
Office of Inspector General

Audit Report

AMTRAK'S NEW COST ACCOUNTING SYSTEM IS A SIGNIFICANT IMPROVEMENT BUT CONCERNS OVER PRECISION AND LONG TERM VIABILITY REMAIN

Federal Railroad Administration

Report Number: CR-2013-056

Date Issued: March 27, 2013






Memorandum

**U.S. Department of
Transportation**

Office of the Secretary
of Transportation
Office of Inspector General

Subject: **ACTION:** Amtrak's New Cost Accounting System
Is a Significant Improvement But Concerns Over
Precision and Long Term Viability Remain
Federal Railroad Administration
Report No. CR-2013-056

Date: March 27, 2013

From: Mitchell Behm 
Assistant Inspector General for Rail, Maritime, and
Economic Analysis

Reply to
Attn. of: JA-50

To: Federal Railroad Administrator

For several years, Amtrak management, Congress, and other stakeholders¹ expressed concerns about weaknesses in Amtrak's cost accounting system, the Route Profitability System (RPS). Specifically, they raised concerns over the system's weaknesses in transparency, timeliness, system maintenance, and cost allocation. In 2005, the Government Accountability Office (GAO) reported that Amtrak's reliance on cost allocation rather than cost assignment² and RPS's lack of transparency contributed to unreliable financial performance reporting.³ In response to these problems, Congress required the Federal Railroad Administration (FRA) to develop and Amtrak to implement a modern cost accounting and reporting system.

The Passenger Rail Investment and Improvement Act of 2008 (PRIIA)⁴ required the Department of Transportation's Office of Inspector General (OIG) to review the new system to determine whether it produces reliable reporting on Amtrak's financial performance. Specifically, our objectives were to assess whether the system: (1) tracks Amtrak's financial performance by route, line of business, and

¹ Amtrak's other stakeholders include FRA, States and freight and commuter railroads.

² In this report, assigned costs are referred to as costs that can be traced exclusively to a particular product or service; while allocated costs are referred to as costs that cannot be traced exclusively to a particular product or service and therefore must be apportioned in a reasonable and consistent way.

³ GAO, Amtrak Management – Systemic Problems Require Actions to Improve Efficiency, Effectiveness, and Accountability, GAO-06-145, October 2005.

⁴ P.L. No. 110-432 Div. B.

major activity; (2) addresses concerns with RPS; and (3) calculates Amtrak's avoidable costs⁵ with respect to each of its routes using a sound methodology.

In conducting this audit, we interviewed Amtrak and FRA officials and their contractors and consultants to identify critical elements of the new system's design and implementation, and assess whether the system meets its mandatory requirements. We also reviewed Amtrak's new cost accounting system's underlying cost methodology and FRA's avoidable cost methodology, observed system demonstrations, and analyzed system reports. Additionally, we interviewed officials at other railroads, and academics and experts in the fields of transportation economics, information technology, and cost accounting to assess the reasonableness of FRA's avoidable cost methodology. We conducted this audit according to generally accepted Government auditing standards. A more detailed discussion of our scope and methodology is provided in Exhibit A. A description of some basic cost accounting principles is provided in Exhibit B.

BACKGROUND

As a private corporation that receives billions of dollars in capital and operating grant funds from the FRA, Amtrak is required to submit regular reports to Congress on the financial performance of each of its 45 train routes. For 34 years, Amtrak generated these route performance reports using RPS. However, RPS did not provide the reliable cost accounting information essential to making prudent business decisions. Furthermore, because RPS did not report on the financial performance of Amtrak's ancillary lines of business,⁶ there were also concerns over the system's ability to delineate revenues and costs by lines of business.⁷

RPS's shortcomings led to two congressional mandates requiring FRA to develop, and Amtrak to implement, an improved cost accounting and reporting system. The first, the Consolidated Appropriations Act of 2005,⁸ required FRA to develop, and Amtrak to implement, a methodology to calculate and report Amtrak's fully allocated costs and avoidable costs. The second mandate, PRIIA, required Amtrak to implement a modern financial accounting and reporting system to track and report on all its revenues and costs by route, line of business, and major activity.⁹

⁵ Avoidable costs are those costs which can be eliminated with the cessation of an activity, such as the manufacture of a product line, or, in this case, the operation of an Amtrak route.

