maintenance. FTA officials told us that the QICO closeout reports are useful in order to see work completed during each surge as well as to inform post-surge inspections. Through surge 8, WMATA has closed 231 of the 413 discrepancies identified by QICO, including 93 percent of the safety concerns, 57 percent of the quality concerns, and 53 percent of site condition concerns (see table 2).

Table 2: Discrepancies Identified by WMATA Quality Officials through Surge 8, as of September 16, 2016

Discrepancy type	Total	Closed	Open	Closed
Site condition ^a	320	168	146	53%
Quality concern ^b	65	37	18	57%
Safety concern ^c	28	26	2	93%
Total	413	231	166	56%

Source: GAO analysis of Washington Metropolitan Area Transit Authority data. | GAO-17-348

^aPre-existing discrepant asset component, system, or site condition issue

^bQuality of work issue

^cRoadway worker protection or other safety issue

FTA Has Used Inspections and Other Tools to Direct WMATA to Make Safety Repairs and Oversee SafeTrack

FTA Has Conducted Inspections and Directed WMATA to Make Safety Critical Repairs before and during SafeTrack

Prior to WMATA’s announcement of SafeTrack in May 2016, FTA conducted many inspections of WMATA’s track infrastructure and internal inspection program. These have informed its oversight of the project. As previously discussed, FTA established the FWSO office in October 2015 to provide temporary and direct safety oversight of WMATA in the absence of an effective state oversight authority, according to FTA. When WMATA first notified FTA of its plans to implement the SafeTrack project on May 6, 2016, the FWSO had been conducting inspections on the integrity of WMATA’s track since March 2016. The FWSO was in the process of developing a directive requiring WMATA to take corrective actions to address concerns with its track construction, maintenance, and inspection resources, among other issues.⁵⁷ According to FTA, FWSO

⁵⁷FTA reported the results of its track integrity investigation in a final report and Safety Directive to WMATA in August 2016. See DOT, *Final Report: Track Integrity Investigation, Washington Metropolitan Area Transit Authority*; and *Safety Directive No. 16-4, Notice No. 1, Required Actions to Address Findings from Federal Transit Administration Investigations Conducted at the Washington Metropolitan Area Transit Authority*, (Washington, DC, August 8, 2016).

inspectors conducted 76 inspections of WMATA's Metrorail system from October 2015 through May 2016. For example, in March and April of 2016, FTA inspected over 60 miles of track on all six Metrorail lines, with additional follow-up inspections between late April and June. FTA found that WMATA's track inspection program did not fully account for differences in track types, locations, and train traffic volume when WMATA prioritized its inspections. In addition, FTA found that WMATA maintenance departments did not jointly review inspection results to develop coordinated mitigations and assign limited resources to highest priority issues.⁵⁸

Since the start of SafeTrack work in June 2016, FTA has conducted additional inspections and observations of SafeTrack work for each surge. According to FTA inspection data from June 2016 through September 2016, FTA inspectors conducted a total of 102 individual inspections of WMATA rail assets, including 49 inspections that covered SafeTrack-related work. For example, FTA officials told us that from the first SafeTrack surge, FTA officials accompanied WMATA staff on pre-surge inspections to identify repair items and observe work tasks during each surge to assess the quality of the repairs. FTA officials said they also conferred with WMATA staff after each surge to identify work not completed, which WMATA compiles into a prioritized "punch list" of critical repairs to be completed during the course of upcoming routine maintenance. FTA officials told us they have been monitoring WMATA's completion of punch list items and were working with WMATA to ensure progress in completing these tasks.

As a result of its inspections, FTA directed WMATA to complete safety critical work both prior to starting and during SafeTrack, specifically:

- In response to WMATA's initial SafeTrack plan provided to FTA on May 6, 2016, FTA sent a letter on May 11, 2016, directing WMATA to make urgent repairs to reduce the risk of smoke and fire events and the occurrence of arcing insulators on certain sections of the rail system. FTA's letter directed WMATA to repair power cables, insulators, and the electrified third-rail system on certain portions of the Red, Blue, Orange, and Silver lines, before beginning SafeTrack.
- In response to WMATA's proposed schedule changes after the July 29, 2016 derailment of a Silver Line train near the East Falls Church

⁵⁸DOT, *Final Report* (Aug. 8, 2016).

station, FTA sent WMATA another letter on September 1, 2016, encouraging WMATA to also include additional safety-related work in SafeTrack, including: (1) prioritizing additional repairs to arcing insulators on the Red Line; (2) completing unfinished track work from the third surge on the Blue and Yellow lines; and (3) addressing poor tie and fastener conditions on certain sections of the Orange and Blue lines, including a section of the Orange Line that was not originally part of WMATA's SafeTrack surge plan.

