



January 2019

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

Actions Needed to Strengthen Capital Planning and Track Preventive Maintenance Program

GAO Highlights

Highlights of [GAO-19-202](#), a report to congressional requesters

Why GAO Did This Study

Safety incidents in recent years on WMATA's rail system have raised questions about its processes for performing critical maintenance and replacing capital assets. WMATA initiated a new preventive maintenance program for its rail track in 2017, and is currently implementing a new capital planning process.

GAO was asked to examine issues related to WMATA's capital funding and maintenance practices. This report examines: (1) how WMATA spent its capital funds from fiscal years 2011 through 2017, (2) how WMATA's new capital planning process addresses weaknesses it identified in the prior process, and (3) WMATA's progress toward its track preventive maintenance program's goals and how the program aligns with leading program management practices. GAO analyzed WMATA's financial and program information, interviewed officials of WMATA, the Federal Transit Administration, and five transit agencies selected for similarities to WMATA. GAO compared WMATA's capital planning process and track maintenance program with leading practices.

What GAO Recommends

GAO is making five recommendations, including that WMATA establish documented policies and procedures for the new capital planning process and conduct a comprehensive risk assessment for the track preventive maintenance program. WMATA described actions planned or underway to address GAO's recommendations. GAO believes the recommendations should be fully implemented, as discussed in the report.

View [GAO-19-202](#). For more information, contact Mark Goldstein at (202) 512-2834 or goldsteinm@gao.gov.

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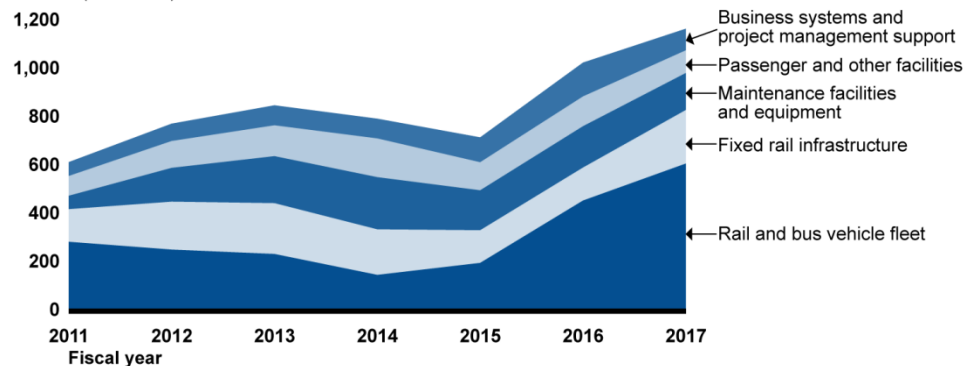
WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

Actions Needed to Strengthen Capital Planning and Track Preventive Maintenance Program

What GAO Found

From fiscal years 2011 through 2017, the Washington Metropolitan Area Transit Authority (WMATA) spent almost \$6 billion on a variety of capital assets, with the largest share spent on improving its rail and bus fleet (see figure). Over this period, WMATA's capital spending was, on average, about \$845 million annually.

Washington Metropolitan Area Transit Authority's Capital Expenditures by Asset Category, in Current Dollar Values, Fiscal Years 2011 through 2017
Dollars (in millions)



Source: GAO analysis of Washington Metropolitan Area Transit Authority (WMATA) data. | GAO-19-202

WMATA's new capital planning process could address some weaknesses it identified in the prior process. WMATA established a framework for quantitatively prioritizing capital needs (investments to a group of related assets) over a 10-year period. However, WMATA has not established documented policies and procedures for implementing the new process, such as those for selecting specific projects for funding in its annual capital budget. WMATA is currently using its new capital planning process to make fiscal year 2020 investment decisions. WMATA has proposed a fiscal year 2020 capital budget of \$1.4 billion. Without documented policies and procedures for implementing the new planning process, WMATA's stakeholders do not have reasonable assurance that WMATA is following a sound process for making investment decisions.

WMATA has made significant progress toward its track preventive maintenance program's goals, which are to reduce both track-defect and electrical-fire incidents by 50 percent in fiscal year 2019 compared with 2017. In fiscal year 2018, WMATA met its goal for reducing track defect incidents and reduced electrical fire incidents by 20 percent. However, in designing the program, WMATA did not fully assess risks. For example, WMATA did not quantitatively assess the impact of track defects or electrical fires on its ability to provide service, nor did it consider other risks such as non-electrical track fires, which represent about 30 percent of all fires on the system, or other factors, such as resources or track time. Without a comprehensive risk assessment, WMATA lacks reasonable assurance that the program is designed to address risks affecting the safety of the rail system or other risks that could hinder the new program's success.

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Abbreviations

COSO	Committee of Sponsoring Organizations of the Treadway Commission
FTA	Federal Transit Administration
MAP-21	Moving Ahead for Progress in the 21st Century Act
NTSB	National Transportation Safety Board
PRIIA	Passenger Rail Investment and Improvement Act of 2008
WMATA	Washington Metropolitan Area Transit Authority

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January 31, 2019

Congressional Requesters

The Washington Metropolitan Area Transit Authority (WMATA) is one of the largest transit operators in the nation, providing service for nearly 1-million rail and bus passenger trips each day, making it critical to the National Capital Area's transportation infrastructure.¹ In recent years there have been questions about the safety of WMATA's rail transit system and whether it has effective processes in place to replace assets and perform critical maintenance. For example, the National Transportation Safety Board (NTSB) found that WMATA had ineffective inspection and maintenance practices that contributed to a January 2015 smoke incident near L'Enfant Plaza station that resulted in one fatality and 91 injuries.² After investigations by the NTSB and the Federal Transit Administration (FTA), among other actions, the FTA assumed direct safety oversight of WMATA in October 2015. To address safety concerns and recommendations from NTSB and FTA, WMATA conducted SafeTrack, which was a large rehabilitation project that made emergency repairs to WMATA's track infrastructure between June 2016 and June 2017.³ At the conclusion of SafeTrack, WMATA implemented its new track preventive maintenance program designed to better ensure the long-term reliability of its infrastructure and to prevent the need for another SafeTrack.

In addition to its efforts to improve safety, WMATA has also had a growing maintenance backlog. In November 2016, WMATA reported that it had about \$17.4 billion in state-of-good-repair needs, up from the \$7.6

¹Federal Transit Administration, *National Transit Database: Service Data and Operating Expenses Time-Series By Mode, 2017*.

²The NTSB is an independent federal agency charged with investigating certain accidents associated with various modes of transportation such as railroad, highway, marine, pipeline, and aviation. NTSB, *Washington Metropolitan Area Transit Authority L'Enfant Plaza Station Electrical Arcing and Smoke Accident*, NTSB/RAR-16/01 NTSB (Jan. 12, 2015).

³For more information see: GAO, *Washington Metropolitan Area Transit Authority: Improved Planning of Future Rehabilitation Projects Could Prevent Limitations Identified with SafeTrack*, [GAO-17-348](#) (Washington, D.C.: Mar. 14, 2017).

billion it reported in February 2010.⁴ In 2018, the District of Columbia, the state of Maryland, and the Commonwealth of Virginia each enacted legislation that is expected to provide about \$500 million combined annually in additional funding to WMATA for capital purposes, a sum that may help address this backlog. This funding is in addition to the \$340 million contributed on average annually by state and local jurisdictions for capital purposes from fiscal years 2011 through 2017, and almost \$460 million received annually on average as grants from the federal government for capital expenses over that period.⁵ WMATA is currently developing a new capital planning process to improve its capital investment decision-making and to address weaknesses WMATA identified in its prior capital planning process.

You asked that we review WMATA’s capital funding and maintenance practices. This report examines:

1. How WMATA expended its capital funding from fiscal years 2011 through 2017;⁶
2. How WMATA’s new capital planning process addresses weaknesses it identified in the previous process, and
3. WMATA’s progress toward its track preventive maintenance program goals and how the program aligns with leading program management practices.

To assess WMATA’s capital spending from fiscal years 2011 through 2017, we reviewed WMATA’s annual budgets, fourth-quarter and year-end financial reports, budget reconciliation reports, comprehensive annual financial reports, FTA grant awards, and other documents

⁴FTA 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. In February 2010, WMATA estimated \$7.6 billion worth of “state of good performance” needs. State of good performance was a term used by WMATA beginning around 2008 to describe projects that maintain and replace assets on a lifecycle basis and that promote safety and reliability, and preserve service levels. FTA defined the term “state of good repair” in 2016. Since the two terms are conceptually similar, we use state of good repair as a common term to refer to across the time period covered in this report. WMATA made both the November 2016 estimate and the February 2010 estimate to cover a 10-year time period.

⁵For the purposes of this report, fiscal year refers to WMATA’s fiscal year from July 1st through June 30th unless specified otherwise.

⁶For the purposes of this report, “capital funds” and “capital funding” refer to the funding WMATA receives from various sources that it allocates toward capital investments.

provided by WMATA and FTA.⁷ We selected fiscal year 2011 because it was the first year in which WMATA received federal funding authorized by the Passenger Rail Investment and Improvement Act of 2008 (PRIIA), and we selected fiscal year 2017 because it was the most recent year that capital expenditure data were available at the time of our review.⁸ We also interviewed officials from WMATA and FTA to identify how WMATA budgets and spends its capital funds. To identify categories of capital spending, we collected information from WMATA's fourth-quarter reports and year-end financial reports that were presented to WMATA's board of directors and classified capital expenditures according to spending categories included in WMATA's annual capital budgets and fourth-quarter financial reports. To identify annual capital funding received by WMATA from fiscal years 2011 through 2017, we analyzed the information provided by FTA on federal funding provided to WMATA and reviewed financial reports from WMATA. We determined that these data had some limitations but were sufficiently reliable for the purposes of our review. An external audit report of WMATA financial information for fiscal year 2016 noted a material weakness with WMATA's process for accounting acquisition costs of capital assets. Specifically, there were inconsistencies between WMATA's general ledger and sub-ledger, which are used to record acquisition costs, depreciation, and other financial information related to capital assets. As a result, additional steps were required to reconcile the difference between the two sources and could have resulted in a material error. However, after interviewing WMATA officials about the weakness and assessing the available financial information, we determined that the data we used were sufficiently reliable for our purpose of showing general trends of capital expenditures.⁹

⁷For purposes of this report, "capital spending" and "capital expenditures" refer to funds that WMATA expended on capital projects. In particular, we use WMATA's definition of expended funds, which is "the actual expenses paid or accrued to date in the current fiscal year." See WMATA, *Washington Metropolitan Area Transit Authority Fiscal Year 2015 Financials: Quarterly Financial Report, FY2015-Q4, April-June 2015*.

⁸PRIIA, enacted in 2008, authorized \$1.5 billion to WMATA, available in increments over 10 years, or until expended, for capital improvements and preventive maintenance. These funds are appropriated to the Secretary of Transportation who is authorized to make grants to WMATA. Pub. L. No. 110-432, Div. B., § 601, 122 Stat. 4907, 4968 (Oct. 16, 2008). The first appropriation for this program was in fiscal year 2010, though WMATA did not receive the funds until fiscal year 2011.

⁹A material weakness is a deficiency, or combination of deficiencies, in internal control such that there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented, or detected and corrected, on a timely basis.

To assess WMATA's new capital planning process, we reviewed WMATA documentation, including its two most recent Capital Needs Inventory reports prepared in 2010 and 2016. We also reviewed available WMATA documentation on the new planning process, including guidance documents on how WMATA intends to initiate capital projects, and interviewed WMATA officials about capital planning and development of the new capital planning process. Further, we compared WMATA's new capital planning process to leading practices identified in GAO's *Executive Guide* on capital decision-making,¹⁰ leading practices for rehabilitating and replacing capital assets contained in the Transit Cooperative Research Program Report 157,¹¹ and project management principles from the Project Management Institute, Inc.¹² In addition, we interviewed officials from five peer transit agencies that are similar to WMATA to obtain information from them on how they conduct capital planning. We selected these agencies based on a number of factors, including those that were comparable to WMATA in terms of transit route miles, system use, and capital spending. The transit agencies we selected were: (1) Bay Area Rapid Transit; (2) Chicago Transit Authority; (3) Massachusetts Bay Transportation Authority; (4) Metropolitan Atlanta Rapid Transit Authority; and (5) Southeastern Pennsylvania Transportation Authority. The results of these interviews are not generalizable.

To assess WMATA's track preventive maintenance program, we reviewed WMATA documentation about the program, interviewed WMATA officials, and analyzed track defect and wayside electrical fire

¹⁰GAO, *Executive Guide: Leading Practices in Capital Decision-Making*, GAO/AIMD-99-32 (Washington, D.C.: Dec. 1998). For purposes of this report we refer to this document as the *Executive Guide*.

¹¹Transit Cooperative Research Program, *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 Transit Cooperative Research Program serves as a forum for transit agencies to research issues of common concern to the transit industry. It is sponsored by FTA.

¹²Project Management Institute, Inc., *A Guide to the Project Management Body of Knowledge, PMBOK® Guide*, Sixth Edition (2017). The Project Management Institute 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.

data provided by WMATA from fiscal years 2016 through 2018.¹³ We interviewed WMATA officials about their procedures for collecting and analyzing these data. To assess the accuracy of these data, we also performed independent tests that included verifying WMATA's final tally of track-defect and fire incidents and verifying there were no extended periods of time in which data were missing. We determined the data were sufficiently reliable for the purposes of our report. We also interviewed officials from the American Public Transportation Association and the American Railway Engineering and Maintenance-of-Way Association to discuss best maintenance practices in the transit industry.¹⁴ We then compared WMATA's track preventive maintenance program to leading program management practices identified by the Project Management Institute, Inc.¹⁵ and internal control standards related to risk assessment published by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) and followed by WMATA.¹⁶ A more detailed summary of our scope and methodology appears in appendix I.

