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SUBJECT: Audit Report – Evaluation of Major Transportation Technology
Initiatives (Report Number NL-AR-11-008)

This report presents the results of our audit of four U.S. Postal Service transportation technology initiatives (Project Number 10XG023NL000). The objectives of our self-initiated audit were to assess the planning, implementation, functionality, and results of four transportation technology initiatives. This audit addresses operational and strategic risks. See [Appendix A](#) for additional information about this audit.

The Postal Service manages a vast transportation network that moves more than 170.6 billion mailpieces through its network at a cost of about \$7.9 billion per year. The Postal Service's goal is to control transportation costs while improving performance of the transportation network to meet or exceed service requirements. To optimize the transportation and distribution network and improve operations, the Postal Service procured the:

- Surface Visibility (SV) system designed to improve the visibility of mail as it moves through the plant-to-plant surface transportation network.
- Transportation Optimization, Planning, and Scheduling (TOPS) system designed for use as a national transportation network optimization tool that enhances the surface and air transportation mail assignment processes.
- Postal Vehicle Service Management System (PVS-MS), designed to provide transportation managers with the technological mechanism to monitor, measure, and manage heavy fleet assets and associated labor.
- Yard Management System Pilot (YMS Pilot), designed to track vehicles at Network Distribution Centers (NDC) within the yard and dock areas.

Conclusion

Although the Postal Service expensed more than \$300 million on four transportation technology initiatives, none of them achieved all of their intended results. Specifically:

- The SV technology initiative was generally capable of functioning as planned, but it is not fully providing the intended transportation visibility.
- The TOPS technology initiative was implemented for routing air transportation, but not for surface transportation (one of its major components) and long-range air route planning as originally designed.
- The PVS-MS technology initiative was implemented to monitor driver and fleet performance but lacked the necessary connectivity to function properly and was discontinued in 2008.
- The YMS Pilot technology initiative was implemented at two locations and improved yard efficiency through automation, but it did not replace all required manual processes.

These conditions occurred for the following reasons:

- Sponsors and project managers were guided by policies focused on finance and budgetary processes but could have benefited from a robust system development life cycle policy. However, the Postal Service did not implement such a policy until March 2009, years after these four transportation initiatives were planned and developed.
- Project managers did not consistently identify significant operational deficiencies for corrective action.
- Investment planning policies were not always comprehensively followed.
- Investment planning policies are not as rigorous compared to industry best practices.
- Implementation of these transportation technology initiatives did not always have support (for example, training, funding, oversight) from all levels of the Postal Service.

As a result, these technologies generally did not improve network operations or service as intended, nor did they provide the anticipated savings. See [Appendix B](#) for our detailed analysis of these topics.

We recommended the vice president, Network Operations, in coordination with the vice president, Global Business, and the vice president, Information Technology, when planning and implementing future transportation technologies:

1. Ensure that Network Operations sponsors and project managers follow the Postal Service's technology solution lifecycle guidelines.
2. Require operational deficiencies be identified for corrective action and addressed prior to project closeout.
3. Facilitate the inclusion of robust risk assessment, risk mitigation, system data migration, and transition planning best practices into investment planning policies.
4. Ensure establishment and maintenance of the proper line of authority, funding, and oversight for key programs by responsible sponsors and management officials.
5. Ensure comprehensive training is provided for employees throughout the technology's life cycle.

Management's Comments

Management agreed with the majority of our findings and agreed with all of our recommendations, citing specific, planned corrective actions for each. Management also cited processes that were put in place after the technologies were developed that would aid in future technology planning and implementation. Regarding our findings, management expressed disagreement with our assertion that YMS Pilot technology did not eliminate all targeted manual processes. They cited the Pittsburgh NDC as an example and stated that the YMS Pilot technology at that location was not deficient, but that local management was not complying with the technology's requirements.

Management also disagreed with some of our monetary impact, specifically identifying that \$1,456,256 of the total \$9,323,532 in questioned costs resulted in direct benefits to the Postal Service. Management also disagreed with our categorization of the expenses shown in [Appendix E](#). See [Appendix F](#) for management's comments in their entirety.

Evaluation of Management's Comments

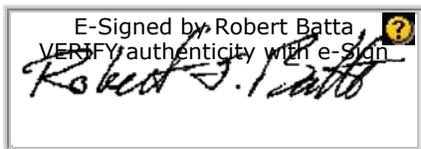
The U.S. Postal Service Office of Inspector General (OIG) considers management's comments responsive to the recommendations and their corrective actions should resolve the issues identified in the report.

Regarding management's disagreement with the YMS Pilot finding, we recognize that the Pittsburgh NDC shortfall example is a result of field non-compliance rather than a deficiency in YMS. However, as shown in [Appendix B](#) of the report, we found the Postal Service was not able to eliminate all manual yard checks as intended due to underperformance of the real time locator system (RTLS) component.

Concerning management's disagreement with portions of the monetary impact, we agree that the applicable technology (TOPS) provided benefits, but these benefits did not result in any documented savings as specified in the Decision Analysis Report (DAR) through the end of fiscal year (FY) 2010, the end of our audit period. Regarding the OIG's categorization of the expenses shown in [Appendix E](#) as unnecessary, our determination is based upon the facts that PVS-MS was abandoned and TOPS provided none of the savings, nor achieved the primary component functionality. These transportation technology investments were approved primarily because of their planned return on investment (ROI).

The OIG considers all of the recommendations significant, and therefore requires OIG concurrence before closure. Consequently, the OIG requests written confirmation when corrective actions are completed. These recommendations should not be closed in the Postal Service's follow-up tracking system until the OIG provides written confirmation that the recommendations can be closed.

