5.1 Rail Transportation

Railroads provide transportation for passengers and a wide range of commercial goods, and support regional economic activity. Similar to other forms of transportation, rail traffic is subject to various regulatory requirements, including requirements for tracks, rail cars and locomotives, crew, operations, inspection and maintenance, tariffs, and methods and types of goods and services that can be transported.

This section assesses the potential rail transportation impacts of the Proposed Action and No-Action Alternative. For the purposes of this assessment, rail transportation refers to unit trains[1] that would service the project area (Proposed Action-related trains), as well as the type and volume of other rail traffic using the same rail lines. The Proposed Action, at full operations, would bring approximately 8 incoming unit trains carrying coal to the project area and send out approximately 8 empty unit trains each day from the project area. No rail construction outside of the project area is proposed by the Applicant.

This section describes the regulatory setting, presents the historical and current rail transportation conditions in the study area, establishes the methods for assessing potential rail transportation impacts, assesses potential impacts, and identifies measures to mitigate those impacts, where applicable.

5.1.1 Regulatory Setting

Laws and regulations relevant to rail transportation are summarized in Table 5.1-1.

Table 5.1-1. Regulations, Statutes, and Guidelines for Rail Transportation

Regulation, Statute, Guideline	Description
Federal	
Federal Railroad Safety Act of 1970	Gives FRA rulemaking authority over all areas of rail line safety. FRA has designated that state and local law enforcement agencies have jurisdiction over most aspects of highway/rail grade crossings, including warning devices and traffic law enforcement.
Highway Safety Act and the Federal Railroad Safety Act	Gives FHWA and FRA regulatory jurisdiction over safety at federal highway/rail grade crossings.
Federal Railroad Administration general regulations (49 CFR Parts 200–299)	Establishes railroad regulations, including safety requirements related to tracks, operations, and cars.
Interstate Commerce Commission Termination Act of 1995 (49 USC 101)	Establishes the Surface Transportation Board and upholds the common carrier obligations of railroads; requires railroads to provide service upon reasonable request.

[1] A unit train is a train in which all cars carry the same commodity and are shipped from the same origin to the same destination.

Regulation, Statute, Guideline	Description
State	
Washington Utilities and Transportation Commission	Inspects and issues violations for hazardous materials, tracks, signal and train control, and rail operations. WUTC regulates the construction, closure, or modification of public railroad crossings. In addition, WUTC inspects and issues defect notices if a crossing does not meet minimum standards.
WSDOT Local Agency Guidelines M 36-63.28, June 2015, Chapter 32, Railroad/Highway Crossing Program	Focuses on adding protection that improves safety and efficiency of railroad/highway crossings. Provides a process for investigating alternatives for improving grade-crossing safety, such as closure, consolidation, and installation of warning devices.
WSDOT Design Manual M 22.01.10, November 2015, Chapter 1350, Railroad Grade Crossings	Provides specific guidance for the design of at-grade railroad crossings.
Rail Companies—Operation (WAC 480-62)	Establishes operating procedures for railroad companies operating in Washington State.
Local	
Longview Municipal Code 11.40.080 (Railroad Trains Not to Block Streets)	Prohibits trains from using any street or highway for a period of time longer than five minutes, except trains or cars in motion other than those engaged in switching activities.

Notes:
FRA = Federal Railroad Administration; FHWA = Federal Highway Administration; CFR = Code of Federal Regulations; USC = United States Code; WUTC = Washington Utilities and Transportation Commission; WSDOT = Washington State Department of Transportation; WAC = Washington Administrative Code

5.1.2 Study Area

The study area for direct impacts on rail transportation is the project area for the Proposed Action. The study area for indirect impacts on rail transportation includes the rail routes expected to be used by Proposed Action-related trains between the project area and the Powder River Basin and Uinta Basin.

The assessment of potential indirect impacts focuses on the Reynolds Lead and BNSF Spur and the BNSF Railway Company (BNSF) main line in Cowlitz County. An assessment along the BNSF main line in Washington State and to and from the Powder River Basin and the Uinta Basin is also presented.

5.1.3 Methods

This section describes the sources of information and methods used to evaluate the potential impacts on rail transportation associated with the construction and operation of the Proposed Action and No-Action Alternative.

5.1.3.1 Information Sources

The following sources of information were used to define the existing conditions relevant to rail transportation and identify the potential impacts of the Proposed Action and No-Action Alternative on rail transportation in the study areas.

Rail Segment Capacity

Estimates of rail segment capacity for the Reynolds Lead and BNSF Spur were based on the methods developed for the Association of American Railroads (Cambridge Systematics 2007). The *Washington State Rail Plan* (Washington State Department of Transportation 2014a) was used to estimate rail segment capacity on BNSF main line routes in Washington State.

Existing, Projected, and No-Action Alternative Rail Traffic

Existing and projected rail traffic for the Reynolds Lead and BNSF Spur were based on information from the Longview Switching Company (LVSW) as operator of the Reynolds Lead and BNSF Spur and field observations. Existing and projected rail traffic for routes within Washington State was based on the *Washington State Rail Plan*. The Applicant provided estimates of rail traffic under the No-Action Alternative (approximately 2 additional trains per day in 2028).

Rail Operations

The following information sources were used for Proposed Action-related rail operations.

- **Volumes.** Proposed Action-related rail traffic to the project area at full operations would include 8 loaded trains per day and 8 empty trains per day.

  The types and number of trains from Longview Junction to the project area for 2015 and 2028 were developed from meetings with LVSW and the Port of Longview. The types and number of baseline train traffic beyond Longview Junction on main line routes were developed from the *Washington State Rail Plan* using linear extrapolation of 2010 and 2035 projected train traffic to 2015 and 2028.

- **Routes.** Representative coal mines were selected to identify rail routes outside Washington State. Routes to and from the project area within Washington State were based on existing BNSF and Union Pacific Railroad (UP) operational practices and Washington State Department of Transportation (WSDOT) documents including the *Washington State Rail Plan* and *Washington State Freight Mobility Plan* (Washington State Department of Transportation 2014b).

