

## **Washington State Rail Plan**

*Technical Note 4c: Statewide Freight and Passenger Rail  
Needs and Opportunities*

# **Final Report**

*prepared for*

**Washington State Department of Transportation**

*prepared by*

**Cambridge Systematics, Inc.**



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# 1.0 Introduction

This Technical Note 4c: *Statewide Freight and Passenger Rail Needs and Opportunities* builds off of previous technical notes produced for the Washington State Rail Plan, including Technical Note 2: *Freight and Passenger Rail Inventory*; Technical Note 3a: *Freight Rail Demand, Commodity Flows and Volumes*; and Technical Note 3b: *Passenger Rail Usage and Impacts of the Rail System in Washington State*. These previous technical notes identified the infrastructure that comprises the Class I, passenger, and short-line rail system, including the passenger volumes and freight volumes that move across each system (now and in the future). This technical note summarizes the key needs and issues currently facing Washington's passenger and freight rail system. This includes the infrastructure, operational or institutional issues that are impacting the safety, capacity or efficiency of the state's rail system. The needs were identified through several different sources, including the technical work completed in this State Rail Plan and stakeholder outreach efforts.

This technical note recognizes that Washington's rail system contributes to the state's economy and quality of life by providing an extensive, robust transportation mode to convey people and goods. There are many different actors involved in planning and overseeing the rail system, including the Washington State Department of Transportation (WSDOT), the Washington Utilities and Transportation Commission, Amtrak, BNSF Railway, and the Union Pacific Railroad. Though each of these agencies may have different goals for their involvement in the state's rail system, WSDOT's involvement is guided by the six transportation policy goals established by the legislature, as well as by the State Rail Plan vision statement. Washington's Transportation Policy Goals (RCW 47.04.280) are summarized in Table 1.1. Table 3.1 (see page 3-1) will link these Transportation Policy Goals to the key needs described throughout this technical note.

**Table 1.1 Washington’s Transportation Policy Goals as Established by RCW 47.04.280**

<b>Economic Vitality</b>	<b>To promote and develop transportation systems that stimulate, support and enhance the movement of people and goods and ensure a prosperous economy.</b>
<b>Preservation</b>	To maintain, preserve and extend the life and utility of prior investments in transportation systems and services.
<b>Safety</b>	To provide for and improve the safety and security of transportation customers and the transportation system.
<b>Mobility</b>	To improve the predictable movement of goods and people throughout Washington state.
<b>Environment</b>	To enhance Washington’s quality of life through transportation investments that promote energy conservation, enhance healthy communities and protect the environment.
<b>Stewardship</b>	To continuously improve the quality, effectiveness and efficiency of the transportation system.

Source: Washington State Legislature, RCW 47.04.280:  
<http://apps.leg.wa.gov/rcw/default.aspx?cite=47.04.280>

The State Rail Plan vision statement was created through a collaborative process with freight and passenger stakeholder participation in a series of open houses and one-on-one stakeholder interviews. The result of this process was a refined vision statement that represents the combined goals for the state’s rail system. It is a “blueprint” for future rail planning and investment activities. It is:

As an integral part of Washington’s multimodal transportation network, the rail system provides for the safe, reliable and environmentally responsible movement of freight and passengers to ensure the state’s economic vitality and quality of life.

For the most part, today’s rail system already fulfills many of the concepts embedded in the Transportation Policy Goals and the vision statement. Washington’s passenger and freight rail system is extensive, comprising about 3,200 miles of track that connect many of the state’s populations and job centers, and support the domestic and international supply chains of key industries. In general, the system provides good mobility and sufficient capacity for freight and passenger rail trains (as shown in Figure 3.5 on page 3-20). In addition, the system supports industries that contribute over \$106 billion to the state’s Gross Domestic Product and 1.2 million jobs. Finally, rail is already the most fuel-efficient, least carbon-producing mode per ton, and provides an alternative transportation mode for citizens and goods to move throughout the state.

However, in order to fulfill the goals of the rail system embodied in the vision statement, the rail system will need to be maintained and improved so that it continues to provide safe, efficient capacity to meet future demand. To this end,

this technical note will discuss some of the issues and needs that are currently constraining the potential of the state’s passenger and freight rail system. It does so in the following sections:

- **Section 2.0. Background and Methodology.** Summarizes the sources used to identify needs, the categorization of the needs, and summarizes the portions of the system that are most impacted by each need.
- **Section 3.0. Washington Rail System Needs.** Summarizes the eight needs that emerged during the State Rail Plan technical work and stakeholder outreach.
- **Section 4.0. “Umbrella” Institutional Needs and Opportunities.** Summarizes those regulatory and institutional issues that impact passenger and/or rail system operations and performance across the entire system.



## 2.0 Background and Methodology

### 2.1 SOURCES USED TO IDENTIFY NEEDS

This technical note summarizes the key needs and issues facing Washington’s passenger and freight rail system. The definition of a “need” in this technical note includes the infrastructure, operational or institutional issues that affect the safety, capacity or efficiency of the state’s rail system. Several different sources provided the foundation for the identification of needs, including:

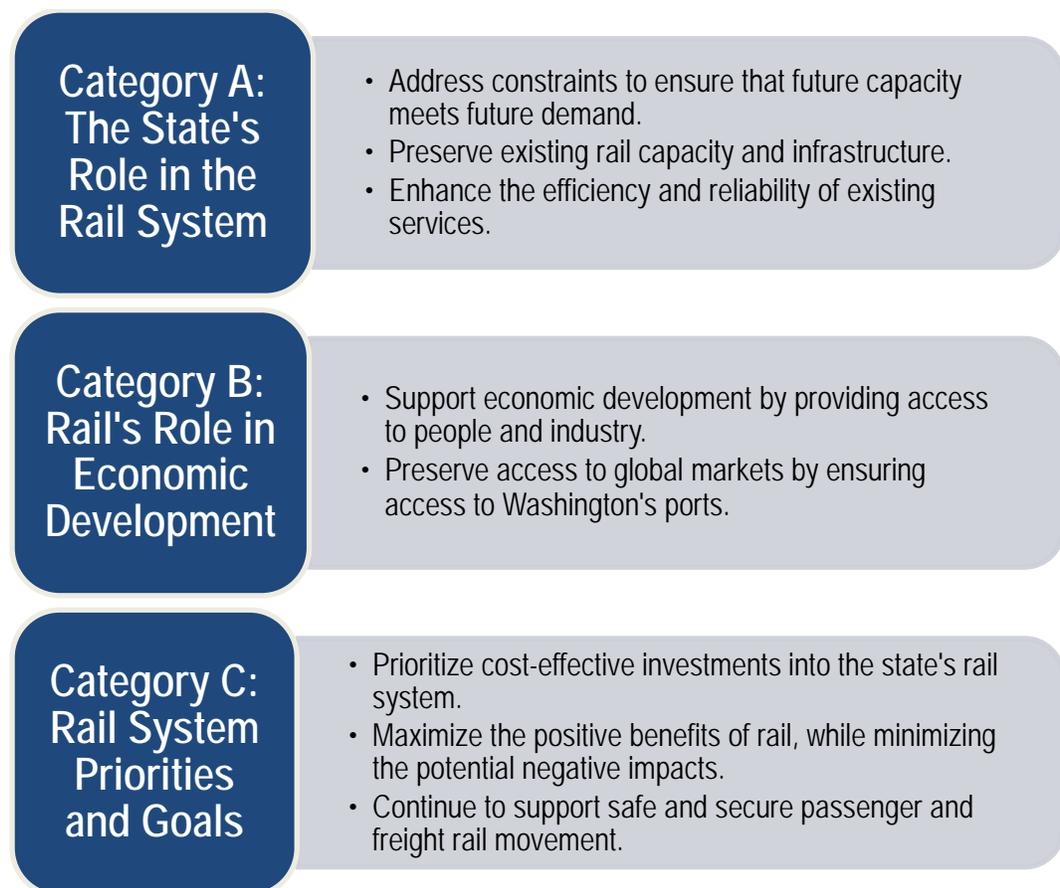
- **Previous Needs Identified in Other Statewide Plans.** Some needs from previous rail system planning efforts have been addressed through capital or operational investments and improvements. Others have not, and remain as identified needs in this plan. Plans reviewed in the effort include the *2010 to 2030 Statewide Freight Rail Plan*, the *2006 Washington Rail Capacity and System Needs Study*, the *2010 Washington Transportation Plan*, the *2009 Washington Transportation Plan Freight Update*, and the *2008 Amtrak Cascades Mid-Range Plan*.
- **Carrier Identified Needs.** Through the outreach process, workshops, the Stakeholder Advisory Committee, and direct carrier interviews, we learned of issues directly from carriers. This includes BNSF Railway (BNSF), Union Pacific Railroad (UP), Amtrak and several different short-line railroads.
- **Rail User and Community Identified Needs.** A wide variety of freight and passenger system stakeholders provided input through a series of one-on-one interviews, as well as a series of State Rail Plan workshops. Stakeholders included in this outreach effort include rail shippers and passengers, ports, local communities, environmental groups, and representatives of key passenger and freight rail advocacy groups.
- **Needs Identified Through Technical Work of the Washington State Rail Plan.** Technical work completed in this State Rail Plan contributed to the formation of the needs. Key portions of the technical analysis are extracted to help illustrate needs and issues within this technical note. Other technical analysis is summarized in the relevant technical notes, including Technical Note 2: *Freight and Passenger Rail Inventory*; Technical Note 3a: *Freight Rail Demand, Commodity Flows and Volumes*; Technical Note 3b: *Passenger Rail Usage and Impacts of the Rail System in Washington State*; and Technical Note 4a: *Freight Forecasts and Capacity Analysis*.

## 2.2 THREE CATEGORIES OF NEEDS

The needs discussed throughout this technical note are grouped into the three categories shown in Figure 2.1:

- **Category A. The State's Role in the Rail System**, which includes those needs relating to the capacity, operations, maintenance and preservation of the state's passenger and freight rail systems.
- **Category B. Rail's Role in Economic Development**, which includes those needs and opportunities relating to rail's role in providing mobility and economic development to Washington's industries and citizens.
- **Category C. Rail System Priorities and Goals**, which includes the fiscal, environmental and safety goals of the state's rail system as outlined in the vision statement.

Figure 2.1 Three Categories of Needs



Within these three broad categories of needs (A, B and C), there are a variety of infrastructures, operational and institutional needs, issues and opportunities discussed. These types of needs are described below.

### **Infrastructure Challenges and Needs**

The infrastructure requirements to maintain rail infrastructure can be significant—in fact in 2010, it was estimated that the 20-year needs of the passenger and freight rail system in Washington totaled nearly \$9 billion.<sup>1</sup> This includes needs such as track and siding repair, bridge replacement, grade crossings and associated facility (rail yard, etc.) development, as well as the removal of geometric constraints (height or width constraints) throughout the system. In most cases, challenges and needs were identified from previous studies, technical work and through the stakeholder outreach process.

### **Operational/Mobility Challenges and Needs**

Operational issues include capacity constraints, chokepoints and conflicts with freight rail, passenger rail and commuter rail trains. This category of needs is immediately recognizable to most people who use the state’s rail system for transportation or shipping purposes. And, in fact, numerous passenger and freight rail stakeholders have suggested that one of the key outcomes of this State Rail Plan is a more thorough understanding of the key chokepoints and bottlenecks that are impacting the safety, efficiency and capacity of the state’s rail system. In most cases, challenges and needs were identified from previous studies, technical work and through the stakeholder outreach process.

### **Institutional Challenges and Needs**

Institutional challenges and needs generally relate to the role of the state in the passenger and freight rail system. They often focus on the process for determining how and when the state (or other partners) should participate in the planning and funding of the state’s rail system. This can include the topics of performance measurement, project prioritization or the evaluation of public benefits. In addition, some institutional needs involve the manner in which the Washington State Department of Transportation (WSDOT) integrates their rail planning efforts with work performed by other agencies.

## **2.3 WHERE ARE THE NEEDS LOCATED?**

The needs identified in Section 3.0 impact all components and infrastructure that comprise Washington’s passenger and freight rail system. These are described below.

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<sup>1</sup> Washington Transportation Plan Attachments, 2010, [www.wstc.wa.gov/wtp/documents/WTP2030\\_Final\\_1210.pdf](http://www.wstc.wa.gov/wtp/documents/WTP2030_Final_1210.pdf).

## **The Class I, Long-Distance, Intercity and Commuter Rail Infrastructure**

This system includes about 1,900 miles of track, over which the two major freight railroads in Washington (BNSF and UP) operate, as well as the state's two long-distance passenger rail services (Empire Builder and Coast Starlight), the intercity trains (Amtrak Cascades), and the Sounder Commuter rail service. In most parts of the state, the infrastructure is actually owned by the Class I freight railroads, which allows passenger rail to operate over it using a series of operating agreements.

Combined, this Class I, long-distance, intercity and commuter rail system carries the vast amount of freight moving in the state, as well as the majority of passengers using rail. It connects Washington citizens to locations throughout the rest of the country, and helps to connect Washington products and freight to global markets. As such, constraints and limitations on this system have the largest overall impact to the state's economy, as well as the efficiency, reliability and safety of the state's rail system. It is shown in Figure 2.2.

## **Short-Line and Regional Railroads**

In addition to Class I main line railroads, an efficient and seamless rail system also can benefit from the presence of regional and short-line railroads. Class II, or regional railroads, are defined as having revenue between \$34.7 million and \$433.2 million. Short-line (or Class III) railroads are those that have revenues of less than \$34.7 million and are engaged in line-haul<sup>2</sup> movement. One regional railroad operates in Washington. In contrast, there are 24 active short lines in Washington state; some of which operate over tracks that currently are owned by the state itself.<sup>3</sup> There are 17 local railroads and seven switching and terminal railroads. Though they carry a fairly small percentage of the overall freight volumes, they control about 1,464 miles of track; almost 40 percent<sup>4</sup> of the total rail infrastructure mileage throughout the state. The system is shown in Figure 2.3.

Class III railroads also can include tourism railroads, though those needs are not discussed in this technical note. Short-line railroads can provide important collector/distributor services for the larger railroads and local rail services for shippers (in particular, rural shippers). Intermodal connectors are locations

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<sup>2</sup> Line-haul movement is the long-haul rail portion of a trip between the originating and terminating intermodal yards. On either end of the line-haul is the local dray to and from the actual shipper or receiver of the goods.

<sup>3</sup> For more information about the ownership of state-supported short-line railroads, please reference Technical Note 2: *Passenger and Freight Rail Inventory*, produced for this State Rail Plan effort.

<sup>4</sup> Technical Note 2: *Passenger and Freight Rail Inventory*, Washington State Rail Plan, 2012.

where cargo or passengers are moved from one transportation mode to another. They support full system mobility and efficient use of the state's water, truck and rail modes.