We conducted our work from November 2017 to January 2019 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.

¹³WMATA only had detailed track defect and electrical fire incident data available for fiscal years 2016 through 2018. WMATA categorizes electrical fires as fires caused by insulators, track components, and cables. Wayside electrical fires occur when one of these categories of fire occurs on the track wayside. In general, the track wayside refers to the space along the track enclosed by boundaries such as roadway fences and tunnel walls.

¹⁴The American Railway Engineering and Maintenance-of-Way Association was formed in 1997 as the result of a merger of three previous rail and engineering organizations. Its mission is to develop and advance technical and practical knowledge and recommend practices for the design, construction, and maintenance of railway infrastructure.

¹⁵Project Management Institute, Inc., *The Standard for Program Management - Fourth Edition (2017)*®.

¹⁶Committee of Sponsoring Organizations of the Treadway Commission, *Internal Control-Integrated Framework* (New York: American Institute of Certified Public Accountants, 2013). Internal control involves the plans, methods, policies, and procedures that an entity uses to fulfill its mission. 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.

Background

WMATA was created in 1967 through an interstate compact—matching legislation passed by the District of Columbia, state of Maryland, and Commonwealth of Virginia, and then ratified by Congress—to plan, develop, finance, and operate a regional transportation system in the National Capital area.¹⁷ A board of eight voting directors and eight alternate directors governs WMATA. The directors are appointed by the District of Columbia, Virginia, Maryland, and the federal government, with each appointing two voting and two alternate directors.¹⁸ WMATA operates six rail lines—the Red, Orange, Blue, Green, Yellow, and Silver Lines—connecting various locations within the District of Columbia, Maryland, and Virginia.¹⁹ WMATA’s rail system has 118 linear miles of guideway: 51 miles of subway, 58 miles at ground level, and 9 miles on aerial structures.

WMATA’s capital investments are funded through multiple sources.²⁰ These include a combination of grants it receives from the federal

¹⁷Interstate 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. In addition to the District of Columbia, the Washington Metropolitan Area Transit Zone also includes the following local jurisdictions: Prince George’s County and Montgomery County, Maryland (and political subdivisions of the state of Maryland within those counties), as well as Arlington County, Fairfax County, and Loudoun County, Virginia (and political subdivisions of the Commonwealth of Virginia within those counties), and the Virginia cities of Alexandria, Fairfax, and Falls Church.

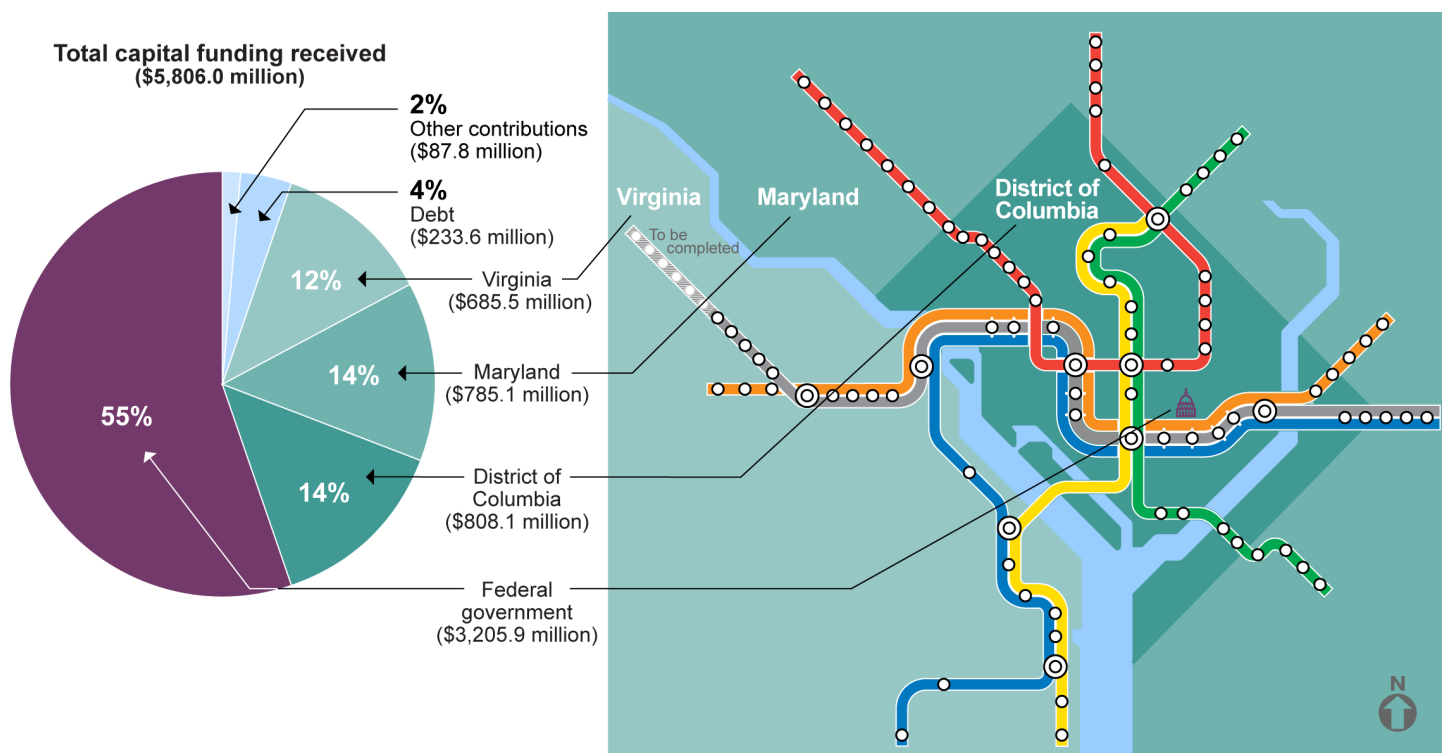
¹⁸Specifically, Virginia’s directors are appointed by the Northern Virginia Transportation Commission; Maryland’s directors are appointed by the Washington Suburban Transit Commission; and the District of Columbia’s directors are appointed by the Council of the District of Columbia. Federal directors are appointed by the Secretary of the U.S. Department of Transportation.

¹⁹Although WMATA is responsible for the operation and maintenance of the Silver Line, the Metropolitan Washington Airports Authority is responsible for its construction, which is funded jointly by the Airports Authority along with grants and contributions from federal, state, and local governments. Phase 1 of the Silver Line opened in 2014, and Metropolitan Washington Airports Authority officials expects that Phase 2 of its construction will be completed by fiscal year 2020.

²⁰The capital budget covers expenses that will lead to a future benefit beyond the current fiscal year, and include such things as vehicle replacement and rehabilitation. WMATA also has an operating budget, which is funded primarily by the fares it collects and contributions it receives from states and local jurisdictions in which it operates. The operating budget covers expenses such as labor needed to operate the rail and bus systems. In fiscal year 2019, WMATA’s approved operating budget is \$1.8 billion.

government, along with matching funds and other contributions it receives from the states and local jurisdictions in which it operates (see fig. 1).

Figure 1: Washington Metropolitan Area Transit Authority Capital Funding by Jurisdiction, Fiscal Years 2011 through 2017, with Simplified Rail System Map



Source: GAO analysis of Washington Metropolitan Area Transit Authority (WMATA) data. | GAO-19-202

Note: Capital funding from Virginia and Maryland represents funding from those states as well as funding from the cities and counties within those states through which WMATA operates.

From fiscal years 2011 through 2017, WMATA received about \$5.8 billion in capital funding.²¹ Over half of this funding came from the federal government (\$3.2 billion), and state and local jurisdictions provided 41 percent (\$2.4 billion). WMATA also took on about \$230 million in long-term debt to finance its capital program during this time period.²² The

²¹For the purposes of this report, all dollar amounts are nominal or current dollar prices and are not adjusted for general price level changes over time.

²²We excluded a short-term line of credit of \$150 million that WMATA obtained in fiscal year 2017 and was largely repaid in fiscal year 2018.

federal funding included grant awards,²³ in addition to annual appropriations authorized under PRIIA.²⁴ In 2008, PRIIA authorized \$1.5 billion to WMATA, available in increments over 10 years beginning in fiscal year 2009, or until expended, for capital improvements and preventive maintenance.²⁵ PRIIA funding and certain federal grants require state or local jurisdictions to provide matching funds. Additionally, a large portion of funding from state and local jurisdictions is governed by capital-funding agreements, which are periodically negotiated between WMATA and the states and localities. From fiscal years 2011 through 2017, state and local jurisdictions contributed on average about \$340 million annually to WMATA, generally for capital purposes. The annual capital contributions from the jurisdictions are expected to more than double as a result of the recent legislation enacted by the District of Columbia, Maryland, and Virginia in 2018.²⁶ In addition, WMATA officials told us that it will have the ability to further leverage this dedicated funding and issue debt to finance its capital projects.

WMATA has several steps in its capital planning process. These include developing the following:

- *Capital Needs Inventory.* WMATA periodically identifies its capital investment needs in this inventory. WMATA issued a Capital Needs Inventory in February 2010 and another in November 2016, each covering a 10-year period.²⁷ According to WMATA, Capital Needs

²³Federal grants awarded to WMATA included Urbanized Area Formula Grants (49 U.S.C. § 5307), Fixed Guideway Capital Investment Grants (49 U.S.C. § 5309), and State of Good Repair Grants (49 U.S.C. § 5337), among others. From fiscal years 2011 through 2017, the awards to WMATA for these particular grants amounted to approximately \$1.94 billion.

²⁴Pub. L. No. 110-432, Div. B., § 601, 122 Stat. 4907, 4968 (Oct. 16, 2008). These funds are appropriated to the Secretary of Transportation who is authorized to make grants to WMATA.

²⁵The first appropriation for this program was in fiscal year 2010, though WMATA did not receive the funds until fiscal year 2011.

²⁶The Maryland legislation provides \$167 million annually and the District of Columbia legislation provides \$178.5 million annually. The Virginia legislation does not specify the total amount of annual funding, but specifies the sources of that funding which WMATA estimates will provide about \$154 million annually. See 65 D.C. Reg. 004285 (Apr. 13, 2018); 2018 Md. Code Ann. Adv. Legis. Serv. 351 (LexisNexis); 2018 Va. Adv. Legis. Serv. 856 (LexisNexis).

²⁷WMATA's 2010 Capital Needs Inventory covered fiscal years 2011 through 2020, while WMATA's 2016 Capital Needs Inventory covers calendar years 2017 through 2026.

Inventories help inform the annual capital budget and capital improvement program.

- *Annual Capital Budget.* Each year, WMATA prepares an annual capital budget, which identifies projects WMATA plans to undertake in the next fiscal year. WMATA's fiscal year 2019 annual capital budget was approved by the board of directors at \$1.3 billion.
- *Six-Year Capital Improvement Program.* Within WMATA's annual capital budget, WMATA includes a Six-Year Capital Improvement Program identifying capital projects WMATA plans to implement over a 6-year period. WMATA's most recent Six-Year Capital Improvement Program (covering the fiscal year 2019—2024 period) was approved by the board of directors at \$8.5 billion.

According to WMATA officials, WMATA is currently implementing a new capital planning process through which it will develop its fiscal year 2020 Capital Budget and fiscal year 2020-2025 Six-Year Capital Improvement Program. WMATA adopts and implements the capital budget by June 30 for the new fiscal year, which begins on July 1. The fiscal year 2020 Capital Budget is scheduled to be adopted and implemented by June 30, 2019. Among other things, the goals and objectives of this new capital planning process are to

- construct an objective, data-driven, and risk-based approach to estimate major rehabilitation and capital asset replacement needs;
- build a capital investment prioritization methodology aligned with WMATA's strategic goals and grounded in asset inventory and condition assessments; and
- develop a process that will support the construction and ongoing stewardship of its Transit Asset Management Plan. The latter is discussed in more detail below.

WMATA has also recently undertaken efforts to address issues related to the condition and maintenance of its track. After SafeTrack concluded in June 2017, WMATA implemented what officials describe as its first track preventive maintenance program designed to incorporate industry-wide best practices related to track maintenance, in order to improve the rail system's long-term safety and reliability.²⁸ The new program commenced

²⁸Prior to developing this program WMATA did not have a program that incorporated generally accepted best industry practices, and their new program is designed to correct this.

in June 2017, and WMATA’s board reduced late-night service to allow for longer maintenance work hours.

To make the best use of the extra maintenance hours, WMATA focused its new program on six separate initiatives that together would address what WMATA viewed as its two most pressing track maintenance concerns—electrical fires caused by cable and insulator defects along the track wayside, and defects to the track itself, including unsecured rail fasteners and worn track switches (see table 1). These initiatives are planned to cover the entire transit system and will take various amounts of time to complete.

Table 1: Description of the Six Initiatives within Washington Metropolitan Area Transit Authority’s Track Preventive Maintenance Program

Initiative	Description	Primary Purpose	Estimated Time to Complete Pass of Entire Rail System
Cable “Meggering”	Helps prevent track fires by identifying and replacing electric cables that no longer adequately insulate electric current.	Reduce wayside electrical fire incidents	4 years
Stray Current Testing	Helps prevent track fires by identifying components within the return circuit ^a that do not provide sufficient electrical isolation and allow stray currents to escape.	Reduce wayside electrical fire incidents	5 years
Track Bed Cleaning	Removes fire hazards from the track bed, such as debris and water, which can spawn combustion during electrical arcing incidents. ^b This initiative is also meant to improve the quality of the stray current testing initiative by cleaning the tracks in advance.	Reduce wayside electrical fire incidents	To be determined ^c
Switch Maintenance	Helps ensure the proper functioning of rail switches, frogs, ^d and interlockings, which are parts of the railroad where tracks can cross each other or change to direct trains along different routes.	Reduce track defect incidents	5 years
Torqueing	Tightens the nuts and bolts that hold rail fasteners in place on direct fixation track. Direct fixation track is the standard method of construction for track in tunnels and elevated sections where the track is directly anchored to concrete rail ties as opposed to wooden crossties.	Reduce track defect incidents	1 year
Tamping	Helps ensure the proper horizontal and vertical alignment of ballasted track. Ballasted track is fastened to wooden cross ties and lies on top of a gravel bed. It normally appears outside of tunnels in the open-air.	Reduce track defect incidents	2 years

Source: GAO analysis of WMATA information and interviews with officials. | GAO-19-202.