- **Train parameters.** Train parameters including the number of rail cars per unit train (125 rail cars for each train) and number of locomotives (3 per unit train) were based on information provided by the Applicant, input from BNSF, and existing BNSF coal train operations (BNSF Railway Company 2016).

- **Reynolds Lead, BNSF Spur, and project area operations**. Operations of the Reynolds Lead, BNSF Spur, and the project area were based on information provided by LVSW and the Applicant.

5.1.3.2 Impact Analysis

The following methods were used to evaluate the potential impacts of the Proposed Action and No-Action Alternative on rail transportation. For the purposes of this analysis, potential impacts resulting from operations impacts are based on the Applicant's planned maximum throughput capacity of up to 44 million metric tons per year.

Train Parameters

For purposes of this analysis, all Proposed Action-related trains were assumed to have the parameters shown in Table 5.1-2.

Table 5.1-2. Train Parameters

Rail Cars	
Type	Alum Rotary Gondola
Gross rail load (tons)	143
Tare weight (tons)[a]	20.9
Lading per car (tons)[b]	122.1
Coupled Length (feet)	53
Locomotives	
Type	4400 HP AC
Weight (tons)	216
Length (feet)	73
Number in train	3
Configuration[c]	2-0-1
Total Train	
Cars per train	125
Total tare weight of cars (tons)[a]	2,613
Total lading weight (tons)[b]	15,263
Locomotive weight (tons)	648
Total train weight (tons)	18,524
Total train length (feet)	6,844

Notes:
[a] Empty weight
[b] Weight of coal
[c] Locomotives are distributed through trains (distributed power) in various configurations. Proposed Action-related trains would likely have two locomotives at the head and one at the rear of the train (Wolter pers. comm. verified by field observations December 4, 2014).

According to the Applicant, proposed rail operations would support terminal throughput of 40 million metric tons per year. The Proposed Action is based on a throughput of up to 44 million metric tons of coal per year. The Applicant assumes a 10% increase in throughput (4 million metric tons of coal per year) from rail car capacity that can be achieved through industry process and technological improvements by 2028.

Rail Segment Capacity

Capacities for the Reynolds Lead and BNSF Spur were estimated using the methods developed by the Association of American Railroads. Capacity estimates provided are practical capacities consistent with the capacity estimates presented in the *Washington State Rail Plan*. Capacity estimates for main line routes in Washington State were obtained from the *Washington State Rail Plan*.[2] The capacity estimates involve estimating maximum practical capacity in number of trains per day, determined by signal type, number of tracks, and geometric limitations. Practical capacity provides a more realistic and reasonable figure because of these considerations where operational capacity only considers the number of trains per day that could run over a route.

Traffic-control systems dictate capacity and help maintain a safe distance between trains passing or meeting on the same track. There are three basic types of systems.

- **Automatic Block Signals (ABS).** ABS is an electronic signal system that can control when a train can advance into the next block. A block is a section of track with signals at each end. Only one train can occupy a block at one time at normal speed.
- **Traffic Warrant Control (TWC).** Under this control system, train crews obtain authority to occupy and move on a main track from the dispatcher in the form of a completed track warrant form. Usually the track warrant information is transmitted to the train crew by phone, radio, or electronic transmission to the locomotive.
- **Centralized Traffic Control (CTC)**. With CTC, electrical circuits monitor the location of trains, allowing dispatchers to control train movements from a remote location, usually a central dispatching office. The signal system prevents trains from being authorized to enter sections of track occupied by other trains moving in the opposite direction.

In 2008, Congress passed the Rail Safety Improvement Act of 2008, which requires all passenger railroads and Class I freight railroads to install Positive Train Control (PTC) on all lines that carry passengers or certain hazardous liquids. PTC is designed to reduce train accidents caused by human error. PTC is a system that automatically stops a train if the engineer does not respond properly to a signal indication. While future generations of PTC may help railroads increase capacity on individual corridors, the PTC technology currently being installed on U.S. railroads is not expected to have a meaningful impact on corridor capacity (Association of American Railroads 2014).

Train Routes

Proposed Action-related train routes from mines in the Powder River Basin in Montana and Wyoming, and Uinta Basin in Utah and Colorado to the project area, and the return of empty trains, was assumed to be the same as current BNSF and UP routes and as documented in adopted WSDOT publications, including the *Washington State Rail Plan* and *Washington State Freight Mobility Plan*. The *Washington State Rail Plan* examines rail volume and capacity for all BNSF routes in Washington State because volume and capacity, and thus routing decisions, are dynamic.

In 2012, BNSF changed its train operations protocol to enhance use of existing capacity using directional running. This strategy routes all westbound-loaded unit trains (including coal) from

[2] Capacity estimates in the *Washington State Rail Plan* for 2010 were used for existing conditions and capacity estimates for 2035 were used for 2028 conditions. As described in the *Washington State Rail Plan*, Class I railroads (BNSF and UP) and other infrastructure owners will likely address key capacity issues as they emerge.

Pasco via the Columbia River Gorge to Vancouver, where they continue on the BNSF north-south main line to their final destination. Empty unit bulk trains from north of Vancouver, including Cowlitz County, return to Pasco and to points east via Stampede Pass. This analysis assumes this protocol would be used for Proposed Action-related trains. The following describes the expected routes for BNSF and UP empty and loaded Proposed Action-related trains.

