DISTRICT OF COLUMBIA OFFICE OF THE INSPECTOR GENERAL



DISTRICT DEPARTMENT OF TRANSPORTATION

Struggled to Manage Streetcar Construction Program and Could Not Adapt and Respond to Changes in the Project Scope, Schedule, and Budget

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DDOT Struggled to Manage Streetcar Construction Program Because it Could not Adapt and Respond to Changes in the Project Scope, Schedule, and Budget

WHY WE DID THIS AUDIT

During the formulation of the *Fiscal Year 2018 Audit and Inspection Plan,* the Office of the Inspector General (OIG) identified the Streetcar Program as a high-risk area due to significant scope, schedule, and budget variations from its original design.



The revival of the DC Streetcar Program began in the early 2000s with the goal of connecting neighborhoods in the District of Columbia. In October 2005, the District developed the *District of Columbia Transit Improvements Alternative Analysis* plan. The plan identified a 22-mile transit system with an estimated total cost of \$572 million.

We assessed the root causes of delays related to delivery of the currently operating Streetcar line and DDOT's 6-year capital budget plan for the Streetcar Program.

OBJECTIVES

1. Identify root causes of delays related to the delivery of the currently operating streetcar line.

2. Assess District Department of Transportation's 6-year capital budget plan for the Streetcar Program.

WHAT WE FOUND

The Streetcar Program experienced significant delays and cost variations during its implementation. Twenty-two miles were originally planned to be operational by 2021 at a cost of \$572 million. Thus far, the District has delivered 1 operational streetcar line – the 2.4 mile H Street/Benning Road Line from Union Station to Oklahoma Avenue. The H Street/Benning Road Line opened in February 2016, almost 4 years behind schedule, at a total cost of \$248 million.

DDOT project managers responsible for managing the streetcar projects did not have the technical expertise needed to oversee the design and build of the system. In June 2015, the American Public Transportation Association (APTA) released its peer review of the H Street Benning Road Corridor Streetcar Project. APTA found inadequate station marking and signage,

EXECUTIVE SUMMARY

possible noncompliance with the Americans with Disabilities Act, doors that scraped against the platform, incomplete safety assessments, and a lack of critical design components.

The Streetcar Program was delayed in becoming operational due to several factors. These factors included a lack of technical expertise, the struggle to maintain control of the project's scope, schedule, and budget, and DDOT staff turnover. The high rate of turnover in senior personnel resulted in decentralized and inconsistent program management, ineffective oversight of consultants, and incomplete contract documentation.

Besides the high turnover, a lack of project control systems¹ and project scheduling hindered DDOT's capacity to implement the streetcar projects within the scope, schedule and budget. Effective project control systems would have helped DDOT cope with management turnover and adapt to the changing goals of the program. More effective project scheduling would have allowed DDOT to monitor the project activity and milestones essential to maintaining control over the program.

DDOT worked on multiple streetcar projects simultaneously toward the goal of building a 22-mile system but did not track and manage each streetcar initiative, project, or segment individually. When the District government changed its priorities in FY 2015 to focus on completing the H Street/Benning Road Streetcar Line prior to any other lines, DDOT could not reconcile capital planning or spending to any specific streetcar line or project.

DDOT is implementing a 6-year capital improvement program that extends the current H Street/Benning Road Line. DDOT should take proactive measures, such as regularly updating the project management plan, maintaining required documentation, and enhancing internal controls to minimize variations in scope, schedule, and budget.

WHAT WE RECOMMEND

To better manage and document the implementation of the Streetcar Program, DDOT needs to update and follow the project management plan, track and maintain documentation of the contracts and scheduled deliverables, and better assess consultant performance. DDOT must also enhance its internal control structure to ensure oversight of contractors and maintain better documentation. The OIG made 15 recommendations for DDOT to improve overall project management functions.

EXECUTIVE SUMMARY

¹ DDOT's Project Management Plan states that the project control systems help DDOT proactively detect variations in scope, schedule, and budget.

GOVERNMENT OF THE DISTRICT OF COLUMBIA Office of the Inspector General

Inspector General



November 27, 2019

Jeff Marootian Director District Department of Transportation 55 M Street, S.E., Suite 400 Washington, D.C. 20003

Dear Director Marootian:

Enclosed is our final report, *DDOT Struggled to Manage Streetcar Program and Could not Adapt and Respond to Changes in the Project Scope, Schedule, and Budget* (OIG No. 18-1-01KA). We conducted this audit in accordance with generally accepted government auditing standards (GAGAS). Our audit objectives were to: (1) identify root causes of delays related to the delivery of the currently operating streetcar line; and (2) assess District Department of Transportation's 6-year capital budget plan for the Streetcar Program. The audit was included in our *Fiscal Year 2018 Audit and Inspection Plan*.

We provided District Department of Transportation (DDOT) with our draft report on September 18, 2019, and on November 16, 2019, , received DDOT's response, which is included in its entirety as Appendix D to this report. We appreciate that DDOT officials addressed some findings immediately upon notification during the audit.

In total, we made 15 Recommendations to DDOT for actions deemed necessary to correct the identified deficiencies. DDOT concurred with all recommendations except Recommendation 11. For Recommendations 1-10 and 12-15, DDOT actions taken and/or planned are responsive and meet the intent of the recommendations. Therefore, we consider these recommendations resolved but open pending evidence of stated actions. Although DDOT did not agree with Recommendation 11, DDOT's actions taken and/or planned are responsive and meet the intent of the recommendation. Therefore, we consider this recommendation resolved but open pending evidence this recommendation resolved but open pending evidence this recommendation resolved but open pending evidence that the cost of implementing this recommendation is higher than the benefit.