⁶ In addition to its intercity train operations, Amtrak engages in ancillary business activities, including commuter rail services for several States and transit agencies, equipment maintenance for other rail carriers, and rights-of-way and real estate leasing.

⁷ GAO-06-145

⁸ P.L. No. 108-447 Div. H.

⁹ Major activities within Amtrak's routes and lines of business include train operations, equipment maintenance, food and beverage services, and sleeping car services.

In 2010, Amtrak implemented its new system, Amtrak's Performance Tracking (APT), which is based on a cost methodology developed jointly by FRA and Amtrak, to track and report on its financial performance. APT consists of two modules—one that tracks and reports on Amtrak's financial performance and another that calculates and reports avoidable costs for each Amtrak route. In 2010, Amtrak also implemented its SAP Enterprise Resource (SAP)¹⁰ system that consolidates data from Amtrak's supply chain, human resources management, and asset performance management systems with its financial accounting system. APT is one of SAP's ancillary systems¹¹ and is dependent on the financial data that SAP contains to track and report on Amtrak's financial performance. APT and SAP were independently designed and consequently are not fully integrated. This lack of integration has required Amtrak to develop a software bridge, or interface, that allows the movement of financial data from SAP into APT.

In 2012, Amtrak announced its plan to reorganize its train operations into four new business lines—Northeast Corridor Services, Long-Distance Services, State Supported Routes, and Commuter Routes. This reorganization is intended to improve both Amtrak's understanding of the sources of its revenues and costs and its evaluation of each line's financial performance.

RESULTS IN BRIEF

While APT and SAP, Amtrak's cost accounting and financial accounting systems, were independently designed pursuant to separate congressional mandates, together they allow Amtrak to track and report on its financial performance by route, line of business and major activity.¹² However, implementation issues related to data flow between the two systems have delayed its performance reporting. Amtrak developed a new software interface between the two systems that is intended to align the data from SAP to work correctly with APT. While the new interface may resolve the underlying data flow issues, the company has not yet demonstrated that it can produce performance reports in a timely manner to meet statutory reporting requirements.

APT addresses the concerns raised about RPS's shortcomings including system transparency and reporting timeliness but it does not address concerns related to system maintenance and cost assignment. To improve transparency, Amtrak maintains both paper and electronic copies of APT's methodology and has developed a formal process to evaluate and document system changes. With APT,

¹⁰ SAP is a German software company that is an international leader in software and software-related services. Thousands of companies use SAP software to run their day-to-day business transactions and processes.

¹¹ SAP has 29 ancillary systems, including ones that feed cost data into SAP from various business functions such as procurement, payroll, sales and distribution, etc., and others that rely on information generated within SAP.

¹² Amtrak uses APT to report its performance by route and line of business, while SAP reports by major activity.

Amtrak expects to be able to produce monthly performance reports in 12 to 14 days after the end of the reporting period, a significant improvement over RPS. However, when designing APT, Amtrak customized the system to its operations rather than using an off-the-shelf system. This custom design makes APT challenging and more costly to maintain, raising concerns regarding its long-term utility. Furthermore, while it assigns about 90 percent of its revenues, Amtrak assigns only 20 percent of its costs and allocates the rest. While all cost accounting systems rely on cost allocation to a degree, it is generally preferable to assign as many costs as practical and allocate the remainder on some reasonable and consistent basis. Amtrak is unable to assign a greater percentage of its costs or allocate costs more precisely because Amtrak does not collect sufficiently detailed cost data. For example, Amtrak does not measure and record each train journey's fuel consumption, but rather relies on a formula that estimates a journey's fuel consumption. In addition, Amtrak's heavy reliance on cost allocation reduces the precision of its performance reporting. Finally, Amtrak developed APT and SAP around its current business practices, but it did not assess those business practices to identify changes that would allow more precise tracking and financial performance reporting.

According to Amtrak officials, Amtrak has not yet implemented FRA's methodology for calculating avoidable costs due to time and resource limitations. However, this methodology has significant limitations. FRA's methodology relies notably on the use of statistical estimation that is not supported by economic theory; fails to account for key factors such as wages and rents; and bases its calculations on a limited data sample. Consequently, Amtrak and Congress may not have a reliable estimate of the savings that could result from eliminating a route.