^aThe return circuit carries electrical current from the running rails back to the traction power substation.

^bAccording 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.

^cThe Track Bed Cleaning initiative is initially focused on the Red Line, as it is the oldest line, and according to officials, has the most debris and water intrusion. WMATA estimates a full sweep of the Red Line will take one year and plans on extending this initiative to its other rail lines beginning in fiscal year 2019.

^dA frog is a track structure used at the intersection of two running rails to provide support for wheels and passageways for their flanges, thus permitting wheels on either rail to cross the other.

FTA also plays a role in WMATA activities by providing and directing the use of federal funds, overseeing safety, and requiring transit asset management. FTA provides grants that support capital investment in public transportation, consistent with locally developed transportation plans, and has provided such funding to WMATA as noted above. Additionally, though states play a role in safety oversight of rail transit systems through state safety oversight programs, FTA also has the authority to conduct various safety oversight activities such as inspections and investigations.²⁹ Furthermore, FTA has the authority to assume temporary, direct safety oversight of a rail transit system if it finds the state safety oversight program is inadequate, among other things. After FTA conducted a safety management inspection and issued a safety directive with 91 required actions, it found WMATA's state safety-oversight program to be inadequate and assumed direct safety-oversight of WMATA in October 2015. Finally, FTA is responsible for assisting public transportation systems to achieve and maintain their infrastructure, equipment, and vehicles in a state of good repair. Specifically, in July 2016, FTA issued regulations establishing a National Transit Asset Management System.³⁰ Applicable transit agencies³¹ were required to have an initial transit asset management plan completed by October 1, 2018.³² For "tier I providers," such as WMATA,³³ this plan is to contain

²⁹See 49 U.S.C. § 5329.

³⁰The Moving Ahead for Progress in the 21st Century Act (MAP-21) required this rulemaking. Pub. L. No. 112-141, § 20019, 126 Stat. 405, 707 (July 6, 2012) (codified at 49 U.S.C. § 5326). A 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).

³¹Recipients and subrecipients of federal financial assistance under Chapter 53 of the United States Code that own, operate, or manage capital assets used for providing public transportation are required to have transit asset management plans.

³²49 C.F.R. § 625.31(a).

nine elements, including 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.³⁴ WMATA completed its Transit Asset Management plan, dated October 1, 2018. This plan outlines WMATA's policy, approach, and targeted actions to improve its asset management practices over the next 4 years.

³³A tier I provider is a recipient that owns, operates, or manages either (1) one hundred and one or more vehicles in revenue service during peak regular service across all fixed route modes or in any one non-fixed route mode, or (2) rail transit. 49 C.F.R. § 625.5.

³⁴In addition to the two items noted above, the other Transit Asset Management Plan elements for tier I providers are: (1) a description of analytical processes or decision-support tools that a provider uses to estimate capital investment needs over time and develop its investment prioritization; (2) a provider's project-based prioritization of investments, developed in accordance with 49 C.F.R. § 625.33; (3) a provider's Transit Asset Management and state of good repair policy; (4) a provider's Transit Asset Management plan implementation strategy; (5) a description of key Transit Asset Management activities that a provider intends to engage in over the Transit Asset Management plan horizon period; (6) a summary or list of the resources, including personnel, that a provider needs to develop and carry out the Transit Asset Management plan; and (7) an outline of how a provider will monitor, update, and evaluate, as needed, its Transit Asset Management plan and related business practices, to ensure the continuous improvement of its Transit Asset Management practices. 49 C.F.R. § 625.25(b).

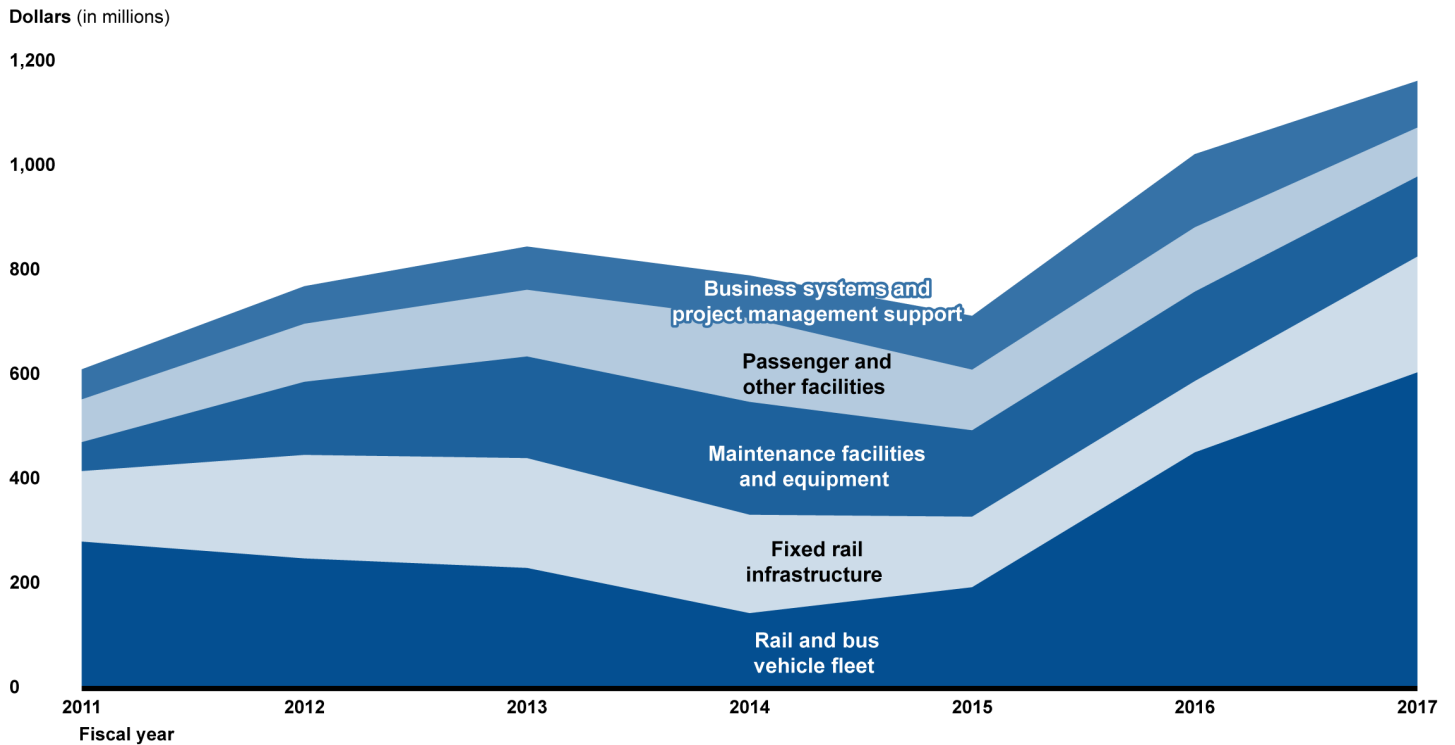
WMATA Has Focused Recent Capital Expenditures on Its Vehicle Fleet and Expects Future Expenditures to Increase to Meet State-of-Good-Repair Needs

Since Fiscal Year 2011, WMATA Has Expended the Largest Share of Its Capital Funds on Replacing and Maintaining Its Rail and Bus Fleets

WMATA expends its capital funds on a variety of capital assets as part of its capital budget and Capital Improvement Program.³⁵ From fiscal year 2011 through 2017, WMATA expended approximately \$5.9 billion on capital investments. Of this amount, WMATA expended the largest portion on assets related to the replacement, rehabilitation, and maintenance of its revenue vehicles (railcars, buses, and vans) and lesser amounts on other categories of assets, as discussed below and shown in figure 2.

³⁵WMATA identifies capital expenditures as those funds that are expended either to procure or construct fixed assets, or to improve and extend the useful life of an existing asset.

Figure 2: Washington Metropolitan Area Transit Authority's Capital Expenditures by Asset Category, in Current Dollar Values, Fiscal Years 2011 through 2017



Source: GAO analysis of Washington Metropolitan Area Transit Authority (WMATA) data. | GAO-19-202

- Rail and Bus Vehicle Fleet:** WMATA expended approximately \$2.16 billion (36 percent) of the total \$5.9 billion on projects related to its rail and bus fleet from fiscal years 2011 through 2017. The \$2.16 billion included approximately \$1.1 billion (51 percent) on replacing, expanding, and rehabilitating its rail fleet and approximately \$956 million (44 percent) on its bus fleet.³⁶ According to WMATA, it initiated its railcar replacement program in 2005 to increase capacity and reduce maintenance costs. In addition, a June 2009 Red Line collision of two trains near Fort Totten resulted in nine deaths and led the NTSB to recommend that WMATA retire and replace all 1000 series

³⁶Approximately \$95 million (4 percent) was also expended on replacing MetroAccess vehicles. WMATA operates a paratransit service (MetroAccess) that provides van service to individuals with disabilities.

railcars.³⁷ From fiscal year 2011 through 2017, WMATA expended almost \$656 million on replacing these and other railcars and expanding its overall fleet. This effort includes WMATA's planned purchase of a total of 748 new 7000-series railcars (see fig. 3). Approximately \$530 million was expended on replacing vehicles from fiscal years 2015 through 2017. For example, in fiscal year 2017 WMATA accepted delivery of about 50 percent (364 railcars) of its planned purchase of 748, 7000-series railcars. WMATA expects to complete its current railcar replacement program by fiscal year 2024, with an estimated total program cost of about \$1.7 billion.³⁸

Figure 3: Photograph of a 7000-series Railcar



Source: Washington Metropolitan Area Transit Authority (WMATA). | GAO-19-202

- **Fixed Rail Infrastructure:** WMATA expended about \$1.23 billion of the total \$5.9 billion (21 percent) to maintain its fixed-rail infrastructure. Of this \$1.23 billion, WMATA expended about \$650 million (53 percent) on rail infrastructure and rehabilitation projects and \$573 million (47 percent) on improvements to its track and structures (e.g., bridges

³⁷National Transportation Safety Board, *Collision of Two Washington Metropolitan Area Transit Authority Metrorail Trains Near Fort Totten Station, Washington, D.C., June 22, 2009*. (Washington, D.C.: 2010).

³⁸According to WMATA, its railcar replacement program also includes the planning and acquisition of new 8000-series railcars.

and tunnels). According to WMATA, the rail infrastructure and rehabilitation projects began in 2009 and were the first comprehensive rehabilitation of WMATA's rail infrastructure in its history. Typical projects included rehabilitating WMATA's water drainage pumps and tunnel ventilation, fire, and communications systems, among other things. WMATA work related to track and structures involved the maintenance and rehabilitation of the steel rail that guides railcars, the cross ties and fasteners that hold the rail in place, the third rail that provides power to trains, and the bridges and tunnels the track runs on or through. The share of WMATA's total capital expenditures going to track and structures increased from about \$80 million in fiscal year 2016 to \$158 million in fiscal year 2017. This expenditure was primarily to implement SafeTrack.

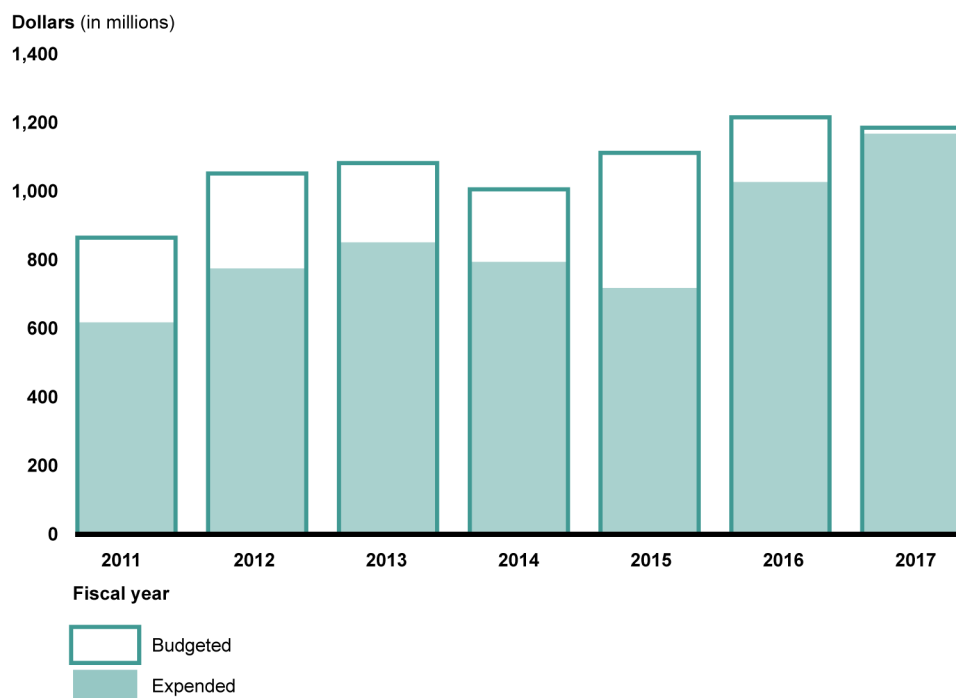
- *Maintenance Facilities and Equipment:* WMATA expended approximately \$1.1 billion of the total \$5.9 billion (19 percent) on assets related to maintenance facilities and equipment, which include rail yards, bus garages, and equipment used to rehabilitate and maintain WMATA's track and vehicle fleet. For example, from fiscal years 2011 through 2017 WMATA expended approximately \$75 million in constructing the Cinder Bed Road bus maintenance facility in Lorton, Virginia.
- *Passenger and Other Facilities:* WMATA expended about \$814 million of the total \$5.9 billion (14 percent) on passenger, business, and security support facilities. Such facilities include rail and bus stations, police facilities, and elevator and escalator rehabilitation.
- *Business Systems and Project Management Support:* WMATA also expended about \$628 million of the total \$5.9 billion (11 percent) on assets related to operations and business support software and equipment.