- **Loaded BNSF trains.** Loaded BNSF trains would originate in the Powder River Basin in Montana and Wyoming, and travel over BNSF and Montana Rail Link lines through Billings, Montana, and Sandpoint, Idaho, crossing into Washington east of Spokane. Trains would proceed through Spokane and Pasco to Vancouver. From Vancouver, trains would move north to Longview Junction and enter the LVSW rail line at Longview Junction on the BNSF Spur, cross the Cowlitz River Bridge and continue on the Reynolds Lead to the project area. Trains would be unloaded, inspected, and prepared for empty movement.
- **Empty BNSF trains.** Empty BNSF trains would move from the project area over the Reynolds Lead and BNSF Spur to Longview Junction. From Longview Junction, trains would move north on the BNSF main line to Auburn. From Auburn, trains would move east over Stampede Pass to Pasco. From Pasco, empty BNSF trains would move over the same route as loaded trains to the Powder River Basin in Montana and Wyoming.
- **Loaded UP trains.** Loaded UP trains from the Uinta Basin in Utah and Colorado and the Powder River Basin in Wyoming would move via the UP main line through Salt Lake City and Pocatello following the Columbia River on the Oregon side to North Portland Junction in Portland, Oregon. From North Portland Junction, trains would cross the Columbia River and move on the BNSF main line to Longview Junction. All loaded UP trains would operate on the same track between Longview Junction and the project area as described for loaded BNSF trains.
- **Empty UP trains.** Empty UP trains would move back to Longview Junction via the Reynolds Lead and BNSF Spur. From Longview Junction, UP trains would move south to North Portland Junction in Portland, Oregon, and back to the Uinta Basin and Powder River Basin via the same route as loaded UP trains.

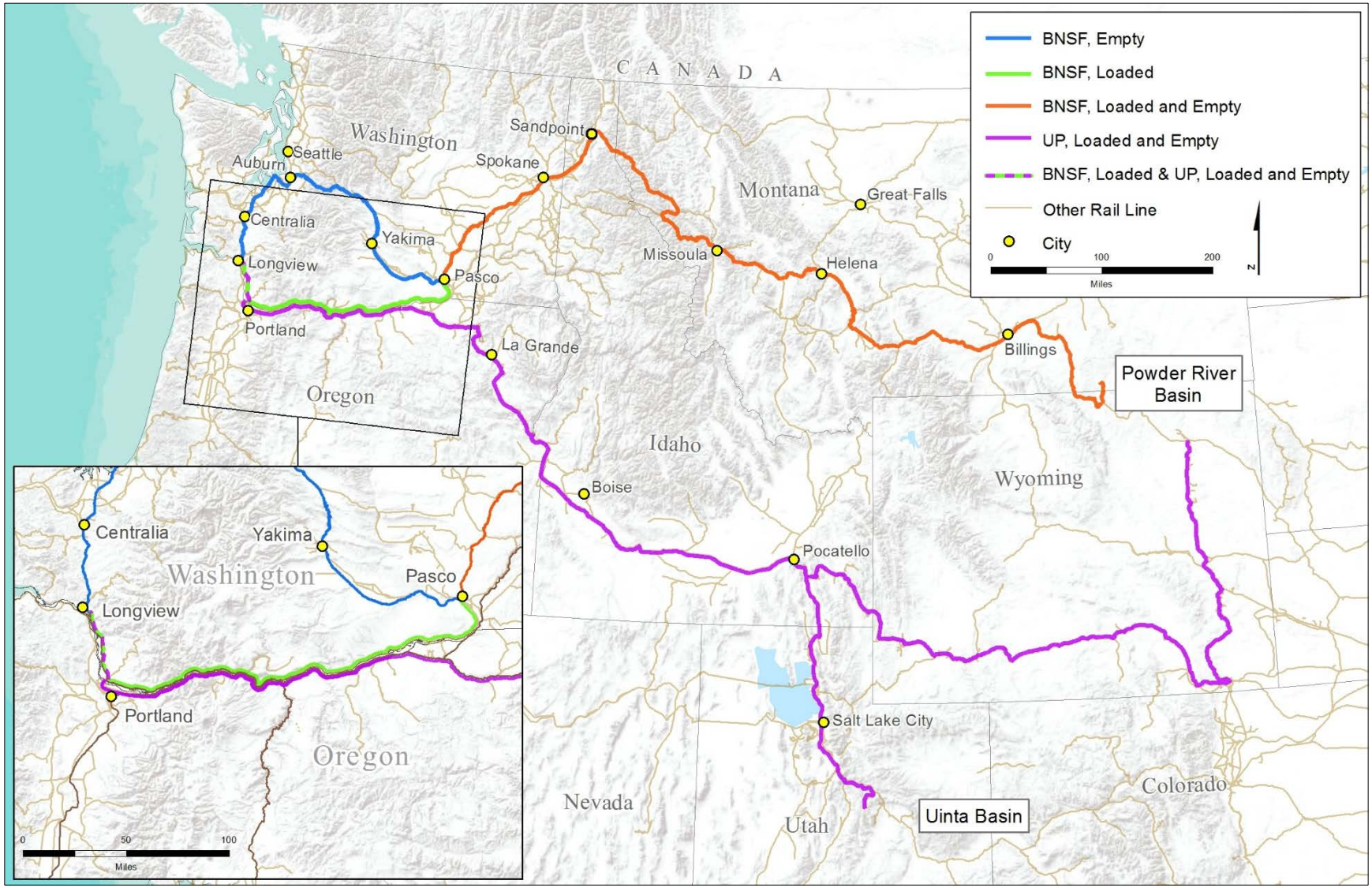
Figure 5.1-1 illustrates the routes used for this analysis. However, BNSF and UP have alternative routes. As volume increases on any one-line segment, BNSF and UP may revise operations to distribute traffic over existing infrastructure. BNSF and UP may also expand their infrastructure, which occurs on an ongoing basis based on demand.

Future Rail Traffic

Rail traffic estimates in the *Washington State Rail Plan* were used to determine potential impacts of Proposed Action-related trains to rail traffic capacity in Washington State. The types and number of baseline train traffic beyond Longview Junction were developed using linear extrapolation of 2010 and 2035 projected train traffic to 2015 and 2028.[3] Rail traffic estimates provided in the *Washington State Rail Plan* do not include the rail traffic for proposed coal or crude oil projects in Washington State. Therefore, Proposed Action-related rail traffic was added to 2028 baseline rail traffic estimates for the purposes of this analysis.

