Office of Inspector General

Audit Report

AMTRAK FACES CHALLENGES SUSTAINING INCREASED UTILIZATION AT ITS HEAVY MAINTENANCE FACILITIES

Federal Railroad Administration

Report Number: CR-2011-177
Date issued: September 22, 2011

Memorandum

U.S. Department of Transportation
Office of the Secretary
of Transportation
Office of Inspector General

Subject: ACTION: Amtrak Faces Challenges Sustaining Increased Utilization at Its Heavy Maintenance Facilities
Federal Railroad Administration
Report Number: CR-2011-177

Date: September 22, 2011

From: Mitch Behm
Assistant Inspector General for Rail, Maritime, & Economic Analysis

Reply to Attn. of: JA-50

To: Federal Railroad Administrator

Amtrak's ridership has grown significantly in the last decade, breaking passenger records in 9 of the last 10 years. This increase has stressed Amtrak's aging fleet and put a premium on the abilities of the company's maintenance operations to not only ensure the fleet continues to operate safely but also to provide services to support demand. Until 2009, however, the company could not fully fund the expansion of heavy maintenance operations to repair the rolling stock it needed to keep up with rising demand. In 2009, the American Recovery and Reinvestment Act (ARRA) provided the company with an infusion of $1.3 billion that it could use in part to increase heavy maintenance work.

Section 227 of the Passenger Rail Investment and Improvement Act of 2008 (PRIIA) required the Department of Transportation's Office of Inspector General (OIG) to review Amtrak's utilization of its equipment maintenance and repair facilities, including the Beech Grove Mechanical facility in Indiana. Because Amtrak used ARRA funding to increase utilization at its heavy maintenance facilities, we focused our review on the impact that ARRA funding had on current and future utilization at these facilities. Specifically, we (1) determined how Amtrak used ARRA funds at its three heavy maintenance facilities to increase utilization, and assessed the effect of the funding's expiration; and (2) evaluated Amtrak's efforts to generate revenue through increased utilization at its heavy maintenance facilities and the marketing of maintenance services to outside rail carriers.

To conduct this review, we visited Amtrak's three heavy maintenance facilities to observe operations and collect data on staffing and productivity. We met with Amtrak management and labor about the company's heavy maintenance operations, and with commuter rail agencies and Canada's national passenger rail corporation about their maintenance operations. We also met with officials from the Federal Railroad Administration (FRA) about Amtrak's use of its ARRA funds. We conducted this audit from January 2010 through July 2011 in accordance with generally accepted government auditing standards. A more detailed description of our scope and methodology is provided in Exhibit A.

RESULTS IN BRIEF

Amtrak used ARRA funding to increase its workforce and more fully utilize available capacity at two of its three heavy maintenance facilities. Specifically, at Beech Grove, Indiana, Amtrak increased its workforce by 23 percent, and at the Bear, Delaware facility by 19 percent. These workforce expansions facilitated Amtrak's refurbishment of passenger cars and locomotives that were not in use. However, with ARRA's funding expiration in September 2011, Amtrak will not be able to sustain this expanded workforce and will have to lay-off the majority, if not all, of these employees. Furthermore, the costs associated with the lay-offs—continuing coverage of benefits as required by Amtrak's labor agreements—will further strain Amtrak's regular funding for maintenance operations.

Amtrak has decided to market its maintenance services to other rail carriers to increase utilization and generate new revenues through its Beech Grove facility.[1] Amtrak officials recognize that Beech Grove needs to overcome the problems of its aged infrastructure and improve its efficiency to be competitive in the maintenance services market. They have undertaken several initiatives in this regard, including tracking cycle times and conducting "Lean Process Reviews" to determine how to streamline heavy maintenance processes. As a result, Amtrak reduced cycle times for heating ventilation/air conditioning rebuilds and seat removal and replacement. Amtrak continues to identify areas for improvement and consult with similar maintenance service providers for best practices. However, the company's lack of experience in this market will make the establishment of Beech Grove as a competitor difficult. Amtrak has performed limited work for outside operators in the past, but mostly on a non-competitive basis. The company's recent bid to perform maintenance services for a California transit authority was unsuccessful. It is studying that bid to learn how it can gain a competitive advantage in the maintenance services market and, in turn, generate revenues through greater utilization of Beech Grove.

