Pacific Northwest Marine Cargo Forecast Update and Rail Capacity Assessment

Final Report

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Executive Summary

The Pacific Northwest economy is inextricably tied to domestic and international markets. Efficient performance of the inland transportation system, especially in its linkage to the public and private port system, is critical to the economic health of the region.

Approximately every five years the Washington Public Ports Association (WPPA) and Washington State Department of Transportation (WSDOT) sponsor an update to the Washington State Marine Cargo Forecast. The most recent forecast was completed in March 2009, and provided unconstrained forecasts of cargo projected to move through public and private marine terminals on Puget Sound, the Washington Coast, and the Lower Columbia River in Washington and Oregon.

In the past two decades an increasing percentage of the commerce moving through Pacific Northwest ports has been carried by rail. The most recent two Marine Cargo Forecast studies have also included analyses of rail capacity. These rail capacity analyses modeled the various mainline rail segments in Washington, taking into account the projected marine cargo volumes as well as growth in domestic train traffic and passenger train traffic. Key outputs of these analyses were prioritized lists of rail system projects that would help to solve existing and anticipated capacity constraints.

The most recent marine cargo forecast was completed in the middle of the 2009 economic recession, a time of unusually sharp declines in marine cargo and rail traffic. However, since that report was completed rail traffic has rebounded to pre-recession levels. In addition, many of the ports in the region are anticipating major increases in cargo, especially exports of dry bulk such as grain, minerals, ores, and other bulk commodities. The anticipated volumes of these new cargos could significantly impact the mainline rail system in the northwest, impacting the marine cargos as well as passenger traffic and domestic cargo.

BST Associates (BST) and MainLine Management (MLM) were retained to prepare the following 2011 update to the 2009 report. The purpose of this analysis is to update the marine cargo forecasts, to compare the projected level of rail traffic with the capacity of the various mainline segments in the region, and to produce a prioritized list of projects to alleviate anticipated capacity constraints. An important addition to the 2011 analysis is the inclusion of the mainline rail system in Oregon.

The report was prepared at the request of the Ports of Everett, Seattle, Tacoma, Grays Harbor, Longview, Kalama, Vancouver and Portland. Additional entities participated in the preparation, including the Washington State Department of Transportation, Oregon Department of Transportation, and Washington Public Ports Association. The Class I railroads also participated in a review of the analysis, but this is not a Class I railroad product.

Marine Cargo Forecasts

The marine cargo forecasts produced for this analysis are unconstrained, which assumes that the necessary marine terminals and rail capacity will be in place to meet market demand. The method for updating the 2009 forecast involved several steps.

- First, cargo volumes were updated by commodity and region using the most recent data available.
- Second, the forecasts provided in the 2009 Marine Cargo Forecast were then updated based upon adjusted trends and forecast growth rates. A key part of this step was the inclusion of potential market opportunities that are being evaluated by individual ports.
- Finally, the mode of inland transportation was estimated for each scenario by commodity, sub-region and growth scenario.

Potential new market opportunities included: ores, minerals, grain, containers and liquid bulks. For each of the commodity types two growth scenarios were projected: the high-growth forecast included all of the market opportunities currently under consideration, while the moderate growth forecast included a portion of the market opportunities (approximately one half).

A summary of cargo projections through the year 2030 is presented below

Commodity Forecasts

Containers

In the 2009 marine cargo forecast, container traffic was projected to reach 10.4 million TEUs in 2030, with an average annual growth rate of 5.2 percent between 2010 and 2030.

Under the revised moderate growth forecast, containers are projected to reach 8.3 million TEUs by 2030 (4.1 percent annual growth). Under the revised high growth forecast, containers are projected to reach 12.3 million TEUs by 2030 (6.1 percent annual growth).

Breakbulk/Neobulk

In the 2009 marine cargo forecast, these commodities were projected to increase by an average annual 1.5 percent, reaching 11.1 million tons in 2030.

Under the moderate-growth scenario, breakbulk/neobulk cargoes are expected to grow by an average annual rate of 1.2 percent from 2010 to 2030, reaching 10.5 million tons in 2030. Under the high growth forecast, breakbulk/neobulk cargoes grow by an average annual rate of 2.2 percent from 2010 to 2030, reaching 12.7 million tons 2030.

A key difference between the 2009 study and the current one is that log exports grew rapidly over the past year and are expected to remain strong through the mid-term (approximately five years).

Grain and Related Products

Pacific Northwest grain and oilseed exports have shown impressive growth over the past decade, growing from approximately 20 million metric tons in 2000 to 34 million metric tons in 2010. Wheat, corn and soybeans are the most important commodities, but other products such as soybean meal and dried distiller's grains (DDGS) have become increasingly important.

BST Associates forecasts that Pacific Northwest grain and oilseed exports will increase from 34.1 million metric tons in 2010 to 39.1 million tons (moderate growth scenario) and 53.3 million metric tons in 2030 (high growth scenario).

Dry Bulk Cargoes

The 2009 forecast projected relatively modest gains in bulk traffic, with volumes expected to reach 31.8 million tons in 2030, or at an average annual growth rate of approximately 1.0 percent between 2010 and 2030. However, the dry bulk forecast was based upon the existing commodity base and did not anticipate the strong interest in additional export cargo opportunities.

Under the revised moderate growth forecast, dry bulk cargoes are expected to reach 97.1 million tons in 2030 (average annual growth of 6.8 percent per year between 2010 and 2030). Under the revised high growth forecast, dry bulk cargoes could reach 155.3 million tons in 2030 (average annual growth of 9.3 percent per year between 2010 and 2030). Growth is driven by increasing mineral and ore exports, among other commodities.

Liquid Bulks

The liquid bulk trades in the Pacific Northwest, which is dominated by crude oil, is expected to gradually change as regional refineries shift their source from Alaska to other domestic and foreign suppliers. The 2009 forecast projected modest growth for liquid bulk traffic, expecting volumes to reach 48.4 million tons in 2030 (0.8 percent annual growth).

Under the revised moderate growth forecast, liquid bulk cargoes are expected to reach 42.4 million tons in 2030 (0.2 percent per year), reflecting the changed sourcing patterns. Under the high growth forecast, liquid bulks are expected to reach 51.6 million tons in 2030 (1.2 percent per year). The high growth forecast incorporates new LNG imports/exports.

Sub-Region Forecasts

Lower Columbia Oregon and Oregon Coast

The Lower Columbia Oregon and Oregon Coast sub-region is projected to reach 44.6 million tons in 2030 under the moderate growth forecast (2.6 percent annual growth from 2010 to 2030) and 70.5 million tons in 2030 under the high growth forecast (5.0 percent annual growth).

Rail traffic is projected to reach 26.3 million tons in 2030 under the moderate growth forecast, and 47.5 million tons in 2030 under the high growth forecast.

Lower Columbia Washington

The Lower Columbia Washington sub-region is projected to reach 49.4 million tons in 2030 under the moderate growth forecast (4.3 percent annual growth) and 82.5 million tons in 2030 under the high growth forecast (7.0 percent annual growth).

Rail traffic is projected to reach 43.0 million tons in 2030 under the moderate growth forecast, and 74.9 million tons in 2030 under the high growth forecast.

Puget Sound and Washington Coast

The Puget Sound and Washington Coast sub-region is projected to reach 141.0 million tons in 2030 under the moderate growth forecast (2.6 percent annual growth) and 192.3 million tons in 2030 under the high growth forecast (4.2 percent annual growth).

Rail traffic is projected to reach 84.8 million tons in 2030 under the moderate growth forecast, and 131.6 million tons in 2030 under the high growth forecast.

Rail Capacity Assessment

This section summarizes the rail capacity analysis. As noted above, rail volumes fell markedly during the recent recession, but they recovered strongly in 2010, reaching pre-recession levels. Coupled with this rapid pace of recovery, there are significant opportunities for growth in rail traffic, particularly in bulk train exports of minerals, ores and grain.

The rail forecasts include a projection of the number of trains under moderate and high growth scenarios, under both average and peak operating conditions. The rail forecasts are driven by the marine cargo forecast, but also include domestic freight traffic and passenger train volumes. Domestic traffic and passenger traffic was based on studies prepared for WSDOT and ODOT as well as on discussions with rail service providers.

The analysis assumes that existing trains absorb most of the growth in rail traffic before new trains are added. However, operational requirements sometimes necessitate new train starts, and this is included in the forecast. The capacity of the various main line segments was estimated based upon discussions with rail service providers, recent studies and consultant judgment.

Table 1-1 summarizes study results. Under the moderate growth scenario, the only segments that experience sustained capacity constraints are the Vancouver to Pasco and the Everett to Blaine lines. Under the high growth scenario, the constraints on the Vancouver to Pasco and the Everett to Blaine segments occur earlier. In addition, constraints are expected in the Pasco to Spokane, Vancouver to Kalama/Longview, and King Street Station to Everett lines. These results assume that a series of physical improvements are completed, and that certain operational protocols are changed.

Table 1-1: Anticipated Year of Capacity Constraint, by Line Segment

Line Segment	Moderate Growth Scenario		High Growth Scenario	
	Avg. Day	Peak Day	Avg. Day	Peak Day
Pasco, WA to Vancouver, WA (BNSF)				
Pasco, WA to Wishram, WA	2030	2025	2025	2020
Wishram, WA to Vancouver, WA	---	2030	2025	2024
Hinkle, OR to Portland, OR (UP)	---	---	---	---
Pasco, WA to Spokane, WA (BNSF)	---	---	2030	2025
Spokane, WA to Sand Point, ID (BNSF)	---	---	---	---
Hinkle, OR to Eastgate, ID (UP)	---	---	---	---
Vancouver, WA to Tacoma, WA (Joint Line)				
Vancouver, WA to Kalama/Longview, WA	---	---	---	2030
Kalama/Longview, WA to Tacoma, WA	---	---	---	---
Tacoma, WA to Seattle, WA (Joint line)				
Tacoma, WA to Auburn, WA	---	---	---	---
Auburn, WA to Seattle, WA	---	---	---	---
Seattle, WA to Everett, WA (BNSF)	---	---	2023	2020
Everett, WA to Vancouver, BC (BNSF)	---	2030	2025	2020
Everett, WA to Spokane, WA via Stevens Pass (BNSF)	---	---	---	---
Auburn, WA to Pasco, WA via Stampede Pass (BNSF)	---	---	---	---

Source: MainLine Management

In order for rail capacity to meet the of projected freight volumes, the authors of this report recommend a series rail system improvements. These projects generally fall into two categories, mainline improvements and port access improvements. However, the projects labeled as port access improvements also provide benefits to the mainline system. Reducing the amount of time that it takes for trains to move between the port terminals and the mainline reduces delays on the mainline system, and thereby increases mainline capacity.

The recommended mainline projects include:

- **Peninsula Junction to North Portland Junction, Portland**. (Funding is in place to complete preliminary engineering and the NEPA analysis, but not construction.)
- **Vancouver, WA Freight Rail Bypass**. (Construction is under way, and is anticipated to be complete in 2013.)
- **Point Defiance Bypass, Tacoma to Nisqually**. (Construction of Phase 1 is under way; Phase 2 is anticipated to be complete 2016.)
- **Blakeslee Junction Improvements, Centralia. (**Phase 1A & 1B are partially funded, and the funds have all been moved to a future biennium. Phases 2-5 are not funded.)

- **Third main line Kalama to Kelso –WSDOT Passenger Plan Option 3.** (North portion is funded, engineering is under way).
- **Vancouver to Kelso - WSDOT Passenger Plan Option 4**. (funding is in place for several of these projects, engineering is under way)

The recommended port access projects include:

- **Port of Vancouver, WA Freight Access Project**. (First phases are finished, entire project is scheduled to be complete in 2017)
- **Unit Train Staging/Storage Yard near Woodland**. (No action currently under way.)
- **Cowlitz River Bridge – Longview**. (Partial funding is in place to begin preliminary engineering and the NEPA analysis, with remaining funding expected in January 2010. Construction not funded.)
- **Bullfrog Junction Realignment, Tacoma.** (Preliminary planning is complete, project proponents are seeking funding.)

Growth in the volume of export bulk trains is expected to increase the demands on existing rail capacity in the region, and even moderate growth will require BNSF and UP to assess the capacity requirements necessary to meet the growing demand. Both railroads have the ability to increase capacity through a combination of physical and operational improvements, and should be able to meet growing demand well into the future.

Chapter 2
Marine Cargo Forecasts

This section provides summary of the marine cargo forecast. These summaries are presented by commodity group and by sub-region in the Pacific Northwest. The marine cargo forecasts are unconstrained, which assumes that the necessary marine terminals and rail capacity will be in place to meet market demand.

The method for updating the 2009 forecast involved several steps. First, current cargo volumes were updated by commodity and region using the most recent data (2010 for commodities moving on international routes and 2009 for commodities moving on domestic routes). Volumes for 2011 were estimated based upon data from individual ports, the Pacific Maritime Association, U.S. Department of Agriculture, and other industry and government sources.

Commodity handling groups were defined to include:

- Containers,
- Neobulk/breakbulk cargoes – breakbulk, autos and logs,
- Grain and related products – wheat, barley, corn, soybeans, soy meal, beet pulp pellets and like products,
- Dry bulk cargoes – minerals, ores, chemicals, fertilizers, wood chips, manufactured products and like products,
- Liquid bulk cargoes – crude oil, petroleum products, chemicals and like products.

The forecasts include all public and private terminals, which were divided into the following sub-regions:

- Lower Columbia River Oregon and Oregon Coast,
- Lower Columbia River Washington,
- Puget Sound and Washington Coast.

Second, the forecasts provided in the 2009 Marine Cargo Forecast were updated based upon adjusted trends and forecast growth rates. In addition, a key effort in this update was to consider the potential market opportunities that are being evaluated by individual ports. This process included a discussion with participating ports and the Class I railroads and literature review of industry resources.

Potential new market opportunities included: ores, minerals, grain, containers and liquid bulks.

For each commodity group two growth scenarios were projected. The high-growth forecast included all of the market opportunities currently under consideration. The moderate growth forecast included a portion of the market opportunities (approximately one half).

Third, the inland mode of transportation was estimated for each growth scenario, commodity, and sub-region.