[3] The rail traffic estimates in the *Washington State Rail Plan* are based on data collected between 2010 and 2013. Rail traffic is highly dynamic and fluctuates as a result of changing demand. The 2028 rail traffic estimates are intended to provide a "snapshot" of estimated rail traffic volumes; the rail traffic estimates do not represent actual volumes for 2028.

Figure 5.1-1. Expected Routes of Loaded and Empty Proposed Action-Related Trains



Train Speed and Travel Time

The current maximum speed for the Reynolds Lead is 10 miles per hour. The maximum speed over the Reynolds Lead could increase from 10 miles per hour (mph) to up to 25 mph if track improvements are made by LVSW.[4] This improvement would reduce the train travel time from Longview Junction to the project area from approximately 49 minutes to approximately 32 minutes. For purposes of this analysis, it was assumed that Proposed Action-related trains would reach a maximum speed of 20 mph if the planned improvements were made, with an average speed of approximately 11 mph on the BNSF Spur and Reynolds Lead. Because these improvements are not certain, the impact analysis includes train speeds and transit time over each road crossing with and without planned improvements to the Reynolds Lead and BNSF Spur.

5.1.4 Existing Conditions

This section describes the existing environmental conditions in the study area related to rail transportation that could be affected by the construction and operation of the Proposed Action and the No-Action Alternative.

5.1.4.1 Project Area

As described in Chapter 2, *Project Objectives, Proposed Action, and Alternatives*, the project area is located on 190 acres, primarily within the 540-acre Applicant's leased area. The project area includes a portion of a rail loop that transitions from the Reynolds Lead onto the project area and extends from the project area to the Applicant's leased area. Rail traffic within the project area serves the existing bulk product terminal adjacent to the project area and within the Applicant's leased area as described in Chapter 2, *Project Objectives, Proposed Action, and Alternatives*.

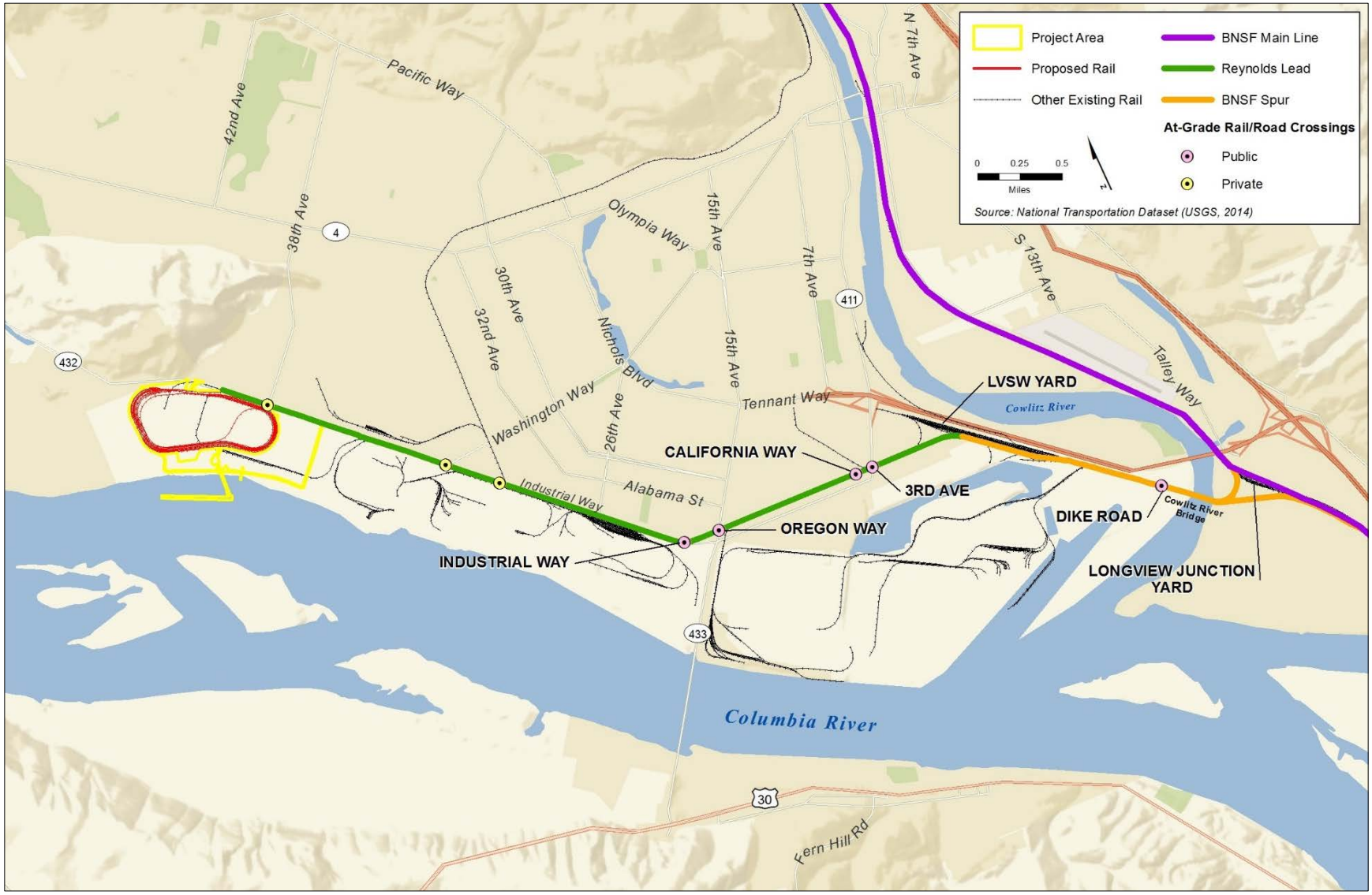
5.1.4.2 BNSF Spur and Reynolds Lead

The project area is located at the end of the Reynolds Lead, an existing rail line that serves the Port of Longview and several industries, and connects via the BNSF Spur to the BNSF main line. The junction of the BNSF Spur and BNSF main line is called Longview Junction (Figure 5.1-2). The speed limit on Reynolds Lead and BNSF Spur is 10 mph. At an average speed of 9 mph, the existing travel time from Longview Junction to the project area is approximately 49 minutes. The following describes the BNSF Spur and Reynolds Lead.