We are making several recommendations to FRA to improve the precision of Amtrak's financial performance reporting.

APT CAPTURES AMTRAK'S FINANCIAL PERFORMANCE, BUT PROBLEMS WITH DATA FLOW HAVE DELAYED REPORTING

With APT and SAP, Amtrak can capture its financial performance by route, line of business and major activity, as PRIIA requires. However, issues related to the implementation of the software interface between the two systems affected the flow of data from SAP into APT and prevented Amtrak from compiling timely performance reports. Consequently, Amtrak has not yet complied with PRIIA's requirement to produce performance reports within 90 days of its fiscal year's end. Amtrak has recently made changes to the interface that it believes corrects the data flow issues and should enable it to comply with PRIIA's reporting timeline.

APT ADDRESSES SOME BUT NOT ALL OF RPS'S SHORTCOMINGS

APT is an improvement over RPS with regards to system transparency and reporting timeliness, but its high level of customization could make it costly and challenging to maintain. Furthermore, Amtrak developed APT and SAP around its current business practices, and did not assess those practices to identify changes, such as collection of more detailed cost data. Such data might enable Amtrak to assign additional costs or make more precise allocations, which would lead to more precise financial performance reporting. As a result, like RPS, APT allocates rather than assigns a majority of Amtrak's operating costs.

APT Is More Transparent and Timely than RPS, But Its Complex Design May Be Challenging and Costly To Maintain

APT is more transparent than RPS and is capable of timely reporting, but its complex design, caused by a high level of customization, will be difficult to maintain. RPS lacked transparency because Amtrak did not adequately document its methodology, and only a few individuals had access to the system. Consequently, Amtrak management and other stakeholders questioned the accuracy and reliability of the system's performance reports.

APT is more transparent than RPS because Amtrak maintains up-to-date paper and electronic copies of the system's methodology, and grants access to both internal and external stakeholders to review the methodology. Furthermore, Amtrak has a process in place for reviewing suggestions from system users for changes to the methodology. As revisions are implemented, Amtrak updates both the paper and electronic copies of the methodology to maintain transparency.

While RPS regularly issued performance reports as late as 6 weeks after the end of each reporting period—each month of the fiscal year—Amtrak officials told us that APT will require only 14 business days following the end of the month to produce reports. This reporting time meets the timeliness requirements of Amtrak's management and aligns more closely to the reporting timelines of comparable railroads.

While APT's transparency and reporting timeliness are markedly better than RPS's, its maintenance may be problematic because of its high level of customization. RPS used an obsolete software platform and was also highly customized. As the system aged, Amtrak had difficulty finding individuals with the expertise to operate and maintain the system. FRA and Amtrak jointly designed and developed APT. As a result, Amtrak will have to maintain APT itself, as it did RPS. While off-the-shelf software systems must be customized to a

degree to support their users' operations, Amtrak's high level of customization, which includes the SAP/APT interface, will require ongoing investment to ensure continued viability.

Amtrak's Reliance on Cost Allocation Reduces the Precision of APT's Reporting

Amtrak's heavy reliance on cost allocation, which requires cost estimation, reduces the precision of APT's performance reporting. While it assigns over 90 percent of its revenue, Amtrak assigns only about 20 percent of its costs, and allocates the rest. APT increased the percentage of assigned costs from RPS's 5 percent to 20 percent. However, Amtrak is unable to assign a greater percentage of costs because its current business practices do not require the collection of detailed data on costs. The company did not assess its business practices to identify changes that would allow more precise financial performance reporting. For example, Amtrak's current business practice does not call for tracking each train journey's fuel consumption, but rather relies on a formula that estimates a journey's fuel consumption. While every cost accounting system relies on allocation to a degree, other railroads assign as much as 80 percent of their costs to track their performance with precision. Before they introduce new systems, these entities, for example, the Canadian National Railway Company and the Swiss Federal Rail Company, analyze their business practices to identify changes that will improve reporting precision.

While it did not engage in a business process analysis for APT and SAP's development, Amtrak is in the process of making changes to its business practices in at least one area. For example, it is expanding its asset management system, known as Maximo, to collect more detailed cost data regarding Amtrak's capital assets that will allow the company to increase its percentage of assigned costs. Eventually, Maximo will be used to track the maintenance expenses for all of Amtrak's infrastructure and rolling stock assets, and feed these data into SAP. As a result, Amtrak's reporting of its maintenance and capital costs by route and line of business will be more precise.