Director. Marootian DDOT's Streetcar Program Final Report OIG Project No. 18-1-01KA November 27, 2019 Page 2 of 3

We appreciate the cooperation and courtesies extended to our staff during this audit. If you have any questions concerning this report, please contact me or Benjamin Huddle, Assistant Inspector General for Audits, at (202) 727-2540.

Sincerely,

Daniel W. Lacas

Inspector General

DWL/tda

Enclosure

cc: See Distribution List

Director. Marootian DDOT's Streetcar Program Final Report OIG Project No. 18-1-01KA November 27, 2019 Page 3 of 3

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BACKGROUND

The revival of the DC Streetcar Program began in the early 2000s to connect neighborhoods in the District of Columbia. The District of Columbia and the Washington Metropolitan Area Transit Authority (WMATA) conducted a study during 2004 and 2005, *The District of Columbia Transit Alternatives Analysis (DCAA)*, commonly known as *DC's Transit Future*.² The purpose of the study was to define a network of efficient, accessible, high-quality surface transit options across the District. The DCAA plan identified transit service needs and the goals and objectives for transit by the year 2030. See Appendix C for a map of the system as originally planned.

The study also defined a streetcar system as a type of light rail normally powered by overhead wires on ordinary streets fitted with rails. Slightly smaller and slower than conventional light rail, streetcars typically serve as internal circulators in a city rather than as means for commuters to get to and from the suburbs. Streetcar stops are usually closer together than heavy rail stations, but farther apart than regular bus stops.³

In May 2007, the District Department of Transportation (DDOT) entered into a Memorandum of Agreement (MOA) with WMATA regarding the Anacostia Streetcar Project (Anacostia). DDOT asked WMATA to procure three streetcars for the Streetcar Program and to store and maintain the vehicles. In May 2007, WMATA purchased three streetcars for the Anacostia Streetcar Project.

In June 2007, the District's 6-year Capital Improvements Plan (CIP) FY 2008 – FY 2013, included a project "Light Rail System" under the WMATA Mass Transit Subsidies account. The CIP allocated \$19 million in funds to the Streetcar Program to cover design and construction activities for Anacostia, the purchase of five streetcars, and a study of the Anacostia II and H Street/Benning Road Line.

In February 2009, DDOT initiated construction of the initial segment of the Streetcar Program, which included construction of an approximately 1.25 mile segment of an at-grade⁴ streetcar system running generally along South Capitol, east of Malcolm X Boulevard, and continuing along Firth Sterling Avenue to the Anacostia Metro Station. DDOT projected an estimated completion date of March 2012.

In September 2009, DDOT assumed responsibility for implementing the Streetcar Project from WMATA.

² DIST. OF COLUMBIA AND WASHINGTON METRO. AREA TRANSIT AUTH., DISTRICT OF COLUMBIA TRANSIT IMPROVEMENTS ALTERNATIVES ANALYSIS FINAL REPORT (2005),

https://ddot.dc.gov/sites/default/files/dc/sites/ddot/publication/attachments/dcaa_final_report_10-28-05.pdf. ³ *Id.*

⁴ At-grade is the industry term for street level, or not underground or raised on a platform.

In September 2010, the District awarded a contract to HDR Engineering to perform program management, planning, operations, legal counsel, strategic & project communications, governance and management, and procurement to support the District's Streetcar Program.

The District's revised vision for a streetcar system was articulated in the April 2010 *Final Report* of the DC's Transit Future System Plan (2010 Plan). In 2012, DDOT identified a 22-mile "priority" streetcar network to be operational by 2021.

In June 2012, DDOT entered into a \$50 million contract with Dean Facchina LLC to design and construct the H Street/Benning Road Streetcar Line and to build an operational, maintenance, and storage facility for the fleet with a target completion date of fall 2013.

In March 2014, DDOT cancelled construction of the 1.25 mile initial segment of the Streetcar Program due to noncompliance with the National Environment Policy Act (NEPA).⁵

In February 2016, the District launched the 2.4-mile, H Street/Benning Road Streetcar Line, operationalized the facility, and put the streetcar vehicles purchased in 2008 into service for the first time.

Between FYs 2012 through 2017, DDOT worked simultaneously on multiple streetcar projects, in various stages, toward the goal of building a 22-mile system. Examples of these projects are:

- Operating and maintenance facility and storage yard for the H Street/ Benning Road Line, procurement of streetcars, and installation of the electrical and control infrastructure for each line. DDOT also relocated utilities and improved roadways, bridges, and sidewalks along the route.
- Professional work was also performed in other areas such as engineering, streetcar technical design, testing, and commissioning, rail system engineering, system integration, construction management, telecommunications, signal engineering and management, architectural design, environmental impact, safety, and security.

⁵ NEPA (42 U.S.C. § 4321) is a United States environmental law that promotes the enhancement of the environment.

• Planning and/or environmental documents were also produced for various proposed streetcar segments including the Anacostia Initial Line,⁶ Anacostia Extension,⁷ Benning Extension,⁸ Union Station to Georgetown,⁹ Southeast/Southwest Line,¹⁰ and North/South Study.¹¹

Audit Objectives

The objectives of this audit were to: (1) identify root causes of delays related to the delivery of the currently operating streetcar line; and (2) assess DDOT's 6-year capital budget plan for the Streetcar Program. The audit was included in the *OIG Fiscal Year 2018 Audit and Inspection Plan.*

https://www.dcstreetcar.com/planning/future-lines/union-station-to-georgetown/union-station-to-georgetown-project-library/ (last visited Jun. 11, 2019).

⁶ DIST. DEP'T OF TRANSP., *Anacostia Initial Line*, DCSTREETCAR, https://www.dcstreetcar.com/planning/future-lines/anacostia-initial-line/ (last visited Jun. 11, 2019).