Prior to Fiscal Year 2017, WMATA Did Not Fully Expend Its Total Annual Capital Budget but Expects to Increase Expenditures to Address Repairs

From fiscal years 2011 through 2017, WMATA frequently over-estimated in its annual budgets the annual amount of capital investments it could implement (see fig.4). Out of the approximately \$7.5 billion that WMATA budgeted for capital investments over this period, it expended approximately \$5.9 billion (80 percent). WMATA's ability to fully expend its capital budget has varied from year to year. Specifically, WMATA expended about 65 percent (\$700 million) of its \$1.1 billion capital budget in fiscal year 2015, compared with 85 percent (\$1.1 billion) of its \$1.2 billion capital budget in fiscal year 2016. In fiscal year 2017, WMATA

expended nearly 100 percent of its \$1.18 billion capital budget.³⁹ WMATA attributed the increased expenditures to intensified efforts to address deferred maintenance, primarily through the SafeTrack initiative and an increased delivery and acceptance rate for the new 7000-series railcars, among other things. The total amount expended in fiscal year 2017 to replace the older railcars with new vehicles totaled about \$335 million.

Figure 4: Washington Metropolitan Area Transit Authority’s Total Capital Expenditures from Fiscal Years 2011 through 2017



Source: GAO analysis of Washington Metropolitan Area Transit Authority (WMATA) data. | GAO-19-202

According to WMATA, there are a number of reasons why it has not fully expended its capital budget in any given year:

- *Contracting and Scheduling Issues:* WMATA officials stated that there were contract and scheduling delays in the implementation of planned

³⁹In November 2016 and April 2017, WMATA amended and increased its approved budget of \$950 million by \$150 million and \$75 million, respectively, to include funding for the SafeTrack program, the replacement of additional railcars, and for other purposes.

capital projects. For example, WMATA officials said contracts were sometimes not executed during the fiscal year in which funds were originally budgeted for the work, and in other instances contract work was not carried out according to schedule and expenditures were delayed.

- *Changing Priorities:* WMATA officials stated that in some instances, the reevaluation and reprioritization of contracted projects affected WMATA's ability to expend its capital budget. In such cases, new capital needs were sometimes identified and prioritized over other needs, which caused delays in work schedules and potential financial claims by contractors due to delays. For example, WMATA stated that in fiscal year 2011 the initiation of the Red Line rehabilitation program was delayed as a result of the prioritization of the safety needs in response to the 2009 Fort Totten accident.
- *Federal Reimbursement Restrictions:* WMATA officials cited FTA restrictions on its reimbursement of federal funds between fiscal years 2014 and 2015 as a reason for its inability to expend budgeted capital funds in those years.⁴⁰ In a financial management oversight review completed by FTA in 2014, FTA found material weaknesses and significant deficiencies in WMATA's financial management controls, policies, and procedures regarding its receipt of federal grant funds. Based on these preliminary findings, FTA restricted WMATA's ability to automatically access federal grant reimbursements until WMATA undertook corrective actions. During these years, WMATA reported its management slowed expenditures on targeted capital projects due to concerns over reimbursement of grants. By October 2017, after WMATA implemented an action plan to improve its financial controls, FTA reinstated WMATA's ability to automatically receive all awarded federal funds on a regular schedule.⁴¹

⁴⁰Federal Transit Administration, *Financial Management Oversight Review: Full Scope Systems Review of the Washington Metropolitan Area Transit Authority* (Washington, D.C.: June 2014).

⁴¹In December 2016, FTA informed WMATA that the necessary corrective actions had been implemented and WMATA had made sufficient progress in resolving certain issues brought up in the financial management oversight review. As a result, FTA reinstated WMATA's ability to automatically receive funds on a regular schedule for grants awarded after July 1, 2015. By October 2017, FTA removed such restrictions for the remaining grants, those awarded before July 1, 2015. For more information regarding the steps taken by WMATA to address financial management recommendations, see GAO, *Washington Metropolitan Area Transit Authority: Steps Taken to Address Financial Management and Safety Recommendations, but Financial Management Internal Controls Need Strengthening*, [GAO-15-640R](#) (Washington, D.C.: July 15, 2015).

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- *Unpredictable Funding:* WMATA officials stated that unpredictable funding affected the level of its capital expenditures from year to year. Since WMATA had multi-year capital projects with multi-year procurements, according to WMATA officials, uncertainty with regard to how much capital funding would be received on an annual basis affected the implementation of projects.
 - *Inadequate Capital Planning Process:* WMATA attributed some of its inability to expend budgeted capital funds to the absence of a uniform and efficient capital planning process. According to WMATA, it lacked formal procedures to initiate projects and newer projects often experienced delays in implementation, which delayed expenditures on these projects. Later in this report, we discuss WMATA's efforts to develop a new capital planning process.

Although WMATA expended more of its capital budget in fiscal year 2017 than it had in prior years, it estimated that capital spending will need to increase even more to address state-of-good-repair needs. In 2016, WMATA projected that its state-of-good-repair needs amounted to about \$17.4 billion from 2017 through 2026. This level is almost \$10 billion more than WMATA estimated for its state-of-good-repair needs from 2011 through 2020 in its February 2010 Capital Needs Inventory. WMATA officials attributed the increase to a capital planning process insufficient to identify capital needs and an increase in cost of needs that were previously unmet. In addition, WMATA officials said the quality and quantity of asset data had improved over time. To address its state-of-good-repair needs, in November 2016 WMATA estimated that it will need to expend about \$1.74 billion annually on capital expenditures from 2017 through 2026.⁴² This is more than twice the \$845 million average annual capital expenditures from fiscal year 2011 through fiscal year 2017.

⁴²We did not independently verify WMATA's state-of-good-repair estimate or the annual spending that might be needed to address this estimate. However, other reports have discussed the magnitude of WMATA's state-of-good-repair needs. See, for example, Metropolitan Washington Council of Governments, *Technical Panel Final Report on Metro* (Washington, D.C.: April 2017) and Ray LaHood, correspondence to the Honorable Terence R. McAuliffe, Governor, Commonwealth of Virginia (Oct. 23, 2017). See also Ray LaHood, *Review of Operating, Governance and Financial Conditions at the Washington Metropolitan Area Transit Authority* (Dec. 5, 2017).

WMATA's New Capital Planning Process Could Address Some Previous Weaknesses WMATA Identified, but the Process Does Not Have Documented Policies and Procedures and Has Other Weaknesses

WMATA's new capital planning process could address some of the weaknesses it identified in the previous process, such as better distinguishing capital needs (investments in groups of related assets) from capital projects (investments in specific assets).⁴³ However, WMATA has not

- established documented policies and procedures to guide the process;
- developed performance measures to assess capital projects and the capital planning process; and
- developed a plan to obtain complete information about the inventory and condition of WMATA assets.

These remaining weaknesses could hinder sound capital investment decisions.

WMATA's New Capital Planning Process Could Facilitate Better Identification of Capital Investment Needs

WMATA's new capital planning process could facilitate better identification of capital investment needs. Leading practices for capital planning, among other things, call for an organization to conduct a comprehensive assessment of its needs to meet its mission.⁴⁴ WMATA uses the Capital Needs Inventory to assess its capital needs over a 10-year period across its various assets and help identify specific projects to include on subsequent capital improvement programs. In November 2016, WMATA issued its most recent Capital Needs Inventory, covering calendar year 2017 through 2026, and reported there were weaknesses and limitations in the process used to prepare the previous Capital Needs Inventory, issued in 2010. Those weaknesses and the actions WMATA has taken to address them include the following:

- *Distinguishing capital needs from capital projects.* WMATA reported in 2016 that the 2010 Capital Needs Inventory was primarily a list of

⁴³WMATA defines capital need as a request to rehabilitate, replace, or add a group of assets to the WMATA system. Each capital need consists of a group of similar or interdependent assets. WMATA defines capital projects as the planning, acquisition, construction, replacement, or rehabilitation of a capital asset.

⁴⁴[GAO/AIMD-99-32](#).

proposed projects and did not provide proper attention to evaluating WMATA's overall asset needs and the readiness of projects for programming in the capital improvement program. WMATA has taken actions to potentially address this weakness. In April 2016, WMATA issued a policy/instruction document that established policies and procedures for preparing capital needs inventories. This document defined the process for capital needs identification and established a framework evaluating and prioritizing capital investment needs. Among other things, this framework requires that WMATA departments develop capital needs justification packages and that these packages be reviewed by the Capital Program Advisory Committee for completeness and accuracy before being forwarded for further review.⁴⁵ The guidance also requires that WMATA's strategic objectives be considered when identifying and prioritizing capital projects.

- *Qualitative rather than quantitative prioritization of needs.* In 2016, WMATA reported that the prioritization of capital needs in the 2010 Capital Needs Inventory was primarily based on qualitative assessments by management rather than being driven by quantitative information and condition assessments. According to WMATA, the 2010 Capital Needs Inventory was largely based on the professional judgment of staff in consideration of WMATA's strategic goals but was not data-driven. WMATA has taken actions to address this weakness by issuing a policy that requires WMATA's senior management serving on the Capital Program Advisory Committee to use a more quantitative-based capital prioritization formula in preparing the Capital Needs Inventory.⁴⁶ For example, the November 2016 Capital Needs Inventory used a quantitative approach to rank and prioritize capital needs. This approach included the use of four criteria—asset condition, safety and security, service delivery, and ridership impact—to numerically score capital needs and WMATA then used a risk-

⁴⁵WMATA's Capital Program Advisory Committee is an interdepartmental committee that crafts, stewards, and updates the capital prioritization formula, which is an analytical methodology for prioritizing capital investment needs. Among other things, this committee annually solicits information about capital investment needs, develops guidance and reporting tools for investment needs submissions, and reviews capital needs justification packages.

⁴⁶According to WMATA, the capital prioritization formula is based on FTA's Transit Economic Requirements Model-Lite, which is a data-based analytical methodology for prioritizing capital investment needs over a 10-year horizon.

based weighting approach to combine these criteria into a single overall prioritization score.

WMATA Has Not Yet Established Documented Policies and Procedures, or Developed Performance Measures and Complete Asset Inventory Information

While WMATA has addressed some weaknesses it identified in its prior planning, it has not established documented policies and procedures to guide the annual capital planning process, or developed measures to assess capital project and program performance and a plan to obtain complete information on its assets and their physical condition.

Policies and Procedures to Guide the New Capital Planning Process

Although WMATA established policies and procedures for prioritizing capital needs—that is, investments in groups of related assets—for the 2016 Capital Needs Inventory, it has not established documented policies and procedures for the new capital planning process, including how WMATA will rank and select individual projects to address those needs through its annual capital budgets and Six-Year Capital Improvement Program. For example, through its Capital Needs Inventory WMATA stated it needed to invest \$17.4 billion over a 10-year period to address its state-of-good-repair needs, including replacing vehicles, rehabilitating stations, and investing in other types of assets. WMATA uses the annual capital budget and Six-Year Capital Improvement Program to identify the specific projects to be funded to meet the 10-year investment needs. However, because WMATA has not established documented policies and procedures for the new capital planning process, it has not yet identified the specific methodologies to rank and select projects for funding on an annual basis.

According to WMATA officials, the legacy annual capital planning process was based on implementing the list of projects that resulted from its 2010 Capital Needs Inventory and WMATA did not have a documented capital planning process that it followed on an annual basis. WMATA officials told us that the legacy capital planning process was “ad hoc” in nature, in part because WMATA was reacting to emergencies. For example, because WMATA needed to address the NTSB recommendation to replace the 1000-series railcars and address FTA safety directives after the 2015 smoke incident at the L’Enfant Plaza Station, it did not adhere to a formal annual-planning process.

The COSO internal control standards point out the importance of organizations documenting their processes to facilitate retention and sharing of organizational knowledge.⁴⁷ Leading practices contained in the *Executive Guide* also recommend that organizations have defined processes for ranking and selecting projects for capital funding. In addition, the *Executive Guide* noted that organizations find it beneficial to rank projects because the number of requested projects often exceeds available funding.⁴⁸

Officials from all five of the peer transit agencies we spoke with told us they had or planned to develop documented processes for making capital investment decisions. For example, officials from four of the five peer transit agencies we spoke with said they use a project scoring and ranking system in their capital planning process, and officials from the fifth agency told us it plans to develop such a system. Officials from one agency provided us with its project evaluation and scoring system that assigns scores using eight selection criteria that are tied to the agency's strategic business plan and state priorities. The selection criteria include such things as system preservation, safety, and cost-effectiveness. Officials from another agency told us they use an analytical tool to score projects and that every project (new or existing) gets re-scored annually.

