

**AMTRAK CASCADES AND COAST
STARLIGHT ROUTES: IMPLEMENTATION OF
NEW METRICS AND STANDARDS IS KEY TO
IMPROVING ON-TIME PERFORMANCE**

Federal Railroad Administration

*Report Number: CR-2010-117
Date Issued: September 23, 2010*



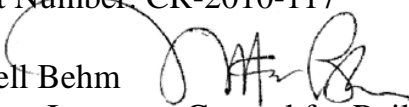
Memorandum

**U.S. Department of
Transportation**

Office of the Secretary
of Transportation
Office of Inspector General

Subject: **ACTION:** Report on the Causes of Delays for the
Coast Starlight and Amtrak Cascades Routes
Federal Railroad Administration
Report Number: CR-2010-117

Date: September 23, 2010

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

Reply to
Attn. of: JA-50

To: Federal Railroad Administrator

Over the past 2 years, Congress has enacted legislation and committed billions of dollars to upgrade and expand the nation's intercity passenger rail service. Early this year, the U.S. Department of Transportation awarded \$8 billion in stimulus funds from the American Recovery and Reinvestment Act of 2009 (ARRA)¹ to 31 states to develop high-speed and intercity passenger train service. For this initiative to be successful, passenger trains need to reach their destinations on time. Poor on-time performance (OTP) discourages ridership, thereby resulting in lower revenues and higher operating costs.

In 2008, we reported that poor OTP on Amtrak's intercity passenger routes impacted its bottom line.² Subsequent to our findings, Congress passed the Passenger Rail Investment and Improvement Act of 2008 (PRIIA)³, which requires us to report on service delays and needed improvements on Amtrak's Pacific Coast train routes—Coast Starlight and Amtrak Cascades.⁴ Accordingly, this report (1) describes the routes' OTP between 2004 and 2009⁵, (2) identifies the factors underlying the routes' OTP, and (3) evaluates the impact of Federal Railroad Administration's (FRA) new metrics and standards on OTP.

¹ Public Law 111-5

² OIG Report Number CR-2008-047 "The Effects of Amtrak's Poor On-Time Performance," March 28, 2008. OIG reports can be found on our website: www.oig.dot.gov.

³ Public Law 110-432

⁴ Section 225 of Division B of PRIIA.

⁵ All references to years are in fiscal years unless otherwise noted.

To conduct our work, we interviewed FRA, Surface Transportation Board (STB), and Amtrak officials and reviewed relevant laws, policies, and Amtrak documentation. We also traveled on the Coast Starlight and Amtrak Cascades routes and met with state, commuter train, and freight officials in Portland, OR, Washington, DC, and Seattle, WA. To determine the causes of delays, we analyzed Amtrak delay data and spoke with conductors, host railroad and state officials to obtain their views about the causes of delays along the routes. We conducted this performance audit from October 2008 through July 2010 in accordance with generally accepted government auditing standards. See details on our scope and methodology in Exhibit A.

RESULTS IN BRIEF

While the Coast Starlight and Amtrak Cascades lines experienced significant delays from 2004 through 2009, total minutes of delay on both lines dropped after 2006. At their peak in 2006, the Coast Starlight and Amtrak Cascades experienced more than 67 and 38 hours of delays, respectively, per 10,000 train miles. However, by 2009, delays on both routes had fallen significantly. With these drops in delay time came improvements in OTP for both lines. After hitting a low of 4 percent in 2006, Coast Starlight's OTP improved to 82 percent by 2009. Amtrak Cascades' OTP also hit its low, below 50 percent, in 2006, but by 2009, it had risen to 71 percent. This level, however, was below Amtrak's established OTP goals for corridor trains at that time.

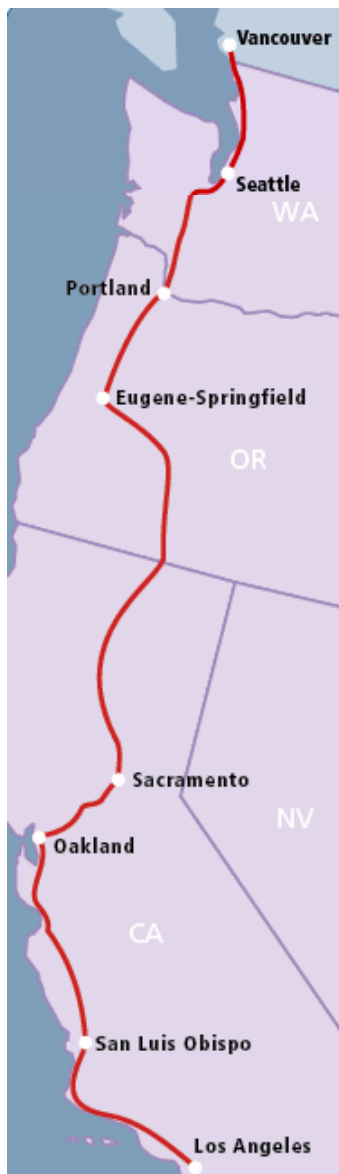
Most delays on the Coast Starlight and Amtrak Cascades routes were attributable to the routes' host railroads, BNSF Railway and Union Pacific Railroad, with significant portions of total minutes of delay attributed to freight train interference (FTI) and slow orders.⁶ Other delays were attributable to Amtrak for problems such as train equipment failures and late connections as well as to third parties for events such as trespassing or poor weather conditions. Several factors contributed to the decrease in delays—and ultimately the lines' improved OTP. First, the host railroads and Amtrak improved operations by enhancing training for host railroad dispatchers and reducing the numbers of slow orders. Capital improvements and investments by the States of Washington and Oregon, among others also contributed to better OTP. Finally, reduced freight traffic caused by the depressed economy contributed to the routes' improved performance since fewer freight trains on the tracks reduced FTI.

⁶ FTI can result from a number of circumstances, such as when passenger trains meet or overtake freight trains, resulting in the passenger train having to slow down or stop. Slow orders are reductions in train speeds imposed for safety reasons if the quality of a section of track is not sufficient to meet its maximum allowable speed for daily operations. In addition, slow orders can decrease the maximum allowable speed on segments involving or near maintenance areas or capital projects.

FRA has taken action to develop new OTP metrics and standards, as required by PRIIA. However, delays in issuing these new performance measures have stalled other actions that could further improve OTP over the long term. For example, STB officials told us they planned to wait until the final metrics and standards were issued to begin investigating poor OTP. Effective implementation of the new metrics and standards will depend on the quality of Amtrak delay data, which is used to support them. Some state and host railroad officials questioned the quality of Amtrak delay data, even though only a small percentage of delay entries are ultimately challenged by host railroads. Ensuring quality data on delays is important given its uses by the various stakeholders involved in intercity passenger rail. FRA along with the states needs to ensure that the benefits of recent Federal intercity passenger rail legislation are fully realized and improvements in OTP for the Coast Starlight and Amtrak Cascades are sustainable.

We are making recommendations to the FRA administrator regarding adequate oversight for both the implementation of new metrics and standards and the actions needed to address concerns over the limitations of conductor delay reports.

BACKGROUND



Together, the Coast Starlight and Amtrak Cascades passenger rail corridors run more than 1,800 miles between Vancouver, British Columbia and Los Angeles, CA. Amtrak Cascades operates two daily roundtrip services between Vancouver and Seattle, and four daily roundtrip services between Seattle and Portland, and two daily roundtrip services between Portland and Eugene, which take approximately 4, 3.5, and 2.5 hours, respectively. These short-distance corridor services are funded by Amtrak and Washington's and Oregon's departments of transportation. The Coast Starlight makes one daily round-trip between Los Angeles and Seattle. Each one-way journey is scheduled to take 34.5 hours. The Coast Starlight is one of Amtrak's 15 long-distance intercity passenger trains and is funded entirely by Amtrak.

