AMTRAK
OFFICE of INSPECTOR GENERAL
NATIONAL RAILROAD PASSENGER CORPORATION

TRAIN OPERATIONS:
The Acela Express 2021 Program Faces Oversight Weaknesses and Schedule Risks

OIG-A-2018-002 | November 16, 2017

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Memorandum

To: Scot L. Naparstek
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DJ Stadtler
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Stephen Gardner
Executive Vice President / Chief Commercial Officer

From: Stephen Lord
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Date: November 16, 2017

Subject: *Train Operations: The Acela Express 2021 Program Faces Oversight Weaknesses and Schedule Risks* (OIG-A-2018-002)

In August 2016, Amtrak (the company) received a federal loan[1] to purchase 28 new high-speed trainsets for $1.6 billion and undertake 10 infrastructure improvements needed to operate and maintain these trains for $850 million. Collectively, these projects—called the Acela Express 2021 program—represent the company's largest single investment in its 46 years of service. The new equipment will replace the 20 Acela trainsets currently providing high-speed service on the Northeast Corridor, allowing the company to increase service frequency between Washington, D.C., and Boston, Massachusetts.

The Acela Express 2021 program is in the design stage. The trainset contractor, Alstom, is scheduled to deliver the first prototype in December 2019, and the new trainsets are scheduled to enter revenue service starting in January 2021. In addition, all 10 of the related infrastructure projects are in the design phase, and construction is scheduled from 2018 to 2021. Four of these projects must be completed before the new trains enter revenue service. They are aimed at improving the company's service and inspection

[1] This loan was provided through the Federal Railroad Administration's Railroad Rehabilitation and Improvement Financing Program, which provides direct federal loans and guarantees to finance railroad infrastructure development.

facilities (in Washington, D.C.; New York City; and Boston) and various trackside safety upgrades.

The trainset Project Management Office (trainset PMO) under the Chief Commercial Officer is responsible for procuring the trainsets.[2] Engineering, in the Operations department, is responsible for managing the 10 related infrastructure projects. The Enterprise Program Management Office (EPMO), in the Chief Administration Office, is responsible for overseeing the overall program—the trainsets and the 10 related infrastructure projects.

Given the company's past challenges in managing major acquisition programs[3] and the high-risk nature of this program, our audit objective is to assess the company's oversight of the program and identify potential risks, if any, to completing the program on time. This report will be our first in a series over the life of the program. To address this objective, we used guidance published by the company's EPMO and commonly accepted standards for project and program management.[4] For more details on our scope and methodology, see Appendix A.

SUMMARY OF RESULTS

As the largest single investment the company has ever made, the Acela Express 2021 program is a high-risk program. The company has taken important steps to help manage the Acela Express 2021 program and mitigate risks, such as putting a management structure in place and developing risk management tools to manage the trainset purchases. However, nearly a year into the program, it faces some significant oversight challenges and risks to completing the program on time. In particular, management oversight and risk management tools are only partially in place for the EPMO and 10 supporting infrastructure projects. In addition, Alstom and the company have not resolved a disagreement over a potential three-month delay in delivering the trainsets. The 10 infrastructure projects also face additional schedule risks because of

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[2] Prior to October 2017, the trainset PMO was part of the Marketing and Business Development department.

[3] Amtrak Office of Inspector General (OIG), *Top Management and Performance Challenges—Fiscal Years 2017 and 2018* (OIG-SP-2017-009), March 29, 2017.

[4] Project Management Institute, *Project Management Body of Knowledge (PMBOK Guide), 5th Edition*, 2013; Government Accountability Office (GAO), *Schedule Assessment Guide: Best Practices for Project Schedules* (GAO-16-89G), December 2015; and Amtrak's EPMO Program Management and Risk Management Standards.

the limited availability of company labor and projects managed by external stakeholders. Successfully addressing these challenges and risks in the next several months is critical to ensuring that the trainsets enter revenue service as planned in 2021.

We identified the following specific oversight weaknesses and schedule risks:

- **Oversight weaknesses.** In July 2017, the company designated the EPMO as the program lead but has not formally defined its duties and authorities to manage this program. In addition, the Engineering department has not staffed a team to manage the 10 supporting infrastructure projects. Moreover, the company has not implemented key risk management tools, such as a program-wide integrated master schedule, or a list of project risks and mitigation plans for the 10 related infrastructure projects to help ensure the trainsets enter revenue service on time.

- **Schedule risks.** The company also faces the following schedule risks:

    - *Trainset delivery schedule*. According to Alstom's monthly progress reports, the trainsets are 81 to 89 days behind their delivery schedule because of redesign work needed to meet U.S. crash protection standards. Trainset PMO officials believe that Alstom can recover from this delay, but Alstom officials stated that they have already mitigated it to the extent possible. The company is weighing its contractual options to remedy the schedule delay.

    - *Availability of Amtrak labor.* The Engineering department has not yet determined the number and type of agreement personnel it needs for the infrastructure projects, and some of these personnel are in high demand company-wide and may not be available when the projects begin. Engineering officials told us the department intends to use contractors to perform some work. Labor Relations officials told us they will be reviewing these plans with agreement personnel. However, it is unclear whether the necessary staff will be available to adhere to the projects' schedules.

    - *External factors.* Projects outside the program's control could affect key infrastructure projects. For example, improvements at Sunnyside Yard in New York City are critical for the trainsets to enter revenue service, but this project could be affected by the Metropolitan Transportation

Authority's (MTA) demolition of several facilities. However, Engineering has not reached final agreement with MTA about when their work will be completed, and the estimated completion date for the Sunnyside Yard improvements has already slipped from December 2019 to January 2021—the same month when the trainsets are scheduled to enter revenue service.