As a result of WMATA not having documented policies and procedures for its capital planning process, it is unclear how important parts of the process will work and the basis for WMATA's investment decisions. WMATA has outlined some high-level policies for the capital planning process and prepared limited guidance for certain parts of the process. For example, WMATA officials told us that its recently issued Transit Asset Management Plan contains asset management policies that address the ranking and selecting of capital projects. Although the Transit Asset Management Plan discusses the process for estimating and prioritizing capital needs and, which are precursors of projects, the plan does not specifically address how projects would be selected for annual capital budgets and the capital improvement program. In addition, WMATA developed limited guidance for staff to use in developing new capital projects. Under this guidance, capital funds could be provided to evaluate, plan, and develop projects. While this guidance may be useful

⁴⁷COSO, *Internal Control-Integrated Framework* (New York: American Institute of Certified Public Accountants, 2013).

⁴⁸[GAO/AIMD-99-32](#)

for developing projects, it does not establish the policies and procedures WMATA will follow to decide which projects will be funded through the annual capital budget and the capital improvement program.

Further, the documentation prepared by WMATA to date does not establish policies and procedures for the entire capital planning process and how decisions will be made throughout the process. WMATA reported in its fiscal year 2019 annual budget that it had created a capital program manual that identifies the roles, responsibilities, processes, and calendars of events to inform the fiscal year 2020 capital program. WMATA officials told us that the previous Director of the Capital Planning and Program Management Department had included this information in the draft budget proposal when these documents were being developed. However, WMATA officials told us that these documents were not completed, and that the information was mistakenly not removed from the budget before the previous director of the department left the agency.⁴⁹

WMATA officials told us they plan to formalize policies, procedures, and manuals for the fiscal year 2021–2026 capital-investment program cycle. The current leadership of the Capital Planning and Program Management Department told us that given the time-constraints facing WMATA in the current fiscal year 2020 planning cycle, WMATA decided not to formally document the new capital planning process until after WMATA has had a chance to test it through the current planning cycle to see how it works. According to the official, the department’s leadership has instructed staff to document steps taken in implementing the new process so that WMATA will have the opportunity to learn from the new process and make necessary changes before developing formal, written procedures that will guide future planning cycles.

Although delaying formal development of policies and procedures may provide an opportunity to learn from the process while implementing it, it does not provide the guidance necessary now as WMATA uses its new capital planning process to develop the fiscal year 2020 capital program. In particular, because WMATA has not established policies and procedures for ranking and selecting projects, WMATA does not have a framework or clear criteria for programming projects in the annual capital budget for fiscal year 2020. WMATA has proposed a fiscal year 2020

⁴⁹According to WMATA officials, the WMATA board of directors was made aware that these documents did not exist.

capital budget of \$1.4 billion. In addition, WMATA's plan to document steps taken in implementing the new process as it is occurring does not provide reasonable assurance that WMATA is making decisions using a consistent process to direct investments toward WMATA's highest priority needs. A consistent process is all the more important to ensure that WMATA does not continue to use an ad-hoc process for capital investment decisions, as it did in its legacy process. WMATA's annual capital spending is anticipated to increase substantially over the fiscal year 2020-2025 period, as WMATA expects to be programming the additional \$500 million annually for capital purposes committed by the District of Columbia, Maryland, and Virginia. Without a documented planning process that includes procedures for ranking and selecting projects for funding in the fiscal year 2020 capital budget, WMATA's stakeholders lack reasonable assurance that WMATA's capital investment decisions will be made using a sound and transparent process.

Performance Measures to Assess Capital Projects and the Capital Planning Process

WMATA has also not developed performance measures to assess capital projects and the capital planning process. Leading practices from the *Executive Guide* suggest that one way to determine if a capital investment achieved the benefits that were intended when it was selected is to evaluate its performance using measures that reflect a variety of outcomes and perspectives. By looking at a mixture of measures, such as financial improvement and customer satisfaction, managers can assess performance based on a comprehensive view of the needs and objectives of the organization. Leading organizations we studied in preparing the *Executive Guide*, such as private sector companies, use financial and non-financial criteria for success that are tied to organizational goals and objectives. According to the *Executive Guide*, project-specific performance measures are then used to develop unit performance measures and goals, which are ultimately used to determine how well an organization is meeting its goals and objectives.

WMATA officials told us they have not developed performance measures for assessing the performance of individual projects or the capital planning process as a whole. One WMATA official told us that WMATA would like to evaluate results of the new capital planning process to determine whether organizational goals have been met. The official suggested that WMATA would work with a consultant to demonstrate a linkage between capital planning goals and WMATA's organizational goals. However, the official did not indicate when this step would occur or provide additional information. Moreover, it is unclear whether the official's intentions for this effort would result in measures for assessing

Information on Asset Inventories and Physical Condition Assessments

individual projects as well as the overall capital planning process. By developing measures, WMATA will be better positioned to assess whether specific capital investments met their intended outcomes or if the capital planning process itself is helping WMATA achieve its strategic goals and objectives and effectively using taxpayer funds.

WMATA also does not have a complete inventory or physical condition assessments of its assets. Leading practices for good capital decision-making call for organizations to conduct a comprehensive assessment of their needs and identify the organization's capabilities to meet these needs.⁵⁰ This process includes taking an inventory of assets and their condition and assessing where there are gaps in meeting organizational needs. The Transit Cooperative Research Program has also identified asset inventory and condition assessments as the first step in determining what asset rehabilitations and replacements are needed as transit providers address their state-of-good-repair requirements.⁵¹ Asset inventories and condition assessments provide critical information for capital-investment decision making.

WMATA has initiated various efforts to obtain better information about its assets and their condition. These efforts have included:

- *Transit Asset Inventory and Condition Assessment Project.* In 2016, WMATA began this project to provide a physical inventory of WMATA assets and their condition, in part to comply with FTA's Transit Asset Management regulations. According to WMATA, this project was to be the cornerstone in ensuring a complete, consistent, accurate, and centralized repository of relevant asset-related data. However, WMATA officials said that the project primarily focused on obtaining an inventory and condition assessment of WMATA facilities and equipment. A February 2018 WMATA memo to senior management stated that even when the project was completed, WMATA would still lack a robust database of track, guideway, infrastructure (e.g., tunnels and bridges), systems, and communication assets—elements that the November 2016 Capital Needs Inventory noted were the largest gaps in the asset information used to support capital needs forecasting. According to WMATA, this project produced inventory and condition

⁵⁰GAO/AIMD-99-32.

⁵¹Transit Cooperative Research Program Report 157, *State of Good Repair: Prioritizing the Rehabilitation and Replacement of Existing Capital Assets and Evaluating the Implications for Transit* (2012).

assessments for about 30 percent of WMATA's asset base. As of October 2018, WMATA considered the project complete since it provided information to help prepare WMATA's completed Transit Asset Management Plan, dated October 1, 2018. WMATA officials noted that they will continue to develop their asset inventories and condition assessments through its new Enterprise Asset Management Program, described below.

- *Enterprise Asset Management Program.* In December 2017, WMATA began development of an Enterprise Asset Management Program. According to WMATA, this program is an effort to institutionalize asset management practices that are aligned with industry best practices to provide, among other things, high quality asset data for informed decision-making, including for capital planning. Expected program tasks include updating asset records and improving and consolidating asset inventories in WMATA's asset system of record (called Maximo).

WMATA's efforts to develop more complete asset inventory and condition assessments are not complete. Among other things, WMATA documentation on the Enterprise Asset Management Program cited "inattention, poor standardization, and organizational silos" as factors that have resulted in WMATA having multiple sets of asset records in various states of accuracy and usefulness. The Enterprise Asset Management Program, according to WMATA, is an effort to help address this situation and improve asset data quality, including inventory and condition assessments.

Although WMATA is developing a new Enterprise Asset Management Program, it has yet to develop a plan for obtaining a complete inventory or physical condition assessments of its assets. The Project Management Institute's *Guide to the Project Management Body of Knowledge, PMBOK® Guide*⁵² describes the elements of good project management and their importance in achieving organizational goals. Among these elements are:

- Having a project charter that formally authorizes a project, that commits resources to the activity, and that provides a direct link to organizational strategic objectives;

⁵²Project Management Institute, Inc., *A Guide to the Project Management Body of Knowledge, PMBOK® Guide*, Sixth Edition (2017).

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- Preparing a project plan to define the basis of the project's work and how the work will be performed; and
 - Establishing a monitoring and control process to track, review, and report overall progress in meeting the plan's objectives.

WMATA has prepared draft documents that describe how it will implement the Enterprise Asset Management Program and that contain some elements of good project management. For example, in January 2018 WMATA circulated a proposed charter that once approved would authorize the Enterprise Asset Management program, identify needed resources, and link to WMATA's strategic goals. As of October 2018, this proposed charter had not yet been finalized. Draft program documents also indicate there would be a monitoring and control process that would establish regular reporting to internal stakeholders to assess program accomplishments and progress implementing the program.

While WMATA has developed a proposed charter and a monitoring and control process for its Enterprise Asset Management Program, it has not established a plan for collecting asset inventory and condition assessment information. The draft program charter includes general tasks for updating asset records and improving and consolidating asset inventory data in Maximo. However, a plan would provide more specific details for how the work would be completed, such as the information to be collected on different assets, how and when this information would be consolidated into Maximo, milestones for completing the work, or how the effort would be funded. Without a plan to obtain asset inventory and condition assessment information WMATA will continue to lack critical information needed for good capital planning and sound investment decision-making.

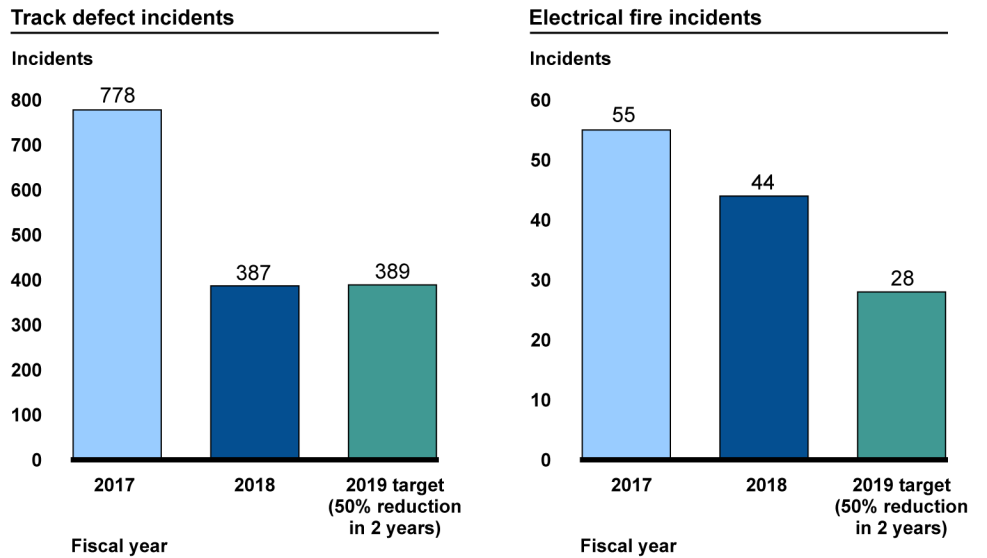
WMATA Reported Significant Progress toward Goals, but the Track Preventive Maintenance Program Does Not Fully Align with Leading Practices

WMATA Has Reduced Both Track Defect Incidents and Electrical Fires but Faces Challenges Implementing Its Track Preventive Maintenance Program

WMATA has reported significant progress toward its goals of reducing track defects and fire incidents, but still faces several challenges with implementing its track preventive maintenance program. WMATA defines an incident as any unplanned event that disrupts rail revenue service. According to WMATA officials, within the track preventive maintenance program WMATA seeks to reduce incidents specifically caused by electrical wayside fires and track defects each by 50 percent from fiscal year 2017 to fiscal year 2019. WMATA reported that in fiscal year 2018 it had met its goal for track defect incidents but not for electrical wayside fires. According to officials, track defect incidents—which include incidents caused by defective fasteners, switches, and “ballast”⁵³—were reduced by 50 percent from a total of 778 in fiscal year 2017 to 387 in fiscal year 2018. Electrical-wayside-fire incidents—including incidents caused by cable and insulator fires—went down 20 percent from a total of 55 in fiscal year 2017 to 44 in fiscal year 2018 (see fig.5).

⁵³“Ballast” is granular material placed in the track bed to support and restrain track, and provide drainage.

Figure 5: Washington Metropolitan Area Transit Authority's Track Defect and Electrical Fire Incidents, Fiscal Years 2017 and 2018, Projected Fiscal Year 2019 Target



Source: GAO analysis of Washington Metropolitan Area Transit Authority (WMATA) data. | GAO-19-202

Although WMATA has reduced both track defect incidents and electrical fires, the track preventive maintenance program is not intended to address the full range of all defects and track fires that may occur on the system. WMATA officials told us that the track preventive maintenance program specifically seeks to reduce electrical-wayside-fire incidents, which are a specific sub-set of overall track fires, and does not include non-electrical fires or smoke incidents, such as the ones caused by railcars or debris. WMATA captures and publicly reports the non-electrical fires as part of its quarterly Metro Performance Report, but according to WMATA officials, these fires are not specifically addressed through the track preventive maintenance program. While electrical fires decreased in fiscal year 2018, non-electrical fires did not change, as WMATA reported 23 non-electrical fires for both fiscal years 2017 and 2018. Additionally the track preventive maintenance program addresses a certain sub-set of track defect incidents such as those caused by loose fasteners and defective switches. According to WMATA, these track defect incidents can be addressed through its track geometry, torquing, and switch maintenance initiatives. WMATA addresses other types of track defects, such as rail breaks and third-rail defects, through its capital program. However, according to WMATA, track defects attributable to the capital

program are still included as part of the overall goal to reduce all track defect incidents by 50 percent by fiscal year 2019.