We appreciate the cooperation and courtesies provided by your staff. If you have any questions or need additional information, please contact Jody Troxclair, director, Transportation, or me at 703-248-2100.



E-Signed by Robert Batta
VERIFY authenticity with e-Sign

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APPENDIX A: ADDITIONAL INFORMATION

BACKGROUND

Between FYs 2003 and 2006, the Postal Service spent about \$70 million in capital investments to procure new transportation technologies. Table 1 provides descriptions of the technologies.

Table 1. Postal Service – Major Transportation Technologies

Transportation Technology	Description
SV	The SV technology was designed to capture real-time data at the handling unit, container, and trailer levels using mail processing equipment and wireless handheld scanners within Postal Service facilities.
TOPS	The TOPS technology was designed to be a tactical planning system that optimizes transportation schedules, distribution tables, and mail routing plans ¹ and performs ‘what if’ analyses.
PVS-MS ²	PVS-MS technology was an off-the-shelf fleet operations management application with on-board vehicle computer that was designed to provide transportation managers with the technological mechanism to monitor, measure, and manage heavy fleet assets. It was to use global positioning system (GPS) and wireless technology to transmit data to and from the heavy fleet of cargo vans, tractors, and spotters, and was to assist PVS to remain a viable service provider in the competitive transportation marketplace.
YMS Pilot	YMS Pilot was a modified off-the-shelf application designed to track vehicles from their entrance into the facilities’ yard, when the vehicle is docked, and where the vehicle will be spotted in the yard for redeployment to another facility.

In addition to the initial capital investments, the Postal Service spent more than \$234.6 million in supporting expenses³ for these systems between FYs 2004 and 2010 as shown in Table 2. These supporting expenses included salary and benefits, supplies,

¹ The manager component produces mail routing plans and assignment instructions based on the approved and procured transportation routes developed by the Optimizer. The TOPS manager will be used to perform short-range planning; in particular, to create the actual planned routes that the plant personnel will use to dispatch the mail (typically on a weekly basis).

² Included as part of tractors/spotters and cargo vans unitary plan.

³ Network Operations – Finance and Business Analysis (FABA) branch, as of November 2010, provided SV, TOPS, and YMS Pilot fiscal year total expense information, totaling about \$233.6 million. The remaining \$1 million in PVS-MS expenses was obtained from management-approved planning documentation.

services, depreciation (of the initial capital investment), transportation, and information technology.

Table 2. Transportation Technology Initial Capital Investments and Other Expenses Over Time

	SV	TOPS	PVS-MS	YMS Pilot	Total
Initial Capital Investment:	\$22,544,171⁴	\$23,345,961⁵	\$21,692,000⁶	\$2,512,296⁷	\$70,094,428
Other Expenses by Year					
FY 2004	\$3,865,226	\$2,359,542	\$507,000	\$0	
FY 2005	24,103,512	2,672,832	536,000	0	
FY 2006	25,063,504	3,769,638	0	5,575,602	
FY 2007	32,382,971	9,344,034	0	3,884,968	
FY 2008	36,022,882	18,135,726	0	1,817,770	
FY 2009	25,729,123	11,915,550	0	607,546	
FY 2010	8,785,004	10,973,609	0	572,020	
Total	\$161,979,276	\$59,170,931	\$1,043,000	\$12,457,906	\$234,651,113
Total by Technology	\$184,523,447	\$82,516,892	\$22,735,000	\$14,970,202	\$304,745,541

OBJECTIVES, SCOPE, AND METHODOLOGY

This report presents the results of our audit of the Postal Service’s major transportation technology initiatives – SV, TOPS, PVS-MS, and the YMS Pilot. The objectives of our self-initiated audit were to assess the planning, implementation, functionality, and results of these transportation systems.

During our work, we visited Postal Service Headquarters and the New Jersey and Pittsburgh NDCs. We reviewed relevant Postal Service policies and procedures, as well as industry best practices. We interviewed managers and employees as well as observed and photographed operations. We obtained and reviewed investment policies

⁴ As described in the March 2004 *Surface Visibility Surface Air Support System Phase III* DAR, which was approved on March 9, 2004.

⁵ As described in the April 2005 *Transportation Optimization, Planning and Scheduling (TOPS)* DAR, which was approved on May 6, 2005.

⁶ As described in the May 2003 *2,014 Cargo Vans* DAR, which was approved on May 30, 2003 (updated in September 2003), and in the March 2005 *1,406 Tractors and 382 Spotters* DAR, which was approved on April 6, 2005. Management informed us that this technology’s investment for tractors/spotters and cargo vans was part of the “unitary plan” of the DARs.

⁷ At the time of the pilot, both facilities were referred to as bulk mail centers.

and documents such as DARs, Investment Highlights, DAR Compliance Reports, and meeting minutes. We requested, obtained, and analyzed system documentation from management and investment capital and supporting expense information from Network Operations' FABA branch.

We did not rely on the computer-processed data these technologies recorded for the Postal Service during its operations to satisfy the audit objectives; rather, we primarily ascertained the usability and functionality of these technologies' outputs from interviews and physical observations. We did corroborate the investment capital and supporting expense information provided by FABA with the Postal Service's Enterprise Data Warehouse.

We conducted this performance audit from February 2010 through September 2011 in accordance with generally accepted government auditing standards and included such tests of internal controls, as we considered necessary under the circumstances. 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. We discussed our findings and conclusions with management in August 2011 and included their comments where appropriate.

