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INFORMATION TECHNOLOGY: Reservation System Infrastructure Updated, but Future System Sustainability Remains an Issue

Audit Report OIG-A-2015-010 | May 19, 2015

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AMTRAK
NATIONAL RAILROAD
PASSENGER CORPORATION

Office of Inspector General

REPORT HIGHLIGHTS

Why We Did This Review

Amtrak's reservation system processes about $2.1 billion in ticket revenue annually and also delivers key information used to manage business operations. However, the system has been in service for over 33 years and is based on technology from the late 1950s. A one-day outage of the system could cause about $6 million in lost revenue.

In fiscal year (FY) 2009, Amtrak's Information Technology (IT) department initiated a program to modernize the reservation system and update its technical infrastructure.

That program, known as the Reservation Ecosystem Next Generation Program (Res-NG), cost about $74.4 million and had a FY 2014 completion goal.

Our audit objective was to determine to what extent the Res-NG program met its objective of modernizing the company's reservation system.

INFORMATION TECHNOLOGY: Reservation System Infrastructure Updated, but Future System Sustainability Remains an Issue

(Audit Report OIG-A-2015-010, May 19, 2015)

What We Found

Amtrak's attempt to modernize its reservation system through the Res-NG program had mixed results, and the program will be terminated in FY 2015 without fully achieving its modernization objective.

The Res-NG program completed projects to update the reservation system's mainframe hardware, operating system, and network protocols, but did not complete 38 percent of its planned projects. The completed projects ensured the reservation system will continue to handle the current volume. However, the uncompleted projects did not deliver certain significant system improvements needed by the Operations, Marketing, and Finance departments, such as removing non-reservation functionalities. Weak program management such as inadequate tracking of costs and poor communication between the IT department and other departments within the company adversely affected completion of the program's projects.

More importantly, the company does not have a strategy to replace or significantly upgrade the reservation system to ensure its future sustainability and growth. For example, there is no plan to systemically improve the reservation system, and integrate it with technology improvement efforts being managed by other departments. This uncoordinated approach creates risks for the system's future viability and could result in inefficient expenditures and lost revenue.

Recommendation

The Chief Information Officer agreed with our recommendation to develop a comprehensive reservation system strategy to ensure performance sustainability and efficient integration with other company-wide IT modernization efforts.

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Office of Inspector General

Memorandum

To: Jason Molfetas
Executive Vice President/Chief Information Officer

From: David Warren
Assistant Inspector General, Audits

Date: May 19, 2015

Subject: Information Technology: *Reservation System Infrastructure Updated, but Future System Sustainability Remains an Issue* (Audit Report OIG-A-2015-010)

The objectives of the Reservation Ecosystem[1] Next Generation Program (Res-NG) were to modernize the reservation system to meet the business needs of Amtrak (the company), and update technical infrastructure, including mainframe hardware, the operating system, and network protocols. These objectives were to be accomplished by four program goals: technology refresh/update, functional modernization, industry trend adoption, and improved data access. Planning for the Res-NG program began in fiscal year (FY) 2009, and work started in FY 2010. The Res-NG program was funded by capital grants from the Federal Railroad Administration (FRA) and was scheduled to be completed in FY 2014. The initial cost estimate was $74.4 million.

The reservation system includes the "Arrow" system that also delivers key information used to manage business operations, such as providing locomotive and passenger car

[1] *Reservation Ecosystem* or System is a set of inter-related systems (internal and external) that work jointly to automate reservations, ticketing, and train operations business processes. Arrow is a vital component of this reservation system.

assignments to the Operations department, passenger booking information to the Marketing department, and credit card information to the Finance department. Notably, Arrow and the associated reservation processes have been in service for more than 33 years and are based on IBM mainframe application technology created in the late 1950s. The reservation system processes about $2.1 billion in ticket revenue annually.

Our reporting objective was to determine to what extent the Res-NG program met its objective of modernizing the company's reservation system, which includes the Arrow system as its critical component. We discuss our audit scope and methodology in Appendix A.