The results of the forecast are presented below.

Containers

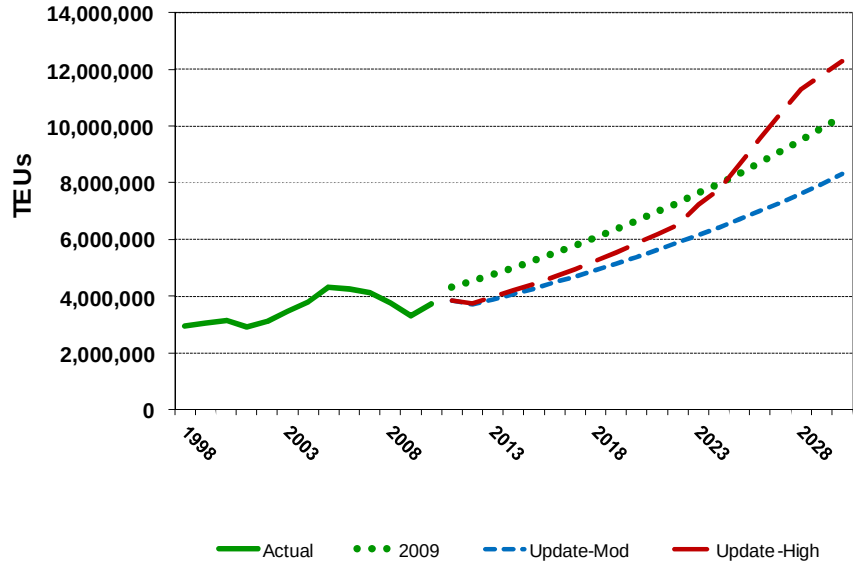
The revised Pacific Northwest container forecast is presented in Figure 2-1. The moderate-growth forecast is lower than the forecast presented in 2009 due to revised expectations about near-term growth and intensified competition from ports in Canada and on all-water routes (after completion of the Panama Canal improvements).

In the 2009 marine cargo forecast, containers were projected to reach 10.4 million TEUs in 2030, with average annual growth rate of 5.2 percent between 2010 and 2030. The revised forecast projects that container volumes will increase by:

- 4.1 percent under the moderate growth forecast, reaching 8.3 million TEUs, and,
- 6.1 percent under the high growth forecast, reaching 12.3 million TEUs,

Under the high growth forecast, container volumes are expected to increase at a slower rate than anticipated in the 2009 marine cargo forecast through 2020. However, the volumes expected for Puget Sound and Lower Columbia Oregon ports are comparable to the volumes expected in the prior forecast in 2030 (approximately 10 million TEUs). In the high growth scenario, container traffic is assumed to commence in Coos Bay in 2023 and increase to 2030.

Figure 2-1: Pacific Northwest Container Cargo Trends and Forecast



Source: Individual ports, BST Associates

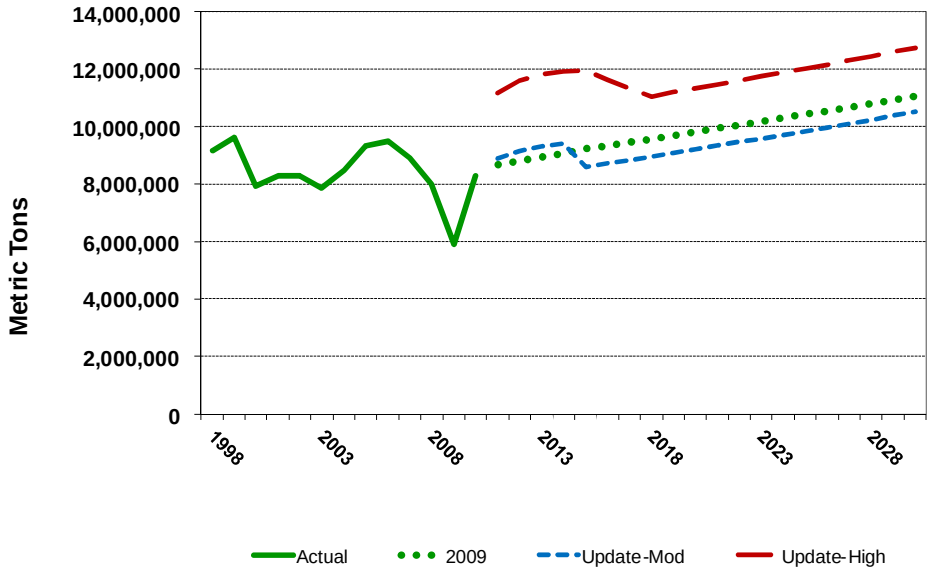
Break and Neobulk Cargoes

The revised forecast for Pacific Northwest breakbulk and neobulk cargoes is presented in Figure 2-2. In the 2009 marine cargo forecast, these commodities were projected to increase by an average annual 1.5 percent, reaching 11.1 million tons in 2030.

Under the moderate-growth scenario, the forecast is slightly higher in the near-term than in the 2009 forecast, mainly due to increased log exports, which are expected to be relatively robust and then decline as the domestic housing industry begins to recover. Under the moderate growth forecast, breakbulk/neobulk cargoes are expected to grow by an average annual rate of 1.2 percent from 2010 to 2030, reaching 10.5 million tons in 2030.

Under the high growth forecast, breakbulk and neobulk volumes are expected to remain at higher levels. Log exports are projected to continue at a more rapid rate through approximately 2018 and then level out. Under the high growth forecast, breakbulk/neobulk cargoes grow by an average annual rate of 2.2 percent from 2010 to 2030, reaching 12.7 million tons 2030.

Figure 2-2: Pacific Northwest Breakbulk and Neobulk Cargo Trends and Forecast



Source: BST Associates

Grain and Related Products

Pacific Northwest grain and oilseed exports have shown impressive growth over the past decade, increasing from approximately 20.1 million metric tons in 2000 to 34.1 million metric tons in 2010, or at an average annual growth rate of 5.4 percent per year.

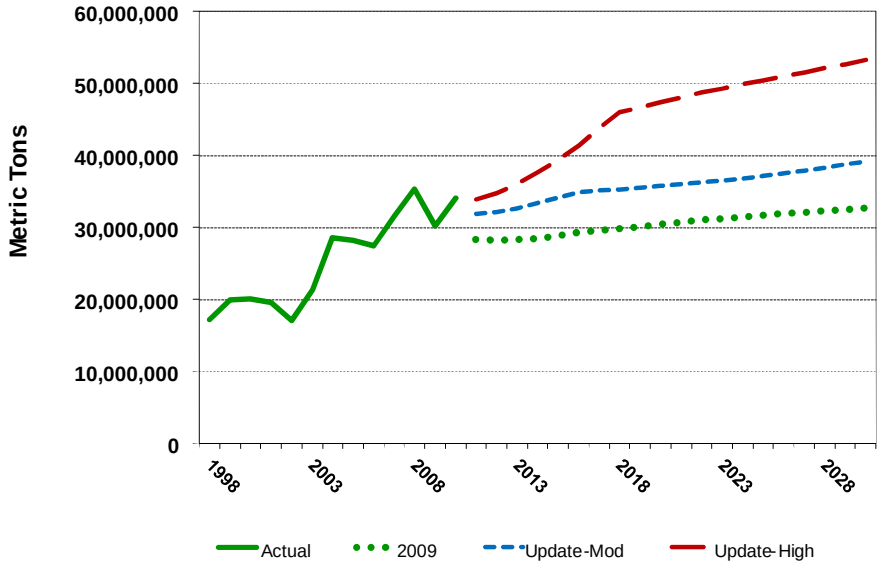
The 2009 forecast projected relatively modest gains in grain traffic, with volumes expected to reach 32.7 million tons in 2030. However, the forecast was based upon the reduced volumes in 2009 and did not anticipate the rapid increase in export volumes that occurred in 2010 (an increase of 4 million tons).

The revised Pacific Northwest forecast for grain and related products is presented in Figure 2-3. The new EGT elevator in Longview and expansion projects planned or under way in Portland, Vancouver, and Kalama will provide most of the capacity needed to absorb the forecast growth. The elevators in Seattle and Tacoma are operating at or near capacity and do not have expansion plans. Increased capacity is also being added at the AGP facility at the Port of Grays Harbor, and the proposed bulk port at Cherry Point north of Bellingham may include a grain facility.

Under the revised forecast, grain and related products are expected to reach:

- 39.1 million tons in 2030 under the moderate growth forecast, with average annual growth of 0.7 percent per year between 2010 and 2030,
- 53.3 million tons in 2030 under the high growth forecast, with average annual growth of 2.2 percent per year between 2010 and 2030.

Figure 2-3: Pacific Northwest Grain & Oilseed Trend and Forecast



Source: BST Associates, US Department of Commerce and WISERTrade data

Dry Bulk Cargoes

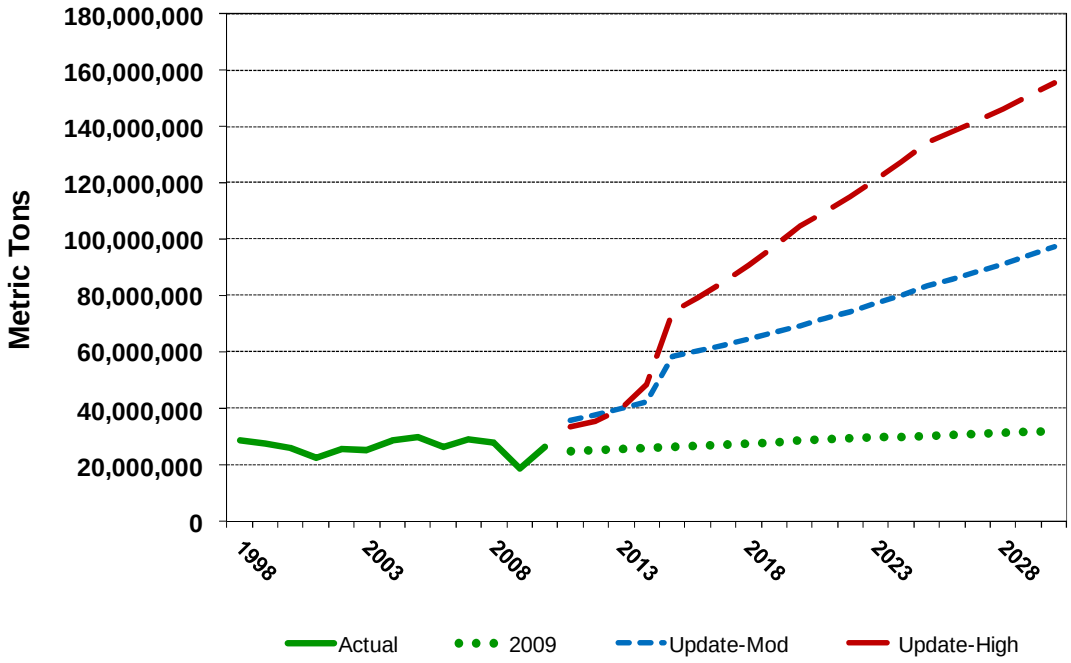
Dry bulk cargoes include a wide variety of products, such as woodchips, petroleum coke, potash, soda ash, gypsum, limestone, metal ores, and others. In addition, there is strong interest in coal, potash and ore exports. The revised Pacific Northwest forecast for dry bulk cargoes is presented in Figure 2-4.

The 2009 forecast projected 1.0 percent annual growth in bulk traffic, with volumes expected to reach 31.8 million tons in 2030. That forecast did not anticipate the rapid increase in dry bulk exports that actually occurred, where volumes jumped from 18.8 million tons in 2009 to 26.2 million tons in 2010.

Under the revised forecast, dry bulk cargoes are expected to reach:

- 97.1 million tons in 2030 under the moderate growth forecast, with average annual growth of 6.8 percent per year between 2010 and 2030,
- 155.3 million tons in 2030 under the high growth forecast, with average annual growth of 9.3 percent per year between 2010 and 2030.

Figure 2-4: Pacific Northwest Dry Bulk Cargo Trends and Forecast



Source: BST Associates

The expected growth in dry bulks is due to exports of potash, ores, coal and other commodities. Although there is uncertainty regarding volumes and export locations, the underlying basis of the export opportunity is sound for several reasons:

- there is strong international demand for these commodities,
- the regional transportation system is in place to move these commodities,
- the U.S. and Canada have substantial supplies of key commodities, and
- U.S. and Canadian exports can be delivered via Pacific Northwest ports at prices below the required delivered price.

Liquid Bulks

The liquid bulk trades in the Pacific Northwest are dominated by petroleum, including crude oil and refined petroleum products. Other important commodities include chemicals, fertilizers and other products.

The revised forecast for Pacific Northwest liquid bulk cargoes is presented in Figure 2-5. Under the revised forecast, liquid bulk cargoes are expected to reach:

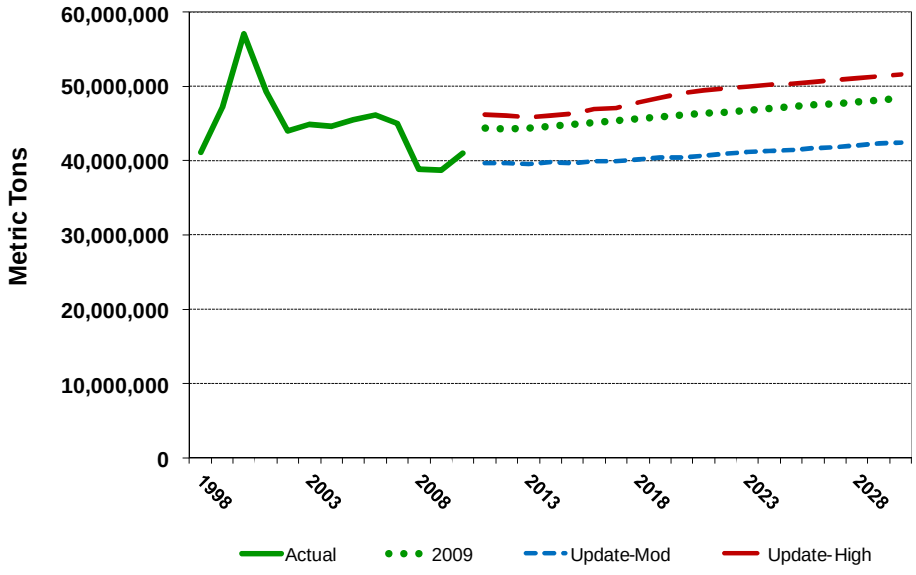
- 42.4 million tons in 2030 under the moderate growth forecast, with average annual growth of 0.2 percent per year between 2010 and 2030,
- 51.6 million tons in 2030 under the high growth forecast, with average annual growth of 1.2 percent per year between 2010 and 2030.