⁷ DIST. DEP'T OF TRANSP., *Anacostia Extension Project Library*, DCSTREETCAR, https://www.dcstreetcar.com/planning/future-lines/anacostia-extension/anacostia-extension-project-library/ (last visited Jun. 11, 2019).

⁸ DIST. DEP'T OF TRANSP., Benning Road Extension Project Library, DCSTREETCAR,

https://www.dcstreetcar.com/planning/future-lines/benning-road-extension/project-library/ (last visited Jun. 11, 2019).

⁹ DIST. DEP'T OF TRANSP., Union Station to Georgetown Project Library, DCSTREETCAR,

¹⁰ DIST. DEP'T OF TRANSP., *Southeast/Southwest Extension Project Library*, DCSTREETCAR, https://www.dcstreetcar.com/planning/future-lines/m-street-sesw/southeastsouthwest-extension-project-library/ (last visited Jun, 11, 2019).

¹¹ DIST. DEP'T OF TRANSP., *North-South Corridor*, DCSTREETCAR, https://www.dcstreetcar.com/planning/future-lines/northsouth/ (last visited Jun. 11, 2019).

FINDINGS

DDOT STRUGGLED TO MANAGE STREETCAR PROGRAM BECAUSE DDOT COULD NOT ADAPT AND RESPOND TO CHANGES IN THE PROJECT SCOPE, SCHEDULE, AND BUDGET

DDOT did not assess, implement, and monitor the design and construction activities of the Streetcar Program, including tracking spending and milestones against the original streetcar plan to mitigate the risks for delayed implementation of and cost overruns in the program.

According to the U.S. Government Accountability Office's (GAO) *Standards for Internal Control in the Federal Government* (Green Book), "[m]anagement is directly responsible for all activities of an entity, including the design, implementation, and operating effectiveness of an entity's internal control system."¹² Developing a plan to evaluate, monitor, and control all aspects of the Streetcar Program would help ensure effective and efficient use of resources in reaching the Program's objectives.

The root causes of delays and cost overruns included a lack of technical expertise in streetcar operations at DDOT, high turnover among senior-level officials and ineffective project control systems. These factors also hindered DDOT's ability to accommodate additional engineering and construction requirements.

DDOT did not Successfully Implement the Streetcar System

The District's revised vision for a streetcar system was articulated in the April 2010 *Final Report* of the DC's Transit Future System Plan (2010 Plan). In 2012, DDOT identified a 22-mile "priority" streetcar network to be operational by 2021.

The 22-mile system included an East-West line from Benning Road Metrorail Station to the Georgetown waterfront, a North-South line from Takoma to Buzzard Point, and an Anacostia–Southwest Line connecting Joint Base Anacostia Bolling with the Wharf area via the 11th Street Bridge and M Street. Of the 22 miles originally planned, the District has delivered only the 2.4 mile, 8 stop, H Street/Benning Road Line from Union Station to Oklahoma Avenue.

According to DDOT's 2012 Project Management Plan (PMP), a project is a successful project when the project objectives are achieved within time, cost, and at the desired quality while utilizing the available resources effectively and efficiently.¹³ Implementation of the Streetcar Program was delayed and the project incurred cost overruns. We discussed the delays and cost overruns with DDOT officials who provided the following written explanation:

¹² U.S. GOV'T ACCOUNTABILITY OFF., GAO-14-704G, STANDARDS FOR INTERNAL CONTROL IN THE FEDERAL GOVERNMENT 12 (2014), https://www.gao.gov/assets/670/665712.pdf (last visited Jun. 11, 2019).

¹³ DIST. DEP'T OF TRANSP., DC STREETCAR PROJECT, PROJECT MANAGEMENT PLAN FOR H/BENNING AND ANACOSTIA INITIAL LINE SEGMENT 31 (Oct. 18, 2012).

Both internal and external factors contributed to the delays. These factors include, but [are] not limited to, changes in Mayoral administrations and, therefore, changes in project direction, changes in funding of the six-year capital improvement plan as adopted by the Mayor and Council, turnover in DDOT leadership and management, streetcar delivery delays, and changes in engineering and construction to accommodate new and additional requirements. Unfortunately, many of these changes were beyond the control of the DC Streetcar Program and program staff. Neither the PMP nor the risk management plan was able to qualitatively consider these factors because many were unique to DC.

Leading to the Fiscal Year (FY) 2015 budget formulation, DDOT worked on multiple streetcar projects in various stages simultaneously toward the goal of building a 22-mile system, which, according to the officials, contributed to the delays and cost overruns. To address DDOT's concerns of working on multiple projects simultaneously, the District changed streetcar funding and policy direction during the FY 2015 budget formulation and approval process. The entire Streetcar Program was scaled back to the 2.4 mile H Street/Benning Road Line and most of the on-going work associated with the 22-mile system was stopped, except for a 1.8-mile extension from Oklahoma Avenue to the Benning Road Metrorail Station. When measured against the PMP criteria for a successful project, the Streetcar Program did not reach expected outcomes as envisioned. DDOT did not use resources effectively and efficiently to ensure that the project objectives were met within the desired time, cost, and quality parameters.

DDOT did not Implement Project Control Systems to Manage Scope, Schedule, and Budget Variations

Project control systems provide a framework that allows management to assess changes in the schedules, costs, and requirements to maintain control over project delivery. According to the PMP, "project controls systems provide early detection of scope, schedule, and budget variations."¹⁴ These systems are essential to managing complex projects and efficiently using resources.

DDOT worked simultaneously on multiple streetcar projects in various stages toward the goal of building a 22-mile system; however, DDOT failed to segregate these projects individually for both planning and budget management. Only one capital project account was established in the capital budget for the entire Streetcar Program. This single project housed more than a decade of expenditures for the entire Program, which includes more than just the capital cost related to the 2.4-mile operational H Street/ Benning Road Line.