WMATA established goals for completing each of the six track preventive maintenance initiatives within a certain time period and reported that in fiscal year 2018 it was on-track to meet or exceed those goals for four of the initiatives. For example, in implementing its “cable meggering” initiative, WMATA established a goal to inspect and replace electric cables across its entire rail system within 4 years. According to WMATA, it met its target for fiscal year 2018 by completing 25 percent of the entire system in that year. In addition to cable meggering, WMATA also met its annual targets for the switch maintenance, track bed cleaning, and stray current-testing initiatives. As for the two initiatives behind schedule, the torquing initiative was 70 percent complete and the tamping initiative stood at 90 percent for the 2018 target (see table 2). Officials told us they have developed various ways to improve efficiency with these initiatives. For instance, WMATA improved the productivity of its switch maintenance initiative by separating the work to inspect the switches from the follow-up repair work to grind and weld them. These activities had previously been conducted by the same team.⁵⁴

⁵⁴Switch maintenance requires the grinding and welding of frogs and interlockings. Grinding is a process that removes irregularities from track surfaces.

Figure 6: Washington Metropolitan Area Transit Authority's Reported Progress for Completing the System-Wide Pass of Its Track Preventive Maintenance Initiatives, as of July 2018

Category	Preventive maintenance program	Purpose	Goal to complete system wide pass (years)	Percentage of annual target completed in 2018	Percentage of entire system complete
Electrical fires	Cable meggering	Reduce number of power cable faults	1 2 3 4	100%	25%
	Stray current testing	Improve electrical isolation of the track	1 2 3 4 5	150%	25%
	Trackbed cleaning	Reduce fire risk and deterioration caused by water	To be determined ^a	100%	46%
Track defects	Switch maintenance	Inspect, weld, and grind interlocking components	1 2 3 4 5	333%	70%
	Torqueing	Eliminate excessive strain and loading in direct fixation track	1	70%	70%
	Tamping	Stabilize ballasted track structure and correct alignment	1 2	90%	45%

Source: Washington Metropolitan Area Transit Authority (WMATA) May 2018 presentation to the board of directors. | GAO-19-202

^aThe Track Bed Cleaning initiative is initially focused on the Red Line, as it is the oldest line with the most debris and water intrusion. WMATA estimates a full sweep of the Red Line will take one year and plans on extending this initiative to its other rail lines beginning in fiscal year 2019.

However, WMATA faces challenges in implementing the track preventive maintenance program moving forward. WMATA officials described track preventive maintenance as a necessary operation that must be continuously performed and balanced in conjunction with regular train operations that provide service to their customers. According to WMATA officials, executing this new program requires regular refinements to ensure it continues to progress toward its desired outcomes. Among the implementation challenges identified by WMATA officials were the following:

- **Securing Sufficient Track Time.** WMATA officials told us that getting adequate time to perform track maintenance is difficult because it requires reducing the number of hours in which WMATA provides service to customers. Consequently, increased maintenance hours can result in lost revenue. Officials from the peer transit agencies we interviewed stated that the tension between conducting maintenance and providing service is common in the transit industry. According to WMATA officials, prior to SafeTrack, windows for performing track maintenance were not sufficient to complete all necessary work,

partially because of this need to balance maintenance hours and service hours. To address this issue, WMATA increased its weekly overnight work hours from 33 hours to 39 hours during SafeTrack. After SafeTrack was complete, WMATA extended weekly overnight work hours again to a total of 41 hours.⁵⁵ However, maintaining these extended overnight work hours past fiscal year 2019 requires approval from WMATA's board of directors. As a result, the long-term viability of WMATA's track preventive maintenance program is partially dependent on the board's decision to balance the competing demands for service hours and maintenance time.

- *Work Time Productivity.* To maintain extended track-maintenance hours into succeeding years, it will be important for WMATA to demonstrate the new program's productivity. According to WMATA officials, making the most productive use of the extended working hours is a challenge, but it will be necessary to justify the extended maintenance windows. WMATA officials told us that only a portion of overnight work hours yields productive maintenance time. For example, once a line ceases operations, it takes an additional hour for all trains to reach their final destination, and another hour after that to safely turn off all power running to the track and then establish a work zone. Once maintenance work is completed, additional time must be allotted for restoring power and allowing trains to move back into position. Because of these requirements, a five-hour work window may only yield two hours of productive work time (called "wrench time"). For this reason, WMATA began tracking its wrench time at the beginning of fiscal year 2018. As of June 2018, WMATA reported that average wrench time had increased from about 2.0 hours per day in July 2017 to 2.37 hours.
- *Resource Constraints.* According to WMATA officials, having sufficient people with the necessary skills and experience to perform track maintenance work is a significant challenge. For instance, expanded maintenance windows have increased WMATA's workforce requirements. As a result, WMATA has used contractors to assist with its stray-current testing and track bed cleaning initiatives. In another example, WMATA's torqueing initiative is particularly resource intensive as the entire rail system contains 135 miles of "direct fixation" track, where the torqueing work is being done, and over

⁵⁵A portion of these hours yield actual maintenance time since a portion of the outage time is also needed to allow trains to vacate tracks, shut down electrical power, and safely establish work zones.

504,000 fasteners to check and tighten as necessary.⁵⁶ According to WMATA officials, bolts and fasteners are torqued during their initial installment and then again 90 days afterward as part of the initial capital expenditure. After that, any subsequent torquing is executed as part of the new track preventive maintenance program. WMATA stated that the torquing initiative seeks to torque all 135 miles of direct fixation track annually. WMATA officials said the torquing initiative is a mix of contractor and in-house staff, with contractors supplementing WMATA forces as needed.

WMATA's Track Preventive Maintenance Program Does Not Fully Align with Leading Program Management Practices

WMATA's track preventive maintenance program has followed certain leading program management practices such as establishing key performance metrics and monitoring progress toward them. Leading practices recommend that organizations establish performance baselines for their programs and communicate performance metrics to key stakeholders.⁵⁷ For instance, as previously noted, WMATA established a measureable program goal to reduce track-defect and electrical-wayside-fire incidents by 50 percent within 2 years, and WMATA also established time periods to complete its system-wide preventive maintenance initiatives. In addition, WMATA's Rail Services Department—which manages the track preventive maintenance program—among other things, holds a monthly “RailSTAT” meeting in which the teams leading the preventive maintenance initiatives report their progress toward these goals to WMATA's management.

However, WMATA's program does not fully align with other applicable internal-control standards or leading program-management practices. Specifically, COSO internal control standards and leading practices identified by the Project Management Institute's *The Standard for Program Management* stresses the importance of identifying and assessing program risks and developing a program management plan.

⁵⁶“Direct fixation” track primarily appears in tunnels and on bridges where the track is directly anchored to concrete rail ties. Miles referred to here are tracks going in both directions, which are known as “directional route miles.” Directional route miles measure the route path with regard to both directions of service.

⁵⁷Project Management Institute, Inc., *The Standard for Program Management - Fourth Edition* (2017).

Regarding risk assessments:

- COSO recommends that organizations identify risks to the achievement of its objectives and analyze risks as a basis for determining how the risks should be managed. Furthermore, the risk identification is to be comprehensive.⁵⁸
- *The Standard for Program Management* also recommends that when identifying risks, the assessments be both qualitative and quantitative in nature.⁵⁹

Regarding program management plans:

- *The Standard for Program Management* recommends that organizations develop program management plans that align with organizational goals and objectives. This includes aligning the program management plan with the organization's overall strategic plan. Elements of the plan are to provide a roadmap that identifies such things as milestones and decision points to guide program activities.⁶⁰

In developing the track preventive maintenance program, WMATA did not fully identify or quantitatively assess risks associated with the program. WMATA officials told us that in developing the track preventive maintenance program they used their professional judgment to identify track-defect and fire incidents as the most significant risks that they needed to address through the program. However, WMATA's risk identification was not comprehensive in nature, as it only considered two technical aspects of track maintenance: electrical fires and track defects. As previously mentioned, non-electrical fires—which were not included in the scope of the program or risk assessment—did not change from fiscal year 2017 through 2018 and represent approximately 30 percent of all fires on the system over those years. Although WMATA officials told us in designing the program they reviewed track-related incident data from 2016, they did not quantitatively analyze the impact of these incidents on service or safety. In addition, WMATA did not consider broader strategic risks to its program, such as the availability of a program's funding and

⁵⁸Committee of Sponsoring Organizations of the Treadway Commission, *Internal Control-Integrated Framework* (New York: American Institute of Certified Public Accountants, 2013).

⁵⁹Project Management Institute, Inc. (2017).

⁶⁰Project Management Institute, Inc. (2017).

stakeholders' support for the continuation of the program.⁶¹ Specifically, while WMATA has identified several challenges with implementing the program—such as securing sufficient track time, demonstrating work time productivity, and overcoming resource constraints—none of these factors, or potential mitigations, were documented in a risk assessment in developing the program.

WMATA has also not prepared a program management plan for the track preventive maintenance program. Although WMATA has identified program goals, officials told us that WMATA has not formally documented the overall structure of the program or how it would be implemented. Instead, the officials said the presentations they provide to WMATA's board of directors, along with their ongoing staff and executive team meetings, regarding the track preventive maintenance program cover the relevant information needed for running the program. While providing such information to the WMATA board of directors provides some accountability for the program, these presentations do not represent a formal program management plan that links with WMATA's strategic plan or that identifies milestones and decision points necessary to guide the program. As we previously reported, WMATA did not develop a project management plan before starting its SafeTrack work, and due to this omission and other issues, we found that WMATA lacked assurance that the approach taken with SafeTrack was the most effective way to identify and address safety issues.⁶² Furthermore, as this is the first time WMATA has implemented a track preventive maintenance program, a program management plan could help formally establish the program, provide strategic guidance for this new program by providing accountability for both internal and external stakeholders, and ensure that program goals are met. A program management plan could also provide practical benefits, such as helping ensure that WMATA's extended overnight work hours are efficiently implemented and that sufficient resources are devoted to the program.

⁶¹WMATA's Rail Services Department developed a business plan in which some of the offices within the department identified general risks to their activities. However, the information provided did not identify risks specific to the track preventive maintenance program.

⁶²GAO, *Washington Metropolitan Area Transit Authority: Improved Planning of Future Rehabilitation Projects Could Prevent Limitations Identified with SafeTrack*, [GAO-17-348](#) (Washington, D.C.: Mar. 14, 2017).

Without the strategic direction provided by a comprehensive risk assessment and a formal program management plan, WMATA lacks a documented vision for how the track preventive maintenance program should be structured and implemented in order to meet the agency's strategic goals and improve track safety. Specifically, without a risk assessment that uses quantitative and qualitative data to assess risks—such as data for all fires on the system and qualitative risks such as securing sufficient time for maintenance—WMATA lacks assurance that the program is comprehensively designed to address risks affecting the safety of the rail system or other risks that could hinder the program's success. Moreover, a program management plan that draws on information from a comprehensive risk assessment would provide WMATA officials with the assurance that they are prepared to respond to current and future challenges that could threaten the long-term viability of the program.

Finally, although WMATA developed the track preventive maintenance program to prevent the need for another emergency repair project like SafeTrack, without a formal program management plan, the WMATA employees charged with managing and implementing the program lack an important document to guide their decision-making to meet that objective and the agency's overall strategic objectives. Developing a program management plan would outline the specific requirements to successfully implement the program, including necessary track time, expected productivity of program initiatives, and required resources. Furthermore, it would provide WMATA's board of directors with confidence that the program has a clear roadmap with milestones and decision points as the board considers maintaining the extended overnight work hours necessary to implement the program.

Conclusions

WMATA's rail and bus systems provide nearly a million passenger trips each day, and those passengers rely on WMATA for safe and reliable public transportation in the nation's capital and the surrounding areas. The federal, state, and local jurisdictions that fund WMATA expect WMATA to wisely use taxpayer funds to ensure the system is safe and reliable. WMATA can better meet these expectations by establishing documented policies and procedures that outline how the new capital planning process will work and the basis of investment decisions. In addition, developing measures to assess the performance of individual projects and the capital planning process would provide greater assurance to WMATA's funding partners that its investment decisions result in a measurable improvement in operating performance, reliability,

or other metrics. Furthermore, WMATA's recent efforts to establish an Enterprise Asset Management Program, once finalized, could help WMATA develop a more complete inventory of its assets and collect critical information on their condition—both of which are consistent with sound capital planning. However, without a plan that provides specific details for obtaining this information, WMATA will continue to lack the critical asset information necessary to make lasting improvements in its capital planning process and make sound capital-investment decisions.

Similarly, track preventive maintenance plays a critical role as WMATA works to reduce the track defects and fires that have endangered safety and service reliability. WMATA could better demonstrate the direction of the track preventive maintenance program and how it can improve track safety by more comprehensively assessing the technical and broader risks facing the program and by developing a formal plan that provides greater assurance WMATA is prepared to address challenges that could threaten the long-term viability of the program. Both actions would help WMATA better focus the program on critical maintenance needs and demonstrate its value to WMATA's board of directors and other stakeholders as WMATA endeavors to provide safe, reliable, and quality service to its riders.

Recommendations for Executive Action

We are making the following five recommendations to WMATA.

- The General Manager of WMATA should establish documented policies and procedures for the new capital planning process. These policies and procedures should include methodologies for ranking and selecting capital projects for funding in WMATA's fiscal year 2020 capital budget and fiscal years 2020-2025 Capital Improvement Program and for future planning cycles. (Recommendation 1)
- The General Manager of WMATA should develop performance measures to be used for assessing capital investments and the capital planning process to determine if the investments and planning process have achieved their planned goals and objectives. (Recommendation 2)
- The General Manager of WMATA should develop a plan for obtaining complete information regarding WMATA's asset inventory and physical condition assessments, including assets related to track and structures. (Recommendation 3)
- The General Manager of WMATA should conduct a comprehensive risk assessment of the track preventive maintenance program that

includes both a quantitative and qualitative assessment of relevant program risks. In addition to considering technical program risks, WMATA should also consider broader program risks, such as the availability of funding for the program and stakeholders' support. (Recommendation 4)

- The General Manager of WMATA should prepare a formal program management plan for the track preventive maintenance program that aligns with WMATA's strategic plan, addresses how the program is linked to overall strategic goals and objectives, and includes program milestones and decision points. (Recommendation 5)

Agency Comments and Our Evaluation

We provided a draft of this report to WMATA and the Department of Transportation for review and comment. WMATA provided written comments, which are reprinted in appendix II, and technical comments, which we incorporated as appropriate in the report. The Department of Transportation provided technical comments, which we incorporated as appropriate.