Washington State Law directs WSDOT to invest in the short-line rail system to address a number of transportation needs. Most important is the fact that, in the absence of short-line railroads, freight currently carried on rail would likely be diverted to more trucks using Washington's roads. This would increase wear and tear and associated roadway maintenance costs, as well as increase the safety concerns caused by potential truck/vehicle interactions. In addition, short-line rail can provide cost-effective service to important industries, in particular, those in rural areas or with limited road access. Finally, in some areas, they provide a competitive, redundant service to trucking, which can improve the cost effectiveness and reliability of shipping.

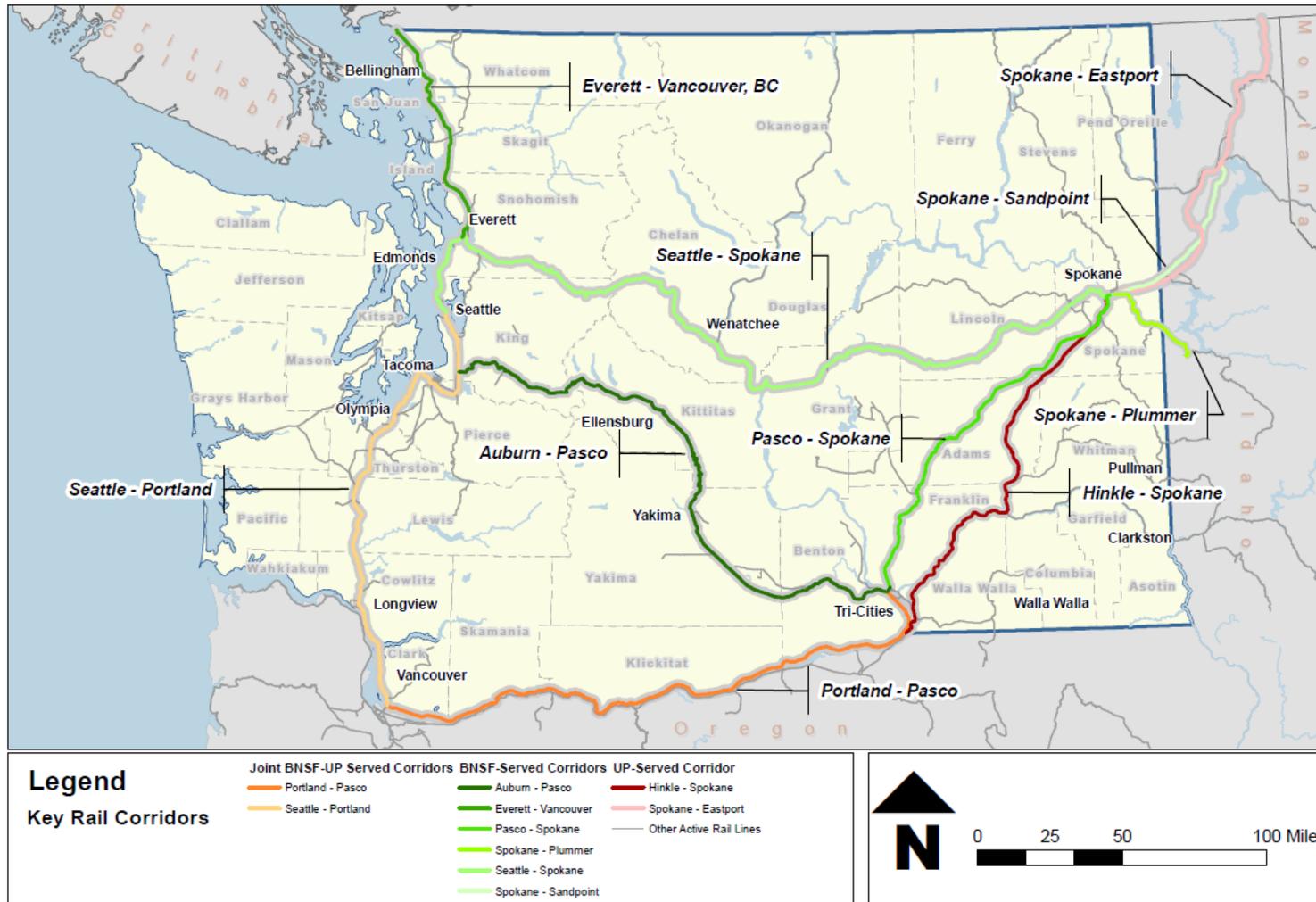
Washington state's 2007 purchase of the CW Branch as part of the Palouse River and Coulee City Railroad System is an example of a short-line project where public benefit justified public participation. In this case, the existing owner determined that the amount of shipping on the line was insufficient to provide for the very large costs of deferred maintenance on the line. The line was therefore threatened with continued deterioration and eventual abandonment. However, grain growers in eastern Washington appealed to the state for assistance, citing the fact that they would have to transfer shipments to truck if the rail line were abandoned. The state agreed that the social cost of adding trucks to the road justified the maintenance of the CW Branch, and purchased the line in 2007. It is now operated by Eastern Washington Gateway Railroad (EWG), under a lease agreement with WSDOT.<sup>5</sup>

However, short lines throughout Washington still face numerous other issues related to increased maintenance and service costs, declining revenue and deteriorating infrastructure. Some of these issues and needs are explored more in the following sections.

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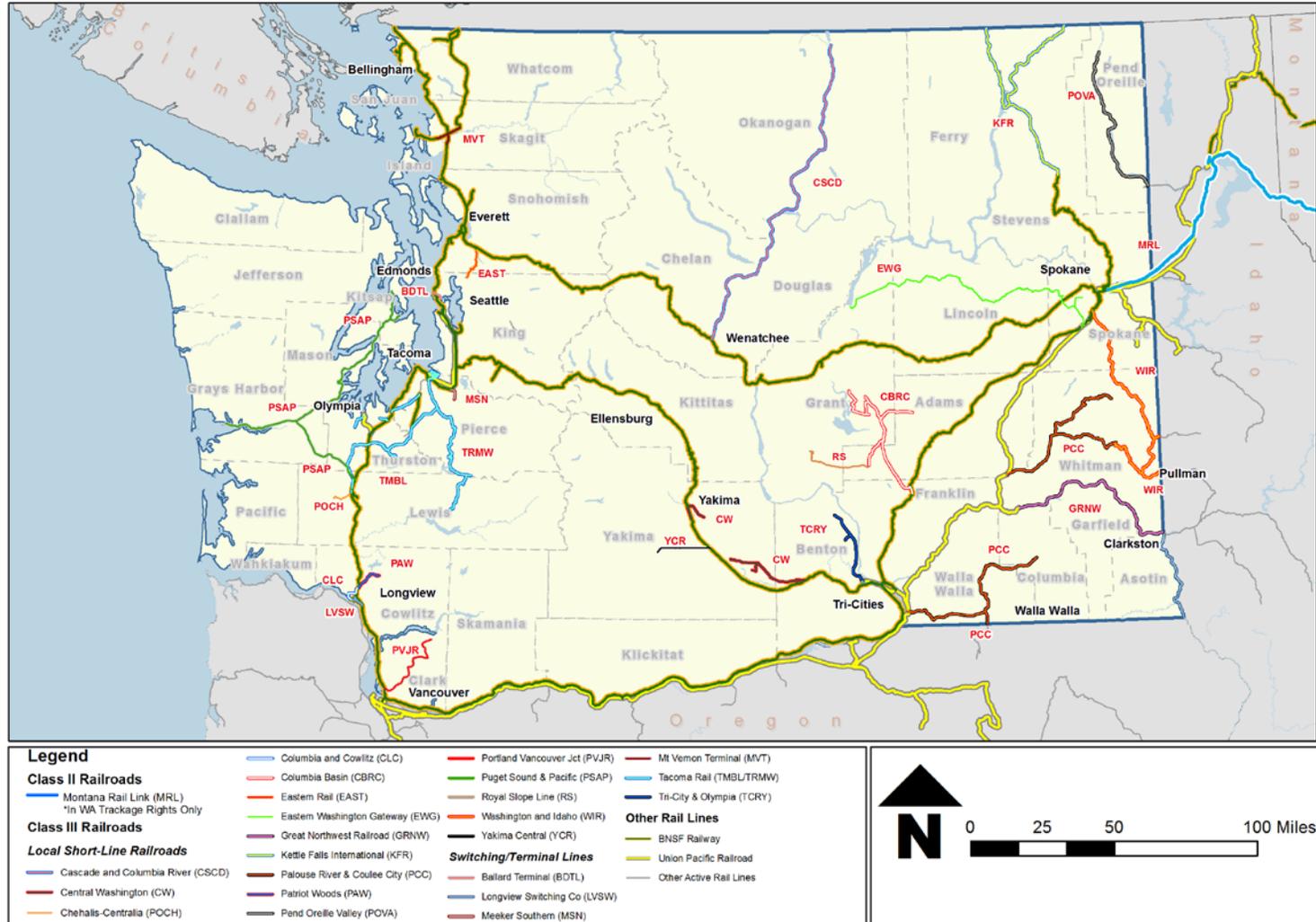
<sup>5</sup> *Palouse River and Coulee City Rail System*. WSDOT, January 2011.

Figure 2.2 Infrastructure Serving the Class I, Long-Distance, Intercity and Commuter Rail System in Washington



Source: Compiled using information from State Freight Rail Plan Appendix 3B, 2009 and the Freight Mobility Strategic Investment Board (FMSIB) Updated Strategic Network, 2012.

Figure 2.3 Short-Line Railroad Operators in Washington



Source: Compiled using information from State Freight Rail Plan Appendix 3B, 2009 and the FMSIB Updated Strategic Network, 2012.

Western Washington Railroad (WWR) is a new railroad and is not shown.



# 3.0 Washington’s Rail System Needs

Section 2.2 described three categories of rail needs. This section discusses eight distinct rail needs, mapped to each category in Table 3.1. In addition, Table 3.1 indicates the Washington Transportation Policy Goal that corresponds to each need. The eight needs recognize, and correspond to, Washington’s Transportation Policy Goals as established by RCW 47.04.280. For example, Need A1: *Address capacity constraints in order to meet future passenger and freight rail demands* corresponds to Washington’s Economic Vitality and Mobility Goals. Likewise, Need A2: *Preserve existing rail capacity and infrastructure* corresponds to Washington’s Preservation goal. This connection reaffirms that the priority needs for the state’s rail system are in line with the transportation priorities as established by Washington’s Legislature.

**Table 3.1 Categorization of Each Need**

	Category	State Rail Plan Need	Corresponding Washington Transportation Policy Goal
A	The State’s Role in the Rail System	A1 Address capacity constraints in order to meet future passenger and freight rail demands.	Mobility, Economic Vitality
		A2 Preserve existing rail capacity and infrastructure.	Preservation
		A3 Enhance the efficiency and reliability of existing rail services.	Stewardship, Mobility
B	Rail’s role in economic development	B1 Support economic development by providing access to people and industry.	Economic Vitality
		B2 Preserve access to global markets by ensuring access to Washington’s ports.	Economic Vitality
C	Rail system priorities and goals	C1 Prioritize cost-effective investments into the state’s rail system.	Preservation, Stewardship
		C2 Maximize the positive benefits of rail, while minimizing the potential negative impacts to communities and the environment.	Environment
		C3 Continue to support passenger and freight rail safety and security.	Safety

### 3.1 CATEGORY A. THE STATE'S ROLE IN THE RAIL SYSTEM

#### Need A1. Address Capacity Constraints in Order to Meet Future Passenger and Freight Rail Demand.

##### *Issue Summary*

Demand drivers for Washington's passenger and freight rail include population, income and industry activity. All of these drivers are anticipated to see rapid growth by 2040. Washington's population is anticipated to grow to almost 9 million people by 2040—an increase of almost 3 million from 2000. Per capita income also is expected to grow steadily from about \$40,000 in 2013 to almost \$60,000 (in 2005 dollars) by 2040. This increased income is likely to translate into increased demand for passenger rail, as well as increased freight rail service to deliver consumer goods to growing populations.

Exacerbating the growth in demand from a rising population and rising incomes is the projected growth in goods movement industries in Washington, as well as international trade. Goods movement industries, such as manufacturing, retail and wholesale trade, and construction, rely on the rail system to support their domestic and international supply chains. Washington's goods movement industries, as measured by labor force forecasts, are projected to grow at a steady rate of about 0.6 percent annually between 2010 and 2035. International trade (which already makes up 29 percent of total rail tonnage in Washington)<sup>6</sup> is anticipated to see aggregate international trade volume projected to grow from 105.7 million tons in 2010 to 190.4 million tons in 2030.

The result of this growth will be increasing demands on the state's passenger and freight rail system. Passenger rail ridership is anticipated to grow across all intercity, long-distance, and commuter services, as shown in Figure 3.1. Amtrak Cascades,<sup>7</sup> Amtrak Empire Builder and Amtrak Coast Starlight are all anticipated to see more than a million annual riders by 2035. According to

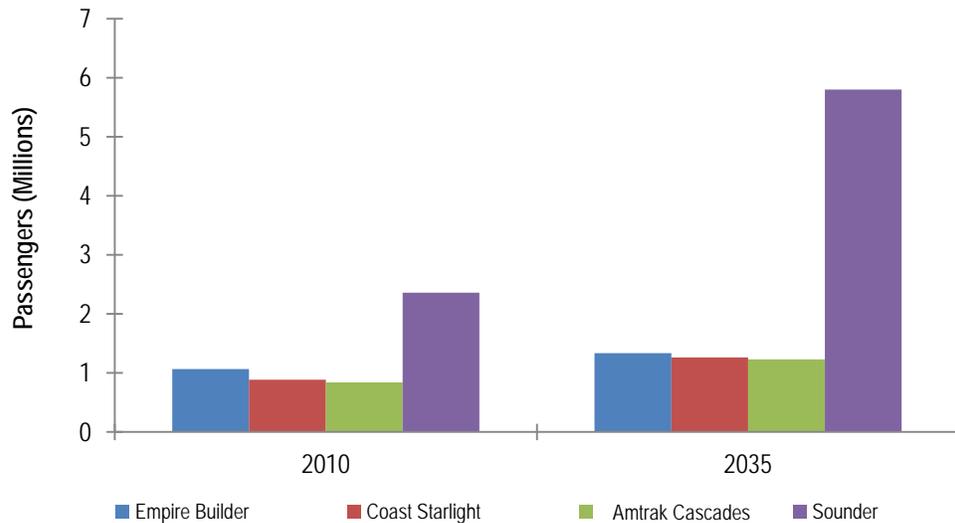
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<sup>6</sup> Federal Highway Administration (FHWA) Freight Analysis Framework Commodity Flows Database Version 3.3, (FAF3.3) Data. The international trade percentage of the total tonnages (all modes included) was computed, excluding the through flows; that is flows neither originating nor terminating in Washington.