¹⁴DDOT's Project Management Plan states that the project control systems help DDOT proactively detect variations in scope, schedule, and budget.

For example, DDOT had budget authority of \$176 million for all streetcar projects for FY 2012. However, the project code did not specify the allotted amount for the H Street/Benning Road Line or other streetcar lines, and DDOT could not specifically account for how it spent the \$176 million. Table 1 summarizes the budget changes to the Streetcar Program for all 6 years in the Capital Improvement Plan (CIP).

Six year CIP	FY 2012 CIP (FY2012 - 2017)	FY 2013 CIP (FY2013- 2018)	FY 2014 CIP (FY2014- 2019)	FY 2015 CIP (FY2015- 2020)	FY 2016 CIP (FY2016- 2021)
Approved	\$176	\$339	\$543	\$721	\$565
budget authority					
(in Millions)					
Budget Change	\$134.2*	\$163**	\$204	\$178	(\$156)
* This is the difference	between supported	l hudget amount d	of \$41.8 million and 1	insupported budget	amount of \$176

Table 1: Streetcar Program	Budget Changes	for FYs 2012-2017
Tuble II Streetcul II ogium	Duager Changes	

* This is the difference between supported budget amount of \$41.8 million and unsupported budget amount of \$176 million.

** The subsequent differences were derived from the previous period's funding levels.

Source: District budget book.

DDOT could not reconcile capital planning or spending to any specific streetcar line or project. Based on our discussion with DDOT officials, we believe creating a master project and subprojects would be more effective to manage a complex project. This practice according to GAO, would allow the "[break] down [of] work into smaller elements . . . [which] allows program managers to identify more precisely which components are causing cost or schedule overruns and to more effectively mitigate overruns by manipulating their root cause."¹⁵ Such reconciliation could have helped DDOT compare actual performance to expected results throughout the streetcar program implementation and analyze significant differences.

We discussed the lack of reconciliation with DDOT officials who stated that the decision to use only one project code for all streetcar-related capital expenditures was made more than a decade ago and was approved annually through the budget formulation process by the executive and legislative branches. According to DDOT, DDOT used SA-306 as the project code for the entire Streetcar Program from FYs 2008 through 2018.

Although DDOT created no master project and subprojects for the Streetcar Program prior to FY 2018, DDOT has done so for FY 2018, consistent with best practices, but has yet to implement a project controls system.

¹⁵ U.S. Gov't Accountability Off., GAO-16-89G, Schedule Assessment Guide, Best Practices for Project Schedules 21 (2015).

We recommend that the DDOT Director:

- 1. Implement a project controls system to track budgets and costs variations as described in the 2012 project management plan.
- 2. Periodically update the project management plan for scope, schedule, and budget variations as the project progresses.

DDOT did not Develop a Project Schedule to Manage Project Delays

DDOT experienced significant delays in implementing the H Street/Benning Road Line. DDOT revised the delivery date several times – from March 2012 to the Summer/Fall 2013 and finally to February 2016. *GAO's Schedule Assessment Guide of Best Practices for Project Schedules* states that "the critical path method is used to derive the critical activities—that is, activities that cannot be delayed without delaying the end date of the program."¹⁶ Consistent with the GAO's best practices, DDOT planned to use the critical path method to manage the project schedule as reflected in the 2012 PMP, which states:

A comprehensive program of planning and scheduling will help control of the risk associated with the Project's time completion goals. The schedule will be developed using the Critical Path Method (CPM) with the ability to develop "what-if" scenarios due to potential changes. The schedule will communicate the work plan effectively by establishing activity definitions, duration, relationships and milestones that are essential to maintaining control.¹⁷

However, DDOT did not develop the project schedule as described in the 2012 PMP. Project scheduling would have allowed DDOT to establish project activity duration and milestones critical to maintaining control over project changes and delays. We discussed a lack of project scheduling with DDOT officials who acknowledged that many of the factors that contributed to delays were not included in the critical path method analysis, including policy and priority changes, problems working with the State Safety Oversight Office (SSO), and unexpected court and board decisions. Project scheduling would have helped DDOT manage the above factors and provided an effective audit trail.

We recommend that the DDOT Director:

3. Implement project scheduling to control the risk associated with Streetcar Program time completion goals as described in the program management plan.

¹⁶ *Id*. at 6.

¹⁷ DIST. DEP'T OF TRANSP., *supra* note 12, at 34.

DDOT did not Consistently Report Milestones to Manage Project Delays

Absent a project schedule, we reviewed the District's budget and financial plans to verify the project's milestones and progress made. As part of the District's budget formulation process, DDOT used a standardized Office of Chief Financial Officer template to transmit summarized information. The template requires that DDOT capture project description, justification, progress assessment, and projected vs. actual milestone data. However, the District's *Budget and Financial Plan*¹⁸ for FY 2012 – FY 2016 included incomplete project milestones for the Streetcar Program. For example, DDOT projected milestones for planned completion dates by project phases but did not report the actual completion dates consistently in any progress report from FY 2012-FY 2016.

DDOT also did not update the progress assessment for those fiscal years. Instead, DDOT inserted the following same sentence for each subsequent assessment: "DDOT is completing the H Street/Benning Phase through the electrification of the existing tracks, the construction of termini, and the construction of a maintenance facility."¹⁹ We discussed the incomplete milestone data and outdated progress assessments with a DDOT project manager who explained that DDOT provides input into the budget process but does not typically review the budget book itself before publication. Complete milestone data and updated progress assessments would have provided District officials timely information on variations in project scope, schedule, and budget. This information is necessary to make informed decisions when approving DDOT's budget request.