Like most Amtrak passenger trains, Coast Starlight and Amtrak Cascades trains operate on tracks owned by private freight railroad companies. Dispatchers from the host railroads direct the movement of all freight and passenger trains. For routes to operate, Amtrak, the host railroads, and state departments of transportation enter into various agreements that specify their obligations to one another.

- Amtrak enters into operating agreements with host railroads to use their rights-of-way.⁷ The agreements typically specify (1) Amtrak's per-train mile incremental maintenance costs to cover track wear and tear due to passenger trains, (2) Amtrak's incentive payments and penalties to the host railroad depending on the host's performance, and (3) the host railroad's obligation to maintain its tracks at a certain level of utility. Amtrak has operating agreements with Union Pacific

⁷ When it was created by the Rail Passenger Service Act of 1970, Amtrak was granted priority access to all tracks owned by private freight railroad companies. These include seven U.S. Class 1 railroad companies: BNSF Railway, Norfolk Southern Railway, CSX Transportation, Union Pacific Railroad, Kansas City Southern Railway, Grand Trunk Corporation, and Soo Line. The main exception is Amtrak's Northeast Corridor (NEC) train service, which operates between Washington, DC, and Boston, MA, where Amtrak passenger trains run on tracks, except for short stretches, that are owned by Amtrak.

and BNSF for Coast Starlight,⁸ and with Union Pacific and BNSF for Amtrak Cascades.

- Amtrak maintains operating agreements with state departments of transportation to operate trains on state-subsidized corridor routes. These agreements typically specify the number of trips, schedules and OTP goals, and the types of services Amtrak will provide, such as ticketing and reservation systems. The agreements also stipulate the amount of compensation the state will pay Amtrak for these services and other actions the state will take to make the service feasible, such as providing passenger station facilities. For the Amtrak Cascades routes, Amtrak has agreements with Oregon and Washington.
- States and host railroads enter into various agreements for capital improvement projects, such as increasing rail capacity and upgrading track and signals. These agreements have not historically included all specified service outcome elements—number of trips, trip times, and reliability.

In March and September 2008, we reported on Amtrak's poor non-NEC OTP. In the March report, we estimated that Amtrak could have reduced its 2006 operating losses by \$136.6 million by bringing overall OTP up to 85 percent from 30 percent for long distance and 67 percent for corridor routes.⁹ In the September report,¹⁰ we identified several root causes of delays that contributed to poor OTP for Amtrak trains, including host railroad's dispatching and track maintenance practices, and insufficient rail capacity¹¹ to handle the growing needs of intercity passenger, freight, and commuter trains. We made recommendations, including that FRA seek legislative changes that would provide Amtrak with a platform to address its concerns regarding host railroad practices that affect OTP.

Several PRIIA objectives aim to improve the service and reliability of intercity passenger rail. First, PRIIA requires FRA and Amtrak to establish new OTP and delay measures and urges Amtrak and the host railroads to incorporate these new measures into their operating agreements to the extent practicable. Second, PRIIA gives the STB authority to initiate an investigation—on its own or in response to a complaint from Amtrak, a host railroad, or other train operator—if an intercity passenger train service fails to achieve minimum performance measures for two consecutive quarters. STB can award damages if it determines that the cause of

⁸ For a short distance, the Coast Starlight runs on tracks owned by the Southern California Regional Rail Authority.

⁹ OIG Report Number CR-2008-047.

¹⁰ OIG Report Number CR-2008-076, "Root Causes of Amtrak Train Delays," September 8, 2008. OIG reports are available on our website: www.oig.dot.gov.

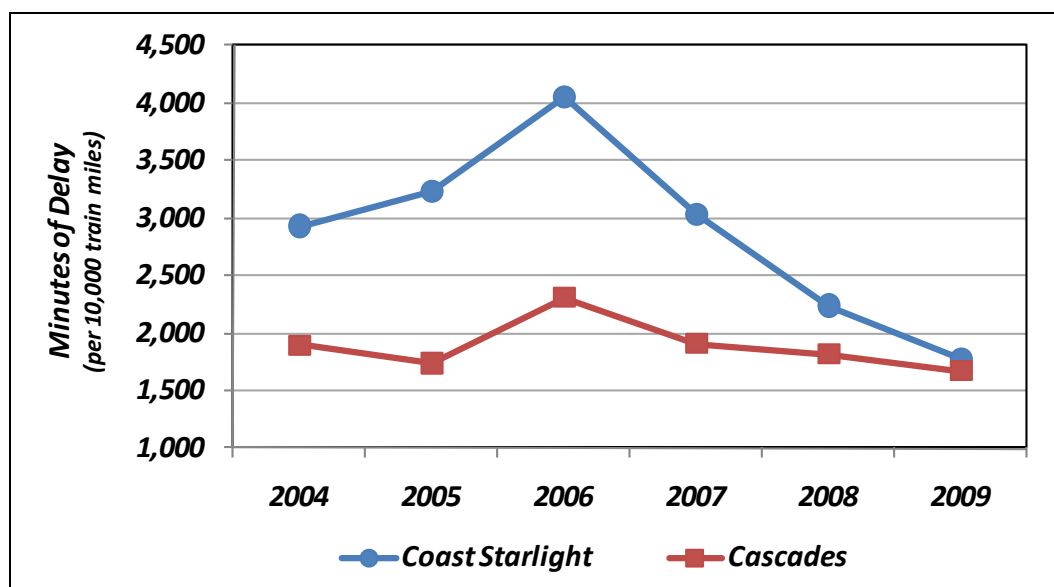
¹¹ Available rail capacity is impacted by a number of factors including train control and dispatching systems, the number of main line tracks and crossings, the number and length of sidings, the presence of longer freight trains, and the differences in speeds of passenger and freight trains.

poor performance was the host railroad's failure to provide preference to Amtrak over freight trains. Finally, PRIIA requires Amtrak to evaluate the financial and operating performance of each of its 15 long-distance routes, many of which have turned in poor OTP records in recent years. It also requires Amtrak to develop performance improvement plans for these long-distance routes and tasks FRA with overseeing the development and implementation of those plans.

WHILE DELAYS CONTINUE, ON-TIME PERFORMANCE HAS IMPROVED

While the Coast Starlight and Amtrak Cascades routes experienced significant delays from 2004 through 2009, the total minutes of delay per 10,000 train miles have dropped since 2006, their peak year, resulting in improved OTP for both routes (see figure 1). Delays on both routes peaked in 2006 at a total of 4,053 and 2,310 minutes for the year, equating to more than 67 and 38 hours of delay per 10,000 train miles, respectively. However, by 2009, delays on both routes dropped to 1,776 and 1,674 minutes, respectively, for the year.

Figure 1: Coast Starlight and Amtrak Cascades Total Minutes of Delay, Fiscal Years 2004 through 2009

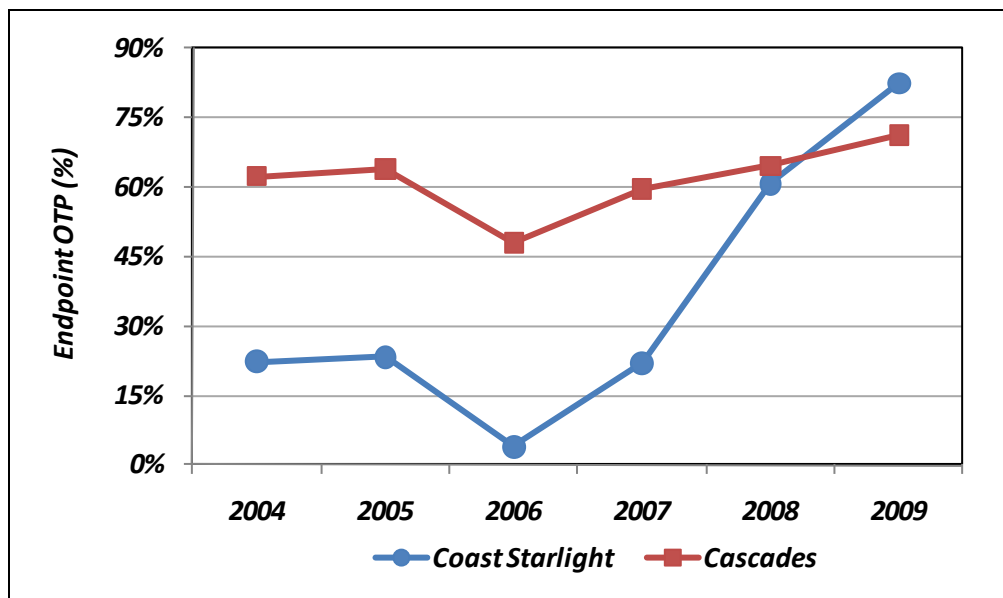


Source: OIG analysis of Amtrak data

With decreases in minutes of delay, annual OTP for Coast Starlight and Amtrak Cascades improved (see figure 2). Coast Starlight's annual OTP dipped to a low of 4 percent in 2006—the lowest on record that year in the Amtrak system—but by 2009 had risen to 82 percent, surpassing previously established Amtrak goals for

