ROOT CAUSES OF AMTRAK TRAIN DELAYS

Federal Railroad Administration

Report Number: CR-2008-076
Date Issued: September 8, 2008

Memorandum

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

Subject: ACTION: Report on the Root Causes of Amtrak Train Delays
Federal Railroad Administration
Report Number CR-2008-076

Date: September 8, 2008

From: David Tornquist
Assistant Inspector General
for Rail and Maritime Program Audits and
Economic Analysis

Reply to Attn. of: JA-50

To: Federal Railroad Administrator

This report presents the results of our audit of the root causes of delays for Amtrak trains operating outside of the Northeast Corridor (NEC).[1] We conducted this audit at the request of the Senate Appropriations Subcommittee on Transportation, Housing and Urban Development, and Related Agencies. Amtrak train delays reduce Amtrak's ticket revenues and increase its costs, thereby increasing Amtrak's reliance on Federal operating subsidies and reducing its viability as a transportation alternative. However, Amtrak and the freight railroads on whose tracks Amtrak operates disagree on the causes of these delays, making it difficult for them to reach consensus on how best to address them.

Our audit objectives were to: (1) identify the root causes of delays for Amtrak trains operating outside the NEC, (2) assess whether Amtrak's passenger trains have been granted preference over freight trains as prescribed by law, (3) identify practices in dispatching trains that influence delays, and (4) evaluate whether delays in maintaining track have impacted Amtrak train delays.

We interviewed officials from Amtrak, the Association of American Railroads (AAR), four Class 1 freight railroads[2] and other stakeholder groups regarding

[1] The NEC is the route connecting Boston, MA, and Washington, D.C., by way of New York, NY. Outside of the NEC, almost all Amtrak train miles occur on track owned and operated by freight railroads.

[2] U.S. Class 1 freight railroads are defined as having operating revenue in excess of $346.8 million in 2006. Amtrak operates outside the NEC on track owned by six Class 1 host railroads: Burlington Northern Santa Fe Railway, Norfolk Southern Railway Company, CSX Transportation, Inc., Union Pacific Railroad Company, Canadian National Railway, and Canadian Pacific Railway (the last two are the smallest host railroads, which we did not visit).

train dispatching practices, freight railroad capital investment and maintenance activities, and railroad infrastructure capacity. We also analyzed Amtrak's and freight railroads' on-time performance (OTP)[3] data for trains, reported causes of delays, train scheduling, and the condition of track infrastructure. Exhibit A further details our audit scope and methodology. Exhibit B lists the activities visited or contacted.

BACKGROUND

In March of 2008, we reported that improving Amtrak's OTP on routes outside the NEC to 85 percent in fiscal year (FY) 2006 would have reduced Amtrak's operating loss (primarily by increasing ticket revenues and decreasing labor and fuel costs) by $137 million.[4] This constituted more than 30 percent of Amtrak's $452 million FY 2006 cash loss.

Amtrak's operating performance outside of the NEC is closely linked to the performance of the six Class 1 freight railroads over whose tracks Amtrak operates. These "host" railroads monitor and control the movements of all trains operating over their tracks, which include not only Amtrak but also freight and commuter trains. In addition, they impose slow orders for safety reasons and undertake maintenance and capital improvement projects on their tracks, which can directly affect operating speeds.[5]

Amtrak has struggled in recent years to achieve overall OTP levels higher than 70 percent on routes outside the NEC. In FY 2007, long distance trains' OTP averaged 42 percent and corridor trains' OTP (trains traveling less than 500 miles) outside the NEC averaged 65 percent. This compares to an OTP of 88 percent for the *Acela* and 80 percent for NEC corridor trains, which are dispatched by Amtrak and operate on Amtrak-owned track (see table 1).

Table 1. Amtrak's On-Time Performance (FY 2005 - FY 2007)

Service Type	FY 2005	FY 2006	FY 2007
All Amtrak Trains	*70%*	*68%*	*69%*
NEC *Acela*	75	85	88
NEC	78	80	80
Other Corridors	71	67	65
Long Distance	43	30	42

Source: OIG analysis of Amtrak data

[3] Throughout this report, unless otherwise specified, "OTP" measures endpoint performance (from the first station to the last station of the route).

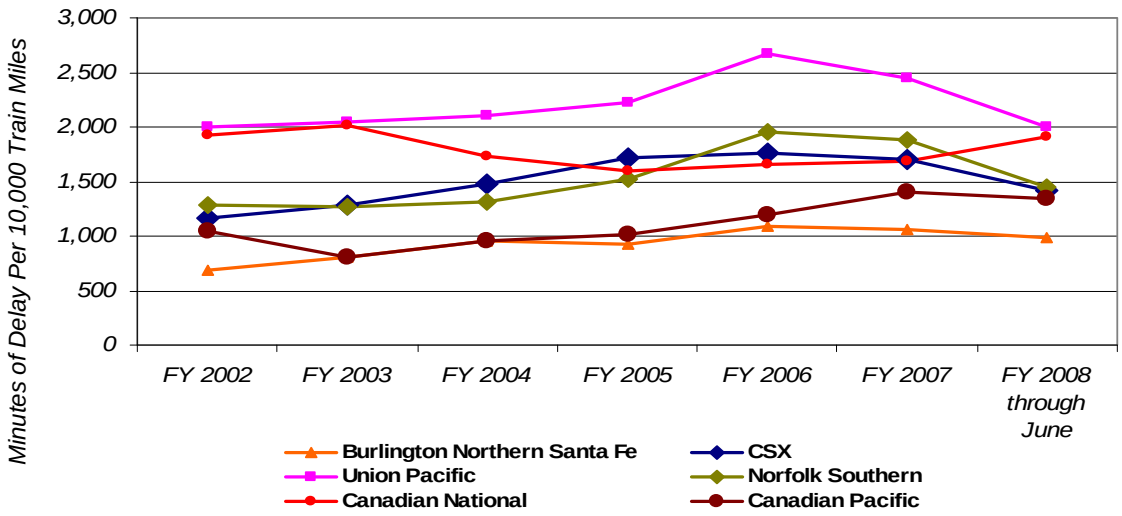
[4] OIG Report Number CR-2008-047, "The Effects of Amtrak's On-Time Performance," March 28, 2008. OIG reports are available on our website: www.oig.dot.gov.

[5] The Federal Railroad Administration establishes a maximum speed for different classes of track based on the track characteristics and its condition. Train speeds are reduced for safety reasons through "slow orders" 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 reduce the maximum allowable speed on segments involving or near maintenance areas or capital projects.

Delays on Amtrak's long distance trains off the NEC are widespread, and even the best routes experience significant delays at some point. We found that only 4 of 13 long distance routes achieved an OTP of at least 60 percent for 4 or more years during the FY 2001 to FY 2007 time period: the City of New Orleans, the Crescent, the Empire Builder, and the Southwest Chief. Corridor trains generally had better OTP from FY 2001 to FY 2007 but still showed a broad distribution of delays among trains and variability by trains across years.

We also found that some host railroads consistently had fewer minutes of delay per 10,000 Amtrak train miles than others between FY 2002 and June of FY 2008. Specifically, Burlington Northern Santa Fe consistently had the fewest delay minutes while Union Pacific consistently had the most (see figure 1).

Figure 1. Total Delays by Host Railroad (FY 2002 – June 2008)



Source: OIG analysis of Amtrak data

RESULTS IN BRIEF

We found several root causes of Amtrak train delays that, if addressed, would improve Amtrak's OTP and financial viability. Amtrak trains are delayed by (1) host railroad dispatching practices, some of which result in preference violations; (2) track maintenance practices and the resulting speed restrictions; (3) insufficient track capacity; and (4) external factors beyond the host railroads' control. We did not allocate the causes of Amtrak train delays among these categories because Amtrak and the host railroads disagree both on how to measure delays and how to define Amtrak's right to preference in the use of rail infrastructure. Further, delay causes are often interrelated and cannot easily be distinguished, and there are only limited data to assess delay causes. We found,

however, that steps can be taken, both within current law and with statutory changes, to reduce Amtrak train delays and improve its OTP.

Some host railroad dispatching practices violate Amtrak's preference rights, but disagreement over preference makes measuring violations difficult. Congress granted Amtrak the right of preference in 1973,[6] and Amtrak believes that the preference statute gives it the right to run trains unimpeded on host railroads' tracks. The host railroads acknowledge their obligation to grant preference but do not agree that this means Amtrak trains should never encounter delays due to interactions with other trains.

Further, the host railroads view it as their responsibility to keep all trains moving as efficiently as possible through the rail network. In addition, AAR strongly believes that adhering strictly to Amtrak's definition of preference would quickly shut down the rail network. Amtrak agrees that this could happen in some circumstances but takes issue with how frequently these circumstances would arise. Amtrak also argues that the host railroads do not have the right to unilaterally decide when to deny an Amtrak train its dispatching preference in order to maintain network fluidity. Since 1973, there has been no further definition by Federal courts or other regulatory bodies.

In addition, the current mechanism for enforcing Amtrak's preference rights is ineffective because Amtrak has no right to either sue the host railroads in court or appeal to the Secretary when it believes its preference is violated. While the freight railroads can appeal to the Secretary for a waiver of their preference obligations, they have no incentive to use it. They can simply choose to adjust their dispatching practices if they determine that giving Amtrak trains preference adversely affects their operations to an unacceptable degree. The host railroads acknowledged that certain dispatching practices intentionally delay Amtrak trains, and we believe these practices violate preference. These include delaying Amtrak trains to maintain network fluidity; stopping freight trains on the mainline tracks to change out crews; and, in some cases, allowing intermodal trains to proceed before Amtrak trains.

Since preference remains undefined, other practices may also be determined to be preference violations. Among these are other dispatching-related factors that can unintentionally delay Amtrak trains, including inconsistent routing decisions and handing-off processes between host railroads and the number of relatively inexperienced dispatchers, all of which can lead to poor dispatching decisions. In addition, priorities set by the host railroad's senior management strongly influence the way dispatchers handle Amtrak trains and the delays these trains experience. We believe Amtrak's OTP may be improved through better (1) enforcement of

[6] 49 C.F.R. § 24308(c) (1973).

Amtrak's preference rights (i.e., legislation), (2) oversight of individual dispatching decisions, and (3) host management cooperation with Amtrak through an expanded route action plan program. Increased cooperation would build on the Secretary of Transportation's April 2008 challenge to Amtrak and each host railroad to devise and implement a route action plan for one route operated on that host railroad's tracks.

Track maintenance practices can delay Amtrak trains, at times unavoidably. Host railroads have a contractual, not statutory, obligation to maintain their infrastructure at levels that allow Amtrak to meet its schedules with a reasonable degree of reliability. The condition of the infrastructure can result in speed restrictions, or "slow orders," that are imposed by the host railroads due to track defects, routine maintenance, capital expansion projects, or inclement weather. They can restrict travel speed to as low as 10 mph for Amtrak trains capable of 79 mph.

Amtrak argues that better routine maintenance practices by host railroads would limit the occurrence of track defects and the associated slow orders. However, host railroads claim that they are limited in the amount of capital they have available to address these track maintenance issues. They therefore give priority to fixing the mainline tracks that handle the majority of train traffic. Amtrak has raised concerns that this practice negatively impacts the performance of Amtrak routes operating over non-mainline tracks. The host railroads also state that many of the major infrastructure improvement projects that currently delay Amtrak trains will serve to increase Amtrak's OTP in the future.

Amtrak and the host railroads also differ in their understanding of what effort the host railroads are required to put forth to maintain the quality of track under their contractual operating agreements. To address these issues, we are recommending increased involvement from the Federal Railroad Administration (FRA), the Secretary of Transportation, and state governments to help clarify the host railroads' responsibilities, provide additional capital for infrastructure improvements, and develop route action plans that include agreements on host railroad maintenance efforts.

Insufficient rail capacity contributes to delays. The host railroads argue that Amtrak train delays are primarily caused by a rail network that currently has insufficient capacity to handle the needs of intercity passenger, freight, and commuter railroads. Amtrak concedes that capacity limitations contribute to delays but does not agree that they are either the sole or primary reason for train delays. Between 1980 and 2006, demand for freight rail transportation increased substantially (by 92.8 percent, as measured by ton-miles) and is projected to continue to do so in the future. At the same time, however, the host railroads have

significantly reduced their physical track (by 42.4 percent) to reduce their maintenance costs and remain competitive.

As rail traffic has increased, the rail network has become more congested and average train speeds have slowed. From 2000 to 2007, railroad traffic density (measured by revenue-ton miles per mile of railroad track) increased by 27 percent. The average speed of freight trains steadily declined from between 22 mph and 23 mph in the 1990s to between 19 mph and 21 mph from 2000 to 2004. Speed differentials between passenger and freight trains, rail bottlenecks, increased intermodal traffic, and longer freight trains all further reduce rail capacity. Additional capacity can be created by investing in better train control and dispatching systems, additional mainline tracks, longer and more frequent sidings,[7] crossings, signals, and bigger train yards. Therefore, to supplement the host railroads' own capacity-related investments, we are recommending that FRA support additional investment to increase rail capacity through FRA's Capital Assistance to States – Intercity Passenger Rail Service Program to reduce delays to Amtrak trains. We also recommend that FRA develop model contract terms to assist states in maximizing the impact of their own capital investments.

Amtrak and the host railroads measure Amtrak train delays differently, which hinders joint action to address root causes of delays and improve Amtrak's OTP. Amtrak measures its trains' performance and delays according to its published schedules and fairly stringent Interstate Commerce Commission (ICC) delay tolerances.[8] The host railroads focus on contractual incentive performance standards, which are less stringent than the published schedules. We found that the schedule time, not the contractual incentive standards, is the better metric by which to measure host railroad performance for two reasons: (1) it reflects the expectation of Amtrak's passengers and (2) the host railroads are contractually obligated to make "every reasonable effort to meet the public schedule time."

Amtrak's published schedules are agreed to by the host railroads as part of their operating agreements; however, the host railroads have expressed concerns that Amtrak's schedules are unrealistic and outdated and do not reflect increased freight traffic and congestion on the rail lines. The perceived lack of credibility in the schedules can lessen the host railroads' commitment to adhering to them. Amtrak has noted that it will add time to its schedules in exchange for the host railroads' commitments to improve Amtrak trains' OTP over their territory, among other reasons (exhibit C summarizes schedule changes for selected Amtrak routes). Therefore, we are recommending that FRA work with both the freight

[7] Sidings are short segments of secondary tracks used for passing trains that are on the mainline tracks.

[8] The Interstate Commerce Commission, which was abolished in 1996, briefly had oversight over Amtrak's On-Time Performance until 1979. Amtrak still uses the same minutes of delay tolerances, though its OTP is not currently regulated by the ICC or its successor regulative body, the Surface Transportation Board (STB).

railroads and Amtrak to resolve these disputes and establish common OTP and delay standards to measure Amtrak's performance.

SUMMARY OF RECOMMENDATIONS

We found that opportunities exist for Amtrak and the host railroads to cooperate in reducing delays and improving the OTP of Amtrak trains. FRA can play a lead role in facilitating this cooperation and, where needed, seek recommended legislative changes. Our recommendations fall into the three following categories:

- **Dispatching and Preference:** FRA should seek two legislative changes that would clarify Amtrak's preference rights and enhance the enforceability of those rights.
- **Route Action Plans:** FRA should institutionalize and expand the planning process initiated by the Secretary of Transportation in April 2008. This should include obtaining agreement between Amtrak and the freight railroads on how to measure and report delays.
- **Capacity:** FRA should seek additional funding for its Capital Assistance to States – Intercity Passenger Rail Service Program and increase the consideration given to increasing OTP in selecting projects. FRA should also work with states that are making their own capital investments in freight railroads to improve the linkage between these investments and host railroad commitments to improve Amtrak train OTP. Our complete recommendations are listed on pages 24 and 25.

SUMMARY OF AGENCY COMMENTS AND OFFICE OF INSPECTOR GENERAL RESPONSE

We held an exit conference with FRA officials on June 18, 2008, to discuss our findings and recommendations. We provided FRA with our formal draft report on July 16. On July 30, we received FRA's response, which is contained in its entirety in the appendix to this report. FRA officials generally concurred with all of our recommendations, but did not provide target dates for completing all of them. FRA's comments and our response are fully discussed on pages 26 and 27.

We appreciate the courtesies and cooperation of FRA, Amtrak, AAR, Burlington Northern Santa Fe Railway, CSX Transportation, Inc., Union Pacific Railroad Company, and Norfolk Southern Railway Company representatives during this audit. If you have any questions concerning this report, please contact me at (202) 366-1981 or Mitchell Behm, Program Director, at (202) 366-1995.

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

We found several root causes of Amtrak train delays that, if addressed, would improve Amtrak's OTP and financial viability. Amtrak trains are delayed by (1) host railroad dispatching practices, some of which result in preference violations; (2) track maintenance practices and the resulting speed restrictions; (3) insufficient track capacity; and (4) external factors beyond the host railroads' control. We did not allocate the cause of Amtrak train delays among these categories because Amtrak and the host railroads disagree both on how to measure delays and how to define Amtrak's right to preference in the use of rail infrastructure. Further, delay causes are often interrelated and cannot easily be distinguished, and there are only limited data to assess delay causes. We found, however, that steps can be taken, both within current law and with statutory changes, to reduce Amtrak train delays and improve its OTP.

Delays Are Widespread Across Amtrak Trains

An examination of the performance of Amtrak long distance trains against their public schedules shows that delays are widespread among routes, and even the best routes experience significant delays at some point. For example, from FY 2001 to FY 2007, only 4 of 13 long distance routes off the NEC consistently had an OTP of at least 60 percent:[9] the City of New Orleans, which operates on Canadian National Railway (CN) tracks; the Crescent, which operates on Norfolk Southern Railway Company (NS) tracks; and the Empire Builder and the Southwest Chief, both of which operate on Burlington Northern Santa Fe Railway (BNSF) tracks. Even these strong-performing trains experienced significant annual fluctuations in OTP. For example, the City of New Orleans route was the best performing long distance train during this period; yet, it still reported an OTP of 45.8 percent in 2003 and rebounded to over 83 percent between FY 2004 and FY 2007 (see exhibit D for charts of OTP by Amtrak route and host railroad for FY 2001 to FY 2007).