[1] According to Amtrak officials, the company is initiating these marketing efforts at Beech Grove. At the Bear and Wilmington facilities, as well as terminal locations, Amtrak is focusing on the improvement of utilization.

We are making recommendations to FRA's Administrator regarding Amtrak's planning for workforce challenges and increased utilization of the Beech Grove facility.

BACKGROUND

Amtrak operates 21 equipment maintenance and repair facilities nationwide, most of which are located at route endpoints, or terminal facilities, and perform turnaround cleaning, corrective work and preventive (periodic) maintenance. Three facilities—located in Bear, Delaware, Beech Grove, Indiana, and Wilmington, Delaware—conduct heavy maintenance, including substantial equipment overhauls which require removal of the equipment from the operating fleet for at least 30 days. Amtrak employs a three-tiered overhaul program on its rolling stock. Level 1 involves the complete rebuilding of HVAC units, brake valves, and other critical system components, as well as heavy cleaning of carpeted surfaces and cushion replacement. Level 2 overhauls include all aspects of Level 1 overhauls plus replacements of major components such as windows and cables. Level 3 overhauls include the Level 2 overhaul plus complete upgrades of interiors including bathroom modules and seat rebuilds.

Table 1. Work Performed at Heavy Maintenance Facilities

Location	Type of Work Performed
Bear, Delaware	Overhauls Amfleet single-level passenger cars used on the East coast
Wilmington, Delaware	Overhauls electric locomotives used on the Northeast Corridor (NEC)[2]
Beech Grove, Indiana	Overhauls diesel locomotives and Superliner[3] and Horizon[4] passenger cars

Source: Amtrak

In addition to overhauls, these three facilities perform a variety of other rolling stock maintenance services. The Bear facility repairs wrecks[5] and rebuilds seats, braking systems, and other components for its overhauls and component replacements at terminal operations. The Wilmington facility repairs wrecks, and provides preventative maintenance and support for a variety of components, such as air conditioners and braking systems. Beech Grove—the oldest and largest of the three facilities—repairs wrecks and provides support for replacement of components on trains at terminal operations.

[2] The NEC includes both Amtrak and non-Amtrak owned portions of the rail line from South Station in Boston, Massachusetts to Union Station in Washington, D.C.
[3] Superliner passenger cars are bi-level passenger cars used primarily on Amtrak long-distance routes.
[4] Horizon passenger cars are single-level passenger cars used primarily on Amtrak routes in the Midwest.
[5] Wrecks are pieces of rolling stock taken out of service due to extensive damage.

During the last decade, the workforce and output at the three heavy maintenance facilities were underutilized largely because of scarce funding for maintenance work and fewer scheduled overhaul cycles. In 2006, Amtrak's Inspector General (IG) reported that the maintenance facilities had significant excess capacity[6] and that most did not fully staff activities during all shifts.[7] The IG also recognized that the ideal solution would be to use the excess capacity to perform more maintenance, and thereby generate additional revenue. At the time of the review, however, passenger demand had not grown enough to justify increased facility use. Since that study, acceleration in passenger demand growth has required Amtrak to bring additional rolling stock on line, but until ARRA, the company did not have the funding to increase maintenance enough to bring stored rolling stock back into the operating fleet. Amtrak invested just over $90 million of its ARRA funds for this effort.

In October 2010, Amtrak introduced a plan to generate revenue through the marketing of Beech Grove's passenger rail equipment maintenance and repair services to other rail carriers. The plan includes the conversion of Beech Grove into a world class maintenance facility with value added capabilities that will entice other carriers to purchase its repair services. However, this plan does not take into account the existing structural limitations of Beech Grove's physical plant.