The 2009 forecast projected that liquid bulk traffic would reach 48.4 million tons in 2030, with average annual growth of approximately 0.8 percent between 2010 and 2030.

One significant change that is expected to impact liquid bulks is a shift in the source of crude oil for regional refineries. Under both the 2009 forecast and the current forecast the volume of crude oil from Alaska is expected to decline. The 2009 forecast assumed that the decline in domestic waterborne volumes from Alaska would be made up through a combination of waterborne foreign receipts and imports by pipeline. Under the current forecast the refineries in the region are also expected to begin receiving crude oil by rail from North Dakota, which may impact waterborne volumes. Under the moderate growth scenario, liquid bulk projections are lower to account for this shift.

New opportunities for liquid bulk cargo are also under consideration; most notably LNG imports (or perhaps exports) are being considered in Coos Bay and Astoria. The high growth scenario reflects these opportunities.

Figure 2-5: Pacific Northwest Liquid Bulk Forecast



Source: BST Associates

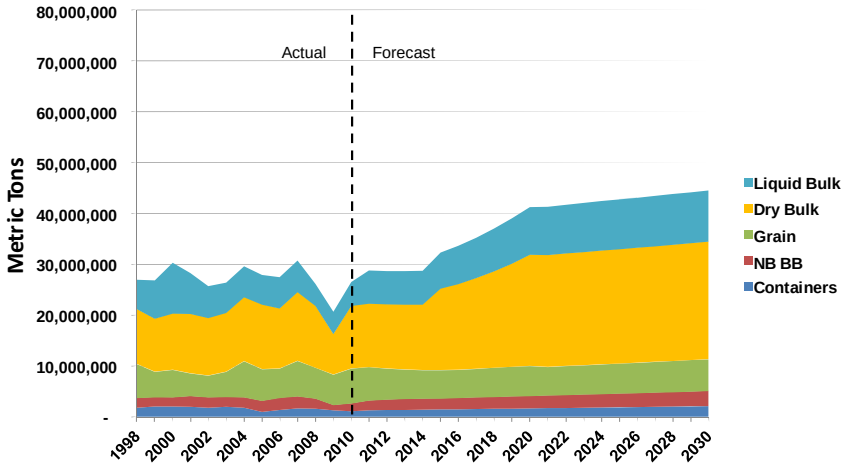
Regional Forecasts by Commodity

This section summarizes expected growth for each sub-region and commodity group.

Lower Columbia Oregon and Oregon Coast

Under the moderate growth forecast, the volume for the Lower Columbia Oregon region is projected to reach 44.6 million tons in 2030, with an average annual growth rate of 2.6 percent between 2010 and 2030. See Figure 2-6.

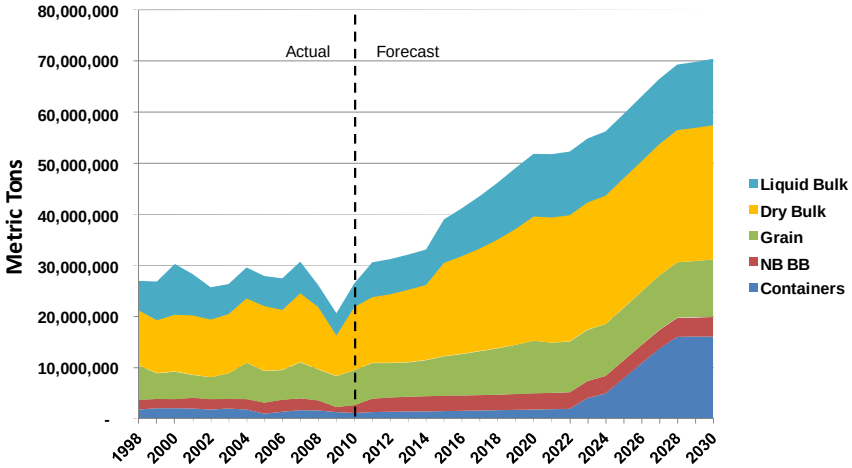
Figure 2-6: Lower Columbia Oregon and Oregon Coast Forecast
Moderate Growth Scenario



Source: BST Associates

Under the high growth forecast, the volume for the Lower Columbia Oregon region is projected to reach 70.5 million tons in 2030, with an average annual growth rate of 5.0 percent between 2010 and 2030. See Figure 2-7.

Figure 2-7: Lower Columbia Oregon and Oregon Coast Forecast
High Growth Scenario

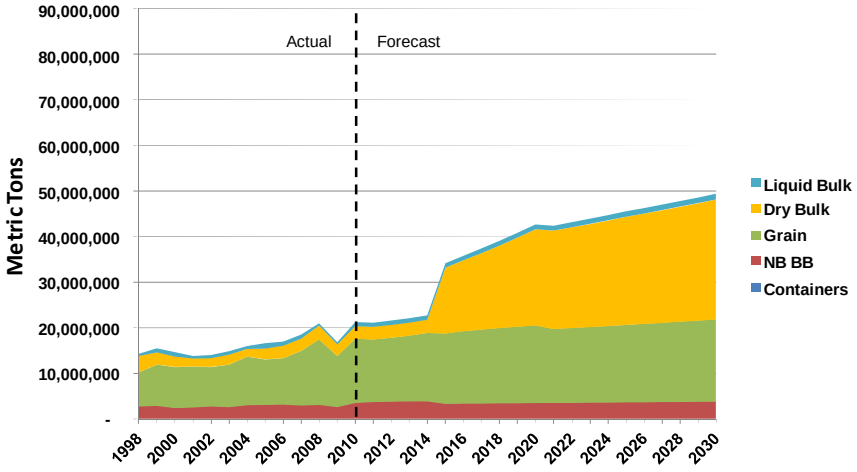


Source: BST Associates

Lower Columbia Washington

Under the moderate growth forecast, the volume for the Lower Columbia Washington region is projected to reach 49.4 million tons in 2030, with an average annual growth rate of 4.3 percent between 2010 and 2030. See Figure 2-8.

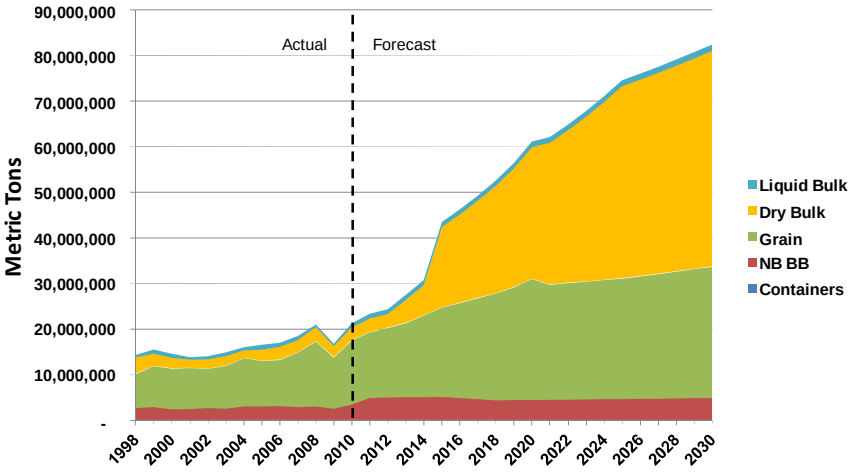
Figure 2-8: Lower Columbia Washington Forecast
Moderate Growth Scenario



Source: BST Associates

Under the high growth forecast, the volume for the Lower Columbia Washington region is projected to reach 82.5 million tons in 2030, with an average annual growth rate of 7.0 percent between 2010 and 2030. See Figure 2-9.

Figure 2-9: Lower Columbia Washington Forecast
High Growth Scenario

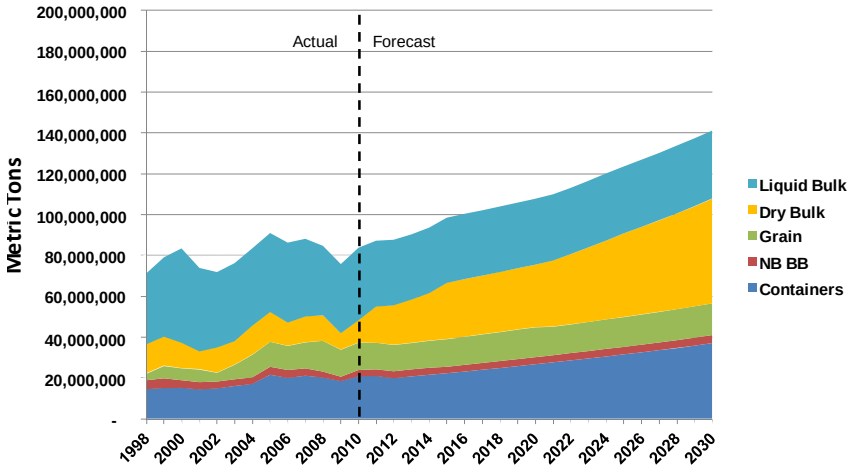


Source: BST Associates

Puget Sound and Washington Coast

Under the moderate growth forecast, the volume for the Puget Sound and Washington Coast region is projected to reach 141.0 million tons in 2030, with an average annual growth rate of 2.6 percent between 2010 and 2030. See Figure 2-10.

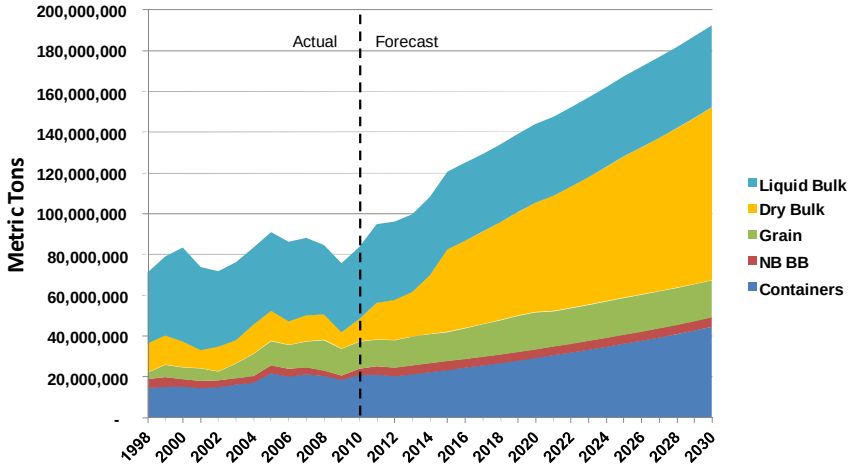
Figure 2-10: Puget Sound and Washington Coast Forecast
Moderate Growth Scenario



Source: BST Associates

Under the high growth forecast, the volume for the Puget Sound and Washington Coast region is projected to reach 192.3 million tons in 2030, with an average annual growth rate of 4.2 percent between 2010 and 2030. See Figure 2-11.

Figure 2-11: Puget Sound and Washington Coast Forecast
High Growth Scenario



Source: BST Associates

Rail Forecasts by Region

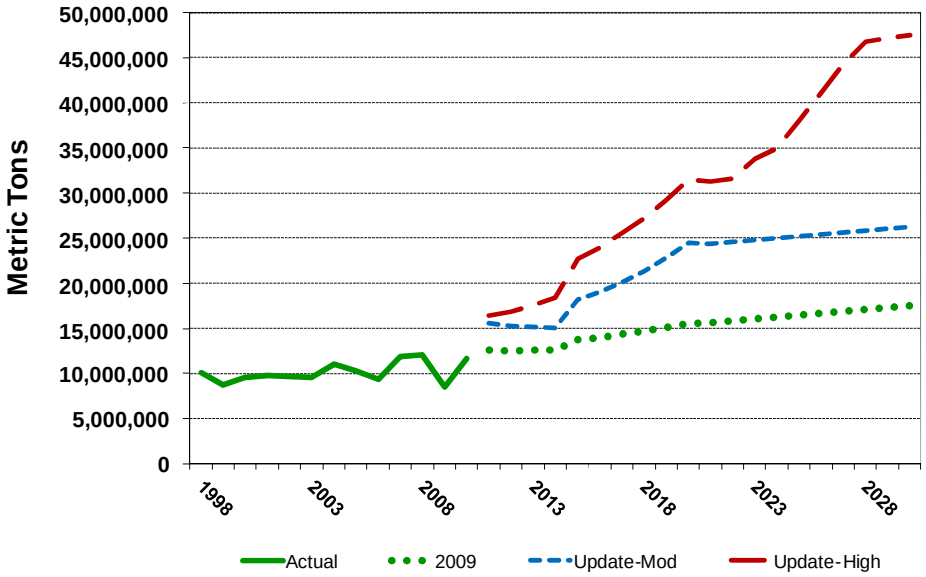
This section summarizes expected growth in rail traffic by sub-region.