WMATA took several actions to address FTA's concerns. First, WMATA adjusted the order of early surges in its initial SafeTrack plan and has replaced insulators, repaired power cables and third-rail components, and assigned a dedicated work crew to improve drainage on the sections of the Red Line between Medical Center and Van Ness stations, as cited in FTA's May 11 and September 1 letters. Second, WMATA officials told us that Metrorail completed unfinished work from the third surge on the Blue and Yellow lines during an additional single-tracking event. Finally, in January 2017, WMATA scheduled an additional surge from May to June 2017 to address FTA's concerns regarding poor track condition on a certain section of the Orange Line.

FTA reported that WMATA's actions taken in response to FTA's concerns have helped reduce safety incidents. According to an FTA report, WMATA has reduced the prevalence of electrical arcing incidents on the Red Line between Medical Center and Van Ness station as a result of WMATA's additional maintenance activity in that section of track.⁵⁹ Specifically, FTA reported that between March 1, 2016, and June 14, 2016, WMATA had experienced 18 electrical arcing incidents between Medical Center and Van Ness, including 4 major events at the end of April and early May. Since taking additional maintenance actions, WMATA experienced 8 arcing events over the 4 month period from mid-June 2016 through mid-October 2016, and FTA has characterized these events as relatively minor.

FTA Has Required WMATA to Prepare and Refine Its SafeTrack Project Management Plan

In addition to FWSO inspections of WMATA infrastructure and safety procedures, FTA has also exercised its project management oversight

⁵⁹DOT, *Final Report: Traction Power Electrification System Investigation Washington Metropolitan Area Transit Authority*, (Washington, DC, Dec. 9, 2016).

authority over SafeTrack since July 2016. FTA's project management oversight includes monitoring a major capital project's progress to determine whether a project is on time, within budget, and in conformance with design criteria, and whether it is constructed to approved plans and specifications, and is efficiently and effectively implemented.⁶⁰ As noted previously, major capital projects include, among other things, projects involving the rehabilitation or modernization of an existing fixed guideway with a total project cost in excess of \$100 million.⁶¹ FTA found that SafeTrack met the \$100-million criteria for a major capital project when it approved an additional \$20 million in safety-related federal funding for the project in mid-June 2016, during the first surge. As a result, FTA announced that it would exercise its project management oversight authority over SafeTrack in a July 1, 2016, letter to WMATA.

After FTA designated SafeTrack as a major capital project based on criteria established in law, WMATA became subject to the statutory requirement to complete a project management plan. Federal law requires that recipients of federal financial assistance for a major capital project related to public transportation prepare a project management plan approved by the Secretary of Transportation, and carry out the project in accordance with the project management plan.⁶² FTA guidelines state that a project management plan provides a functional, financial, and procedural road map for the project sponsor to effectively and efficiently manage a project on-time, within-budget, and at the highest quality and safety.⁶³ According to federal regulations, as a general rule, a major capital project's project management plan must be submitted during the grant review process and is part of FTA's grant application review.⁶⁴ These regulations also state that if FTA determines that a project is major

⁶⁰49 C.F.R. § 633.5.

⁶¹49 C.F.R. § 633.5.

⁶²49 U.S.C. § 5327(a).

⁶³A project management plan must include, among other elements, a budget covering major cost elements, a construction schedule, and quality control and assurance functions. 49 U.S.C. § 5327(a); 49 C.F.R. § 633.25. See also FTA, *Project Management and Construction Guidelines* (Washington, D.C., March 2016). The guidelines also state that a project management plan should include other project planning and management tools, including defined project objectives and an overall risk-informed and performance-based management approach.

⁶⁴49 C.F.R. § 633.21.

under its discretionary authority after the grant has been approved, FTA will inform the recipient of its determination as soon as possible.⁶⁵ In the case of SafeTrack, due to WMATA's desire to begin SafeTrack work immediately, and FTA's determination of SafeTrack as a major capital project after work had already commenced, WMATA did not submit its project management plan to FTA until 4 months into the project. On July 1, 2016, FTA requested that WMATA submit its project management plan to FTA by July 29, 2016. WMATA requested and was granted an extension, and submitted its project management plan to FTA on September 30, 2016.