FRA'S AVOIDABLE COST METHODOLOGY, WHICH AMTRAK HAS NOT YET IMPLEMENTED, HAS SIGNIFICANT LIMITATIONS

According to Amtrak officials, Amtrak has not yet implemented FRA's methodology for estimating avoidable costs because of time and resource limitations. However, the methodology—meant to provide Amtrak and Congress with information on the financial impact associated with eliminating any route—has significant limitations because it relies to a substantial extent on statistical

estimation¹³ that: (1) is not supported by economic theory; (2) does not account for key factors such as wages and rents; and (3) is based on limited data. Other railroad officials we met with have developed transparent and systematic approaches to identify savings without using statistical estimation.

FRA's Methodology Relies on a Questionable Use of Statistical Estimation

Economic theory does not support FRA's use of statistical estimation. According to economic theory, the response of costs to changes in output at one company can be estimated by using the relationship between costs and output levels seen across multiple companies. For example, if costs are \$100 higher at one company that produces 1,000 more units of a product than other companies making the same product, economic theory supports concluding that if another company increases output by 1,000 units, its costs will also increase by \$100. This support only holds up under the assumption that individual companies minimize costs. FRA's methodology substitutes Amtrak's responsibility centers¹⁴ for individual companies. It then uses the relationship between costs and activity levels across responsibility centers to predict the change in costs for Amtrak as a whole following a change in activity level.

The use of this relationship is problematic because minimizing Amtrak's total costs may be incompatible with minimizing responsibility center costs. For example, minimizing total costs may require Amtrak to reduce its fuel costs, which are assigned to one responsibility center. However, achieving lower fuel costs may require increasing locomotive maintenance costs, which are assigned to another responsibility center. Consequently, both responsibility centers cannot minimize costs when Amtrak minimizes its total costs.

Economic theory does not support FRA's designation of estimates derived using one statistical process as "short run avoidable costs," and those derived using another process as "long run avoidable costs." In economic theory, the difference between short run and long run costs is based on some production factors, such as railroad tracks, being fixed in the short run and all production factors being flexible in the long run. Because FRA's methodology does not account for any fixed costs, it cannot produce appropriately differentiated cost estimates, which may affect rail service planning.

¹³ The avoidable cost shares of approximately one-fourth to one-third of total costs were determined using this methodology.

¹⁴ A responsibility center is an organizational unit within Amtrak's financial system for which a specific manager can be held responsible for financial results. FRA has grouped these centers by similarity of activities and functions into 9 cost families, such as maintenance of equipment and sales and marketing, and with 36 subfamilies including maintenance of way track, locomotive maintenance, and fuel.

The absence of key cost drivers, such as wages and rents, in FRA's estimations may bias results. For the most part, the estimations only relate cost changes to changes in an activity measure, such as train-miles. Estimates of how much costs would decrease with a reduction in train-miles using FRA's methodology would, for example, be biased upward if both wages and train-miles fell over the same time period.

Two other aspects of the methodology's use of statistical estimation raise concerns. First, the estimates' reliability and precision may be questionable because FRA bases them on only 3 years' worth of data. Second, for many cost categories¹⁵ the methodology uses an estimate of the share of costs that is avoidable for one cost category to stand in for the share of costs that is avoidable for other categories. For example, the share of costs estimated as avoidable for the preventive and as-needed cost categories for locomotive and car maintenance is used to calculate avoidable costs for major equipment repairs and capital overhauls.

Use of Statistical Estimation to Identify Avoidable Costs Is Not Standard Practice in the Railroad Industry

None of the passenger and freight rail entities we interviewed uses statistical estimation to identify avoidable costs. There is no industry standard for avoidable cost analysis, and it is viewed as an internal process meant to provide information to management's decision-making on future levels of service. FRA decided to use a statistical method because it believed the method to be transparent and objective. Other entities' processes for these calculations vary from finance departments' calculation of savings through systematic cost review, to use of checklists of issues and costs developed by experts with detailed guidance on how to assess them. Transparency is achieved by making thorough documentation of assumptions and rules used in cost savings calculations publically available.