Lower Columbia Oregon and Oregon Coast

Rail traffic in the Lower Columbia Oregon and Oregon Coast sub-region is projected to grow as follows:

- A rail traffic projection for Oregon ports was not undertaken in 2009. However, using a similar process as that undertaken for Washington state ports, marine-related rail volumes would have been expected to increase from 11.7 million tons in 2010 to 17.5 million tons in 2030, or at an average annual growth rate of 2.0 percent.
- Under the current moderate growth forecast, marine-related rail traffic in this region is projected to reach 26.3 million tons in 2030, with an average annual growth rate of 4.1 between from 2010 and 2030.
- Under the high growth forecast, marine-related rail traffic in this region is projected to reach 47.5 million tons in 2030, with an average annual growth rate of 7.3 percent between 2010 and 2030. (See Figure 2-12)

Figure 2-12: Lower Columbia Oregon and Oregon Coast Rail Traffic Forecast



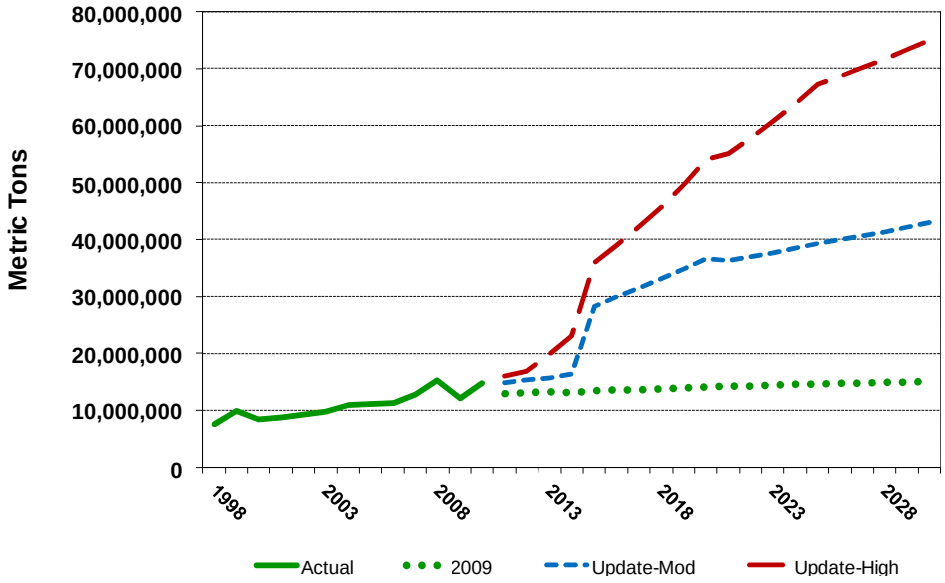
Source: BST Associates

Lower Columbia Washington

Rail traffic in the Lower Columbia Washington sub-region is projected to grow as follows:

- In the 2009 Marine Cargo Forecast, rail volumes were expected to increase modestly from 14.8 million tons in 2010 to 15.1 million tons in 2030, or at an average annual growth rate of less than 0.2 percent.
- Under the moderate growth forecast, marine-related rail traffic in this region is projected to reach 43.0 million tons in 2030, with an average annual growth rate of 5.5 percent between 2010 and 2030.
- Under the high growth forecast, marine-related rail traffic in this region is projected to reach 74.9 million tons in 2030, with an average annual growth rate of 8.4 percent between 2010 and 2030. (See Figure 2-13)

Figure 2-13: Lower Columbia Washington Rail Traffic Forecast



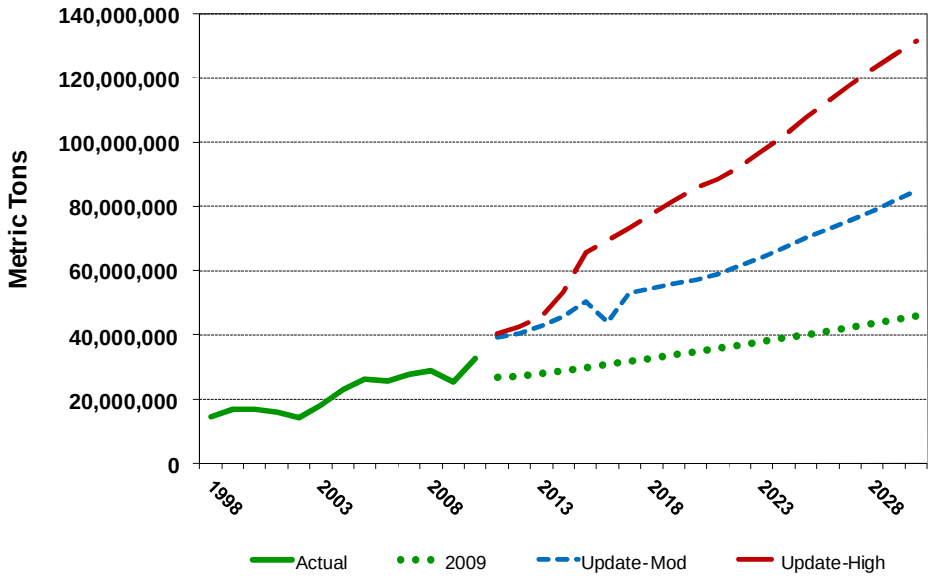
Source: BST Associates

Puget Sound and Washington Coast

Rail traffic in the Puget Sound and Washington Coast sub-region is projected to grow as follows:

- In the 2009 Marine Cargo Forecast, rail volumes were expected to increase from 32.6 million tons in 2010 to 45.9 million tons in 2030, or at an average annual growth rate of 1.7 percent.
- Under the moderate growth forecast, marine-related rail traffic in this region is projected to reach 84.8 million tons in 2030, with an average annual growth rate of 4.9 percent between 2010 and 2030.
- Under the high growth forecast, marine-related rail traffic in this region is projected to reach 131.6 million tons in 2030, with an average annual growth rate of 7.2 percent between 2010 and 2030. (See Figure 2-14)

Figure 2-14: Puget Sound and Washington Coast Rail Traffic Forecast



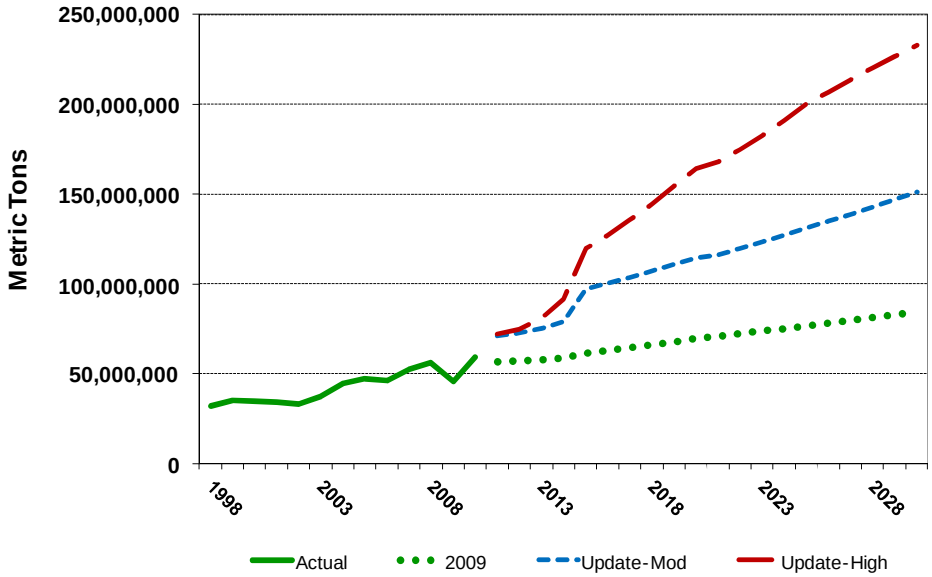
Source: BST Associates

Pacific Northwest Region

Rail traffic in the Pacific Northwest region is projected to grow as follows:

- In the 2009 Marine Cargo Forecast, rail volumes were expected to increase from 59.2 million tons in 2010 to 78.5 million tons in 2030, or at an average annual growth rate of 1.4 percent.
- Under the moderate growth forecast, marine-related rail traffic in this region is projected to reach 151.1 million tons in 2030, with an average annual growth rate of 4.8 percent between 2010 and 2030.
- Under the high growth forecast, marine-related rail traffic in this region is projected to reach 232.8 million tons in 2030, with an average annual growth rate of 7.1 percent between 2010 and 2030. (See Figure 2-15)

Figure 2-15: Pacific Northwest Rail Traffic Forecast



Source: BST Associates

Chapter 3
Assessment of Rail Capacity

The following chapter provides an assessment of rail capacity. A primary objective of the rail capacity update is to identify and prioritize capacity improvements that would help mitigate main line capacity conflicts as rail traffic grows. This chapter was prepared by MainLine Management (MLM).

Assumptions

Key assumptions about baseline conditions, train sizes and forecasts for domestic cargoes are summarized in the following section.

Baseline Conditions

Based on discussions with rail service providers, the rail traffic volumes in 2008 were considered representative of volumes occurring in 2010. More importantly, data was available for rail traffic operations for major rail line segments for 2008. As a result, 2008 was used as the baseline condition for 2010.

Train Sizes

Assumptions on train sizes are based upon discussions with rail providers, terminal operators and consultant experience:

- Unit grain sizes are expected to remain at approximately 110 cars.
- Unit coal trains are expected to remain at 115 to 120 cars.
- Export potash trains operate with 170 cars, approximately 8,500 feet in length.
- Container trains of 8,000 to 8,500 feet from the Puget Sound ports will continue to be operated as long as volumes are available and service requirements can be maintained. Otherwise, international container trains are sized to meet import demand and service requirements.
- Manifest trains will continue to operate at a maximum train size of approximately 7,000 feet.

Forecasts

The rail forecasts include a projection of the number of trains under moderate and high growth scenarios under both average and peak operating conditions.

The forecasts are driven by the marine cargo forecast, which is documented in Chapter Two. For other rail cargo (domestic traffic and passengers), the following assumptions were used:

- Forecasts for passenger trains were taken from studies prepared for WSDOT and ODOT.
- Merchandise trains are projected to grow at 2 percent annually.
- Domestic intermodal trains are projected to grow at 3.5 percent annually.

Figure 3-1: Map of Rail System

Absorption

Currently, many of the existing trains in the region do not run at their maximum potential length. It is assumed that traffic growth will usually be absorbed by existing trains before new trains are deployed. However, this assumption recognizes that service requirements sometimes necessitate new train starts even though existing trains are not running at maximum length.

Capacity by Mainline Segment

This section presents an assessment of the projected demand-capacity relationships at the key line segments over the study forecast period (through 2030). The line segments include:

- Pasco, WA to Vancouver, WA (BNSF)
- Hinkle OR to Portland, OR (UP)
- Pasco, WA to Spokane, WA (BNSF)
- Spokane, WA to Sand Point, ID (BNSF)
- Hinkle, OR to Eastgate, ID (UP)
- Vancouver, WA to Kalama/Longview, WA (Joint line)
- Kalama/Longview, WA to Tacoma, WA (Joint line)
- Tacoma, WA to Seattle, WA (Joint line)
- Seattle, WA to Everett, WA (BNSF)
- Everett, WA to Vancouver, BC (BNSF)
- Everett, WA to Spokane, WA via Stevens Pass (BNSF)
- Auburn, WA to Pasco, WA via Stampede Pass (BNSF)

In each of the following rail segment analyses, graphics are presented to illustrate the growth in rail traffic and growth in rail segment capacity. The increases in capacity indicated by the graphs reflect: 1) improvements that are currently planned or under way, and 2) other potential improvements that the consultants consider to be feasible. With the exception of projects that are contractually obligated under passenger rail plans, other improvements are up to the discretion of the individual railroads, and would likely be added only as needed to meet market demand.

Pasco, WA to Vancouver, WA (BNSF)

BNSF has undertaken several improvements along the section of mainline from Pasco to Vancouver. All meet/pass sidings between Pasco and Wishram (near the middle of the Columbia Gorge) are at least 8,000 feet in length. Between Wishram and Vancouver, six of 11 existing sidings are 8,000 feet in length or longer. BNSF has a priority plan to extend sidings that are not currently 8,000 feet in length, as demand requires.

Figures 3-2 and 3-3 illustrate the consultants' opinion of the capacity of this line segment as well as the projected train volumes under the moderate and high growth scenarios. The analysis implies that:

- Pasco to Wishram
  - Under the high growth scenario, capacity will be reached by 2020 (peak daily traffic) and 2025 (average daily traffic).
  - Under the moderate growth scenario, capacity will be reached by 2025 (peak daily traffic) and 2030 (average daily traffic).

- Wishram to Vancouver:
  - Under the high growth scenario, capacity will be reached by 2024 (peak daily traffic) and 2025 (average daily traffic).
  - Under the moderate growth scenario, capacity will be reached by 2030 (peak daily traffic).

However, the capacity on this route can be enhanced beyond previous study assumptions through a combination of siding extensions and revised operating protocols, as discussed below.

The Pasco to Vancouver route hosts Amtrak trains, and is subject to implementation of Positive Train Control (PTC), as mandated by Congress. Industry analysis of the implementation of PTC indicates that it may negatively impact capacity, especially on line segments in which "fleeting"[1] is used. This is because PTC requires a larger safety zone for following trains than is required under the existing Centralized Traffic Control (CTC).

BNSF is evaluating a plan that would change the traffic flows and volumes on this segment over time. Under this plan, full export bulk trains would move westbound through the Columbia River Gorge. Empty bulk trains from Portland and Vancouver would move eastbound through the Gorge, but empty export bulk trains from Kalama north (i.e., Longview, Grays Harbor, Tacoma, Seattle, etc.) would be routed to Auburn and then over Stampede Pass. Most of the other train types that currently use the Gorge would continue to do so.

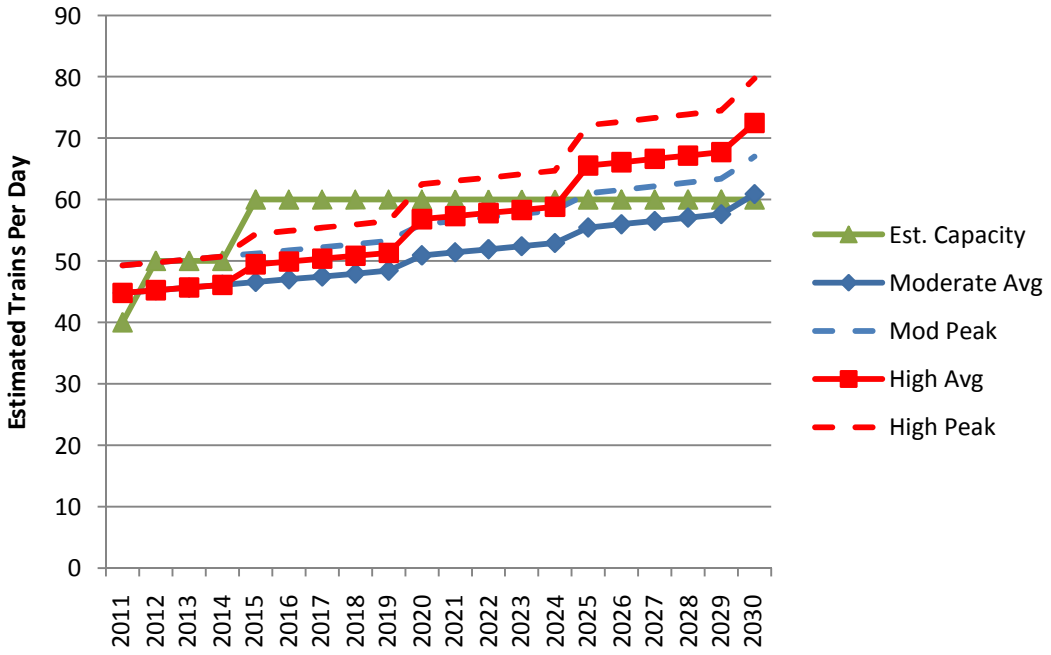
If implemented, this plan would create the opportunity for significant fleeting of westbound trains through the Columbia River Gorge.