long-distance trains. During the same 6-year period, Amtrak Cascades showed a small drop and then a steady, moderate overall improvement in annual OTP. The route's OTP fell to below 50 percent in 2006, but began to rise the following year, reaching its highest level, 71 percent, in 2009. This level, however, remains below Amtrak's previously established OTP goals for corridor trains.

Figure 2: Coast Starlight and Amtrak Cascades OTP, Fiscal Years 2004 through 2009



Source: OIG analysis of Amtrak data

The monthly OTP for both Coast Starlight and Amtrak Cascades varied by season. During winter months, severe weather conditions such as snow, freezing temperatures, heavy rains, and mudslides delay trains in the Pacific Northwest. During summer months, trains may be delayed because of heightened track maintenance and construction work. Host railroad officials pointed out that OTP could improve if Amtrak instituted flexible scheduling or developed seasonal schedules to accommodate slow orders, track work, and other operational conditions. Although Amtrak reviews its public schedules biannually, it generally issues travel advisories and makes temporary schedule adjustments for anticipated delays due to host railroad track work, rather than issue revised schedules for an entire season.

FREIGHT TRAIN INTERFERENCE AND SLOW ORDERS CAUSED MOST DELAYS, BUT RECENT ACTIONS HAVE IMPROVED OTP

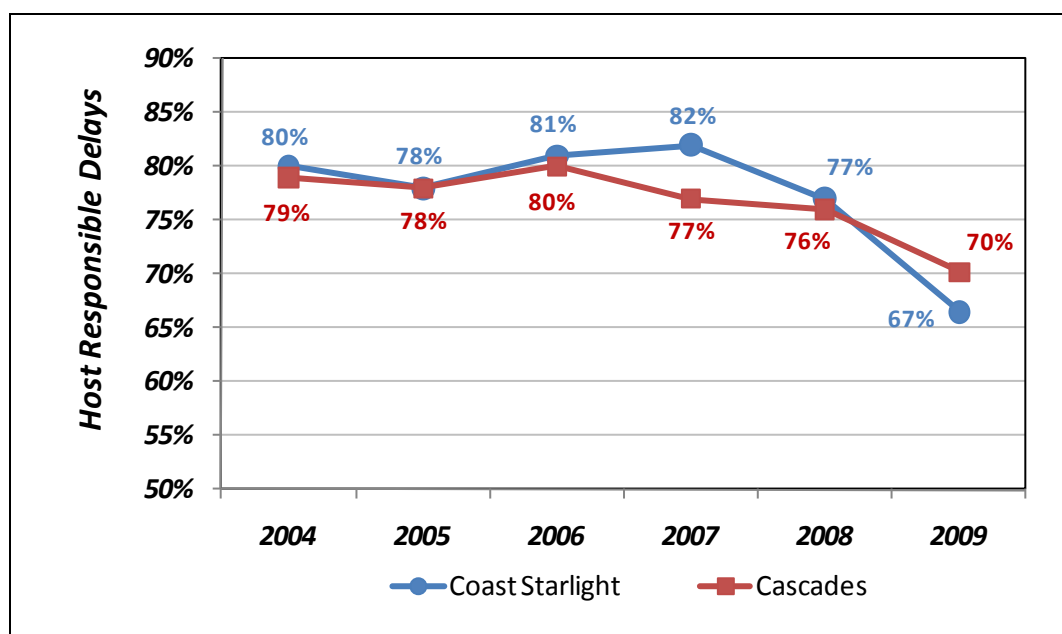
Most delays on the Coast Starlight and Amtrak Cascades routes were attributable to the lines' host railroads, with significant portions of total minutes of delay

assigned to FTI and slow orders. However, delays have decreased—ultimately improving the routes' OTP—due to several factors, including improved operations, capital investments, and reduced freight traffic.

Most Delays Are Attributable to Host Railroads' FTI and Slow Orders

Delays on the Coast Starlight and Amtrak Cascades routes were primarily attributable to the host railroads. Between 2004 and 2008, host-responsible delays averaged roughly 80 percent of all delays before declining to their lowest levels of 67 and 70 percent, respectively in 2009 (see figure 3).

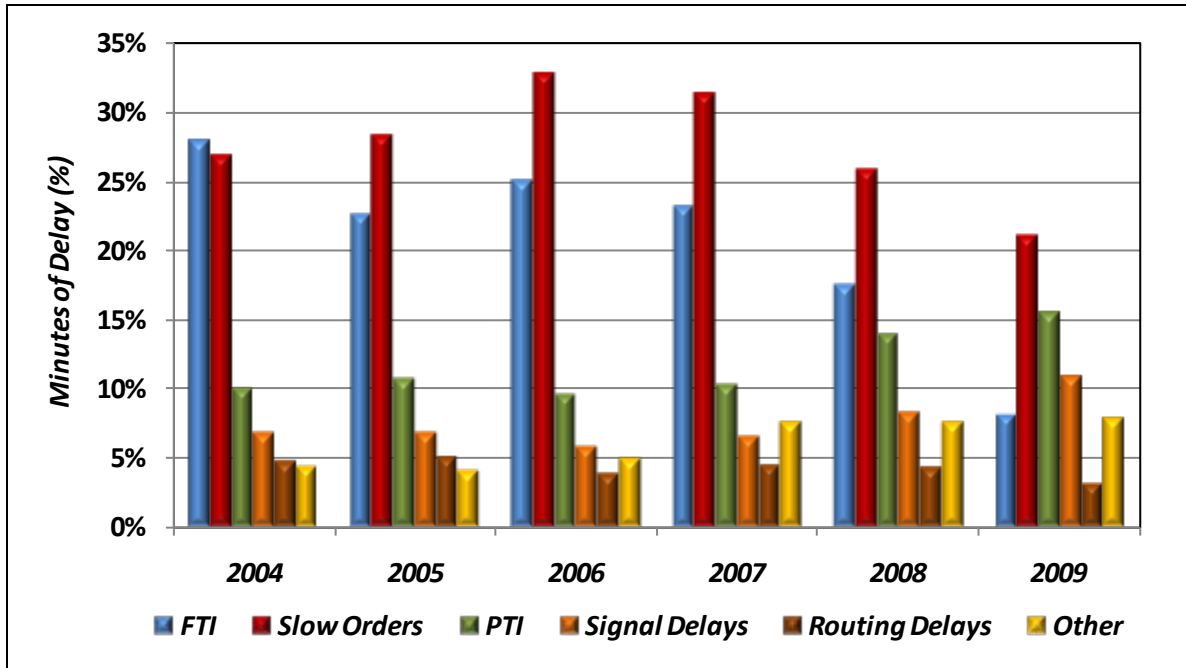
Figure 3: Percent of Host Responsible Minutes of Delay, Fiscal Years 2004 through 2009