The poorest performing long distance trains[10] between FY 2001 and FY 2007 include the Sunset Limited, which operates on CSX Transportation (CSX), BNSF, and Union Pacific Railroad Company (UP) tracks; the Coast Starlight, which operates on BNSF and UP tracks; and the Lake Shore Limited, which operates on NS tracks. Both the Sunset Limited and the Coast Starlight reached single-digit OTP during this time period, at 4.3 percent in 2003 and 3.9 percent in FY 2006, respectively. The Lake Shore Limited reached a low of 20 percent OTP in FY 2005.

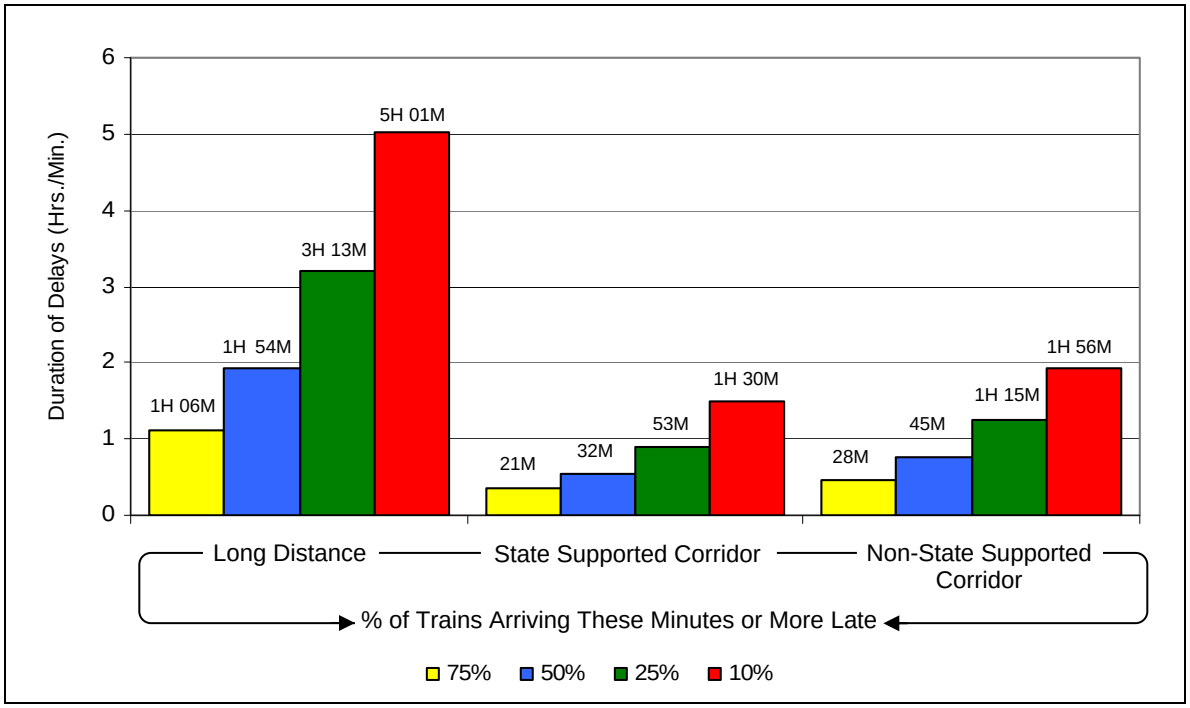
[9] We defined "consistently" as having at least 60 percent OTP for 4 or more years between FY 2001 to FY 2007.

[10] We defined the poorest performing trains as those most frequently having one of the three lowest annual OTP during this time period.

Corridor trains generally had better OTP than long distance trains between FY 2001 and FY 2007, but still showed a broad distribution of delays among trains and variability by trains across years. The best performing corridor trains include the Hiawatha, which runs on UP and CP tracks; the Capitols, which runs on UP tracks; and the Pacific Surfliner, which primarily runs on BNSF tracks. The worst performers include the Carolinian, which runs on both CSX and NS tracks, and the Michigan line, which runs on NS and CN tracks. Both trains showed an OTP that dropped from mid-50 percent in FY 2001 to 26 percent and 31 percent, respectively, in FY 2007. The Missouri service, which began in FY 2006, also had similarly poor OTP, at 33 percent in FY 2006 and 28 percent in FY 2007.

We analyzed Amtrak's FY 2007 OTP data, and found that when Amtrak long distance and corridor trains were late, they were late by substantial amounts of time, even when including the ICC delay tolerance of up to 30 minutes. For example, 75 percent of long distance trains arrived more than an hour late, and 25 percent arrived more than 3 hours late. Corridor routes, which have shorter trip times, tended to be late by shorter amounts of time. For non-state supported corridor routes, 75 percent of trains arrived 28 minutes or more late, and 25 percent arrived 1 hour and 15 minutes or more late. State-supported corridor routes performed slightly better—75 percent of trains arrived 21 minutes or more late and 25 percent arrived 53 minutes or more late (see figure 2).

Figure 2. Percent of Trains Arriving Late (by Minutes of Delay)



Source: OIG analysis of Amtrak data

Findings

We also found that minutes of delay per 10,000 train miles were widely distributed among the host railroads (see figure 1, p. iii). However, some host railroads consistently performed better than others from FY 2002 through June of FY 2008. Specifically, Burlington Northern Santa Fe consistently had the fewest delay minutes while Union Pacific consistently had the most. With the exception of Canadian National, delay minutes per 10,000 train miles declined for all host railroads between FY 2007 and the first three quarters of FY 2008.

Some Host Railroad Dispatching Practices Violate Amtrak's Preference Rights, but Disagreement Over Preference Makes Measuring Violations Difficult

Host railroad dispatching practices can delay Amtrak trains and violate Amtrak's preference rights. However, the absence of agreement between Amtrak and the host railroads on the meaning of preference makes it difficult to quantify the dispatching-related delays caused by preference violations. The situation is further complicated by the fact that preference has never been clearly defined by Federal courts or other regulatory bodies.

Amtrak and the Host Railroads Disagree About How To Define Preference

Amtrak's right to preference is contained in Section 24308(c) of Title 49 of the United States Code, which requires that passenger trains receive "preference over freight transportation in using a rail line, junction, or crossing." There are two exceptions: (1) in the event of an emergency[11] and (2) when a railroad applies for and receives relief from the Secretary of Transportation. To win relief, the freight railroad must prove that giving preference to passenger rail "materially lessens" the quality of freight transportation provided to shippers. The Secretary would then work out a cooperative agreement between the parties for that specific exception. To date, there have been no cases of a railroad seeking an exception from the Secretary.

Amtrak believes that, from a legal standpoint, its right to preference is absolute, (i.e., it applies in every instance not specifically excluded by the statute) and that the statute grants Amtrak the right to run trains unimpeded by other trains on host railroads' tracks. In this view, any instance in which an Amtrak train is held for or slowed by following a freight or other train is a preference violation, regardless of why it occurs.[12] Amtrak also argues that a position taken by the Department of Justice during the only enforcement action ever brought against a host railroad

[11] Emergencies are defined in 49 C.F.R. § 220.13 (1973) as "derailments, collisions, storms, wash-outs, obstructions to tracks, and other hazardous conditions that could result in death or injury, damage to property, or serious disruption of railroad operations."

[12] Instances in which an Amtrak train is held for or is slowed by following a freight train are commonly referred to as "Freight Train Interference" (FTI).

supports its definition of preference.[13] According to Amtrak, railroad dispatchers have an obligation to plan for meets between Amtrak and other trains and to take steps to allow Amtrak to proceed without delay. In addition, Amtrak believes that certain host railroad practices, such as operating trains that are too long to fit on existing sidings and parking trains on sidings, are preference violations. Both of these practices limit the dispatcher's ability to schedule meets that do not delay Amtrak trains.

The host railroads acknowledge their statutory obligation to grant priority access to Amtrak trains, under what they term to be an outmoded law. According to the AAR, "[b]y law, Amtrak trains operating over freight lines must be given priority; this means that when Amtrak trains meet or overtake freight trains, the freight trains are shunted to sidings or parallel lines until the passenger train has passed." This does not mean that an Amtrak train will run unimpeded, but, for example, that a freight train must get out of the way at the next available opportunity when overtaken by a faster Amtrak train.

More importantly, the host railroads view it as their responsibility to maintain fluidity in the railroad system. Amtrak trains are to be given priority, but the larger goal is to ensure that all trains, (i.e., freight, Amtrak, and commuter) keep moving as efficiently as possible. As stated by one host railroad, "the primary function of the dispatcher is to maintain network fluidity to ensure the safe and efficient operation of all trains."

Unfortunately, the current mechanism for resolving disputes between Amtrak and the host railroads regarding the definition of preference and what constitutes a preference violation is ineffective. The freight railroads have no incentive to exercise their right to appeal to the Secretary for relief from the preference requirements. They can simply choose to adjust their dispatching practices if they determine that granting Amtrak trains preference in certain circumstances adversely affects their operations to an unacceptable degree. Amtrak, however, has no right to appeal to the Secretary to enforce what it believes to be its right to preference. While Amtrak itself cannot sue, the Department of Justice may sue the host railroads on Amtrak's behalf, but has only done so once in 35 years. As a result, Amtrak does not have an effective means to obtain relief if it believes its operations are being adversely affected by the host railroads not providing preference.

Therefore, we are recommending that FRA seek legislative changes to provide Amtrak with the same right as the host railroads to appeal to the Secretary on

[13] This case, the United States vs. Southern Pacific Transportation Company, was initiated in 1979 and settled before the court made a final judgment. Therefore, the court did not either endorse or reject the Department of Justice's legal interpretation of the preference statute. A subsequent Administration may or may not interpret the preference statute in the same manner.

preference issues. In conjunction with our other recommendations, this would place responsibility for the proposed activities to address Amtrak train delays within the Department of Transportation. This proposal would not alter the Department of Justice's current authority to bring legal action to enforce the preference law.[14]

While Hosts Railroads Have No Clear Legal Basis for Making Network Fluidity Paramount, In Some Instances, Amtrak's Definition of Preference Could Shut Down the Rail Network

There is no specific allowance in the preference statute giving host railroads the option of deciding to deny an Amtrak train preference to maintain network fluidity. AAR strongly believes, however, that adhering strictly to Amtrak's definition of preference would quickly shut down the rail network. Amtrak agreed that, as a practical matter, such strict adherence could cause rail traffic in certain areas of high traffic volume and chokepoints to shut down. According to Amtrak, there will be certain circumstances in which the host railroads have no practical alternative than to violate what Amtrak views as its right to preference.[15] However, Amtrak and the host railroads differ on how frequently these circumstances would arise and who should decide—Amtrak or the host railroads—when a particular Amtrak train should forego its right to preference to maintain network fluidity. In our view, giving Amtrak the right to appeal to the Secretary on preference issues would create a forum in which FRA could mediate disputes over preference between Amtrak and the host railroads.

Some Host Railroad Dispatching Practices Delay Amtrak Trains

Each train dispatcher makes hundreds of decisions every day on how to handle the flow of train traffic. These decisions can increase or reduce delays for Amtrak trains and grant or deny Amtrak its preference rights. While dispatchers operate within the policies set by their supervisors, they have significant autonomy in making decisions because the situations impacting their decisions are constantly changing.

[14] Section 209 of S. 294, the Passenger Rail improvement Act of 2007, would give the Surface Transportation Board (STB) the authority to investigate the poor OTP or delays on Amtrak trains, permit Amtrak freight railroads or states that support Amtrak service the right to petition the STB, and allow the STB to award damages for preference violations. S. 294 passed the Senate on October 30, 2007, but has not yet been enacted into law.

[15] Theoretically, the freight railroads could avoid a shutdown by seeking an exemption from their preference obligations, as permitted under the statute. As a practical matter, it is unclear how well this provision would work given the dynamic nature of the rail network, which requires frequent, real-time decisions to address unplanned events.

For example, dispatchers decide which trains may occupy main track lines or sidings, whether unused freight equipment may be parked on sidings, and whether a train may change its expired crew at a point other than its normal location—all of which can directly impact Amtrak trains.

Dispatching Decisions on the Silver Service Trains. According to CSX, dispatchers across 7 dispatching desks will make 255,500 dispatching decisions per year to move the 4 Silver Service trains between Miami and Washington, D.C. Dispatchers will make 1,275 decisions on a single 24-hour Silver Service trip. Overall, CSX dispatches 57 Amtrak trains per day.

The host railroads we visited stated that, as a matter of company policy, Amtrak trains are to be given dispatching priority. Nevertheless, some dispatching practices can delay Amtrak trains, although not purposefully. These dispatching practices include the following:

- **Manual overrides by dispatchers to automated dispatching systems, necessitated by unplanned traffic disruptions:** Host railroads often rely on automated dispatching systems to facilitate a dispatcher's job and set these systems to automatically grant Amtrak first dispatching priority. These systems work well in granting Amtrak priority when the rail network is operating as scheduled and planned. However, unplanned events—such as train derailments, unscheduled or late trains, or maintenance work—frequently require dispatchers to manually make last-minute traffic management decisions. The frequency of unplanned disruptions or "out of slot" trains in daily operations removes the certainty that Amtrak trains will be consistently granted first priority and increases the potential for dispatching errors.

- **Inconsistent methods for handing off trains between host railroads:** Each host railroad dispatches only their territory. However, many Amtrak long distance trains traverse multiple host railroads' territories, and are "handed off" from one host to another. This creates a fragmented system in which dispatchers working for different railroads cannot see trains traveling in another railroad's territory. Dispatchers receiving trains from another territory have to estimate when a train will be entering their territory or try to obtain this information from a dispatcher working for the adjacent railroad. One senior railroad manager told us that "the level of coordination between different railroads and different territories varies; sometimes it's good, sometimes not."

- **Relative inexperience of dispatchers in recent years:** Inexperienced dispatchers contribute to delays due to errors in traffic management or other decisions. The host railroads noted that over the past few years, the rail industry has lost a significant number of experienced dispatchers due to an aging and rapidly retiring workforce. New dispatchers are now hired with little to no railroad experience and limited familiarity with track territories, the

railroad's operating rules, and the industry's culture. According to one host railroad, almost half of its dispatchers have no prior dispatching experience.

Dispatching Practices Can Deliberately Delay Amtrak Trains and Violate Amtrak's Right to Preference

The host railroads acknowledged that they have certain dispatching practices that deliberately delay Amtrak trains. While other actions may also be violations, we consider these intentional delays to be preference violations and found that they are caused by several factors, such as those discussed below.

- **Maintaining "network fluidity:**" The host railroads stated that dispatchers are instructed to hold Amtrak trains, if necessary, to minimize the overall system delays, or avoid longer delays to Amtrak trains later on.

- **Stopping freight trains on the mainline tracks to change crews that have reached or expired their hours of service:**[16] We analyzed Amtrak's Freight Train Interference (FTI) delay data for January 2006 through December 2007 for six long distance Amtrak routes[17] and found some, although minimal, delays due to expired crews or freight crew changes. These delays amounted to 1.2 percent or less of the FTI delays experienced by these routes during that period.

- **Giving intermodal freight trains priority over an Amtrak train if the dispatcher believes that it will not cause the Amtrak train to be late:** Intermodal freight transport is a growing area of business for freight railroads, and some host railroads expressed the sentiment that their intermodal operations are harmed by giving Amtrak trains first dispatching priority. However, only one host railroad stated that they had an explicit policy to grant intermodal trains priority over Amtrak trains.

Since decisions by individual dispatchers can delay Amtrak trains, we are recommending that FRA seek a legislative change to expand the personal liability dispatchers now have for violations of FRA safety rules to include personal liability for violations of Amtrak's preference rights. FRA should seek to complement this increased liability with express authority for Amtrak to pay incentives to individual host railroad dispatchers for meeting dispatching metrics agreed upon by Amtrak and the individual host railroads. This change would increase the attention given by the host railroad to dispatching Amtrak trains.

[16] The Hours of Service of Railroad Employees Law, 49 C.F.R. § 228. (First enacted in 1907, the Hours of Service Act was revised 1969 by Public Law 91–169.) This law applies to all railroads and sets the maximum hours that a railroad employee may work. It also requires a certain amount of time off before employees are legally allowed back on duty; otherwise, the railroad may incur civil penalties.

[17] These routes were the Capitol Limited, Cascades, Carolinian, Heartland Flyer, Kansas City-St. Louis, and Coast Starlight.

FRA should report to Congress regularly on which host railroads agreed to permit these payments, what amounts were paid, and how these actions affected delays and OTP.

Increased Focus From Host Railroads on Amtrak Train Dispatching Can Significantly Decrease Amtrak's Delays and Increase Its OTP

The host railroads exhibit varying levels of commitment to ensuring that Amtrak trains are consistently dispatched to avoid delays, which results in fluctuating Amtrak route performance. For example, one host railroad told us that improving Amtrak's OTP improves its own operations and helps to build a positive public image in the states where it operates.

There are other host railroads, however, whose management priorities have fostered a "corporate culture" against Amtrak. This is an expectation filtered down from senior management to all railroad employees, including dispatchers, that preference be given to freight operations, particularly intermodal trains, over Amtrak trains. Some host railroads stated that Amtrak negatively impacts their businesses by using capacity that could go to higher-paying customers.

We found, therefore, that increased management attention from the host railroads to how Amtrak trains are dispatched can help to quickly decrease Amtrak train delays and improve OTP. For example, both Amtrak and CSX refer to the Auto Train[18] as a prime example of how improved cooperation and host railroad management effort can drastically improve an Amtrak train's OTP.

A Corporate Culture Unfavorable to Amtrak. A 2006-2007 internal investigation at one host railroad found that the railroad's corporate culture led the dispatchers to intentionally delay Amtrak in order to benefit their own intermodal train business.

For example, the investigation found the railroad's senior management gave explicit instructions to one division's managers that its dispatchers must prioritize intermodal trains over Amtrak, without regard to the resulting delays to Amtrak trains.

The Auto Train had only 16.8 percent OTP in FY 2006, but this number rose to 62 percent in FY 2007 due to increased cooperation between CSX and Amtrak. The senior management of CSX and Amtrak met in July 2006, and CSX agreed to improve its management commitment to Amtrak OTP. In the months after this meeting, Amtrak and CSX established an agreement to add time to the Auto Train's schedule in exchange for improved OTP. As a result, the Auto Train has consistently shown better on-time performance. There have also been OTP improvements on the Silver Star, the California Zephyr, the Crescent, Capitol

[18] The Auto Train transports passengers and vehicles between the Washington, D.C., area and Sanford, Florida.