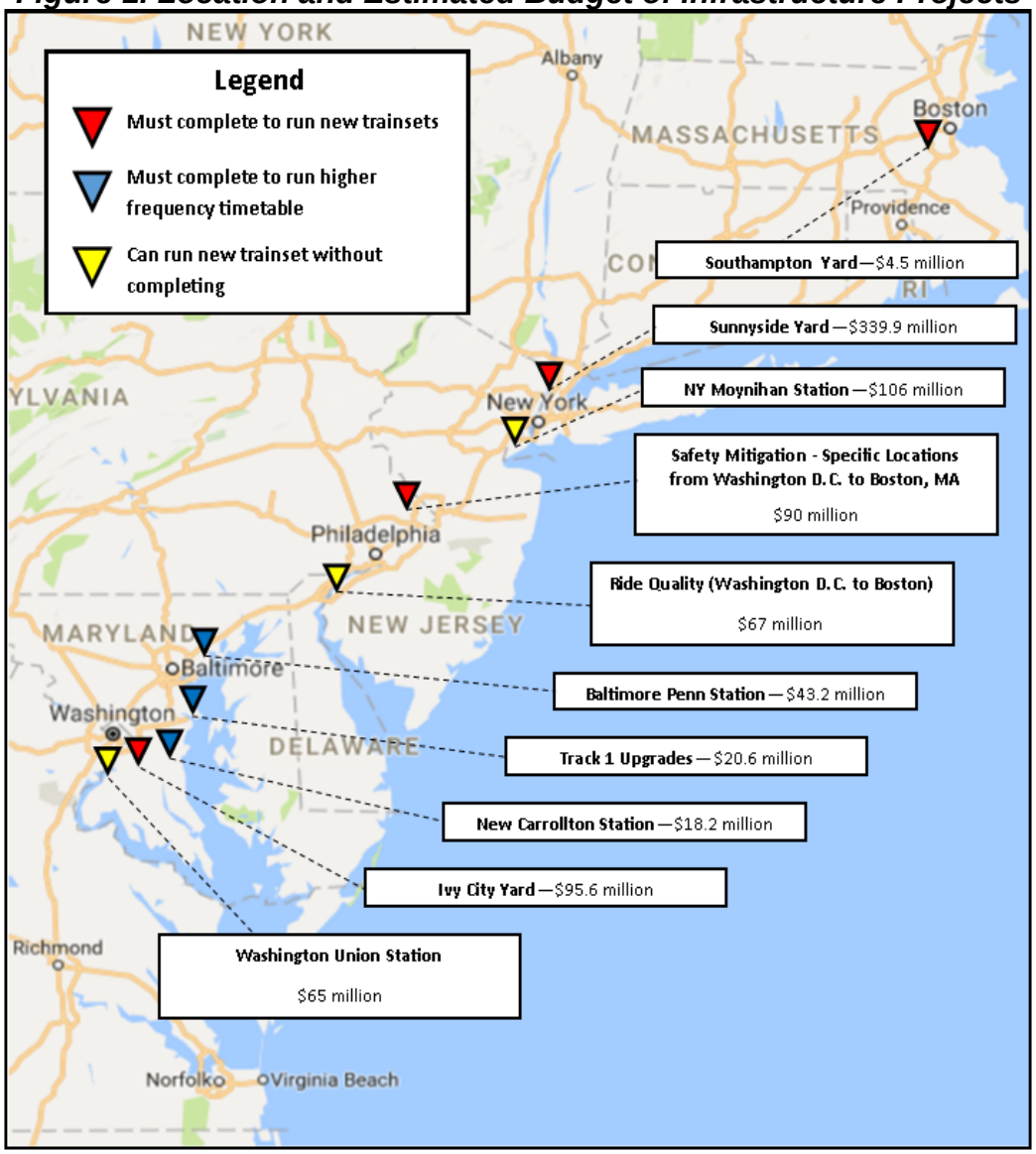
In commenting on a draft of this report, management agreed with all six of our recommendations and described planned corrective actions that, if fully implemented, will address the intent of these recommendations. The company included planned implementation dates for five recommendations but did not specify an implementation date for our recommendation to develop an integrated master schedule identifying the program's critical path.

BACKGROUND

In August 2016, the company received a federal loan to purchase 28 new high-speed trainsets for $1.6 billion and undertake 10 infrastructure improvements needed to operate and maintain these trains for $850 million. This loan was provided through a Federal Railroad Administration program—the Railroad Rehabilitation and Improvement Financing Program—which provides direct federal loans and guarantees to finance railroad infrastructure development. The first payment on this 23-year loan is due on or before June 15, 2021.

The infrastructure portion of the Acela Express 2021 program includes 10 improvement projects on the Northeast Corridor totaling $850 million. As shown in Figure 1, four of these projects must be completed to run the new trainsets, and two must be completed to run trains on the higher-frequency timetable. The other four projects do not need to be completed by 2021 to run the new trainsets.

Figure 1. Location and Estimated Budget of Infrastructure Projects



Source: OIG analysis of Engineering department documents

COMPANY HAS NOT FULLY ESTABLISHED KEY MANAGEMENT STRUCTURES AND TOOLS TO EFFECTIVELY MANAGE THE PROGRAM

The company has put a management structure in place and developed risk management tools to manage the trainset purchases, but it has not put the necessary structures and tools in place for the program as a whole or for the 10 related infrastructure projects, as shown in Table 1. Without these management structures and

tools, schedule delays could affect whether the trainsets enter revenue service on time starting in January 2021.

Table 1: Status of Program Management Structures and Risk Management Tools for the Acela Express 2021

In place  Partially in place  Not in place 

Management Structures and Risk Management Tools		Overall Program	Trainset Purchases	Infrastructure Projects[a]
Management Structures[b]	Management structures in place			
	Management team in place			
Risk Management Tools	Integrated master schedule or critical path[c] schedule developed			
	Risks identified and mitigation plans developed			

Source: OIG analysis based on EPMO Program Management and Risk Management Standards

Notes:
[a] The Infrastructure projects are made up of the ten individual Acela Express related engineering projects referenced throughout the report.
[b] We define *management structure* as having an organizational chart with clear roles and responsibilities, outlined in a program or project charter. We define *management team* as having individuals in place to manage projects.
[c] A *critical path* identifies the critical activities that cannot be delayed without delaying the end date of the program.