AMTRAK CANNOT MAINTAIN ITS EXPANDED WORKFORCE ONCE ARRA FUNDING EXPIRES

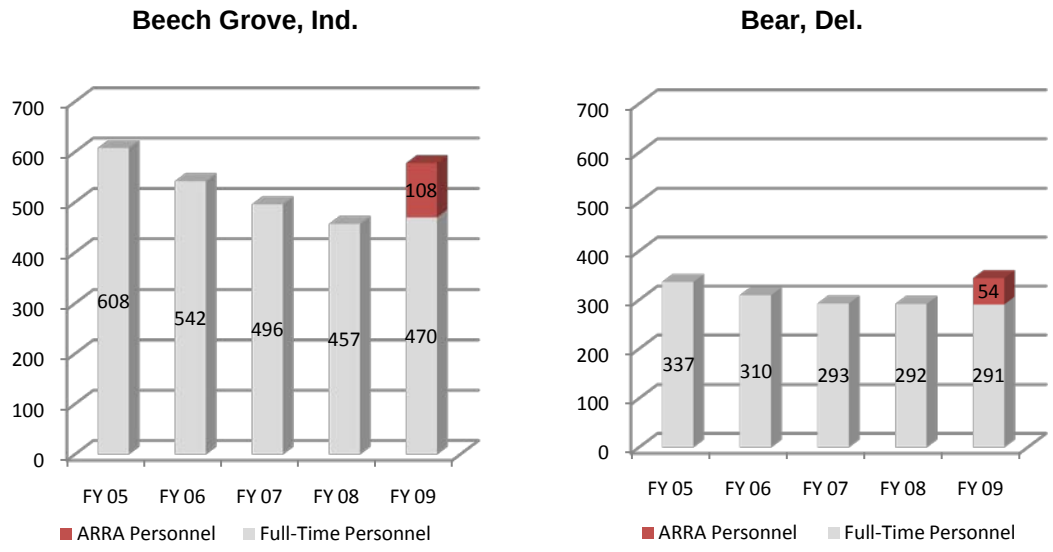
Amtrak cannot sustain the expanded workforce that it used to more fully utilize its heavy maintenance facilities after its ARRA funding expires in September 2011. Amtrak officials believed that attrition would permit them to convert the 162 employees acquired through ARRA funding to full-time positions. However, sufficient attrition has not occurred and Amtrak must now find other means to retain these resources or incur the expenses associated with laying them off.

Beech Grove added 108 employees and the Bear facility added 54 employees (see Figure 1). Amtrak employed its new personnel to overhaul passenger cars and locomotives in storage and return them to service. According to Amtrak officials, the additional workforce and rolling stock allowed Amtrak to better utilize available capacity at its heavy maintenance facilities. With the new personnel,

[6] Capacity refers to the physical space available to support the workload at a particular facility.
[7] Amtrak Office of Inspector General, *Mechanical Maintenance Facility Rationalization* (Washington, D.C.: April 24, 2006).

Beech Grove returned to the fleet 15 locomotives and 20 passenger cars that were wrecked or out of service, and the Bear facility returned 60 passenger cars.

Figure 1. Impact of ARRA Funding On Workforces at Beech Grove and Bear Heavy Maintenance Facilities



Source: Amtrak

Because sufficient attrition has not occurred to permit conversion of all ARRA employees to full-time positions, Amtrak will need a new revenue source to continue to support its enlarged workforce once its funding has returned to pre-ARRA levels. The company's ARRA funding expiration date was extended from February 17, 2011 to September 30, 2011. However, the new expiration date only delays layoffs. According to Amtrak officials, if Amtrak furloughs its ARRA workers, it will be obligated to pay for these employees' benefits through the end of the month in which they are furloughed plus an additional four months of those benefits. Because Amtrak's average cost of benefits for one maintenance employee for four months totals approximately $5,000, the costs of 162 furloughed employees for four months each would be more than $800,000.

AGED INFRASTRUCTURE AND A LACK OF MARKETING EXPERIENCE HINDER AMTRAK'S PLANS TO GENERATE ADDITIONAL REVENUE AT BEECH GROVE

Amtrak has improved the efficiency of Beech Grove's maintenance processes. However, its plan to increase the facility's utilization and create a new source of revenue through the marketing of its services will be challenging to implement fully. The facility's aged infrastructure coupled with Amtrak's lack of experience

in the market will make it difficult to develop Beech Grove into the highly competitive facility that Amtrak's plan calls for.

Beech Grove's Efficiency Is Limited By Its Age and Infrastructure

Beech Grove does not operate efficiently due to its age and poor condition. The facility was constructed between 1904 and 1908 and designed to address early 20th century rail industry maintenance needs. Amtrak acquired the facility in 1975, but has not reconfigured Beech Grove to make it more efficient because of the high cost involved. The maintenance and utility costs for such an old facility are also high. Additionally, the building's layout fits a job shop type of operation instead of the progressive flow line of a modern heavy maintenance operation. This layout increases maintenance activity cycle times because additional movements of stock must occur between buildings.