Between Longview Junction and the project area there are five public and three private at-grade road crossings (Figure 5.1-2). These road crossings experience rail traffic from current train operations to and from the Port of Longview and/or from industrial switching activities at locations along the Reynolds Lead.

[4] As described in Section 5.1.5, LVSW proposes to upgrade the Reynolds Lead and part of the BNSF Spur as a separate action should it be warranted by increased rail traffic resulting from existing and future customers. These upgrades would include adding ballast, replacing ties, upgrading rail, and upgrading the traffic control system.

Figure 5.1-2. Reynolds Lead and BNSF Spur



BNSF Spur

The BNSF Spur runs from the BNSF Seattle Subdivision main line switch at Longview Junction, across the Cowlitz River Bridge to the LVSW yard (Figure 5.1-2). There is one main track with TWC traffic control. The Cowlitz River Bridge is a manually operated drawbridge controlled by LVSW. The bridge opens once every 4 to 5 years to allow passage of river-dredging vessels. The speed limit through this area is 10 mph because of speed restrictions on the bridge.

Existing rail traffic on the BNSF Spur is about 7 trains per day. Capacity is about 16 trains per day, which supports the current volume (Cambridge Systematics 2007). The 7 trains average 78 rail cars per train and 4,920 feet in length. Dike Road is the only public at-grade road crossing on the BNSF Spur.

Existing trains consist of approximately 4 grain trains per day (2 loaded and 2 empty) to and from the EGT grain terminal at the Port of Longview, 2 to 3 manifest trains[5] per day from the BNSF main line to the LVSW yard, and an occasional unit train of clay, soda ash, or other trains destined to or from the Port of Longview. The Port Industrial Rail Corridor connects with the BNSF Spur just east of the LVSW yard. The switch is a remotely controlled switch operated by the BNSF dispatcher. Trains to or from Port of Longview facilities leave or enter the BNSF Spur at the Industrial Rail Corridor switch. Other trains originate or terminate in the LVSW yard.

Reynolds Lead

The Reynolds Lead runs from the west end of the LVSW yard to the project area (Figure 5.1-2). There is one main track with TWC traffic control. The speed limit is 10 mph, and capacity is about 16 trains per day (Cambridge Systematics 2007). Average existing traffic is approximately 2.3 trains per day. Each train averages 21 rail cars per train with an average train length of approximately 1,450 feet. There are four public at-grade road crossings on the Reynolds Lead between the LVSW yard and the project area: 3rd Avenue (State Route 432), California Way, Oregon Way (State Route 433), and Industrial Way (State Route 432) (Figure 5.1-2).

Existing trains operating on the Reynolds Lead include an LVSW local crew that places and pulls cars at industrial facilities along the Reynolds Lead 3 days per week, and a local crew that delivers and picks up cars that are interchanged to and from the Columbia & Cowlitz Railway at two sidings just west of California Way. The Columbia & Cowlitz Railway also operates on the Reynolds Lead between the Weyerhaeuser plant near Industrial Way and these sidings to deliver and pick up interchange cars to or from the LVSW rail line.

5.1.4.3 Main Line Routes in Washington State

Proposed Action-related trains would travel on BNSF main line routes within Washington State beyond Longview Junction. Table 5.1-3 summarizes infrastructure and traffic data for the route segments expected to be used by Proposed Action-related trains and the route segments are summarized below. Figure 5.1-3 illustrates estimated 2015 rail traffic and capacity using estimates provided in the *Washington State Rail Plan*.

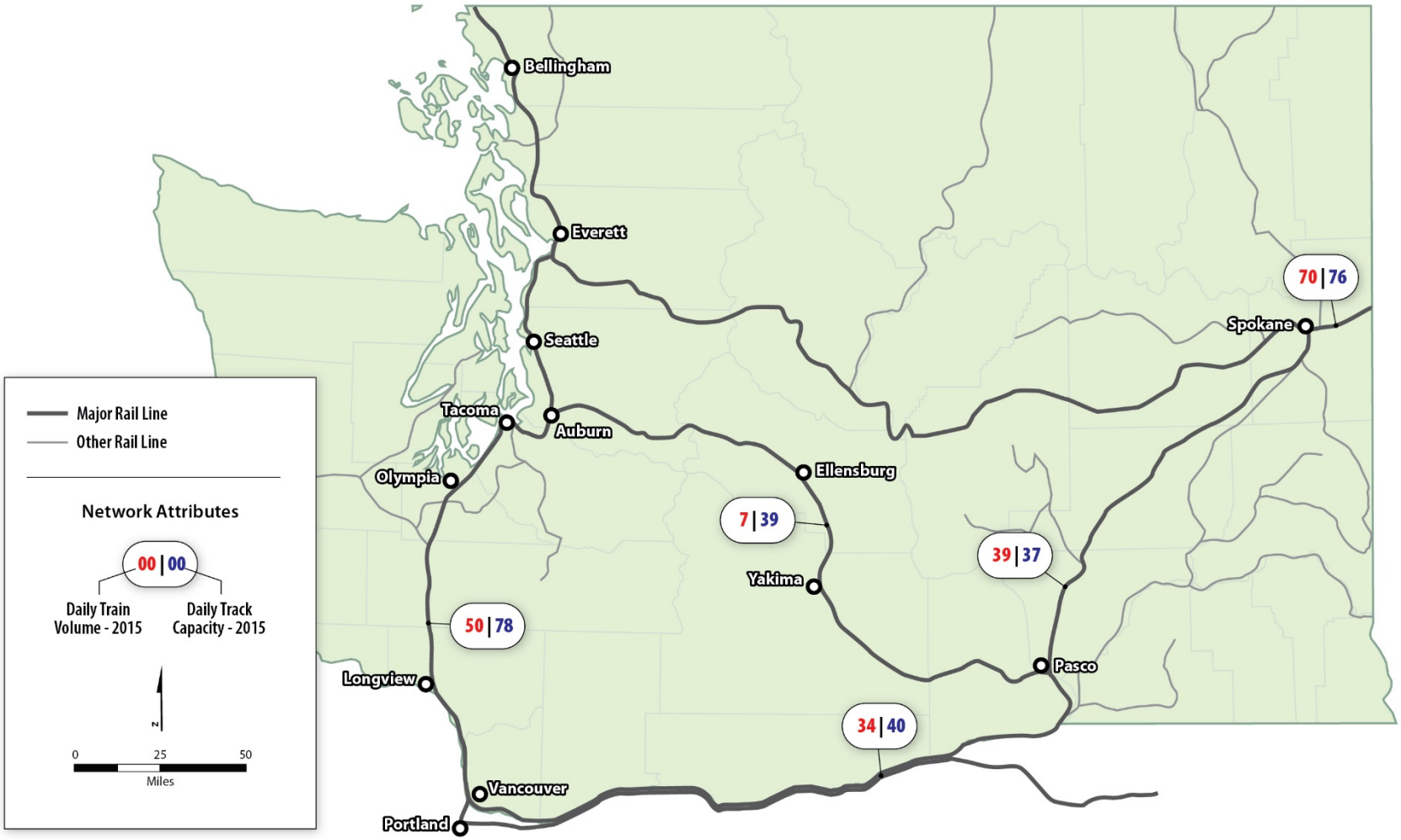
[5] Unlike unit trains, manifest trains are composed of rail cars with different commodities originating in different locations and delivered to different locations.