Limited, and Lake Shore Limited trains. Amtrak attributes these to instances of improved freight management cooperation with Amtrak through negotiated plans.

In April 2008, the Secretary of Transportation challenged Amtrak and each host railroad to devise and implement a route action plan for one route operated on that host railroad's tracks. Through the route planning process, Amtrak and the host railroads negotiate specific steps to improve OTP, including schedule changes, capacity projects, slow order reductions, and equipment modifications.

We are recommending that FRA expand this route planning process to all long distance and corridor trains with poor OTP. To incentivize the host railroads to participate, FRA should consider expanding the selection criteria for its Capital Assistance to States-Intercity Passenger Rail Service Program to include active participation by the host railroad in a route management plan for the route on which the grant monies would be spent. In addition, FRA should require Amtrak to report regularly to FRA on the steps taken to implement these plans and publish a "scorecard," similar to what was developed for the I-95 Corridor Action Plan.[19] This process will keep the public informed on progress toward implementing the plan.

Finally, FRA should encourage better internal reporting by the host railroads of delays to Amtrak trains and increased focus by their top management of delays and OTP. FRA should accomplish this by reporting to Congress how each host railroad internally reports OTP and delay data, who receives the data, how frequently the data are received, what the standard procedure is for reviewing and acting on the data, and what results derive from these review procedures.

Track Maintenance Practices Can Delay Amtrak Trains, at Times Unavoidably

Host railroads have a contractual, not statutory, obligation to maintain their infrastructure at levels that allow Amtrak to meet its schedules. Infrastructure-related speed restrictions, or "slow orders," can result from track defects, planned (routine) maintenance, capital expansion projects, or inclement weather. Host railroads claim that they are limited in the amount of capital needed to address track maintenance issues.

Host Railroads Have Contractual Obligations To Maintain Track Utility Within Reasonable Levels

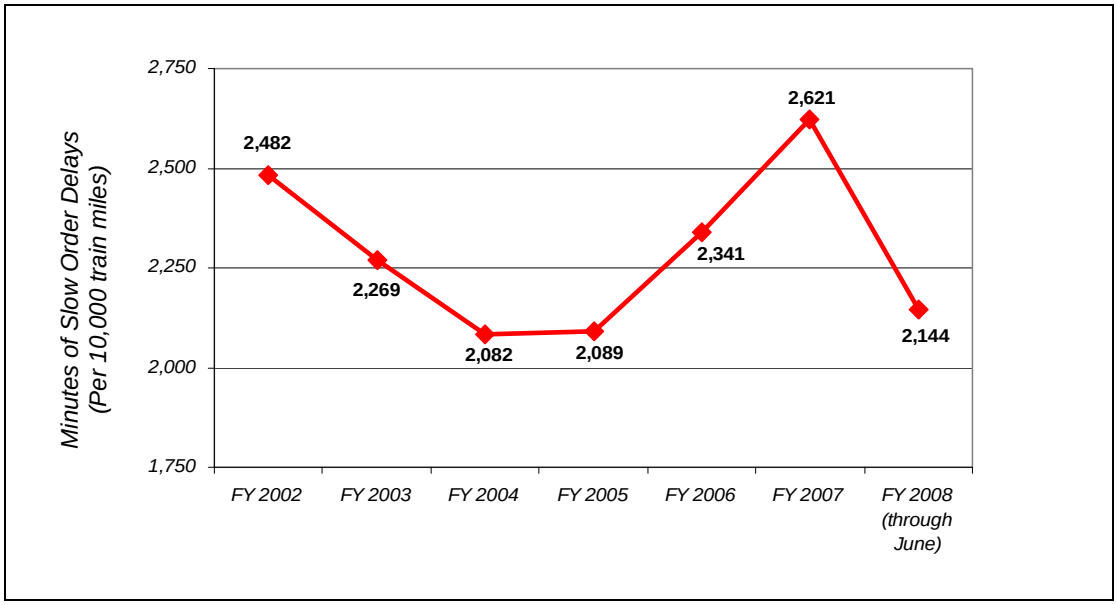
Amtrak's contracts with BNSF, CSX, and NS require these host railroads to make reasonable efforts to maintain a level of infrastructure quality that will allow

[19] The I-95 Corridor Action Plan is a plan developed by Amtrak and CSX to make dispatching and other improvements in exchange for adding time to Amtrak schedules for I-95 corridor train routes

Amtrak trains to meet their operating schedules with a reasonable degree of reliability. By contrast, Amtrak's contract with UP specifies by route the maximum minutes of permitted slow order delays. Slow orders can impose speed restrictions as low as 10 mph on Amtrak trains that are capable of reaching top speeds of 79 mph. Excessive amounts of slow orders and the delays from running at restricted speeds can drastically impede Amtrak's ability to meet its public schedules.

Slow order delays to Amtrak trains outside the NEC have decreased overall between 2002 and June 2008 by 13.6 percent. These delays steadily declined between 2002 and 2004, then increased by 25.9 percent to a peak in FY 2007, and then declined in the first half of FY 2008. Despite the recent decrease, the current amount of slow order delays remains above the FY 2005 level (see figure 3 below).

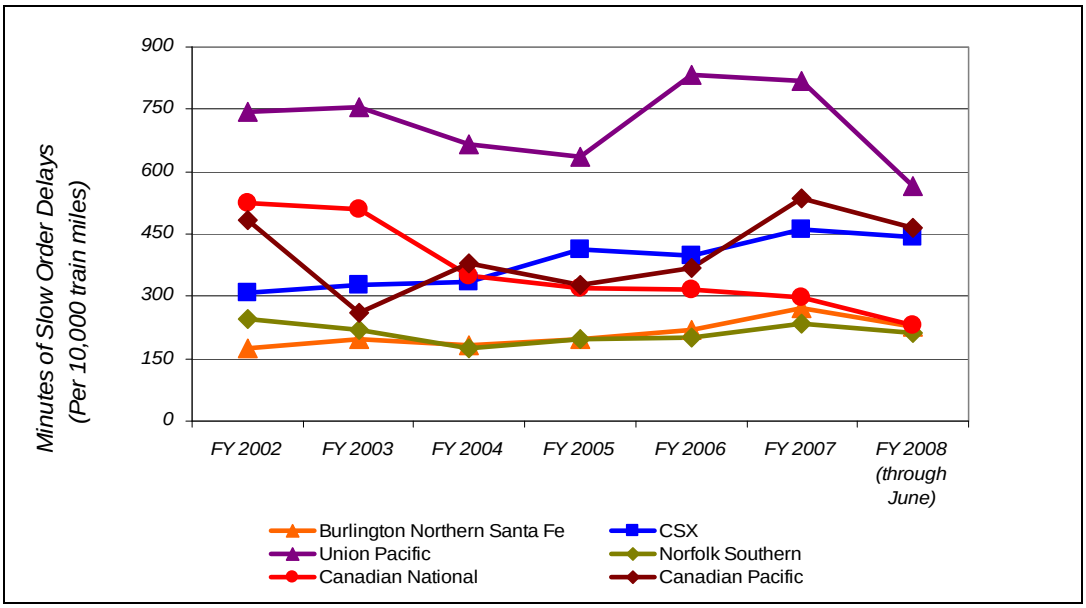
Figure 3. Total Minutes of Slow Order Delays (FY 2002-June FY 2008)



Source: OIG analysis of Amtrak data

Between FY 2002 and June of FY 2008, the top three contributors to Amtrak's slow order related delays were UP (with 26.4 percent), CP (with 21.7 percent), and CSX (with 20.6 percent) (see figure 4 on following page).

Figure 4. Minutes of Slow Order Delays by Host Railroad (FY 2002 – June FY 2008)



Source: Amtrak

Slow Orders Arise From Several Circumstances, Including Track Defects, Planned Maintenance, Capital Projects, or Inclement Weather

Slow orders result from circumstances both within and outside the host railroads' control. For example, host railroads can control when planned maintenance or capital projects occur but cannot plan for when track defects occur. Planned maintenance and capital projects are major infrastructure improvement work scheduled by the host railroads months or years in advance. Amtrak can plan for these slow order restrictions.

Defective or poor quality track often requires the placement of a slow order to ensure safe train operations. These track defects are caused by daily wear from train operations, inclement weather, or an accident or unplanned disruption that caused damage to the tracks. Track defects can occur at any time; therefore, maintenance to fix track defects is unscheduled. Amtrak trains are typically unaware of these track defects before encountering slow orders during a route.

Recent data provided by Amtrak for UP and CSX indicated that most slow orders are caused by track defects, not planned maintenance or capital projects. According to Amtrak, in November 2007, 97 percent of the slow orders on UP routes used by Amtrak were due to track defects rather than major track maintenance work projects. CSX also conducted an analysis, which showed that 70 percent of slow orders on their tracks within the I-95 corridor in calendar year

2007 were caused by track defects while 30 percent were caused by planned maintenance work.[20]

Host Railroads Argue That Limits on Available Capital Restrict Their Ability To Address Slow Orders

According to Amtrak, the fact that most slow orders arise from track defects indicates that the host railroads are not maintaining their track sufficiently to avoid unnecessarily delaying Amtrak trains. Also, Amtrak argues that some host railroads take too long to address slow orders. In Amtrak's view, the host railroads need to improve their routine maintenance practices to limit the occurrence of track defects.

Host railroads argue that slow orders adversely affect their own freight operations, giving them no reason to leave a slow order in place longer than necessary. They further state that their ability to fix track defects is constrained by:

- an insufficient number of track maintenance workers, which prevents them from addressing the defects quickly.
- increased network traffic and operations restrictions (i.e., a desire not to disrupt ongoing freight and passenger operations), which create scheduling restrictions.
- seasonal constraints that delay completion of track work.

Finally, railroads are an extremely capital-intensive industry, and there is insufficient capital available to address all track defects within a limited timeframe. AAR stated that, as a result of this limitation on capital, the host railroads' priorities are to fix the mainline tracks, which handle the majority of train traffic and provide the greatest return on investment from a network standpoint. Therefore, the Amtrak routes that run along these mainlines benefit from this investment. Amtrak has raised the concern that certain Amtrak routes that do not operate over the freight railroads' mainline tracks do not receive the same level of investment and attention by the host railroads in removing slow orders.

In addition, according to AAR, the host railroads are spending record amounts on infrastructure improvement projects that may delay Amtrak trains now but will serve to increase Amtrak's OTP in the future. The host railroads work with Amtrak to try to schedule major infrastructure projects in times of low traffic months.

[20] It should be noted that planned maintenance work can be highly cyclical and may skew slow order delay data on individual routes as major work is undertaken, but then not repeated for several years.

The contrasting views of Amtrak and the host railroads on slow orders reflect the absence of a clear definition of "with a reasonable degree of reliability" and a difference in perspective on the degree to which the operating agreements are binding in nature. Amtrak believes the contracts are binding, even if they lack clear definitions. Some host railroads indicated that they view the contracts as expressing goals they intend to meet but not binding near-term obligations; they also stated they are making a reasonable effort to maintain track at a sufficient level of utility. Therefore, we are recommending expanding the route action planning process and increasing the visibility of the implementation of the resulting plans, which would help Amtrak and the host railroads reach agreement on specific steps to reduce slow orders and ensure these steps are implemented.

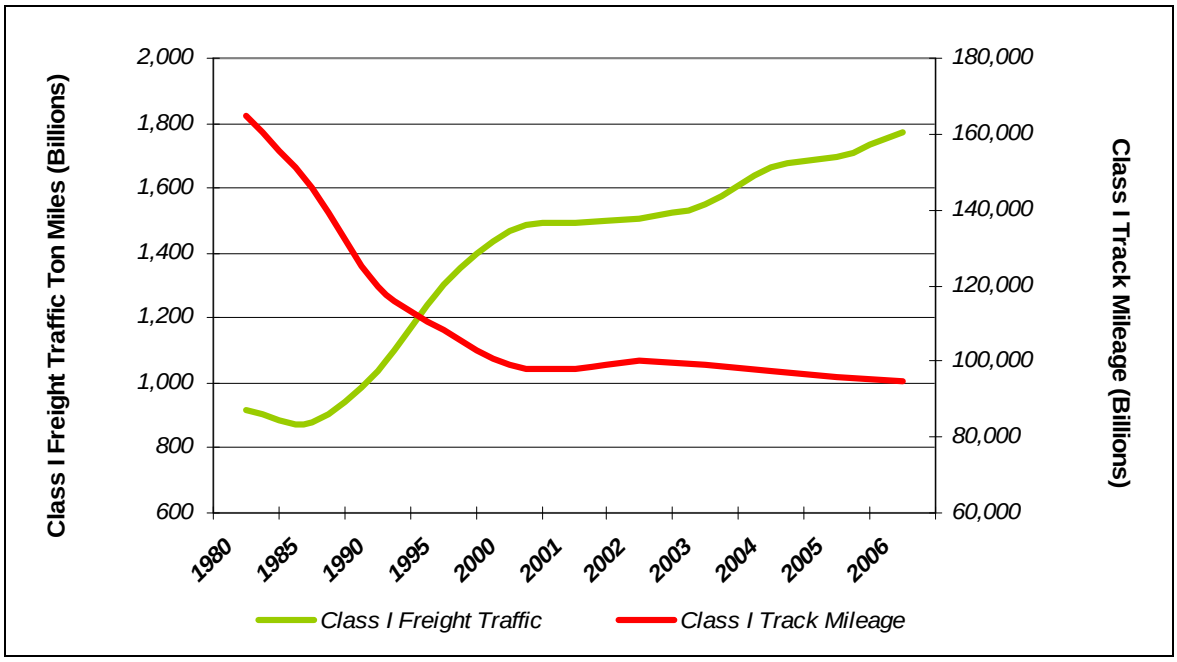
Insufficient Rail Capacity Contributes to Delays

The host railroads argue that Amtrak train delays are primarily caused by a rail network that currently has insufficient capacity to handle the needs of intercity passenger, freight, and commuter railroads. This situation will only worsen as both freight and passenger rail traffic increase in the future. Amtrak concedes that capacity limitations contributes to delays, but does not agree that it is either the sole or primary reason for train delays.

Rail Congestion Is Rising Due to Rapidly Increased Rail Traffic and Decreased Track Mileage

Demand for freight rail transportation has increased substantially since 1980 and is projected to continue to do so in the future. At the same time, however, the host railroads reduced their physical track to reduce their maintenance costs and remain competitive within the railroad industry and across other modes of freight transportation (trucks, airlines, ships). Between 1980 and 2006, Class 1 railroad freight traffic increased by 92.8 percent (as measured by ton-miles), while the Class 1 rail network decreased by 42.4 percent (as measured in miles of physical track). (see figure 5 on the following page).

Figure 5. Change in Freight Traffic and Track Mileage on Delays (1980-2006)



Source: OIG analysis of data provided by AAR and Bureau of Transportation Statistics

As rail traffic has increased, the rail network has become more congested. From 2000 to 2007, railroad traffic density (measured by revenue-ton miles per mile of railroad track) increased by 27 percent. Since 1990, rail traffic density has increased by 118 percent. According to FRA, freight demand forecasts predict increasingly constrained freight rail capacity. Overall demand[21] for freight transportation is projected to grow 43 percent by the year 2020, while rail freight traffic is expected to grow by 35 percent during this period.[22] Rail traffic growth may substantially increase in the event that highway congestion or other public policy issues drive freight business from the roads to rail.

According to the AAR, the freight railroads' operations have been affected by this increased congestion. As a result, the average speed of freight trains steadily declined from between 22 mph and 23 mph in the 1990s to between 19 and 21 mph from 2000 to 2004.[23]

The most recent comprehensive review we found of rail capacity and infrastructure investment needs is the *National Rail Infrastructure Capacity and Investment Study*, which was published by the AAR in 2007.[24] This report was

[21] This includes demand across all modes of transportation, including rail, trucks, airplanes, and ships.
[22] This estimate assumes that rail will maintain its current share of the freight market.
[23] Statement of Joseph H. Boardman, Federal Railroad Administrator, before the House Committee on Transportation and Infrastructure, Subcommittee on Railroads, April 26, 2006.
[24] National Rail Infrastructure Capacity and Investment Study, prepared for Association of American Railroads by Cambridge Systematics Inc., September 2007.

undertaken to forecast future freight rail capacity needs and the cost to meet those needs. The study also provides a snapshot of congestion levels on the current freight track network and states that 88 percent of the rail network is operating below capacity.

Although the study's calculations of network capacity included data on passenger train traffic, the study's definitions of capacity levels were specific to the freight railroads' operations. For example, routes characterized as operating below capacity would be capable of returning to normal operating conditions within 24 to 48 hours after a disruption. This is a much longer time standard than what is needed to run tightly scheduled Amtrak trains, which have a 30-minute or less on-time tolerance. Furthermore, data on other factors affecting Amtrak's ability to meet a schedule, such as the amount of slow orders or location, length, and frequency of track sidings, were not included in the study. Therefore, we concluded that the study results cannot be used to accurately determine whether the rail network has sufficient capacity to deliver Amtrak trains on schedule.

Most Amtrak Trains Operate on Single Tracks With Bi-Directional Traffic, Which Can Increase Congestion and Reduce Available Capacity

Several structural factors constrain rail capacity, including the amount of single track on which an Amtrak route operates; the number, length, and location of sidings (passing track segments next to mainline tracks); and the type of train control system. Host railroads indicate the current freight rail network is dealing with a complicated, multi-directional flow of traffic. On many routes, Amtrak trains travel against the flow of freight traffic. On stretches of single track, it becomes harder to avoid congestion.

We found that most Amtrak routes off the NEC operate on single track, but with the most efficient type of signaling system and frequent sidings.[25] We examined the track and signaling infrastructure for Amtrak routes off the NEC.[26] We found that about 70 percent of the track mileage for these routes is on single track. In addition, 7 of 13 Amtrak's long distance routes and 6 of its 12 corridor routes we examined operate over routes that were at least 70 percent single track. We also found that 75 percent of the track mileage for these routes is controlled by centralized traffic control systems, instead of the less efficient automatic block signaling systems or manual control. In addition, 60 percent of the route mileage for these Amtrak routes had sidings every 10 miles or less (see table 2 and exhibit E for more detailed findings).