As of January 2017, FTA has yet to approve WMATA's project management plan because key elements lacked sufficient detail. FTA officials told us that WMATA's plan did not provide adequate information on the SafeTrack budget and costs of the work being conducted, as well as information to identify and manage project risks, or assess the performance of the project against defined metrics. FTA provided WMATA with detailed comments on WMATA's plan covering these and other issues. As previously noted, WMATA officials told us that they do not consider the project management plan to be the most appropriate tool to manage SafeTrack tasks, which are primarily maintenance activities. However, WMATA officials also told us that they were working closely with FTA to improve the quality and level of detail in the plan.

Conclusions

WMATA's recent record of significant safety incidents demonstrates that its Metrorail system faces serious safety and infrastructure challenges. Through SafeTrack, WMATA has accomplished a substantial amount of repair work to bring its track infrastructure closer to a state of good repair. WMATA is also learning some important lessons in implementing SafeTrack that could better equip it to identify and address issues in future large-scale rehabilitation projects. Perhaps more importantly, SafeTrack indicates that WMATA is now committed to preventative maintenance, including the repairing of track assets before they break and cause more cost and safety impacts on Metrorail riders. Though SafeTrack consists largely of routine maintenance work, the intensity, length, cost, and disruption of the effort distinguishes it from normal

⁶⁵49 C.F.R. § 633.21.

maintenance work. As a result of the urgent need for work on the track infrastructure and the unique nature of SafeTrack, WMATA's planning of SafeTrack did not fully align with leading practices, and WMATA likely experienced some early challenges as a result. These challenges highlight the importance of comprehensive planning and project management for large-scale rehabilitation projects to minimize the impacts on riders and ensure work is completed efficiently and according to quality standards. Indeed, SafeTrack is not a comprehensive approach to addressing WMATA's safety needs and additional efforts will be needed to bring the entire Metrorail system to a state of good repair. Without a policy requiring planning processes that are more consistent with leading project management practices, which call for thorough analysis, planning, and informed decision-making, WMATA's ability to effectively address future infrastructure challenges may be limited. This situation is particularly true for future large-scale rehabilitation projects that may not be designated as major capital projects and subject to FTA's project management oversight authority, but which could still benefit from having a project management plan in place before beginning the project, consistent with leading practices. Furthermore, documenting these planning requirements, and the relevant procedures for carrying them out, would help ensure that they are carried out consistently, in order that staff and management can be held accountable for them.

Recommendations

To ensure future large-scale rehabilitation projects are in line with leading project management practices, WMATA should develop a policy that requires and includes relevant procedures specifying that the following three actions be taken prior to starting large-scale projects:

- use detailed data on the conditions of assets to develop project objectives and scope;
- evaluate and compare alternative ways of accomplishing the project objectives, including estimates for the alternatives' costs and impacts; and
- develop a comprehensive project management plan for the selected alternative—to include key elements such as detailed plans for managing the project's scope, schedule, and cost—for those projects that may not be designated major capital projects.

Agency Comments

We provided a draft copy of this report to DOT, NTSB, and WMATA for review and comment.

In written comments, reproduced in appendix I, DOT said that, since exercising oversight authority, FTA has guided and examined WMATA's work toward improving its safety culture, infrastructure, and operations. DOT also said that FTA will continue to provide safety oversight of WMATA and help it build upon improvements made in the last year.

In comments provided in an e-mail, NTSB noted that it shares our concern that WMATA's interlockings, and other track work, were not fully considered in planning SafeTrack. NTSB also said that FTA's public transportation safety oversight approach lacks the necessary standards, expertise, and resources. This report focused on FTA's oversight of the SafeTrack project specifically, so we did not evaluate FTA's overall public transportation safety model. We do, however, have planned work to examine FRA and FTA safety oversight programs.