We recommend that the DDOT Director:

4. Ensure that the District's annual budget book reflects accurate and up-to-date project milestone data, and progress assessment information.

DDOT Lacked Technical Expertise to Manage the Invoice Process, and Design and Build of the Streetcar System

DDOT project managers lacked the expertise to review and approve invoices for payments. According to DDOT's invoice processing and payment standard operating procedures (SOP), "[i]f an invoice contains an error, no matter how small, or any part of the invoice is in dispute, it is rejected and returned to the contractor. Any of the approvers or reviewer can reject an invoice."²⁰ The following are examples of invoices the former project manager approved that should have been rejected but resulted in payments after and before DDOT's SOP was in place:

• Invoices valued at \$169,057 out of \$1,571,181 should have been rejected because the actual pay rates billed were higher than the contract rates, and two sub-contractors who received payments were not approved in the contract terms and conditions to perform tasks related to the project.

¹⁸ The District publishes *Capital Improvements Plan* for 6-years as part of its Budget and Financial Plan. ¹⁹ See e.g., GOV'T DIST. OF COLUMBIA, FY 2013 PROPOSED BUDGET AND FINANCIAL PLAN, VOL. 6 FY 2013 TO FY

²⁰¹⁸ CAPITAL IMPROVEMENTS PLAN KA0-38 (2012). ²⁰ DIST. DEP'T OF TRANSP., INVOICE PROCESSING AND PAYMENT, STANDARD OPERATING PROCEDURES 8 (2017).

- An invoice for \$141,474 should have been rejected because it did not have DDOT approvals. Per discussion with DDOT officials, several payments did not go through the invoice approval process as required.
- An invoice for \$110,950 should have been rejected because it was for non-billable, indirect costs according to the contract terms and conditions.
- Vendor payments totaling \$380,504 should have been rejected because they were invoiced against an expired task order. DDOT officials said the error occurred because of miscommunication between the DDOT contracting office and DDOT Streetcar Program officials.
- Invoices for 22 payments valued at \$26 million were approved by unauthorized officials and should have been rejected, based on DDOT's SOP.21

Failure to monitor and properly authorize Streetcar Program vendor payments resulted in misuse of funds and inaccurate payments, which contributed to cost overruns.

Besides lacking expertise to review and approve invoices for payments, DDOT lacked technical expertise necessary to manage the design and build of the streetcar system due to high turnover in senior-level personnel. DDOT had 7 directors, 5 chief engineers, 6 prime consultants, 4 associate directors (Transit), 4 deputy associate directors (Streetcar), dozens of DDOT task managers, 5 contracting officers, and 10 contracting officer technical representatives over the past decade. The high rate of turnover in senior personnel made it difficult to maintain consistency and continuity in program management and to retain managers with institutional knowledge needed to make informed decisions.

We recommend that the DDOT Director:

- 5. Develop additional controls to enforce policies and procedures for checking and verifying all streetcar-related invoices and to ensure the program manager issues and manages all task and purchase orders.
- 6. Ensure the streetcar program manager position requires practical experience and technical expertise on supervision, monitoring, and documenting Streetcar Program performance.
- 7. Improve the existing knowledge management system to capture key programmatic information, expertise, documentation, and the rationale for decisions.

DDOT's Organizational Structure did not Support Implementation of Streetcar Program Safety Requirements

The District of Columbia Fire & Emergency Medical Services Department (FEMS) serves as the State Safety Oversight (SSO) agency to comply with the Federal Transit Administration requirement that the District government establish a new and separate entity to provide safety

²¹ The OIG did not evaluate the validity of the invoices approved for payment by DDOT.

oversight of the Streetcar operation.²² According to DDOT, FEMS SSO staff had no experience in providing oversight for rail transit system safety. DDOT officials stated the SSO had to rely heavily on consultants for guidance on how to comply with rail transit system safety requirements. DDOT officials also stated the safety oversight process was challenging, laborious, time-consuming, and caused delays.

To ensure DDOT met rail transit system safety requirements for launching the H Street/Benning Road Line, DDOT engaged the American Public Transportation Association (APTA) in 2015 to conduct a peer review and make recommendations on DDOT's readiness. The APTA review found inadequate station markings and signage, potential noncompliance with the Americans with Disabilities Act, doors that scraped against the platform, incomplete safety assessments, and a lack of critical design components – such as heaters to keep track switches from freezing in cold weather.²³ APTA recommended substantial organizational changes, reevaluation of the reporting relationships within DDOT, and creation of a structure with a project manager or a direct hire who reports to the project manager who is a technical expert in streetcar operations.²⁴ To date DDOT has not implemented several APTA recommendations despite the February 2016, launch of the 2.4-mile, H Street/Benning Road Streetcar Line.

We recommend that the DDOT Director:

- 8. Establish a management structure with centralized authority over streetcar operation, maintenance, planning, design and construction, safety, security and management of contractors.
- 9. Streamline the State Safety Oversight process to ensure the program moves forward efficiently as the District expands the streetcar system.

DDOT Purchased Streetcar Vehicles Earlier than Needed

DDOT entered into an MOA in May 2007 with the Washington Metropolitan Area Transit Authority (WMATA) to purchase and store three streetcars prior to building the tracks and infrastructure. However, DDOT did not use these vehicles until safety testing in 2015. WMATA was responsible for inspecting the vehicles upon delivery from the vehicle manufacturer, and maintaining the vehicles while in storage. DDOT did not ensure that WMATA maintained the vehicles as agreed. WMATA was to "protect the [streetcars] from the elements by keeping them 'Tarp-stored'" according to the MOA.