[25] Frequent sidings on single track increase available capacity because they allow (1) a faster moving train to pass a slower freight train via the siding or (2) a slower moving train to pull into the siding to let the passenger train continue on the main track.

[26] This analysis relied on the database supporting the U.S. Department of Energy's Transportation Routing Analysis Geographic Information System (TRAGIS) simulation model, which is maintained by the Oak Ridge National Laboratory.

Table 2. Track Characteristics of Amtrak Routes

Structural Factor	*Miles*	*Percentage*
Track:		
1 Track	14,622	70.6%
2 Tracks	5,853	28.2%
3-4 Tracks	253	1.2%
	20,728	**100.0%**
Signal:		
Centralized traffic control	15,596	75.3%
Automatic block signaling	3,221	15.5%
Manual	1,911	9.2%
	20,728	**100.0%**
Siding Frequency:		
Less than every 10 miles	12,511	60.4%
Every 10 and 20 miles	5,495	26.5%
Greater than every 20 miles	2,722	13.1%
	20,728	**100.0%**

Note: Last major update completed in 2002
Source: OIG analysis of Department of Energy data

Despite the difficulties in avoiding congestion and delays when operating over single tracks, there are several Amtrak routes that have consistently strong OTP on mostly single-tracked rails.[27] There are many other factors involved in determining a route's performance. Therefore, there is no direct correlation between single- or double-tracked rails and good or bad on-time performance.

Passenger and Freight Train Speed Differences Consume Considerable Track Capacity

Capacity is also constrained by the different business models under which Amtrak and the freight railroads operate. This results in a mix of scheduled and un-scheduled trains operating at different speeds on the same track. Amtrak seeks to consistently and reliably transport passengers along established routes according to public schedules and therefore operates shorter, lighter, and faster trains than the majority of freight trains.[28] In contrast, the freight railroads operate their trains in a largely unscheduled, less time-sensitive model and vary the type, length, weight, and speed of their trains to meet customer needs. Because freight railroads operate a mix of scheduled and unscheduled trains, the resulting mix of freight traffic on the tracks varies daily. For example, a customer could request an

[27] The City of New Orleans and the Empire Builder are two examples of strong performing, single-tracked routes.
[28] The exception to this is intermodal freight trains, which can operate at speeds comparable to Amtrak trains.

additional shipment of a good with an expedited timeframe, which could be added to the existing mix of freight trains.

The recent growth in freight traffic has increased the mix of passenger and freight trains operating on Amtrak routes, reducing the effective capacity of the rail network. Amtrak and freight intermodal trains have a maximum speed of 79 mph, while most other freight trains have a top speed of 60 mph and generally travel much slower. Trains of a single type can be operated at similar speeds and with more uniform spacing between the trains because they have similar braking capabilities.

In areas where there is mixed traffic, including different length, speed, and braking conditions, dispatchers plan longer spacing between trains to ensure safe braking conditions. Therefore, areas of track that handle a mix of train types cannot handle as many trains per day and have less track capacity than track sections with traffic of a single train type. Depending on the number of tracks and type of dispatching control system[29] being used, moving from a single train type (e.g., all intermodal trains) on a corridor to a mix of train types (e.g., merchandise, intermodal, and passenger) can reduce track capacity by up to 38 percent[30] (see table 3 below).

Table 3. Impact of Multiple Train Types on Typical Rail Corridors

Number of Tracks	*Type of Control* [a]	*Decrease in Average Capacity if Multiple Train Types Are Used*
1	N/S or TWC	**20%**
1	ABS	**28%**
1	CTC or TCS	**38%**
2	N/S or TWC	**20%**
2	ABS	**34%**
2	CTC or TCS	**25%**
3	CTC or TCS	**18%**

Source: OIG analysis of Cambridge Systematics data

[a] *Types of Controls: N/S-TWC – No Signal/Track Warrant Control; ABS – Automatic Block Signaling; CTC-TCS – Centralized Traffic Control/Traffic Control System*

[29] The type of train control system impacts the spacing achievable between trains. Please see the AAR September 2007 report, "National Rail Freight Infrastructure Capacity and Investment Study," for further information on the different types of control systems.

[30] National Rail Infrastructure Capacity and Investment Study Table, prepared for Association of American Railroads by Cambridge Systematics Inc., September 2007.

Several Bottlenecks on the Freight Rail Network Can Slow Traffic Flow

Bottlenecks on the existing rail network make it difficult to move traffic through certain locations.[31] While we found no comprehensive list of bottlenecks, Amtrak identified at least seven segments where existing track capacity cannot handle the volume of traffic. These bottlenecks affect the following routes:

- Texas Eagle
- Heartland Flyer
- Capitol Limited
- Blue Water
- Pere Marquette
- Segments of the Michigan service
- Sunset Limited
- Coast Starlight
- Kansas City Mule
- Anne Rutledge
- Segments of the Missouri service
- Empire Builder

Other areas identified as having bottleneck problems around large urban areas include Chicago, Los Angeles, Long Beach, Kansas City, and between Washington, D.C., and Richmond, Virginia,[32] along the I-95 corridor.

Recent Growth in Intermodal Traffic and Freight Train Length Reduce Capacity

Rail network capacity has also been reduced by the growth in intermodal traffic and train length. The growth of intermodal train traffic, according to the National Industrial Transportation League, has had profound effects on the railroad system. This traffic tends to be higher speed and higher priority compared to, for example, unit train coal or merchandise traffic. It therefore takes up significant space on the railroads' network. A significant part of this traffic comes from the West Coast in the form of containers imported from the Far East, a factor that has caused congestion on certain lines.[33] U.S. rail intermodal traffic volume quadrupled between 1980 and 2007, from 3 million trailers and containers to more than 12 million.

Additionally, freight railroads have increasingly relied on longer trains to meet demand. For example, 1 railroad increased its average car length from 40- to 100-car trains and another has moved from 60-car trains to between 100- and 150-car trains. Longer trains reduce effective capacity because fewer sidings and

[31] Felix Ammah-Tagoe, PhD, and Deborah Johnson MA, "Understanding Potential Freight Bottlenecks in the United States: A Look at the GeoFreight Visual Display Tool," 7th MTS Research and Technology Coordination Conference, Washington, D.C., November, 2004.

[32] Cited in Ammah-Tagoe and Johnson study noted above and in the statement of Joseph H. Boardman, Federal Railroad Administrator, before the House Committee on Transportation and Infrastructure, Subcommittee on Railroads, April 26, 2006.

[33] Statement of Matthew K. Rose Chairman, President and CEO of Burlington Northern Santa Fe Corporation, before the House Transportation and Infrastructure Committee, April 26, 2006.

terminals can accommodate the trains, and this requires them to occupy the main line track for a longer period of time.

Additional capacity will be needed as part of a comprehensive solution to Amtrak's delay problems. Capacity can be created by public or private investment in better train control and dispatching systems, additional mainline tracks, longer and more frequent sidings, crossings, signals, and bigger train yards. Therefore, in addition to the host railroads' own capacity-related investments, additional investment to increase rail capacity through FRA's Capital Assistance to States – Intercity Passenger Rail Service Program will be needed to reduce delays to Amtrak trains. In addition, many states invest considerable capital funds to upgrade freight rail networks. We believe FRA can help states improve the effectiveness of state capital investments by developing model contract terms that states can use to link those investments to commitments from the freight railroads to improve OTP.

Root Causes of Delays Are Difficult To Isolate and Quantify

Many Amtrak trains are delayed by a combination of factors that reflect the interrelated nature of the rail network. Unraveling the root cause of delays in these instances partly depends on the meaning of Amtrak's preference rights and the host railroads' contractual obligations to maintain a level of utility on the rail infrastructure. In addition, Amtrak's conductor delay data, the most comprehensive data source on delay causes, provides only a limited perspective on these root causes.

Most Amtrak Delays Have Multiple, Interrelated Causes

The rail network operates 24 hours a day, 7 days a week. Delays in one part of the network can set off another type of delay later on in the network, which creates a "ripple" effect. As delays accumulate, the likelihood of unplanned meets between Amtrak trains and other trains increases; it then becomes difficult, or nearly impossible, to identify the initial cause of the Amtrak train delay. It can take up to 5 days, and sometimes up to 1 month, to restore service to normal operations after an unplanned disruption. Unlike the aviation system, which allows planes to be repositioned overnight, there is no "down time" within which trains can be repositioned.

From the host railroads' perspective, the root cause of a delay should be attributed back to the initial unplanned disruption. From Amtrak's perspective, its preference and contractual rights make the initial disruption from days earlier not relevant. This is because within the context of the status of the rail network, Amtrak's view is that, at any given time, the host railroads are obligated to give Amtrak priority and make a reasonable effort to deliver Amtrak trains on time.

We did not find a single, underlying root cause that consistently explained delays. Some routes with high levels of slow order delays had poor OTP while others did not. Similarly, some routes run primarily on single track had good OTP, while others did not. Each route has its own combination of factors that cause delay and each requires a plan to address those specific factors to effectively reduce delays and improve OTP.

Amtrak Delay Data Primarily Reflect What the Conductor Observes

Amtrak's conductor delay reports only record the observable cause of delay and are therefore limited in quantifying the proportionate share of the root causes of Amtrak train delays. Amtrak conductors record delay information in 47 categories for each milepost of each route. The conductor's observations, however, are not necessarily based on root causes. This is because the conductor can only see for a limited distance in front of the train and may not be aware of other disruptions elsewhere on the track network that could be affecting the train. Amtrak conductors recording the immediate reason of delay to a specific Amtrak train are frequently unable to identify other causes elsewhere in the network that could be contributing to the delay, unless specifically told by a train dispatcher. Furthermore, capacity limitations are not included as a possible cause of delay because Amtrak considers it the host railroads' obligation to deliver Amtrak trains according to schedule despite congestion or other infrastructure-related issues.

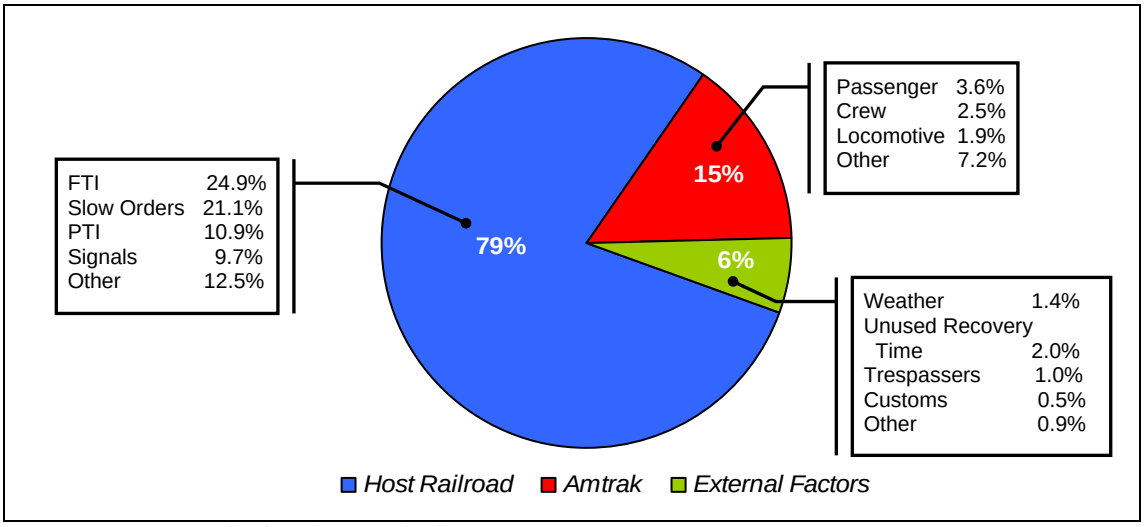
Despite these limitations, the conductor delay data can contribute to the understanding of the relative proportion of what is directly delaying Amtrak trains, even if they do not necessarily reflect the underlying root causes. In FY 2007, according to Amtrak's data,[34] 24.9 percent of delay minutes were due to freight train interference, 21.1 percent for slow order delays, 10.9 percent for interference delays with other passenger trains (other Amtrak trains), and 9.7 percent for signal failure delays.

Amtrak-caused delays included 3.6 percent for any passenger-related delays, 2.5 percent for delays caused by Amtrak's crews, 1.9 percent for locomotive failures, and 7.2 percent for other causes, which include other mechanical delays. External source related causes of delay include 1.4 percent for weather, 2.0 percent for unused recovery time,[35] and 1.0 percent due to trespasser delays (see figure 6 on the following page).

[34] These causes-of-delay data are for all routes of long distance and corridor trains off the NEC.

[35] Unused recovery time is when Amtrak trains may be ahead of or on schedule for a segment of the route, where they cannot use recovery time to make up delays. For example, if a train arrives at a station early, it cannot use the extra time because it has a scheduled departure time.

Figure 6. Amtrak Conductor Reported Causes of Delays, FY 2007



Source: OIG analysis of Amtrak data

Amtrak and the Host Railroads Measure Amtrak Train Delays Differently, Which Hinders Joint Action To Improve Amtrak OTP

Amtrak measures its trains' performance and delays according to its published schedules and fairly stringent ICC delay tolerances. In discussing Amtrak's delays, the host railroads tend to focus on contractual incentive performance standards, which are less stringent than the published schedules.[36] In addition, while Amtrak's on-time performance statistics focus on overall route performance, each host railroad is concerned only with the segments of Amtrak routes that operate over their own territory. This difference in focus makes agreement on the magnitude of the delay problem difficult, let alone agreement on how to solve it. We determined that the schedule time, not the contractual incentive standards, is the better metric by which to measure host railroad performance.

Amtrak Focuses on Public Schedules While Host Railroads Focus on Incentive Standards

Amtrak schedules reflect three components: (1) pure run-time, that is, the time it would take an Amtrak train to traverse a route unimpeded with no speed restrictions lowering speeds below the track's rated speed; (2) station dwell time, that is, the scheduled time the train waits in a station for passengers to depart and board; and (3) recovery time, that is, an amount of time negotiated with the host railroads to account for unplanned disruptions, (e.g., weather) and expected delays resulting from shared usage of track. Amtrak does not plan for delays due to host

[36] Contractual incentive standards specify the conditions host railroads must meet in terms of delivering trains on time to earn incentive payments from Amtrak.

railroad operations in its schedules besides those included in the recovery time.[37] As shown in table 4 below, the window within which an Amtrak train is considered to be on time depends on the route's distance.

Table 4. Comparison of On-Time Tolerances Across Amtrak and Freight Rail

Amtrak On-Time (with ICC tolerance)		Freight Intermodal (standard)	Freight Intermodal (premium)	Freight Train (other)
Route Length (miles)	**On-Time Tolerance**			
51-250	10 min	Scheduled within 8- to12-hour window	Scheduled within 4- to 8-hour window	Unscheduled within 24- to 48- hour window
251-350	15 min			
351-450	20 min			
451-550	25 min			
550 or more	30 min			

Source: OIG analysis of AAR and Amtrak data

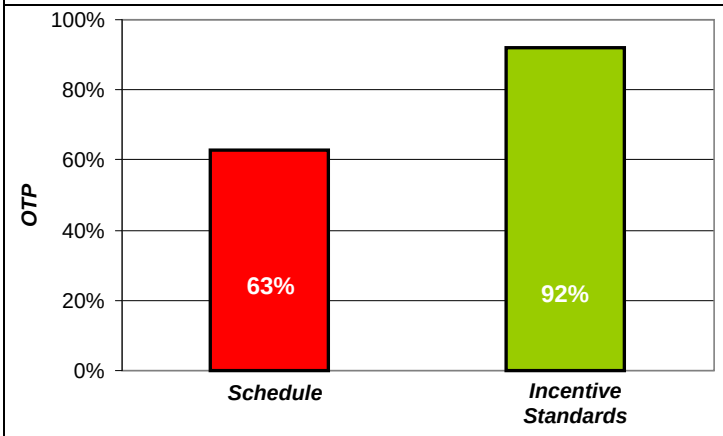
It is important to note that high-value, premium, intermodal freight trains, which travel at speeds comparable to Amtrak trains, operate on a significantly longer window of delay tolerance, between 4 to 8 hours compared to up to 30 minutes for Amtrak. This highlights one of the significant differences between Amtrak's highly scheduled business model and the freight's more loosely scheduled model. The fact that many freight trains are not scheduled at all also contributes to the constantly changing circumstances the host railroads must accommodate to move both passenger and freight trains on the same tracks.

Each host railroad has an operating contract with Amtrak that specifies certain standards by which the host railroad can earn incentive payments for delivering Amtrak trains across their tracks on time. In general, these standards require host railroads to deliver 80 percent of the Amtrak trains on time to specific checkpoints, with allowances given for certain types of delays or events. According to Amtrak, these allowances add 10 to 20 percentage points to the train's OTP as measured by schedule.

[37] Amtrak negotiates separate agreements for specific routes with the host railroads, in which Amtrak often agrees to add time to its public schedules in exchange for improvements in a certain Amtrak route's OTP. In those cases, Amtrak does add time to its schedule to account for delays due to host operations.

For example, during April 2008, the Amtrak Cascades trains, operating over BNSF's tracks, had 63 percent OTP (within the scheduled time plus an on-time tolerance of 10 minutes). However, when considering the contractually allotted tolerances used to measure performance for incentive payments, the same trains had 92 percent OTP (see figure 7).

Figure 7. OTP by Schedule vs. Incentive Standards for Amtrak Cascades (April 2008)



Source: OIG Analysis of Washington DOT data

We determined that the schedule time, not the contractual incentive standards, is the better metric by which to measure host railroad performance for the following two reasons.[38]

- First, it reflects the expectation of Amtrak's passengers. As we reported in March 2008, potential passengers' lack of confidence in Amtrak's OTP will cause them to choose not to ride the train, which reduces Amtrak's ridership and revenues.

- Second, despite focusing on incentive payment standards when discussing their performance in delivering Amtrak trains, the host railroads are contractually obligated to make "every reasonable effort to meet the public schedule time." This includes making a reasonable effort to (1) deliver Amtrak trains to all scheduled passenger stops by the scheduled time; (2) avoid excessive delays to trains; and (3) consistent with safety, make up delays, even those that occurred on other host railroads.

Incentive Payments Are Insufficient To Motivate Better Handling of Amtrak Trains. As of January 2008, only BNSF, CP, and CN were earning incentive payments from Amtrak. Three of the four Class 1 railroads we visited stated that they tended to view the incentive payments as insufficient to influence the way they dispatch Amtrak trains. The contracts' penalty provisions are also ineffective since host railroads are penalized only if they have received incentive payments in the past 12 months, which most railroads do not receive.