Company Has Designated EPMO as the Program Lead, But Has Not Defined its Authority

In July 2017, the company designated the EPMO as the program lead. However, it is unclear what authority the EPMO has over the trainset PMO and the infrastructure projects that the Engineering department is managing. In addition, the company has not implemented key risk management tools necessary to oversee the program.

- **Management structure.** The company has not formally defined the duties and authorities of the EPMO to manage the overall program. The company initially planned to establish a coordination committee to provide program oversight. However, the Vice President, Northeast Corridor Business Development, told us this committee was never established because of challenges associated with the company's 2017 reorganization. In July 2017, the Chief Executive Officer and Board of Directors directed the EPMO to assume responsibility for overseeing the Acela Express 2021 program, according to the Vice President, EPMO. However, these duties and authorities have not been defined in the program charter, leaving it unclear whether the EPMO has full authority over the trainset PMO and infrastructure projects. As we previously reported, establishing these authorities in the program charter can help avoid gaps in project accountability and management, and can help keep the program on schedule.[5]

- **Management team.** One year after the project's inception, the company is still in the process of establishing a team to oversee the overall program (trainsets and infrastructure projects). The Vice President, EPMO, hired a Director, Program Management Office, who began in September 2017.

- **Integrated master schedule.** The company has not finalized a program-wide integrated master schedule, in accordance to commonly accepted standards for project and program management.[6] Integrated master schedules are used to ensure that all program scheduling dependencies are identified, potential delays are mitigated, and activities are completed on time. The EPMO has developed a draft schedule that includes the critical path for the trainset purchase and is

[5] For example, we reported that the Gateway program's concrete tunnel—a project to preserve the right-of-way under the Hudson River—had a project management structure outlined in the charter that helped keep the project on schedule. See *Acquisition and Procurement: Gateway Program's Concrete Casing Project Progressing Well; Cost Increases Will Likely Exceed Project Budget* (OIG-A-2014-004), February 11, 2014.
[6] GAO-16-89G.

working with the Engineering department to build component schedules for the ten related infrastructure projects. Without a complete integrated master schedule, the company may not identify program dependencies to ensure that all activities are completed on time.

- **Risks and mitigation plans.** The company has not developed a list of program risks and mitigation plans and used them to develop an overall program risk profile as called for in the EPMO's risk management standards. Such tools—commonly called a risk register—are used to rank, monitor, and manage program risks. The Vice President, EPMO, stated that her office plans to develop a risk management template for all program components to use but that this process has not been completed. Subsequently, the new Director, Program Management Office is responsible for developing the overall program risk management template.

Until a program management structure is defined and the EPMO has the authority to make program- and project-level decisions on budget, schedule, and scope, the program will remain vulnerable to additional schedule delays and cost overruns.

Management Structure and Risk Management Tools for Trainset Purchases Are in Place

The trainset PMO established a management structure with clear lines of authority and accountability and with risk management tools for managing the trainset contract as follows:

- **Management structure.** In February 2016, six months before the trainset contract was signed, the company established a management structure for the trainset PMO. This structure included position descriptions and lines of authority for a project sponsor, trainset PMO Executive Project Director, Project Engineer, Project Risk and Scheduling Manager, Project Safety and Quality Manager, Budget Manager, Project Document Control Manager, Project Warranty Manager, Project Contract Manager, Project Legal Counsel, and administrative staff.

- **Management team**. The company has hired staff to fill the management structure for the trainset PMO. Specifically, the Executive Project Director of the

trainset PMO hired the 13 staff they identified are needed to manage the program.

- **Critical path schedule.** The trainset PMO, in coordination with Alstom, created a schedule that identifies critical path activities to ensure that the trainsets are delivered on time. The Senior Project Controls Manager in the EPMO reviews the schedule included in Alstom's monthly reports to identify any changes and impact on critical path activities.

- **Risks and mitigation plans.** Each of the teams developing the trainset specification created a risk register, which was incorporated into the Amtrak Business Case approved by the Board in 2013. The trainset PMO then created a comprehensive risk register to identify and mitigate risks. Using the EPMO guidance, this was converted to standards the EPMO created for all projects. As of June 2017, the register included 144 risks and plans to mitigate all of them. For example, the trainset PMO identified potential challenges in complying with the accessibility standards of the Americans with Disabilities Act (ADA). To mitigate this risk, the trainset PMO engaged with Alstom, the Federal Railroad Administration (FRA), and the ADA community during the design review process to ensure stakeholder buy-in and full compliance with ADA accessibility requirements.

Management Team and Risk Management Tools for Infrastructure Projects Are Not Fully in Place

The Engineering department has not fully staffed a management team or implemented the risk management tools necessary to manage the 10 related infrastructure projects. Thus, the company is vulnerable to schedule delays in addition to those the projects have already experienced, which we discuss later in this report. Because some of these schedule delays affect the four projects that must be completed before the new trainsets enter revenue service, the timely completion of the Acela Express 2021 program could be at risk.

- **Management structure.** In June 2017, the Engineering department established a management structure with 13 positions to manage the 10 Acela Express 2021 infrastructure projects: a director, a budget analyst, and eleven managers—five program managers, a project manager, and five construction managers.

- **Management team.** The Engineering department has appointed a director, filled three positions, three more positions are in the final stages of recruitment, and one position has been advertised and is anticipated to be filled by the end of 2017. The budget analyst position has been advertised and is expected to be filled in early 2018. A senior program manager of stations has been advertised and will be filled by the end of 2017. This senior program manager will evaluate the need and timing of the remaining four positions to manage the individual station projects. Nevertheless, until these management positions are filled, the 10 infrastructure projects will be vulnerable to potential schedule delays and cost overruns.