Amtrak Has Increased the Efficiency of Beech Grove's Maintenance Processes to Help Overcome Its Aged Infrastructure

Despite Beech Grove's antiquated configuration, Amtrak has recently increased the facility's efficiency in an effort to attract additional work and increase revenue. It now tracks cycle time in addition to its measure of through-put. Through-put compares a maintenance facility's planned production against the facility's actual production in a year. Cycle time for a maintenance activity is the amount of time that passes between a unit's removal from service and its return to service. With its focus on cycle time, Amtrak could determine whether bottlenecks occur in the maintenance process and how they should be addressed to improve efficiency. In 2010, the Mechanical Department began conducting "Lean Process Reviews" to determine how it could streamline its heavy maintenance processes. Specifically, these reviews map out and evaluate each maintenance process within the larger overhaul and wreck repair process at each heavy maintenance facility. Through these evaluations, Amtrak officials have identified specific areas for efficiency improvements. For example, at Beech Grove, Amtrak made the following improvements after Lean Process Reviews:

- **Heating ventilation/air conditioning (HVAC) rebuild shop.** The process to remove refrigeration coolant from HVAC machines generally had to be completed overnight. Through its evaluation process, Amtrak identified shop layout improvements and hardware upgrades that resulted in a 25 percent reduction in HVAC cycle time, according to Amtrak officials.

- **Seat removal and replacement.** In the past, the process to remove the seats from the upper level of one passenger car required five individuals working a minimum of 20 hours each. The Mechanical Department

> reviewed the process and determined that the use of an air cargo handler (scissor lift), modified to assist in rail car seat removal, would significantly streamline the process. Amtrak purchased an air cargo handler, and now three individuals can remove all seats from both levels of a car in a single shift−a significant reduction in labor hours.

Amtrak is also restructuring its business processes to better align procurement with materials management across all of its heavy maintenance facilities. Employees at the Beech Grove facility report that significant time is lost on projects because they have to wait for tools and supplies to be delivered to them from an offsite warehouse 2.5 miles from the facility. To reduce this time loss and make materials management more efficient, the Procurement Department has begun to implement an Integrated Supply and Demand Process (ISDP) which facilitates communication among the various departments involved in procurement and supply. Better communication will help synchronize demand and ensure that necessary parts are procured and provided to the maintenance facilities in a timely and cost efficient manner. As part of ISDP, the Department will implement SupplyPro—a system of vending machines that dispense regularly-used parts or items to mechanics working on the maintenance facilities' shop floors. Local contractors will stock the SupplyPro system machines. This use of contractors will reduce Amtrak's material storage and labor costs, and increase efficiency in parts procurement. Amtrak has been surveying local suppliers that could provide this service to the Beech Grove facility.

Finally, as part of its evaluations of specific maintenance processes at Beech Grove, Amtrak reviewed the major overhaul programs of a U.S.-based airline to understand how the airline improved overhaul maintenance processes at its domestic facility. Additionally, Amtrak has consulted with VIA Rail Canada, Canada's national passenger railroad company, to garner lessons learned from its efforts to increase productivity at maintenance facilities. Amtrak has communicated with VIA Rail on the areas of operations, maintenance, and marketing. The information gathered through these relationships has helped Amtrak make improvements and identify areas in which it can implement more efficient processes at its heavy maintenance facilities.

Amtrak's Inexperience in the Maintenance Services Market Will Make it Difficult for Beech Grove to Compete

Amtrak has drafted a marketing plan for the services it plans to offer to other rail carriers. However, because its facilities have historically focused on Amtrak's own fleet maintenance, the company lacks extensive experience in the competitive market for maintenance services. Consequently, the development of Beech Grove as a competitor will be difficult. Amtrak's plan showcases the equipment types

and manufacturers' products that Amtrak has previously serviced. The plan also includes detailed information on overhauls and wreck repairs for both cars and locomotives. However, the outside work Amtrak has conducted has been on a limited, non-competitive basis primarily for commuter rail providers such as Metro-North (New York City metro area commuter rail service), CalTrans (California's Department of Transportation), and MARC (Maryland's regional rail commuter service). This work generally occurs on an *ad hoc* basis—either an outside agency approaches Amtrak or Amtrak discovers that an agency needs additional services and offers to perform them under an existing business relationship.