PRIOR AUDIT COVERAGE

We did not identify any prior OIG audits or reviews directly related to the objective of this audit. However, the Government Accountability Office (GAO) produced two related reports on the Postal Service's investment/development of the Intelligent Mail[®] program.⁸ The GAO reports concluded that:

- Planning was not comprehensive compared to industry best practices and risk mitigation plans were not in place.
- All costs were not properly identified for the technology system, including the costs of integration with other systems.
- The Postal Service experienced implementation problems and missed milestones.
- The Postal Service experienced difficulty in attributing savings directly to the program as opposed to other events.

⁸ *Intelligent Mail Benefits May Not Be Achieved if Key Risks Are Not Addressed* (Report Number GAO 09-599, issued May 2009) and *U.S. Postal Service Needs to Strengthen System Acquisition and Management Capabilities to Improve Its Intelligent Mail[®] Full Service Program* (Report Number GAO 10-145, issued October 2009).

APPENDIX B: DETAILED ANALYSIS

Technologies Did Not Achieve Intended Results

Overall, we determined that none of the transportation technology initiatives reviewed achieved all of their intended results. Specifically:

- The SV technology initiative was generally capable of functioning as planned, but it is not providing the intended transportation visibility. For example, instead of scanning all mail using the device as required, employees, in some cases, were manually estimating volumes and thus compromising visibility. In addition, we observed that not all intended scans were being performed and there was significant scanning non-compliance for the remaining required scans. The following summarizes planned functionalities and results of the SV technology.

<i>Results Achieved⁹</i>	<i>SV Major Planned Functionalities/Goals</i>
	<u>Performance Improvements</u>
	– Asset Identification
	– Asset Tracking
 ¹⁰	– Visibility
	<u>Decreased Costs</u>
Unknown through FY 2010, but significant reductions reported in FY 2011¹¹	– Reduced Transportation Costs
Unknown	– Improved Dock Productivity Tracking and Performance

- The TOPS technology initiative was implemented for routing air transportation but not for surface transportation (one of its major components) and long-range air route planning as originally designed. Most importantly, the surface transportation component was not functional because of data quality problems with source data and output results. Consequently, the Postal Service was unable to maximize surface truck loads using this system. The following summarizes planned functionalities and results of the TOPS technology.

⁹ KEY:  = Planned Functionality/Goal Achieved  = Planned Functionality Not Achieved

Unknown = Additional Audit Work is Needed to Verify Functionality/Goal Achievement.

¹⁰ We determined the SV technology is capable of improving visibility; however, our conclusion is based on the fact that the recommended scans were not consistently being performed.

¹¹ According to headquarters’ officials, SV trailer load scans were used to assess trailer utilization and they reduced contracted miles by 81.3 million through July 2011 by eliminating unnecessary transportation. The OIG plans to audit SV use and related savings in FY 2012.

<i>Results Achieved</i>	<i>TOPS Major Planned Functionalities/Goals</i>
✗	– Optimizer component ¹²
✗	– Holiday Planning
✗	– What-if Analyses
✓	– FedEx Block Requests ¹³
✗	– Contingency Planning
✗	– Manager component ¹⁴
✓	– Air Transportation Planning
✓	– Retirement of National Air and Surface System (NASS) ¹⁵

- The PVS-MS technology initiative was implemented to monitor driver and fleet performance but lacked the necessary wireless connectivity to function properly. Consequently, the Postal Service could not effectively utilize the GPS tracking and other capabilities to improve fleet efficiency. For example, there were data connectivity difficulties between the PVS-MS equipment on the mail hauling vehicles and the PVS-MS equipment at the facility.¹⁶ To compensate for these difficulties, the drivers' workday processes had to be adjusted to allow the extra time needed to ensure connectivity near the end of their workdays.¹⁷ This technology was subsequently abandoned because of wireless connectivity issues.

Illustration 1. Installed PVS-MS Tractor-Trailer Device



Source: Postal Service Training Manual dated March 2006.

¹² Component was to create a national transportation network through the analysis of various scenarios to determine the lowest cost transportation network given the service commitment.

¹³ TOPS FedEx block planning component was completed and tested, but never used, and a separate technology was developed for this purpose. The OIG questions the necessity of this new development.

¹⁴ Component was to generate corresponding dispatch plans and routing instructions for the procured transportation.

¹⁵ TOPS replaced the NASS, which was developed in the 1970s to support transportation planning and routing.

¹⁶ We learned PVS-MS's antenna access points, located at various dock locations, had their transmission ranges limited to 75 feet to minimize the risks of unauthorized system access.

¹⁷ Some sites' workaround solution was to have their drivers download the data onto a memory stick, which had to be uploaded by the supervisor into the local PVS-MS workstation. Other sites had their drivers temporarily park with the front of their mail hauling vehicles facing the dock to be closer to the antenna locations (later, the drivers would have to move their vehicles to their proper parking locations).

The following summarizes planned functionalities and results of the PVS-MS technology.

<i>Results Achieved</i>	<i>PVS-MS Major Planned Functionalities/Goals</i>
✗	– Improve Customer Service
✗	– Vehicle Utilization
✗	– Automation of Paperwork
✗	– Reduce Costs and Improve Productivity

- The YMS Pilot technology initiative was tested and implemented at two locations (the New Jersey and Pittsburgh NDCs) before planned deployment at other NDCs.¹⁸ The pilot technology improved yard efficiency through automation, but it did not relieve all required manual processes. For example, we found the Pittsburgh NDC was not using YMS’s automated trailer move assignment capabilities (a major component of YMS) to its fullest extent due to local program compliance issues. As a result, only about 30 percent of the Pittsburgh NDC’s moves were automated, while the rest were manually input.