<sup>7</sup> Amtrak Cascades will be fully supported by the Washington State Department of Transportation (WSDOT) and Oregon Department of Transportation (ODOT) as of October 2013 as part of the requirements of Passenger Rail Investment and Improvement Act of 2008 (PRIIA). Amtrak Empire Builder and Amtrak Coast Starlight will remain as Amtrak-supported routes.

Sounder rail forecasts, ridership is anticipated to reach 5.8 million passengers per year by 2035.

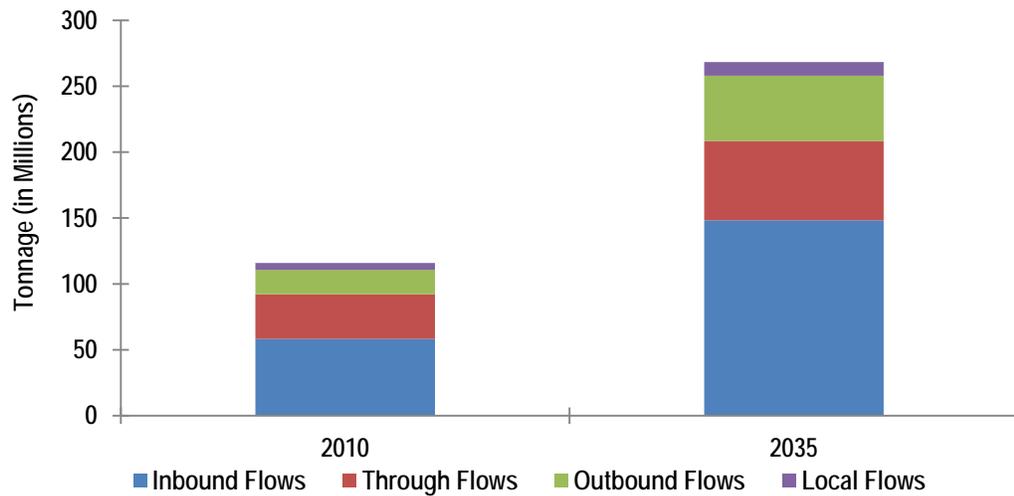
Figure 3.1 Projected Passenger Rail Ridership Growth, 2010 to 2035



Source: Amtrak (2012) and Cambridge Systematics (2013), Amtrak Cascades Ridership Forecast Model (Draft); Sound Transit (2012) and WSDOT Rail Division (2012).

Freight rail is anticipated to grow from 116 million tons (2010) to 268 million tons (2035), as shown in Figure 3.2. The largest overall tonnage increase will be inbound flows—those that originate outside of Washington, but have destinations within the state. Inbound flows are anticipated to grow to about 150 million tons by 2035.

Figure 3.2 Projected Freight Rail Commodity Demand Growth, 2010 to 2035



Source: 2010 Carload Waybill Sample, FAF3 dataset.

Growth in passenger and freight rail demand signifies a strong, vibrant and diversified economy. However, it also means that rail system capacity and operational characteristics must be sufficient to absorb the projected demand. If it falls short, the system risks succumbing to slower service, dissatisfied passengers or shippers and decreasing use of rail throughout the state.

Implications of rail service failure could be significant. For example, the lack of reliable rail service could decrease the attractiveness of Washington ports for discretionary cargo, and could contribute to a loss of competitiveness for the Pacific Northwest ports. Likewise, if many of the products shipped by manufacturing or retail industries shifted to trucking, this would have several negative impacts to the state's economy. Taxpayers would bear the costs for increased wear and tear on Washington's roadways, and many industries would pass increasing costs onto Washington consumers. A survey performed of 1,000 private-sector, freight-dependent industries in 2011 found that 56 percent indicated they would pass rising business costs on to consumers, six percent indicated that they would be forced to close, three percent would relocate, 19 percent of industries would absorb the costs and 16 percent would make internal operational changes to offset increasing transportation costs.<sup>8</sup> Therefore, increased costs could lead to rising prices or loss of industry.

### *Specific Needs*

Some of the key capacity-related constraints in the state include the rail corridors described below.

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<sup>8</sup> Washington State University Social and Economic Research Center in 2011.

### **Pacific Northwest Rail Corridor**

The Pacific Northwest Rail Corridor (PNWRC) is the main north-south artery in Washington. It runs parallel to the I-5 corridor from Vancouver, British Columbia (B.C.) to Eugene, Oregon, and is the backbone of the rail system, providing access to the east-west lines. The line passes through the most densely populated portions of the state; and connects thriving industrial clusters in Vancouver (WA), Tacoma, Seattle, Everett, Bellingham and points in between. It is an essential and heavily-traveled line for passenger and freight service. In 2010 it carried up to 46 trains a day along its alignments. Currently, it suffers from several capacity- and bottleneck-related concerns, including the following:

- Passenger/freight conflicts between Amtrak, Sounder, the BNSF Railway (BNSF) and Union Pacific Railroad (UP) trains that traverse the same corridor. This is exacerbated by the presence of many terminals, ports and yards along the corridor.
- Height limitations caused by the Chuckanut tunnels between Everett and Bellingham.
- Upgrades to stations and other facilities will be necessary to retain passenger rail capacity given planned passenger rail expansion plans. Specific needs include the recently completed seismic upgrades and improved signage to King Street Station in Seattle, and the planned replacement of the temporary Amtrak Tukwila Station.
- Capacity improvements and rail upgrades have been identified as necessary along the PNWRC to prepare for the high-speed rail program. One planned project that will address this need is the Kelso to Martin's Bluff project, which will add an additional main track between Kelso and Longview Junction. Other projects that are part of WSDOT's American Recovery and Reinvestment Act of 2009 (ARRA) program funding will also contribute to improved capacity along this line.
- The shared corridor between Longview and Tacoma, a distance of 101.9 miles<sup>9</sup> serves as one of the key outlets for import and export cargo from the Port of Tacoma. The line saw about 41 trains per day in 2010. The Nelson-Bennett Tunnel and the Ruston Tunnel near Tacoma are both single-track tunnels that are the primary capacity constraints within this section of the route. Concerns about these two constraints have led to the implementation of the Point Defiance Bypass, which currently is underway and scheduled for completion in 2017.

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<sup>9</sup> According to the BNSF 2011 employee timetable, the reported segment is from Kalama/Longview to Tacoma, using the BNSF Seattle subdivision.

### **Vancouver-Pasco Line (BNSF)**

This line travels along the Columbia River between Pasco and Vancouver, WA, a distance of 219.8 miles.<sup>10</sup> It is the southernmost line in Washington providing east-west connectivity. It is used by double-stack intermodal container trains moving east, grain trains moving west, and carload trains moving in both directions,<sup>11</sup> carrying 28 trains per day in 2010. In addition, overflow traffic from Everett-Spokane line also uses this line by first going to Vancouver, WA from Everett, and then continuing east. This line suffers from several capacity- and bottleneck-related concerns, including the following:

- The BNSF rail bridge over the Columbia River at Pasco is a single-track bridge. It is anticipated that this bridge will reach capacity before 2030.<sup>12</sup>
- Several sidings on the Wishram to Vancouver, WA segment are less than 8,000 feet in length. They will need to be upgraded to 8,000-foot capacity to absorb the future demand anticipated on this segment.

### **Everett to Spokane (BNSF)**

This line connects Everett to Spokane, a distance of 291.9 miles<sup>13</sup> that includes a section that passes through the Cascade Tunnel at Stevens Pass. The route serves as BNSF's major northern transcontinental route for double-stack intermodal trains. In 2010, roughly 16 trains used this link daily. It is projected to grow to 40 to 42 trains by 2035. Primary capacity constraints on this line include the following:

- The approach to the Cascade Tunnel at Stevens Pass, which includes steep gradients and speed-constraining track curvature.
- The throughput capabilities of the Cascade Tunnel, which requires flushing of the tunnel in between trains (a process that takes 20 minutes for westbound trains and 40 minutes for eastbound trains<sup>14</sup>).

### **Auburn-Pasco (BNSF)**

This line connects Auburn to Pasco, a distance of about 228.2 miles.<sup>15</sup> In 2012, only about six trains used this line.<sup>16</sup> Most trains are routed away from the Stampede Pass Tunnel. There is a major capacity limitation on the line due to:

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<sup>10</sup> According to the BNSF 2011 employee timetable, the reported segment is from Vancouver to the SP&S Junction, using the Fallbridge subdivision.

<sup>11</sup> 2006 *Washington Statewide Rail Capacity and System Needs Study*.

<sup>12</sup> *Marine Cargo Forecasts and Rail Capacity Assessment*, BST Associates, December 2011.

<sup>13</sup> According to the BNSF 2011 employee timetable, the reported segment is from Everett to Spokane, using the BNSF Scenic, Columbia River and Spokane subdivisions.

<sup>14</sup> *Marine Cargo Forecasts and Rail Capacity Assessment*, BST Associates, December 2011.

- Height restrictions in the Stampede Pass Tunnel mean that this route cannot accommodate double-stack trains, which is the preferred means of transporting containers on the rail network.
- Grades over Stampede Pass also make it difficult to haul heavily-loaded unit grain trains along this line.

### **Spokane to Sandpoint, Idaho (BNSF and UP)**

This line connects Spokane, WA to Sandpoint, Idaho (ID), a distance of 69.3 miles.<sup>17</sup> In 2012 up to 50 trains per day used this line. Most of the line is already double- or triple-tracked, though there are short stretches of single-track along the alignment. Several potential bottlenecks and chokepoints could arise on this line in the future:

- The single-track BNSF bridge across Lake Pend Oreille is anticipated to become a capacity chokepoint in the future.
- There are several segments of single-track, such as one between Irvin and Otis Orchard in Washington. In the future, these may become a bottleneck for trains moving across this segment.

## **Need A2. Preserve Existing Rail Capacity and Infrastructure**

### *Issue Summary*

This need incorporates several concepts relating to the preservation and maintenance of existing rail system infrastructure on the state's Class I and short-line rail system. These preservation-related concepts include the following:

- Abandonments.
- Short line deferred maintenance.
- Rail right of way (ROW) encroachment.
- Maintenance of tracks and bridges.

The consistent, unifying theme in these concepts is that procuring new rail ROW or building new rail infrastructure is cost prohibitive and time intensive. It urges

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<sup>15</sup> According to the BNSF 2011 employee timetable, the reported segment is from Auburn to Pasco, using the Stampede and Yakima Valley Subdivisions.

<sup>16</sup> In 2012 the implementation of directional running on this line began, which led to an increase in the amount of trains using the line. Prior to directional running only two trains a year used this line.

<sup>17</sup> According to the BNSF 2011 employee timetable. Reported segment is from Spokane to Sandpoint, ID, using the BNSF Spokane subdivision.

the maximization of existing rail system components, and the maintenance and protection of rail system infrastructure and facilities.

### *Specific Needs*

#### **Abandonments**

Over 2,000 miles of rail ROW have been abandoned in Washington since 1953. Once abandoned, a rail line is very difficult to reconstruct. First, the line is often physically removed; meaning that it would have to be rebuilt to be used. Second, encroachments along former rail ROW have often worsened to the point that rail service would be seriously impeded by the encroachments (or uses such as houses or other sensitive land uses have grown closer to the rail ROW, making the conversion back to active rail service a potential source of community opposition).

Another alternative to abandonment is “rail banking.” “Rail banking” is a method by which lines proposed for abandonment can be preserved for future rail use through interim conversion to trail use. It was established in 1982 as part of the National Trails System Act. As part of this Act, the railroad is allowed to remove all of its equipment from a corridor, and turn it over to any qualified public or private organization that has agreed to maintain it. This strategy has been used in Washington in recent years to preserve rail ROW—between 1998 and 2011 a total of 74.8 miles of railroad right of way were filed for abandonment, of which 59.3 miles (79 percent) are currently rail banked.<sup>18</sup> Though this can be a good strategy to preserve rail ROW, it also can be problematic—often the converted trails are extremely popular, have very strong political constituencies and can be very difficult to convert back to active rail use.<sup>19</sup>

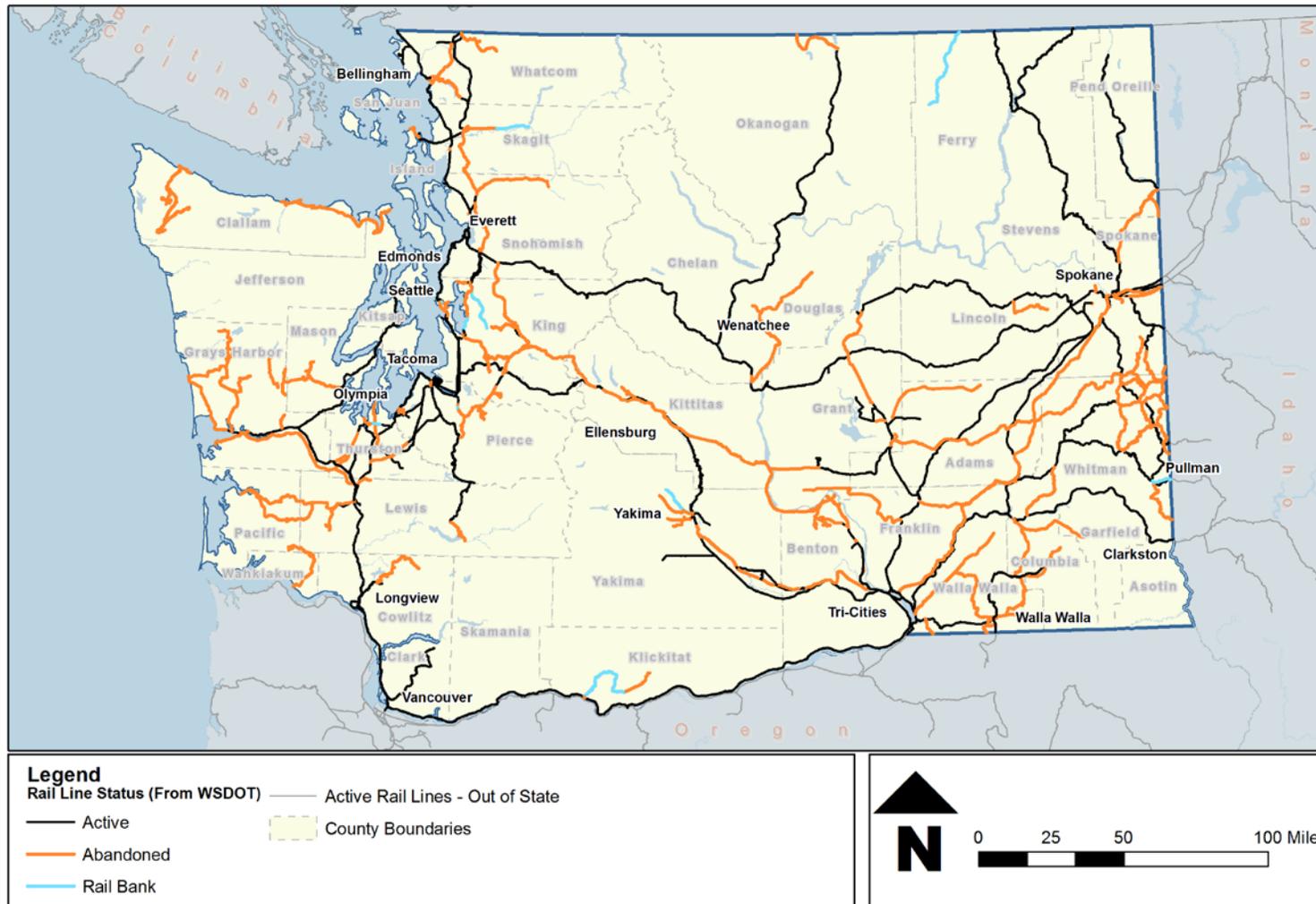
In all, abandonment of a rail line can mean the loss of a valuable transportation asset, and can be economically challenging to industries or cities that rely on it. A map of the abandonments in Washington is included as Figure 3.3.