Source: OIG analysis of Amtrak data

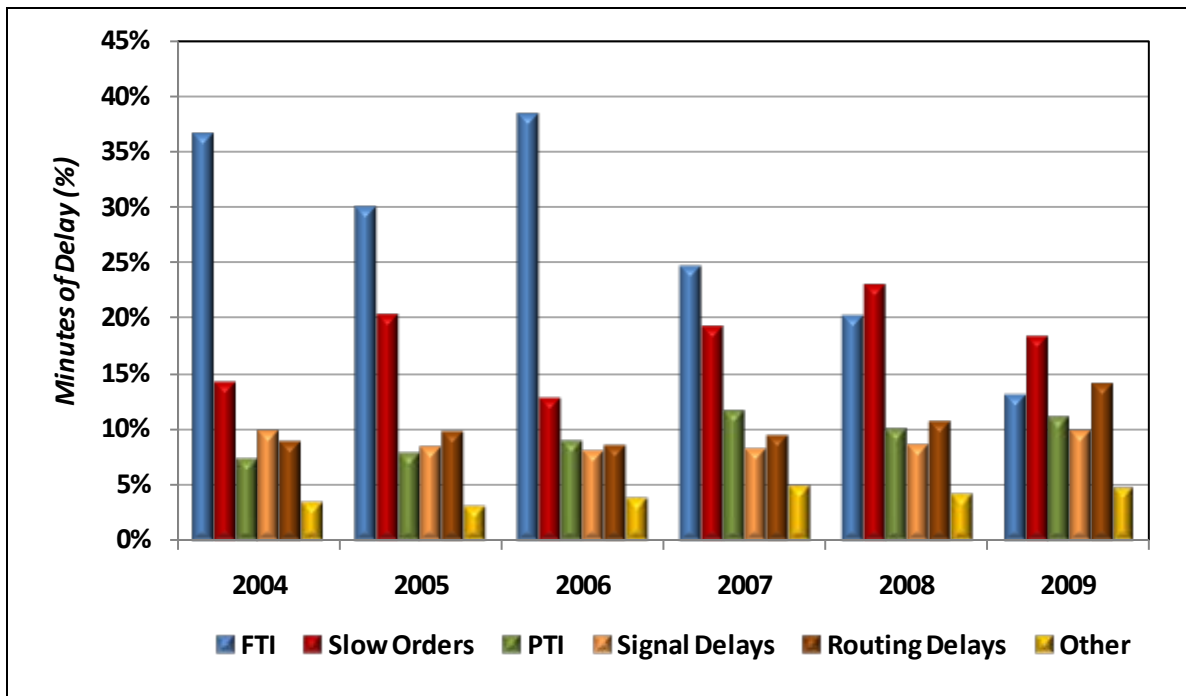
A large portion of the host-responsible minutes of delay from 2004 through 2009 were attributable to FTI and slow orders. Between 2004 and 2007, delays due to FTI fluctuated between 20 and 40 percent of total minutes of delay. However, by 2009, these delays had dropped to below 15 percent. While delays caused by slow orders dropped to approximately 20 percent of total minutes of delay in 2009—after peaking in 2006 and 2007 at over 30 percent for the Coast Starlight—they became the leading cause of delays for both routes (see figures 4 and 5).

Figure 4: Percent of Host Responsible Minutes of Delay by Category, Coast Starlight



Source: OIG analysis of Amtrak data

Figure 5: Percent of Host Responsible Minutes of Delay by Category, Amtrak Cascades



Source: OIG analysis of Amtrak data

The remaining minutes of delay were attributable to Amtrak for problems such as train equipment failures, passenger-related issues, and late connections, or were categorized as third party due to issues such as trespasser incidents, customs and immigration concerns, unused recovery time, and weather. (See Exhibit E for the percentages of delays in each category for the Coast Starlight and Amtrak Cascades routes.)

Operational Changes, Capital Investments, and Reduced Freight Traffic Have Contributed to Improved OTP

Over the past several years, the host railroads and Amtrak have improved their operations by enhancing training for host railroad dispatchers and reducing the number of slow orders to improve OTP. Capital investments and maintenance work by states, commuter lines, and host railroads have also led to improved OTP on the Coast Starlight and Amtrak Cascades routes. Finally, the lagging economy has contributed to the improved OTP of Amtrak's passenger trains. With fewer freight cars moving on the rails, delays due to FTI, one of the major causes of poor OTP on both routes, have declined.

Operational Changes by the Host Railroads and Amtrak Have Led to Improved OTP

Improved dispatching practices have led to fewer FTI delays on the Coast Starlight and Amtrak Cascades routes. To improve passenger train dispatching, Union Pacific hired a new manager of dispatching operations and enhanced its dispatcher training program. New dispatchers are required to complete a 6-month training program that includes both class work and simulations of dispatch situations.¹² BNSF officials also informed us that they provide dispatchers with extensive training, which includes classroom and on-the-job training, followed by workshops and skills training. Officials at both railroads said they provide newer dispatchers with on-the-job coaching and counseling by senior staff, supervision, and performance evaluations.

A reduction in the number of slow orders issued by Union Pacific also contributed to Coast Starlight's improved OTP. Amtrak officials told us that Union Pacific had been issuing a large number of slow orders for track defects and maintenance work on tracks used by the Coast Starlight and Amtrak Cascades. From calendar year 2004 to 2006, the number of minutes of delay attributed to these slow orders rose from 100 minutes to more than 170 minutes per trip, according to data

¹² Host railroad officials from both Union Pacific and BNSF Railway stated that recent retirements have required the companies to hire large numbers of new dispatchers.

provided by Union Pacific and Amtrak.¹³ Arbitration between Amtrak and Union Pacific led to Union Pacific's agreement in February 2009 to comply with most of the contractual limits on slow orders. During arbitration, Union Pacific began undertaking major track and tie improvement work along the Coast Starlight route, resulting in a significant reduction in slow orders. By late calendar year 2009, the number of minutes of delay attributable to slow orders on the Coast Starlight route had dropped to about 40 minutes per trip.

Capital Investments and Maintenance Work by States, Commuter Lines, and Host Railroads Increased Line Capacities and Reduced Delays

Substantial capital investments have increased capacity and train round trips, and improved OTP, on both the Coast Starlight and Amtrak Cascades routes. However, given the long-term nature of capital improvement programs, many capital projects are ongoing. Between 2004 and 2009, the State of Washington invested nearly \$61 million in capital projects along both the Coast Starlight and Amtrak Cascades routes. Washington made investments intended to mitigate the impact of additional passenger trains, increase line capacity, reduce delays, and improve OTP. For example, between 2005 and 2007, the state spent almost \$4 million on the construction of a new set of crossovers to allow faster passenger trains, including those on the Amtrak Cascades route, to move around slower freight trains. As outlined in the project description, the benefits include improved safety by allowing trains to safely pass one another at greater speeds and improved on-time performance with faster, more frequent service.

During the same period, the State of Oregon invested almost \$38 million in capital projects to improve infrastructure along the tracks used by the Coast Starlight and Amtrak Cascades routes. State officials informed us that these investments have focused on the construction of additional tracks, and track and signal improvements. These track and signal improvements lessened the impact of adding a second Amtrak Cascades roundtrip and increased line capacity, train speeds, and rail network fluidity for both passenger and freight trains, all of which ultimately improved OTP on both routes.