Illustration 2. Spotter Tractors at the New Jersey NDC

RTLS devices, part of the technology hardware.



Source: New Jersey NDC, May 2010

We also determined the YMS Pilot relieved some, but not all, required manual daily yard checks to reconcile the trailer locations at the two pilot facilities.¹⁹

The following summarizes planned functionalities and results of the YMS Pilot technology:

<i>Results Achieved</i>	<i>YMS Pilot Technology Major Planned Functionalities/Goals</i>
✓	– Improve Customer Service
✓	– Increase Dock Utilization
✓	– Improve Yard Inventory Accuracy
✗ ²⁰	– Eliminate all Manual Yard Checks
✓	– Automate Check-in/Move/Checkout

¹⁸ Deployment at additional facilities was suspended due to a headquarters’ initiative to explore outsourcing of facility operations.

¹⁹ The temporary poles with RTLS devices, that have to be put on trailers that do not have permanently installed RTLS devices, many times cause YMS ‘floating’ to occur between adjacent dock and yard spaces. In other words, the system sometimes had difficulty distinguishing exactly which space a vehicle was parked in the yard and would report the vehicle was in an adjacent space.

²⁰ The YMS Pilot relieved some, but not all, required manual daily yard checks to reconcile the trailer locations at the two pilot facilities.

We concluded there were five primary reasons why these transportation technology initiatives did not achieve all their intended results. First, we found the sponsors and project managers were guided by policies focused on finance and budgetary processes rather than a system development life-cycle policy. Additionally, we determined that project management did not consistently identify significant operational deficiencies for corrective action. Third, we concluded investment planning policies were not always comprehensively followed. Fourth, investment planning policies are not as rigorous as compared to industry best practices. Finally, we determined implementation of these transportation technology initiatives did not always have support from all levels of the Postal Service.

[The Handbook F-66](#). The Handbook F-66, *General Investment Policies and Procedures*, mainly addressed finance and budgetary processes and concentrates on system planning. However, the Handbook F-66 is not a Technical Solutions Life-Cycle (TSLC) policy,²¹ as it does not substantially focus on all aspects of the TSLC including implementation, functionality, and sustainability of systems. Thus, at the time these four systems were developed, the Postal Service lacked a robust technology life-cycle process.

We learned that in March 2009, the Postal Service established the TSLC project management guidelines. TSLC is the ‘corporate development methodology used to establish and implement technology solutions’ and describes the phases [of the lifecycle] that serve as a programmatic guide to project activity and provide a flexible but consistent way to conduct projects to a depth matching the scope of the project. The TSLC guidance states, “this policy applies to all Postal Service employees and contractors that develop, enhance, or maintain technology solutions used by or developed for the Postal Service.” We reviewed the contents of the project management guidelines and determined that its provisions provide sponsors and project managers further guidance in key areas of new project implementation, not addressed in the Handbook F-66. Had the TSLC policy been established and used before development of the four transportation initiatives, the sponsors and project managers would have benefited from its guidelines. See [Appendix C](#) for more information about these policies.

[Systems Problems Were Not Always Disclosed and Addressed](#). During our review of the existing DAR close-out documentation and processes,²² we found the Postal

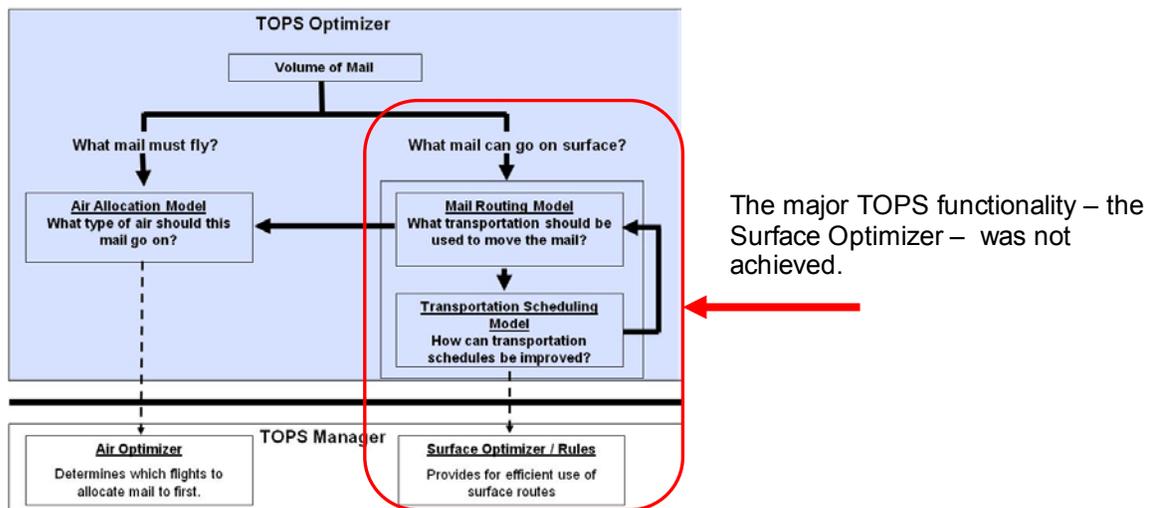
²¹ In October 2009, the Postal Service issued Handbook AS-805-A - *Information Resource Certification and Accreditation Process*, which provides guidance on how information resource certification and accreditation process is integrated with the information technology (IT) TSLC; it also explains the roles/responsibilities of the functional business areas (VPs, sponsor, and project managers), and that the business areas need to work jointly with IT personnel to implement systems.