[38] There are many other ways to measure on-time performance, and each has its own strengths and weaknesses and serves different purposes. FRA summarized these issues regarding a wide range of alternate on-time performance indicators in its May 2008 quarterly report to Congress on improving the on-time performance of Amtrak intercity rail service—letter from Federal Railroad Administrator Joseph Boardman to the House and Senate Committees on Appropriations Chairman Senator Robert Byrd, May 2008.

Finally, while all four host railroads we met with expressed concern that Amtrak's schedules were inflexible and unchanging, we found that Amtrak has added time to some routes. Exhibit C summarizes schedule changes for selected Amtrak routes and provides the general reasons why Amtrak added or removed time for these selected routes.

Given the differing viewpoints on how to properly measure OTP and delays, we are recommending that FRA use its quarterly OTP reporting requirement to obtain agreement between Amtrak and the host railroads on a proper performance measure. FRA should then publicly report OTP and delay data by host and route on a regular basis.

RECOMMENDATIONS

There are several root causes of Amtrak train delays that, if addressed, would improve Amtrak's OTP and financial viability. Amtrak has options available to address some of these root causes, which it has yet to fully exercise. If Amtrak believes it has compelling evidence of preference violations, Amtrak could petition the Department of Justice to initiate a legal case against the host railroads to enforce its preference rights and thereby affect host railroad dispatching practices. Amtrak could also pursue arbitration or other legal action to enforce the terms of its operating agreements with the host railroads. Both these avenues, however, are either ineffective or potentially cumbersome.

We believe that FRA can play a lead role in facilitating cooperation between Amtrak and the host railroads to reduce delays and, where needed, can seek recommended legislative changes.

We recommend that the FRA Administrator:

1. Seek a legislative change that would provide Amtrak with the same right to appeal to the Secretary of Transportation to enforce its preference rights as the host railroads now have to appeal to the Secretary to obtain relief from their preference obligations.

2. Seek a legislative change to expand the personal liability dispatchers now have for violations of FRA safety rules to include personal violations of Amtrak's preference rights.

    a. FRA should seek to complement this increased liability with express authority for Amtrak to pay incentives to individual host railroad dispatchers for meeting dispatching metrics agreed upon by Amtrak and the individual host railroads.

   b. FRA should report to Congress regularly on which host railroads agreed to permit these payments, what amounts were paid, and how these actions affected delays and OTP.

3. Expand the route action plan process to include all Amtrak long distance and corridor routes with poor OTP and increase the visibility of the implementation of the resulting plans.

4. Use its quarterly OTP reporting requirement to obtain agreement between Amtrak and the host railroads regarding how to measure OTP and delays and then publicly report OTP and delay data by host and route on a regular basis.

5. Encourage better internal reporting by the host railroads and increased focus by their top management of delays and OTP.

6. Support the permanent authorization of, and increased funding for, the Capital Assistance to States-Intercity Passenger Rail Service Program through the upcoming surface transportation reauthorization and give increased consideration to projects that result in a binding commitment by the involved host railroad to improve OTP on that route.

7. Develop model contract terms that can be used by the states that are investing their own funds into freight railroad capital projects to link those investments to commitments to improve OTP.

AGENCY COMMENTS AND OFFICE OF INSPECTOR GENERAL RESPONSE

We held an exit conference with FRA officials on June 18, 2008, to discuss our findings and recommendations. We provided FRA with our formal draft report on July 16. On July 30, we received FRA's response, which is contained in its entirety in the appendix to this report. FRA officials generally concurred with all of our recommendations and provided appropriate planned actions. However, FRA did not provide target dates for completing all proposed actions. With this in mind, we respectfully request that FRA provide specific target dates to our office within 30 days of the issuance of this report for each action required to address our recommendations.

In its response to our report, FRA also noted that the most likely vehicle for it to address recommendations 1 and 2 is the upcoming Amtrak reauthorization bill. According to FRA, Congress is close to reaching an agreement on this bill. We recognize that FRA's ability to address and act upon recommendations 1 and 2 depends on whether Congress passes this legislation. Therefore, should Congress enact an Amtrak reauthorization this session, we request that FRA provide us, within 30 days of such enactment, an assessment of whether that legislation is sufficient to address our recommendations or if further actions are needed. Should the Amtrak reauthorization not be enacted this session, we request that FRA provide us with a plan of action to implement our recommendations within 30 days of the end of the Congressional session.

- **Recommendation 1:** FRA stated that it would consider the issue of preference legislation further and engage appropriate representatives within the Department to explore how such an approach could be structured and the appropriate legislative vehicle for possible consideration by Congress.

- **Recommendation 2:** FRA stated that it opposes the use of the rail safety statutes for non-safety purposes. Instead, FRA proposed to achieve the same end by enacting an entirely separate civil penalty provision that has no relation to the rail safety statutes beyond using them as a model.

  - *Recommendation 2a.:* FRA agreed to consider the issue of complementing this increased liability with express authority for Amtrak to pay incentives to individual host railroad dispatchers further and engage appropriate representatives within the Department to explore how such an approach could be structured and the appropriate legislative vehicle for possible consideration by Congress.

- *Recommendation 2b.:* FRA stated that it already reports to Congress quarterly on its actions to improve on-time performance and if an incentive program was established, the issues and results associated with that program would be included in these reports.

- **Recommendation 3:** FRA stated that it will actively monitor the progress of the route action plan and evaluate those aspects that work and those that can be improved. FRA will also work with Amtrak and the host railroads to expand successful efforts as both parties become comfortable with the process.

- **Recommendation 4:** FRA stated that it will engage Amtrak and the host railroads in discussions designed to reach a consensus on appropriate OTP metrics. In the interim, FRA will present OTP status based upon multiple metrics.

- **Recommendation 5:** FRA stated that it will continue to work with Amtrak and the host railroads to develop consensus metrics and improved reporting of these metrics. We consider this recommendation closed.

- **Recommendation 6:** FRA stated the Administration first proposed such legislation in 2003 and continues to support permanent authorization. The proposed legislation would provide the Secretary with sufficient discretion in awarding grants that are contingent upon a binding commitment from the host railroad to OTP improvements. We consider this recommendation closed.

- **Recommendation 7**: FRA stated that it believes such standard contract terms could be a good starting point for negotiations between states and host railroads. FRA expects to learn much from the FY 2008 and FY 2009 start-up of the capital grants to states for intercity passenger rail program that could form the basis for developing such model contract terms.

ACTIONS REQUIRED

FRA's response and planned actions address the intent of recommendations 5 and 6 and we consider these recommendations closed. While we believe FRA's proposed actions also meet the intent of the remaining recommendations, we cannot consider them resolved without target dates for FRA's planned actions. In accordance with Department of Transportation Order 8000.1C, we request that FRA provide target dates for its planned actions for all other recommendations within 30 days of the issuance of this report.

We appreciate the courtesies and cooperation of FRA representatives during this audit. If you have any questions concerning this report, please contact me at (202) 366-1981 or Mitchell Behm, Program Director, at (202) 366-1995.

EXHIBIT A. SCOPE AND METHODOLOGY

Scope

The Senate Appropriations Subcommittee on Transportation, Housing, and Urban Development, and Related Agencies requested that our office (1) identify the root causes of Amtrak delays for Amtrak trains operating 0outside of the Northeast Corridor, (2) assess if host freight railroads grant Amtrak trains preference over freight trains as prescribed by law, (3) identify dispatching practices that impact delays, and (4) evaluate whether delays in maintaining track have impacted Amtrak's train delays.

The legal opinions and data used in this report were obtained from Amtrak, the host freight railroads, the Federal Railroad Administration (FRA), and the Association of American Railroads (AAR). The data were used to perform the analyses detailed below. During the audit, we met with senior operations managers of four Class 1 freight railroads that dispatch Amtrak trains and observed their dispatching center operations. These railroads were Burlington Northern Santa Fe Railway (BNSF), Norfolk Southern Railway Company (NS), CSX Transportation, Inc. (CSX), and Union Pacific Railroad Company (UP).

We conducted this performance audit from June 1, 2007, to June 30, 2008, in accordance with Generally Accepted Government Auditing Standards prescribed by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence that provides a reasonable basis for our findings and conclusions based on our audit objectives. We believe the evidence obtained provides a reasonable basis for our findings and conclusion based on our audit objectives. There has been no prior audit coverage in this area by the Department of Transportation's Office of Inspector General.

Methodology

To identify root causes of delays, we collected and analyzed Amtrak's data on performance relative to schedule; OTP data, skeleton schedules, from which public schedules are developed; U.S. Department of Energy data on track characteristics; and contractual agreements with BNSF, NS, CSX, and UP. We also collected and analyzed Amtrak's minutes of delay data captured through conductor delay reports. Amtrak's minutes of delay data cover freight-caused delays, such as freight and other train interference; slow orders; maintenance of way; Amtrak-caused delays, such as equipment and passenger-related delays; and delays caused by weather and third parties. We found that Amtrak's minutes of delay data often reflected secondary causes. Root causes were often represented in multiple categories. Discussions with Amtrak operations staff and freight

railroads operations staff provided a clearer description of the underlying and often immeasurable causes of delay.

To assess whether Amtrak's statutory right of preference is granted to its trains, we reviewed the statute (49 U.S.C. § 24308 [1973]); the legal opinion provided to Amtrak from its outside counsel, Wilmer Cutler Pickering Hare and Dorr, LLP; and the "Response to Memorandum of Southern Pacific in Opposition to Motion for Preliminary Injunction" in the 1981 legal proceedings United States v. Southern Pacific Transportation Company. In addition, we met with Amtrak's legal staff and outside legal counsel, the host railroads, FRA, and AAR to understand the various interpretations of the preference legislation. We also met with the Office of Inspector General and Department of Transportation Offices of General Counsel to obtain their legal opinions on the meaning of preference.

To identify dispatching practices that impact delays, we met with representatives of the major freight railroads dispatch operations at BNSF, CSX, NS, and UP; observed their dispatch operations; and reviewed the host railroads' written dispatching and operations policies and procedures. We also reviewed an FRA study, "Understanding How Train Dispatchers Manage and Control Trains" that provided detail descriptions of how experienced railroad dispatchers manage and schedule trains in today's environment. We also met with key stakeholders, including the FRA and AAR. Where relevant, we analyzed Amtrak's minutes of delay and OTP data to validate findings from our interviews with the host railroads and Amtrak concerning host dispatching policies and practices.

To evaluate whether delays in maintaining track have impacted Amtrak's train delays, we analyzed Amtrak's minutes of delays from slow orders between FY 2001 and the third quarter of FY 2008 and obtained slow order data from UP and CSX. We interviewed the host railroads, Amtrak, AAR, FRA, and other stakeholders to understand the railroad industry's capital and infrastructure investment planning process, the role that slow orders play in overall train operations, and its impact on Amtrak's on-time performance. Amtrak's operating contracts with each of the host railroads provided the terms under which the host railroads are obligated to maintain their tracks related to Amtrak's schedule reliability.

We sought, but were unable to obtain, detailed data regarding the location, cause, and duration of slow orders on freight railroad tracks, as well as detailed data on existing rail capacity and traffic by route. Much of this information is considered proprietary by the freight railroads. We continue to seek this additional data, and, if it becomes available, plan to conduct econometric analyses to try to determine the relative contribution of different root causes, i.e., capacity or dispatching practices, to Amtrak train delays.

Exhibit A. Scope and Methodology

EXHIBIT B. ACTIVITIES VISITED OR CONTACTED

Amtrak, Washington, D.C.

Association of American Railroads, Washington, D.C.

Burlington Northern Santa Fe Railway, Fort Worth, TX

Cambridge Systematics, Inc., Washington, D.C.

CSX Transportation, Inc., Jacksonville, FL

Department of Transportation, Office of General Counsel, Washington, D.C.

Federal Railroad Administration, Washington, D.C.

Norfolk Southern Railway Company, Atlanta, GA

Union Pacific Railroad Company, Omaha, NE

EXHIBIT C. SELECTED AMTRAK SCHEDULE CHANGES, 1971-2007

Train	↑ / ↓	Schedule Change 1971-2007
California Zephyr		
Train 5	↑	Added 8 hours, 30 minutes
Train 6		Added 6 hours, 15 minutes
Capitol Limited		
Train 29	↓	Removed 1 hour, 40 minutes
Train 30		Removed 1 hour, 10 minutes
Cardinal		
Train 50	↑	Added 45 minutes
Train 51		Added 2 hours, 5 minutes
Carolinian:		
Train 79	↓	Removed 12 minutes
Train 80		Removed 12 minutes
City of New Orleans		
Train 58	↑	Added 2 hours, 15 minutes
Train 59		Added 2 hours, 33 minutes
Coast Starlight		
Train 11	↑	Added 4 hours
Train 14		Added 3 hours, 10 minutes
Crescent		
Train 19	↑	Added 3 minutes
Train 20		Added 1 hour, 45 minutes
Empire Builder		
Train 7	↓	Removed 15 minutes
Train 8		Removed 59 minutes
Lake Shore Limited		
Train 48	↑	Added 2 hours, 10 minutes
Train 49		Added 30 minutes
Silver Meteor		
Train 97	↑	Added 3 minutes
Train 98		Added 8 minutes
Silver Star		
Train 81	↑	Added 1 hour, 39 minutes
Train 82		Added 1 hour, 18 minutes
Southwest Chief		
Train 3	↑	Added 2 hours, 35 minutes
Train 4		Added 3 hours, 21 minutes
Sunset Limited		
Train 1	↑	Added 3 hours
Train 2		Added 3 hours, 20 minutes
Texas Eagle		
Train 21	↑	Added 3 hours, 35 minutes
Train 22		Added 2 hours, 25 minutes

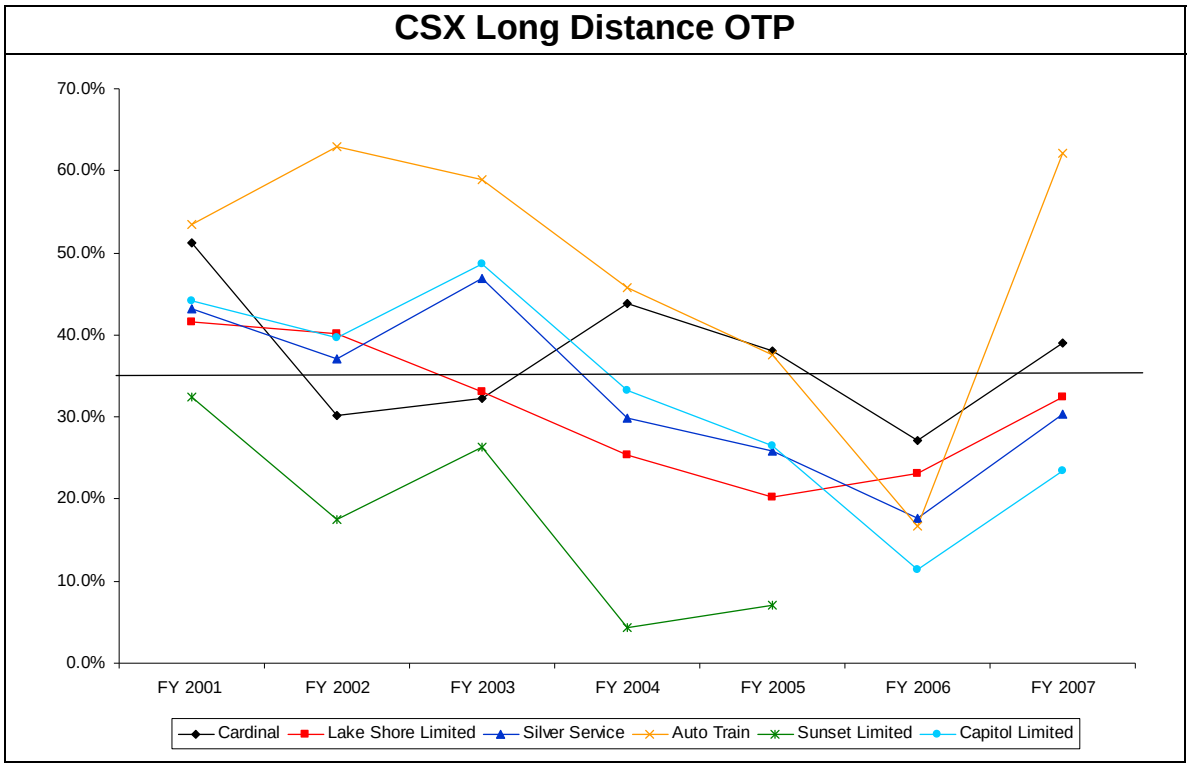
Source: Amtrak

Though there may be other route-specific reasons for changing certain schedules that are not included here, Amtrak changed some of its schedules because of:

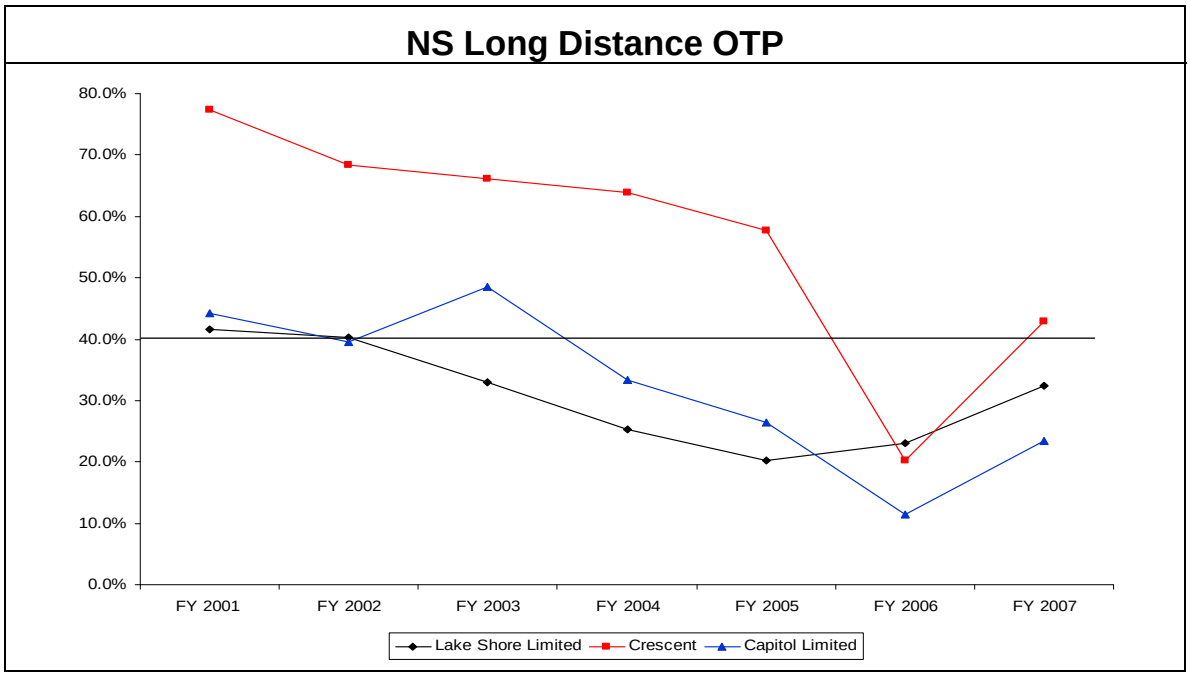
- Changes to route, which include adding or changing station stops.
- Attempts to work with host railroads to improve OTP and/or reduce minutes of delay on certain routes.
- Added time to several routes. (Amtrak did this in 2001 because of its mail and express service; when the mail and express service was discontinued in 2007, not all of this extra time was removed from the schedules.)
- Downgrading of track speeds by host railroads.