Sound Transit commuter rail also invested over \$500 million during this time period between Seattle, Everett, and Tacoma, Washington—in BNSF's line which it shares with both Coast Starlight and Amtrak Cascades. The investments addressed capacity constraints by upgrading or expanding signaling systems and by adding tracks and crossovers, which allow trains to move from one track to another. These investments, while made to improve Sound Transit services, have

¹³ According to Amtrak officials, these delays exceeded the allowable number of minutes of delay due to slow orders contained in Amtrak's operating agreement with Union Pacific.

positively impacted the OTP of the two Amtrak routes. BNSF and Union Pacific also undertook capital and maintenance projects that have improved the quality of service along the Coast Starlight and Amtrak Cascades routes. For example, Union Pacific completed significant tie replacements, cleaned or replaced ballast, and added a new siding to maintain existing tracks and expand capacity.¹⁴ BNSF, solely or in conjunction with Sound Transit or the State of Washington, installed segments of double track and added sidings and crossovers to allow Amtrak trains to pass freight trains more easily. According to freight officials, these improvements have led to higher quality tracks and additional capacity, making it easier for Amtrak trains to remain on schedule. Most recently, the Federal government has increased its role in intercity passenger rail by making capital funds available to the states, from which the Coast Starlight and Amtrak Cascades routes will benefit (see Exhibit C for additional information on recent Federal grant programs for rail).

All of the actions that Amtrak, host railroads, and states have taken to improve performance along the Coast Starlight and Amtrak Cascades routes are consistent with Amtrak's operational performance improvement plans.¹⁵ Amtrak's operational performance improvement plan process addresses OTP and delay problems through three stages: (1) operational improvements, such as dispatching practices and signaling systems; (2) maintenance issues, such as repairs and upgrades to host railroad track and other infrastructure or to Amtrak trains and equipment; and (3) capital improvements to increase rail capacity. Amtrak officials said that, in these plans, capital improvements are undertaken only if operational and maintenance improvements do not fully address the existing OTP and delay issues. They noted that capital spending is always a last resort and that many delay problems for both Amtrak and the host railroads can be solved through operational and maintenance actions. Although such a plan has not been implemented for either the Coast Starlight or the Amtrak Cascades routes, the process is similar to the actions that Amtrak, host railroads, the states of Washington and Oregon, and Sound Transit have taken to improve passenger service on the 2 routes.

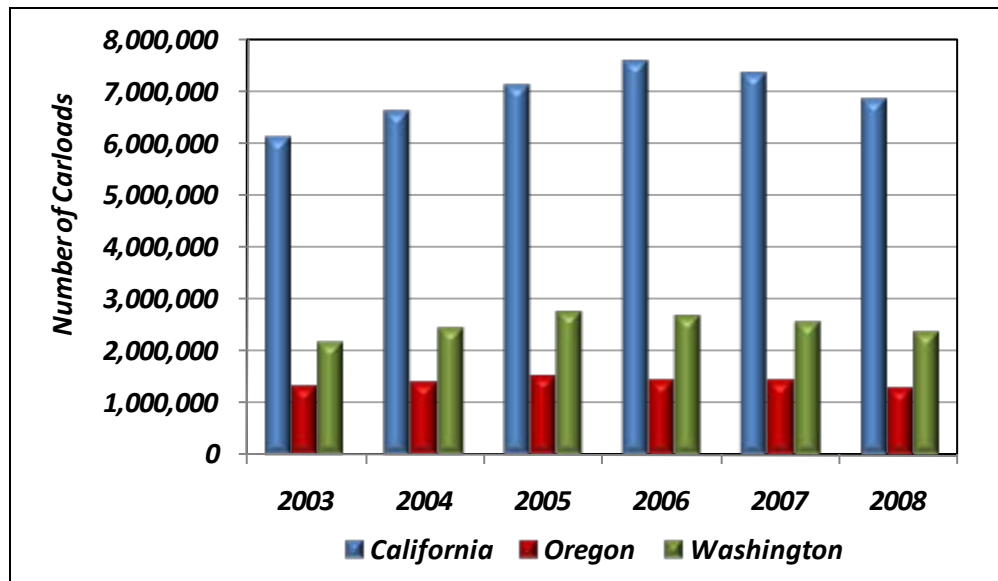
¹⁴ Ties are the portion of the track structure placed under the rails to hold them steady in place and distribute the weight of the rails and rolling stock. A siding is a track located next to a main rail line that allows a train to move out of the way of an oncoming train. Sidings are also used to store trains or to add or remove cars from a train. Ballast is a selected material placed in a track to hold its position, distribute weight, dissipate force, and provide drainage.

¹⁵ Previously, Amtrak called these performance improvement plans, but renamed them operational performance improvement plans to distinguish them from the PRIIA-mandated performance improvement plans for all long-distance passenger routes. The PRIIA-mandated plans are to consider service quality, financial issues, as well as OTP. Amtrak's operational improvement plans focus on OTP and delay issues.

Lower Freight Traffic Increased Capacity on Both Routes

The recent decline in freight traffic on the Pacific Coast, caused by the lagging economy, contributed to the improved performance of these routes. According to STB data,¹⁶ the amount of freight traffic in California, in terms of the number of freight carloads, began to fall in calendar year 2007 and continued to drop in 2008 (see figure 6). During this 2-year period, freight traffic in the state declined by about 10 percent from a peak of nearly 7.6 million carloads in 2006. Data are not yet available for 2009. The decline started earlier in Oregon and Washington. The amount of freight traffic began to drop in calendar year 2006, a year earlier than in California, and continued to fall through 2008. During this 3-year period, freight traffic in Oregon and Washington declined by 15 and 13 percent, respectively, from their peaks in 2005.

Figure 6: Trends in Freight Traffic (by Calendar Year)



Source: OIG analysis of STB data

FRA officials informed us that while the lagging economy has led to reduced freight traffic, freeing up capacity on rail lines and improving passenger train OTP, there is not a one-to-one relationship between higher OTP and lower freight traffic. For example, between 2007 and 2009, the Coast Starlight's OTP rose by 60 percent and the Amtrak Cascades' OTP increased by some 20 percent, while freight traffic declined by only 10 to 15 percent in the three Pacific Coast states.

¹⁶ These data come from the STB's Carload Waybill Sample database, which contains a sample of waybills filed by most large U.S. railroad companies. Waybills are documents that contain the details of the shipment, route, and charges. This review used the total number of loaded rail cars that originated in, terminated in, or passed through California, Oregon, or Washington.

Officials agreed that other factors may be affecting OTP, such as more stringent Federal guidance (e.g., FRA's proposed metrics and standards for intercity passenger rail), which may have prompted host railroads to focus on passenger train OTP. These officials acknowledged that while OTP has improved, it will reemerge as an issue, especially when the economy revives.

DELAYS IN ISSUING NEW METRICS AND STANDARDS HAS STALLED ACTIONS TO FURTHER IMPROVE OTP

FRA and Amtrak have taken action to develop new OTP metrics and standards, as required by PRIIA. However, the final metrics and standards have only recently been issued, delaying several PRIIA requirements and related actions that could improve OTP. Furthermore, the measures' effectiveness could be compromised by the limitations of the data used to support them. Some state and host railroad officials questioned the reliability of Amtrak delay data. Ensuring quality data on delays is not only critical to effectively implementing new performance measures but it is also important given its numerous uses by Amtrak, FRA, the states, and host railroads.

Implementation of New Metrics and Standards Affecting OTP Has Been Delayed

As required by PRIIA, FRA and Amtrak jointly developed metrics and minimum standards for measuring the OTP of intercity passenger train operations (see table 1). FRA also set minimum standards for the number of host-responsible and Amtrak-responsible minutes of delay.¹⁷

Table 1: OTP Metrics and Standards for Non-Northeast Corridor Routes

Metric	Purpose	Minimum standard
Endpoint OTP	Records the percentage of trains that arrive at their final destinations on time. ^a	At least 80 percent
Effective speed	Helps prevent long-term "schedule creep" by dividing a train's mileage by scheduled time plus average lateness at final destination.	
All-stations OTP	Identifies the percentage of trains that arrive at each station along a route on time. ^b	At least 80 percent ^c

^a Based on the former Interstate Commerce Commission's tolerances, which consider trains 10 to 30 minutes past scheduled arrival to be on time, depending on the length of the trip. A Coast Starlight train, for example, can arrive 30 minutes late at its final destination and still be considered on time.

^b Based on 49 U.S.C. Section 24101(c)(4), a train is considered to be on time at each station along a route if it arrives within 15 minutes of its scheduled arrival time.