- **Critical path schedule.** The Engineering department has developed critical path schedules for Sunnyside Yard and Ivy City Yard, but the remaining projects have limited schedules that do not define in detail, all the activities necessary for completion, or the interrelationships among them. The department has not developed critical path schedules for the remaining eight infrastructure projects because it did not have the personnel resources in place to develop the schedules, or because the design for these projects is not advanced enough to develop a detailed schedule, according to the Deputy Chief Engineer and Director, Major Projects. However, without accurate critical path schedules for each project, the company may not be able to identify all scheduling risks and their programmatic impacts.

- **Risks and mitigation plans.** Engineering has not fully identified the risks or developed mitigation plans for any of the 10 infrastructure projects, contrary to the EPMO's risk management standards and commonly accepted standards in project management. These standards state that assessing scheduling risks and identifying mitigation strategies are essential to preventing schedule slippage that could impact the project's completion date. Engineering officials told us they have not used these tools because they have not put the necessary personnel resources in place to develop risk and mitigation plans. Nevertheless, our prior work[7] has shown a consistent pattern of weak project management in the Engineering department. Without a risk register for each of the 10 infrastructure projects, the company may not be able to analyze, monitor, and properly

[7] OIG-SP-2017-009

mitigate project risks, which could leave the company vulnerable to unanticipated schedule delays.

SCHEDULE RISKS COULD DELAY PROGRAM COMPLETION

The company faces risks to several projects that, if not mitigated, could prevent the new trainsets from entering revenue service on schedule.

Potential Delay in Delivery of Trainsets

The company is aware of a risk related to the trainset delivery schedule and is actively monitoring it. According to Alstom's monthly reports to the company, the trainsets are 81 to 89 days behind their delivery schedule. This reported delay occurred because Alstom misinterpreted the FRA's passenger equipment safety standards,[8] according to Alstom's Project Director. Alstom initially designed the new trainsets to meet a 20 mph crash energy management requirement—the standard Alstom met for its European customers—based on its interpretation of the FRA's standards. However, during the preliminary design review in October 2016, the company informed Alstom that the design must comply with the 25 mph crash energy management standard. To meet this higher standard, Alstom had to redesign and test components that link the power car and first and last passenger vehicles. The redesign work caused Alstom to change its production schedule, which delayed the trainset delivery schedule.

Trainset PMO officials told us they believe that Alstom has enough cushion in its production, testing, and delivery schedule to recover from this delay. However, Alstom officials stated that they have already mitigated the delays to the extent possible by reconfiguring the production schedule and cannot compress the schedule any further. Nevertheless, Alstom has not submitted a formal request to change the schedule, so the trainset PMO continues to hold Alstom to the original delivery date. To help mitigate potential production delays similar to those the company experienced on a procurement of new long-distance equipment,[9] the company is weighing its contractual

[8] In December 2016, FRA issued a Notice of Proposed Rulemaking, 49 C.F.R. §§ 236, 238, which outlined crash energy management standards.

[9] In 2010, the company contracted to purchase 130 single-level passenger cars with a delivery date of 2014. As of July 2017, the company had 77 of these cars. See *Asset Management: Additional Actions Can Help Reduce Significant Risks Associated with Long-Distance Passenger Car Procurement* (OIG-A-2016-003), February 1, 2016.

options for addressing this potential schedule delay, according to the Vice President, Northeast Corridor Business Development.

Potential Schedule Risks in Completing Infrastructure Projects

Several infrastructure projects are exposed to schedule risks because they depend on agreement personnel who are in high demand throughout the company. In addition, four projects—Sunnyside Yard and the improvements to the two stations and tracks in Maryland—rely on stakeholders outside the Acela Express 2021 program to complete projects. If the company does not take additional actions to mitigate these risks in the next several months, schedule delays could affect whether the trainsets enter revenue service on time.

Availability of Amtrak labor. The availability of some agreement personnel—such as those needed for safety and track work—is a risk for 8 of the 10 infrastructure projects. Currently, these resources are in high demand throughout the company. For example, Engineering department data show that system-wide demand for track personnel exceeds available personnel by 61 percent for fiscal year 2017. Engineering officials told us the department intends to use contractors to perform some work. Labor Relations officials told us they will be reviewing these plans with agreement personnel. However, as of August 2017, Engineering had not determined the number and type of agreement personnel who will be needed over the next three years for the eight projects; therefore, the department does not know how many contractors may be needed. According to the Director, Major Projects, the company plans to review two of the projects with Labor Relations by the end of 2017. However, it is unclear whether the company has the necessary staff available to adhere to the projects' schedules and if these and the other six projects are not completed on a timely basis, project construction could be delayed.

External schedule risks to Sunnyside Yard improvements. Improving Sunnyside Yard in New York City is the largest of the 10 infrastructure projects, accounting for about $340 million of all infrastructure costs (40 percent). The estimated completion date for the Sunnyside Yard improvements has already slipped from December 2019 to January 2021—the same month when the trainsets are expected to enter revenue service. This slippage occurred as designs matured. Additional delays could jeopardize the project's timely completion and prevent trains from entering revenue service on time.

This project is also exposed to additional schedule risks because some of the work involves stakeholders outside the company, and Engineering has not reached agreements with MTA about when work will be completed to avoid delays to the Acela Express 2021 program. For example, before the company can begin construction, MTA must demolish several buildings it owns in the yard because they are in the path of tracks used for storage. An Engineering official told us they are negotiating with MTA but have not agreed on the date when MTA will begin demolition. The Director, Major Projects, told us that if the facilities are not demolished by early summer 2018, construction of the new maintenance facility would be delayed.

External schedule risks to Maryland improvement projects. Improvements at the Baltimore and New Carrollton stations in Maryland and the track in between are expected to allow the company to increase the frequency of high-speed trains between Washington, D.C., and New York City. However, to achieve these benefits, the Engineering department must complete a project that is not part of the Acela Express 2021 infrastructure improvements—the renovation of an interlocking[10] south of the New Carrollton station. As of August 2017, the Engineering department had not developed a final project budget or schedule for the interlocking renovation. If this project is not completed before the new trainsets are delivered, the company will not be able to increase the frequency of trains in the timeframes as planned.