One area of concern is the single track BNSF rail bridge over the Columbia River at Pasco. The estimated capacity in the segment analysis assumes that BNSF will be able to operate a sufficient number of trains over the bridge to meet the projected long-term demand. Congestion, however, could be expected to be a problem in near the end of the forecast period.

Two potential increases in capacity are illustrated in Figures 3-2 and 3-3. These include adoption of the new operating plan, connecting individual sidings into sections of double-track main line, and the addition of siding extensions.

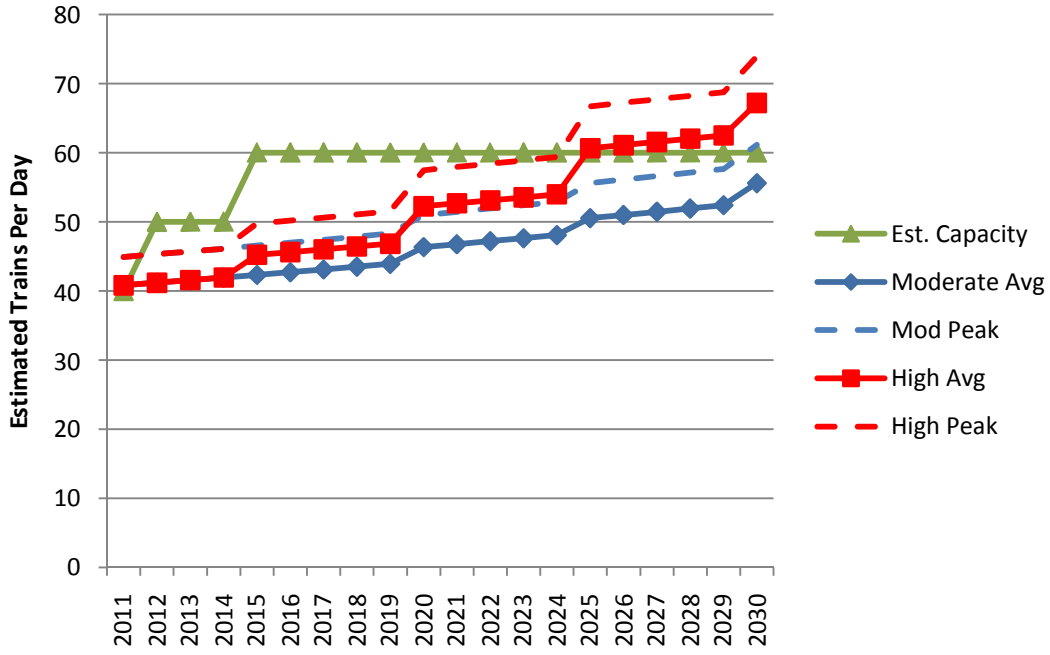
[1] "Fleeting" is a term used to describe train movements in which a series of trains are operated in one direction, and then in the other direction. This minimizes meet/pass requirements and can increase the practical capacity of a line segment.

Figure 3-2: Rail Corridor Capacity – Pasco to Wishram (BNSF)



Source: MainLine Management

Figure 3-3: Rail Corridor Capacity – Wishram to Vancouver BNSF



Source: MainLine Management

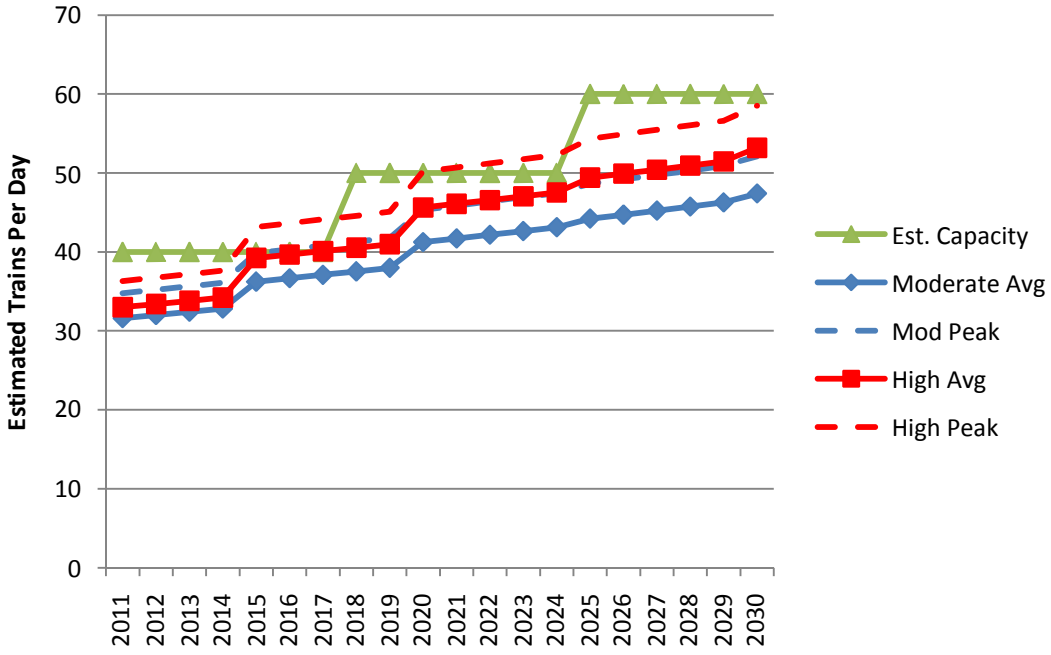
Hinkle, OR to Portland, OR (UP)

The UP main line runs along the Oregon side of the Columbia River between Hinkle and Portland, and is similar to the BNSF line on the Washington side of the Columbia River between Vancouver and Pasco.

Options for increasing capacity on this segment are similar to those for the BNSF. These include fleeting of trains, along with siding expansion where constructable.

As Figure 3-4 demonstrates, no capacity constraints are expected under either the moderate or high growth scenarios. The capacity improvements illustated in the graph are based on connecting individual sidings into sections of double-track main line, and the addition of siding extensions, and possible fleeting of trains.

Figure 3-4: Rail Corridor Capacity, Hinkle to Portland (UP)



Source: MainLine Management

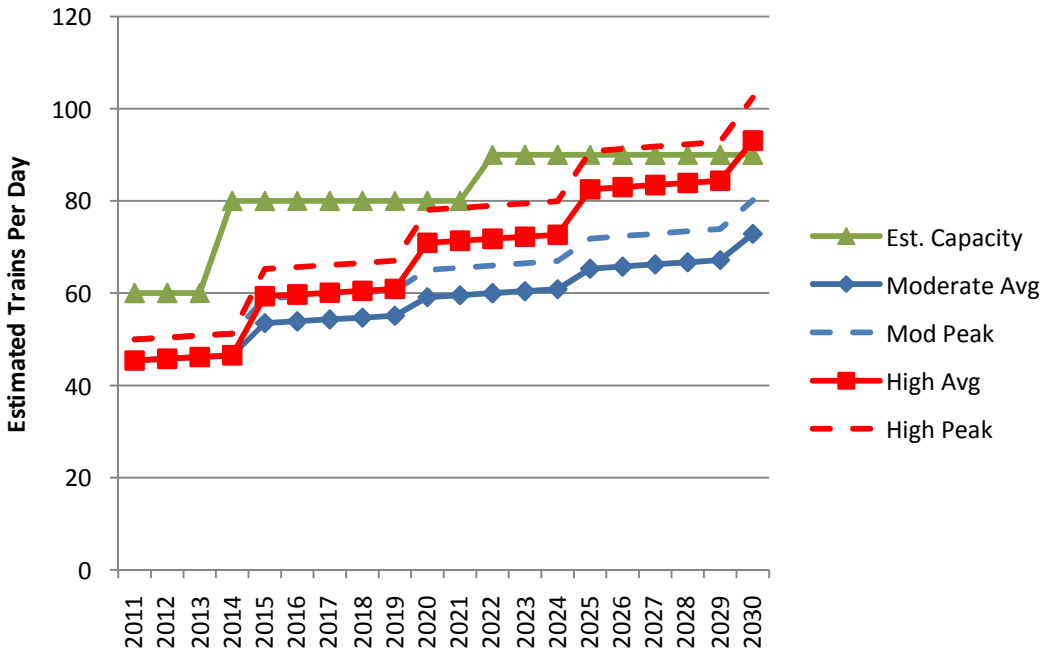
Pasco, WA to Spokane, WA (BNSF)

Between Pasco and Spokane all sidings are 8,000 feet in length or longer and capacity exists to operate several more trains in each direction on the segment. As a result of the projected growth in export traffic, BNSF is planning for capacity expansion on this segment. In the consultant's opinion, such an expansion would likely involve combining key sidings into long sections of double-track and adding high-speed crossovers to increase operational flexibility.

As shown in Figure 3-5, the analysis implies that the Pasco to Spokane segment will reach capacity by 2025 (peak) and 2030 (average) under the high growth scenario, but there are no capacity constraints under the moderate growth scenario.

Capacity increases illustrated in the graph result from connecting individual sidings into sections of double-track main line.

Figure 3-5: Rail Corridor Capacity – Pasco to Spokane (BNSF)



Source: MainLine Management

Spokane, WA to Sand Point, ID (BNSF)

There are two main line segments between Spokane, Washington and Sand Point, Idaho, one operated by the BNSF and one by the UP.

Most of the BNSF corridor features multiple main tracks, but there are short stretches of single track between Irvin and Otis Orchard, WA (3.1 miles), Rathdrum and Athol, ID (11.1 miles with a siding at Ramsey) and between Algoma and Cocolalla, ID (2 miles). It is likely that BNSF can increase the capacity of this segment to meet demand, primarily by double-tracking the remaining single track segments between Spokane and Sandpoint, although some of those sections present certain difficulties and enhanced costs.

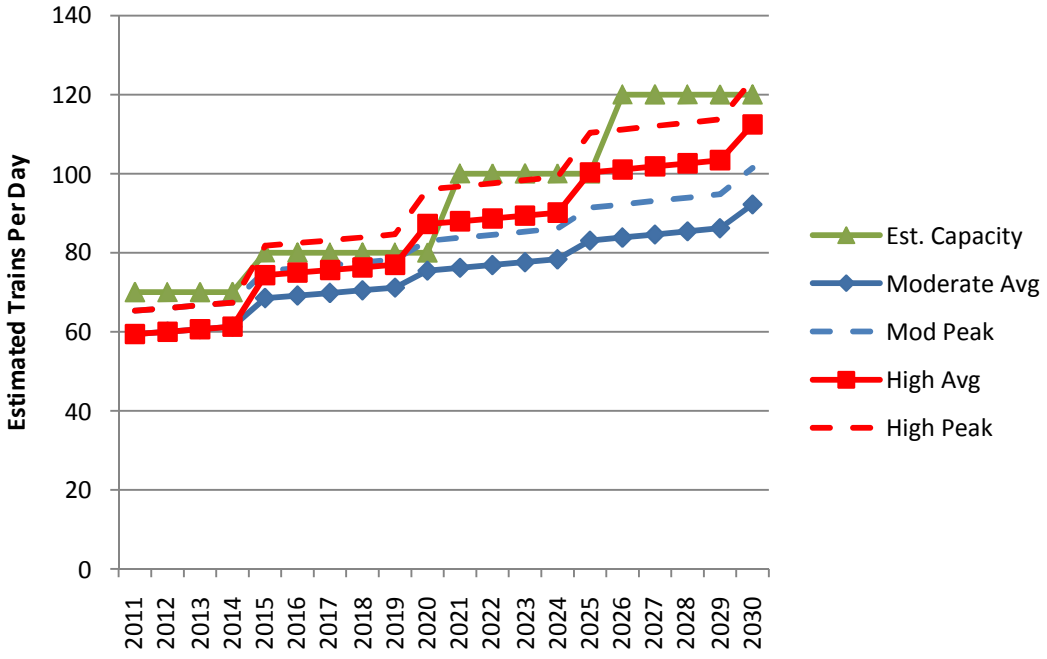
A capacity concern that may materialize over the long-term for BNSF is the single track bridge across Lake Pend Oreille. The train volumes indicated in the 2030 projections may require fleeting of traffic across the bridge. In addition, fleeting of trains may create the need for additional storage track on either side of the bridge to stage trains before crossing.

As shown in Figure 3-6, the analysis implies that the Sandpoint to Spokane segment has sufficient capacity under average conditions, but may be constrained under peak conditions. Under the moderate growth scenario, there are no sustained capacity constraints.

Capacity increases illustrated in the graph result from double-tracking three single-track segments, adding a third main line in key locations, and potentially adding staging tracks at either end of the Lake Pend Oreille Bridge.

The UP segment between Spokane and Sand Point is included in the next section of this chapter, Hinkle, OR to Eastgate, ID.