^c Effective 2012.

¹⁷ Amtrak-responsible delays are set at no more than 325 minutes per 10,000 Train Miles. Host-responsible delays are set at no more than 900 minutes per 10,000 Train Miles.

While FRA issued its proposed metrics and standards for public comment in March 2009, the final metrics and standards were not issued until May 2010. As a result, several PRIIA requirements and related actions have been stalled.

First, the development of new performance improvement plans between Amtrak and host railroads was slowed because, according to Amtrak officials, the host railroads want to ensure that the plans' goals are aligned with the final metrics and standards. Second, progress in incorporating the new, more rigorous measures into Amtrak-host railroad operating agreements as they expired or were renegotiated stalled. According to FRA staff, the new metrics and standards will provide more stringent and transparent performance measures than those used to calculate performance incentives in the current agreements, which provide greater tolerances. For example, in calculating OTP, FRA's endpoint OTP metric allows a basic tolerance of 10 minutes for a short trip, which means a train can be up to 10 minutes late and still be considered on time. For the same trip, a host railroad's tolerance used to calculate a performance incentive may be significantly more. One state official suggested that more binding and realistic agreements between Amtrak and host railroads would be more effective.

Finally, delays in issuing the new metrics and standards have also had an impact on STB investigations into OTP. According to STB officials, they planned to wait until the final metrics and standards were issued to begin investigating poor OTP or other service quality deficiencies of intercity passenger train services to determine the extent to which delays could reasonably be addressed by the host railroad, Amtrak, or other operators. STB will have the authority to review the accuracy of passenger train performance data, which it can obtain from all parties, and the extent to which scheduling and congestion contribute to delays. In some cases, investigations may result in awards to Amtrak if STB determines that a service's delays or inability to achieve minimum standards are attributable to a host railroad's failure to provide preference to Amtrak trains over freight trains. State officials said that the threat of STB action may have led to recent improvements in Amtrak's OTP. One state official said STB's new role has made host railroad's pay attention to passenger train OTP.

State and Host Railroad Officials Question the Reliability of Amtrak's OTP Data

The effectiveness of FRA's new metrics and standards will depend on the reliability of Amtrak's OTP data, most of which are derived from conductor delay reports. Some state and host railroad officials have expressed concerns about the reliability of the information—particularly attribution of the causes of delays. Several officials said that conductors are limited by what they see when recording the cause of a delay and often do not know the root cause of a delay. Officials also pointed out that conductors' other responsibilities—including tasks such as

counting and recording passenger tickets—may distract them from accurately identifying causes of delays. In addition, comment letters related to FRA's proposed metrics and standards related concerns about FRA's reliance on conductor delay data. One freight railroad trade association commented that conductor delay reports are of little value in assessing the true extent and cause of delays and that FRA should require use of supplemental data, such as freight train data, to determine root causes of delays. Amtrak officials told us that assigning root causes of delays is subjective. However, analysis of root causes can be a useful supplemental method for understanding why the direct cause of a delay occurred. They stated that in order to avoid subjectivity, Amtrak assigns delay codes based on the direct causes of delay to the Amtrak train.

Amtrak's process for preparing conductor delay reports is well documented. Conductors manually fill in standard delay report forms, which include station arrival and departure times and the type and minutes of each delay using 47 pre-defined codes. (See Exhibit D for a list of the codes.) Each conductor assigns a code based on his or her observations of the direct cause of the delay event, including information from the train engineer or host railroad dispatcher. At the end of a trip, conductors fax their reports to an Amtrak operations center,¹⁸ where data entry clerks key the conductor-recorded information into Amtrak's On-Time Performance and Delay Reporting System. Each delay code has a direct responsible party, either the host railroad or Amtrak, or the third party category. At the same time, copies of conductor delay reports are also sent to host railroads. If a host railroad does not agree with an item in a report, it can raise the issue with Amtrak staff or directly with the train conductor or field supervisor in order to resolve it.¹⁹ The host railroads have up to 6 days to propose changes to delay reports. In addition to reviewing conductor reports, Amtrak staff also follow-up with conductors and field supervisors as necessary. Conductors may be asked to clarify or correct entries in their reports. After 6 days, the delay data are "locked" in the OTP system and cannot be changed.

A small percentage of delay entries are questioned by host railroads. Amtrak officials noted that, of the estimated 2,000 delay entries recorded each day for the entire network, host railroads question about 10 to 20 entries (about ½ to 1 percent). Amtrak officials also cited an audit conducted by a host railroad that examined a sample of 55 train runs during a single month in 2008. Of a total 7,066 minutes of delay reported by Amtrak conductors, the host railroad raised questions on about 8 percent of the total, including over-reported delays and the use of wrong delay codes. Of the amount questioned, only a portion were found to

¹⁸ Coast Starlight and Amtrak Cascades reports go to the operations center in Oakland, California.

¹⁹ Most host railroads have passenger desks manned by host railroad staff fully funded by Amtrak who review the conductor delay reports. Passenger desk staff also monitor the status of Amtrak trains and notify Amtrak of major impending issues, and advocate for Amtrak delay avoidance within the host dispatching center.

require adjustment upon review. Amtrak officials noted that many of these adjustments reallocated minutes from one host-responsible delay code to another (e.g., from FTI to slow orders). Officials pointed out that conductor delay data are the only data that are consistently collected across the Amtrak system.

The reliability of Amtrak conductor delay reports takes on greater significance when considering its many other uses. In addition to supporting PRIIA-required metrics and standards, conductor-recorded delay data are used extensively by Amtrak, FRA, the host railroads, and state departments of transportation for a variety of official purposes:

- Amtrak uses conductor delay data for both internal and external purposes. It uses the information in daily reports, which show the performance of all Amtrak trains for the prior day, and in information "dashboards", which go to Amtrak's Board of Directors and management officials. Amtrak also uses delay data: to calculate its monthly performance incentive payments to host railroads; to develop operational improvement plans that address OTP and delay problems; and for monthly statistical reports that are posted on its public and internal websites.
- FRA uses Amtrak conductor delay data as the basis for its quarterly reports to Congress. These reports track the performance progress of all Amtrak passenger train routes, including OTP.
- The state departments of transportation (for state-supported routes) and host railroads use Amtrak conductor delay data to develop periodic reports on train delays and to help pinpoint locations of recurring delays. Host railroads and the states told us that they routinely "scrub" the Amtrak data. For example, host railroads may replay dispatchers' tapes to learn why delays occurred, and states may verify Amtrak data with information collected by their own field staff.

CONCLUSIONS

The groundwork for improved OTP for the Coast Starlight and Amtrak Cascades routes has been laid. This is evident by the operational improvements instituted by Amtrak and host railroads to enhance host railroad dispatching practices and reduce slow orders. In addition, the substantial capital investments and maintenance work by the states of Washington and Oregon, host railroads, and Sound Transit to increase capacity and improve the quality of the freight rail infrastructure have had a positive impact on the routes' OTP. Also, given the Federal government's recent investment of \$590 million in stimulus from ARRA in Washington state, linking enforceable service outcomes to grant awards is key to ensuring that the public investments result in the anticipated public benefits,

such as improved OTP. However, FRA's delay in finalizing new metrics and standards for OTP of intercity passenger trains makes it difficult to determine if the momentum that has been achieved up to now—throughout the Amtrak system—is sustainable, particularly when the economy improves, freight traffic increases, and the rails become congested again. While it remains to be seen what effect STB will have in its new investigative role, FRA will be challenged in ensuring that Amtrak develop and implement effective performance improvement plans, negotiate OTP requirements into operating agreements, and address concerns about the accuracy of conductor delay data.