Exhibit C. Selected Amtrak Schedule Changes, 1971-2007

EXHIBIT D. AMTRAK OTP BY ROUTE AND HOST [39]

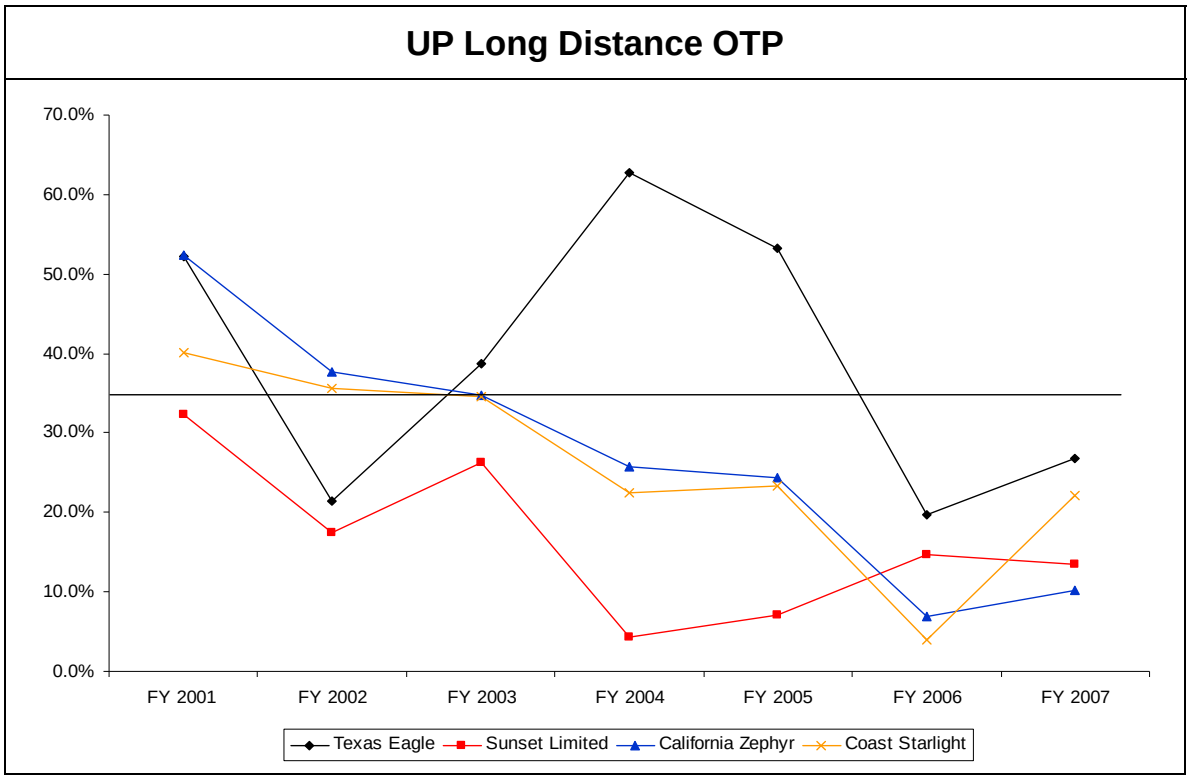


Note: Cardinal service is shared with CN, NS, and UP; but CSX is the primary host for this route. Lakeshore Limited service is shared with NS; Silver service is shared with NS; but the majority of the route is on CSX. Sunset Limited service, shared with UP and BNSF, was discontinued on the CSX portion of the line after Hurricane Katrina (2005). Capitol Limited service is shared with NS.

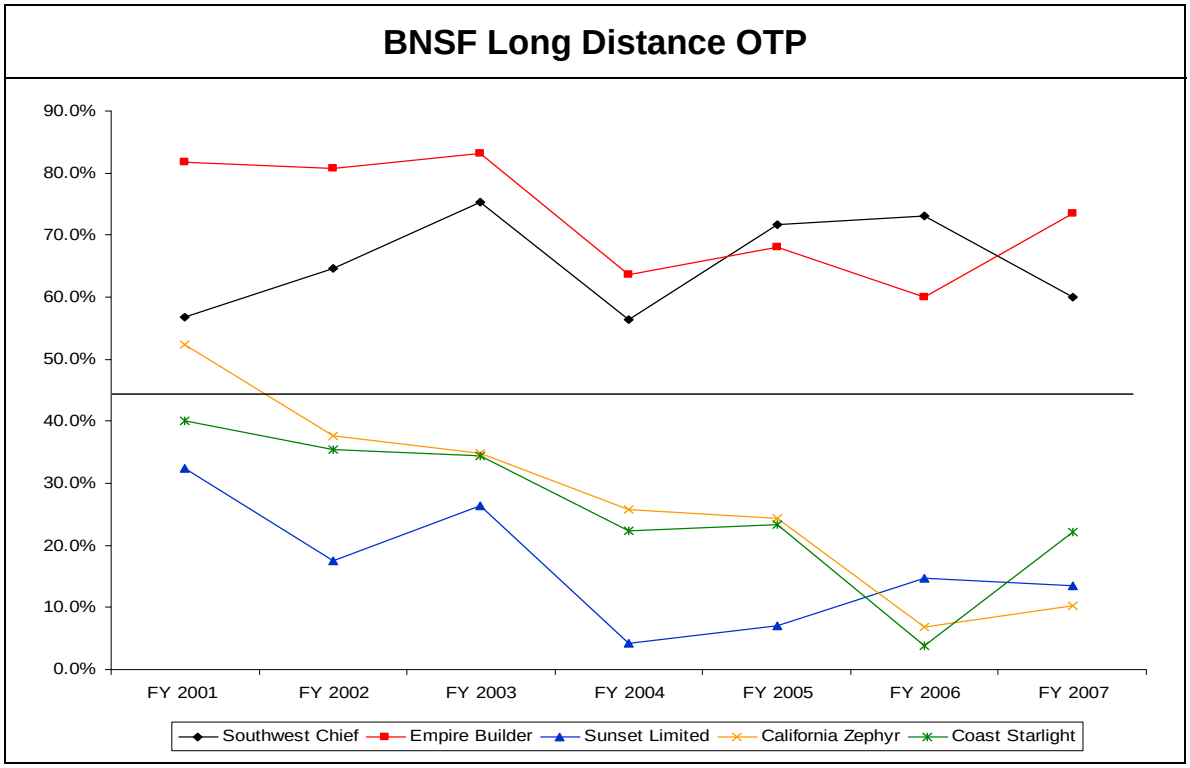


Note: Lake Shore Limited and Capitol Limited services are shared with CSX.

[39] For all charts in Exhibit D, the source is OIG analysis of Amtrak data.

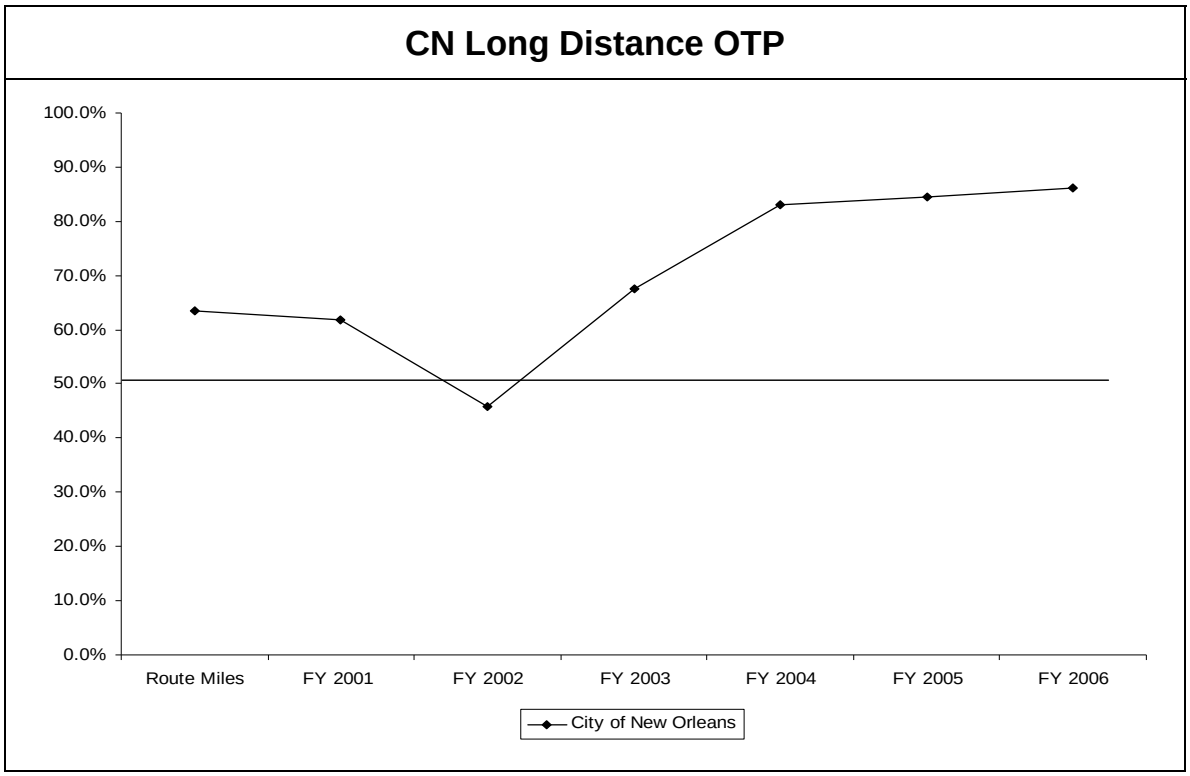


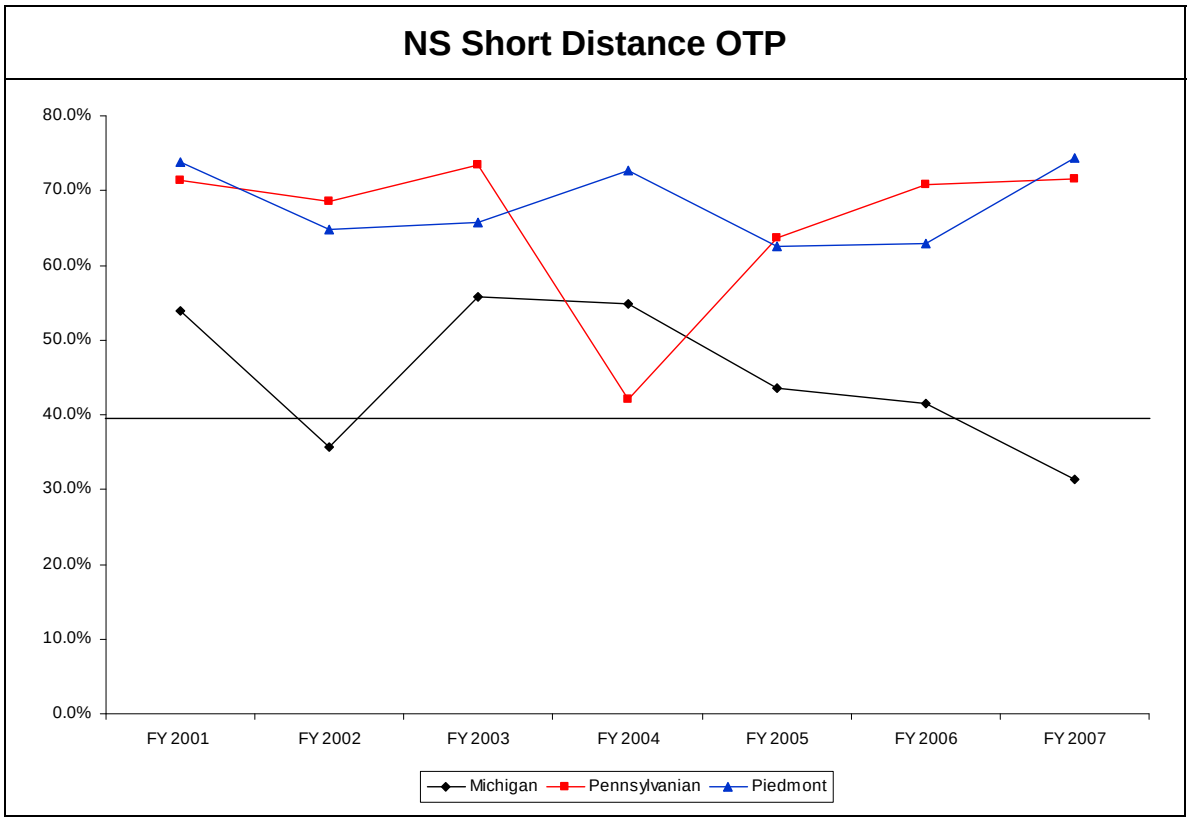
Note: Texas Eagle service is shared with BNSF and CN, but the majority of the route is on UP. Sunset Limited service is shared with BNSF and CSX (through 2005), but the majority of the route is on UP. California Zephyr and Coast Starlight services are shared with BNSF. The majority of the Coast Starlight service's route is on UP.



Note: Sunset Limited service is shared with UP and CSX (through 2005), but most is on UP. Empire Builder service is shared with CP, but BNSF is the primary host . California Zephyr and Coast Starlight services are shared with UP. The majority of the Coast Starlight service's route is on UP.

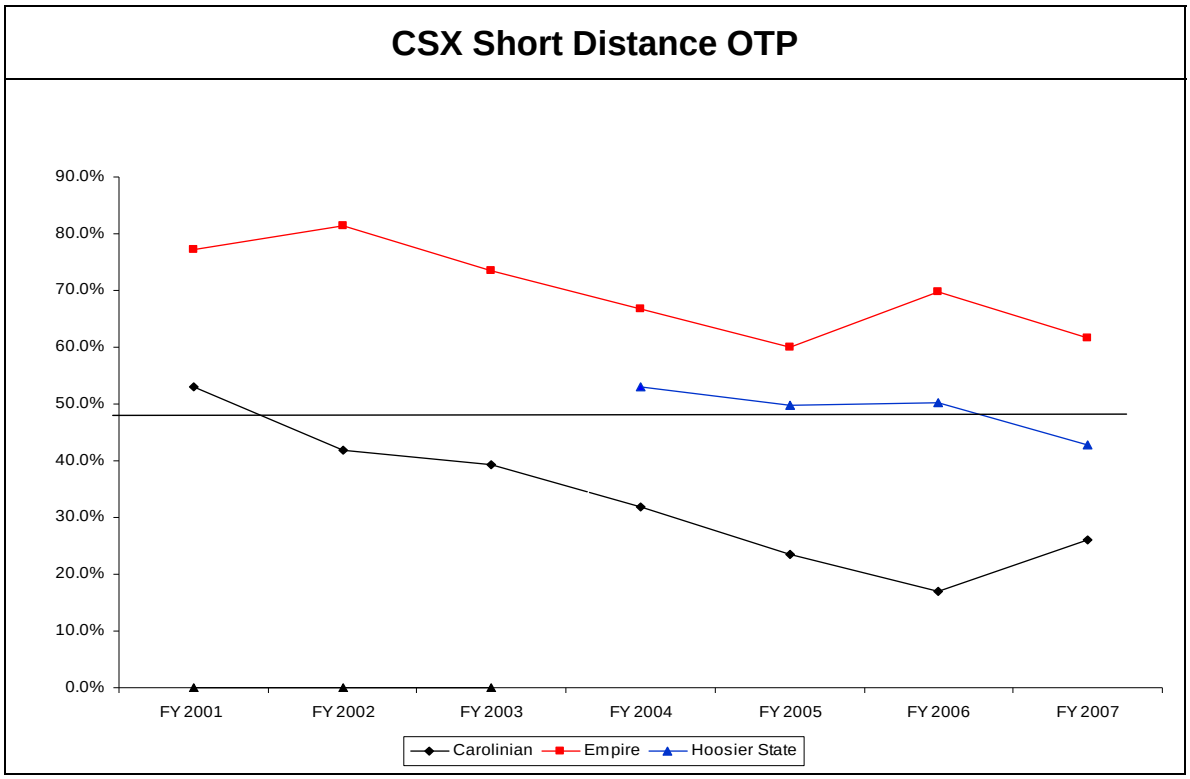
Exhibit D. Amtrak OTP by Route and Host



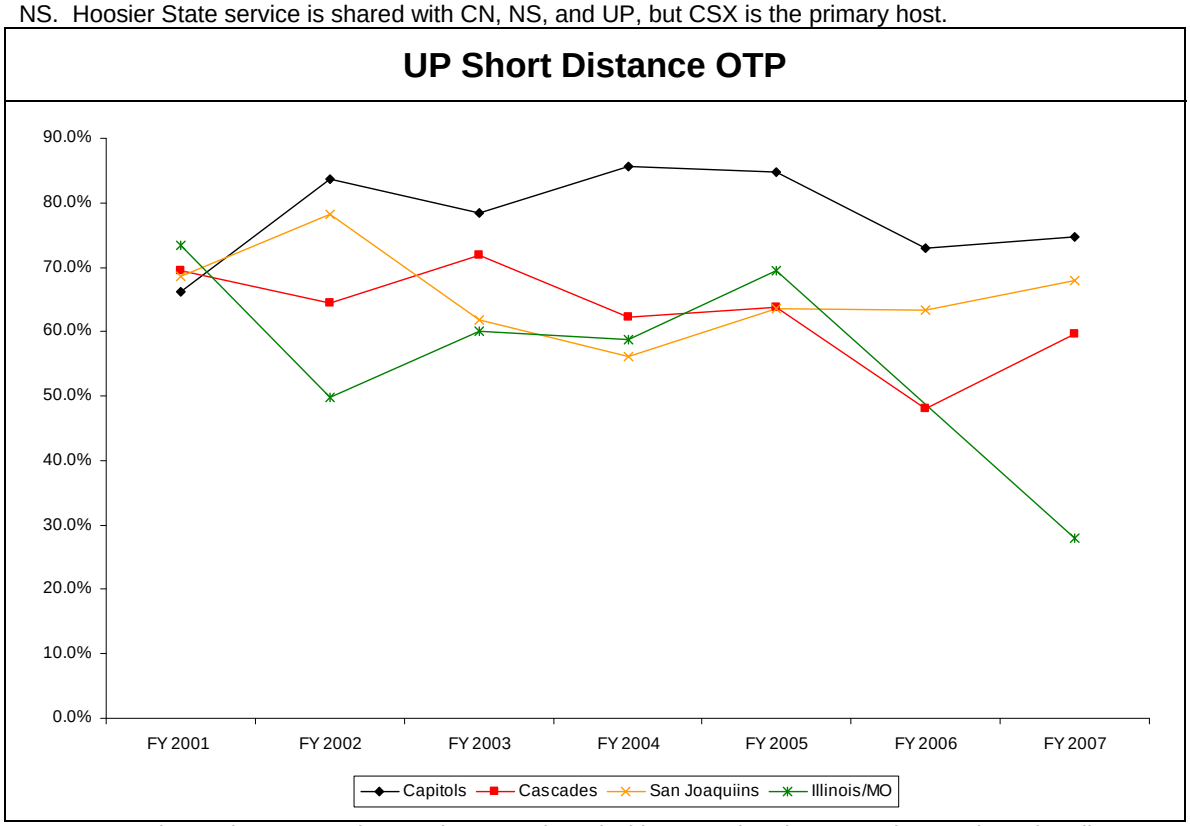


Note: Michigan service is shared with CN and CSX.