Table 5.1-3. Washington State Rail Route Segments

Route Segment	Railroad	Subdivision	Miles	Current Traffic Control System[a]	Current Main Tracks [a]	Current Passenger Train Route?	Future Passenger Train Route?	Estimated 2015 Capacity (Trains/day)[b]	Estimated 2015 Trains Per Day[c]	Projected 2035 Trains per Day[a]
Idaho/Washington State Line-Spokane	BNSF	Spokane	18.6	CTC	2	Yes	Yes	76	70	125
Spokane-Pasco	BNSF	Lakeside	145.5	CTC	1	Yes	Yes	37	39	66
Pasco-Vancouver	BNSF	Fallbridge	221.4	CTC	1	Yes	Yes	40	34	56
Vancouver-Longview Junction	BNSF	Seattle	34.8	CTC	2	Yes	Yes	78	50	85
Longview Junction-LVSW Yard (BNSF Spur)	BNSF	LVSW	2.1	TWC	1	No	No	16	7	N/A
LVSW Yard-Project Area (Reynolds Lead)	BNSF	LVSW	5.0	TWC	1	No	No	16	2	N/A
Longview Junction-Auburn	BNSF	Seattle	118.6	CTC	2	Yes	Yes	78	50	85
Auburn-Yakima	BNSF	Stampede	139.6	TWC	1	No	No	39	7	13
Yakima-Pasco	BNSF	Yakima Valley	89.4	TWC	1	No	No	39	7	13

Notes:
[a] Source: Washington State Department of Transportation 2014b, extrapolated to 2015.
[b] Source: Washington State Department of Transportation 2014b, extrapolated to 2015, and Cambridge Systematics 2007.
[c] Source: Washington State Department of Transportation 2014b; LVSW pers. comm.; Port of Longview pers. comm.
LVSW = Longview Switching Company; CTC = Centralized Traffic Control; TWC = Traffic Warrant Control; N/A = No projection available for route segment

Figure 5.1-3. Estimated Washington State Rail Network Daily Track Utilization in 2015



- **Idaho/Washington State Line–Spokane.** This segment covers 18.6 miles and is part of BNSF's Kootenai River Subdivision. It is a double track with CTC. Capacity is approximately 76 trains per day and volume is approximately 70 trains per day. All BNSF trains between the eastern part of BNSF's system and points in Washington State move over this segment. Train traffic includes intermodal, grain, coal and general manifest trains. Amtrak's Empire Builder passenger service between Chicago, Illinois; Seattle, Washington; and Portland, Oregon also uses this segment.
- **Spokane–Pasco.** This corridor covers 145.5 miles and is part of BNSF's Lakeside Subdivision. This line is mostly single track with CTC. Capacity is approximately 37 trains per day and volume is approximately 39 trains per day. Train traffic on this segment includes intermodal, grain, coal and general manifest trains. The Portland section of Amtrak's Empire Builder passenger service uses this segment. BNSF is currently making upgrades to this segment, including adding a second main line in some areas.
- **Pasco–Vancouver.** This segment covers 221.4 miles and is BNSF's Fallbridge Subdivision, also known as the Columbia River Gorge route. It is mostly single track with CTC. Capacity is approximately 40 trains per day and volume is approximately 34 trains per day. Train traffic on this route includes intermodal, grain, coal and manifest. The Portland section of Amtrak's Empire Builder passenger service also uses this route. BNSF uses directional operations on this segment, which increases capacity by running westbound loaded unit trains on this segment and eastbound empty unit trains via Stampede Pass.
- **Vancouver–Longview Junction.** This segment covers 34.8 miles of BNSF's Seattle Subdivision. It is double track with CTC. About 21 miles of this segment is in Cowlitz County. Capacity is approximately 78 trains per day and volume is approximately 50 trains per day. This line also carries all UP trains between Portland, Oregon and Tacoma. Traffic includes intermodal, grain, coal and other unit trains along with manifest trains. This section of the BNSF line is also a key route for passenger trains. Amtrak's Coast Starlight trains to and from California and Amtrak Cascades trains between Eugene, Oregon and Seattle, Washington use this segment.