Amtrak's lack of extensive experience in the maintenance work market was evident recently when it bid to overhaul 15 CalTrans locomotives over 4 years. Its $17 million bid was more than 28 percent higher than the winning bid. After it lost the bid, the company conducted a thorough analysis to better understand why its bid was rejected and how it could improve future bids. Based on what it learned in the analysis, Amtrak plans to focus on appropriate accounting of overhead costs and better pricing. The company recognizes the need to improve its competitiveness in order to grow its maintenance services business. However, since it is still developing and refining its marketing strategy, Amtrak cannot be sure when the revenue it expects from contract awards will begin to accrue.

CONCLUSION

Amtrak's utilization challenges at its heavy maintenance facilities were temporarily overcome by an influx of ARRA funding. However, with the expiration of that funding, the company will have to lay off personnel that were used to increase maintenance facility utilization; therefore negatively affecting sustainment of that utilization. Additionally, Amtrak will incur costs associated with these layoffs. Amtrak has devised a plan to mitigate these additional expenses by using its Beech Grove facility to provide maintenance services to outside rail carriers as a means to generate additional revenue, but that plan will be contingent upon Amtrak's ability to successfully market itself as a maintenance service provider. At the same time, Amtrak will need to be mindful of the maintenance needs of its own fleet so that it can maintain necessary service levels for its increasing passenger demand.

RECOMMENDATIONS

In order for Amtrak to continue to meet passenger demand with a fleet that is in good repair, and address the challenges at its heavy maintenance facilities, we recommend that FRA's Administrator require Amtrak to:

1. Develop an actionable plan to address pending workforce challenges and maximize utilization at its heavy maintenance facilities; and

2. Develop a strategic plan to achieve competitiveness for its maintenance services in the maintenance market that aligns with Amtrak's business model and does not undermine Amtrak's own fleet maintenance.

AGENCY COMMENTS AND OFFICE OF INSPECTOR GENERAL RESPONSE

We provided a draft of our report to FRA on August 15, 2011, and received their response on September 12, 2011, which can be found in its entirety in the appendix of this report. FRA concurred with our recommendations and stated that it will include individual provisions in its fiscal year 2012 Capital Grant Agreement with Amtrak directing Amtrak to develop (1) a plan to address pending workforce challenges and maximize utilization of its heavy maintenance facilities, and (2) a strategic plan for its maintenance services. FRA requested that Amtrak complete those plans by December 31, 2011 and September 20, 2013, respectively. FRA's planned actions address the intent of our recommendations, and we therefore consider both recommendations resolved but open pending completion of those actions.

ACTIONS REQUIRED

Based on FRA's response, we consider the recommendations in this report resolved but open pending completion of FRA's planned actions.

We appreciate the courtesies and cooperation of Federal Railroad Administration and Amtrak representatives during this audit. If you have any questions concerning this report, please call me at (202) 366-9970, or Yana Hudson, Program Director, at (202) 366-2985.

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cc: Audit Liaison, OST, M-1
Audit Liaison, FRA, RAD-43

EXHIBIT A. SCOPE AND METHODOLOGY

We conducted this audit from January 2010 through July 2011, in response to a directive in the Passenger Rail Investment and Improvement Act of 2008 (PRIIA).[1] We conducted it in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

To examine Amtrak's use of ARRA funding to increase utilization of its three heavy maintenance facilities, we visited Amtrak's heavy maintenance facilities at Beech Grove, Indiana, Wilmington, Delaware, and Bear, Delaware, and met separately with management and unions to understand the facilities' operations. Additionally, we met with and collected data and documentation from Amtrak's Finance, Mechanical and Policy departments to understand how the company used ARRA funds to hire additional personnel and return wrecked rolling stock to active service. Finally, we met with FRA officials about the Agency's oversight of Amtrak's ARRA funding. We also visited VIA Rail's Montreal Maintenance Centre in Montreal, Quebec, to meet with VIA management and to learn about their interactions with Amtrak regarding lessons learned for heavy maintenance processes and to observe their heavy maintenance facility operations.