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<sup>18</sup> This data source is the 2012 WSDOT Railroad GIS layer.

<sup>19</sup> Reworded from Washington State Freight Rail Plan, 2010.

Figure 3.3 Rail Abandonments in Washington



Source: WSDOT.

### **Short-Line Deferred Maintenance**

Many short lines have considerable infrastructure needs and are delaying maintenance due to capital limitations (and, in some cases, due to uncertain future economic conditions). This may lead to a situation where it is unsafe to operate, except at very slow speeds, which decreases the viability of short-line rail. Deferred modest maintenance spending can lead to equipment deterioration that requires substantial investments to repair.

In addition, many of the smaller short-line railroads do not have track and bridge infrastructure sufficient to accept rail cars of 286,000-pound capacity. This means that they must operate at a very low speed, and cannot accept heavier cars to increase volume and efficiency. This issue is especially acute when discussing “last mile connectivity” concern and track segments that only connect to a few customers. With the large railroads moving from 263,000 pounds to 286,000 pounds and 315,000 pounds as standard maximum car weights, the ability to handle standard modern rolling stock has become a particular concern; without accommodation of these heavier cars, the competitive position of many short lines will be substantially compromised.

### **Rail Right of Way Encroachment – Incompatible Land Uses**

Rail ROW is increasingly threatened from encroaching, incompatible land uses—residential areas, schools, playgrounds or other sensitive land uses. In some places, growing urban development is constraining the potential expansion of rail movements, and contributing to potential new sources of complaints and conflicts regarding rail system operations.

State law requires Seattle and Tacoma to include a *Container Ports Element* in their respective comprehensive plans to address transportation and land use near rail and other port infrastructure. Clark County designated *industrial railroad base zones* near some rail lines. The designation is appropriate for land uses that require and take advantage of rail access for industrial and manufacturing purposes such as manufacturing, assembly, fabrication, processing, and bulk handling and storage (warehousing).

### **Maintenance of Tracks and Bridges**

Surmounting western Washington’s topography required the construction of many bridges and trestles. While main line structures have been upgraded and are generally in good condition, many of the light density lines suffer from deteriorated and functionally obsolete wooden structures. The cost of their repair or replacement is often beyond the financial capacity of the operators. Short-line operators named bridge repairs as one of their highest priorities in the stakeholder outreach process. Some of the statements made during the one-on-one stakeholder interviews included the following comments:

- Short-line railroads expressed concerns about numerous bridges, including the Woodinville Trestle, the Snohomish River Bridge, the Hoquiam and

Wishkah River Bridges, and seven bridges along the alignment of the Portland-Vancouver Junction Railroad.

- Several ports expressed concerns about deteriorating timber trestles, such as the SR 99 trestle replacement necessary to allow the East Marginal Way Grade Separation Phase II to proceed.

### **Need A3. Enhance the Efficiency and Reliability of Existing Rail Services**

#### *Issue Summary*

Passenger and freight rail transportation use, in many cases, is discretionary. People who chose rail often have other options, including car, bus, flight or even not taking the trip. Freight shippers can, in some cases, shift to truck, barge or air cargo modes. Ensuring that the rail system offers reliable, timely performance is paramount to retaining its users.

#### **On-Time Performance**

On-time performance is a key measure of service reliability and one of the highest priorities of Amtrak Cascades customers. WSDOT understands the importance of on-time performance, and has committed to an 88-percent performance standard on the Amtrak Cascades line by 2017. This is an aggressive standard when compared to current operations – in the fourth quarter of 2012 (October 1 to December 31), WSDOT met its current on-time performance target of 80 percent for the first time since it began reporting the metric in 2001.<sup>20</sup> On-time performance improved nine percentage points from the previous quarter, when 71 percent of Amtrak Cascades trains ran on time, and five percentage points over the fourth quarter of 2011, when the route achieved 75 percent on-time performance.<sup>21</sup> On-time performance from 2008 through 2012 is shown in Figure 3.4.

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<sup>20</sup> This refers to the performance of Washington-funded trains. It also assumes that a Seattle-Portland train is on time if it arrives up to 10 minutes beyond its scheduled arrival time (15 minutes for the Portland-Vancouver, B.C. train).

<sup>21</sup> WSDOT, December 2012, Rail: Amtrak Cascades Quarterly Update.

Figure 3.4 Amtrak Cascades On-Time Performance, 2008 to 2012



Source: WSDOT Rail Division, December 2012, “Rail: Amtrak Cascades Quarterly Update,” *The Gray Notebook*. Considers Washington-funded trains only.

### Landslides

Extreme weather events, such as landslides, can damage Washington’s freight and passenger rail infrastructure, cause delays that impact the route’s on-time performance, and pose a safety threat. While landslides are expected to occur in the Pacific Northwest, these events have occurred more frequently in recent years and have affected both freight and passenger trains traveling along the PNWRC.

Currently, landslides occur most frequently on the PNWRC between Seattle and Everett. Along this corridor, Amtrak Cascades experienced seven cancellations and 26 disruptions during the first quarter of 2013 due to landslides between Seattle and Everett. During the same period in 2012, there were eight cancellations and only four disruptions. During each episode, alternate transportation was provided so passengers could reach their intended destination. When landslides occur, BNSF institutes a 48-hour moratorium on passenger rail service in the affected area. WSDOT works closely with BNSF to determine the extent of the impact so it can deploy and communicate alternate bus service to our passengers.

WSDOT, BNSF, Sound Transit and Amtrak are working together to explore the potential root causes of landslides through this particular area. These efforts include sharing geotechnical and hydrological information about historical slides and other data. However, it is recognized that the diverse topography, steep

hillsides and historic slide patterns will continue to challenge these efforts to increase slope stabilization.<sup>22</sup>

### **Long-Distance Train – Empire Builder**

The key operational challenge for the Empire Builder is addressing re-occurring delay. As noted in Technical Note 2: *Freight and Passenger Rail Inventory* produced in this study, between October 2011 and June 2012, the Empire Builder generally performed below Endpoint On-Time Performance (OTP) and All-Stations OTP metrics outlined by PRIIA Section 201. On the other hand, the Empire Builder performs well with regard to delays (as measured in minutes per 10,000 train miles). Though it met standards for delays in 2012, there is a need to improve operational performance by understanding the causes of the delays. Some of these causes are factors outside of Washington—for example operational or weather delays to the Empire Builder as it passes through other states. However, other delays are caused by complications within Washington, including freight train interference, signal delays and slow order delays. In addition, anecdotally passengers report long delays at the Cascade Tunnel on Stevens Pass—likely due to the requirements to flush the tunnel between trains. The most frequent Amtrak-responsible delays are internal to Amtrak, and include passenger-related delays such as checked baggage and large groups, as well as locomotive failure.

### **Long-Distance Train – Coast Starlight**

This line is operated by Amtrak and uses tracks owned by multiple host railways, including BNSF, Southern California Regional Rail Authority, and UP. Operational challenges include meeting on-time performance, as well as delay targets. As noted in Technical Note 2: *Freight and Passenger Rail Inventory*, similar to Empire Builder, on-time performance and delay targets on Coast Starlight were not met during FY 2012. Some of the delays are the result of constraints and operational decisions made by the host railroads, such as routing-dispatching delays and temporary slow orders. Such delays, though necessary for safety reasons or to support the efficient movement of freight, can have the side effect of causing delays to the passenger rail service. Reducing the occurrence or significance of these passenger/freight conflicts is a key priority for this line.

### **Intercity Trains – Amtrak Cascades**

Amtrak Cascades trains begin and end their service within the PNWRC; one of 11 federally-designated, high-speed rail corridors in the country. The tracks that the Amtrak Cascades runs over are owned by BNSF and UP (though ODOT and WSDOT pay Amtrak for running the service). As discussed in Technical Note 2: *Freight and Passenger Rail Inventory*, the Amtrak Cascades travels on one of the busiest corridors in the state. Therefore, conflicts with freight rail are fairly common. The problem is particularly acute in the Portland/Vancouver area,

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<sup>22</sup> [www.wsdot.wa.gov/Projects/Rail/slidemangement](http://www.wsdot.wa.gov/Projects/Rail/slidemangement).

where the railroad's north-south and east-west routes intersect. A number of additional segments have also been identified as key needs:

- There are 25 at-grade rail crossings between Kelso and Centralia, which often leads to slowed trains and delays.
- There are a number of track deficiencies and quality concerns between Nisqually and the Columbia River, which cause delays.
- The main line near Everett is often backed up with trains arriving or departing from the Amtrak station.

As described in the "Issue Summary" (page 3-11), on-time performance has fluctuated over the past five years and only just recently (in Quarter 4 of 2012) reached its on-time performance target of 80 percent. In all other quarters between 2008 and 2012, its on-time performance was below its target.

WSDOT secured nearly \$800 million in federal funds to help passenger rail overcome these challenges. The state is delivering critical rail infrastructure improvements to improve travel choices, preserve the ability to move freight and foster economic growth across our state. The Cascades High-Speed Rail Program consists of a series of projects that will increase service reliability, reduce travel time and add two Amtrak Cascades round trips between Seattle and Portland for a total of six daily round trips.

### *Enhancing Rail Safety*

This set of ARRA projects will improve track quality, eliminate track defects and upgrade wayside horns along the corridor to direct audible warnings toward cars and pedestrians at railroad crossings. Electronic upgrades will help prevent signal failures and set the stage for 21<sup>st</sup> Century train control technology:

- Advanced Wayside Signal System.
- Corridor Reliability - Slide Management Projects.
- Corridor Reliability Upgrades - North.
- Corridor Reliability Upgrades - South.

### *Relieving Rail Congestion*

The same way highways jam up when there are too many cars, rail lines jam up with too many trains. Larger, slow-moving freight trains usually can pull over onto another track to move out of the way of faster passenger trains, but not always. There are a number of projects in Washington state aimed at relieving congestion by building bypass tracks or passing lanes or by extending siding tracks:

- Blaine - Swift Customs Facility Siding.
- Mount Vernon - Siding Extension.

- Everett - Storage Track.
- Seattle - King Street Station Track Improvements.
- Tacoma - Point Defiance Bypass.
- Kelso Martin's Bluff - Toteff Siding Extension.
- Kelso Martin's Bluff - New Siding.
- Kelso Martin's Bluff - Kelso to Longview Junction.
- Vancouver - Yard Bypass Track.
- Vancouver - New Middle Lead.
- Port of Vancouver - West Vancouver Freight Access.

### *Building American-made Trains*

In order to meet the ever-increasing demand for more rail service and boost the rail manufacturing industry, Washington state is purchasing new passenger coaches and locomotives, designed and built in the United States. This "next generation" rail equipment will feature better fuel efficiency, added passenger comfort, travel conveniences and safety upgrades:

- Amtrak Cascades New Trainset.
- Eight New Locomotives.

### *Upgrading Passenger Stations*

As the demand for reliable passenger rail travel increases, stations are being expanded and refurbished to serve growing numbers of passengers and to provide them with enhanced security, comfort and timely information:

- Seattle - King Street Station Renovation.
- Tukwila Station.

The federal funds also support development of the Washington State Rail Plan. As a condition of the \$800 million WSDOT secured to implement improvements in support of more frequent and reliable service, WSDOT must achieve a 10-minute reduction in run time, an on-time performance of 88 percent, and add two daily round trips between Seattle and Portland to its schedule by 2017. Twenty projects will be funded as part of this program, including those that build additional rail line capacity and upgrade tracks, utilities, roadway signals, other facilities and equipment, and advanced warning systems.<sup>23</sup>

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<sup>23</sup> WSDOT and Oregon DOT, 2013, *Cascades Rail Corridor Management Workplan: January 2013*.

As described in the “Issue Summary” (page 3-11), both passenger and freight rail are affected by landslides that occur along the PNWRC. Specifically, there is a need to stabilize the tracks between Vancouver, WA, and the U.S.-Canadian border to enhance safety along the corridor and prevent the service disruptions that occur in the event of a landslide.

### **Schedule Needs**

Anecdotal information from public stakeholders has sometimes focused on the need to increase service frequency, improve train schedule times and extend service hours. Specifically stakeholders identify needs related to:

- More convenient travel times on the Empire Builder between Seattle and Spokane. The late night arrival and departure times to/from Spokane are inconvenient. In particular transit service in Spokane is limited at the times trains arrive and depart.
- Increased service frequency and travel time on Amtrak Cascades between Portland and Seattle. The scheduled arrival and departure times for business travelers between Seattle and Portland make it difficult to rely on the Amtrak Cascades service for a day trip. Additional mid-morning or mid-afternoon trips or express service/higher speed service would increase ridership demand.

While these needs are clearly important to address, they must be balanced against the financial capabilities of WSDOT and its partners. Though many of the planned passenger rail-specific needs will facilitate improvements to passenger rail service, WSDOT recognizes that there are still unmet needs from users of the state’s passenger rail services. Moving forward, WSDOT and its partners will continue to work on those investments that are the most pressing priorities within existing funding constraints.