The MOA states DDOT would pay WMATA \$144,286 to store the streetcars for 12 months. Our analysis of amendments to the MOA indicated that DDOT paid \$1.02 million for an additional 65 months of storage due to delays in construction of the streetcar tracks. DDOT did

²² Mayor's Order 2012-192, Designation of the D.C. Fire & Emergency Medical Services Department as the Official State Safety Oversight Agency for the D.C. Streetcar Project (Nov. 5, 2012). The Department of Energy and Environment (DOEE) will serve as the District's SSO upon approval from the Federal Transit Administration. D.C. Code § 8-151.08a (2017).

 ²³ AM. PUB. TRANSP. Ass'N, REPORT OF THE NORTH AMERICAN TRANSIT SERVICES ASSOCIATION PEER REVIEW
PANEL ON THE STREETCAR SERVICE READINESS PROVIDED AT THE CITY OF WASHINGTON, D.C. 6- 14(June 2015).
²⁴ Id.

not perform inspections or maintain documentation that WMATA protected the streetcars from elements prior to extending the storage period for 65 months. Nonetheless, according to a letter dated July 20, 2012, DDOT authorized WMATA to use \$1 million for repairs on three streetcars. DDOT did not maintain documentation indicating the repairs were made. DDOT stated that "extended exposure to the outdoor elements resulted in the streetcars having to undergo major upgrades and component replacements to meet federal and local safety laws, rules, and regulations."

In the absence of documentation or evidence, DDOT should make an assessment to determine whether WMATA's lack of protection and repairs contributed to the streetcars having to undergo major upgrades and component replacements.

We recommend that the DDOT Director:

- 10. Ensure that the next streetcar procurement is coordinated and managed based on Streetcar Program's needs, as determined by the construction progress of the next streetcar extension.
- 11. Determine what amount, if any, of the \$2.2 million the District can recoup from WMATA.

DDOT Hired a Contractor to Build an Operational, Maintenance, and Storage Facility Prior to Securing a Building Site

In 2012, DDOT planned and started construction of the operational, maintenance, and storage facility for the fleet, known as the DC Streetcar Car Barn (Car Barn), near the unoccupied Spingarn High School. After the District hired a contractor to begin construction, local residents of the Kingman Park Civic Association led an effort to designate Spingarn as an historic site. D.C. Historic Preservation Board (DHPB) deliberations regarding the historic site designation caused construction of the Car Barn to stop. After a prolonged negotiation, the original design was significantly changed to include additional non-streetcar features to meet the demand of all stakeholders, elected officials, and new DHPB requirements.

DDOT could have performed proactive community outreach to identify the barriers to constructing the Car Barn on the proposed site prior to engaging a contractor to design and build the Car Barn. To meet rigid safety and security requirements and to comply with federal rules and regulations during the delay, DDOT asked the contractor to first construct a temporary operating and maintenance facility on the ground of the future storage site. The temporary facility was demolished in June 2017 when the Car Barn became operational. The additional redesign and construction increased the cost and delayed the project. The original construction project had an estimated completion date of October 2014, with an estimated budget of \$11.8 million. The project was completed 3 years after the planned 2014 completion date and cost approximately \$40 million – a cost overrun of \$28.2 million.

We recommend that the DDOT Director:

- 12. Establish procedures to proactively identify the barriers to planned projects on proposed construction sites prior to hiring a contractor.
- 13. Establish procedures to ensure sufficient outreach to community stakeholders prior to beginning construction.

DDOT HAS AN OPPORTUNITY TO IMPROVE MANAGEMENT OF THE STREETCAR PROGRAM OVER THE NEXT 6 YEARS

DDOT can make operational changes to minimize the risk of cost overruns and project delays. DDOT has over \$146 million allocated to the Streetcar Program to extend the current system to the Benning Road Metro station by FY 2025. To limit uncontrolled variations of the scope, schedule, and budget for future streetcar projects, DDOT must improve oversight of all streetcar contractors and consultants and maintain complete project documentation. In addition, DDOT should consider all recommendations discussed in this report when making operational changes.

DDOT Must Improve Oversight of all Streetcar Contractors and Consultants

DDOT officials stated that they are in the procurement process for a Project Management Consultant (PMC) to provide management support for Streetcar Program activities. Because of past challenges, DDOT will need to determine how best to manage and assess the PMC's performance, and that of other consultants and contractors.

DDOT has no current project management plan, even as it is in the procurement process for a new PMC. The project management plan is important because it guides consultants and DDOT management through planning, design, construction, and professional work associated with streetcar procurement. The project management plan, along with other DC Streetcar documentation, serves as DDOT's formal process for managing the projects for the Streetcar Program. Per discussion with DDOT officials, the PMC in place was to provide a new project management plan in 2014 but did not deliver it to DDOT until 2016. To date, DDOT officials have not yet reviewed, used, or approved the 2016 project management plan.

We recommend that the DDOT Director:

14. Establish a management structure that defines established roles for the Project Management Consultant and allows for adequate District oversight of the contractor's work.

DDOT Must Maintain Complete Documentation

DDOT could not provide files for 3 of the 10 contracts related to the streetcar projects we selected for review. DDOT indicated that OCP is the repository for all contract files but acknowledged these contracts should also be available in DDOT's files. According to DDOT, prior to 2015, the PMC assisted DDOT in maintaining copies of contract files. Since then, DDOT has used multiple contractors to assist in maintaining copies of contract files, which made it difficult for DDOT to maintain control over contract file management. Without complete documentation, it is unclear how DDOT determined whether contracts complied with procurement laws and regulations.

We recommend that the DDOT Director:

15. Coordinate with OCP leadership to establish policies and procedures for the electronic storage and control of Streetcar Program contract documents.