In written comments, reproduced in appendix II, WMATA agreed with our findings and conclusions, and said that it is working to address the recommendations. WMATA also said that the draft report did not reflect the urgent safety state of the Metrorail system prior to beginning SafeTrack, which precluded comprehensive project planning. We acknowledge throughout the report that, at the time SafeTrack was being developed, WMATA faced significant safety issues and leadership was making critical decisions on how to address systemic deferred maintenance. Nevertheless, by not fully carrying out leading project management practices, WMATA lacked assurance that SafeTrack was the most efficient and least disruptive approach to accomplishing the track repair objectives. Having a policy and procedures in place requiring these project management practices for future large-scale rehabilitation projects will ensure that WMATA plans such projects so they best meet their objectives.

As agreed with your offices, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies to the Secretary of Transportation, Chairman of NTSB, General Manager of WMATA, WMATA Board of Directors, and the appropriate congressional

committees. In addition, the report will be available at no charge on GAO's website at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-2834 or goldsteinm@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. Individuals that made key contributions to this report are listed in appendix I.

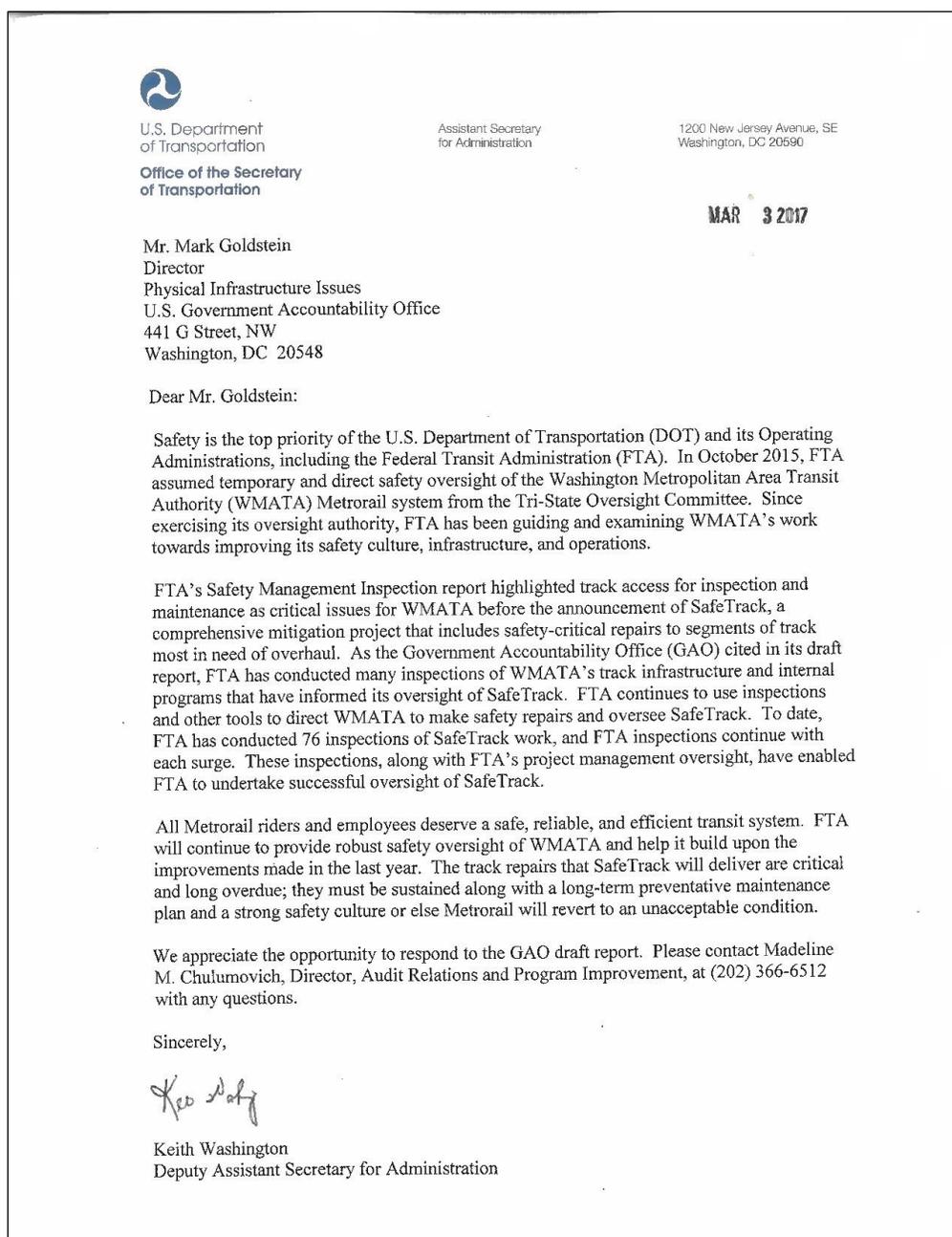
A handwritten signature in black ink, appearing to read 'M. Goldstein', with a long horizontal flourish extending to the right.