²² According to Handbook F-66E, *Postal Vehicle Service Management System*, project sponsors must prepare and submit DAR Compliance Reports for review on a quarterly basis for submission to the Postal Service’s Program and Financial Performance group. These DAR Compliance Reports are required to be submitted from the date of DAR final approval until 18 months after the project’s completion. According to the *USPS Investment Process Overview*, updated January 2011, the Postal Service also refers to the period these compliance reports must be submitted as the Conversion, Execution, and the Post Deployment Update tollgates.

Service did not consistently identify significant operational deficiencies for corrective actions. Additionally, sponsors and project managers certified two of these transportation technology initiatives as completed, although they did not achieve some planned significant functionalities and goals.

- For example, the TOPS DAR Compliance Report submitted for the third quarter of FY 2008 stipulated project completion. However, the report failed to contain that the major planned functionality and goal, involving the TOPS Optimizer surface component²³ was not achieved (see Figure 1).

Figure 1. TOPS Optimizer Flowchart



- In another example, the SV DAR Compliance Report submitted for the fourth quarter of FY 2008, indicated project completion in February 2007. However, the report (and previously submitted quarterly reports) failed to contain that a major planned functionality/goal of improving transportation visibility was not achieved because of scanning non-compliance in the field.

Certain Project Planning Best Practices Were Not Utilized. We determined that the Postal Service did not use certain project planning best practices in implementing the technologies. Use of these best practices would have helped ensure that the technologies achieved their intended results. These best practices include:

- Risk assessments.
- Risk mitigation plans.
- System data migration plans.
- Transition planning.

²³ The Optimizer was planned to be the first component to be implemented. It will determine the correct number of trips, and optimal transportation schedules to meet mail service requirements at minimal cost. Users of the TOPS Optimizer should also be able to perform long-range (monthly/annual) transportation planning.

We determined that two of the technologies (SV and TOPS) had risk assessments,²⁴ but we found those assessments were inadequate. We found the SV DAR's risk assessment to be inadequate, because it only mentioned three risks²⁵ that could impede the successful implementation of a functional system. The risks identified in this DAR only related to additional technology installed elsewhere in the Postal Service system in order for SV to function. We also determined the TOPS DAR risk assessment to be inadequate, because it only identified three risks²⁶ that could impact the successful implementation of a functional system. The identified risks did not address the numerous contributing data sources and the questionable data quality.

We also found the Postal Service did not prepare risk mitigation plans and system data migration plans, as they were not required in Handbook F-66. In our view, if the Postal Service implemented these best practices, it would have corrected some of the system problems during the design and testing phases. For example, the migration of SV and YMS Pilot system data were not linked; consequently, trailer arrival and departure data had to be entered twice by dock personnel.

Furthermore, management did not use adequate transition planning when project managers changed, except for the YMS Pilot Initiative.²⁷ During our discussions with management, they stated that technology project managers (sponsors) changed as many as five times with little or no communication or transition. Management also stated the transitions negatively affected implementation of these technologies.

²⁴ Although not required by Handbook F-66 at the time, these two technologies did contain risk assessments.

²⁵ The SV risk assessment in the DAR, *Surface Visibility SASS Phase III*, approved March 9, 2004, consisted of one paragraph: "Successful implementation of Surface Visibility is dependent upon approval of the Mail Processing Infrastructure (MPI) Phase 2 and the Next Generation Transaction Concentrator. Without this infrastructure in place, the deployment of Surface Visibility will not be economically feasible. Additionally, if EDL (enhanced distribution label) is not deployed, tracking of handling units to container nesting would be impossible." We noted this risk assessment section of the DAR predated the 2005 version of Handbook F-66 but was inadequate.

²⁶ The risk assessment in the TOPS DAR investment document consisted of three paragraphs, which identified one technical risk ranked as 'medium,' one operational risk rated as 'low' and one integration risk rated as 'low.' We noted this risk assessment section of the DAR predated the 2005 version of Handbook F-66 but was inadequate.

²⁷ The YMS Pilot project manager remained with the project in spite of changes in assigned position, which provided the necessary continuity for successful planning efforts.

Table 3 summarizes our evaluation of the planning processes and compares the processes with industry best practices. For more information, see [Appendix D](#).

Table 3. Adequacy of Planning Process by Technology

Process Step	SV (approved 3/2004)	TOPS (approved 5/2005)	PVS-MS (approved 5/2003 & 3/2005)	YMS Pilot	Requirement per Handbook F-66 & F-66E paragraphs (as of 12/2010)	Industry Best Practice
Risk Assessment	Inadequate	Inadequate	No	No ²⁸	F-66 5-5 ²⁹ F-66E 2-6.14	Yes
Risk Mitigation Plan	No	No	No	No	No ³⁰	Yes
Migration Plan	No	No	N/A ³¹	No	No	Yes
Transition Planning	No	No	No	Yes	No	Yes

[Technology Implementation Was Not Always Supported](#). Various implementation issues inhibited the success of these systems. Management’s line of authority did not provide appropriate support for the successful implementation. In addition, we found headquarters managers, and sponsors did not always provide the appropriate support to ensure program compliance. Specifically:

- *Line of Authority/Oversight.* At the local level, many of the employees who performed scanning for the SV did not work directly for the transportation manager responsible for the system - creating a disconnect in the supervision chain. This led to low scan rates and a lack of oversight by the appropriate functional area in ensuring compliance with SV system input (scanning).