RESERVATION SYSTEM MODERNIZATION OBJECTIVE WAS NOT FULLY ACHIEVED

The Res-NG program, which was comprised of multiple projects, will be terminated in FY 2015 without fully achieving the modernization objective. The program was generally successful in updating the reservation system's mainframe hardware, operating system, and network protocols. We found that the completed projects have ensured the system can handle the current reservation volume. However, numerous projects were cancelled and did not deliver certain significant system improvements needed by the Operations, Marketing, and Finance departments (see Appendix B for a list of cancelled projects). While some of the cancelled projects will be addressed through new technology programs managed by those departments, the company does not have a strategy to replace or significantly upgrade the reservation system to ensure its future sustainability and growth. Without a comprehensive strategy for modernizing the reservation system and integrating it with systems being developed in other departments, the company is exposing itself to unnecessary financial and operational risks.

Program Management Structure

The company structured the Res-NG Program as follows: An Executive Steering Committee provides program oversight. The committee members are the Vice President, Operations; Chief Information Officer; Chief Marketing & Sales Officer; and Chief Financial Officer, among others. The Information Technology (IT) department and its Res-NG Program Director are responsible for managing the overall program, and project managers are responsible for specific projects within the program.

Figure 1 shows the Res-NG program leadership responsible for oversight and management.

Figure 1. Res-NG Program Leadership as of FY 2014

Program Oversight	Program Management
Executive Steering Committee	**IT Department**
Vice President Operations Chief Information Officer Chief Marketing & Sales Officer Chief Financial Officer Chief Relationship Officer Chief Sales Distribution & Customer Service Chief Business Operations	Chief Information Officer Chief Relationship Officer Senior Director Marketing & Sales Res-NG Program Director Project Managers

Source: Res-NG Program Director

Many Planned Modernization Projects Were Not Completed

The Res-NG program had 58 projects in its initial scope, and was scheduled to be completed by the end of FY 2014. According to data provided by the Program Director, of the 58 projects in the initial scope, 33 have been completed (57 percent), 3 are ongoing (5 percent), and 22 have been cancelled (38 percent). Program officials could not provide a breakdown of the initial cost estimate of $74.4 million by project. Four projects were added to the initial scope of the 58 projects. For the status of all 62 projects, see Appendix B.

The completed projects have stabilized the reservation system, ensuring that the system can continue to handle the current reservation volume. The cancelled projects, however, left certain significant gaps in system improvements that were needed by the Operations,

Marketing, and Finance departments. Cancelled projects included those designed to meet the needs of these departments—such as moving non-reservation functionalities, including assigning locomotives and passenger cars to trains, off the Arrow system; eliminating the storage of credit card information in the Arrow system; and replacing reservation booking tools used by reservation call center and station agents. As shown in Appendix B, these three projects are now being undertaken by the Operations, Finance, and Marketing departments respectively.

Figure 2 shows the status of original projects by program goals.

Figure 2. Status of Projects in Initial Scope as of December 12, 2014

Goal	Completed	Ongoing	Cancelled	Total
Technology Refresh	5	0	0	**5**
Functional Modernization	11	3	12	**26**
Industry Trend Adoption	7	0	4	**11**
Improved Data Access	10	0	6	**16**
Total	**33**	**3**	**22**	**58[a]**
Percent	**57%**	**5%**	**38%**	**100%**

Source: Data provided by the Res-NG Program Director

Note: a - Excludes four projects added later by the IT department: two are completed, and two are planned to be completed during FY 2015.

IT officials provided several reasons for not completing all planned projects. For instance, in the first 18 months, the program could achieve only 75 percent of its planned activities because of inefficiencies created by delays in moving the data center.[2] Further, an IT official responsible for developing the Res-NG architecture reported in June 2013, the program moved away from its original goals causing certain project deliverables not to be achieved. The program's direction changed over time because of management turnover, change in priorities, and unanticipated technical difficulties. For example, instead of reducing complexity, the implementation of new pricing and shopping functionality increased complexity and risk of the reservation system.

[2] In FY 2011, IBM completed migration of Amtrak's data center to new locations.

Program Oversight and Management was Weak

Over several years, we have reported on weaknesses in program and project management across the company's various departments. Consistent with our previous reports, we found that weak management and oversight adversely affected the overall success of the Res-NG program. As detailed below, program performance could have been improved by 1) monitoring costs more closely, 2) communicating more effectively between IT and user departments, 3) tracking project progress more comprehensively, 4) conducting required program evaluations, and 5) retaining key program documents. In response to the recommendations in our July 2014 report on capital project management,[3] the company is working to establish an enterprise project management office in the Operations department to improve cost estimating, scheduling, and project oversight and delivery. Further, independent of the enterprise project management office initiative, the IT department has started conducting a detailed review of IT costs; has established committees for broader governance; and is planning to improve its Program Management Office processes.