Mark Goldstein
Director Physical Infrastructure Issues

List of Requesters

The Honorable Jason Chaffetz Chairman
The Honorable Elijah E. Cummings Ranking Member Committee on
Oversight and Government Reform House of Representatives
The Honorable Mark Meadows Chairman
The Honorable Gerald E. Connolly Ranking Member Subcommittee on
Government Operations Committee on Oversight and Government
Reform House of Representatives
The Honorable Tammy Duckworth United States Senate

Appendix I: Comments from the Department of Transportation



Appendix II: Comments from the Washington Metropolitan Area Transit Authority



March 3, 2017

VIA EMAIL

Mr. Mark Goldstein
Director, Physical Infrastructure Issues
United States Government Accountability Office
441 G. Street, N.W.
Washington, D.C. 20001

RE: Response to GAO-17-348, Safe Track: Improved Planning of Future
Rehabilitation Projects Could Prevent Limitations Identified with Safe Track

Dear Mr. Goldstein:

Thank you for the opportunity to provide a formal response to the Government Accountability Office (GAO) report to Congress entitled: Washington Metropolitan Area Transit Authority; Improved Planning of Future Rehabilitation Projects Could Prevent Limitations Identified with Safe Track (GAO 17-348).

We want to thank the GAO for the highly professional manner in which the review was conducted. We appreciate the diligent effort by the GAO team representing the Physical Infrastructure and General Counsel Offices and are pleased to have worked closely with them over the past seven months on the review.

While WMATA concurs with the findings and conclusions in the report and is already working to address the recommendations, we are concerned that the report does not accurately reflect the urgent safety state that demanded that we move as quickly as possible to start SafeTrack. The report does not clearly express the true level of crisis the agency was facing almost one year ago.

At that time, WMATA needed to make real time decisions to address urgent National Transportation Safety Board recommendations and Federal Transit Administration Safety Directives. Correspondence from FTA's Acting Administrator to WMATA leadership dated May 11, 2016 underscored the pressing nature of the situation, "During the Federal Transit Administration's (FTA) recent investigations and inspections of the Washington Metropolitan Area Transit Authority (WMATA) Metrorail system, FTA safety oversight officials have identified track locations where urgent repairs are required to reduce the risk of smoke and fire events and to ensure the safety of passengers and employees." Simply put, we did not have the luxury of time to pull together a large project management plan as this was not a typical project. Instead, we moved swiftly and worked collaboratively with the FTA on the SafeTrack plan and schedule. In fact, the FTA directed adjustments to the schedule based on its assessment that some portions of our infrastructure needed to be repaired immediately rather than toward the end of the program. The approach that we took in this emergency situation was "real time" project planning. FTA did not ask us to delay

**Washington
Metropolitan Area
Transit Authority**

600 Fifth Street, NW
Washington, DC 20001
202/962-1234

www.wmata.com

A District of Columbia,
Maryland and Virginia
Transit Partnership

Mr. Goldstein
Page 2

the commencement of SafeTrack, nor were concerns expressed regarding the level of project planning prior to implementing this initiative. In addition, it is important to note that SafeTrack was never intended to address all of our state of good repair track needs in one year. The stated goal was to accelerate the return to a state of good repair, not achieve it in one year. When SafeTrack is concluded Metrorail will be a 40 year old heavy rail system whose track infrastructure has been rehabilitated.

The report points out that WMATA developed three alternatives for SafeTrack, but does not emphasize the integral role of track time in determining the final schedule. Prior to SafeTrack, the Metrorail system was closed only 33 hours each week, providing little time for maintenance and inspections. By contrast, in 1998 when the Metrorail system was roughly 20 percent smaller, had 12 fewer stations and was under less stress (i.e. by running shorter trains less frequently), the system enjoyed 25 percent more maintenance time – 44 hours per week. Adjusting Metrorail operating hours and increasing track access has enabled Metro crews to properly maintain and rehabilitate tracks and signals, mitigate water intrusion and complete other safety-critical maintenance and inspections beyond the completion of SafeTrack. The change will also reduce the risk of disruptive shutdowns for extensive repairs. Maximizing track time was a key consideration in SafeTrack planning.