### **Fleet Availability**

The *Amtrak Cascades Mid-Range Plan* (2008) includes a project aimed at increasing the capacity of existing trainsets. Current Amtrak Cascade trainsets take a long time to change by crews and are no longer in production. To address this issue, Washington currently is purchasing new passenger coaches and locomotives, designed and built in the United States. This “next generation” rail equipment will feature better fuel efficiency, added passenger comfort, travel conveniences and safety upgrades. Specifically a new trainset will be bought for Amtrak Cascades and eight new locomotives will be added.<sup>24</sup>

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<sup>24</sup> [www.wsdot.wa.gov/Rail/Projects.htm](http://www.wsdot.wa.gov/Rail/Projects.htm).

## 3.2 CATEGORY B. RAIL'S ROLE IN REGIONAL AND STATE ECONOMIC DEVELOPMENT

### Need B1. Support Economic Development by Providing Access to People and Industry

#### *Issue Summary*

Ensuring that the transportation system supports economic development is one of the key goals of the transportation system, as set forth by Washington's Transportation Policy Goals<sup>25</sup> as well as the State Rail Plan Vision Statement. For the most part, Washington's rail network already works to provide economic benefit to residents and businesses. It accomplishes this through its 3,200 miles of railroad tracks<sup>26</sup> that provide mobility for goods and passengers moving into, out of, within and through the state. Specific infrastructure includes:

- Two Class I Railroads - BNSF and UP together employ more than 3,700 people and own roughly 1,900 miles of rail.
- Twenty-four short-line railroads (and switching terminals) provide connections between the Class I railroads and smaller shippers/rural areas.
- Intermodal terminals provide transfer points between rail, truck and marine modes.
- Long-distance, intercity and commuter rail services provide a variety of passenger rail options, as part of the state's multimodal transportation system.

Economic benefits from passenger and freight rail are varied, and can include job creation, support of industry and tourism and reduced roadway congestion. The *Amtrak Cascades Mid-Range Plan* (December 2008) highlights the route's economic development benefits. Value added is used as an indicator that reflects the net benefit of the route, and includes both labor income (wages and salaries), profits for businesses and taxes paid to governments. Accordingly, the benefits to local communities along the I-5 corridor from the Amtrak Cascades are estimated at \$306.5 million, with statewide benefits totaling nearly \$400 million.<sup>27</sup> Amtrak Cascades supports industries such as tourism, transportation, construction and maintenance.

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<sup>25</sup> Washington's Transportation Policy Goals as established by RCW 47.04.280.

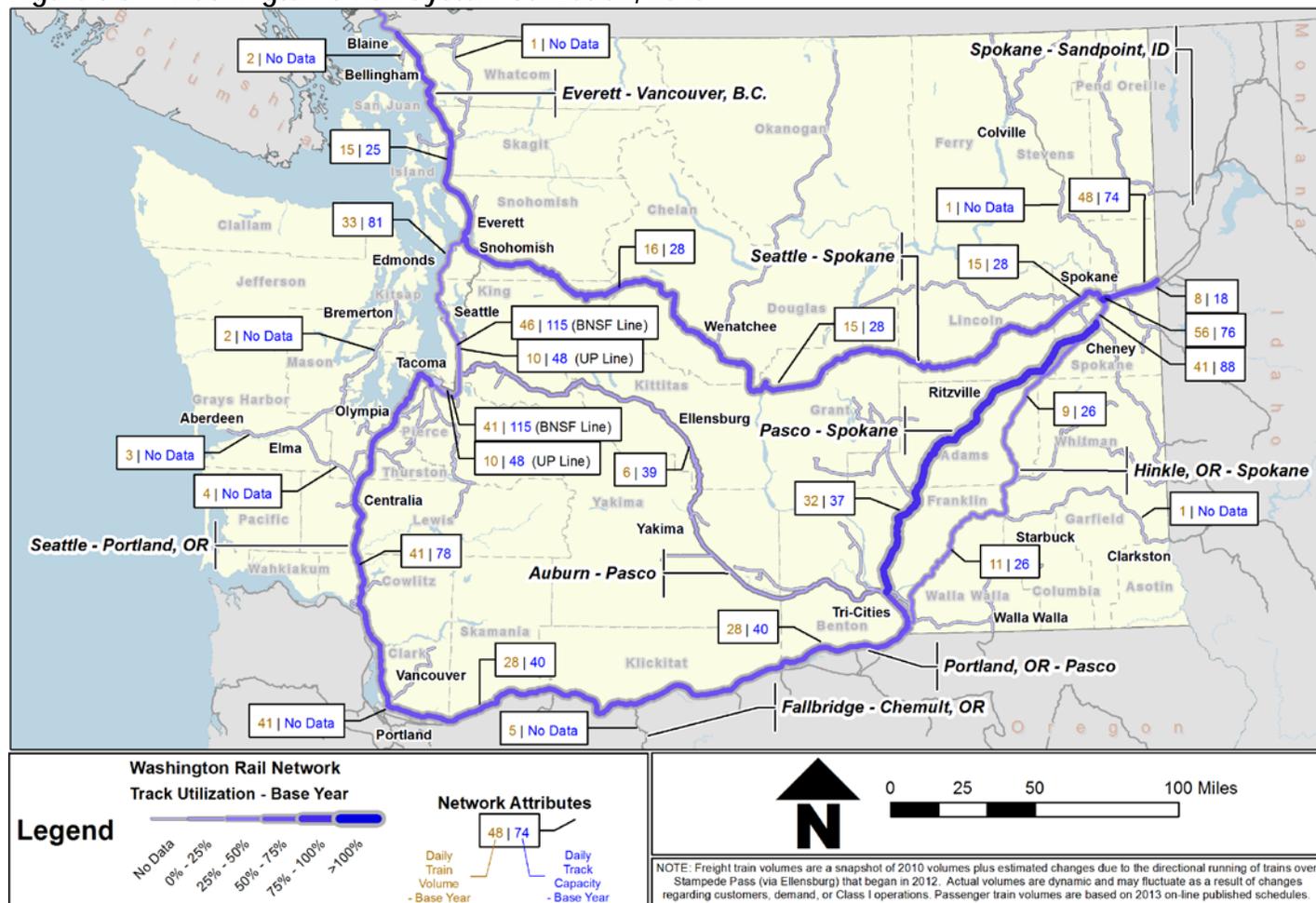
<sup>26</sup> [www.aar.org/Railroads-States/State-Rankings-2010.pdf](http://www.aar.org/Railroads-States/State-Rankings-2010.pdf).

<sup>27</sup> WSDOT, State Rail and Marine Office, *Amtrak Cascades Mid-Range Plan*, December 2008.

In general, the rail system (as of 2010) provided sufficient capacity to freight and passenger rail trains, as shown in Figure 3.5. In fact, the estimates produced for WSDOT, as part of this State Rail Plan, show that there were no recognized capacity constraints on Washington's rail system in 2010. There were several portions of track that are very highly used, including the BNSF's Pasco-Spokane segment at about 87 percent, followed by BNSF's Portland-Pasco segment at about 71 percent.

Preserving this connectivity is critical to moving people and goods efficiently by rail. Decreased connectivity could result in several negative impacts to the state's passenger and freight rail system. For example, much of the passenger rail traffic in the state is discretionary; meaning that passengers have other potential transportation options (including driving, flying, bus or not making the trip). A decrease in connectivity or reliability of the system could decrease the attractiveness of passenger rail; causing a loss in ridership and revenue. On the freight side, connectivity is crucial to support international trade through Washington's marine and inland ports, as well as the linkages to rural industries and agricultural producers. A loss in rail connectivity may result in additional shifts to truck; a move which can result in higher business costs and associated impacts to Washington's roads, congestion, air quality and road safety. A loss of rail also decreases the transportation modal options that are available to shippers, potentially leading to an over-reliance on the trucking mode and a lost opportunity to use rail for some shipments. Finally, it may result in decreased business activity, which can lead to job losses and business closures.

Figure 3.5 Washington's Rail System Utilization, 2010



Sources: 1) BNSF 2010 Train Counts Data for Washington; 2) UP 2012 Q1 Train Counts Data for Spokane-Eastport, Idaho corridor; and 3) Cambridge Systematics' Estimation of 2010 Train Volumes and Capacity Analysis using the 2011 BNSF Northwest Division timetable data, 2011 BNSF R-1 report data, and a TransCAD Model of Oak Ridge National Laboratory's Rail Network.

Note: Directional running of trains is assumed on the Stampede Pass route (Auburn-Pasco via Yakima), which was implemented by BNSF in 2012.

## *Specific Needs*

### **Systems Connectivity – Passenger Rail**

“Last mile” connectivity is a concept that can be applied to passenger or to freight transportation. For passengers, “last mile connectivity” is the idea that a passenger, once disembarked from the main rail service, is able to reach their final destination through transit connections, walking/biking facilities or personal vehicle. This “last mile” connectivity is essential to help promote the idea of seamless, easy travel to attract and retain passenger rail users. “Last mile” connectivity can be evaluated by measuring roadway access, ease of parking, number of parking spaces at stations, direct connection to other transit services, and integrated ticketing with other transit services. As noted in Technical Note 2, Washington’s rail services offer the following connections to support “last mile” mobility:

- **Amtrak Empire Builder** stops at 11 stations in Washington. Of these stations, nine have dedicated parking spaces and eight have connections to transit service. Transit connections include intercity and Greyhound bus, taxi, light rail, Link light rail and Washington State Ferries.
- **Amtrak Coast Starlight** stops at six stations within Washington. Five of these stations have dedicated parking facilities and all six have connections to transit service. Transit connections include intercity and Greyhound bus, taxi, light rail, Link light rail and Washington State Ferries.
- **Amtrak Cascades** stops at 12 stations within Washington. Eleven stops have dedicated parking and all 12 have connections to transit service. Transit connections include intercity and Greyhound bus, taxi, light rail, Link light rail and Washington State Ferries.
- The **Sounder** service stops at 12 stations in Washington. Eleven have dedicated parking facilities and all 12 have transit connections to intercity and Greyhound buses, Link light rail, and Amtrak rail service.

However, there are still places in the system where connectivity to transit modes is limited, or where there are concerns about the reliability, frequency or integration of the rail system that limit “last mile” connectivity. For example, there are connectivity concerns at the Spokane Station, where there is limited taxi, shuttle and transit service. Throughout the system, there is concern about the reliability and timeliness of connecting services, and the frequency that connections operate. Other stations are well integrated. For example, transit connections at Tacoma’s Amtrak Station include Tacoma Dome Sounder, Tacoma Dome Link Light Rail and several other bus services (Figure 3.6).

Figure 3.6 Transit Connections at the Tacoma Amtrak Station



Source: U.S. DOT, Bureau of Transportation Statistics, Washington, D.C., 2010, *National Transportation Atlas Database 2010*; Pierce County Transit, Puget Sound Regional Council's 2008 Regional Transportation Network.

### **Systems Connectivity – Freight Rail**

“Last mile” connectivity for the freight system generally refers to the efficiency with which goods reach their final destination on the rail system. The system achieves this in one of two ways:

- **Industrial site access:** “Last mile” connectivity can be achieved when the final destination is at a customer loading dock, manufacturing facility or other industrial site that has direct access to an industry siding track. Stakeholders consider rail-served industrial sites as a limited and precious resource throughout the state. Stakeholders report several instances of lost opportunities following the closure of a rail-served industry. In some cases, these sites have been redeveloped or rezoned into retail centers or truck-oriented industrial parks, eliminating the opportunity for new rail freight generating or rail freight receiving businesses moving in at a later date. Providing rail access via short-line connections or rail spurs to industrial sites can help to attract new businesses and support existing businesses, and therefore may be an economic and employment growth tool. Rail infrastructure serving industrial sites is often in poor or deteriorating condition. This may limit its usefulness for shippers and receivers or impede the ability to use modern, efficient rail equipment.
- **Intermodal terminals:** Intermodal terminals are another facility type that help to provide “last mile” connectivity, by facilitating the transfer of goods from rail to other modes (truck, barge or marine vessel) for delivery to their final destination. They are the key links in supply chains using Washington’s ports, including the Ports of Seattle, Tacoma, Everett, Olympia and others. Currently, the connectivity to the intermodal terminals in the Puget Sound region is limited. There are limited arterials and rail lines for accessing the ports, and many of the access facilities are congested or not capable of handling modern or efficient rail equipment. The location of several of the region’s ports within urban areas means that these limited arterial access routes often have shared uses.

Many recent or planned projects address intermodal terminal access. For example, the Port of Seattle and its partners completed the East Marginal Way Grade Separation in 2012. This project included a large grade separation with Duwamish Avenue South; an action that should improve rail and road access to port terminals, BNSF and UP intermodal yards, and regional manufacturing facilities.<sup>28</sup> Similarly, the SR 509/East D Street Slip Ramp project will construct a new interchange to help link the Tideflats area and

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<sup>28</sup> [www.portseattle.org/Supporting-Our-Community/Regional-Transportation/Pages/East-Marginal-Way-Grade-Separation.aspx](http://www.portseattle.org/Supporting-Our-Community/Regional-Transportation/Pages/East-Marginal-Way-Grade-Separation.aspx).

the BNSF intermodal yard, as well as increase area safety and mobility near the Port of Tacoma.<sup>29</sup>

## **Need B2. Preserve Access to Global Markets by Ensuring Access to Washington's Ports**

### *Issue Summary*

International trade contributes significant economic benefits to Washington. According to the Office of Trade and Industry Information, export-supported jobs linked to manufacturing account for an estimated 8.6 percent of Washington's total private-sector employment.<sup>30</sup> The two main deep-water marine ports – the Ports of Seattle and Tacoma – together handled 3.5 million 20-foot equivalent units (TEU) in 2011,<sup>31</sup> which makes them the third largest container port complex in the United States. Combined, \$111 billion of goods were imported to or exported from Washington in 2011 – an amount that is anticipated to grow (Figure 3.7 and Figure 3.8).

International trade depends heavily on rail – both to carry shipments of Washington agricultural products and manufacturing products for export, and to convey imported consumer goods to the growing Washington markets. International trade currently makes up almost one-third (29 percent) of total rail tonnage in Washington.<sup>32</sup> The amount of rail tonnage associated with international trade is anticipated to grow substantially – by 2035, it is anticipated to comprise almost 43 percent of total rail tonnage.<sup>33</sup>

In light of this anticipated growth, the state's rail system must provide high-quality, efficient and reliable connectivity to the state's ports. The consequences of degraded rail service could be severe. Many international shipments are discretionary, and could use the ports in Vancouver, B.C., Prince Rupert (Canada), or California to reach similar markets. In addition, the newly expanded Panama Canal,<sup>34</sup> once completed in 2014, potentially could create

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<sup>29</sup> [www.cityoftacoma.org/Page.aspx?nid=1103](http://www.cityoftacoma.org/Page.aspx?nid=1103).

<sup>30</sup> [www.trade.gov/mas/ian/statereports/states/wa.pdf](http://www.trade.gov/mas/ian/statereports/states/wa.pdf).