WMATA concurred in part, or with the intent of four of the recommendations, and disagreed with a fifth. Specifically, regarding the first recommendation, which is

- that WMATA establish documented policies and procedures for the new capital planning process, and
- that the policies and procedures include methodologies for ranking and selecting capital projects for the fiscal year 2020 capital budget and fiscal year 2020—2025 capital-improvement program.

WMATA stated that it agreed with the recommendation, in part. WMATA said it will continue its efforts to finalize and document policies and procedures for the capital planning process for fiscal year 2021 and beyond. WMATA noted that it already has in place numerous planning tools, such as the 2016 Capital Needs Inventory assessment, which helped inform the fiscal year 2020 capital planning process. According to WMATA, it is currently reviewing policies, procedures, training materials, and other documents for the fiscal year 2020 planning process, and those documents will be updated and formalized through final documentation in fiscal year 2021. WMATA noted that it anticipates that many of the elements we recommend regarding the capital planning process will be part of the process documented in fiscal year 2021. For example,

WMATA expects that additional automation, decision-making, governance, and reporting capabilities, will be part of the process that will be documented for fiscal year 2021. However, while WMATA has tools available to inform the capital planning process, it has not prepared documented policies and procedures for this process in fiscal year 2020. As we reported, without documented policies and procedures, including those for ranking and selecting projects for the fiscal year 2020 capital budget, WMATA's stakeholders do not have reasonable assurance that capital investment decisions are made using a sound and transparent process. Taking action now to establish methodologies for ranking and selecting projects for the fiscal year 2020 capital budget would provide WMATA with an opportunity to improve upon those methodologies for the fiscal year 2021 capital planning process to better ensure investments are directed to WMATA's highest priority needs. As such, we continue to believe this recommendation is valid and that WMATA should fully implement it.

Regarding the second recommendation that WMATA develop performance measures for assessing capital investments and the capital planning process, WMATA stated that it agreed with the intent of the recommendation. WMATA also stated that it has developed such measures through compliance with federal requirements, including the FTA's performance-based planning requirements and the requirement under MAP-21 that tier I transit providers, such as WMATA, establish state-of-good-repair targets that are linked to the capital program. WMATA noted these targets are set forth in its Transit Asset Management Plan. Although WMATA's October 2018 Transit Asset Management plan includes some broad performance measures and targets for the state-of-good-repair for its various asset classes, as we reported, WMATA has not developed performance measures to assess individual capital projects or the capital planning process itself, as suggested by leading practices in the *Executive Guide*. As discussed in the report, such measures are important to determine if capital investments have achieved their expected benefits and if they have achieved organizational goals. Leading practices also indicate that by using a mixture of measures managers can assess performance based on a comprehensive view of the needs and objectives of an organization. These needs and objectives can go beyond just the state-of-good-repair to include such things as measures for assessing projects that would improve service reliability, expand capacity, or achieve financial objectives. We continue to believe that fully implementing this recommendation would help ensure that capital investments meet their

intended outcomes and that the capital planning process helps WMATA achieve its strategic goals and objectives.

Regarding the third recommendation that WMATA develop a plan for obtaining complete information about asset inventories and condition assessments, WMATA stated that it agreed with the intent of the recommendation and that its 2018 Transit Asset Management Plan outlines plans for continuing its asset inventory update. WMATA also said that it is working to ensure it has a complete asset inventory that addresses legacy information and that includes accurate, up-to-date condition assessments. As we reported, the Enterprise Asset Management Program—the program that WMATA told us it plans to use to continue development of asset inventories and condition assessments—includes some elements of good project management, but it also lacks an established plan for collecting asset inventory and condition assessment information. Without a plan to obtain asset inventory and condition assessment information WMATA will continue to lack critical information needed for good capital planning and sound investment decision-making. Thus, we continue to believe that this recommendation is valid and that WMATA should fully implement it.

Regarding the fourth recommendation that WMATA conduct a comprehensive risk assessment of the track preventive maintenance program that includes both quantitative and qualitative assessment of relevant program risks, WMATA stated that it agreed with the intent of the recommendation and is putting in place a new process that will address it. Specifically, WMATA stated it is in the process of developing a new Reliability Centered Maintenance process that will include a comprehensive risk assessment of track infrastructure that includes consideration of broader risks such as costs, funding, and track access. According to WMATA, the new process is an engineering framework that will define the maintenance regimen, including preventive maintenance, and improve safety, reliability, and cost-effectiveness. During our review, WMATA officials did not discuss the Reliability Centered Maintenance process in detail or provide documentation that allowed us to evaluate how this process might interface with the current track preventive maintenance program. As a result, we were not able to evaluate how it might address identification and assessment of risks associated with track preventive maintenance. As we reported, going forward track preventive maintenance will play a critical role as WMATA works to reduce track defects and fires. We will review WMATA's actions to conduct a comprehensive risk assessment as part of our routine recommendation follow-up process.

Regarding the fifth recommendation that WMATA prepare a formal program management plan for the track preventive maintenance program, WMATA stated that it disagreed with the recommendation. WMATA noted that specific technical details of the track preventive maintenance program are evolving as it better understands the most effective maintenance regime through implementation of the Reliability Centered Maintenance process. WMATA stated that it believes the framework of Reliability Centered Maintenance is better suited to the ongoing mission of physical asset management than traditional project and program management tools. According to WMATA, the purpose of Reliability Centered Maintenance is to ensure that all efforts are focused on the safety, reliability, and cost-effectiveness of assets through their lifecycle, which is more relevant and applicable to WMATA's strategic plan than any individual preventive maintenance program. As stated above, WMATA did not provide details about Reliability Centered Maintenance during our review so we are not able to evaluate this process in relation to the track preventive maintenance program. We will review WMATA's actions related to implementation of the Reliability Centered Maintenance process as part of our routine recommendation follow-up process. We continue to believe this recommendation is valid and that WMATA should fully implement it.

We will send copies of this report to appropriate congressional committees, the Secretary of Transportation, the Administrator of the Federal Transit Administration, and the General Manager of WMATA. In addition, we will make copies available to others upon request, and the report will be available at no charge on the GAO 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. GAO staff who made key contributions to this report are listed in appendix III.



Mark L. Goldstein
Director, Physical Infrastructure Issues

List of Requesters

The Honorable Steny H. Hoyer
House Majority Leader
House of Representatives

The Honorable Benjamin L. Cardin
United States Senate

The Honorable Tim Kaine
United States Senate

The Honorable Chris Van Hollen
United States Senate

The Honorable Mark R. Warner
United States Senate

The Honorable Don Beyer
House of Representatives

The Honorable Anthony Brown
House of Representatives

The Honorable Gerald E. Connolly
House of Representatives

The Honorable Eleanor Holmes Norton
House of Representatives

The Honorable Jamie Raskin
House of Representatives

The Honorable John Sarbanes
House of Representatives

Appendix I: Objectives, Scope and Methodology

This report examines: (1) How WMATA expended its capital funding from fiscal years 2011 through 2017; (2) How WMATA's new capital planning process addresses weaknesses it identified in the previous process; and (3) WMATA's progress toward its track preventive maintenance goals and how the program aligns with leading program management practices.

For each of our objectives we reviewed pertinent federal statutes and regulations as well as WMATA and FTA policies and documents. We also selected a non-generalizable sample of five similar U.S. transit agencies based on similarity to WMATA in transit route mileage, system use, capital spending, system age, and rail fleet age. We also factored geographical diversity into our selection process. We then interviewed the officials from these selected transit agencies using a standard set of questions to learn how they utilize their capital funds, conduct capital planning, and oversee maintenance; and then we compared their processes to WMATA. Transit route mileage, system use, capital spending, and rail fleet age were measured using data from FTA's National Transit Database. We measured system age according to data available within the American Public Transportation Association's *2017 Public Transportation Fact Book*, and geographical diversity was determined through data available from the U.S. Census Bureau. The transit agencies we selected were: (1) Bay Area Rapid Transit, Oakland, California; (2) Chicago Transit Authority, Chicago, Illinois; (3) Massachusetts Bay Transportation Authority, Boston, Massachusetts; (4) Metropolitan Atlanta Rapid Transit Authority, Atlanta, Georgia; and (5) Southeastern Pennsylvania Transportation Authority, Philadelphia, Pennsylvania.

To assess WMATA's capital spending from 2011 through 2017, we interviewed knowledgeable officials from WMATA and FTA and also reviewed WMATA annual budgets, fourth-quarter and year-end financial reports, budget reconciliation reports, comprehensive annual financial reports, and FTA grant awards. We selected fiscal year 2011 because it was the first year in which WMATA received federal funding authorized by the Passenger Rail Investment and Improvement Act of 2008 (PRIIA), and we selected fiscal year 2017 because it was the most recent year

that capital expenditure data were available at the time of our review.¹ By analyzing this information we determined that the following sources provided the most comprehensive and reliable available data on each of the following topics for our report (see table 3):

Table 2: Data Sources Utilized by GAO to Analyze WMATA’s Capital Spending

Report Topic	Data source
WMATA’s annual capital budgets and spending information	WMATA’s fourth-quarter and year-end financial reports
WMATA’s annual capital funding from the federal government	FTA’s Transit Award Management System (TRAMS) grant award information
WMATA’s annual capital funding provided by Maryland, Virginia, the District of Columbia, and the other local jurisdictions within WMATA’s transit zone	WMATA’s budget reconciliation reports
WMATA’s short- and long-term debt used to finance certain expenses	WMATA’s comprehensive annual financial reports ^a

Source: GAO analysis of WMATA information. | GAO-19-202.

^aAlong with reviewing the comprehensive annual financial reports, we also provided WMATA with a questionnaire to help gather this information.

We collected the aforementioned data, analyzed them to identify errors or other anomalies, and interviewed officials to determine how the data are compiled and checked for accuracy. We determined that these data had some limitations, as an external audit report of WMATA financial information for fiscal year 2016 noted a material weakness with WMATA’s process for accounting acquisition costs of capital assets. Specifically, there were inconsistencies between WMATA’s general ledger and sub-ledger, which are used to record acquisition costs, depreciation, and other financial information related to capital assets. As a result, additional steps were required to reconcile the differences between the two sources and could have resulted in a material error. However, after interviewing WMATA officials about the weakness and assessing the available financial information, we determined that the data we used were

¹PRIIA, enacted in 2008, authorized \$1.5 billion to WMATA, available in increments over 10 years, or until expended, for capital improvements and preventive maintenance. These funds are appropriated to the Secretary of Transportation who is authorized to make grants to WMATA. Pub. L. No. 110-432, Div. B., § 601, 122 Stat. 4907, 4968 (Oct. 16, 2008). The first appropriation for this program was in fiscal year 2010, though WMATA did not receive the funds until fiscal year 2011. Fiscal year 2018 spending information was not available at the time of our audit work.

sufficiently reliable for our purpose of showing general trends of capital expenditures.²

Our analysis sought to depict how WMATA allocates and expends funds according to major asset categories within its capital-improvement plan. However, these asset categories only remained consistent from 2011 through 2015, and were revised during 2016 and 2017. However, we determined that each asset category consisted of Capital Improvement Projects that were each assigned a number. These projects and their corresponding numbers remained in existence from fiscal year 2011 through 2017, even though the asset categories were updated in fiscal year 2016. Tracking by Capital Improvement Project number provided a means to report consistently through that time period. Therefore, we used the asset categories from fiscal years 2011 through 2015 as our base reporting categories. These categories consisted of: (1) Vehicles/Vehicle Parts, (2) Rail System Infrastructure Rehabilitation, (3) Maintenance Facilities, (4) Systems and Technology, (5) Track and Structures, (6) Passenger Facilities, (7) Maintenance Equipment, (8) Other Facilities, and (9) Project Management and Support. We consolidated WMATA's nine asset categories into five asset categories in order to represent broader categories of investment: Rail and Bus Vehicle Fleet (Vehicle/Vehicle Parts), Fixed Rail Infrastructure (Rail System Infrastructure and Track and Structures), Maintenance Facilities and Equipment (Maintenance Facilities and Maintenance Equipment), Passenger and Other Facilities (Passenger Facilities and Other Facilities), and Business Systems and Project Management Support (Systems and Technology and Project Management and Support). We then reviewed WMATA's fiscal year 2016 Fourth Quarter Report, fiscal year 2017 Fourth Quarter Report, and fiscal year 2017 Budget Reconciliation Report to match each project number from those two years to their corresponding category from fiscal year 2011 through 2015.