While the report discusses the planning processes undertaken by other transit agencies for major capital projects, we appreciate the acknowledgement by GAO that “the information gathered from these entities is not generalizable to all transit agencies.” Industry best practices and sharing of information with other transit agencies are of great value, but the unique nature of the challenges WMATA faced a year ago called for an equally unique response.

The work that has been accomplished under SafeTrack has been significant. Highlights of the work completed to date include:

- Work and productivity rates have met or exceeded what was originally planned.
- 12 of the 16 SafeTrack surges have been completed.
- Over 28,000 ties have been replaced, more than done in the past 2 years combined.
- Over 20,000 fasteners have been replaced.
- By the end of SafeTrack, over 50,000 ties will have been replaced, reducing the number of defective ties to under 5,000.

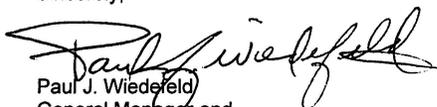
We are making progress. In 2016, we reduced track-related delays by seven percent, including delays caused by smoke, fire or arcing insulators (compared to previous year). In addition, by the end of calendar year 2017, nearly 20 percent of all track in the Metrorail system will be refurbished under the SafeTrack program.

Mr. Goldstein
Page 3

At the conclusion of SafeTrack in late June, Metro will begin industry standard Preventive Maintenance (PM) programs. Prior to SafeTrack, these critical programs had either been inadequately implemented or not carried out to a degree sufficient to deliver meaningful results. The five PM programs that Metro will initiate after SafeTrack are: Systemwide Tamping and Surfacing (T&S), Interlocking Component Maintenance, Mechanical Joint Maintenance, Traction Power Cable Meggering and Earth to Ground Stray Current Testing. These programs will be predominantly carried out during non-passenger service hours overnight. This recognizes that weekend single tracking operations, weekend shutdowns and weeknight early outs on line segments are primarily focused on capital work that involves the replacement or rehabilitation of wayside components and infrastructure. A robust and well-resourced PM program is critical to ensure the long term safety and reliability of Metro's aging infrastructure.

Thank you again for the opportunity to provide a response to the SafeTrack report. At WMATA we are committed to ensuring that the Nation's Capital is served by a safe and reliable public transit system.

Sincerely,



Paul J. Wiederfeld
General Manager and
Chief Executive Officer

Appendix III: GAO Contact and Staff Acknowledgments

GAO Contact

Mark Goldstein, (202) 512-2834 or goldsteinm@gao.gov

Staff Acknowledgments

In addition to the contact named above, Matt Barranca (Assistant Director), Kyle Browning (Analyst in Charge), Jason Blake, Lacey Copping, Hannah Laufe, Sara Ann Moessbauer, Malika Rice, and Michelle Weathers made key contributions to this report.

Appendix IV: Accessible Data

Agency Comment Letters

Text of Appendix I: Comments from the Department of Transportation

Mr. Mark Goldstein Director

Physical Infrastructure Issues

U.S. Government Accountability Office 441 G Street, NW

Washington, DC 20548

Dear Mr. Goldstein:

Safety is the top priority of the U.S. Department of Transportation (DOT) and its Operating Administrations, including the Federal Transit Administration (FTA). In October 2015, FTA assumed temporary and direct safety oversight of the Washington Metropolitan Area Transit Authority (WMATA) Metrorail system from the Tri-State Oversight Committee. Since exercising its oversight authority, FTA has been guiding and examining WMATA's work towards improving its safety culture, infrastructure, and operations.

FTA's Safety Management Inspection report highlighted track access for inspection and maintenance as critical issues for WMATA before the announcement of SafeTrack, a comprehensive mitigation project that includes safety-critical repairs to segments of track most in need of overhaul. As the Government Accountability Office (GAO) cited in its draft report , FTA has conducted many inspections of WMATA's track infrastructure and internal programs that have informed its oversight of SafeTrack. FTA continues to use inspections and other tools to direct WMATA to make safety repairs and oversee SafeTrack. To date, FTA has conducted 76 inspections of SafeTrack work, and FTA inspections continue with each surge. These inspections, along with FTA's project management oversight, have enabled FTA to undertake successful oversight of SafeTrack.