<sup>31</sup> [http://aapa.files.cms-plus.com/PDFs/NORTH%20AMERICA%20PORT%20CONTAINER%20TRAFFIC%20RANKING%202011\\_1361895265064\\_1.pdf](http://aapa.files.cms-plus.com/PDFs/NORTH%20AMERICA%20PORT%20CONTAINER%20TRAFFIC%20RANKING%202011_1361895265064_1.pdf).

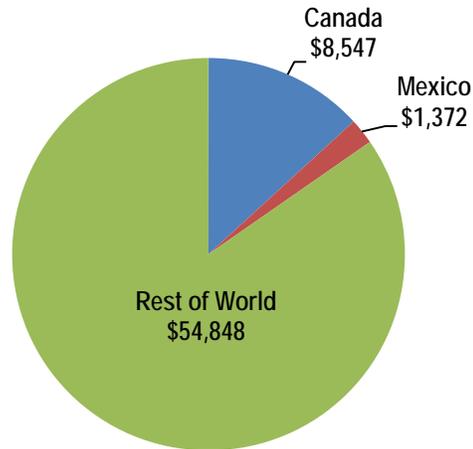
<sup>32</sup> FHWA Freight Analysis Framework Commodity Flows Database Version 3.3, (FAF3.3) Data. The international trade percentage of the total tonnages (all modes included) was computed excluding the through flows; that is flows neither originating nor terminating in Washington.

<sup>33</sup> Ibid.

<sup>34</sup> [www.pancanal.com/eng/expansion/](http://www.pancanal.com/eng/expansion/).

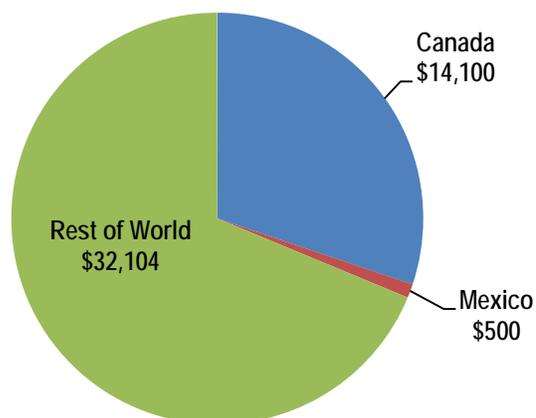
attractive new demand for Pacific Rim trade at ports along the U.S. Eastern Seaboard (including Miami, Savannah, Baltimore, Norfolk and others). If surface transportation capacity or efficiency is harmed, Washington ports could become less attractive to ocean carriers, leading to a loss of business and export opportunities.

**Figure 3.7 Exports From Washington in 2011**  
*Millions of Dollars*



Source: TradeStats Express, International Trade Administration, U.S. Department of Commerce.

**Figure 3.8 Imports Into Washington in 2011**  
*Millions of Dollars*



Source: TradeStats Express, International Trade Administration, U.S. Department of Commerce.

## *Specific Needs*

### **Everett to Spokane (BNSF)**

This line connects Everett to Spokane, a distance of roughly 242 miles that includes a section that passes through the Cascade Tunnel at Stevens Pass. Primary constraints that impact international trade on this line include:

- The approach to the Cascade Tunnel at Stevens Pass, which includes steep gradients and heavy track curvature.
- The throughput capabilities of the Cascade Tunnel, which requires flushing of the tunnel between trains (a process that takes 20 minutes for westbound trains and 40 minutes for eastbound trains<sup>35</sup>).

### **Auburn-Pasco Line (BNSF)**

This line connects Auburn to Pasco, a distance of about 228 miles. In 2012, only about six trains used this line.<sup>36</sup> This is due to the presence of the Stampede Pass Tunnel, which has at times of high international trade growth (such as during the 2006 *Washington Rail Capacity and Systems Needs Study*) been listed as a major capacity limitation. At present time, international trade is not growing at a level where Stampede Pass is a capacity limitation on the line. In fact, the 2011 *Marine Cargo Forecast and Rail Capacity Assessment* estimated that Stampede Pass would not become a capacity constraint by 2030, even under the high growth scenario. Primary constraints that impact international trade on this line include:

- Height restrictions in the Stampede Pass Tunnel mean that this route cannot accommodate double-stack trains. At some point in the future, if global trade volumes rise, this could become an impediment to double-stack container trains. However, as discussed in the previous paragraph, at this time this is not a concern.
- However, steep grades over Stampede Pass (2.2 percent) also make it difficult to haul heavily-loaded unit grain trains along this line.

### **Pacific Northwest Rail Corridor**

The PNWRC is the main north-south artery in Washington. It runs parallel to the I-5 corridor, and is the backbone of the rail system, controlling access to the east-west lines. The line passes through the most densely populated portions of the state; and connects thriving industrial clusters in Vancouver (WA), Tacoma, Seattle, Everett and Bellingham. Thus, it is an essential line for passenger and

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<sup>35</sup> *Marine Cargo Forecasts and Rail Capacity Assessment*, BST Associates, December 2011.

<sup>36</sup> In 2012 implementation began of directional running over Stampede Pass in combination with the Columbia Gorge route between Pasco and the Puget Sound region. Now, loaded westbound bulk trains destined for the Puget Sound region use the low-grade Columbia Gorge route, and return empty over Stampede Pass to Pasco.

freight service. In 2010, it carried up to 46 trains a day along its alignments. One export-related future capacity conflict may develop on this line:

- Potential capacity conflicts north of Seattle if the potential growth in export bulk trains (coal bound for export through the Gateway Pacific Terminal at Cherry Point in Whatcom County) develops as planned.<sup>37</sup> Estimates for full build out of this terminal suggest that up to eight coal trains and one train handling other dry bulk products would use this segment every day (each one arriving full and leaving empty for the return trip).<sup>38</sup>

### **Efficiency of Operations at Intermodal Locations and Rail Yards**

Washington's ports serve many different functions. For many ports, providing economic development opportunities to their region and the state as a whole is one of their mandates. As such, ports are a fundamental part of the state's economy. Maintaining a competitive advantage at the ports is a major concern for both the Ports of Tacoma and Seattle. The majority of the cargo that comes through state ports is discretionary cargo (i.e., containers, autos, grain, dry bulks and break-bulk cargos not destined for Washington consumers) that can shift to other gateways. Considering the competitive ports located to the north (Vancouver, B.C. and Prince Rupert in Canada) and south (Oakland, Long Beach and Los Angeles) of the state, the importance of maintaining efficient operations is paramount.

The inability to provide efficient transportation services risks a loss of cargo, competitiveness and economic development opportunities. Stakeholders mentioned several efficiency chokepoints. These include:

- Delays in switching at the Port of Tacoma due to the presence of multiple rail companies operating different portions of the same move.
- Delays at the Spokane rail yard, where 5-day a week (Monday-Friday) operations can cause long delays in carload shipments for short-line rail customers if a car arrives on a Thursday afternoon or Friday.
- Delays around the Tideflats area in Tacoma, and in accessing the BNSF intermodal terminal.<sup>39</sup>
- Connections to the Port of Everett, including bottlenecks such as the Salmon Bay lift bridge.

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<sup>37</sup> More information is expected to emerge during the feasibility studies planned for 2013 and later. For example, an environmental impact statement (EIS) is underway for the Gateway Pacific Terminal as of March 2013, <http://gatewaypacificterminal.com/the-project>.

<sup>38</sup> Gateway Pacific Terminal Website: <http://gatewaypacificterminal.com/the-project/f-a-q/>

<sup>39</sup> [www.cityoftacoma.org/Page.aspx?nid=1103](http://www.cityoftacoma.org/Page.aspx?nid=1103).

### 3.3 CATEGORY C. RAIL SYSTEM PRIORITIES AND GOALS

#### Need C1. Prioritize Cost-Effective Investments into the State's Rail System

##### *Issue Summary*

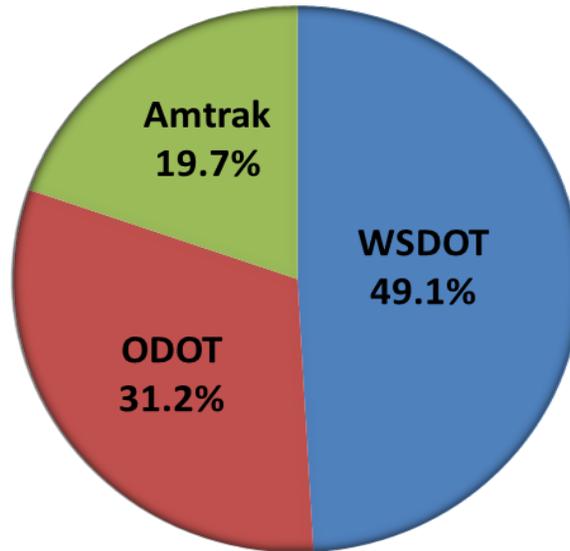
The continuing global recession, coupled with limited federal and state spending on transportation, means that public and private transportation funding sources are increasingly scarce and competitive. Several recent trends point to the increasing need to focus on cost-effective investments into the state's rail system, including the following:

- WSDOT short-line grant applications from the Freight Rail Assistance Program (FRAP)<sup>40</sup> were overwhelmed for the 2012 to 2013 application pool with \$25 million of quality grant applications received for the available \$2.5 million in funding.
- The federal contribution to the Amtrak Cascades corridor operations (which currently covers almost 20 percent of operating costs, as shown in Figure 3.9) will expire on October 2013, per the requirements of PRIIA, requiring more state resources from Washington and Oregon.
- The lack of predictability in year-to-year capital and operating funds can limit the ability to plan ahead, make it difficult to invest in long-range projects, and disrupt the ability to respond to the rapidly changing needs of customers.
- Competition for multimodal funds at the state level means increasingly limited resources for rail. WSDOT's 2011 to 2013 budget provided for continued state-supported passenger rail service operations, and capital projects along the Amtrak Cascades line.

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<sup>40</sup> [www.wsdot.wa.gov/Freight/Rail/GrantandLoanPrograms](http://www.wsdot.wa.gov/Freight/Rail/GrantandLoanPrograms).

Figure 3.9 Amtrak Cost Sharing for 2011 to 2013 (With Subsidy)



Source: WSDOT Rail Division.

### *Specific Needs*

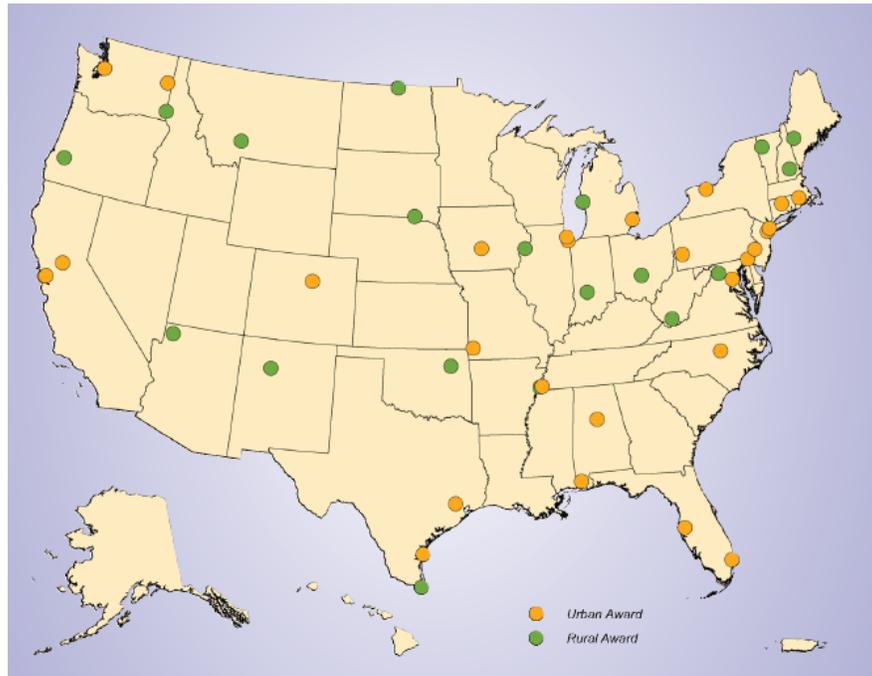
#### **Lack of Short-Line Funding**

Short-line railroads often operate on very small margins. With low traffic volumes and high operating costs, many have found themselves unable to continue necessary maintenance or investments. The result can be slow, more dangerous short-line rail service, which may lead to a further loss of customers and service opportunities. Or, it can lead to safety and operational concerns that further limit the usefulness of the rail infrastructure. Some of the specific ways in which short-line funding opportunities are limited include the following:

- Washington already has two dedicated programs for investment in rail: the Freight Rail Investment Bank (FRIB) and FRAP. However, both of these programs are insufficient to address needs. For example, the 2012-2013 year received \$25 million of requests for a \$2.5 million total grant amount. Stakeholders indicate that these WSDOT programs are one of the few available funding sources for investment into short-line rail. The alternatives include delaying/stopping the project, or searching for increased private sector participation.
- Applicants for short-line rail projects (which tend to be in rural areas) must compete with larger, urban-focused projects in competitive federal funding programs such as Transportation Investment Generating Economic Recovery (TIGER). A review of the 2012 successful TIGER grant awards show that out of 47 awards, 19 (40 percent) were awarded to rural regions (Figure 3.10). Likewise, in 2011 there were 46 TIGER awards, of which 20 (43 percent) were awarded to rural regions. Therefore, though TIGER awards are an available funding source, they are highly competitive, limited opportunities.

- Other feedback from short-line rail stakeholders reveals that there is a perception that available funding programs lack consistency, predictability and transparency.

Figure 3.10 2012 Successful TIGER Awards



Source: [www.dot.gov/tiger/2012-tiger-awards](http://www.dot.gov/tiger/2012-tiger-awards)

### Funding Rail Safety Improvements: Positive Train Control (PTC) Implementation

Funding freight and passenger rail safety improvements is an ongoing challenge, in particular, in an era of scarce resources. One ongoing funding dilemma is the implementation of PTC. In 2008, the U.S. Congress mandated that PTC technology be implemented on all main line corridors that carry both freight and passenger trains. PTC is a predictive collision avoidance technology designed to prevent train-to-train collisions, over speed derailments, incursions into work zones, and movement of trains through a switch left in the wrong position. Using GPS technology, PTC is designed to improve the safe operation of passenger and freight railroads. This legislation was passed in the wake of a head-on collision in California between a UP freight train and a Metrolink commuter train. The presence of PTC technology could have potentially helped to avert this accident.