Exhibit D. Amtrak OTP by Route and Host

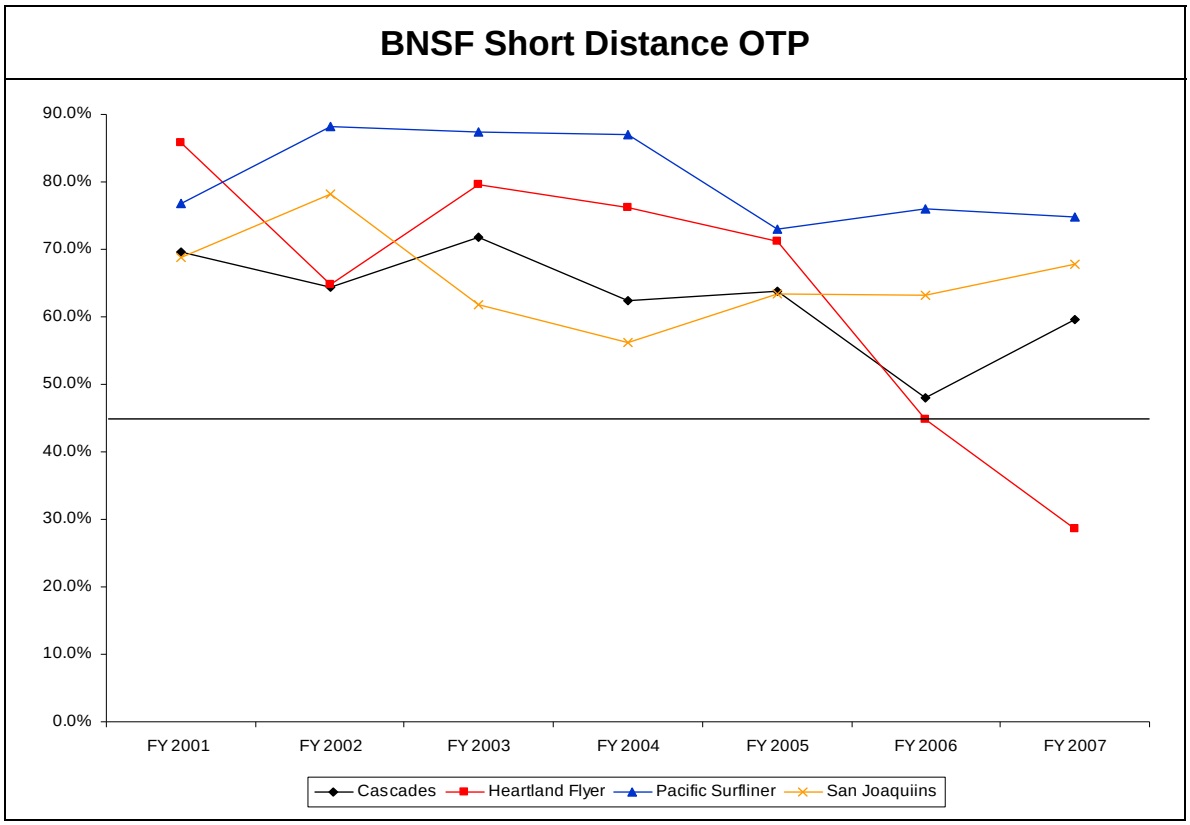


Note: Empire service is shared with CN, but most of the route is on CSX. Carolinian service is shared with NS. Hoosier State service is shared with CN, NS, and UP, but CSX is the primary host.



Note: Cascades and San Joaquins services are shared with BNSF; but the Cascades service primarily runs over BNSF. Only a small portion of the San Joaquins service runs over UP. Illinois service is shared with BNSF and CN.

Exhibit D. Amtrak OTP by Route and Host



Note: Cascades, Pacific Surfliner, and San Joaquins services are shared with UP, but BNSF is the primary host for both the Cascades and San Joaquins services.

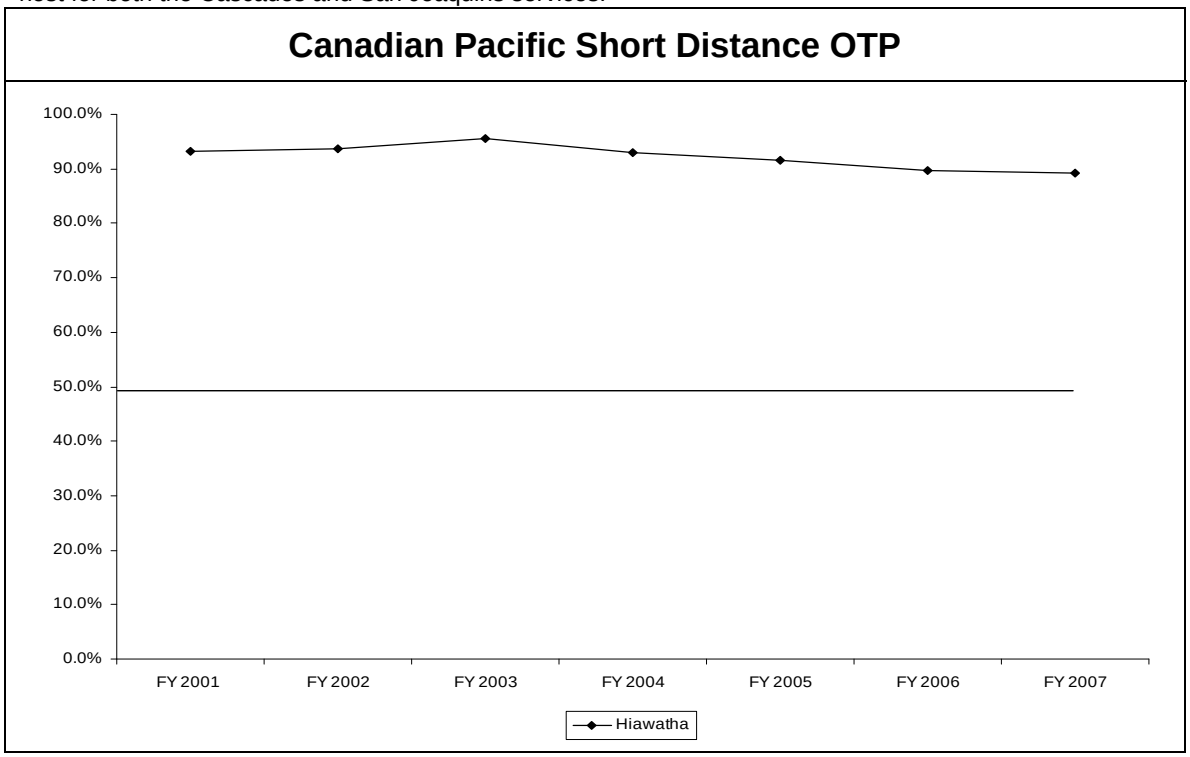
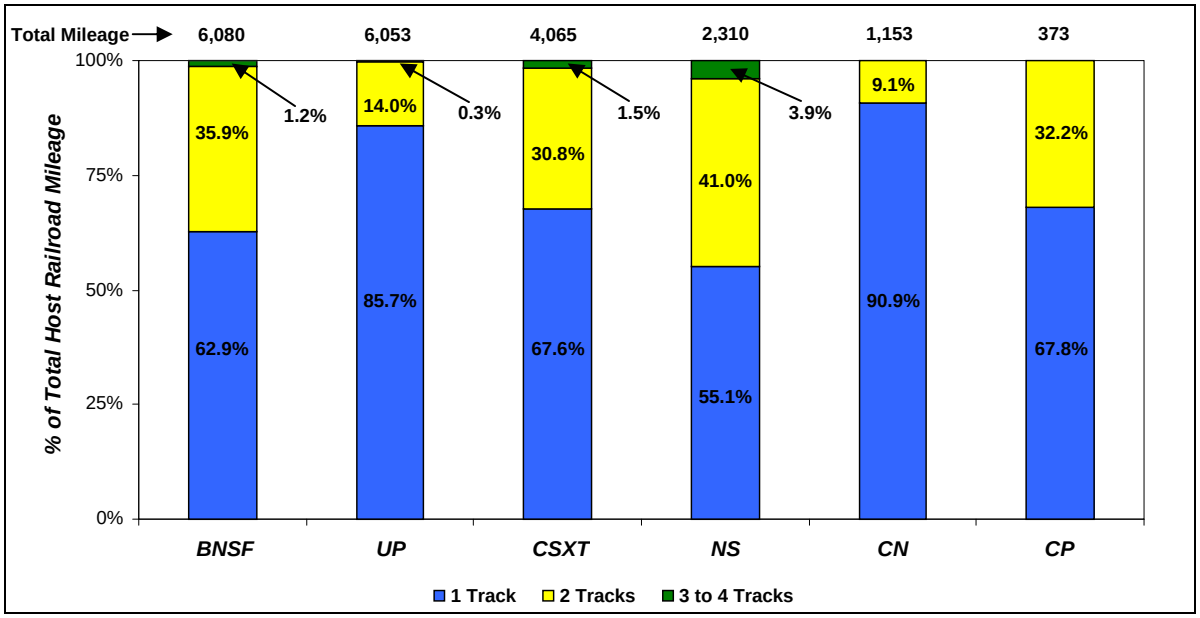


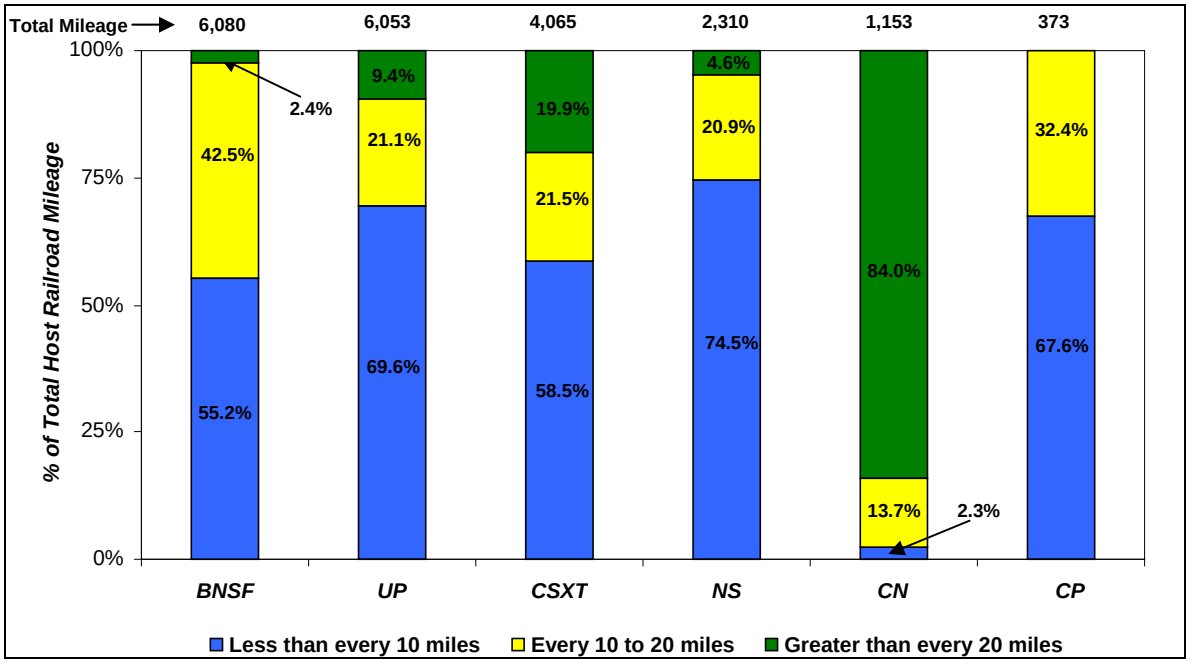
Exhibit D. Amtrak OTP by Route and Host

EXHIBIT E. TRACK INFRASTRUCTURE CHARACTERISTICS [40]

Number of Tracks by Host Railroad



Siding Frequency by Host Railroad



[40] For all charts in Exhibit E, the source of the data is OIG analysis of Department of Energy data.

Signal Type by Host Railroad

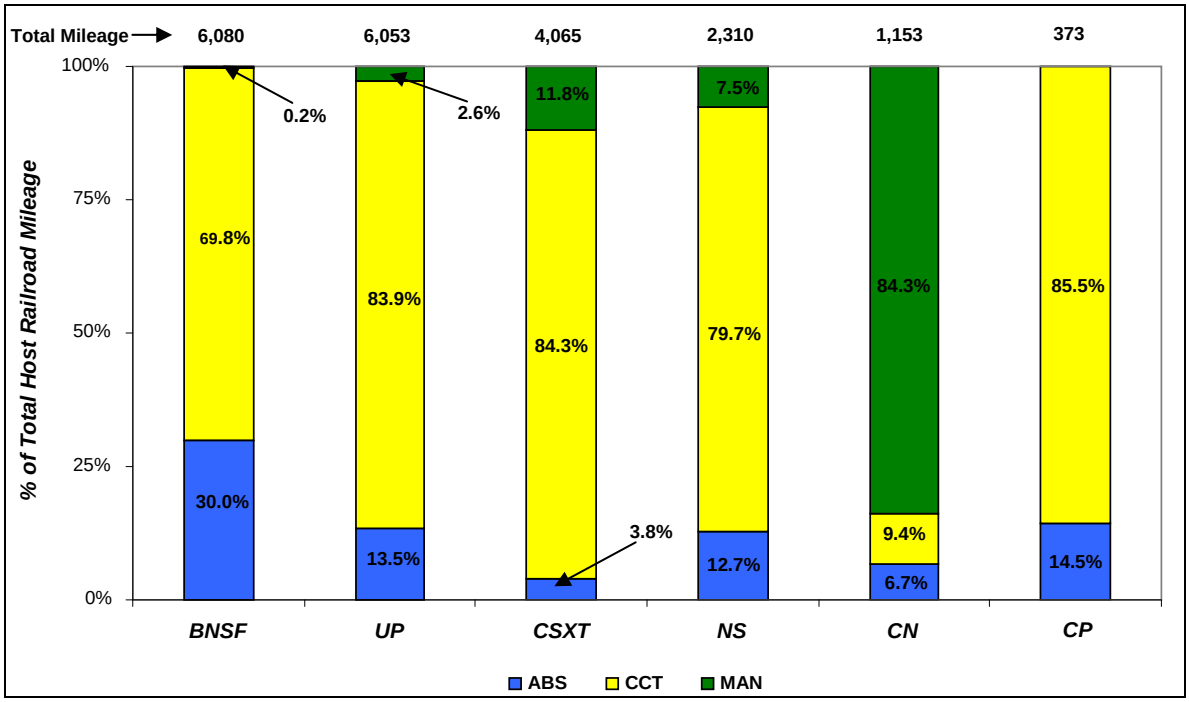


Exhibit E. Track Infrastructure Characteristics

EXHIBIT F. MAJOR CONTRIBUTORS TO THIS REPORT

Name	Title
Mitchell Behm	Program Director
Debra Mayer	Project Manager
Marjorie Tsaousis	Management and Program Analyst
Chia-Mei Liu	Economist
Jerrod Sharpe	Economist
Andrea Nossaman	Writer-Editor
Thomas K. Lehrich	Chief Counsel

APPENDIX. AGENCY COMMENTS

Memorandum

U.S. Department
of Transportation

Federal Railroad Administration

Date: July 30, 2008 Reply to Attn of:

Subject: Response to the Draft Report Entitled "Root Causes of Amtrak Train Delays"—Project No. 07C3004C000

From: Clifford Eby
Deputy Administrator

To: David Tornquist
Assistant Inspector General for Rail and Maritime
Program Audits and Economic Analysis

The Federal Railroad Administration appreciates the opportunity to review your office's report: "Root Causes of Amtrak Train Delays". The report appropriately recognizes that there are multiple causes for delays impacting Amtrak trains, not the least of which is the growing congestion on parts of our national rail system resulting from the growth in the amount of freight moving by rail over a rail system that is substantially smaller than existed in 1971. The report also recognizes that because there are multiple causes for delay, there will be no one "silver bullet" that dramatically improves Amtrak's On Time Performance (OTP). Instead, success will come from a multi-faceted approach requiring a continuing commitment by Amtrak and the host railroads to continuous improvement. There is also a role for a Federal-State partnership to address bottlenecks and other causes of delay as proposed by Secretary of Transportation Mary E. Peters in President Bush's FY 2009 budget request. With that as an introduction, I will discuss the report's recommendations.