CONCLUSIONS

The company has taken important steps to help manage the Acela Express 2021 program and mitigate risks but still faces key oversight challenges and potential risks to completing the program on time. In particular, the authorities of the various offices involved in this project have yet to be defined and the management oversight and risk management tools are only partially in place for the 10 related infrastructure improvement projects being built to accommodate the new trainsets. Specifically, the 10 infrastructure projects face risks associated with the availability of agreement personnel, with the use of contractors, and with projects managed by external stakeholders. Addressing these challenges and risks successfully in the next several months is critical to ensuring that the trainsets enter revenue service as planned in 2021.

[10] An interlocking allows trains to move from one track to another.

RECOMMENDATIONS

To ensure effective program oversight and help mitigate schedule risks so that the Acela Express 2021 program is completed on time and trains enter revenue service as planned, we recommend that:

1. The Executive Vice Presidents, Administration, Business Development, and Marketing and Operations clarify authorities by defining in the program charter the authority of the EPMO, the trainset PMO, and the Engineering department to make program- and project-level decisions on budget, schedule, and scope.

2. The Executive Vice President, Chief Administration Officer, direct the Vice President, Enterprise Program Management, to develop an integrated master schedule that identifies the program's critical path, as well as a program risk register and risk mitigation plans.

3. The Executive Vice President, Chief Operating Officer, direct the Chief Engineer to take the following steps:

    a. Take timely action to staff a team to manage the 10 infrastructure projects.
    b. Determine the number of agreement personnel and contractors required to complete the infrastructure projects in time to avoid program delays.
    c. Review plans to use contractors with agreement personnel as necessary.
    d. Reach agreement with external stakeholders on schedules for projects they manage to mitigate potential program delays.

MANAGEMENT COMMENTS AND OIG ANALYSIS

Amtrak's Executive Vice President / Chief Operating Officer, Executive Vice President / Chief Administration Officer, and Executive Vice President / Chief Commercial Officer provided comments on a draft of this report on November 3, 2017. These officials agreed with all six of our recommendations and identified planned actions that addressed the intent of our recommendations. They also included implementation dates for all but one recommendation. The company's planned actions are summarized below.

- **Recommendation 1:** Management agreed with our recommendation to clarify authorities by defining in a program charter the authority of the EPMO, the

trainset PMO, and the Engineering department to make program- and project-level decisions on budget, schedule, and scope. The company stated that the Director of the newly created Program Management Office within EPMO is drafting a program charter that will formally establish the authority and work responsibilities for all internal stakeholders. The Director expects to complete the charter by November 30, 2017.

- **Recommendation 2:** Management agreed with our recommendation to develop an integrated master schedule that identifies the program's critical path, as well as a program risk register and risk mitigation plans. With regards to an integrated schedule, the EPMO completed an analysis of the baseline schedule for the trainsets as well as the Engineering schedule. Management stated that it plans to combine these schedules to create an integrated master schedule but did not specify a date for completion. Such a schedule should be completed in a timely manner to help focus management attention on the activities critical to the success of the program and help ensure the program is completed on time and within budget. With regard to the risk registers and mitigation plans, the company expects to have a risk register by March 31, 2018 and develop a full project management plan that will address risk mitigation later in 2018.

- **Recommendation 3a:** Management agreed with our recommendation that the company take timely action to staff a team to manage the ten infrastructure projects. Of the 13 positions identified as necessary to manage the projects, three have been filled, three are in the final stages of recruitment, and one will be filled by the end of 2017. These hires will fill all positions necessary for executing six projects that do not involve stations. The company plans to fill one financial manager position by early 2018 and one senior program manager position by the end of 2017. Once hired, the program manager will determine how best to fill the remaining four positions with managers for individual station projects.

- **Recommendation 3b:** Management agreed with our recommendation to determine how many agreement personnel will be necessary to complete the infrastructure projects in time to avoid program delays. The Engineering department plans to determine how many and when personnel are required for each project throughout the design process. The department intends to provide this information to a recently created Engineering workforce planning group that will allocate the workforce to the company's highest priorities. After accounting for these priorities, the remaining Engineering forces will be available for

improvement projects such as those supporting the Acela Express 2021 program. The company plans to have Engineering workforce allocation plans and schedules for all its projects, including the Acela Express 2021 program, by June 30, 2018.

- **Recommendation 3c:** Management agreed with our recommendation to discuss plans to use contractors, if necessary, with agreement personnel. The company has initiated talks with agreement personnel to use contractors for some of the track and electric traction work at the Sunnyside Yard and Ivy City Yard. For other projects, the company plans to initiate such talks either after completing 60 percent of the design phase or when the system-wide workforce planning effort shows that the company does not have adequate agreement personnel to complete the work.

- **Recommendation 3d**: Management agreed with our recommendation to reach agreement with external stakeholders on schedules for the projects these stakeholders manage to mitigate potential program delays. The company has been negotiating with MTA for the demolition of buildings in Sunnyside Yard and intends to reach an agreement by November 10, 2017. This agreement would require MTA to start work on December 1, 2017 and complete it by June 1, 2018. In addition, the company noted that construction is underway for the Hanson Interlocking project, and work is scheduled to be completed by October 30, 2020.

Management also provided technical comments that we have incorporated in this report as appropriate. For management's complete response, see Appendix B.

APPENDIX A

Scope and Methodology

This report provides the results of our audit of the company's oversight and potential risks of the Acela Express 2021 program. Our audit objective was to assess the company's oversight of the program and identify potential risks, if any, to completing the program on time. The scope of our work focused on oversight weaknesses and risks to the Acela Express 2021 program. We performed our audit work from November 2016 through September 2017 at company locations in New Carrollton and Baltimore, Maryland; New York City; Philadelphia, Pennsylvania; and Washington, D.C.