Program Cost Estimate Was Not Effectively Managed

Program costs are projected to exceed the initial cost estimate of $74.4 million by about $2 million (3 percent), and the initial cost estimate has not been updated to reflect cancelled and added projects. In addition, program directors did not maintain a breakdown of the initial cost estimate by project, which makes it difficult, if not impossible, to compare cost performance of individual projects.

These actions are inconsistent with well-established program management standards. For example, the Project Management Institute (PMI) Standard for Program Management recommends monitoring the program's finances and controlling expenditures within budget to ensure that program goals are met and cost overruns are justified. The PMI standard also recommends updating the program's budget baseline when scope changes with significant cost impacts are approved.

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[3] *GOVERNANCE: Improved Policies, Practices, and Training Can Enhance Capital Project Management* (Audit Report OIG-A-2014-009, July 15, 2014).

According to the Chief Information Officer, the IT department is now improving its financial oversight by conducting a detailed review of IT costs. This review includes estimating the total cost of ownership of various IT applications and services, and identifying opportunities for savings within the IT department.

Program Communication was Weak

Another best practice from the PMI Standard for Program Management is to communicate information accurately and ensure that stakeholders understand it. However, senior executives in Marketing and Operations departments stated that there was a lack of clear communication and understanding between their departments and the IT department regarding expected deliverables from the Res-NG program. For example, in early 2014, Marketing instructed IT to stop two Res-NG projects already underway because it did not agree with the technical direction of the projects. The cancelled projects will now be accomplished by the Customer Experience program—an initiative managed by Marketing.

Program leadership partially attributed the lack of communication to the turnover of management: for example, four Chief Information Officers, five Program Directors, and three architects have served since the beginning of the program. This turnover contributed to a loss of continuity and institutional knowledge, which has affected communication between IT and user department executives.

The IT department has taken steps to improve communication and collaboration with user departments in the last 12 months. For instance, the Technology Investment Steering Committee has been established to identify and increase awareness of departmental business initiatives that require cross-departmental participation and technology improvements. The IT department has worked with other departments to expand the role of the Executive Steering Committee to look across all technology programs, and ensure cross-functional alignment on critical decisions from a company perspective. In addition, the IT department has created a Chief Relationship Office, which provides direct communication and status of the IT projects to user departments.

Project Tracking was Weak

Best practices in the PMI Standard for Program Management recommend that managers control program scope to ensure successful completion. The initial Res-NG *Project Management Plan* included 58 projects in the scope as key program requirements. According to the Program Director, the status of these projects was not tracked to ensure that they were completed. We analyzed data provided by the Program Director to help define the status of the 58 projects. For more information, see Appendix B.

Further, the Res-NG *Project Management Plan* included improving disaster recovery capability as a core program objective. However, according to the IT mainframe manager, certain newly added components such as servers supporting the reservation system were not tracked through its transition to IT Operations' disaster recovery plan—and hence not tested. The IT department is planning to improve the company's disaster recovery capability by deploying "high availability"[4] technology and reducing single points of failure.

According to the Chief Information Officer, the IT department, in January 2015, started implementing a six-month plan to improve its Program Management Office processes to provide transparency of project plans and status.

Program Reviews were Not Conducted

Senior IT officials stated that Res-NG program reviews were not conducted on an ongoing basis to ensure that expected benefits were delivered; again, this was inconsistent with established norms for program management. For example, Amtrak policy on Capital Programming (8.37.0) dated December 4, 2009, and best practices in the PMI Standard for Program Management recommend conducting periodic program reviews to ensure that expected benefits are being delivered. In addition, our September 2013 report on planning

[4] *High availability* systems have minimal downtime, whether planned or unplanned.

capital projects[5] recommends the company develop and implement a plan to monitor ongoing projects. The Chief Financial Officer agreed, commenting that company program reviews would help ensure that programs are within budget and scope and are delivering the anticipated results. The Chief Information Officer stated he is taking actions to address the lack of program reviews within the IT department.