Though potentially offering significant safety benefits, these improvements also come at a cost. In fact, the Federal Railroad Administration (FRA) estimates that the full cost of deployment of PTC to freight railroad carriers is at least \$10 billion (with some estimates reaching as high as \$15 billion). It includes the installation of more than 17,000 Class I locomotives with the necessary onboard hardware; and the further installation of in-track PTC on almost 74,000 miles of

rail infrastructure.<sup>41</sup> Since the only identified source of funding for PTC are the capital funds of the Class I railroads, this significant investment into PTC could result in delayed investments in other areas, such as capacity improvements, maintenance or expansion. Currently, Congress is debating whether to extend the deadline of full PTC implementation beyond 2015, as many railroads will not be able to meet the deadline.<sup>42</sup>

### **Grade Crossing Needs**

Grade crossings offer another expensive (and largely unfunded) challenge. Though the FHWA Section 130 Highway-Railroad Grade Crossing Program (administered through the Highway Safety Improvement Program fund) provides grants for the improvement of highway-railroad grade crossings, the funding program is very small—with a national maximum of \$220 million per year.<sup>43</sup> The grants are to be used for projects that enhance safety, and other projects including separation or protection of at-grade crossings, the reconstruction of existing railroad grade crossing structures, and the relocation of highways or rail lines to eliminate grade crossings. In general, federal funding is available at a 90 percent share. For certain projects (including signing, pavement markings, active warning devices and crossing closures), the federal share may amount to 100 percent. Regardless, the total funding sources available to address grade crossing needs are relatively small.

### **Passenger Rail Funding Changes**

PRIIA enacted changes in the relationship between the federal government and states with respect to intercity passenger rail funding. These changes are significant for WSDOT because they will require the agency to provide more funding for Amtrak Cascades operations than their current share. Presently, Washington and Oregon jointly fund 80 percent of Amtrak Cascades' operating costs, but as of October 1, 2013, their share will rise to 100 percent.<sup>44</sup> Given WSDOT's commitment to providing a greater share of funding for Amtrak Cascades operations, prioritization of cost-effective investments is especially important moving forward.

### **Perceived Imbalance of Funding Between Freight and Passenger Rail Lines**

Some stakeholders (primarily freight system shippers and stakeholders) voiced their frustration at the size of state and federal investments in passenger rail

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<sup>41</sup> <http://rail.railplanning.com/files/2011/03/20100528-Oliver-Wyman-Stifel-Niclaus-call-PTC-benefits.pdf>.

<sup>42</sup> [www.joc.com/regulation/fra-recommends-congress-extend-ptc-deadline](http://www.joc.com/regulation/fra-recommends-congress-extend-ptc-deadline).

<sup>43</sup> <http://safety.fhwa.dot.gov/safetealu/qa/qa91405.cfm>.

<sup>44</sup> WSDOT and Oregon DOT, 2013, *Cascades Rail Corridor Management Workplan: January 2013*.

versus freight rail. There are important historical reasons for this, including the fact that freight rail service is provided by private companies (BNSF, UP and their associated partners), who are responsible for substantial investments for capital improvements to their infrastructure (causing a historical de-emphasis on freight rail in federal policy). Moreover, most of the state's passenger rail investments are made to infrastructure owned by freight railroads, and are intended to preserve the ability of the freight railroad to serve expected growth in freight traffic. Some stakeholders feel that investments into freight rail projects would constitute a public investment into a private company; an action they believe should be limited in scope. However, other stakeholders feel that the public sector should consider making commensurate investment into freight rail projects as it does for passenger rail projects. A better understanding of new opportunities created by Moving Ahead for Progress in the 21<sup>st</sup> Century (MAP-21) may help to further this discussion at the state level.

## **Need C2. Maximize the Positive Benefits of Rail, While Minimizing the Potential Negative Impacts to Communities and the Environment**

### *Issue Summary*

#### **Criteria Pollutants**

Petroleum and diesel consumption results in the emission of various pollutants, and depending on the mode of transportation and specific fuel used, the types of pollutants produced differ. Specifically, trucks contribute most to nitrogen oxide (NO<sub>x</sub>) and particulate matter (PM) emissions, marine vessels contribute mostly to sulfur dioxide pollution, whereas air cargo planes contribute to small amounts of pollution of NO<sub>x</sub>, PM and other pollutants as well.<sup>45</sup>

Rail operations produce a range of toxic pollutants including carbon monoxide (CO), NO<sub>x</sub>, volatile organic compounds, PM, and carbon dioxide (CO<sub>2</sub>). While in general rail is a more efficient mode in terms of fuel consumption (compared to passenger vehicles and trucks) for moving people and goods, its emission standards and technology do lag behind that of trucks.

On a per-ton basis, rail is the most efficient way to move large, heavy loads—in fact, rail fuel efficiency ranges from 156 to 512 ton-miles per gallon, while truck fuel efficiency ranges from 68 to 133 ton-miles per gallon.<sup>46</sup> Therefore, use of rail reduces fuel consumption necessary for each ton-mile. It can also reduce fuel consumption on a per passenger-mile unit, assuming high ridership volumes.

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<sup>45</sup> [www.ops.fhwa.dot.gov/publications/fhwahop10024/fhwahop10024.pdf](http://www.ops.fhwa.dot.gov/publications/fhwahop10024/fhwahop10024.pdf)

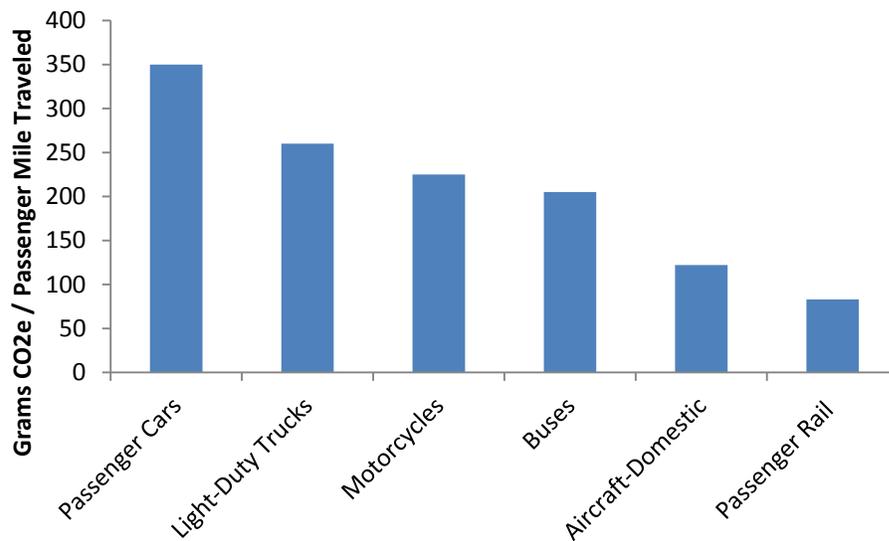
<sup>46</sup> ICF International, U.S. DOT, FRA, *Comparative Evaluation of Rail and Truck Fuel Efficiency on Competitive Corridors*, November 2009, [www.ontrackamerica.org/files/Comparative\\_Evaluation\\_Rail\\_Truck\\_Fuel\\_Efficiency.pdf](http://www.ontrackamerica.org/files/Comparative_Evaluation_Rail_Truck_Fuel_Efficiency.pdf).

Since the primary driver of emissions is fuel consumption, the reduced use of fuel associated with freight and passenger rail (as opposed to trucks or passenger vehicles) can lead to reduced emissions of CO, PM, NO<sub>x</sub>, and ozone.

### Greenhouse Gases (GHG)

In terms of GHG emissions, passenger and freight rail are the least polluting mode-per-unit of CO<sub>2</sub>. As shown in Figure 3.11, passenger rail averages under 100 grams (g) of CO<sub>2</sub> per passenger-mile traveled, compared with about 300g for passenger vehicles, and about 260g per light-duty trucks. Likewise, freight rail averages 28g of CO<sub>2</sub> per ton-mile, compared to 313g for trucks, and 1,472g for domestic aircraft (Table 3.2). Therefore, though passenger and freight rail contribute to Washington’s GHG emissions, they are the most efficient mode (of traditional transportation modes) by which to transport people and goods.

Figure 3.11 GHG Emissions per Passenger-Mile by Passenger Transportation Mode



Source: U.S. Environmental Protection Agency (EPA), *Inventory of U.S. Greenhouse Gas Emissions and Sinks, 2008*.

**Table 3.2 GHG Emission Rates per Ton-Mile by Freight Mode**

Mode	GHG Emissions (Teragrams)	Ton-Miles	Emissions per Ton-Mile (gCO <sub>2</sub> e)
Domestic Aircraft <sup>a</sup>	22.60	15,357	1,472
Trucking	405.49	1,294,492	313
Domestic Marine <sup>a</sup>	30.20	561,629	54
Pipelines	32.40	913,202	35
Freight Rail	51.50	1,852,833	28

Source: Cambridge Systematics, Inc. analysis of the U.S. EPA emissions data.

<sup>a</sup> International air cargo and marine GHG emissions are excluded because of the lack of ton-mileage data for these modes. For the marine mode, it is likely that large ships burning bunker fuel would have a higher emissions rate than domestic cargo ships, which typically use cleaner distillate fuel.

However, there are also potential negative impacts from moving goods by rail. For example, rail movement can involve dust, sound, vibrations and emissions; all of which, if not mitigated, can have negative impacts on surrounding communities. Therefore, the challenge is to maximize the positive benefits of rail transportation, while minimizing the impacts to communities and the natural environment.

### *Specific Needs*

#### **Potential of Diverting from Truck to Rail**

Additional environmental benefit can be achieved if rail intermodal shipments create an alternative to trucks, and therefore help to reduce the amount of truck vehicle miles traveled. Modal choice is a very complex decision for shippers, based on numerous criteria, including the distance the commodity must travel, the commodity weight and whether or not it is perishable, transportation costs, or commodity origin and destination characteristics. Decisions about modal shifts are primarily made by shippers and companies, and therefore can be difficult for the public sector to encourage or influence. Nevertheless, there could be several potential advantages to diverting a portion of Washington’s freight from truck to rail, including the following:

- Reduction in congestion on the highway network in urban areas from a reduced number of trucks traveling throughout the day.
- Reduction in fuel usage per ton of freight.

- Reduction in mobile source emissions on a per-ton basis.
- Reduction in pavement wear and tear.<sup>47</sup>

If the rail system can offer improved cost, reliability and speed compared to trucking, then some share of existing truck traffic could be expected to divert to rail. The amount that could be projected to divert is difficult to calculate; and would likely be determined by the average travel time, origins and destinations of the cargo, the weight and bulkiness of shipments, whether or not the shipment is perishable or time-sensitive, and the value-per-ton of the commodity in question.<sup>48</sup> Quantifying the reduction in congestion, fuel usage, pavement wear and tear and mobile source emissions from a potential project to address modal shift could be a way to estimate the public's interest in such projects.

### **Need C3. Continue to Support Passenger and Freight Rail Safety and Security**

#### *Issue Summary*

WSDOT's role in providing for safe and secure rail travel is very limited. For the most part (and as summarized in Table 3.3), rail safety and security are regulated and enforced by the FRA, the Washington Utilities and Transportation Commission (UTC), and the Department of Homeland Security (DHS). WSDOT's role is mostly in public education, as well as communicating the contact information in the event of accident, complaint or other safety concern.

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<sup>47</sup> Feasibility Plan for Maximum Truck to Rail Diversion in Virginia's I-81 corridor, Cambridge Systematics, 2009, [www.drpt.virginia.gov/studies/files/Draft%20final%20report.pdf](http://www.drpt.virginia.gov/studies/files/Draft%20final%20report.pdf).

<sup>48</sup> Ibid.

**Table 3.3 Federal and State Agency Roles in Passenger and Freight Rail Safety and Security**

Agency	Scope of Activity	Authorities/Responsibilities
FRA	Train/Track Safety	<ul style="list-style-type: none"> <li>• Develop and enforce basic operating rules for train safety, tank car safety, railroad industrial hygiene, rail equipment safety, grade crossing safety and trespass prevention.</li> <li>• Oversee employee hours of service regulations and signal and train control regulations.</li> <li>• Responsible for track inspection/audit.</li> <li>• Rail movement of spent nuclear fuel and radioactive waste.</li> <li>• Manage the Rail Safety Improvement Act of 2008.</li> </ul>
DHS	Rail Security	<ul style="list-style-type: none"> <li>• Establish requirements for national rail security strategy and risk assessment.</li> <li>• Track hazardous materials (hazmat) shipments.</li> <li>• Create railroad requirements for developing institutional risk assessments.</li> <li>• Conduct programs for rail security training.</li> <li>• Conduct rail security research and development.</li> </ul>
UTC	Rail Safety	<ul style="list-style-type: none"> <li>• Oversee rail operations and conduct physical inspections in coordination with FRA.</li> <li>• Inspect railroad crossings and investigate complaints or accidents.</li> <li>• Resolve complaints (Quiet Zones and trespassing complaints, for example).</li> <li>• Ensure employee safety through employee regulations.</li> <li>• Fund rail safety projects through the Grade Crossing Protective Fund.</li> <li>• Promote public awareness as a partner in the Operation Lifesaver Program.</li> </ul>
WSDOT	Rail Safety	<ul style="list-style-type: none"> <li>• Publish general rail safety principles and “rules to remember.”</li> <li>• Fund grade crossing protection improvements from federal highway dedication (Section 130).</li> <li>• Distribute information online for public education, including the contact information for the Washington UTC, the BNSF and UP railroads, and the Surface Transportation Board.</li> <li>• Promotes public awareness through participation in the Operation Lifesaver Program.</li> </ul>

Source: Cambridge Systematics, 2013.

However, rail safety is extremely important to WSDOT and its partners and therefore is included as an ongoing need and opportunity in this State Rail Plan. Safety concerns generally fall into three categories:

1. Trespassing concerns.
2. At-grade highway-rail crossing concerns.
3. Hazmat shipment concerns.

### *Specific Needs*

#### **Trespassing Concerns**

Safety concerns can exist at or near passenger rail stations, where there are often very few barriers preventing trespassing or crossing of rail infrastructure. This can lead to incidents of accidental or purposeful trespassing. The UTC publishes rail trespass fatalities in Washington state each year, which totaled ten fatalities in 2012, two fatalities in 2011, 15 fatalities in 2010, and 11 fatalities in 2009.<sup>49</sup> Though not all of these incidents occurred near passenger rail stations, they did occur in places where pedestrians were easily able to walk on or near rail infrastructure. These tragic incidents can be reduced through the adoption of prevention strategies, such as building of physical barriers and better indication of escape routes. WSDOT also publishes some “Rules to Remember,”<sup>50</sup> targeted at reducing the incidence of trespassing, and of reminding the public that it is a dangerous, illegal activity.