To assess the company's oversight, we reviewed EPMO policies and standards, as well as other commonly accepted standards in program- and project-management. We then compared these standards to the oversight structures and tools in place by program-level management, by the trainset PMO, and the Engineering Department to identify weaknesses that could impact program delivery. We interviewed the Vice President, EPMO and the Vice President, Northeast Corridor Business Development. We also interviewed relevant officials from the FRA and observed two quarterly program coordination meetings.

To identify schedule risks for the trainset, we reviewed the Alstom's monthly reports from January through June 2017. We interviewed the Executive Project Director, trainset PMO and Alstom's Project Director and Project Engineer.

To identify schedule risks for the infrastructure projects, we reviewed and assessed project charters and related design submissions, and interviewed project managers. We interviewed the former and current Chief Engineer; the Deputy Chief Engineer, Major Projects; and various project managers. In addition, we conducted field visits to four of the infrastructure project locations: Ivy City Yard, Sunnyside Yard, Baltimore Penn Station, and New Carrollton Station. We also interviewed the Chief Labor Relations Officer to better understand labor policies and procedures for using contractors.

We conducted this performance audit 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.

Internal Controls

Our review considered the extent to which the company used its internal control framework to assess if departments implemented controls designed to specifically mitigate risks associated with managing a major procurement and infrastructure projects. We did not conduct an independent review of company controls.

Computer-Processed Data

Our analyses and findings did not rely on computer-generated data from any company information systems.

Prior Audit Reports

We identified and reviewed the following reports by our office and the Government Accountability Office as relevant to this review:

Amtrak OIG:

- *Top Management and Performance Challenges—Fiscal Years 2017 and 2018,* (OIG-SP-2017-009), March 29, 2017
- *Asset Management: Additional Actions Can Help Reduce Significant Risks Associated with Long-Distance Passenger Car Procurement,* (OIG-A-2016-003), February 1, 2016
- *Acquisition and Procurement: New Jersey High-Speed Rail Improvement Program Has Cost and Schedule Risks,* (OIG-A-2015-012), June 17, 2015
- *Governance: Improved Policies, Practices, and Training Can Enhance Capital Project Management,* (OIG-A-2014-009), July 15, 2014
- *Acquisition and Procurement: Closer Alignment with Best Practices Can Improve Effectiveness,* (OIG-A-2014-006), July 7, 2014
- *Asset Management: Amtrak Followed Sound Practices in Developing a Preliminary Business Case for Procuring Next-Generation High-Speed Trainsets and Could Enhance its Final Case with Further Analysis Sound Practices Followed for Next-Gen Business Case,* (OIG-E-2014-007), May 29, 2014

- *Acquisitions and Procurement: Gateway Program's Concrete Casing Project Progressing Well; Cost Will Likely Exceed Project Budget,* (OIG-A-2014-004), February 11, 2014

GAO:

- *GAO Schedule Assessment Guide: Best Practices for Project Schedules* (GAO-16-89G), December 2015
- *GAO Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs* (GAO-09-3SP), March 2009

APPENDIX B

Management Comments

NATIONAL RAILROAD PASSENGER CORPORATION

Memo

AMTRAK

Date	*November 3, 2017*	From	Scot L. Naparstek EVP, Chief Operating Officer Donald A. Stadtler EVP, Chief Administration Officer Stephen J. Gardner EVP, Chief Commercial Officer
To	Stephen Lord Assistant Inspector General, Audits	Department	*Operations, Administration and Commercial.*
		cc	Eleanor D. Acheson Mark Yachmetz Sarina Arcari Gerhard Williams Mark Benedict

Subject *Train Operations: The Acela Express 2021 Program Faces Oversight Weaknesses and Schedule Risks* (Draft Audit Report for Project No. 002-2017)

The relaunch of Amtrak's Acela Express service in 2021 (AE 2021) is one of the most important and complex initiatives being undertaken by Amtrak. It will define the future of Amtrak's most lucrative line of business for a generation and its successful delivery will literally involve all of Amtrak's departments. Management agrees with the general thrust of the OIG's report that the challenge of successfully delivering AE 2021 requires a management structure that assures the coordination and delivery of the many AE 2021 project elements consistent with scope, schedule and budget.

AE 2021 is also occurring during the maturation of Amtrak's approach to project management led by the Enterprise Project Management Office (EPMO), which is bringing best management practices to Amtrak. The EPMO has proposed and the Executive Leadership Team has accepted an approach to the management of this comprehensive program. This approach represents an evolution in Amtrak's ability to manage complex programs like AE 2021, and aligns with the OIG's three recommendations.

Amtrak undertook a reorganization subsequent to the OIG providing this report for management's review. With regard to the substance of the subject report and this response, the only relevant change currently is that the Northeast Corridor Business Development function, including the Trainset Project Management Office, has been transferred from the Marketing and Business Development Department to a new Commercial Department reporting to the Executive Vice President and new Chief Commercial Officer previously responsible for the Planning, Technology and Public Affairs Department. That change does

not impact upon the following response to the draft OIG report. As Management makes any further updates to the Corporation's organization in the coming months, we will inform your office.

Recommendation 1:
The Executive Vice Presidents, Administration, Business Development, and Marketing and Operations clarify authorities by defining in the program charter the authority of the EPMO, the trainset PMO, and the Engineering department to make program- and project-level decisions on budget, schedule, and scope.

Management Response/Action Plan:
Management agrees with the OIG's recommendation. While the Trainset PMO, Engineering PMO, and Enterprise Program Management Office (EPMO) are already operating with authority, Amtrak agrees that program leadership authority could be further clarified in the enterprise program charter. The management of AE 2021 is a cooperative effort of the Vice President for Northeast Corridor Business Development (VP NECBD) and the EPMO. The key parts of the management structure currently in place are discussed below and Management will convey any further updates to this structure that stem from changes in the Corporation's organization in the coming months.

The Executive Program Sponsor is responsible and accountable to the Executive Leadership Team for the successful delivery of the AE 2021 program. The Executive Program Sponsor, consistent with delegations of authority, makes decisions or recommends to more senior levels of Amtrak management (e.g. the CEO or the Board) program and project level decisions on budget, schedule and scope for all elements of the AE 2021 Program based upon recommendations from change control boards established for the AE 2021 Program as a whole and for the trainset contract and the Technical Support and Spares Agreement (TSSSA). The Executive Program Sponsor for AE 2021 is the Vice President for Northeast Corridor Business Development.