Program Documentation was Not Complete

The IT department's Project Management Playbook (section 2.1.7) dated July 2010 states, "All relevant project-related material, documents produced, decisions made, issues raised and correspondence exchanged must be captured for future reference and historical tracking." In addition, FRA's Grant (section 206) to Amtrak for FY 2014 Capital and Debt Service requires the company to retain records relating to its performance. The following are examples where Res-NG program documentation was missing or improperly stored:

- About ninety percent of the completed Res-NG projects lacked one or more "Full Pass" quality gate certification reports required by the Project Management Playbook and the Res-NG *Project Management Plan*, which serve as an internal control for ensuring the quality of deliverables. As a result, there is a lack of sufficient evidence to show that these projects successfully passed all quality gates and delivered the expected results. For example, a quality gate "Contingent Pass" certification report for a Customer Data Integration project required the project manager to obtain document approvals and to update certain technical documents. However, we did not find any follow-up communication or documentation indicating that these requirements were met.

- Briefings to the Executive Steering Committee were either missing or found in multiple locations other than the Res-NG electronic file. Our review of the program

[5] *CORPORATE GOVERNANCE: Planned Changes Should Improve Amtrak's Capital Planning Process and Further Adoption of Sound Business Practices Will Help Optimize the Use of Limited Capital Funds* (Evaluation Report OIG-E-2013-020, September 27, 2013).

files showed that the company lacked complete information about decisions made and actions taken regarding the program.

- The Res-NG electronic file was not organized so information could be easily located. The initial list of projects supplied by the IT Project Management Office contained duplicates, and important documents were sometimes stored in unrelated project files.

An Integrated Strategy for Reservation System Modernization is Lacking

The company does not have a comprehensive enterprise strategy that sets direction for its aging reservation system architecture as it moves forward with technology modernization efforts. Instead, we found that related modernization efforts are being managed in silos without the benefit of strategic and lateral integration. For example, modernization efforts are continuing because 6 of the 22 cancelled projects (see appendix B) have been incorporated into new technology programs that will be funded from the company's annual capital grant and managed outside of the IT department, including:

- **Operations Foundation Program**.[6] An Operations department program estimated to cost $427 million through FY 2025. A portion of the Operations Foundation Program relies on the reservation system.

- **Customer Experience Program.**[7] A Marketing department program estimated to cost $112 million through FY 2024. The Customer Experience Program is completely dependent on the reservation system.

[6] The *Operations Foundation Program* is a multi-project, multi-year initiative designed to improve operational processes and technology.
[7] The *Customer Experience Program* consists of several projects with the goal to improve customer shopping, purchasing, and travel experience on Amtrak.

- **Credit Card System Upgrade Project.** A Finance department project estimated to cost $9 million through FY 2017. The Credit Card System Upgrade Project is also completely dependent on the reservation system.

Going forward, this approach creates two kinds of risks: the *financial risk* of inefficient system development efforts, and the *operational risk* of an ineffective reservation system that does not meet customer and company needs.

For example, the company does not have a strategy to replace or significantly upgrade the reservation system to ensure its sustainability and growth. The Reservation System Manager stated that, while the Res-NG program improved stability and extended the life of the reservation system, the core technical architecture underpinning the reservation system has become overly complex, inflexible, and difficult to support and grow with evolving business demands.

Initially, the Arrow system ran on the IBM Transaction Processing Facility (TPF) mainframe operating system that was created in the late 1950s. This system was designed for fast, high-volume applications such as airline/rail reservations and banking transactions. The Arrow system has been incrementally upgraded to meet the company's needs. During 2011-2012, the Res-NG program upgraded the TPF mainframe operating system to the latest version—z/TPF, and network protocol to Transmission Control Protocol/Internet Protocol.

Since the upgrade, Arrow software programmers have developed some new programs using modern, high-level "C language"[8] instead of relying on the old, low-level "Assembler language."[9] Regardless, the Reservation System Manager told us that further upgrades to the system to meet growing customer and company needs will be a challenge because of the inherent complexity and inflexibility of the reservation system's technical architecture. The manager also stated that the labor force supporting the Assembler language is reaching

[8] *C Language* is a high-level, general purpose programming language for developing applications.
[9] According to the Reservation System Manager, the Arrow system mostly uses low-level *Assembler*, a programming language for IBM mainframe computers.

retirement age, and finding companies or personnel who can continue to maintain and upgrade the Arrow system will become increasingly difficult and more expensive over time.