In addition, the users of PVS-MS did not always have support from all levels of the Postal Service. We determined the Postal Service did not require nor provide adequate funding for all mail hauling vehicles to be equipped with the system; therefore, only newly acquired vehicles in the approved capital investments were equipped with the system. Requests for additional funding to equip these mail-hauling vehicles with PVS-MS (that were not part of the vehicle purchase DARs) were left up to the individual areas. In addition, the Postal Service did not ensure field compliance over the systems’ use, and many facilities were not using the technology. Also, many facilities did not generate national compliance reports to

²⁸ There was no formal risk assessment documentation for the YMS Pilot, and the informal risk assessments only addressed the risk of not retaining YMS in the pilot sites and reverting to the prior legacy system.

²⁹ Handbook F-66 was updated in 2005 and required an assessment of risk; however, before that update, it was not a requirement.

³⁰ Although Handbook F-66, Section 5.5, mentions the “mitigating [of] investment risk,” it does not require a mitigation plan to be produced as part of the DAR investment planning decision.

³¹ We categorized the data migration plan as not applicable, because no legacy systems were specifically targeted for this new technology.

ensure proper system implementation as PVS-MS was a standalone system at each facility.

- **Training.** The Postal Service employed a ‘train-the-trainer’ format for the initial SV deployment, and refresher training was provided. However, as the Postal Service added new users, they did not provide formal training.³² In addition, given the system’s complexity, the Postal Service did not procure the appropriate level of training and support from the PVS-MS vendor - further impairing the Postal Service’s ability to fully implement this technology.³³

Projected Savings and Return on Investment

We determined that none of the technologies achieved all of the intended improvements in network operations or service, nor achieved intended projected savings or ROI. Table 4 summarizes our assessment of projected savings and ROI for each of the technologies.

Table 4. Investment, Savings, and ROI by Technology

Technology	SV	TOPS	PVS-MS	YMS Pilot
Total Capital Investment and Expenses	\$184,523,447	\$82,516,892	\$22,735,000	\$14,970,202
DAR Projected Savings	\$287,132,000	\$108,270,000	None ³⁴	N/A ³⁵
DAR Projected ROI (percentage)	26.6 percent	29.0 percent	None	N/A
Claimed Savings at Closeout	\$233,667,000 ³⁶	Unknown ³⁷	None	N/A
Claimed ROI at Closeout	13.5 percent	18.9 percent	None	N/A
Actual Program Savings Achieved (per components/methods specified in the DAR)	Unknown ³⁸	None ³⁹	None	Unknown ⁴⁰

³² Management informed us they will develop and deploy a new training program in calendar year 2011.

³³ During a March 2007 meeting that included Headquarters Surface Operations, Vehicle Programs Engineering, IT Portfolio, and IT Support, the PVS-MS vendor mentioned that clients of its technology usually procure 6 weeks of hands-on training. The Postal Service obtained only 3 days of training for a limited number of ‘area coordinators.’

³⁴ PVS-MS, being part of the Tractor and Cargo Van DARs, had no savings or ROI claims specified in these DARs.

³⁵ Although planning documentation for the YMS Pilot generally asserted savings, documentation was not available or provided by management to corroborate support for these assertions.

³⁶ As stated in a revised SV ROI analysis provided by management dated April 17, 2007, and used at closeout.

³⁷ Postal Service management was unable to locate the supporting cash flow documentation to identify the dollars claimed at closeout for TOPS.

³⁸ Savings unknown through FY 2010; however, management asserted that in FY 2011, about 81.3 million miles in unnecessary transportation has been removed from routes (through July) as a direct result of using data from the SV program. The OIG plans to audit SV use and related savings in FY 2012.

³⁹ Some TOPS components generated benefits and savings not specified in the DAR or tracked by the Postal Service. The specific TOPS component in the DAR for savings generation was not fully enabled as of the close of FY 2010.

⁴⁰ Planning documentation projected a gross savings of \$120 million for YMS if implemented in all 21 NDCs, but the DAR was not signed and did not go past the pilot phase, employed as the Proof of Concept to justify the DAR.

In the final analysis, the capital investments and expenses associated with these technologies totaled \$304,745,541. The planned (DAR projected) savings for these technologies totaled \$395,402,000; however, the claimed savings at project closeout totaled only \$233,667,000 and were attributable to mandated budget reductions for the SV technology and not for the actual use of the technology. Further, we were unable to verify the savings claimed at closeout was realized by the Postal Service, because supporting documentation was not provided. In the closeout of the SV project, management attested to the savings but did not have documentation to support the amounts saved.

We also found the required SV scans added additional workload to those primarily responsible for performing these scans, and despite this additional workload, budgeted labor hours were reduced. Regarding the funding for the Postal Service's investment in the TOPS transportation initiative, area officials questioned whether the TOPS budget reductions (to highway contract route funding to pay for this new technology) were linked to actual opportunities for savings.

APPENDIX C: Handbook F-66E and the TSLC

We determined that project managers and sponsors lacked sufficiently robust technology life-cycle policies to aid in the implementation, functionality, and sustainability of systems, until the TSLC was established in March 2009. Rather, their efforts focused primarily on meeting the requirements placed upon them by Handbook F-66, which provided them little guidance on the implementation of functional systems as summarized in the following table. While the technology implementation process in place before March 2009 provided some direction, we determined the TSLC and its provisions provide project managers and sponsors further more robust guidance in key areas of new project implementation not addressed in Handbook F-66. In the following table, we summarized key sections of these two policies.