#### **At-Grade Rail Crossings**

Grade crossing safety is one of the most pressing issues to the community, to the UTC, FRA, WSDOT and to the railroads themselves. Grade crossing concerns generally focus on the potential for train/passenger vehicle interactions, the potential for disrupted emergency vehicle response time, congestion caused during “gate down time,” and air quality concerns from vehicles idling at grade crossings. The dual pressures of growing populations (and thus growing requirements for land), coupled with increasing rail traffic, are bringing grade crossing concerns to the forefront of the statewide rail planning process in many states.

WSDOT’s role in providing trespassing and rail grade crossing safety is fairly limited. As shown in Table 3.3, WSDOT focuses its efforts on public education, through the Operation Lifesaver program and the publication of rail safety principles and “rules to remember.” WSDOT also funds limited grade crossing protection improvements, through the FHWA’s Section 130 program. Actual tracking of rail grade crossing accident data, and linking improvements to this

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<sup>49</sup> [www.utc.wa.gov/publicSafety/railSafety/Pages/OLCrashStatistics.aspx](http://www.utc.wa.gov/publicSafety/railSafety/Pages/OLCrashStatistics.aspx).

<sup>50</sup> [www.wsdot.wa.gov/Rail/TrainSafety.htm](http://www.wsdot.wa.gov/Rail/TrainSafety.htm).

data, is the responsibility of the UTC and FRA. These agencies track aggregate accident/incident data across the nation. As Table 3.4 shows, there were 1,960 highway-rail incidents nationally in 2012, of which 31 (2 percent) were in Washington. The UTC tracks these accidents, and also keeps a rail grade crossing database comprised of all the rail grade crossings in the state. Additionally, the UTC offers Grade Crossing Protective Fund Grants, a competitive process where railroads, local governments, and other agencies can apply for assistance to make safety improvements at a railroad crossing or along a railroad right of way. The selection process includes the severity of the hazard, the safety benefits resulting from the project, the total costs to implement a project, geographic diversity, and funds available for the program.<sup>51</sup>

**Table 3.4 Washington Rail Accidents Compared to U.S. Totals, 2011 and 2012**

Accident / Incident Type	2011		2012		Washington as % of U.S. Totals	
	WA	U.S.	WA	U.S.	2011	2012
Train accidents (Excluding highway-rail incidents)	40	2,019	31	1,712	2%	2%
Highway-rail incidents	32	2,062	31	1,960	2%	2%
Fatalities	8	251	2	233	3%	1%
Injuries	10	1,034	18	921	1%	2%
Other incidents <sup>a</sup>	137	7,353	133	7,075	2%	2%
Total accidents/incidents	209	11,434	195	10,747	2%	2%

Source: FRA Office of Safety Analysis.

<sup>a</sup> Other incidents include events other than train accidents or crossing incidents, that caused a death or nonfatal condition to any person. This can include stumbling, tripping, or getting on and off equipment.

### Hazardous Materials Safety

In addition to grade crossings, hazmat carried on tanker cars can pose a risk to the communities they pass through. At times, there have been incidents where rail collisions or derailments cause the release of toxic materials into nearby communities. A recent example of a bridge collapse in New Jersey causing

<sup>51</sup> [www.utc.wa.gov/publicSafety/railSafety/Pages/gradeCrossingProtectionFundGrants.aspx](http://www.utc.wa.gov/publicSafety/railSafety/Pages/gradeCrossingProtectionFundGrants.aspx).

several hazmat tanker cars to derail and spill is an illustration of this relatively rare, but very serious issue.<sup>52</sup>

Table 3.5 shows the number of hazmat cars that are damaged/derailed each year in incidents in Washington between 2003 to September 2012. In some years, more than 20 percent of all hazmat cars are derailed and damaged. However, the redundancy of hazmat car design means that these episodes rarely lead to the release of hazmat. As shown in Table 3.5, there are some years where many railcars are damaged, but no hazmat released. These statistics may also be the function of the FRA reporting thresholds, which require reports of any incident—even if it only resulted in very minor damage. Nevertheless, the statistics underscore the need to maintain infrastructure at levels that will provide safe and efficient mobility for cargo of all types.

**Table 3.5 Damaged/Derailed HAZMAT Cars in Washington, 2003 to 2012**

Category	Number of Incidents with Cars Carrying Hazmat	Hazmat Cars Damaged/Derailed (of those Involved in Incidents)	Percent of Hazmat Cars Damaged/Derailed (of those Involved in Incidents)	Cars Releasing Hazmat (of those Involved in Incidents)
2003	247	13	5%	0
2004	92	11	12%	2
2005	210	12	6%	1
2006	192	23	12%	0
2007	65	15	23%	0
2008	247	15	6%	0
2009	63	4	6%	0
2010	184	10	5%	0
2011	110	10	9%	2
2012	50	16	32%	0

Source: FRA Office of Safety Analysis.

<sup>52</sup> [www.cnn.com/2012/11/30/us/new-jersey-train-derail/index.html](http://www.cnn.com/2012/11/30/us/new-jersey-train-derail/index.html).

## 4.0 “Umbrella” Institutional Needs and Opportunities

Previous sections of this technical note have discussed infrastructure and operational issues on the state’s rail system, including capacity, safety and efficiency issues and the projects designed to address them. They also discussed institutional needs and opportunities that are related to a specific need. Other institutional needs, however, are broad enough that they impact (or could impact) the entire passenger and freight rail system. Therefore, this section reviews institutional challenges facing Washington’s passenger and freight rail system. Though these needs are typically not measurable, they are nevertheless very important. Addressing them will be essential for Washington to achieve its long-term rail system objectives.

### State’s Role in the Passenger and Freight Rail System

Part of this State Rail Plan effort has focused on the role of the state in planning and funding the passenger and freight rail system. Discussions with the Washington State Department of Transportation (WSDOT) and numerous passenger and freight rail stakeholders has determined that the policies established in the Washington State Transportation Commission’s 2006 *Rail Capacity and System Needs Study*<sup>53</sup> are still relevant. Specifically, the policies state the following:

- Washington should continue to participate in the preservation and improvement of both the freight and passenger rail transportation system where there are public benefits to Washington state, its businesses, and its communities.
- The state should base its decisions to participate in projects, programs and other rail initiatives on a systematic assessment and comparison of benefits and costs across users and modes.
- Where the state determines there are sufficient public benefits to justify public participation in the preservation and improvement of the rail transportation system, its actions should be guided by the following general principles:
  - Emphasize operations and nonfinancial participation in projects before capital investment.

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<sup>53</sup>[www.wstc.wa.gov/rail/RailFinalReport.pdf](http://www.wstc.wa.gov/rail/RailFinalReport.pdf).

- Preserve and encourage competition.
- Target actions to encourage private investment that advances Washington’s economic development goals.
- Leverage state participation by allocating cost responsibility among beneficiaries.
- Require projects to have viable business plans.

Work completed throughout this State Rail Plan helped to clarify the recommendations necessary to support, advance and implement these policy statements.

### Coordination with Other Plans

One of the needs highlighted by stakeholders in the public outreach process is the need for coordination between different transportation and rail planning efforts at the state and regional levels. Stakeholders report confusion about the purpose of the different plans and the relationship between the plans. For instance, the relationships between this State Rail Plan, the concurrent *Freight Mobility Plan*, the recently-completed *Washington Transportation Plan*, and other modal plans are unclear to some stakeholders. In addition, several stakeholders spoke of the need to have a coordinated vision, and to ensure that the same vision is consistent across numerous planning efforts. This is a concept of growing importance, in particular, when considering the opportunities presented by MAP-21.<sup>54</sup>

This State Rail Plan is a component of a comprehensive transportation planning program in the state that aims to improve mobility using multimodal approaches. Table 4.1 lists Washington transportation plans and their connections to the State Rail Plan. Metropolitan and regional transportation plans developed by Metropolitan Planning Organizations and Regional Transportation Planning Organizations also inform the plan.

**Table 4.1 Recent Transportation Plans and Studies**

Year	Title/Agency	Relation to State Rail Plan
2006	Statewide Rail Capacity and System Needs Study WSTC	Capacity analysis consulted, projects considered, key issues and bottlenecks considered.
2006	Long-Range Plan for Amtrak Cascades WSDOT	Long-range vision and plans for the Amtrak Cascades corridor between Vancouver, B.C. and Portland.

<sup>54</sup>Moving Ahead for Progress in the 21<sup>st</sup> Century, signed into law on July 6, 2012.

Year	Title/Agency	Relation to State Rail Plan
2008	Washington Transportation Plan Update Freight Movement WSDOT	One-time update to the WTP. Additional source for consideration of projects.
2008	Amtrak Cascades Mid-Range Plan WSDOT	Underpins the planning for Amtrak Cascades route planning.
2009	2010-2030 Freight Rail Plan WSDOT	Physical inventory data, historical information.
2010	Washington Transportation Plan 2030 WSTC	Recommends policies for the statewide transportation system.
2010	High-Speed Rail on the Pacific Coast Pacific Coast Collaborative	Examination of opportunities to supplement and leverage existing and planned high-speed rail investments to fully connect the region from San Diego through Portland and Seattle to Vancouver, British Columbia.
2011	Pacific Northwest Marine Cargo Forecast Update and Rail Capacity Assessment Washington Public Ports Association	Consideration in freight projections, rail to port connectivity, alternative demand scenarios.
Soon	State Freight Mobility Plan WSDOT	State Rail Plan will provide rail-related content for Freight Mobility Plan.
Soon	Highway System Plan WSDOT	Identify highway capacity constraints that may be relieved by rail, and identify at-grade crossings improvements on the state highway system.
Soon	Washington Transportation Plan WSTC	Multimodal transportation plan incorporating rail, highway, ferry, aviation, marine and river, public transportation, bicycle facilities, and pedestrian walkways. This plan will include recommendations from the State Rail Plan.
Soon	USDOT Planning Efforts FRA, FTA, FHWA	PRIIA and MAP-21 include provisions for agencies to develop strategies, guidance, and/or plans for freight, rail, public transportation, and highways. These efforts impact the states' transportation systems.

## Performance Measurement Framework

Performance measures use data to provide insights about the use, condition and impacts on the transportation system. These measures illustrate progress towards established targets. A good performance measurement system can help

promote transparency in public spending by better linking investments to outcomes. WSDOT's *The Gray Notebook*<sup>55</sup> is recognized as a national standard for good performance measurement reporting in transportation. Though *The Gray Notebook* is generally geared towards highway-specific performance measurement tools, the September 30, 2012 version of *The Gray Notebook* was expanded to include six rail-freight-specific measures and 24 rail-passenger-specific measures.<sup>56</sup>

Additional performance measures are included in the service outcome agreement signed by WSDOT and BNSF Railway (BNSF) in July 2011.<sup>57</sup> The Service Outcome Agreement was required by the Federal Railroad Administration (FRA) as a condition of providing WSDOT with \$781 million to improve the Amtrak Cascades. It committed WSDOT/BNSF to three outcomes:

- Reduction in travel time of 10 minutes.
- Two additional round trips between Seattle and Portland.
- On-time reliability of 88 percent.

The long-term benefits of the investments will therefore be measured by travel time, the number of Seattle-to-Portland round trips and overall reliability of the service.

An opportunity for WSDOT to even further improve its measurement system would be to evaluate them against newly released MAP-21 guidelines. Under MAP-21, the U.S. Department of Transportation (DOT) will establish performance measures, and state DOTs will develop performance targets in consultation with metropolitan planning organizations and others. Within a year of the final rulemaking on performance measures, states must set targets for measures identified by the U.S. DOT, along with other requirements.

## Objective Project Prioritization Evaluation

This State Rail Plan offers an opportunity to highlight the economic and social benefits of rail to the state's communities and economy. One important component of this should be to help create project evaluation criteria that can be used to identify future projects based on criteria, including job creation, safety benefits, environmental benefits, or other measures of public benefit. Appendix M: Technical Note 5: *Implementation and Investment Plan* includes a discussion of potential criteria.

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<sup>55</sup>[www.wsdot.wa.gov/accountability/GrayNotebook/](http://www.wsdot.wa.gov/accountability/GrayNotebook/).

<sup>56</sup><http://wsdot.wa.gov/publications/fulltext/graynotebook/Sep12.pdf>.

<sup>57</sup>[www.wsdot.wa.gov/News/2011/07/28\\_BNSF\\_Agreement.htm](http://www.wsdot.wa.gov/News/2011/07/28_BNSF_Agreement.htm).

Other stakeholders spoke of the need to make the existing state funding programs (including the Freight Rail Investment Bank Program and the Freight Rail Assistance Program) a more objective process.<sup>58</sup> Specifically, stakeholders suggested that improvements to the program could help to add consistency, predictability and transparency to the process.

Finally, there is strong interest in seeing “post audits” completed on projects that receive funding through a state grant, loan or other funding source. This could help to better understand the full impact of public expenditure on rail infrastructure, and would ensure that projects return the promised benefits.

### **Agency and Stakeholder Collaboration**

Better collaboration can bring about reduced costs of service, improved service and better economic competitiveness for the region. To achieve this, Washington could collaborate with both private- and public-sector stakeholders through a coordinated effort/strategy. This is already occurring on efforts on the Pacific Northwest Rail Corridor (PNWRC). In 2012 WSDOT signed an agreement with the Oregon DOT to facilitate an integrated corridor management approach, allowing both parties to jointly develop a plan for the PNWRC, with the intention of adding British Columbia (B.C.) as another partner.<sup>59</sup> Other venues for cross-border collaboration include arrangements such as the West Coast Corridor Coalition, and the B.C./WA Joint Transportation Executive Council and Working Group. This latter group is comprised of executives from WSDOT and the B.C. Ministry of Transportation and Infrastructure, and has met since 2009 to discuss items such as high-speed passenger rail, Amtrak trains between Seattle and Vancouver, B.C. land border crossing initiatives, and commercial vehicle data sharing.<sup>60</sup> Other multiagency coordination has been successful in procuring federal funds in the past—in particular, through competitive, nationwide programs, such as the Transportation Investment Generating Economic Recovery (TIGER) grants in 2010, 2011 and 2012.<sup>61</sup>

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<sup>58</sup>[www.wsdot.wa.gov/Freight/Rail/GrantandLoanPrograms.htm](http://www.wsdot.wa.gov/Freight/Rail/GrantandLoanPrograms.htm).

<sup>59</sup>WSDOT and Oregon DOT, 2013, *Cascades Rail Corridor Management Workplan: January 2013*.

<sup>60</sup>[www.gov.bc.ca/igrs/attachments/WA\\_BC\\_Framework.pdf](http://www.gov.bc.ca/igrs/attachments/WA_BC_Framework.pdf).

<sup>61</sup>[www.dot.gov/tiger](http://www.dot.gov/tiger).