CONCLUSION

As it reorganizes, Amtrak will need APT and SAP to provide accurate and reliable financial information and data to evaluate its business lines' performance. While APT and SAP represent an improvement over the prior cost accounting system, weaknesses such as overreliance on cost allocation may inhibit Amtrak from achieving improved operations and oversight of its business lines. Furthermore, these weaknesses will inhibit Congress from obtaining the information necessary to ensure the appropriate expenditure of tax payer provided funds.

¹⁵ The share of these categories in total costs however, appears to be limited to less than ten percent.

RECOMMENDATIONS

We recommend that FRA:

1. Verify that the software interface enables the data from SAP to work correctly with APT.
2. Work with Amtrak to develop a plan to maintain APT's long-term utility.
3. Work with Amtrak to analyze its business processes to identify changes that would enable it to assign additional costs wherever economically feasible.
4. Evaluate alternatives for addressing the requirement to calculate avoidable costs.

AGENCY COMMENTS AND OFFICE OF INSPECTOR GENERAL RESPONSE

We provided a draft of our report to FRA on January 9, 2013 and received its response on March 11, 2013. FRA's complete response is included as an appendix to this report. In its response, FRA concurred with all four of our recommendations and provided planned actions and target dates for completion. However, FRA stated that its existing avoidable cost methodology fulfills the purpose of providing an order of magnitude estimate of changes to Amtrak's expenses from the elimination of a single route. We question FRA's assertion because if a comparison of the impact of eliminating different routes is necessary, order of magnitude estimates could not likely differentiate between the savings associated with eliminating each route. FRA also stated that in the event of major reductions in Amtrak's Federal grants, the elimination of multiple routes would have to be considered and that the avoidable cost methodology would not be sufficient under those circumstances. While FRA plans to update its analysis of alternative approaches to avoidable cost estimation, we believe that FRA's statement demonstrates why the Agency needs to evaluate alternatives to the current avoidable cost methodology. Therefore, we ask that FRA reconsider its response to recommendation 4.

ACTIONS REQUIRED

We consider recommendations 1, 2, and 3 resolved but open pending completion of planned actions. Concerning recommendation 4, we ask that within 30 days from the issuance of this report, FRA provide us with additional information on its planned approach to updating its prior analysis of alternative approaches for

calculating Amtrak's avoidable costs. Accordingly, we consider recommendation 4 as open and unresolved until we receive FRA's revised response, or the results of its evaluation demonstrating that FRA has met the intent of our recommendation. Toward that end, FRA also asked if we could share the information we obtained on how related entities calculate avoidable costs. We agree and plan to arrange a meeting to share that information with FRA at the Agency's convenience.

We appreciate the courtesies and cooperation of Federal Railroad Administration representatives during this audit. If you have any questions concerning this report, please call me at (202) 366-1995, or Ms. Yana Hudson, Program Director, at (202) 366-2985.

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cc: DOT Audit Liaison (M-1)
FRA Audit Liaison (RAD-41)

EXHIBIT A. SCOPE AND METHODOLOGY

We conducted this congressionally-mandated performance audit from March 2012 to January 2013, in accordance with generally accepted Government auditing standards. Those standards require that we plan and perform an audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe the evidence we obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

We interviewed Amtrak and FRA officials and their contractors and consultants to identify critical elements of APT's design and implementation and assess whether the system meets the requirements to report Amtrak's results by route, line of business and major activity. From these interviews, we also determined the roles and responsibilities of each entity in APT's development and implementation. We also reviewed APT's cost methodology and participated in system demonstrations. We interviewed officials at comparable railroads and academics and experts in the fields of information technology and cost accounting to assess the reasonableness of FRA's cost methodology and to evaluate whether APT incorporates best practices. Finally, we reviewed APT's reports to assess whether Amtrak can track and report on its financial performance by route, line of business and major activity, and whether these reports capture all of Amtrak's revenues and costs.