Handbook F-66E	TSLC
<p>DAR</p> <ul style="list-style-type: none"> ▪ System description and benefits. ▪ Alternatives. ▪ Economics. ▪ Risk assessment. ▪ Performance metrics. ▪ Financial summary. ▪ Recommendation. ▪ Exhibits (Cash flow, list of sites, major assumptions). ▪ Project schedule. ▪ Net present value analysis. <p>Review and Approval Process</p> <p>Validation</p> <p>DAR Modification</p> <p>DAR Compliance Reports per the Handbook F-66E - [From the date of final approval until 18 months after the project's closeout</p>	<p>Initiate and Plan</p> <ul style="list-style-type: none"> ▪ Identify the short- and long-term business needs. ▪ Cost matrices. ▪ Develop initial project plan. <p>Technology Solution Requirements Procedures</p> <ul style="list-style-type: none"> ▪ Develop technology solution requirements. <p>Analysis and Design Procedures</p> <ul style="list-style-type: none"> ▪ Perform a risk assessment. ▪ Draft system integration test strategy. ▪ Draft Customer Acceptance Testing (CAT) strategy. ▪ Complete project plan final baseline. <p>Technology Solutions Build Procedures</p> <ul style="list-style-type: none"> ▪ Building of test, pre-production, and production infrastructure . ▪ Customization. ▪ Implementation of controls. <p>System Integration Testing Procedures</p> <ul style="list-style-type: none"> ▪ System integration testing. <p>CAT Procedures</p> <ul style="list-style-type: none"> ▪ Perform and analyze CAT.

<p>(completion), every quarter sponsors must prepare and submit DAR Compliance Reports for review.]</p> <ul style="list-style-type: none">▪ Project status of each goal.▪ Budget impact of investments and operating variances.	<ul style="list-style-type: none">▪ Unresolved risk mitigation procedures.▪ Signoff by sponsor and portfolio manager (CAT letter).
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APPENDIX D: INDUSTRY BEST PRACTICES – PROJECT PLANNING

Our research of the industry best practices identified four key planning attributes that contribute to the successful acquisition and/or development of technologies. In the following table, we provide the industry definitions and identify their source.

<p><u>Risk Assessment</u></p> <ul style="list-style-type: none"> ▪ A risk assessment includes the evaluation, categorization, and prioritization of risks. “The evaluation of risks is needed to assign a relative importance to each identified risk and is used in determining when appropriate management attention is required.” 	<p><u>Source</u></p> <p>As described on page 357 of the <i>Capability Maturity Model® Integration for Development V.1.3</i> dated November 2010.</p>
<p><u>Risk Mitigation Plan</u></p> <ul style="list-style-type: none"> ▪ Risk mitigation planning is an approach for addressing or mitigating risks identified in the risk assessment. “A critical component of risk mitigation planning is developing alternative courses of action, workarounds, and fallback positions, and a recommended course of action for each critical risk. The risk mitigation plan for a given risk includes techniques and methods used to avoid, reduce, and control the probability of risk occurrence; the extent of damage incurred should the risk occur (sometimes called a ‘contingency plan’); or both. Risks are monitored and when they exceed established thresholds, risk mitigation plans are deployed to return the affected effort to an acceptable risk level. If the risk cannot be mitigated, a contingency plan can be invoked. Both risk mitigation and contingency plans often are generated only for selected risks for which consequences of the risks are high or unacceptable. Other risks may be accepted and simply monitored.” 	<p><u>Source</u></p> <p>As described on page 7 of the Software Engineering Institute’s (SEI) <i>Risk Management Framework</i>, dated August 2010; and, page 344 of the <i>Capability Maturity Model® Integration for Acquisition V.1.3</i> dated November 2010.</p>

<p><u>Data Migration Planning</u></p> <ul style="list-style-type: none">Migration plans should be used to supplement the plan when legacy systems are targeted for replacement. “The migration plan addresses issues associated with phasing out legacy systems and moving to the new system. These issues include user interface compatibility, database compatibility, transition support, system interface compatibility, and training. By producing and implementing a migration plan, a development organization can help a user community make the transition in an orderly fashion.”	<p><u>Source</u></p> <p>As provided by SEI - Carnegie Mellon®.</p>
<p><u>Transition Planning</u></p> <ul style="list-style-type: none">The number one contributor to the success of a new initiative is the project manager or sponsor. “Manager change, as with organizational change, creates adaptation challenges for all individuals involved.” Productivity of the project team suffers and key deliverables are often missed or delayed. With transition planning, organizations “can ensure that teams are equipped with the means to seamlessly transition new managers into positions and more quickly deliver on their commitments.”	<p><u>Source</u></p> <p>As described by the Procci Change Management Learning Center and the Dawson Consulting Group.</p>

APPENDIX E: MONETARY IMPACTS

Finding	Impact Category	Amount
TOPS	Questioned Costs ⁴¹	\$9,323,532

Although we found the total \$105.2 million investment costs in the TOPS and PVS-MS technologies unnecessary as shown in the following chart, we limited our questioned costs based on OIG policy to those incurred by the Postal Service in FYs 2009 and 2010. Consequently, our monetary impact totals about \$9.3 million for the TOPS technology including \$11,915,550 of expenses in FY 2009, less \$7,255,083 of depreciation, and \$10,973,609 of expenses in FY 2010, less \$6,310,544 of depreciation.

TOPS – PVS-MS Investment Costs

	TOPS	PVS-MS	Total
Initial Capital Investment	\$23,345,961	\$21,692,000	\$45,037,961
Other Expenses by Year			
FY 2004	\$2,359,542	\$507,000	
FY 2005	2,672,832	536,000	
FY 2006	3,769,638	0	
FY 2007	9,344,034	0	
FY 2008	18,135,726	0	
FY 2009	11,915,550	0	
FY 2010	10,973,609	0	
Total	\$59,170,931	\$1,043,000	\$60,213,931
Total by Technology	\$82,516,892	\$22,735,000	\$105,251,892

⁴¹ Questioned costs are costs that are unnecessary, unreasonable, or an alleged violation of law or regulation – in this case, unnecessary.