Figure 3-6: Rail Corridor Capacity – Spokane to Sand Point (BNSF)



Source: MainLine Management

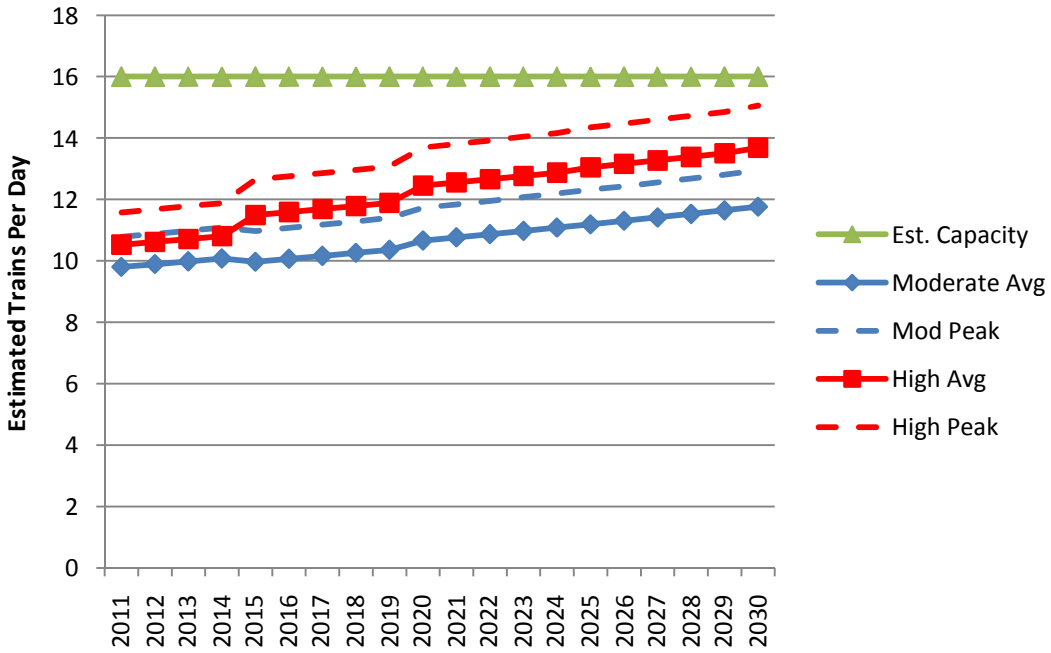
Hinkle, OR to Eastgate, ID (UP)

This segment of mainline is a key route for Canadian cargo exported through Pacific Northwest ports, such as potash, which originate on the Canadian Pacific Railway and are interchanged with the Union Pacific at Eastport, Idaho.

Much of this segment consists of a single track operation operated by Track Warrant Control, which is non-signalized. The distance between meet/pass sidings limits capacity, but current available capacity is sufficient to meet projected traffic volumes under both growth scenarios, as shown in Figure 3-7.

The UP may be able to increase capacity by constructing additional meet/pass sidings if warranted by growth in cargo traffic. However, these potential increases in capacity are not included in Figure 3-7.

Figure 3-7: Rail Corridor Capacity, Hinkle to Eastgate



Source: MainLine Management

Vancouver, WA to Tacoma, WA

Plans to increase volumes of intercity passenger rail have driven the infrastructure expansion proposals for this segment. The analysis of this segment is divided into two sections:

- Vancouver to Longview/Kelso, and
- Longview/Kelso to Tacoma.

The most significant capacity usage on this segment occurs in the Kalama/Longview area due to grain trains leaving/entering the main lines at Kalama and to yard operations at Longview Junction. In both cases, considerable main line capacity is consumed by trains slowly entering/departing the main lines to/from export grain facilities or while they are stopped to work in yard areas.

With the projected increase in loaded and empty bulk trains over this segment, it is possible that BNSF will consider fleeting loaded bulk export trains through the Gorge and running empty bulk trains eastbound over Stampede pass, as discussed above in the Vancouver to Pasco section. Empty and full export bulk trains on the UP system would continue to operate through the Gorge in both directions.

One potential capacity expansion project that may be revisited is the construction of a unit train staging/storage yard near Woodland. At one time this improvement was on the list of passenger-related improvements under consideration by WSDOT, but was cut when that plan was downsized. With the number of export bulk trains projected for this segment, an area for staging loaded bulk trains near Kalama may prove beneficial from a rail operating and service perspective.

Another potential project is to add a second single-track rail bridge to span the Cowlitz River or to replace the existing single-track Cowlitz River Bridge with a new double-track bridge. This bridge is located on the branch line that connects marine terminals at the Port of Longview as well as other industrial customers to the I-5 Corridor main line. The recent Port of Longview Master Plan demonstrated the need to for this project, and it was also identified in the SR432 Highway and Rail Improvement Project.

Passenger-related capacity improvements in the updated WSDOT *Amtrak Cascades Mid-Range Plan* focus on the Kalama/Longview area, and include adding a third main track that bypasses existing congestion points.

The following sections discuss the Vancouver to Tacoma segment in two parts, Vancouver WA to Kalama/Longview and Kalama/Longview to Tacoma.

Vancouver, WA to Kalama/Longview, WA (Joint Line)

Much of the congestion on this segment occurs at Vancouver, and between Vancouver and Kalama/Longview. At Vancouver, through traffic on intersecting main line routes compete for line capacity with operations at the Vancouver Yard, and with trains entering and leaving the Port of Vancouver. Additional passenger train operations are likely to aggravate these conflicts unless sufficient mitigation is constructed to improve efficiency for all train operations in the Vancouver Terminal area.

Between Vancouver and Longview numerous trains arrive and depart the main line to access marine terminals and other customers in the Kalama/Longview area. These trains arriving and departing the mainline move at slow speeds, aggravating congestion issues on this segment.

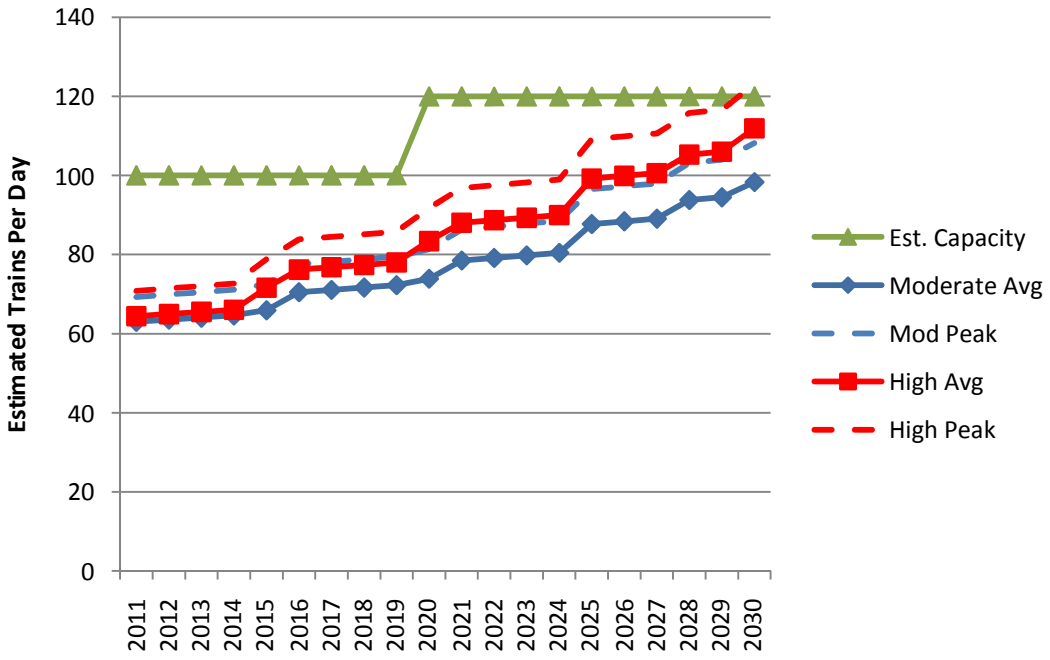
WSDOT's *Amtrak Cascades Mid Range Plan* (Options 3 and 4)[2] will continue to provide the rail capacity needed over time to ensure that intercity passenger growth can occur in conjunction with projected freight growth. The directional operation of loaded and empty bulk trains by BNSF, coupled with the planned passenger rail improvements, should reduce the impact of growing freight and passenger traffic.

In the consultants' opinion, the construction of a third main track through the Kalama/Longview area will be needed in the long-term, as well as construction of a bulk train staging and storage facility near Woodland.

As shown in Figure 3-8, the analysis implies that there is no capacity problem for the section of mainline from Vancouver to Longview under the moderate growth scenario. Under the high growth scenario, capacity is reached by 2030 during peak operations.

Capacity improvements reflected in this graph include completion of the Vancouver Bypass, the new Port of Vancouver Access Route, and the Option 3 passenger improvements (including construction of the third main track between Kalama and Kelso). Other improvements may include completion of third main track between Martin's Bluff and Rocky Point, and expansion of the Cowlitz River Bridge at Longview. In addition, construction of improvements at North Portland Junction will compliment these improvements, even though the junction is not located within this segment.

Figure 3-8: Rail Corridor Capacity – Vancouver (WA) to Kalama/Longview With Passenger Improvements



Source: MainLine Management

[2] For a full list of projects, please access the Amtrak *Cascades* Mid-Range Plan at http://www.wsdot.wa.gov/NR/rdonlyres/83B17378-CDC8-4D57-AA60-4CD64BAF6D94/0/AmtrakCascadesMidRangePlan.pdf

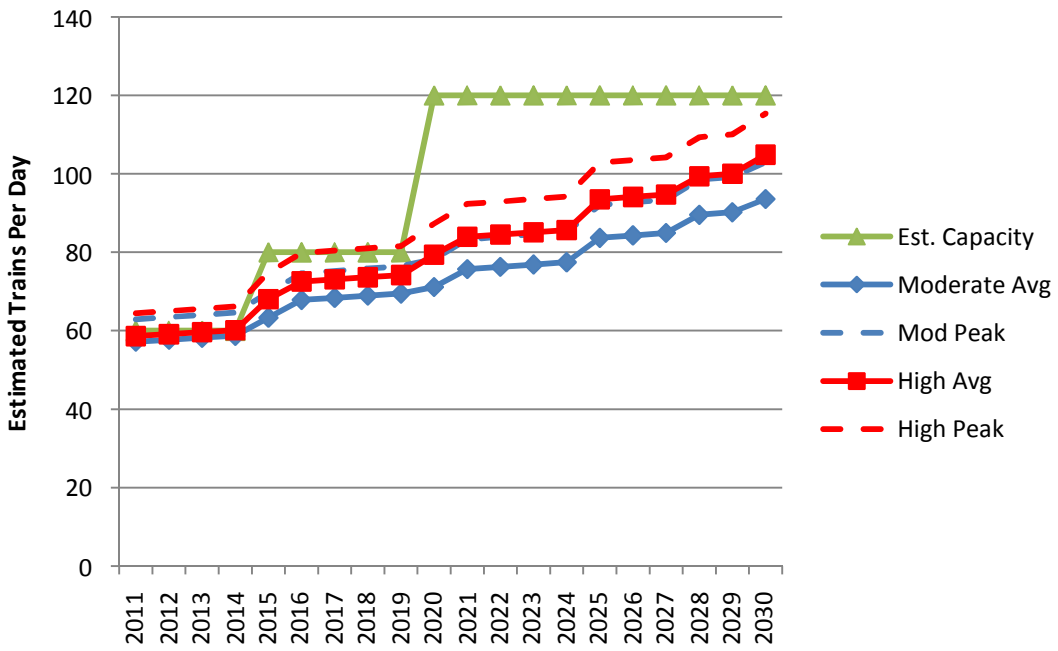
Kalama/Longview, WA to Tacoma, WA (Joint Line)

Two single track tunnels near Tacoma (Nelson-Bennett Tunnel and Ruston Tunnel) are the primary capacity constraints between Longview/Kalama and Tacoma. However, the Point Defiance Bypass, which is planned to be completed by 2017, will alleviate mainline capacity constraints by shifting passenger trains from the existing main line to an alternate route between Nisqually and Reservation Interlocking in Tacoma. In addition, planned CTC high-speed crossovers will provide additional flexibility for train operations across this segment.

Capacity improvements illustrated in Figure 3-9 include completion of the Point Defiance Bypass and the addition of high-speed crossovers. These two projects will allow the Longview/Kalama to Tacoma segment to operate at or below capacity over the 20-year forecast period under both the moderate and high growth scenarios.

In addition, the Blakeslee Junction rail project would allow faster access and egress between the mainline and the Puget Sound and Pacific Railroad branch at Centralia. This project was originally considered for WSDOT's Amtrak *Cascades* list of passenger-related capacity improvements. Completion of this project would also accommodate additional cargo opportunities at the Port of Grays Harbor.

Figure 3-9: Rail Corridor Capacity –Kalama/Longview to Tacoma With Point Defiance Bypass



Source: Mainline Management

Tacoma, WA to Seattle, WA (Joint Line)

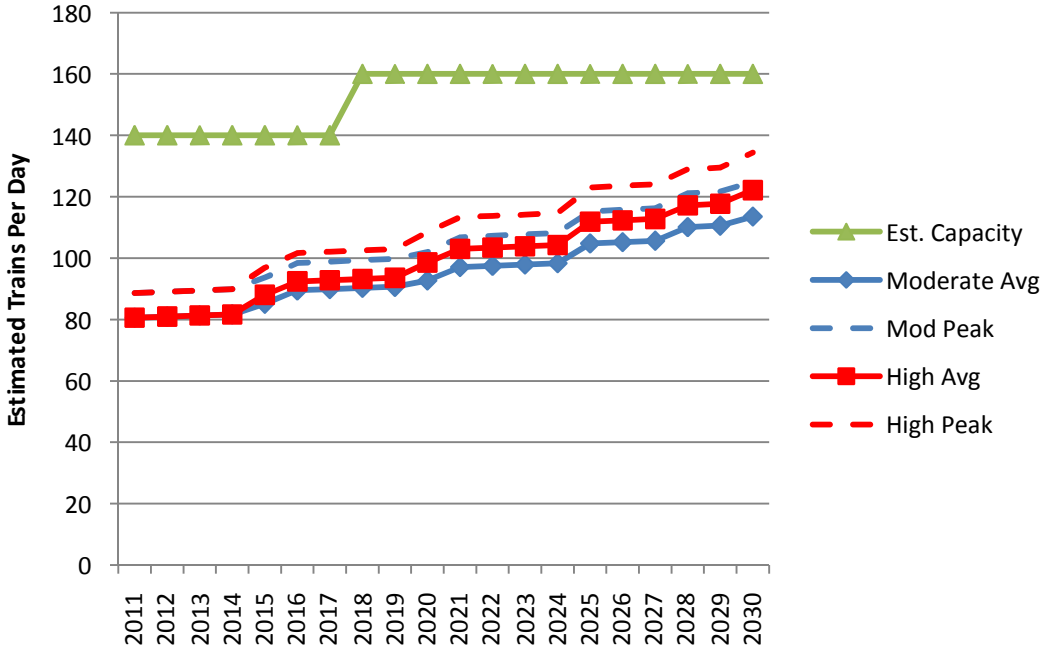
According to Sound Transit there are no conflicts between passenger and freight operations between Tacoma and Seattle, and the level of service provided by BNSF is very good. The Point Defiance Bypass project will further improve freight and traffic flows through Tacoma, and between Tacoma and Seattle.