To assess whether APT addresses the concerns regarding RPS, Amtrak's prior cost accounting system—the issues of timeliness, over reliance on allocation of costs, system maintenance and transparency—we interviewed Amtrak management staff who oversaw both RPS's operation and APT's development. We also had Amtrak management demonstrate how APT works and explain how aspects of APT overcome specific shortcomings of RPS. We also interviewed consultants that Amtrak hired in support of the development of their IT systems. We obtained and reviewed a copy of FRA's cost allocation methodology. We also interviewed information technology and cost accounting experts with regards to how comparable European transportation entities allocate and account for costs. Finally, we interviewed officials with both North American Class I freight railroads and intercity passenger rail carriers to explore comparable systems.

To assess whether APT's avoidable cost module would produce avoidable costs for each Amtrak route using a sound methodology, we reviewed module documentation and interviewed Amtrak, FRA, and Volpe officials. We also reviewed basic economic theory and common economic practice as exemplified by Mas-Colell, Whinston, and Green's "Microeconomic Theory" and Wooldridge's "Econometric Analysis of Cross Section and Panel Data." To determine how related entities calculated their avoidable costs, we conducted

interviews with North American Class I freight railroads and North American and European intercity passenger rail carriers. We also interviewed rail cost experts at Leeds University, Steer Davies Gleave, Lufthansa Systems, and Civity Management Consultants.

EXHIBIT B. GLOSSARY OF KEY COST ACCOUNTING TERMS

allocated cost: In this report, allocated costs are the same as indirect costs (*see definition below*).

allocation: The process of distributing costs or revenues to individual train services and other businesses and customers. In this report, allocation refers to the distribution of indirect costs.

assigned cost: In APT, these costs are directly traced to trains or other businesses and customers rather than allocated. *See definition of Direct Costs below for further clarification.*

direct costs: Costs that are directly expended or committed in the process of producing a service or other output and that can be traced in the accounting system exclusively to that service and/or output in an economically feasible manner.

indirect cost: The costs of resources committed or used as a result of the production of a service or other output that cannot be traced in the accounting system exclusively to that service and/or output in an economically feasible manner.

shared costs: The costs incurred that support more than one service or other output and that cannot be uniquely associated with an individual service or output.

EXHIBIT C. ORGANIZATIONS VISITED OR CONTACTED

During this audit, we visited or contacted the following organizations:

FRA's Contractors:

- John A. Volpe National Transportation Systems Center (Volpe Center)
- Dr. Robert Church – Contractor to Volpe Center

Amtrak's Information Technology Consultants:

- Accenture (SAP system)
- Sandpoint Consulting (APT system)

North American Class I Freight Railroads:

- Canadian National Railway Company
- Norfolk Southern Corporation

Intercity Passenger Rail Carriers:

- Deutsche Bahn AG Railway Company
- Swiss Federal Railway Company
- VIA Rail Canada

Information Technology, Cost Accounting and Economic Experts:

- Lufthansa Systems
- Civity Management Consultants, Hamburg, Germany
 - Frank Zschoche, Founder and Partner
 - Klaus Wittmeier, Senior Project Manager
- Andrew Smith, Ph.d., Leeds University Business School, Leeds, United Kingdom
- Tessa Wordsworth, Principal Consultant, Steere Davies Gleeve

EXHIBIT D. MAJOR CONTRIBUTORS TO THIS REPORT

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APPENDIX. AGENCY COMMENTS



U.S. Department
of Transportation

Federal Railroad Administration

MEMORANDUM

Subject: INFORMATION: FRA Response to OIG Draft Report
on Amtrak's New Cost Accounting System

Date: March 11, 2013

From:

Joseph Szabo

Federal Railroad Administrator

Mitch Behm

To: Assistant Inspector General for Rail,
Maritime, and Economic Analysis

Reply to the
Attn of: ROA-03

Amtrak's new cost accounting system—strengthened by detailed study of intercity passenger rail expense allocation and avoidability—marks a major step forward in rail cost analysis. Amtrak Performance Tracking (APT) is designed to produce systematic, rational, and practical results with regard to both allocated and avoidable costs, at a level of complexity commensurate with the Amtrak's diverse business lines and its necessary reliance on shared services and facilities.

APT provides a consistent and reliable basis for establishing and allocating the costs of each train route operated by Amtrak, and thus supports implementation of section 209 of the Passenger Rail Improvement and Investment Act (PRIIA). Amtrak and the States, with approval from the Surface Transportation Board—the Nation's impartial arbiter of railway costing—endorsed this APT-based methodology, demonstrating its broad acceptability among diverse stakeholders.