APPENDIX F: Management's Comments



September 20, 2011

SHIRIAN B. HOLLAND
ACTING DIRECTOR, AUDIT OPERATIONS

SUBJECT: Evaluation of Major Transportation Technology Initiatives
(Report Number NL-AR-11-DRAFT)

Thank you for the opportunity to respond to the recommendations contained in the Draft Audit Report – Evaluation of Major Transportation Technology Initiatives.

Management agrees with the findings as outlined in the audit with the following exceptions:

The Yard Management System (YMS) initiative did eliminate the manual processes it targeted. The cited example at the Pittsburgh Network Distribution Center (NDC) was, as noted in the audit, due to the local site not complying with the required procedures.

The Postal Service has already identified many of the issues noted in the audit and has taken many steps to address them. As stated in the audit, the Postal Service developed and implemented the Technology Solution Life Cycle (TSLC) process in 2009 by which programs are now designed, developed, and deployed. This system uses a structured approach based upon best practices to standardize and document the life of a program.

The Postal Service has also identified the need to identify and assess risks as part of the program management process. This has been included in the annual budgeting process for programs in the Business Case System (BCS). This application requires program managers to identify and assess risks as well as identifying the potential impact and developing mitigation strategies.

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Management would also like to note that the YMS initiative is currently moving forward with deployment to the remaining NDC facilities. In addition, we have developed an interface between YMS and Surface Visibility (SV) in order to further automate the process by sharing data between the two systems. This was not originally considered because the SV initiative was not initially planned to include the NDC offices. As part of the deployment process of YMS, we have a team at each location to provide hands on training to the local sites. The team is also there to provide support during the implementation and during the following week. Issues that are identified at a site are being addressed if possible prior to the team's departure. Follow-up is made to ensure issues are not dropped. Any issues identified at prior sites are reviewed with subsequent sites in order to share best practices.

The Postal Service disagrees with the conclusions reached in Appendix E regarding the categorization of all of these expenses as unnecessary. During this time period, Transportation Optimization Plan and Schedule (TOPS) was charged for various Information Technology (IT) support costs including database maintenance, computing services, and data transfer totaling \$760,486 in fiscal year (FY) 2009 and \$518,050 in FY2010. In addition, the TOPS account pays for the receipt of the Official Airline Guide files needed to validate planned routes; this cost was \$177,720 in FY2010. The remaining costs were for vendor support for development and changes to the application, the transition of TOPS to Postal Service IT, as well as the retirement of National Air and Surface System which was completed in FY2010.

Recommendation 1:

Ensure that Network Operations sponsors and project managers follow the Postal Service's technology solution lifecycle guidelines.

Management Response/Action Plan:

Management agrees with this recommendation. The TSLC model has been embraced by the Postal Service for all existing programs. The model requires the development and documentation of requirements, testing, and deployment through a standardized system of controls. All future technologies will be developed and planned using this model.

Target Implementation Date:

October 2011

Responsible Official:

Manager, Network Development and Support.

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Recommendation 2:

Require operational deficiencies be identified for corrective action and addressed prior to project closeout.

Management Response/Action Plan:

Management agrees with this recommendation. Future programs will be required to go through an Operational Review prior to submitting the project for closeout. The review process will require input from the sites involved in the project as well as the departments involved at Headquarters.

Target Implementation Date:

November 2011

Responsible Official:

Vice President, Network Operations

Recommendation 3:

Facilitate the inclusion of robust risk assessment, risk mitigation, system data migration, and transition planning best practices into investment planning policies.

Management Response/Action Plan:

Management agrees with this recommendation. The Postal Service has included the identification of risk management items as part of the annual program budgeting and review process. The system requires program managers to identify risk and mitigation plans related to each and documents same. All new technology will be entered in this system and the risks and mitigation plans reviewed prior to proceeding to development.

Target Implementation Date:

October 2011

Responsible Official:

Manager, Network Development and Support.

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Recommendation 4:

Ensure establishment and maintenance of the proper line of authority, funding, and oversight for key programs by responsible sponsors and management officials.

Management Response/Action Plan:

Management agrees with this recommendation. All new technology initiatives in Network Operations will be managed by the Network Development and Support group. They will have oversight of the projects from design to implementation and ensure that a proper line of authority is maintained throughout the process.

Target Implementation Date:

October 2011

Responsible Official:

Vice President, Network Operations

Recommendation 5:

Ensure comprehensive training is provided for employees throughout the technology's life cycle.

Management Response/Action Plan:

Management conditionally agrees with this recommendation. As part of the management of the initiatives in Network Operations, training courses will be developed as needed to meet the needs of the users in both initial deployment and through the life of the program. Training will be reviewed at least on an annual basis to determine if updates are required. Depending upon the degree of change needed, the training may simply be supplemented with notices advising of the minor change or redone. If an initiative does not require formal training, reference material for the initiative will be maintained in accessible locations as appropriate for the initiative.

Target Implementation Date:

May 2012

Responsible Official:

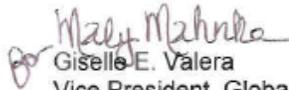
Manager, Network Development and Support.

- 5 -

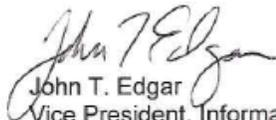
This report and management's response do not contain information that may be exempt from disclosure under the Freedom of Information Act.



David E. Williams
Vice President, Network Operations



Giselle E. Valera
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