While we have no evidence to suggest an imminent reservation system failure, relevant company personnel stated that the eventual combination of aging complex architecture and lack of qualified personnel to maintain the system could result in an unstable and unreliable system—leading to system outages and revenue loss. According to the Vice President of Sales and Customer Service, a one-day outage of the reservation system can cause about $6 million in lost revenue.

Although the company has developed incremental upgrade plans for the reservation system as part of the Customer Experience Program, a comprehensive reservation system strategy has not been developed to ensure sustainability and ability to support revenue and ridership growth. The Senior Vice President of IT Strategy stated that a strategic review of the reservation system would be made part of the ongoing IT strategic planning effort. The IT Strategic Plan, scheduled for completion during calendar year 2015, would:

- analyze the costs and benefits of upgrading or replacing Arrow or outsourcing the reservation system to a third party, and
- determine the most cost-effective manner to develop and maintain interfaces with Operations Foundation, Customer Experience, and the Credit Card System Upgrade projects.

CONCLUSIONS AND RECOMMENDATION

The Res-NG program will end in 2015 with mixed results. The program was generally successful in updating mainframe hardware and software, but it did not fully modernize its aging reservation system. In time, this lack of modernization leaves the company vulnerable to various financial and operational risks. Further, the program did not fully meet its stated goals, particularly those relating to other departments within the company, which are now developing relatively independent IT modernization efforts that interface with the reservation system. Finally, the company lacks a long-term strategy for modernizing its

reservation system and integrating it with technology improvement efforts across various departments.

We recommend that the Chief Information Officer develop a comprehensive reservation system strategy to ensure performance sustainability and efficient integration with other company-wide IT modernization efforts.

MANAGEMENT COMMENTS AND OIG ANALYSIS

In commenting on a draft of this report, the Chief Information Officer agreed with our findings and recommendation. The IT department has already begun the development of a reservation system strategy in consultation with the marketing and operations departments and plans to complete this effort in FY 2016. The response also discussed an action plan to improve governance and management of large scale IT projects within the company by the end of FY 2015. These planned actions address the intent of our recommendation. For management's complete response, see Appendix C.

Appendix A

SCOPE AND METHODOLOGY

This report provides the results of our audit to determine to what extent the Reservation Ecosystem Next Generation Program (Res-NG) met its objective of modernizing the reservation system. We conducted our audit work from May 2014 through January 2015 in Washington, D.C.

The scope of our work focused on assessing the Res-NG program's progress in achieving its objectives and management controls over the program. Our methodology included reviewing the initial project scope, budget, performance goals, subsequent revisions, and progress updates. We also:

- interviewed officials and contractors, particularly from the IT, Marketing, Operations, and Finance departments
- analyzed documents and data associated with the program
- compared actual costs to budget estimates
- compared actual project status to project scope and schedules
- compared projected benefits to realized benefits
- identified significant performance issues and risks
- tested whether projects passed through quality gates as required by the Project Management Playbook and Res-NG *Project Management Plan*
- reviewed PMI's Standard for Program Management and compared them to Res NG program management practices to identify opportunities for improved program oversight and management

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

We reviewed the company's internal controls over the Res-NG Program in the Project Management Playbook and Res-NG *Project Management Plan*. We focused on the management of project cost, schedule and performance. We tested compliance with quality gates for Res-NG projects. We also reviewed briefings to the Executive Steering Committees and program documentation for Res-NG. We did not review the IT department's overall system of internal control for managing its IT projects.

We also reviewed IT plans for further updating the reservation system. However, we did not review the IT department's overall planning process for its IT projects.

Computer-Processed Data

We obtained actual expenses for the Res-NG program from FY 2010 through FY 2014 and estimated expenses for FY 2015 from the Finance department's Financial Information System. We relied on the actual cost numbers reported from FY 2010 through FY 2013 based on an unqualified opinion on the company's financial statements from its external auditors for those fiscal years. We did not validate the FY 2014 numbers because they are un-audited information. However, we compared the financial data to program documents, and we found these numbers to be sufficient for our purposes.