Improvements at King Street Station in Seattle have improved the efficiency of freight and passenger operations in the Seattle area. BNSF is constructing a third main track approximately five miles long between Kent and Auburn. Approximately half of this track is on either side of the wye that accesses the Stampede Pass line. Presumably the purpose of this additional main line is to facilitate efficient freight operations between the existing main lines, Auburn Yard, and Stampede Pass. Given the potential to route empty bulk trains over Stampede pass, this additional track is needed to minimize the impact to current and projected commuter and intercity passenger trains.

The capacity of this segment was analyzed in two parts - Tacoma to Auburn and Auburn to King Street Station. The primary reason for splitting the analysis this way is that the traffic mix is likely to be different on each part if the BNSF routes empty bulk trains over Stampede Pass; the mix of loaded and empty bulk trains between Tacoma and Auburn would be slightly different than the mix north of Auburn.

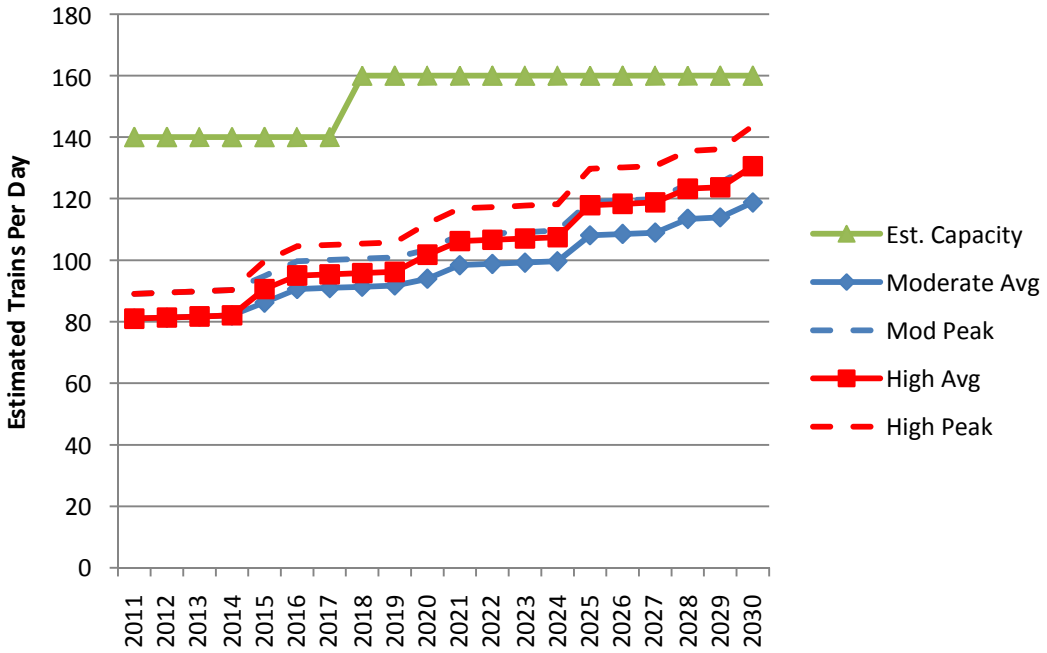
As shown in Figures 3-10 and 3-11, there are no capacity constraints under high-growth or moderate-growth scenarios.

Figure 3-10: Rail Corridor Capacity – Tacoma to Seattle
Joint Line Tacoma to Auburn



Source: MainLine Management

Figure 3-11: Rail Corridor Capacity – Tacoma to Seattle
Joint Line Auburn to Seattle



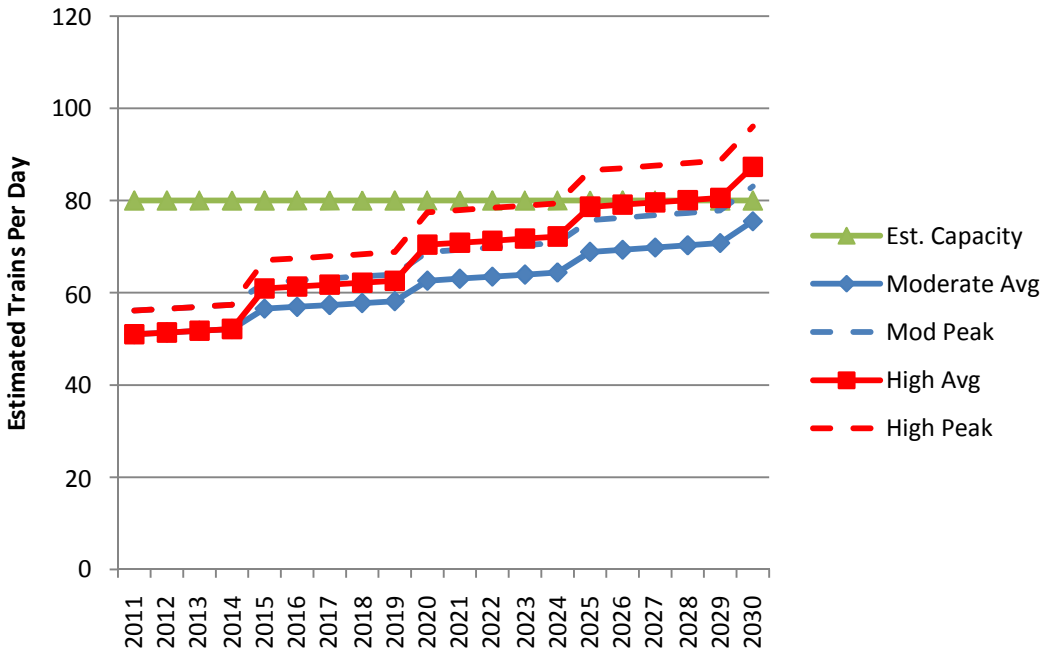
Source: MainLine Management

Seattle, WA to Everett, WA (BNSF)

Capacity expansion on this line segment is driven by passenger rail service requirements, with no freight-related improvements currently planned. Under the agreement between Sound Transit and BNSF for commuter train operations over this segment, Sound Transit purchased "slots", which guaranteed specific passenger volumes and service levels. Under this agreement BNSF must ensure that these passenger service requirements are met, regardless of freight demand.

As shown in Figure 3-12, however, growth in export bulk trains destined north of Everett could result in capacity constraints, starting between 2020 and 2023 under the high growth scenario. That may result in BNSF proactively constructing additional capacity improvements to meet the requirements of the slot purchase arrangement with Sound Transit. Under the moderate growth scenario, there are no capacity constraints until 2030 (under peak operations).

Figure 3-12: Rail Corridor Capacity – King Street Station to Everett



Source: MainLine Management

Everett, WA to Vancouver, BC (BNSF)

Capacity improvements currently planned for the Everett to Vancouver mainline segment are driven largely by passenger service. Three of the projects that are currently being designed or constructed include:

- Siding upgrade and extension at Stanwood,
- Siding upgrade and extension at Mount Vernon,
- Construction of a new siding at the Swift Customs Facility.

The siding extensions and upgrades at Stanwood and Mount Vernon would allow more efficient meet/pass operations involving freight and passenger operations. The new siding at Swift (Blaine) would allow additional capacity for freight train customs inspections while keeping the main line open for other train operations, including passenger.

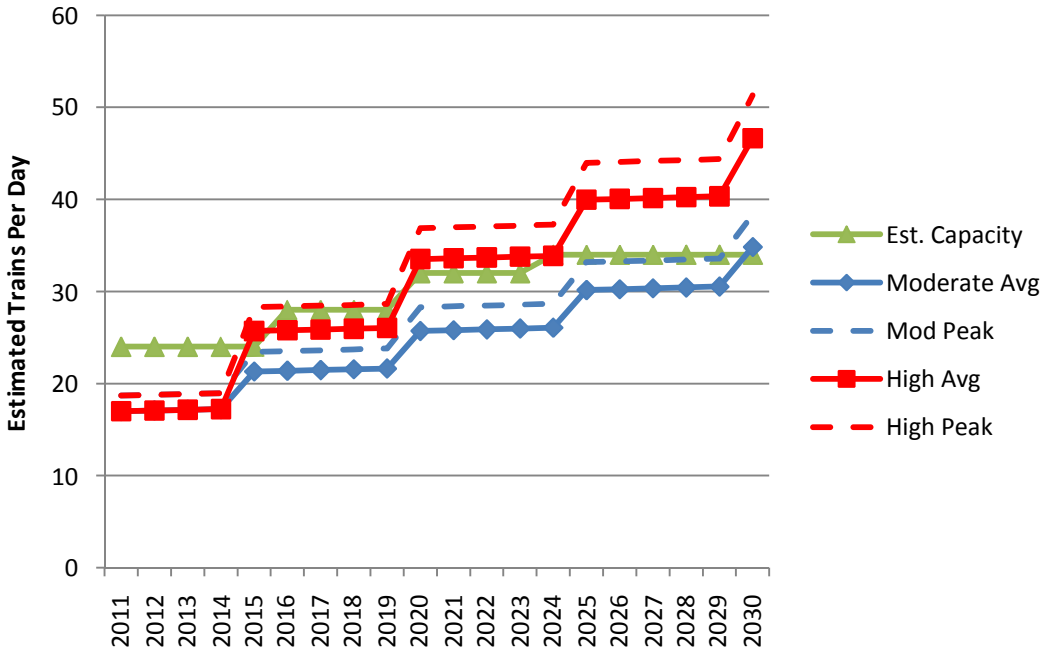
In addition to these improvements, BNSF recently constructed a 10,000 foot siding north of the border at Colebrook, BC. Colebrook is the location where the BNSF ties into the rail line that accesses the Deltaport and Westshore port facilities. Prior to construction of this siding BNSF had no meet/pass locations between the border and Brownsville, BC.

As shown in Figure 3-13, growth in export bulk commodities may lead to sustained capacity constraints along this segment. These constraints are projected to start between 2020 and 2025 under the high growth scenario, and between 2029 and 2030 under the moderate growth scenario.

The increases in sustainable capacity illustrated in Figure 3-13 reflect the consultants' view of potential improvements. Given the track profile of this segment, these potential improvements include the addition of new sidings and the extension of existing sidings.

In addition to the physical improvements, additional capacity improvements on this segment may be possible through the use of fleeting. Although this analysis does not assume a change in operating protocols, growth in the number of bulk trains may necessitate the use of fleeting operations. At lower traffic growth levels, targeted siding expansions would likely be able to accommodate traffic growth over the 20-year horizon.

Figure 3-13: Rail Corridor Capacity – Everett to Vancouver (BC)



Source: MainLine Management

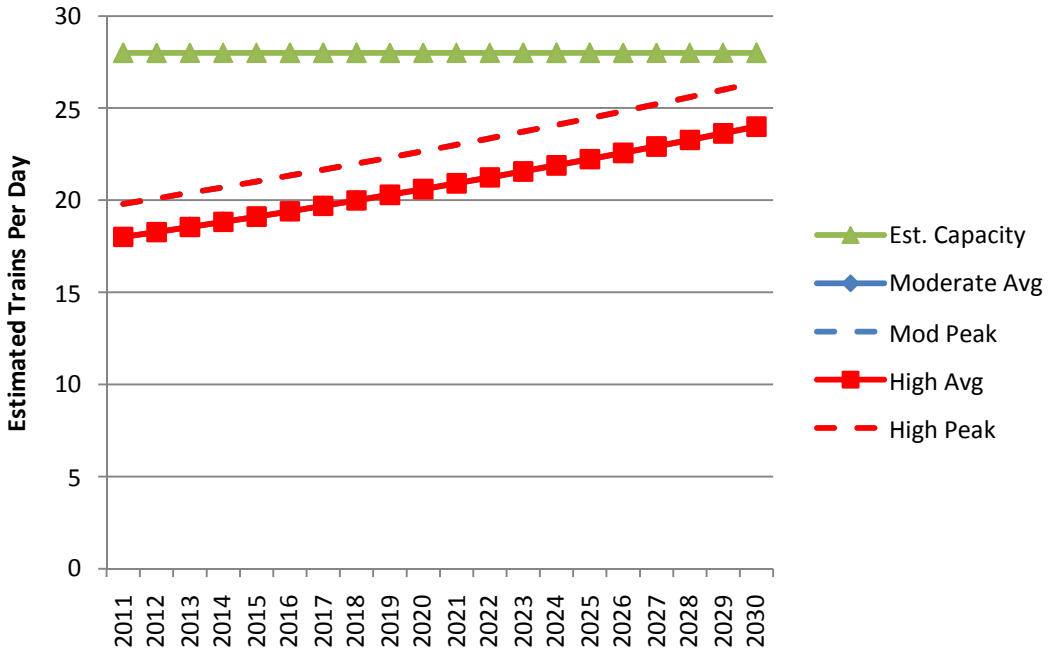
Everett, WA to Spokane, WA via Stevens Pass (BNSF)

The primary capacity constraints on this segment are the approaches to the Cascade Tunnel under Stevens Pass and the throughput of the tunnel. The approaches include heavy curvature and steep grades (i.e. 2.2 percent), which require slow operation. Additionally, the tunnel restricts capacity because the air in the tunnel must be flushed between trains. Flushing takes approximately 40 minutes following eastbound trains and 20 minutes following westbound trains. The maximum sustained capacity through the tunnel is estimated at approximately 28 trains per day, with surge capacity of 30 to 32 trains per day.