Amtrak Enterprise Drives Complexity of Design

The complexity and customization of APT represent a case of form following function. Amtrak operates 44 routes; of these, routes that substantially share facilities account for approximately half of Amtrak's total train-miles and expenses. Furthermore, Amtrak engages in related ancillary businesses, e.g., commuter railroad services, infrastructure provision for commuter and freight rail, reimbursable rail services for other operators, and real estate leasing and management, which share facilities, personnel, and operations with many of Amtrak's intercity passenger services.

While simplicity and efficiency were goals throughout the methodology development process, allocating costs for a multiproduct enterprise with many joint costs necessitates customization and complexity. An off-the-shelf system would likely be criticized as

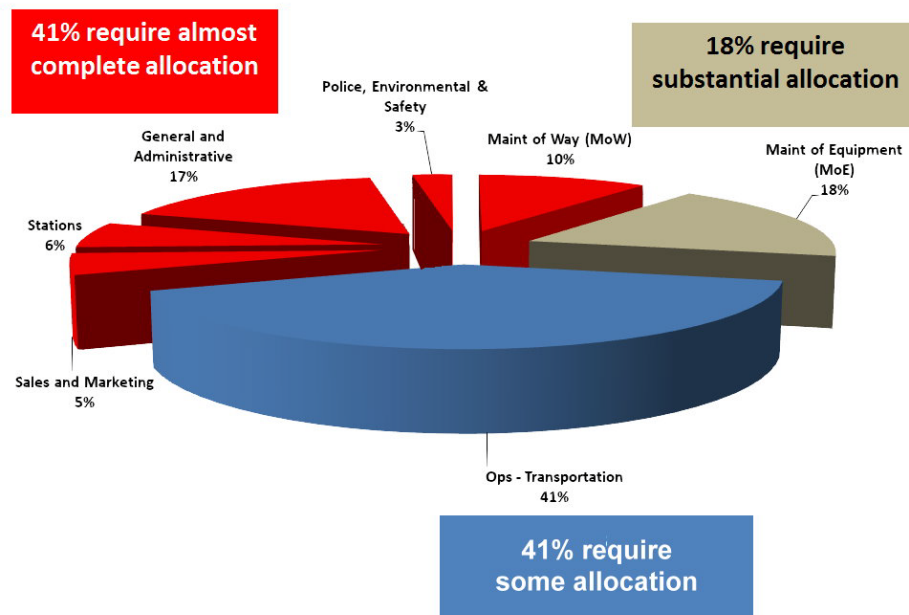
Appendix. Agency Comments

simplistic, inaccurate, and unreliable. Moreover, given APT's transparency and design approach, FRA believes the system will be straightforward to maintain in the future.

Prudent Cost Allocation

Direct assignment of expenses is preferable to allocation, and APT was so designed, to the extent practicable. However, some aspects of Amtrak operations will inevitably have allocated components because routes that share all or most of their facilities with other routes generate about half the company's train-miles and expenses. At the same time, Amtrak's organizational structure and complexity necessitate some level of allocation. About two-fifths of Amtrak expenses (corporate overhead and shared facilities) must be allocated and another fifth (maintenance of equipment) must be substantially allocated as they concern assets that are, in most cases, rotated among routes (Figure 1). Even the transportation operations accounts include support activities, such as dispatching, that necessitate allocation. Moreover, direct assignment in some cases, such as fuel, would be costly—and without sufficient benefit to justify the cost—thereby making allocation the more cost-effective approach.

Figure 1: Analysis of Amtrak's 2012 Route Expenses



Source: APT Report for FY 2012

Balancing the costs and benefits of further APT refinements was a critical guiding principle throughout APT development. FRA agrees with OIG that, where cost-effective opportunities to further refine the allocation methods or substitute assignment for allocation become apparent, Amtrak should certainly pursue them. However, provision of improved financial performance data, particularly data that do not affect the total corporate results, would not necessarily justify additional investments.

Avoidable Cost Methodology Fulfills Module's Purpose

The avoidable expense module of APT is a significant advance in intercity passenger rail costing. To estimate Amtrak's route avoidable costs, APT developers analyzed detailed operating expenses and used a hybrid approach involving business analysis and, where possible, empirically-based equations. The level of detail and analysis are unprecedented.