Prior Audit Reports

We reviewed the following reports by our office, the Government Accountability Office, and the Department of Transportation OIG as being relevant to this audit:

Amtrak OIG

- *Governance: Improved Policies, Practices, and Training Can Enhance Project Management* (OIG-A-2014-009, July 15, 2014)

- *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)

- *Corporate Governance: Planned Changes Should Improve Amtrak's Capital Planning Process and Further Adoption of Sound Business Practices Will Help Optimize the Use of Limited Capital Funds* (OIG-E-2013-020, September 27, 2013)

- *Information Technology: Opportunities Exist to Improve Services, Economies, and Contract Performance* (OIG-A-2013-013, April 16, 2013)

- *Strategic Asset Management Program: Opportunities to Improve Implementation and Lessons Learned* (OIG-E-2012-012, May 31, 2012)

- *Strategic Asset Management Program: Further Actions Should be Taken to Reduce Business Disruption Risks* (OIG 001-2011, June 2, 2011)

- *Strategic Asset Management Program Controls Design Is Generally Sound, But Improvements Can Be Made* (OIG 105-2010, January 14, 2011)

U.S. Government Accountability Office

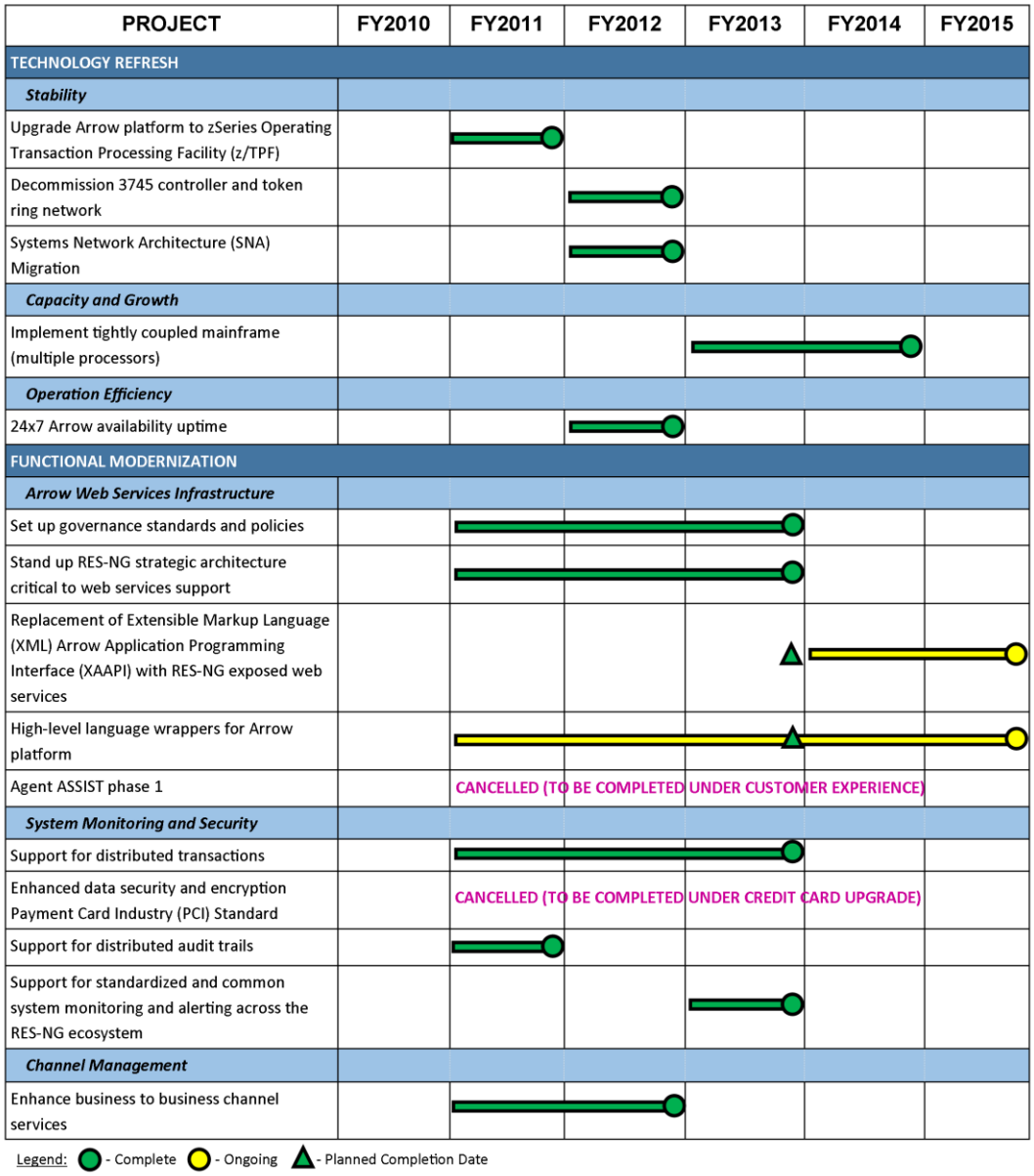
- *Information Technology: Reform Initiatives Can Help Improve Efficiency and Effectiveness* (Testimony GAO-14-671T, June 10, 2014)