To examine Amtrak's efforts to increase capacity to generate revenue, we met with personnel in Amtrak's Mechanical, Policy and Procurement Departments to discuss efforts underway to streamline maintenance processes. We observed improved maintenance processes at Amtrak's heavy maintenance facilities and visited VIA Rail's Montreal Maintenance Centre in Montreal, Quebec, to discuss the similarities and differences in VIA Rail and Amtrak's maintenance operations. Additionally, we collected data and documentation about Amtrak's efforts to market its heavy maintenance facilities to external parties. We also interviewed FRA and Amtrak IG officials to understand their views of Amtrak's ability to successfully compete for outside maintenance work. Finally, we met with external users of Amtrak's heavy maintenance services, including the Maryland Area Regional Commuter (MARC), the Metro North Commuter Railroad (New York) and the California Department of Transportation (Caltrans) to understand how they awarded maintenance work to Amtrak and why much of that work was awarded non-competitively.

[1] Division B or Public Law 111-432 (October 16, 2008)

EXHIBIT B. ORGANIZATIONS VISITED OR CONTACTED

Federal Agencies:

Federal Railroad Administration, U.S. Department of Transportation, Washington, DC

Amtrak:

Amtrak Finance, Policy and Development, and Inspector General, Washington DC

Amtrak Mechanical, Bear, DE, Beech Grove, IN, and Wilmington, DE

Amtrak Procurement, Philadelphia, PA

Amtrak's Labor Unions:

Transport Workers Union of America (TWU)

International Association of Machinist and Aerospace Workers

International Brotherhood of Electrical Workers (IBEW)

Transportation Communications International Union

Sheet Metal Workers International Association

National Council of Firemen & Oilers

Other Organizations:

Metro North Commuter Railroad, New York, NY

California Department of Transportation (Caltrans), Sacramento, CA

Maryland Area Regional Commuter (MARC), Baltimore, MD

VIA Rail Canada, Montreal, Quebec

EXHIBIT C. MAJOR CONTRIBUTORS TO THIS REPORT

Name	Title
Yana Hudson	Program Director
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Emily Vasile	Analyst
Susan Neill	Writer-Editor

APPENDIX. AGENCY COMMENTS

MEMORANDUM

U.S. Department
of Transportation

Federal Railroad Administration

Date: SEP 1 2 2011 Reply to Attn of:

Subject: Response to OIG Draft Report Entitled "Amtrak Faces Challenges Sustaining Increased Utilization at its Heavy Maintenance Facilities" – Project No. 09C3003C000

From: Joseph C. Szabo
Administrator

To: Mitchell Behm
Assistant Inspector General for Rail, Maritime & Economic Analysis

The Federal Railroad Administration agrees with the report conclusion that the expiration of the American Recovery and Reinvestment Act of 2009 funding will pose challenges to Amtrak. Specifically, Amtrak will be challenged to maintain current levels of productivity at its maintenance facilities. For example, without funding employees at Amtrak's Bear, Delaware and Beech Grove, Indiana facilities face potential layoffs, and Amtrak faces the additional burden of costs associated with those layoffs. Because more than three times the employees were hired at Beech Grove as compared to Bear, the Beech Grove facility faces the bigger challenge due to the expiration of ARRA funding. If Amtrak receive sufficient appropriations in fiscal year 2012, so that they have adequate resources to repair all wreck-damaged long distance cars, the need for layoffs may be reduced or eliminated.

Recommendations and Responses

Recommendation 1: Require Amtrak to develop an actionable plan to address pending workforce challenges and maximize utilization at its heavy maintenance facilities.

FRA Response: Concur. FRA will include a provision in the Fiscal Year 2012 Amtrak capital grant agreement to require that Amtrak develop by December 31, 2011 an actionable plan to address the pending workforce challenges and maximize utilization at its heavy maintenance facilities.

Recommendation 2: Require Amtrak to develop a strategic plan to achieve competitiveness for its maintenance in the maintenance market that aligns with Amtrak's business model and does not undermine Amtrak's own fleet maintenance.

FRA Response: Concur. FRA will include a provision in the Fiscal Year 2012 Amtrak capital grant agreement to require the development of a strategic plan by September 30, 2013 to achieve competiveness in the maintenance market that aligns with Amtrak's business model and does not undermine Amtrak's own fleet maintenance.

The Federal Railroad Administration appreciates the opportunity to respond to the OIG draft report. Please contact Dharm Guruswamy at 202-493-6378 with any questions if we may be of further assistance.