To assess WMATA's new capital planning process and how it addresses weaknesses WMATA identified in the previous process, we interviewed WMATA officials about their capital planning process and reviewed WMATA documentation related to the capital planning process. This included Capital Needs Inventories, WMATA's policy for preparation of the 2010 and 2016 Capital Needs Inventories, annual capital budgets—to

²A material weakness is a deficiency, or combination of deficiencies, in internal control such that there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented or detected and corrected on a timely basis.

include capital improvement programs, and guidance documents issued by WMATA related to submitting projects for inclusion in the annual capital budget. We also reviewed the fiscal year 2018 business plan for WMATA's Capital Planning and Program Management Department. We also interviewed officials from the Metropolitan Washington Council of Governments, the American Public Transportation Association, and FTA to discuss WMATA's capital planning and budgeting processes. Furthermore, we compared WMATA's capital planning practices to leading practices identified in GAO's *Executive Guide*.³ The *Executive Guide* was used since it identifies leading practices for capital decision-making that are applicable to a wide variety of organizations, both public and private. For example, the *Executive Guide* developed leading capital planning practices by (1) identifying government and private sector organizations recognized for outstanding capital decision-making practices and (2) identifying and describing the leading capital decision-making practices implemented by these organizations. To identify leading practices for capital planning, we also reviewed Transit Cooperative Research Program Report 157.⁴ This report developed a framework for transit agencies to use when prioritizing the rehabilitation and replacement of capital assets and discusses leading practices in how to do this. We also identified project management principles from the Project Management Institute, Inc.⁵ Finally, we discussed capital planning with the peer transit agencies and prepared a summary of various aspects of capital planning in these agencies.

To examine progress toward goals in WMATA's track preventive maintenance program and how the program compares with leading

³GAO, *Executive Guide: Leading Practices in Capital Decision-Making*, [GAO/AIMD-99-32](#) (Washington, D.C.: Dec. 1998)

⁴Transit Cooperative Research Program, *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 Transit Cooperative Research Program was established in 1992 and serves as a forum for transit agencies to research issues of common concern to the transit industry. The Transit Cooperative Research Program is sponsored by FTA and undertakes research and other technical activities in response to the needs of transit service providers and issues synthesis of transit practice and other reports to end users.

⁵Project Management Institute, Inc., *A Guide to the Program Management Body of Knowledge, PMBOK® Guide*, Sixth Edition (2017). The Project Management Institute 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.

program management practices, we reviewed WMATA documentation about the program, interviewed WMATA officials, and analyzed track-defect data and electrical-wayside-fire data provided by WMATA for fiscal years 2016 through 2018—which were the only years detailed track defect and electrical fire incident data were available. In order to determine whether the data provided were sufficiently reliable, we checked the data for errors, conducted interviews with knowledgeable officials to learn their procedures for collecting and analyzing the data, and performed independent tests that included verifying WMATA’s final tally of track defect and fire incidents and verifying there were no extended periods of time where data was missing. We also provided a set of data reliability questions to determine whether procedures were sufficient. After performing these steps we determined that the data were sufficiently reliable for the purposes of our report.

In our interviews with WMATA, officials also described what goals they had created for the track preventive maintenance program, their progress in meeting those goals, and provided documentation to demonstrate their progress, which we reviewed. We also interviewed officials from the American Public Transportation Association and the American Railway Engineering and Maintenance-of-Way Association about best maintenance practices in the transit industry. We then compared WMATA’s track preventive maintenance program to leading program management practices identified by the Project Management Institute, Inc.’s *The Standard for Program Management*⁶ and internal control standards published by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).⁷ The Project Management Institute’s standards are utilized worldwide and provide guidance on how to manage various aspects of projects, programs, and portfolios. In particular, *The Standard for Program Management* provides guidance that is generally

⁶Project Management Institute, Inc., *The Standard for Program Management - Fourth Edition (2017)*©.

⁷Committee of Sponsoring Organizations of the Treadway commission, *Internal Control-Integrated Framework* (New York: American Institute of Certified Public Accountants, 2013). Internal control involves the plans, methods, policies, and procedures that an entity uses to fulfill its mission. 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.

recognized to support good program-management practices for most programs, most of the time.⁸

We conducted our work from November 2017 to January 2019 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.

⁸Project Management Institute, Inc., *The Standard for Program Management, Fourth Edition (2017)*®, 2.

Appendix II: Comments from the Washington Metropolitan Area Transit Authority

January 11, 2019



Mark Goldstein
Director, Physical Infrastructure Issues
U.S. Government Accountability Office
441 G Street, N.W.
Washington, DC 20548

RE: GAO-19-202

Dear Mr. Goldstein:

Thank you for the opportunity to respond to the Government Accountability Office (GAO) report entitled "Actions Needed to Strengthen Capital Planning and Track Preventive Maintenance Program" [GAO-19-202]. We commend the GAO for its professionalism during this review.

The report focuses on issues that are both important to the Authority and our stakeholders and timely in light of our new dedicated funding. We take seriously our responsibility to be good stewards of these funds and are proud of the progress we have made in recent years to improve safety, service reliability and financial management. Through improvements in our capital program management we have increased our investment rate from 65 percent in fiscal year (FY) 2015 to 99 percent in the FY2018. The achievements have included the replacement of original vintage railcars with 7000-series railcars and the upgrade of core infrastructure, track, switches and fasteners. A new rail preventative maintenance program was introduced, reducing infrastructure disruptions in half and rail fire incidents by nearly 40 percent in the past year. Customers have benefitted from improved station lighting and the introduction of Wi-Fi service in all underground stations and more than half of our tunnels are now wired for cellular service. The results of our improved capital and preventive maintenance programs indicate progress in the right direction, with Metrorail on-time performance reaching an all-time high in 2018 and customer satisfaction on the rise.

While we generally concur with the information presented in the report and the findings, the progress we have made and actions we have already taken to address several issues raised in the recommendations are not fully recognized in the report. Accordingly, we note the milestones and achievements in our capital management and preventive maintenance programs and processes below.

Capital Planning Management

As responsible stewards, we are prudently investing the capital funding we receive, including the federal and recently approved jurisdictional dedicated capital funds, to further address critical safety and reliability needs. Investment decisions are directly linked to our strategic needs and are informed by a wide variety of sources, such as published State of Good Repair targets, previously documented Capital Needs Inventory assessments, asset condition assessments, bus and rail fleet management plans, maintenance management

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schedules, and facilities plans. Due diligence is practiced in converting asset needs into projects with defined scopes, schedules, cost estimates, and deliverable milestones.

Building upon this progress, we are continuing to improve our processes, starting with enhancements, as noted in your report, initiated during the FY2020 capital planning process. With FY2020 as a foundation, we are adding additional capabilities for FY2021 and beyond. We anticipate that many of the elements recommended by GAO regarding the capital planning process, such as including additional automation, decision making, governance, and reporting capabilities, will be part of a refined process that will be documented for FY2021. Additionally, with a goal of continuous improvement, we expect to identify and implement procedure and policy revisions as we learn from implementation, administration, governance, and oversight experiences in FY2021 and future years.

In addition, we are implementing sound business practices that will provide a comprehensive and regularly updated inventory and condition assessment of our entire asset base. As noted in the report, WMATA, along with all transit agencies, recently embarked on a nationwide effort to increase the integrity, accuracy, and availability of asset inventory information and condition data, which is intended to support capital planning to maintain the system in a state of good repair. We have successfully met the new federal requirements under the Federal Transit Administration's (FTA) Transit Asset Management (TAM) rule thus far and will comply with requirements to update our inventory and condition assessment every four years. Further, we have already undertaken efforts to go beyond the scope of the TAM rule and are working to codify an Authority-wide Enterprise Asset Management system.

Recommendation 1: *The General Manager of WMATA should establish documented policies and procedures for the new capital planning process. These policies and procedures should include methodologies for ranking and selecting capital projects for funding in WMATA's fiscal year 2020 Capital Budget and fiscal years 2020-2025 Capital Improvement Program and for future planning cycles.*

We agree with this recommendation, in part, and will continue our efforts to finalize and document policies and procedures for our capital planning process for FY2021 and beyond.

As described earlier in this letter, we already have in place numerous planning tools which helped inform the FY2020 capital process. The FY2020 capital program is directly linked to documented strategic goals, asset conditions, and capital needs, all of which provide assurances that we are advancing capital investments and projects that address prioritized safety and reliability needs.

The policies, procedures, training materials, reporting, and administrative guidelines that guided capital program improvements for FY2020, which we shared with you, are currently being reviewed and will be updated and formalized through final documentation. All related policies and procedures, which we expect to be in effect for the FY2021 capital budget cycle and FY2021-2026 Capital Improvement Program and for future planning cycles, will be incorporated. We anticipate that

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final documentation for the new capital planning process will incorporate the following features and capabilities:

- o Transparent enterprise-wide capital planning process
- o Updated and consolidated capital asset inventory information
- o Performance measures to assess investments against baseline need as well as State of Good Repair targets
- o Linkage to documented strategic drivers to guide decision making
- o Rules by which candidate projects will be prioritized against documented need
- o Administration of the program
- o Enhanced project execution oversight and reporting
- o Consolidated, updated, and documented policies and procedures, trainings, and tactical material for project managers

We are available to walk-through the improvements and changes that are current and in process to enhance the capital planning process, as well as the steps that must be undertaken as part of the creation of final documentation and policy guidance. We look forward to working with you to ensure the GAO recommendations are fully addressed as the process is finalized.

Recommendation 2: *The General Manager of WMATA should develop performance measures to be used for assessing capital investments and the capital planning process to determine if they have achieved their planned goals and objectives.*

We agree with the intent of this recommendation and have accomplished this through compliance with federal requirements, including both the FTA's Performance-Based Planning requirements and the requirement under MAP-21 that WMATA, alongside other Tier I transit providers, establish State of Good Repair targets that are linked to its Capital Program. Federal guidance stipulates that the agency produce a program of projects that addresses the State of Good Repair targets that the agency sets forth in the TAM plan. In compliance with this rule, our targets are transmitted to our Metropolitan Planning Organization under the Performance Based Planning guidelines.

Recommendation 3: *The General Manager of WMATA should develop a plan for obtaining complete information regarding WMATA's asset inventories and physical condition assessments, including assets related to track and structures.*

We agree with the intent of this recommendation and accordingly, have submitted our 2018 Transit Asset Management plan, which outlines the Authority's plans for continuing its asset inventory update. We are working to ensure it has a complete asset inventory which addresses legacy information, data inaccuracies and includes accurate up to date condition assessments. Our goal is to incorporate an interactive process that allows continuous updating, onboarding, and decommissioning as assets evolve.

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Preventive Maintenance

Metro is working to keep the system in a State of Good Repair, which requires a combination of capital renewal and preventive maintenance to address our system's assets as a whole.

In 2016, the lesson learned from SafeTack was that in order to continue to deliver safe and reliable service and avoid a future SafeTrack-like effort, a strong preventive maintenance program along with an improved and expanded capital program was needed. As noted in the report, that year, six preventive maintenance programs were developed, targeting the top causes of delays, considering both incident severity and frequency. We are extremely pleased with the results we have achieved in such a short time. The combined focus on preventive maintenance and capital renewal has led to a significant decline in the number of track infrastructure incidents and the need for emergency work, as well as improvements in service reliability and customer on-time performance. For example, we experienced the lowest number of insulator-related smoke and fire incidents in 2018 that we have in years, despite having experienced record rainfall.

However, to take advantage of learnings and to continuously improve our maintenance practices, Reliability Centered Maintenance (RCM) processes are being implemented that will improve safety, reliability and cost-effectiveness. RCM is an engineering framework that defines the entire maintenance regiment, inclusive of condition monitoring, preventive maintenance, predictive maintenance techniques and planned capital renewal.

The investment in RCM will take considerable time as it represents a substantial shift to a more systematic approach that recognizes the interdependencies of many of our assets, but we have already made some progress. To date, a Reliability Centered Maintenance Planning (RCMP) group has been established within the Department of Rail Services, whose aim is to ensure that efficient and effective maintenance programs are defined for the whole system of rail assets, including both fixed infrastructure and rolling stock. This RCMP group helps to plan and schedule the maintenance of assets, as well as reports on the reliability and performance of the rail car fleet and supporting rail infrastructure. A Rail Infrastructure and Maintenance Engineering Department has also been established within the Department of Rail Services in order to create a functional organization that is tasked with all elements of maintaining the rail infrastructure system in a state of good repair. This new organization is responsible for driving RCM through the Maintenance of Way functions, including defining maintenance requirements, conducting work planning, and maintaining the rail infrastructure in a State of Good Repair.

Recommendation 4: The General Manager of WMATA should conduct a comprehensive risk assessment of the track preventive maintenance program that includes both a quantitative and qualitative assessment of relevant program risks. In addition to considering the technical program risks, WMATA should also consider broader risks, such as the availability of funding for the program and stakeholder support.

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We agree with the intent of this recommendation, which is best addressed through a Reliability Centered Maintenance process that we are already putting in place (as described above). RCM will include a comprehensive risk assessment of the track infrastructure, including broader risks of cost/funding and track access/downtime. However, it will take time to implement RCM across the Authority.

Recommendation 5: *The General Manager of WMATA should prepare a formal program management plan for the track preventive maintenance program that aligns with WMATA's strategic plan, addresses how the program is linked to overall strategic goals and objectives, and includes program milestones and decision points.*

We disagree with this recommendation. The specific technical details of the preventive maintenance program are evolving as we improve our understanding of the most effective maintenance regime for these assets through the implementation of RCM. The purpose of RCM is to ensure that all efforts are focused on the safety, reliability and cost-effectiveness of the assets through their life-cycle, which is more relevant and applicable to the Authority's strategic plan than any individual preventive maintenance program. We firmly believe that the framework of RCM is better suited to the ongoing mission of physical asset management than traditional project and program management tools.

The capital investments the Authority undertakes in the coming years will further improve the safety, reliability and fiscal sustainability of our system. Just as we are working hard to rebuild and maintain our physical assets, we are also diligently working to put into practice the policies and procedures called for in your report. We appreciate the opportunity to provide an overview of all the initiatives underway to address the report's recommendations and look forward to working with our partners and stakeholders to make further progress in the months and years ahead.

Sincerely,



Paul J. Wiedefeld
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), Richard Jorgenson (Analyst in Charge), Melissa Bodeau, Lacey Copping, Cory Gerlach, Erin Guinn-Villareal, Kirsten Lauber, Joshua Ormond, and Patrick Tierney made significant contributions to this report.

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