Department of Transportation Office of the Inspector General

- *FAA's Acquisition Strategy for Terminal Modernization is at Risk for Cost Increases, Schedule Delays, and Performance Shortfalls* (Audit Report AV-2013-097, May 29, 2013)

Appendix B

Timeline of Projects in Initial Scope As Reported by the Res-NG Program Director[10]



[10] As noted in this report, program documentation was incomplete. Therefore, we are presenting the best available information as reported by the Res-NG Program Director.

	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015
Re-platform Functionality						
Consist functionality from Operations Maintenance System (OMS) to Train Equipment Management System (TEMS) platform		CANCELLED (TO BE COMPLETED UNDER OPERATIONS FOUNDATION)				
Train unit maintenance associated functionality (Re-platform to Train Communications Enterprise ecosystem)			CANCELLED			
Real-time pass rider interface		CANCELLED (TO BE COMPLETED UNDER CUSTOMER EXPERIENCE)				
Crew border crossing re-engineering			CANCELLED			
Enterprise train information integration			CANCELLED			
Re-factor Arrow Code						
Point of sale (Cash Drawer)						
Availability re-engineering						
Braniff editor removal			CANCELLED			
Re-factor all functions using Passenger Name Record (PNR) to leverage Transaction Processing Facility Data Facility (TPFDF)			CANCELLED			
Re-factor PNR-prototype						
Re-factor PNR						
Automated Station Accounting Program			CANCELLED			
Re-factor booked ticket functionality			CANCELLED			
Re-factor Maintenance Analysis Program			CANCELLED			
Expand Arrow database capacity and capability						
System clean-up						
INDUSTRY TREND ADOPTION						
Industry Trends						
Ancillary revenue engine		CANCELLED (TO BE COMPLETED UNDER CUSTOMER EXPERIENCE)				
E-Accounts			CANCELLED			
Fare caching						
Fare and price rules management						
Reservations view of customer profile						
Refund and exchange policy management						
Refund, exchange and fees management						

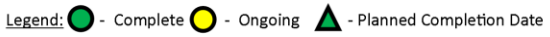
Legend: - Complete - Ongoing - Planned Completion Date

PROJECT	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015
Payment Processing						
Credit card payment and settlement gateway		CANCELLED (TO	BE COMPLETED	UNDER CREDIT	CARD UPGRADE)	
Re-platform to Allow for Adoption						
Dynamic connection construction			CANCELLED			
Pricing and fare quote application						
Implement selected pricing platform						
IMPROVED DATA ACCESS						
Event Publication and Data Export						
Alternative to tape transfer			CANCELLED			
Publish cash drawer data			CANCELLED			
Reservations operational data store						
Revenue transactions operational data store						
Convert flat-file databases to TPFDF			CANCELLED			
Create TPFDF PNR data structure						
Direct reference system re-engineering/re-platform						
Passenger document image presentation		CANCELLED (COMPLETED UNDER E-TICKETING)				
Publish customer data events						
Publish data infrastructure						
Publish manifest data						
Publish inventory data						
Standardized customer contact delivery framework						
Re-factor to Improve Data Access						
Records management re-engineering						
Re-platform to Improve Data Access						
Message and PNR queues re-engineering			CANCELLED			
Queue processing re-platform			CANCELLED			

Legend: - Complete - Ongoing - Planned Completion Date

Timeline of Projects Added to Initial Scope
As Reported by Res-NG Program Director

PROJECT	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015
FUNCTIONAL MODERNIZATION						
Amtrak Reservation Web Service (ARWS)-Standard Messaging Interface for Legacy Enterprise Services (SMILES)						
Availability closure override for booking holiday travel						
Reservation booking designators						
INDUSTRY TREND ADOPTON						
Customer Experience assessment						



Appendix C

COMMENTS FROM AMTRAK'S MANAGEMENT

NATIONAL RAILROAD PASSENGER CORPORATION
60 Massachusetts Ave NE, Washington, DC 20002