All Metrorail riders and employees deserve a safe, reliable, and efficient transit system. FTA will continue to provide robust safety oversight of WMATA and help it build upon the improvements made in the last year. The track repairs that SafeTrack will deliver are critical and long overdue; they must be sustained along with a long-term preventative maintenance plan and a strong safety culture or else Metrorail will revert to an unacceptable condition.

We appreciate the opportunity to respond to the GAO draft report. Please contact Madeline M. Chulumovich, Director, Audit Relations and Program Improvement, at (202) 366-6512 with any questions.

Sincerely,

Keith Washington

Deputy Assistant Secretary for Administration

Text of Appendix II: Comments from the Washington Metropolitan Area Transit Authority

Page 1

March 3, 2017

VIA EMAIL

Mr. Mark Goldstein

Director, Physical Infrastructure Issues

United States Government Accountability Office 441 G. Street, N.W.

Washington, D.C. 20001

RE: Response to GA0-17-348, Safe Track: Improved Planning of Future Rehabilitation Projects Could Prevent Limitations Identified with Safe Track

Dear Mr. Goldstein:

Thank you for the opportunity to provide a formal response to the Government Accountability Office (GAO) report to Congress entitled: Washington Metropolitan Area Transit Authority; Improved Planning of Future Rehabilitation Projects Could Prevent Limitations Identified with Safe Track (GAO 17-348).

We want to thank the GAO for the highly professional manner in which the review was conducted. We appreciate the diligent effort by the GAO team representing the Physical Infrastructure and General Counsel Offices and are pleased to have worked closely with them over the past seven months on the review.

While WMATA concurs with the findings and conclusions in the report and is already working to address the recommendations, we are concerned that the report does not accurately reflect the urgent safety state that demanded that we move as quickly as possible to start SafeTrack. The report does not clearly express the true level of crisis the agency was facing almost one year ago.

At that time, WMATA needed to make real time decisions to address urgent National Transportation Safety Board recommendations and Federal Transit Administration Safety Directives. Correspondence from FTA's Acting Administrator to WMATA leadership dated May 11, 2016 underscored the pressing nature of the situation, "During the Federal Transit Administration's (FTA) recent investigations and inspections of the Washington Metropolitan Area Transit Authority (WMATA) Metrorail system, FTA safety oversight officials have identified track locations where urgent repairs are required to reduce the risk of smoke and fire events and to ensure the safety of passengers and employees." Simply put, we did not have the luxury of time to pull together a large project management plan as this was not a typical project. Instead, we moved swiftly and worked collaboratively with the FTA on the SafeTrack plan and schedule. In fact, the FTA directed adjustments to the schedule based on its assessment that some portions of our infrastructure needed to be repaired immediately rather than toward the end of the program. The approach that we took in this emergency situation was "real time" project planning. FTA did not ask us to delay

Page 2

the commencement of SafeTrack, nor were concerns expressed regarding the level of project planning prior to implementing this initiative.

In addition, it is important to note that SafeTrack was never intended to address all of our state of good repair track needs in one year. The stated goal was to accelerate the return to a state of good repair, not achieve it in one year. When SafeTrack is concluded Metrorail will be a 40 year old heavy rail system whose track infrastructure has been rehabilitated.

The report points out that WMATA developed three alternatives for SafeTrack, but does not emphasize the integral role of track time in determining the final schedule. Prior to SafeTrack, the Metrorail system was closed only 33 hours each week, providing little time for maintenance and inspections. By contrast, in 1998 when the Metrorail system was roughly 20 percent smaller, had 12 fewer stations and was under less stress (i.e. by running shorter trains less frequently), the system enjoyed

25 percent more maintenance time - 44 hours per week. Adjusting Metrorail operating hours and increasing track access has enabled Metro crews to properly maintain and rehabilitate tracks and signals, mitigate water intrusion and complete other safety-critical maintenance and inspections beyond the completion of SafeTrack. The change will also reduce the risk of disruptive shutdowns for extensive repairs. Maximizing track time was a key consideration in SafeTrack planning.

While the report discusses the planning processes undertaken by other transit agencies for major capital projects, we appreciate the acknowledgement by GAO that "the information gathered from these entities is not generalizable to all transit agencies." Industry best practices and sharing of information with other transit agencies are of great value, but the unique nature of the challenges WMATA faced a year ago called for an equally unique response.