CONCLUSION

The Streetcar Program experienced significant delays during its implementation. Of the 22 miles originally planned to be operational by 2021, the District has delivered 1 operational streetcar line – the 2.4 mile H Street/Benning Road Line from Union Station to Oklahoma Avenue. The H Street/Benning Road Line opened in February 2016 – almost 4 years behind schedule.

The root causes of these delays included a lack of technical expertise in streetcar operations at DDOT, high turnover among senior-level officials, and ineffective internal controls. Project managers maintained no system of internal controls that could have enabled them to proactively manage unexpected scope, schedule, and budget variations that hindered DDOT's ability to deliver streetcar lines timely and cost effectively.

DDOT must develop an oversight function with the expertise needed to monitor implementation of the Streetcar Program, including monitoring of contractors' performance, approving invoices, and safety compliance, to avoid further delays and cost overruns. DDOT must also manage project management consultant and contractor performance and maintain complete records to provide adequate oversight of the Streetcar Program.

RECOMMENDATIONS

We recommend DDOT:

- 1. Implement a project controls system to track budgets and costs variations as described in the 2012 project management plan.
- 2. Periodically update the project management plan for scope, schedule, and budget variations as the project progresses.
- 3. Implement project scheduling to control the risk associated with the Streetcar Program time completion goals as described in the project management plan.
- 4. Ensure that the District's annual budget book reflects accurate and up-to-date project milestone data, and progress assessment information.
- 5. Develop additional controls to enforce policies and procedures for checking and verifying all streetcar-related invoices and to ensure the program manager issues and manages all task and purchase orders.
- 6. Ensure the Streetcar program manager position requires practical experience and technical expertise on supervision, monitoring, and documenting Streetcar Program performance.
- 7. Improve the existing knowledge management system to capture key programmatic information, expertise, documentation, and the rationale for decisions.

- 8. Establish a management structure with centralized authority over streetcar operation, maintenance, planning, design and construction, safety, security and management of contractors.
- 9. Streamline the State Safety Oversight process to ensure that the program moves forward efficiently as the District expands the Streetcar system.
- 10. Ensure that the next streetcar procurement is coordinated and managed based on the Streetcar Program's needs and the construction progress of the next streetcar extension
- 11. Determine what amount, if any, of the \$2.2 million the District can recoup from WMATA.
- 12. Establish procedures to proactively identify the barriers to planned projects on proposed construction sites prior to hiring a contractor.
- 13. Establish procedures to ensure sufficient outreach to community stakeholders prior to beginning construction.
- 14. Establish a management structure that defines established roles for the Project Management Consultant and allows for adequate District oversight of the contractor's work.
- 15. Coordinate with OCP leadership to establish policies and procedures for the electronic storage and control of contract documents.

AGENCY RESPONSE AND OFFICE OF THE INSPECTOR GENERAL COMMENTS

We provided District Department of Transportation (DDOT) with our draft report on September 18, 2019, and on November 16, 2019, , received DDOT's response, which is included in its entirety as Appendix D to this report. We appreciate that DDOT officials addressed some findings immediately upon notification during the audit.

In total, we made 15 Recommendations to DDOT for actions deemed necessary to correct the identified deficiencies. DDOT concurred with all recommendations except Recommendation 11. For Recommendations 1-10 and 12-15, DDOT actions taken and/or planned are responsive and meet the intent of the recommendations. Therefore, we consider these recommendations resolved but open pending evidence of stated actions. Although DDOT did not agree with Recommendation 11, DDOT's actions taken and/or planned are responsive and meet the intent of the recommendation. Therefore, we consider this recommendation resolved but open pending evidence this recommendation resolved but open pending evidence this recommendation resolved but open pending evidence that the cost of implementing this recommendation is higher than the benefit.

APPENDIX A. OBJECTIVES, SCOPE, AND METHODOLOGY

We conducted our audit work from November 2018 to March 2019 in accordance with GAGAS. 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.

The objectives of the audit were to: (1) identify root causes of delays related to the delivery of the currently operating Streetcar line; and (2) assess DDOT's 6-year capital budget plan for the Streetcar Program. The audit was included in our *Fiscal Year 2018 Audit and Inspection Plan*.

To accomplish the audit objectives, we interviewed DDOT Streetcar Program management and officials from the Office of the Chief Financial Officer at DDOT responsible for preparing, reviewing, and recording the Streetcar Six-Year CIP. We also reviewed laws and regulations relating to the Streetcar Program and obtained the approved 6-year CIP allotments from FYs 2006-2018. We performed a comparative analysis to determine variances in budgeted amounts and interviewed budget officials to determine the reasons for the budget variances. We also obtained the budget plan for the next 6-years and assessed it against the project management plan.

We used the United States Government Accountability Office (GAO) *Standards for Internal Control in the Federal Government* (Green Book) as a guide to evaluate the design and implementation of DDOT's internal control system for ensuring the District successfully implemented the Streetcar Program. Besides the federal government, the GAO recommends that state, local, and quasi-governmental entities also use internal control standards.

Internal control is management's process to help achieve an agency's mission, goals, and objectives. Management develops, implements, and monitors internal control. Internal control includes plans, methods, policies, and procedures so an agency's operations are efficient and effective. Internal control reasonably assures that the agency achieves its objectives.

We analyzed the APTA 2015 Peer Review of the H Street Benning Road line. We reviewed the 2012 and 2016 project management plans and the 2010 System Plan to determine the milestones and plans for the projects. We identified Streetcar payments from FY 2006 to FY 2018 and performed a variance analysis of budgeted amounts to actual expenditures. We selected 45 vendor payments totaling \$47.6 million, or 22 percent from \$218 million in expenditures from 2009 to 2018, to determine whether DDOT spent Streetcar funding for intended purposes.