A dedicated Program Management Office (AE 2021 PMO) has been established at the enterprise level to support the Executive Program Sponsor through providing leadership for the delivery of the AE 2021 Program elements and ensuring their integration. The AE 2021 Program Management Office team has three Key Objectives:

- On-time fulfillment of all deliverables required across the enterprise for successful AE 2021 operations on or about January 2021.
- On-time fulfillment of all deliverables required across the enterprise for successful continued trainset launches through mid-2022 (or as further defined by Amtrak's commissioning strategy)
- Fulfillment of all enterprise program success criteria.

The AE 2021 Program Management Office team is led by the Director, Program Management Office – AE 2021 and supported by an additional Program Manager, two Project Managers, and a Senior Business Analyst. The Director and Senior Business Analyst are currently in place. The three remaining positions are in the final phases of the selection process, with an expectation they will be hired and become part of the team in Q1 FY'18.

The Director, Program Management Office – AE 2021 was hired in September, and is currently drafting the Program Charter that will formally qualify authority and work stream responsibilities for all stakeholders. The Director, Program Management Office – AE 2021 will lead the AE 2021 Program

Leadership Team, which will be sponsored by the Vice President NEC Business Development and will include the Senior Director of the Trainset PMO and the Director of Engineering Major Programs. The Director, Program Management Office – AE 2021 will lead the AE 2021 program through the Stage Gate Process established by the policies and procedures of the Amtrak EPMO.

Among its responsibilities, the AE 2021 PMO is responsible for regular reporting on the status of AE 2021 program elements, the creation and maintenance of the AE 2021 risk register and integrated master schedule, and the AE 2021 change control board (AE 2021 CCB) that makes recommendations to the Executive Program Sponsor on those proposed changes to AE 2021 program elements' scope, schedule and budget that have the potential to impact the delivery of the overall program. The AE 2021 PMO is located organizationally in the EPMO, and reports to the Executive Program Sponsor for the responsibilities outlined above and to the Vice President for EPMO to assure consistency with Amtrak's project management practices.

The AE 2021 Program Organizational Chart is attached to this response (Attachment A). Authority within the program framework is depicted, and is functioning, in a top-down manner. While risks and issues can be identified at any level of the organization, escalations generally will flow in a bottom-up direction.

The Trainset Project Management Office (Trainset PMO) is responsible for the successful delivery of the contracts with Alstom Transportation for 28 Next Generation High-Speed trainsets, capital spares and the stand-up of the TSSSA for the long-term maintenance of the Trainsets. As noted in the OIG report, the Trainset PMO was established prior to the establishment of the EPMO but was organized along the same project management practices that the EPMO is establishing as Amtrak's standards. The Trainset PMO organizationally reports directly to the VP for NECBD and to the AE 2021 PMO Director for those matters related to the delivery of the overall AE 2021 Program.

The Director of Major Programs (AE 2021) is responsible for those infrastructure-related program elements of AE 2021 that will be carried out by Amtrak forces or contractors supporting the Engineering Department. The Director and related staff organizationally report through the Engineering Department chain of command to the Chief Engineer for matters relating to engineering standards and to the AE 2021 PMO Director for those matters related to the delivery of the overall AE 2021 Program.

There will be project managers for other AE 2021 program elements for which there will not be separate PMOs, such as those projects where Amtrak will be funding activities by other entities, or where the program element is of a more limited and focused nature (e.g. including the ability to assign seats in the upgrade of Amtrak's reservation system.) As with the Trainset PMO and the Major Programs (AE 2021) in the Engineering Department these project managers will report to the AE 2021 PMO Director for those matters related to the delivery of the overall AE 2021 Program.

Responsible Officials: Vice President for Northeast Corridor Business Development (VP NECBD) and Vice President, Enterprise Program Management

Targeted Completion Date: November 30, 2017

Recommendation 2:
The Executive Vice President, Chief Administration Officer, direct the Vice President, Enterprise Program Management, to develop an integrated master schedule that identifies the program's critical path, as well as a program risk register and risk mitigation plans.

Management Response/Action Plan:

Amtrak agrees with this recommendation. Regarding program complexity, the AE2021 Program has scored the highest complexity level or "Mega" under the EMPO Complexity Rating Tool. As such, the program is required to have the following in the "Initiation" phase under the EPMO guidelines: Program Charter, Business Case, Program Scope, Risk Register, Sponsor Approval, and an enterprise-wide Program Kickoff meeting. A diagram detailing the Amtrak Enterprise Program Management Lifecycle is attached to this response. (Attachment B)

Because AE 2021 is a multi-year and multi-project program, some scope components are already in progress (i.e. Trainset PMO and Engineering), while others have not yet initiated. An experienced Master Scheduler (Senior Director of Project Controls, EPMO) has provided schedule analysis for the existing baselined schedule for the Trainset PMO, as well as the Engineering schedule, but an integrated Program Schedule will be achieved during the "Planning" phase.

Amtrak expects to have a finalized Stakeholder Register, Risk Register and Requirements by March 31, 2018. The AE 2021 Program Director also expects to exit the "Initiation" phase and move into the "Planning" phase by the end of this calendar year. A full Project Management Plan will be issued in the "Planning" phase which will thoroughly address Risk Mitigation planning. The Master Scheduler will also be developing the Program's Integrated Master Schedule in the "Planning" phase, which the AE 2021 Program Director will closely monitor and control in the "Executing" phase.

While this framework is still being launched, Amtrak feels confident that any current oversight gaps will be fully address by the AE 2021 Program structure, as outlined. We believe the structure described, combined with adherence to the Amtrak Enterprise standards for project management, including assigning properly credentialed project management professionals to lead the various component efforts of this program, ensures that Amtrak is well positioned to achieve the objectives of the AE 2021 Program.