The work that has been accomplished under SafeTrack has been significant. Highlights of the work completed to date include:

- Work and productivity rates have met or exceeded what was originally planned.
- 12 of the 16 SafeTrack surges have been completed.
- Over 28,000 ties have been replaced, more than done in the past 2 years combined.
- Over 20,000 fasteners have been replaced.
- By the end of SafeTrack, over 50,000 ties will have been replaced, reducing the number of defective ties to under 5,000.

We are making progress. In 2016, we reduced track-related delays by seven percent, including delays caused by smoke, fire or arcing insulators (compared to previous year). In addition, by the end of calendar year 2017, nearly 20 percent of all track in the Metrorail system will be refurbished under the SafeTrack program.

Page 3

At the conclusion of SafeTrack in late June, Metro will begin industry standard Preventive Maintenance (PM) programs. Prior to SafeTrack, these critical programs had either been inadequately implemented or not carried out to a degree sufficient to deliver meaningful results. The five PM programs that Metro will initiate after SafeTrack are: Systemwide Tamping and Surfacing (T&S), Interlocking Component Maintenance, Mechanical Joint Maintenance, Traction Power Cable Meggering and Earth to Ground Stray Current Testing. These programs will be predominantly carried out during non-passenger service hours overnight. This recognizes that weekend single tracking operations, weekend shutdowns and weeknight early outs on line segments are primarily focused on capital work that involves the replacement or rehabilitation of wayside components and infrastructure. A robust and well-resourced PM program is critical to ensure the long term safety and reliability of Metro's aging infrastructure.

Thank you again for the opportunity to provide a response to the SafeTrack report. At WMATA we are committed to ensuring that the Nation's Capital is served by a safe and reliable public transit system.

Sincerely,

Paul J. Wiederfeld

General Manager and Chief Executive Officer

GAO's Mission

The Government Accountability Office, the audit, evaluation, and investigative arm of Congress, exists to support Congress in meeting its constitutional responsibilities and to help improve the performance and accountability of the federal government for the American people. GAO examines the use of public funds; evaluates federal programs and policies; and provides analyses, recommendations, and other assistance to help Congress make informed oversight, policy, and funding decisions. GAO's commitment to good government is reflected in its core values of accountability, integrity, and reliability.

Obtaining Copies of GAO Reports and Testimony

The fastest and easiest way to obtain copies of GAO documents at no cost is through GAO's website (<http://www.gao.gov>). Each weekday afternoon, GAO posts on its website newly released reports, testimony, and correspondence. To have GAO e-mail you a list of newly posted products, go to <http://www.gao.gov> and select "E-mail Updates."

Order by Phone

The price of each GAO publication reflects GAO's actual cost of production and distribution and depends on the number of pages in the publication and whether the publication is printed in color or black and white. Pricing and ordering information is posted on GAO's website, <http://www.gao.gov/ordering.htm>.

Place orders by calling (202) 512-6000, toll free (866) 801-7077, or TDD (202) 512-2537.

Orders may be paid for using American Express, Discover Card, MasterCard, Visa, check, or money order. Call for additional information.

Connect with GAO

Connect with GAO on [Facebook](#), [Flickr](#), [LinkedIn](#), [Twitter](#), and [YouTube](#).
Subscribe to our [RSS Feeds](#) or [E-mail Updates](#). Listen to our [Podcasts](#). Visit GAO on the web at www.gao.gov and read [The Watchblog](#).

To Report Fraud, Waste, and Abuse in Federal Programs

Contact:

Website: <http://www.gao.gov/fraudnet/fraudnet.htm> E-mail: fraudnet@gao.gov
Automated answering system: (800) 424-5454 or (202) 512-7470

Congressional Relations

Katherine Siggerud, Managing Director, siggerudk@gao.gov, (202) 512-4400,
U.S. Government Accountability Office, 441 G Street NW, Room 7125,
Washington, DC 20548

Public Affairs

Chuck Young, Managing Director, youngc1@gao.gov, (202) 512-4800 U.S.
Government Accountability Office, 441 G Street NW, Room 7149 Washington,
DC 20548

Strategic Planning and External Liaison

James-Christian Blockwood, Managing Director, spel@gao.gov, (202) 512-4707
U.S. Government Accountability Office, 441 G Street NW, Room 7814,
Washington, DC 20548