Identifying all possible trade-offs between cost centers, and, for each, determining the precise combination of actions that a company would take in the event of a deletion of a business segment would be impractically complex, costly, and beyond the scope of APT. It is also unnecessary to achieve such theoretical purity and precision, given the purpose of the avoidable costing function.

That purpose is to provide an order-of-magnitude estimate of changes to Amtrak's corporate expenses that would result from elimination of a single route, not from a full restructuring of Amtrak. The analysis was guided by economic theory and commonly used empirical techniques for estimating variability of costs. The result provides a systematic and rational methodology for estimating the avoidability of route-level costs.

Moreover, the avoidable cost module provides only one piece of the net effect of a route deletion on Amtrak's bottom line. Connecting and diverted revenues, as well as incremental costs on parallel routes, if any, can have a significant impact of overall financial results. For example, the ticket revenue earned from a passenger traveling from New York to Los Angeles (via Chicago) is divided between the Lake Shore Limited and the Southwest Chief. If the Lake Shore Limited is eliminated, the passenger has some choices:

- a. Forgo the trip, or use another mode entirely. This will eliminate the Lake Shore's revenues and those on all connecting routes.
- b. Use another mode on which to reach Chicago, then transfer to the Southwest Chief. This will eliminate Lake Shore revenues but preserve those on connecting routes.
- c. Find another way to reach Los Angeles from New York by all-rail. There are three other obvious routings, plus a much longer route via New Orleans. This will eliminate Lake Shore revenues; the net revenue effect on Amtrak will depend on the routing chosen. Conceivably, there could be an expense effect as traffic increases on parallel routes.

Thus, the revenue projection is far from straightforward. Because of the complexity of the assumptions that must be made on a city-pair basis (at least for high-volume city pairs), uncertainties in the revenue domain are as challenging as those pertaining to avoidable expenses.

Finally, PRIIA defined the “national rail passenger transportation system” largely on the basis of Amtrak’s route structure as it existed in 2008. No deletions from that route structure have been proposed or are imminent, thus further limiting the potential immediate applications of APT’s avoidable cost methodology. In the event of major reductions in Amtrak’s Federal grants, eliminating any single route would not likely be adequate. Elimination of multiple routes might well need to be considered, as happened in the late 1970s. The avoidable cost module would not suffice in such a circumstance, because its results are not additive for more than one route. Instead, a case-specific operating and financial analysis would be necessary.

OIG Recommendations and FRA Responses

OIG Recommendation 1: Verify that the software interface enables the data from SAP to work correctly with APT.

FRA Response: Concur

FRA-funded action on this recommendation is underway at the Volpe Center. We expect Volpe to deliver to FRA a summary of its findings not later than the second quarter of FY 2014.

OIG Recommendation 2: Work with Amtrak to develop a plan to maintain APT’s long-term utility.

FRA Response: Concur

FRA will require Amtrak to submit to FRA such a draft plan within 6 months of the effective date of the full-year FY 2014 operating grant agreement between FRA and Amtrak.

OIG Recommendation 3: Work with Amtrak to analyze its business processes to identify changes that would enable it to assign additional costs wherever economically feasible

FRA Response: Concur

Within 6 months of publication of OIG’s final report, FRA will identify cost elements in which Amtrak could either substitute assignment for allocation methodology, or further refine the method of allocation (given the minimum of allocation implicit in Amtrak’s mission and structure). The analysis will consolidate and update previous studies, and will incorporate Amtrak’s comments.

OIG Recommendation 4: Evaluate alternatives for addressing the requirement to calculate avoidable costs.

FRA Response: Concur

While the adopted method fulfills the Congressional mandate for an avoidable costing methodology, FRA recognizes that alternative methods exist for avoidable expense estimation. Accordingly, within 6 months of OIG's publication of its final report, we will summarize and update our prior analysis of such alternatives. To that end, we look forward to reviewing information OIG might have from its interviews to determine how related entities calculated their avoidable costs.

We appreciate this opportunity to offer additional perspective on the OIG draft report. We also appreciate the courtesies of the OIG staff in conducting this review. Please contact Rosalyn G. Millman, FRA Planning and Performance Officer, at 202.493.1339, with any questions or requests for additional assistance.