  Scheduled to be completed by 2017, WSDOT is constructing 3.7 miles of a third main track on the BNSF Seattle Subdivision main line between Longview Junction and Kelso. The purpose of the third main track is to enable 2 trains to pass while a train is simultaneously moving into or out of the Longview Junction yard (Washington State Department of Transportation 2014a). This would reduce the potential for delays to passenger and freight trains running through the area.
- **Longview Junction–Auburn.** This segment includes 118.6 miles of BNSF's Seattle Subdivision. About 18 miles of this segment are in Cowlitz County. There are two main tracks and traffic control is CTC. Current capacity is approximately 78 trains per day and volume is about 50 trains per day. Traffic on this line includes intermodal, empty coal, and grain trains returning to the east and manifest trains. This segment is also a key section for passenger trains. Amtrak's Coast Starlight trains to/from California and Amtrak Cascades trains use this route as do Sound Transit Sounder commuter trains on the section between Tacoma and Auburn.
- **Auburn–Yakima.** This segment is known as BNSF's Stampede Pass route. The Auburn–Yakima segment covers 139.6 miles and makes up BNSF's Stampede Subdivision. The track structure is mostly single track and traffic control is mostly TWC with some segments of CTC. Current capacity is approximately 39 trains per day and volume is approximately 7 trains per day. Traffic volume consists largely of empty coal and grain trains. BNSF uses directional operations

on this segment, which increases capacity by running eastbound unit trains on this segment and westbound loaded unit trains via the Columbia River Gorge.

- **Yakima–Pasco.** This segment covers 89.4 miles. It makes up BNSF's Yakima Valley Subdivision. The track structure is mostly single track and traffic control is mostly TWC with some segments of CTC. Current capacity is approximately 39 trains per day and volume is approximately 7 trains per day. Traffic volume consists largely of empty coal and grain trains returning to the east and some manifest trains.

5.1.4.4 Main Line Routes Beyond Washington State

Proposed Action-related trains from the Powder River Basin operating on BNSF rail lines would move west to Huntley, Montana. From Huntley, Montana to Sandpoint, Idaho, BNSF typically operates coal and other trains over Montana Rail Link tracks. This route is mostly single track with CTC traffic control; however, some sections have two main tracks. From Sandpoint, Idaho, trains would move back to BNSF tracks and cross into Washington State moving toward Spokane. Capacity is approximately 30 to 75 trains per day, depending upon the specific location and track characteristics, and volume is 25 to 28 trains per day (Federal Railroad Administration 2012).

Proposed Action-related trains from the Uinta Basin and Powder River Basin operating on UP rail lines would travel through Pocatello and Boise, Idaho; then along the Oregon side of the Columbia River to the North Portland Junction. From North Portland Junction, UP trains would operate on BNSF tracks, crossing the Columbia River to Vancouver and heading north on the BNSF Seattle Subdivision to Longview Junction. This segment has mostly one main track with CTC or ABS. Capacity is approximately 18 to 75 trains per day, depending on the specific location and track characteristics, and volume is 8 to 16 trains per day.

5.1.5 Impacts

This section describes the potential direct and indirect impacts related to rail transportation that would result from construction and operation of the Proposed Action and No-Action Alternative.

LVSW proposes to upgrade the Reynolds Lead and part of the BNSF Spur as a separate action should it be warranted by increased rail traffic resulting from existing and future customers. These upgrades would include adding ballast, replacing ties, and upgrading rail. These improvements would provide for safer operations and increased speed over the BNSF Spur and Reynolds Lead. LVSW proposes they would also install signals and upgrade the traffic control system to CTC and add an electric, remotely operated switch from the BNSF Spur to the Reynolds Lead. The signaling would add capacity, allowing trains to be spaced closer together and the electronic switch would eliminate the need for all loaded and empty trains (existing trains and Proposed Action-related trains) to stop while a train crew member operates the switch. Construction of these improvements would take approximately 6 months. Because these improvements are not certain, the impact analysis analyzes infrastructure with and without these planned improvements.

5.1.5.1 Proposed Action

This section describes the potential impacts that could occur in the study area as a result of construction and operation of the Proposed Action.

At full operation, Proposed Action-related trains would add 8 loaded and 8 empty coal trains per day (16 total trains per day) to the rail lines between the Powder River Basin or the Uinta Basin and the project area. Section 5.1.3.2, *Impact Analysis,* describes and Figure 5.1-1 illustrates the expected rail routes for Proposed Action-related trains.

Construction—Direct Impacts

The Reynolds Lead would be modified within the project area to accommodate unit train access to and from the coal export terminal. Because the project area is at the terminus of the Reynolds Lead, this construction would not affect existing rail traffic on the Reynolds Lead. Chapter 2, *Project Objectives, Proposed Action, and Alternatives*, describes construction-related activities and scenarios to transport materials to the project area. Under the rail scenario, trains transporting construction materials would travel to and from the project area. The unloading and maneuvering of these trains during construction within the project area would not affect the operations of existing rail traffic on the Reynolds Lead.

Construction—Indirect Impacts

Construction of the Proposed Action would result in the following indirect impact on rail transportation.

Add Temporary Rail Traffic for Transport of Construction Materials

The Applicant proposes that approximately 2.1 million yards of rock would be needed for construction. This material would be transported to the project area by truck or rail, as described in Chapter 2, *Project Objectives, Proposed Action, and Alternatives*. The Applicant estimates approximately two-thirds of the volume (1.4 million yards) would move during the first year of construction, assumed to be 2018. The Applicant has further proposed that moving materials by rail would require an estimated 350 loaded trains of 100 cars each, equivalent to 700 trains (loaded and empty) over the entire construction period. During the first year of construction, when two–thirds of the volume would be transported, this would amount to approximately 467 trains, or an average of 1.3 trains per day in 2018.