RECOMMENDATIONS

To ensure that the benefits of recent Federal intercity passenger rail legislation are fully realized and that improvements in OTP for the Coast Starlight and Amtrak Cascades routes are sustainable, we recommend that the Federal Railroad Administrator:

1. Ensure that the new metrics and standards are incorporated into Amtrak performance improvement plans for its 15 long-distance routes and ensure their implementation.
2. Provide the appropriate technical assistance to Amtrak and host railroads as they negotiate new operating agreements that incorporate the new metrics and standards.
3. Take actions to improve data quality or address concerns regarding the limitations of conductor-recorded delay data.

AGENCY COMMENTS AND OFFICE OF INSPECTOR GENERAL RESPONSE

We provided a draft of our report to FRA on July 30, 2010 and received their response on September 3, 2010, which can be found in its entirety in the appendix of this report. FRA fully concurs with our recommendations and agreed to inform us within 6 months from the issuance of our final report of any activity related to our recommendations by Amtrak or the host railroads. However, with regard to recommendation 1, while FRA agrees with the intent of the recommendation they raised concerns about their authority to compel the inclusion of the new metrics and standards into performance improvement plans. Since performance improvement plans for the 5 worst performing long-distance routes are currently underway, FRA should be able to provide a target action date for this recommendation.

Additionally, we appreciate FRA's efforts to improve intercity passenger rail service. The agency is working to ensure that all capital investments of Federal funds in these services will include enforceable contractual agreements between stakeholders to make and sustain operational improvements. FRA has expressed its understanding that these agreements should cover not only service design and operational issues such as scheduled trip times and service frequencies, but also service reliability.

ACTIONS REQUIRED

We consider FRA's planned actions and follow-up within 6 months for recommendations 2 and 3 reasonable and resolved, subject to follow-up provisions in accordance with DOT Order 8000.1C. We request that within 30 days of this report FRA provide in writing a target completion date for recommendation 1. We appreciate the courtesies and cooperation of FRA representatives during this audit. If you have any questions concerning this report, please call me at (202) 366-9970 or Toayoa Aldridge, the Program Director, at (202) 366-2081.

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

EXHIBIT A. SCOPE AND METHODOLOGY

This audit examined the causes of delays and the on-time performance (OTP) for two Amtrak passenger train routes, the Coast Starlight and the Amtrak Cascades, during a 6-year period (fiscal years 2004 through 2009). The audit was prepared in response to a mandate in Public Law 110-432, §225, the Passenger Rail Investment and Improvement Act (PRIIA) of 2008.

To determine the causes of delays along the Coast Starlight and Amtrak Cascades routes, we obtained and analyzed Amtrak's minutes of delay data from Amtrak's On-Time Performance and Delay Reporting System (OTP System) for the 6-year period. We examined the data to check for accuracy and completeness and found no obvious errors. We compared a sample of data provided with the total minutes of delay we calculated from reports available on Amtrak's website and determined that it was sufficiently reliable for the purposes of this audit. We used prior audit work to identify factors that cause most train delays on Amtrak trains systemwide. During site visits to the West Coast, we rode on most segments of the Coast Starlight and Amtrak Cascades routes to interview Amtrak personnel and make observations. During these rides, we spoke with Amtrak engineers, train conductors, and other personnel to obtain their views on the types of delays they encountered and their causes, track condition and infrastructure, dispatching practices, and other topics. While on the West Coast, we also conducted interviews with other key stakeholders about their perspectives on the locations and causes of train delays, their level of involvement and investment in the two passenger train routes, and their relationships with other stakeholders. These stakeholders included officials from Amtrak's Pacific Division, Union Pacific Railroad, Washington State Department of Transportation, and Sound Transit. We also conducted telephone interviews with officials from BNSF Railway, the California State Department of Transportation, and the Oregon State Department of Transportation, to obtain their views.

To evaluate trends in OTP for the Coast Starlight and Amtrak Cascades routes over the 6-year period and identify the factors that contributed to the trends, we obtained and assessed OTP data from Amtrak's OTP System and determined that it was sufficiently reliable for the purposes of our audit. To look at recent trends in freight traffic, we obtained Sample Waybill data from the Surface Transportation Board (STB) for the number of carloads that originated, terminated, or passed through the states of California, Oregon, and Washington during 6 years (calendar years 2003 through 2008) and used the information as illustrative. In interviews with officials from the California, Oregon, and Washington's departments of transportation, Sound Transit, Union Pacific, BNSF, and Amtrak, we obtained information on recent operational changes (e.g., dispatching practices, reduction in

slow orders due to maintenance work, etc.) and capital investments that may have affected OTP. Finally, we met with officials from Amtrak's Washington headquarters, the Federal Railroad Administration, and the STB to obtain their views on recent passenger train performance and discuss their new responsibilities under PRIIA and DOT's high-speed and intercity rail grant programs.

We conducted this performance audit from October 2008 through July 2010. We conducted this audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides reasonable basis for our findings and conclusions based on our audit objectives.

EXHIBIT B. ORGANIZATIONS VISITED OR CONTACTED

Federal Agencies:

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

Surface Transportation Board, Washington, DC

Amtrak:

Amtrak Headquarters, Washington, DC

Amtrak Pacific Division, Seattle, Washington

Host Railroads:

BNSF Railway, Washington, DC

Union Pacific Railroad, Portland, Oregon

State and Local Rail Agencies:

Washington State Department of Transportation, Seattle

Oregon State Department of Transportation, Portland

California State Department of Transportation, Sacramento

Sound Transit, Seattle

EXHIBIT C. RECENT FEDERAL GRANT PROGRAMS

To establish long-term partnerships between states and the Federal government to support intercity passenger rail, in 2008 Congress enacted the Capital Assistance to States—Intercity Passenger Rail Service Program. The program was established in part to achieve tangible improvements in intercity passenger rail services by improving capacity and reliability, possibly resulting in improvements to OTP. Between 2008 and 2009, \$120 million in grants were made available to states through the program. PRIIA established the High-Speed Intercity Passenger Rail Program (HSIPR), which built on the existing capital assistance grant program, and strengthened the roles of Amtrak, FRA, states, and other stakeholders, requiring them to improve intercity passenger rail service and operations.¹ ARRA moved the HSIPR Program forward by awarding \$8 billion to 31 states to develop high-speed and intercity passenger train service. The Coast Starlight and Amtrak Cascades routes will benefit from this Federal funding (see table 2 below).

Table 2: Federal Grant Awards to Washington, Oregon, and California 2008-2010

State	Capital Assistance to States Program	Project Description	HSIPR Program	Project Description
Washington	\$6 million	Projects include preliminary engineering, environmental review, and right-of-way acquisition for a 1.2 mile segment of the Point Defiance Bypass project. Components of the project include new track and signal systems on a realigned right-of-way and a grade-separated railroad crossing.	\$590 million	Projects include building bypass tracks and multiple upgrades to existing track and signal systems. Several safety-related projects will also be funded, including grade separations, positive train control, and seismic retrofits to Seattle's King Street Station.
Oregon	No relevant funds awarded.	Not applicable.	\$8 million	Work includes upgrading Portland's Union Station and engineering and environmental work for track and signaling projects.

¹ This includes Amtrak's long-distance routes, the Northeast Corridor, state-supported corridors, and new high-speed corridors.