We reviewed documents that establish compliance with federal and local laws, required rules, regulations, standard operating procedures, manuals, guidebooks, and plans. To test compliance, we sampled 10 Streetcar contracts to determine whether DDOT maintained documentation for Streetcar Program contracts.

APPENDIX B. ACRONYMS AND ABBREVIATIONS

APTA	American Public Transportation Association
CBTC	Car Barn Training Center
CIP	Capital Improvements Plan
СРМ	Critical Path Method
DCMR	District of Columbia Municipal Regulations
DDOT	District of Columbia Department of Transportation
DHPB	D.C. Historic Preservation Board
FEMS	Fire & Emergency Medical Services Department
FY	Fiscal Year
GAO	U.S. Government Accountability Office
GAO OCP	U.S. Government Accountability Office Office of Contracting and Procurement
OCP	Office of Contracting and Procurement
OCP OIG	Office of Contracting and Procurement Office of the Inspector General
OCP OIG PMC	Office of Contracting and Procurement Office of the Inspector General Project Management Consultant



APPENDIX C. PROPOSED SYSTEM MAP





Target Date: Completed

OIG Recommendation 6. Ensure the streetcar program manager position requires practical experience and technical expertise on supervision, monitoring, and documenting Streetcar Program performance.

DDOT Response: Agree. The new Chief of Project Delivery who started at DDOT in September is working with the Transit Delivery Division to develop a staffing plan to meet the needs of the program to support streetcar operations.

Target Date: March 2020

OIG Recommendation 7. Improve the existing knowledge management system to capture key programmatic information, expertise, documentation, and the rationale for decisions.

DDOT Response: Agree. The new Chief of Project Delivery who started at DDOT in September is working with the Transit Delivery Division to develop a staffing plan to meet the needs of the program and support streetcar operations.

Target Date: March 2020

OIG Recommendation 8. Establish a management structure with centralized authority over streetcar operation, maintenance, planning, design and construction, safety, security and management of contractors.

DDOT Response: Agree. The new Chief of Project Delivery who started in September is working with the Transit Delivery Division to develop a staffing plan to meet the needs of the program and support streetcar operations.

Target Date: March 2020

OIG Recommendation 9. Streamline the State Safety Oversight process to ensure the program moves forward efficiently as the District expands the streetcar system.

DDOT Response: Agree. The SSO has relocated to the District Department of Energy and Environment (DOEE). The SSO reports to the Executive Office of the Mayor. While DDOT cannot dictate the decision-making process of the SSO, it will work with DOEE to ensure the process moves forward efficiently and effectively.

Target Date: January 2020

OIG Recommendation 10. Ensure that the next streetcar procurement is coordinated and managed based on Streetcar Program's needs, as determined by the construction progress of the next streetcar extension.

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DDOT Response: Agree. DDOT had a successful industry day several months ago whereby all the major streetcar manufacturers attended. Currently, DDOT is working on the technical specifications for the streetcars. There is funding in the six-year Capital Improvement Plan to purchase streetcars for the Benning extension.

Target Date: Proposed in the FY 2021-2026 CIP

OIG Recommendation 11. Determine what amount, if any, of the \$2.2 million the District can recoup from WMATA.

DDOT Response: Disagree. The MOU with WMATA expired in FY 2010. At this time, DDOT does not believe it would be cost efficient to pursue recouping funds from WMATA due to the amount of time that has passed and lack of records. It is also important to note that these streetcars are operational and in use since the opening of the H Street line.

Target Date: Completed

OIG Recommendation 12. Establish procedures to proactively identify the barriers to planned projects on proposed construction sites prior to hiring a contractor.

DDOT Response: Agree. The procedures to identify barriers to planned projects on proposed construction sites have been in place for years. As DDOT plans for the Benning extension, the new PMC will be responsible for identifying these barriers.

Target Date: May 2020

OIG Recommendation 13. Establish procedures to ensure sufficient outreach to community stakeholders prior to beginning construction.

DDOT Response: Agree. DDOT did provide the OIG outreach plans, marketing plans, and public campaign materials associated with the construction of the DC Streetcar Car Barn. DDOT has updated the 2019 Public Involvement Plan which can be found at https://ddot.dc.gov/page/public-involvement-plan. This plan serves two key purposes: (1) Identifies DDOT's requirements, processes, and tools for public involvement; and (2) serves as a manual for DDOT project managers. The DDOT PIP also provides:

- Legal requirements for public involvement
- Definitions of key stakeholders
- Outline of the project development process
- Methods to encourage accessible and inclusive public involvement
- A checklist for the development of a project public involvement plan

Target Date: Completed

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OIG Recommendation 14. Establish a management structure that defines established roles for the Project Management Consultant and allows for adequate District oversight of the contractor's work.

DDOT Response: Agree. The new Chief of Project Delivery who started in September is working with the Transit Delivery Division to develop a staffing plan to meet the needs of the program and support streetcar operations.

Target Date: March 2020

OIG Recommendation 15. Coordinate with OCP leadership to establish policies and procedures for the electronic storage and control of Streetcar Program contract documents.

DDOT Response: Agree. Since contracting and procurement for DDOT has been under the management of the Office of Contracting and Procurement (OCP) since March 2015, OCP is responsible for records retention.

Target Date: Completed. OCP has a records retention schedule - OCP Records Retention Schedule Document, October 1, 2018.

We appreciate the opportunity to work with the OIG staff on this audit. If you should have any additional questions, please do not hesitate to contact me.

Sincerely,

S. Lotton. J. Nonsotion

Jeff Marootian Director District Department of Transportation

CC: Dorinda Floyd, Chief Administrative Officer, DDOT Ellen Jones, Chief Project Delivery, DDOT Jeffrey Bennett, Transit Delivery Division Associate Director, DDOT Calvin Skinner, Agency Fiscal Officer, OCFO

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