Responsible Officials: Vice President, Enterprise Program Management

Targeted Completion Date: March 31, 2018 (Finalized stakeholder register, risk register and requirements, and risk mitigation plan)

Recommendation 3:
The Executive Vice President, Chief Operating Officer, direct the Chief Engineer to take the following steps:

a. Take timely action to staff a team to manage the 10 infrastructure projects.
b. Determine the number of agreement personnel required to complete the infrastructure projects in time to avoid program delays.

c. Seek union approval to use contractors, if necessary.
d. Reach agreement with external stakeholders on schedules for projects they manage to mitigate potential program delays.

Management Response/Action Plan:

3a. Take timely action to staff a team to manage the 10 infrastructure projects.

Management agrees with the OIG's recommendation. Staffing a team to manage the infrastructure projects is critical to the success of the program. Of the 13 positions originally envisioned as necessary, three have been filled, and three are in the final stages of recruitment whereby offers are being extended to the top candidates. One additional position has been advertised and should be filled by the end of 2017. These hires will fill all positions necessary for executing the six projects that do not involve stations. An additional position that will provide program-level billing support, financial analysis and report preparation will be advertised this year and filled in early 2018. The Senior Program Manager of Stations will be responsible for delivering the 4 stations projects. This position should be advertised by 10/30/17 and filled by the end of 2017. This position will further evaluate need and timing of filling four remaining positions proposed to manage the individual stations projects. These positions will be filled as necessary during the first half of 2018. It should be noted that each of these is in the design phase, and is currently being actively managed by an Amtrak design manager so progress is not dependent of the proposed positions at this stage.

Responsible Amtrak Official(s): Director Major Programs, Sr Human Resources Business Partner

Target Completion Date: June 30, 2018

3b. Determine the number of agreement personnel required to complete the infrastructure projects in time to avoid program delays.

Management agrees with the OIG's recommendation. The determination of the number of agreement personnel that are required, and when they are required, is a key component to avoid schedule delays. Accordingly, Amtrak will determine the approximate number, and timing of forces required for each project after conceptual design, and refine those estimates at subsequent design submissions. This information will be submitted to a recently established workforce planning group that is currently establishing workforce allocation necessary for Amtrak's highest priorities: 1) day to day maintenance and inspections, 2) steady state replacement. After accounting for the top priorities, the remaining forces will be available for improvement projects such as those supporting the Acela 2021 program. Resource loaded schedules of the Acela 2021 program project along with Amtrak's additional improvement projects will extend out several years and allow Amtrak to prioritize project work, develop contracting strategies, and establish optimal force levels, given anticipated funding, attrition, and training durations.

Responsible Amtrak Official(s): Director Major Programs, Deputy Chief Engineer – Engineering PMO, Senior Manager - Workforce Management

NATIONAL RAILROAD PASSENGER CORPORATION

Target Completion Dates:

Workforce Projections for Acela 2021 program - 12/30/17 then ongoing through program

Workforce Allocation for priority 1 and 2 above – 3/31/18

Workforce Allocation/Schedule for all projects – 6/30/18

3c. Seek union approval to use contractors, if necessary.

Management agrees with the OIG's recommendation. Amtrak has initiated talks to contract B&B, Track, and Electric Traction work at the Sunnyside Yard and Ivy City Facilities. For other projects, Amtrak will initiate such talks after the 60% design level or at the point it appears Amtrak has inadequate forces in accord with the system-wide workforce planning effort discussed above.

Responsible Amtrak Official(s): Director Major Programs, Director Labor Relations

Target Completion Date: Ongoing throughout initiation of final construction project.

3d. Reach agreement with external stakeholders on schedules for projects they manage to mitigate potential program delays.

Management agrees with the OIG's recommendation. The ability to reach agreements with external stakeholders is critical to the success of the Acela 2021 program. Amtrak has been negotiating with the MTA for the demolition of buildings in Sunnyside Yard necessary for the construction of the Service, Inspection and Storage Facilities. On October 12, 2017 the most recent revision of the proposed agreement was sent to them requiring that work start on December 1, 2017 and be complete June 1, 2018. Amtrak and the MTA intend to have the agreement completed by November 10, 2017. As a backup, in case Amtrak must self-perform, we have completed specifications for asbestos abatement, the first task involved in demolition.

Completion of the Hanson Interlocking Project is an additional external (to Acela 2021 program) risk to the Maryland Section Improvements. Construction is underway, a project budget has been completed, as well as a project schedule. Work is scheduled to be complete on October 30, 2020. This project will be monitored by the project manager for the track 1 improvements project and carried on the risk register. Forces and track outages for Hanson Interlocking, New Carrolton Station and the Track 1 Improvements will be coordinated through a master schedule and the workforce planning initiative discussed previously.

Responsible Amtrak Official(s): Director, Business Development, NEC Infrastructure, Corporate Planning and Strategy

Target Completion Date: November 10, 2017 (MTA Agreement)

Responsible Amtrak Official(s): Director Major Programs, Deputy Chief Engineer – Major Capital Construction

Target Completion: October 30, 2020 (Hanson Interlocking Project)

APPENDIX C

Acronyms and Abbreviations

ADA	American with Disabilities Act
EPMO	Enterprise Program Management Office
FRA	Federal Railroad Administration
GAO	Government Accountability Office
MTA	Metropolitan Transportation Authority
OIG	Amtrak Office of Inspector General
PMBOK	Project Management Body of Knowledge
The company	Amtrak
Trainset PMO	Trainset Project Management Office

APPENDIX D

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OIG MISSION AND CONTACT INFORMATION

Mission

The Amtrak OIG's mission is to provide independent, objective oversight of Amtrak's programs and operations through audits and investigations focused on recommending improvements to Amtrak's economy, efficiency, and effectiveness; preventing and detecting fraud, waste, and abuse; and providing Congress, Amtrak management, and Amtrak's Board of Directors with timely information about problems and deficiencies relating to Amtrak's programs and operations.

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