BNSF currently operates trains of up to 8,000 feet in length via Stevens Pass so long as they do not exceed 5,500 tons without Distributive Power (DPU)[3]. With DPU, trains via Stevens Pass can be increased to 7,000 tons, resulting in fewer trains. BNSF has indicated that Stevens Pass capacity will be reserved for intermodal traffic and Amtrak.

As shown in Figure 3-14, capacity of this line segment will likely not be exceeded over a 20-year horizon under the high growth scenario.

Figure 3-14: Rail Corridor Capacity – Everett to Spokane via Steven Pass (BNSF)



Source: MainLine Management

[3] With distributive power (DPU), remotely controlled helper engines are placed in the middle or at the end of trains.

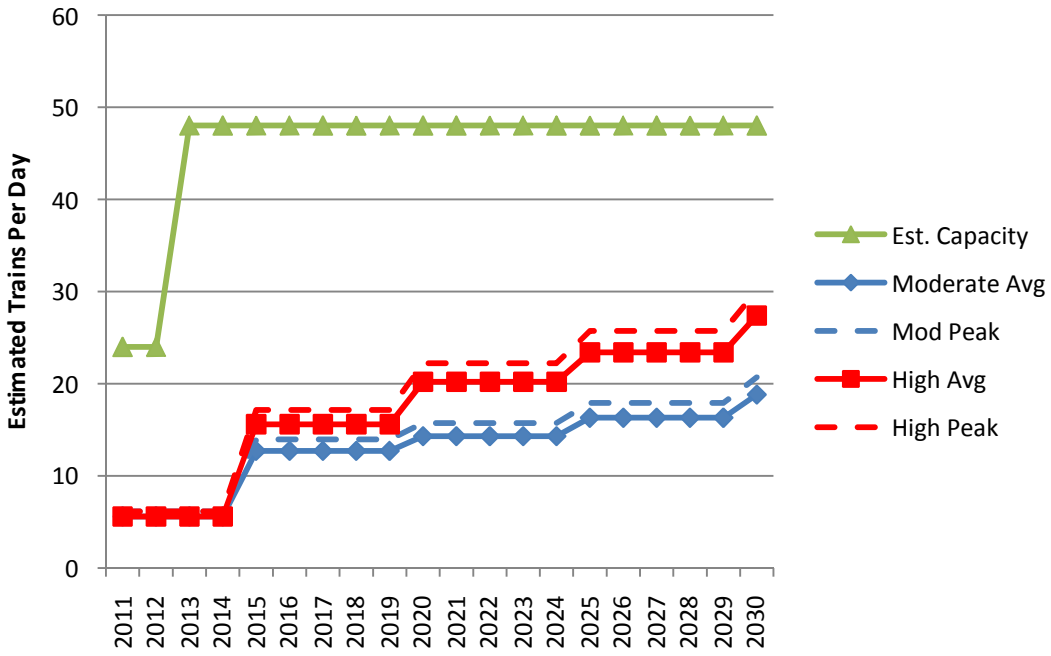
Auburn, WA to Pasco, WA via Stampede Pass (BNSF)

As discussed in the Pasco to Vancouver segment analysis section, BNSF has indicated the potential for Stampede Pass being utilized as a "directional" route for empty bulk trains. The trains using the pass would be those generated on the BNSF system from Kalama north, thereby relieving the BNSF Columbia Gorge route of eastbound empty bulk trains, except for those originating in Portland and Vancouver. It is unclear when this routing protocol would occur, but it will likely be driven by route congestion on the Columbia Gorge segment. If the route does become an eastbound routing for empty BNSF bulk trains, it is also possible that BNSF would utilize the route for eastbound merchandise trains that originate from Everett, Seattle and Tacoma and are destined for the Pasco processing yard.

At some point, increased train operations will likely require upgrading the signal system on the Stampede Pass line to full CTC. The route currently has limited CTC but is predominantly dispatched utilizing Track Warrant Control (TWC). However, if the preponderance of traffic utilizing the route is eastbound only, TWC would likely be sufficient for some time into the future.

As Figure 3-15 demonstrates, use of Stampede Pass as described creates significant additional capacity. The increase in capacity reflects that, under the new operating protocol, the majority of trains using Stampede Pass will move eastbound.

Figure 3-15: Rail Corridor Capacity – Auburn to Spokane
Current Operations



Source: MainLine Management

Project Priorities

A key element of this analysis was the development of a prioritized list of system improvements that would allow the capacity of the regional rail system to match increasing demand.

These projects generally fall into two categories, mainline improvements and port access improvements. However, the projects labeled as port access improvements also provide benefits to the mainline system. Reducing the amount of time that it takes for trains to move between the port terminals and the mainline reduces delays on the mainline system, and thereby increases capacity.

Four projects recommended in the previous report are currently in the construction or detailed planning phase, with completion for each ranging from 2012 through the 2017/2018 timeframe. Completion of these four projects will provide a solid foundation for passenger and freight capacity in the Pacific Northwest. Three of these projects are primarily mainline improvements:

- Vancouver WA Freight Rail Bypass.
- Point Defiance Bypass, Tacoma to Nisqually.
- Third main line Kalama to Kelso (WSDOT Mid-Term Passenger Plan Option 3).

The fourth project is primarily a port access improvement:

- Port of Vancouver USA Freight Access Project.

In addition to these projects, certain main line segments will likely require additional capacity enhancements due to projected growth in rail traffic. Both the BNSF and UP likely have the ability to add the capacity needed through a combination of infrastructure expansion and changes to operations.

Six additional capacity improvement projects that would enhance overall rail operations under the moderate and high growth forecasts are listed below. Three of these projects are listed as mainline projects and three are port access. As described above, however, port access improvements also benefit mainline capacity. Descriptions of each of the projects are provided below the lists

The mainline projects include:

- Portland - Peninsula Junction to North Portland Junction,
- Vancouver to Kelso - WSDOT Passenger Plan Option 3 and 4,
- Centralia - Blakeslee Junction.

The **Peninsula Junction to North Portland Junction** project is a key series of improvements that are needed to improve both passenger and freight train capacity in the Portland area. Among other things, these projects would include reconfiguring the connection between the UP and BNSF at North Portland Junction and easing the curvature at Peninsula Junction. This would reduce congestion on the Columbia Gorge routes of both the BNSF and UP, as well as on the I-5 Corridor, and would allow for faster passenger train speeds. These improvements near the south end of the Columbia River Bridge would complement current projects at the north end of the bridge, including the Vancouver Bypass project, the West Vancouver Access project and upgrades of the main line in Vancouver. Funding is currently in place to complete preliminary engineering and the NEPA analysis, but not construction.

The improvements included in the **WSDOT Passenger Plan Options 3 and 4**[4] between Vancouver and Kelso include the completion of a third main line between Martin's Bluff and Rocky Point and a new siding near Kalama, which will be necessary to reach projected passenger train volumes.

The **Blakeslee Junction** project would improve access/egress efficiency between the I-5 Corridor main lines, and both the Puget Sound and Pacific Railway (PSAP) and Tacoma Rail lines at Centralia. Growth in the number of unit trains moving to and from the Port of Grays Harbor via the Puget Sound and Pacific has increased congestion at the interchange. This project includes a number of elements designed to increase the speed of trains through the interchange, and to increase the capacity of the Grays Harbor branch line. This will benefit both freight and passenger trains. The project is divided into five phases. Early planning has been completed on the project, but only partial funding for Phase 1A and 1B are available. Construction will require additional funding.

In addition, the Puget Sound and Pacific has recently obtained the necessary permits to construct a meet/pass siding on the Grays Harbor branch line. This siding should also improve capacity on the I-5 Corridor mainline through Centralia by providing a place off of the mainline for Grays Harbor trains to wait.

The additional port access projects that are recommended include:

- Unit Train Staging/Storage Yard near Woodland.
- Cowlitz River Bridge – Longview.
- Bullfrog Junction Realignment – Tacoma.

A **Unit Train Staging/Storage Yard near Woodland** would also increase the efficiency of both the BNSF and UP routes through the Columbia River Gorge routes and the I-5 Corridor. The BNSF currently stages unit grain trains in Pasco for movement to export terminals on the Lower Columbia River, Puget Sound, and Grays Harbor. The distance between the Pasco staging yard and the export terminals increases the potential for train delays. A storage yard in Woodland would reduce the distance to the export terminals. This project would also benefit passenger trains by reducing conflicts with slower-moving freight trains. This project is not currently in the planning phase.

The **Cowlitz River Bridge** provides access from the I-5 Corridor mainline at Longview Junction to most of the marine terminals and industrial customers in Longview. This single-track bridge is nearly 90 years old, and projected growth in traffic along the Longview branch line may require the addition of a second line. Options include adding a second single-track bridge or replacing the existing bridge with a new double-track bridge. This project would reduce congestion on the I-5 Corridor mainline (benefitting both passenger and freight trains) and increase the capacity of the Longview branch line. It was also identified in the recent Port of Longview Master Plan as a critical link. The project is estimated to cost $36 million; partial funding is in place for preliminary engineering and NEPA analysis, with the remaining funding expected in January 2012. Construction is not funded.

The **Bullfrog Junction Realignment** project would increase the efficiency of access/egress between the I-5 Corridor mainline and the Port of Tacoma. All of the rail lines serving industries and port facilities on the Tacoma Tideflats currently funnel through the Bullfrog Junction area,

[4] See footnote 2 on Page 30

seriously limiting the number of trains that can enter or leave the port area. In addition, yard activities in the area often use the mainline, reducing mainline capacity on the I-5 Corridor. The Bullfrog Junction area includes a number of chokepoints, including the junction itself, a single single-track bridge over the Puyallup River, and others. A preliminary plan for realignment was developed in 2006, and project proponents are now seeking funding for design and construction.

Conclusion

Growth in the volume of export bulk trains is expected to increase the demand on existing rail capacity in the region. Even moderate growth will require BNSF and UP to assess the capacity requirements necessary to meet the growing demand. Both railroads have the ability to increase capacity through a combination of physical and operational improvements, and should be able to meet growing demand well into the future.

Table 5-1: Current and Projected Number of Trains, by Line Segment

		Moderate Growth				High Growth			
	2011	2020		2030		2020		2030	
Line Segment	Average	Average	Peak	Average	Peak	Average	Peak	Average	Peak
Pasco, WA to Vancouver, WA (BNSF)									
Pasco, WA to Wishram, WA	45	51	56	61	67	57	62	72	80
Wishram, WA to Vancouver, WA	41	46	51	56	61	52	57	67	74
Hinkle, OR to Portland, OR (UP)	32	41	45	47	52	46	50	53	59
Pasco, WA to Spokane, WA (BNSF)	45	59	65	73	80	71	78	93	102
Spokane, WA to Sand Point, ID (BNSF)	59	75	83	92	101	87	96	112	124
Hinkle OR to Eastgate, ID (UP)	10	11	12	12	13	12	14	14	15
Vancouver, WA to Tacoma, WA (Joint line)									
Vancouver, WA to Kalama/Longview, WA	63	74	81	98	108	83	92	112	123
Kalama/Longview, WA to Tacoma, WA	57	71	78	94	103	79	87	105	115
Tacoma, WA to Auburn, WA (Joint line)	81	93	102	114	125	99	108	122	134
Auburn, WA to Seattle, WA (Joint line)	81	94	103	119	131	102	112	131	144
Seattle, WA to Everett, WA (BNSF)	51	63	69	75	83	70	77	87	96
Everett, WA to Blaine, WA (BNSF)	17	26	28	35	38	34	37	47	51
Everett, WA to Spokane, WA via Stevens Pass (BNSF)	18	21	23	24	26	21	23	24	26
Auburn, WA to Pasco, WA via Stampede Pass (BNSF)	6	14	16	19	21	20	22	27	30

Note: Train numbers represent average daily volume. Short term peak volumes may exceed daily average by 10%. For all non-unit trains, growth is absorbed by existing trains before adding additional trains. Train volumes include locals, switchers and non-revenue movements.
Source: MainLine Management, BST Associates

Table 5-2: Summary of Capacity Improvements, by Line Segment

Line Segment
Pasco, WA to Vancouver, WA (BNSF)
Pasco, WA to Wishram, WA
- Siding extensions
- Connecting sidings into double track segments
- Westbound fleeting
Wishram, WA to Vancouver, WA
- Siding extensions
- Fleeting of trains westbound
Hinkle, OR to Portland, OR (UP)
- Siding extensions
- Connecting sidings into double track segments
Pasco, WA to Spokane, WA (BNSF)
- Connecting existing sidings into double track segments
Spokane, WA to Sand Point, ID (BNSF)
- Double tracking the existing single track segments
- Addition of third main track in key locations where available
- Staging tracks on both sides of the Lake Pend Oreille bridge
Hinkle, OR to Eastgate, ID (UP)
None
Vancouver, WA to Tacoma, WA (Joint line)
Vancouver, WA to Kalama/Longview, WA
- Completion of the Vancouver Bypass
- Completion of the new Port of Vancouver Access route
- Completion of WSDOT improvements for passenger plan Option 3, including construction of the 3rd main track between South Kalama and Kelso
- Additional improvements may include completion of 3rd main track between Martin's Bluff and Rock Point, expansion of the Skagit River Bridge at Longview
Kalama/Longview, WA to Tacoma, WA
- Completion of the WSDOT Option 3 and 4 improvements
- Addition of High-Speed crossovers
- Completion of Blakeslee Junction Project
- Completion of Point Defiance Bypass Project
Portland, OR to Vancouver, WA
- North Portland Junction and Peninsula Junction
Tacoma, WA to Seattle, WA (BNSF and UP)
- No projects specified. BNSF will meet passenger service agreements
Seattle, WA to Everett, WA (BNSF)
- No projects specified. BNSF will meet passenger service agreements
Everett, WA to Vancouver, BC (BNSF)
Siding extensions
Additional sidings
Everett, WA to Spokane, WA via Stevens Pass (BNSF)
None
Auburn, WA to Pasco, WA via Stampede Pass (BNSF)
New operating protocol with empty eastbound grain trains using Stampede Pass

Source: MainLine Management, BST Associates