OIG'S DRAFT RECOMMENDATIONS TO FRA

1. **Seek a legislative change that would provide Amtrak with the same right to appeal to the Secretary of Transportation to enforce its preference rights as the host railroads now have to appeal to the Secretary to obtain relief from their preference obligations.**

FRA's Response to Recommendation 1: The issue of how to incorporate Amtrak's intercity passenger trains with freight trains operating on privately owned right of way has been an issue since Amtrak was created in 1971. As the report notes, the preference concept and the ability of the freight carriers to appeal to the Secretary to address preference concerns was added by Congress in 1973, evidently in response to issues Amtrak faced in the first years of operations. In Amtrak's enabling legislation, the Rail Passenger Service Act of 1970, Congress vested most authority for resolving disputes between Amtrak and the freight railroads with the Interstate Commerce Commission (now the Surface Transportation Board). Amendments to the Act were frequently made, particularly in the first 10 years of Amtrak's existence, to attempt to address issues that developed between the freight railroads and Amtrak with authority vested in either the STB or the DOT. Providing Amtrak with specific authority to appeal preference issues has not been provided by Congress during Amtrak's 37 year existence, though it seems likely that it has been sought by Amtrak. The concept of a legislative solution could be explored in greater detail though obviously it is a complicated issue and cannot be addressed simply by adding Amtrak into existing section 24308(c). There is also a concern that offering such a proposal, which the railroad industry will oppose, could undermine the cooperative efforts that are currently underway to address OTP issues as described in the Report.

It should be recognized that any legislation proposed by FRA is a legislative proposal of the Administration that must be vetted through FRA, the Department of Transportation and other parts of the Administration. The time available for making this response did not permit the conduct of additional research, the development of a specific proposal or its appropriate vetting. Unfortunately, resolving the issues and developing a legislative proposal cannot be done in the context of the pending Amtrak reauthorization. At the time the recommendation was made, both the Senate and House of Representatives have each already passed Amtrak reauthorization legislation, the most likely legislative vehicle in which to place such a requirement. It is reported that they are near reaching consensus on compromise legislation. FRA, however, will consider the issue further and engage appropriate representatives within the Department to explore how such an approach

could be structured and the appropriate legislative vehicle for possible consideration by Congress.

2. **Seek a legislative change to expand the personal liability dispatchers now have for violations of FRA safety rules to include personal violations of Amtrak's preference rights.**

    a) FRA should seek to complement this increased liability with express authority for Amtrak to pay incentives to individual host railroad dispatchers for meeting dispatching metrics agreed upon by Amtrak and the individual host railroads.

FRA's Response to Recommendation 2.a: The Report recognizes that there are many causes of Amtrak delay and that some might involve the actions of individuals. There are two concepts reflected in this recommendation: (1) seek a legislative change to expand the personal liability dispatchers now have for violations of FRA's safety rules to include personal violations of Amtrak's preference rights and (2) seek to complement this increased liability with express authority for Amtrak to pay incentives to individual host railroad dispatchers for meeting dispatching metrics agreed upon by Amtrak and the individual host railroads. Individual liability has proven to be an effective, albeit infrequently used, approach to assuring compliance with safety laws and regulations. FRA may assess civil penalties against any person (including a railroad and any manager, supervisor, official, or other employee or agent of a railroad) for a willful violation of or for willfully causing the violation of, the safety statutes or regulations (See 49 U.S.C. 21304 and 49 C.F.R. Part 209, Appendix A). This is a higher standard than FRA applies with respect to collecting civil penalties from railroads reflecting the seriousness of proceeding against individuals. While FRA believes holding individuals accountable for their actions to be an entirely appropriate way to ensure that statutory requirements are carried out, FRA opposes use of the rail safety statutes for non-safety purposes. A better way to achieve the same end would be to enact an entirely separate civil penalty provision having no relation to the rail safety statutes beyond using them as a model. FRA is also concerned that it may be very difficult to determine whether a particular decision by a particular dispatcher failed to accord Amtrak the required preference. It appears that further examination of that issue should be undertaken before draft legislation is prepared. The standard would have to be crafted carefully with such considerations in mind for the statute to be both effective and fair. There is also an issue concerning who would enforce this measure. FRA's Office of Safety and the Safety Law Division of the Office of Chief Counsel should not do so. Their resources are fully and completed engaged in critical safety concerns and should not be diverted. The elements of FRA that regularly deal with intercity passenger matters, the Office of Railroad

Development and the General Law Division of the Office of Chief Counsel would need additional resources to handle this responsibility. Depending upon what the legislation ultimately says, the increment of resources needed could be substantial.

The second recommendation also merits additional study, though in the context of the "carrot" it would need to be determined how such incentives could align with the terms of the existing agreements between the railroads and their employees. The railroads are likely to be concerned about creating a situation where their employees are serving two "masters". Thus, more research is needed to determine the relative benefits of such an approach and if an implementable proposal along the lines of these recommendations could be structured in such a way as to gain broad acceptance within the Congress. Unfortunately, resolving these issues and developing a legislative proposal cannot be done in the context of the pending Amtrak reauthorization. FRA, however, will consider the issue further and engage appropriate representatives within the Department to explore how such an approach could be structured and the appropriate legislative vehicle for possible consideration by Congress.

b) FRA should report to Congress on which host railroads agreed to permit such payments, what amounts were paid, and how these actions affected delays and OTP.

FRA's Response to Recommendation 2.b: FRA already reports to Congress quarterly on its actions to improve on-time performance and if such a program as discussed above were established, the issues and results associated with that program would be included in these reports.

3. Expand the route action plan process to include all Amtrak long distance and corridor routes with poor OTP and increase the visibility of the implementation of the resulting plans.

FRA's Response to Recommendation 3: The performance improvement plans recognize that cooperative action between Amtrak and the host railroad to identify and address specific causes of delay has the potential to measurably improve OTP. This is being borne out in the initial pilot program to such an extent that Amtrak and the host railroads are establishing pilot programs on each of the Class I host railroads. The programs can only be successful to the extent that Amtrak and its host railroads work together in a cooperative fashion. FRA will actively monitor the progress of these pilots and evaluate those aspects that work and those that can be improved. FRA will also work with Amtrak and the host railroads to expand successful efforts as both parties become comfortable with the process.

4. **Use its quarterly OTP reporting requirement to obtain agreement between Amtrak and the host railroads regarding how to measure OTP and delays then publicly report OTP and delay data by host and route on a regular basis.**

FRA's Response to Recommendation 4: In the two quarterly OTP reports to Congress FRA has made to-date, FRA has recognized the different bases on which Amtrak and the host railroads measure OTP and discussed alternative approaches to obtain meaningful and consistent measurement. FRA will use these discussions on OTP measurement methodology to engage Amtrak and the host railroads, perhaps in the context of the performance improvement plan pilots, in discussions designed to reach a consensus on appropriate OTP metrics. In the interim, FRA will be presenting OTP status based upon multiple metrics.

5. **Encourage better internal reporting by the host railroads and increased focus by their top management of delays and OTP.**

FRA's Response to Recommendation 5: FRA believes that improvements should be made in measuring OTP. FRA has broached the issue of how to improve reporting of OTP and causes of delay with the host railroads in their 2008 safety program reviews with FRA's Administrator. In part, the issue is consistency in the metrics used to measure OTP, as addressed in the recommendation immediately preceding this one. FRA will continue to work with Amtrak and the host railroads to develop consensus metrics and improved reporting of these metrics.

6. **Support the permanent authorization of, and increased funding for, the state capital grant program through the upcoming surface transportation reauthorization and give increased consideration to projects that result in a binding commitment by the involved host railroad to improve OTP on that route.**

FRA's Response to Recommendation 6: The Administration first proposed such legislation in 2003 and continues to support permanent authorization. Moreover, in each of the last two years, the Administration has sought $100 million funding to get the program established. It should be noted that permanent authorization of such a program is included by both the Senate and House of Representatives in their version of Amtrak reauthorization bills. As written, this proposed legislation would provide the Secretary sufficient discretion in awarding grants that requiring the binding commitment from the host railroad to OTP improvements could be one of the factors used to determine whether to award a grant. Thus, whether there is a need to include such legislation in the upcoming surface transportation reauthorization will not be known until final action on the pending Amtrak reauthorization.

7. **Develop model contract terms that can be used by the states that are investing their own funds into freight railroad capital projects to link those investments to commitments to improve OTP**.

FRA's Response to Recommendation 7: FRA believes such standard contract terms could be a good starting point for negotiations between States and host railroads. FRA expects to learn much from the FY 2008 and FY 2009 start up of the capital grants to States for intercity passenger rail program that could form the basis for developing such model contract terms, either in terms of implementing regulations of the new grants to States for intercity passenger rail capital investment (as would be required by the Senate and House of Representatives versions of Amtrak reauthorization) or in future grant conditions.

The following pages contain textual versions of the graphs and charts included in this document. These pages were not in the original document but have been added here to accommodate assistive technology.

Root Causes of Amtrak Train Delays
Section 508 Compliant Presentation

RESULTS IN BRIEF

Figure 1 Total Delays by Host Railroad							
FY 2002--June 2008							
Minutes of Delay per 10,000 Train miles							
	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008 through June
Burlington Northern Santa Fe	689	812	956	922	1,087	1,061	978
CSX	1,158	1,279	1,478	1,714	1,760	1,699	1,422
Union Pacific	1,993	2,045	2,108	2,218	2,670	2,444	2,004
Norfolk Southern	1,290	1,265	1,314	1,528	1,961	1,877	1,449
Canadian National	1,931	2,020	1,738	1,593	1,652	1,681	1,916
Canadian Pacific	1,040	805	949	1,018	1,197	1,406	1,349

Source: OIG Analysis of Amtrak Data

FINDINGS
Figure 2

Percent of Trains Arriving Late (by minutes of delay)

	75 Percent of the Trains	50 Percent of the Trains	25 Percent of the Trains	10 Percent of the Trains
	Duration of Delays			
State-Supported Corridors	21 minutes	32 minutes	53 minutes	90 minutes
Non-State-Supported Corridors	28 minutes	45 minutes	75 minutes	116 minutes
Long Distance	66 minutes	114 minutes	193 minutes	301 minutes

Source: OIG Analysis of Amtrak Data

FINDINGS
Figure 3 Total Minutes of Slow Order Delays

Minutes of Slow Order Delays (Per 10,000 train miles)
FY 2002 -- June FY 2008

Host	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008 through June
Total	2,482	2,269	2,082	2,089	2,341	2,621	2,144

Source: OIG Analysis of Amtrak Data

FINDINGS

Figure 4 Minutes of Slow Order Delays by Host Railroad

Minutes of Slow Order Delays (Per 10,000 train miles)							
FY 2002 -- June FY 2008							
Host	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008 through June
Burlington Northern Santa Fe	176	196	182	199	219	273	227
CSX	310	328	334	413	399	461	442
Union Pacific	745	753	664	635	834	819	565
Norfolk Southern	247	221	173	196	202	236	213
Canadian National	523	509	351	321	317	297	231
Canadian Pacific	482	262	378	327	369	535	465

Source: Amtrak

Figure 5
Change in Freight Traffic and Track Mileage on Delays (1980-2006)

	Class 1 Freight Railroad Traffic	Class 1 Track Mileage
Year	Class 1 Traffic Ton-Miles (billions)	Class 1 Track Mileage (billions)
1980	919	164,822
1985	877	145,764
1990	1,034	119,758
1995	1,306	108,264
2000	1,466	99,250
2001	1,495	97,817
2002	1,507	100,125
2003	1,551	99,126
2004	1,663	97,662
2005	1,696	95,830
2006	1,772	94,942

Source: OIG Analysis of Data Provided by AAR and Bureau of Transportation Statistics

FINDINGS

Figure 6 Amtrak Conductor Reported Causes of Delays

FY 2007	
Cause of Delay	**Percent**
Host Railroad	**79%**
FTI	**24.9%**
Slow Orders	**21.1%**
PTI	**10.9%**
Signals	**9.7%**
Other	**12.5%**
Amtrak	**15%**
Passenger	**3.6%**
Crew	**2.5%**
Locomotive	**1.9%**
Other	**7.2%**
External Factors	**6%**
Weather	**1.4%**
Unused Recovery Time	**2.0%**
Trespassers	**1.0%**
Customs	**0.5%**
Other	**0.9%**

Source: OIG analysis of Amtrak data

FINDINGS

Figure 7 OTP for Schedule versus Incentive Standards for Amtrak Cascades

On Time Performance	
April 2008	
	OTP
Schedule	**63%**
Incentive Standards	**92%**

Source: OIG Analysis of Washington DOT data

EXHIBIT D. AMTRAK OTP BY ROUTE AND HOST (For all charts in Exhibit D, the source is OIG analysis of Amtrak data.)

CSX Long Distance OTP							
	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
Cardinal	51.2%	30.1%	32.3%	43.8%	38.0%	27.2%	39.0%
Lake Shore Limited	41.6%	40.2%	33.1%	25.3%	20.3%	23.1%	32.4%
Silver Service	43.3%	37.1%	47.0%	29.9%	25.8%	17.6%	30.3%
Auto Train	53.5%	62.9%	58.9%	45.8%	37.6%	16.8%	62.1%
Sunset Limited	32.4%	17.5%	26.3%	4.3%	7.1%		
Capitol Limited	44.2%	39.6%	48.6%	33.3%	26.4%	11.4%	23.4%

Note: Cardinal service is shared with Amtrak, CN-IC, NS, and UP; Lakeshore service is shared with Amtrak and NS; Silver service is shared with Amtrak and NS; Sunset Limited Service, shared with UP and BNSF, was discontinued on the CSXT portion of the line after Hurricane Katrina; Capitol Limited service is shared with NS and Amtrak.

NS Long Distance OTP							
	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
Lake Shore Limited	41.6%	40.2%	33.1%	25.3%	20.3%	23.1%	32.4%
Crescent	77.4%	68.3%	66.2%	63.9%	57.6%	20.3%	42.9%
Capitol Limited	44.2%	39.6%	48.6%	33.3%	26.4%	11.4%	23.4%

Note: Lake Shore Limited and Capitol Limited services are shared with CSXT.

UP Long Distance OTP							
	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
Texas Eagle	52.2%	21.4%	38.7%	62.7%	53.3%	19.7%	26.8%
Sunset Limited	32.4%	17.5%	26.3%	4.3%	7.1%	14.7%	13.5%
California Zephyr	52.4%	37.7%	34.8%	25.8%	24.4%	6.9%	10.2%
Coast Starlight	40.1%	35.5%	34.5%	22.4%	23.3%	3.9%	22.1%

Note: Texas Eagle service is shared with BNSF and CN,

Sunset Limited Service is shared with BNSF and CSXT (through 2005), California Zephyr and Coast Starlight services are shared with BNSF.

BNSF Long Distance OTP							
	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
Southwest Chief	56.8%	64.7%	75.3%	56.4%	71.7%	73.0%	60.1%
Empire Builder	81.7%	80.7%	83.2%	63.7%	68.1%	60.0%	73.4%
Sunset Limited	32.4%	17.5%	26.3%	4.3%	7.1%	14.7%	13.5%
California Zephyr	52.4%	37.7%	34.8%	25.8%	24.4%	6.9%	10.2%
Coast Starlight	40.1%	35.5%	34.5%	22.4%	23.3%	3.9%	22.1%

Note: Sunset Limited service is shared with UP and CSXT (through 2005), Empire Builder is shared with CP, California Zephyr and Coast Starlight with UP.

CN Long Distance OTP							
	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
City of New Orleans	63.4%	61.7%	45.8%	67.5%	83.0%	84.4%	86.2%

NS Short Distance OTP							
	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
Michigan	53.8%	35.7%	55.8%	54.9%	43.6%	41.5%	31.4%
Pennsylvanian	71.4%	68.5%	73.4%	42.1%	63.7%	70.8%	71.5%
Piedmont	73.8%	64.8%	65.7%	72.6%	62.6%	63.0%	74.4%

Note: Michigan service is shared with CN-IC and CSX, Pennsylvanian with Amtrak.

CSX Short Distance OTP							
	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
Carolinian	53.1%	41.8%	39.2%	31.9%	23.5%	17.0%	26.0%
Empire	77.2%	81.3%	73.6%	66.6%	60.0%	69.8%	61.7%
Hoosier State	n/a	n/a	n/a	53.0%	49.9%	50.2%	42.7%

Note: Empire service is shared with CN, Carolinian with NS and Amtrak, and Hoosier State with CN, NS, and UP.

UP Short Distance OTP							
	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
Capitols	66.2%	83.6%	78.5%	85.6%	84.7%	73.0%	74.6%
Cascades	69.6%	64.4%	71.9%	62.3%	63.9%	48.0%	59.7%
San Joaquins	68.7%	78.1%	61.8%	56.1%	63.5%	63.2%	67.9%
Illinois/MO	73.3%	49.8%	60.0%	58.7%	69.4%	48.6%	27.9%

Note: Cascades and San Joaquins services are shared with BNSF, Illinois/MO is shared with BNSF and CN.

BNSF Short Distance OTP							
	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
Cascades	69.6%	64.4%	71.9%	62.3%	63.9%	48.0%	59.7%
Heartland Flyer	85.8%	64.7%	79.6%	76.3%	71.2%	44.9%	28.6%
Pacific Surfliner	76.8%	88.2%	87.4%	86.9%	73.0%	76.1%	74.8%
San Joaquins	68.7%	78.1%	61.8%	56.1%	63.5%	63.2%	67.9%

Note: Cascades, Pacific Surfliner, and San Joaquins services are shared with UP.

CP Short Distance OTP							
	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
Hiawatha	93.1%	93.7%	95.5%	93.0%	91.6%	89.7%	89.2%