Memo

Date: May 15, 2015

From: Jason Molfetas
Executive Vice President/Chief Information Officer

To: David Warren
Assistant Inspector General,
Audits

Department: Information Technology

Subject: Information Technology: Reservation System Infrastructure Updated, but Future System Sustainability Remains an Issue

cc: Jerry Sokol, Executive Vice President/Chief Financial Officer
DJ Stadtler, Executive Vice President/Chief Operations Officer
Matthew Hardison, Executive Vice President/Chief Marketing & Sales Officer
David Hudson, Senior Vice President/Chief IT Strategy Officer
Ghada Ijam, Senior Vice President/Chief Relationship Officer
Jessica Ginther, Senior Director/Chief Business Officer
Matt Gagnon, Senior Director Amtrak Controls
Benjamin Lyttleton, Lead Amtrak Controls Consultant
Melantha Paige, Senior Amtrak Controls Consultant

This memorandum provides the Information Technology (IT) department response to the April 14, 2015 Draft Audit Report No.010-2014, "Information Technology: Reservation System Infrastructure Updated, but Future System Sustainability Remains an Issue". IT management agrees with the findings and recommendation made by the Office of the Inspector General (OIG). Summarized below are actions that are currently underway or that IT will initiate to address the OIG recommendation.

NATIONAL RAILROAD PASSENGER CORPORATION
60 Massachusetts Ave NE, Washington, DC 20002

OIG Recommendation:
We recommend that the Chief Information Officer develop a comprehensive reservation system strategy to ensure performance sustainability and efficient integration with other company-wide IT modernization efforts.

Management Response:
IT agrees that a reservation system strategy should be developed to ensure performance sustainability and efficient integration with other company-wide IT modernization efforts.

The IT department has already begun the development of a reservation system strategy in consultation with the marketing and operations departments and will complete this effort in FY16.

This strategy includes:

- Cost–Benefit analysis of upgrading/replacing Arrow or outsourcing the reservation system to a third party [Dave Hudson, SVP Technology Strategy with IT support, will complete the analysis by March 31, 2016]; and

- Determination of the most cost-effective approaches to develop and maintain interfaces with Operations Foundation, Customer Experience, and the Payment Platform Program [Dave Hudson, SVP Technology Strategy with IT support, will complete the analysis by March 31, 2016].

The OIG also identified several opportunities for improvement regarding the governance and management of large scale IT projects within Amtrak. IT management agrees with these observations and has made significant changes to improve in this area. Specifically, the IT department has hired a Senior Director to lead its Project Management Office (PMO). The Senior Director is charged with re-defining and implementing a standardized project management process. The new IT PMO will:

- Follow well-established program management guidelines;

- Eliminate duplication of efforts and improve productivity;

- Develop in-house project management skills and capabilities;

- Increase transparency with stakeholders to ensure proper project oversight; and

- Improve tracking of project plans, costs, and project reviews.

[Phyllis Poole, Senior Director, IT PMO will complete the enhancements to IT project management processes by September 30, 2015]

IT management appreciates the opportunity to respond to the OIG findings and recommendation and share the steps the IT department has taken and/or will take to improve our strategic

planning and project management processes which directly impact the delivery of beneficial IT solutions. If you or your staff have any additional questions regarding this subject, please contact David Hudson, Senior Vice President/Chief IT Strategy Officer at (202) 906-4946 or david.hudson@amtrak.com or Michael Goode, Director of IT Risk & Compliance, at (202) 906-4400 or michael.goode@amtrak.com.

Appendix D

ABBREVIATIONS

FY	Fiscal Year
IT	Information Technology
OIG	Office of Inspector General
PMI	Project Management Institute
PNR	Passenger Name Record
Res-NG	Reservation Ecosystem Next Generation Program
TPF	Transaction Processing Facility
TPFDF	Transaction Processing Facility Data Facility

Appendix E

OIG TEAM MEMBERS

Vipul Doshi, Senior Director Audits, Lead

Dan Haigler, Senior Audit Manager

Ashish Tendulkar, Senior Auditor, Lead

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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.

Obtaining Copies of Reports and Testimony

Available at our website: www.amtrakoig.gov.

Reporting Fraud, Waste, and Abuse

Report suspicious or illegal activities to the OIG Hotline (you can remain anonymous):

Web: www.amtrakoig.gov/hotline
Phone: 800-468-5469

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