EXHIBIT D. AMTRAK DELAY CODES AND CATEGORIES*

Category	Code	Delay
Host		
Signal Delays	DCS	Signal Delays
Maintenance of Way Work	DMW	Maintenance of Way Work
Slow Orders	DSR	Temporary Slow Orders
Freight Train Interference	FTI	Freight Train Interference
Passenger Train Interference	PTI	Passenger Train Inference
Routing Delays	RTE	Routing Delays
Other	CTI	Commuter Train Interference
	DBB	B&B Work
	DBS	Debris Strike
	DET	Electric Traction Work Due to Defect
	DTR	Detour
	ITE	Initial Terminal Delay Due to Engineering
	PBB	Planned B&B Work
	PET	Planned Electric Traction Work
	PSR	Planned Slow Orders
	SMW	Scheduled Maintenance of Way Work
Amtrak		
Equipment	CAR	Car Failure
	CCR	Cab Car Failure
	ENG	Engine Failure
	ITM	Initial Terminal Delay Due to Mechanical Failure
Late Connections	CON	Hold For a Late Connection
Passenger Related	ADA	Passenger Related-Disabled Passengers
	HLD	All Other Passenger Related Delay
Other	CTC	CETC System
	INJ	Injury
	ITI	Initial Terminal Delay Due to Late-Arriving Inbound Train
	ITT	Initial Terminal Delay Due to Transportation/Operations Related Causes
	LMU	Late Makeup
	MAL	Mail or Baggage Work
	MCH	Miscellaneous Mechanical Delay
	MSC	Miscellaneous Passenger Delay
	OPS	Miscellaneous Operation Delay
	OTH	Miscellaneous Amtrak-Responsible Delays
	SMK	Smoking Breaks
	SVS	Servicing Delays
	SYS	System Delays

Category	Code	Delay
Third Party		
Unused Recovery Time	NOD	No Delay
Passenger Related	ADA	Passenger Related-Disabled Passengers
Other	BSP	Bridge Strike
	CUI	Customs and Immigration
	DBS	Debris Strike, Damage, and Set Outs
	ITE	Initial Terminal Delay Due to Engineering
	ITT	Initial Terminal Delay Due to Transportation/Operations Related Causes
	MBO	Drawbridge Opening for Marine Traffic
	POL	Police Related
	TRS	Trespasser Incidents
	WTR	Weather

*As of April 2009

**EXHIBIT E. PERCENTAGES OF DELAYS FOR COAST
STARLIGHT AND AMTRAK CASCADES ROUTES, BY FISCAL
YEAR AND RESPONSIBILITY***

Coast Starlight								
Responsibility	Category	2004	2005	2006	2007	2008	2009	2004-2009
Amtrak	Equipment	1.98	4.29	2.94	3.16	4.68	4.68	3.35
	Late Connections	1.14	0.49	1.02	0.55	0.80	0.39	0.74
	Other	9.06	12.16	9.09	6.85	8.33	10.95	9.01
	Passenger Related	3.88	3.23	2.48	3.18	4.34	5.17	3.38
	Amtrak Total	16.06	20.35	15.52	13.74	18.44	21.20	16.47
Host	Signal Delays	6.86	6.81	5.76	6.48	8.33	10.81	6.83
	Maintenance of Way Work	3.09	3.18	3.39	5.52	4.50	3.87	3.71
	Slow Orders	26.90	28.31	32.88	31.42	25.90	21.19	27.62
	Freight Train Interference	27.89	22.53	24.97	23.18	17.48	8.10	21.22
	Other	1.24	0.94	1.58	1.98	3.11	3.89	1.82
	Passenger Train Interference	10.08	10.68	9.53	10.34	13.88	15.50	10.69
	Routing Delays	4.60	4.89	3.73	4.40	4.22	3.14	4.05
	Host Total	80.65	77.33	81.85	83.32	77.42	66.52	75.95
Third Party	Other	3.23	2.27	2.55	2.92	3.53	4.86	2.92
	Passenger Related	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Unused Recovery Time	0.06	0.05	0.08	0.02	0.61	7.42	0.87
		Third Party Total	3.29	2.32	2.63	2.94	4.14	12.28

Amtrak Cascades								
Responsibility	Category	2004	2005	2006	2007	2008	2009	2004-2009
Amtrak	Equipment	4.01	4.84	3.77	4.42	5.56	7.99	5.06
	Other	3.81	4.11	6.17	5.09	4.52	5.86	4.98
	Passenger Related	2.78	2.79	2.04	3.41	4.30	4.83	3.34
	Late Connections	1.95	0.72	0.68	0.71	0.82	0.77	0.92
	Amtrak Total	12.55	12.46	12.65	13.62	15.20	19.44	14.31
Host	Signal Delays	9.69	8.25	7.87	7.99	8.42	9.73	8.62
	Maintenance of Way Work	2.86	2.36	2.54	3.73	2.79	3.14	2.92
	Slow Orders	14.08	20.21	12.72	19.00	22.88	18.15	17.75
	Freight Train Interference	36.54	29.94	38.20	24.50	20.06	12.98	27.14
	Other	0.31	0.51	1.12	1.03	1.17	1.37	0.94
	Passenger Train Interference	7.09	7.66	8.84	11.49	9.82	10.93	9.38
	Routing Delays	8.72	9.60	8.40	9.30	10.45	13.90	10.02
	Host Total	79.29	78.55	79.69	77.03	75.59	70.20	76.76
Third Party	Other	8.16	8.99	7.65	9.31	9.17	9.62	8.80
	Unused Recovery Time	0.01	0.01	0.01	0.03	0.04	0.73	0.13
		Third Party Total	8.16	9.00	7.66	9.34	9.21	10.35

*As of January 2010

Exhibit E. Percentages of Delays for Coast Starlight and Amtrak Cascades Routes, by Fiscal Year and Responsibility*

EXHIBIT F. MAJOR CONTRIBUTORS TO THIS REPORT

<u>Name</u>	<u>Title</u>
Toayoa Aldridge	Program Director
Nancy Benco	Senior Analyst
Lindsay Steward	Analyst
Karen Sloan	Communications Officer
Susan Neill	Writer-Editor

contractual agreements between the stakeholders to provide for, and sustain, operational improvements. While such agreements should address basic service design and operational issues such as scheduled trip times and service frequencies, perhaps even more importantly, they should address the reliable operation of the service.

Recommendations and Responses

Recommendation 1: Ensure that the new metrics and standards are incorporated into Amtrak performance improvement plans for its 15 long-distance routes and ensure their implementation.

FRA Response to Recommendation 1: Concur. While FRA agrees with the intent of this recommendation, its authority to “ensure” that these outcomes are achieved is limited. Under Section 210 of the Passenger Rail Investment and Improvement Act of 2008 (PRIIA), FRA’s authorized role is limited to monitoring the development, implementation, and outcome of the performance improvement plans. FRA expects that Amtrak will incorporate the Section 207 on-time performance standards in the performance improvement plans. FRA will provide oversight of Amtrak’s actions as part of Amtrak grant management activities and will seek to ensure that Amtrak fulfills the intent of this recommendation. However, PRIIA does not provide the FRA with specific statutory authority to compel the inclusion of the metrics and standards in the performance improvement plans developed by Amtrak.

Recommendation 2. Provide the appropriate technical assistance to Amtrak and host railroads as they negotiate new operating agreements that incorporate the new metrics and standards.

FRA Response to Recommendation 2: Concur. Since the operating agreements between Amtrak and its host railroads are private agreements among private parties, FRA can only provide technical assistance in incorporating the metrics and standards into the operating agreements to the extent requested by both parties. FRA stands ready to provide this assistance upon request.

Recommendation 3: Take actions to improve data quality or address concerns regarding the limitations of conductor-recorded delay data.

FRA Response to Recommendation 3: Concur. Conductor delay reports are generally valuable, consistent, and comparable in the information they provide. As stated in the OIG draft report, host railroads have six days to propose changes to Amtrak’s conductor delay reports after they have been filed. However, experience has shown that host railroads question only about 10 to 20 of the 2,000 delay entries recorded daily. As noted in the Metrics and Standards Report, FRA believes that more automated sources of delay data would be beneficial and Amtrak will examine integrating more automated OTP measurement mechanisms in the future. We believe that moving toward more automated sources of delay data in the long term would address the concerns raised over conductor-recorded delay data. In the meantime, while FRA’s authority in this area is limited, it

will work with Amtrak, the host railroads, and other interested parties, at these stakeholders' request, to help them address any issues related to conductor-recorded delay data.

The Federal Railroad Administration appreciates the opportunity to comment on the OIG draft report. FRA will inform the OIG of any activity pursuant to these recommendations within 6 months of final OIG report issuance. Please contact Dharm Guruswamy on 493-6378 with any questions or if we may be of further assistance.