The baseline rail traffic from Longview Junction to the LVSW yard in 2018 is an average of 7 trains per day. The current capacity over these segments is approximately 16 trains per day. Baseline rail traffic and Proposed Action-related construction trains per would not exceed capacity of the Reynolds Lead and BNSF Spur.

This construction rail traffic would use BNSF main line routes in Washington State in 2018. Due to the low number of trains per day compared to existing rail traffic volumes and the daily variability of rail traffic volumes, Proposed Action-related construction trains would not have significant impacts on rail capacity and operations on BNSF main line routes.

Operations—Direct Impacts

During operations, 8 loaded trains would travel to the project area daily, and 8 empty trains would travel outbound from the project area daily. These trains would maneuver along the rail loop in the project area. Rail traffic operations within the project area would not affect rail traffic on the Reynolds Lead because rail operations would be limited to the project area.

Operations—Indirect Impacts

As described previously, LVSW has indicated plans to upgrade the Reynolds Lead and part of the BNSF Spur as a separate action should it be warranted by increased rail traffic resulting from existing and future customers. Because these improvements are not certain, the impact analysis analyzes infrastructure with and without these planned improvements.

Operation of the Proposed Action would result in the following indirect impacts on rail transportation.

Add Rail Traffic on the BNSF Spur and Reynolds Lead

Proposed Action-related loaded trains would move from Longview Junction to the project area, and the reverse, moving empty trains from the project area to Longview Junction. This movement would add rail traffic to the BNSF Spur and Reynolds Lead. The coal export terminal at full throughput in 2028, would receive an average of 8 loaded trains and return an average of 8 empty trains per day. Therefore, 16 Proposed Action-related trains per day would operate on the Reynolds Lead and BNSF Spur.

If LVSW does not make improvements to the Reynolds Lead and BNSF Spur, capacity of the Reynolds Lead and BNSF Spur would be approximately 16 trains per day. The baseline volume is an average of 7 trains per day on the BNSF Spur and 4 trains per day on the Reynolds Lead (2 existing trains and 2 trains with the No-Action Alternative, as described in Section 5.1.5.2, *No-Action Alternative*). Proposed Action-related trains would add 16 trains per day (8 loaded and 8 empty) on each of these segments for a total of 23 trains on the BNSF Spur and 20 trains on the Reynolds Lead. Without improvements to increase capacity, neither the Reynolds Lead nor BNSF Spur would have the capacity to handle baseline rail traffic and Proposed Action-related rail traffic. Without improvements to the Reynolds Lead and BNSF Spur, the Proposed Action would result in a significant adverse impact on rail traffic on the Reynolds Lead and BNSF Spur.

As described previously, LVSW has indicated they expect to expand capacity to meet projected volume from Proposed Action-related trains or any other action, consistent with typical U.S. railroad policy to accommodate freight traffic. LVSW has indicated that it would upgrade the traffic control technology on both the BNSF Spur and the Reynolds Lead from TWC to CTC. The proposed upgrade in traffic control technology would increase capacity on both segments from 16 trains per day to approximately 30 trains per day. This improvement would provide sufficient capacity to handle baseline rail traffic and Proposed Action-related rail traffic. However, this improvement is not currently funded or permitted.

In addition to CTC, LVSW indicated it would upgrade the track on the Reynolds Lead and BNSF Spur. Upgrades would include additional ballast, replacing ties, and upgrading the rail. These improvements would provide for a safer operation and allow for an increase in maximum speed from 10 mph to up to 25 mph on the Reynolds Lead. The speed limit on the BNSF Spur is influenced by the speed limit across the Cowlitz River Bridge, which would remain at 10 mph. LVSW would also install a remotely operated electric switch from the BNSF Spur to the Reynolds Lead to allow for continuous movement and more consistent operation. The electronic switch would eliminate the need for Proposed Action-related trains to stop while a train crew member operates the switch. While LVSW has planned for the capital investment, it has not begun work or applied for permits. LVSW would start the permit process and would make these investments

once it was reasonably certain that the projected volume, from existing or future customers, would materialize.

Table 5.1-4 provides additional information on anticipated operations over the Reynolds Lead and BNSF Spur, including the average time for Proposed Action-related trains to cross each of the at-grade road/rail crossings with the existing track infrastructure and with the planned infrastructure improvements.

Table 5.1-4. BNSF Spur and Reynolds Lead At-Grade Crossing Detail for Proposed Action-Related Trains

	Dike Road	3rd Avenue	California Way	Oregon Way	Industrial Way
Current Track Infrastructure					
Estimated speed	10 mph	8 mph	8 mph	10 mph	10 mph
Estimated passing time	8 minutes	10 minutes	10 minutes	8 minutes	8 minutes
Planned Track Infrastructure					
Estimated speed	10 mph	15 mph	15 mph	20 mph	20 mph
Estimated passing time	8 minutes	5 minutes	5 minutes	4 minutes	4 minutes

Notes:
Source: ICF International and Hellerworx 2016
mph = miles per hour

Add Rail Traffic on the BNSF Main Line in Cowlitz County

The Proposed Action would add rail traffic on the BNSF main line to and from Longview Junction within Cowlitz County.

This segment has two main tracks with CTC. Projected 2028 capacity without improvements or operating changes is approximately 80 trains per day. Projected 2028 volume with Proposed Action-related BNSF trains to and from the Powder River Basin is 81 trains per day; therefore, the projected volume on this segment with Proposed Action-related trains would exceed capacity (80 trains per day).

If all 16 Proposed Action-related trains use the segment between Vancouver and Longview Junction (UP trains), the 2028 volume on this segment in Cowlitz County south of Longview Junction would be 89 trains daily and would exceed capacity without improvements (80 trains daily). This would represent a significant adverse impact on the BNSF main line in Cowlitz County. It is expected that BNSF and UP would make the necessary investments or operating changes to accommodate the growth in rail traffic, but it is unknown when these actions would be taken or permitted.

Add Rail Traffic on BNSF Main Line Routes in Washington State beyond Cowlitz County

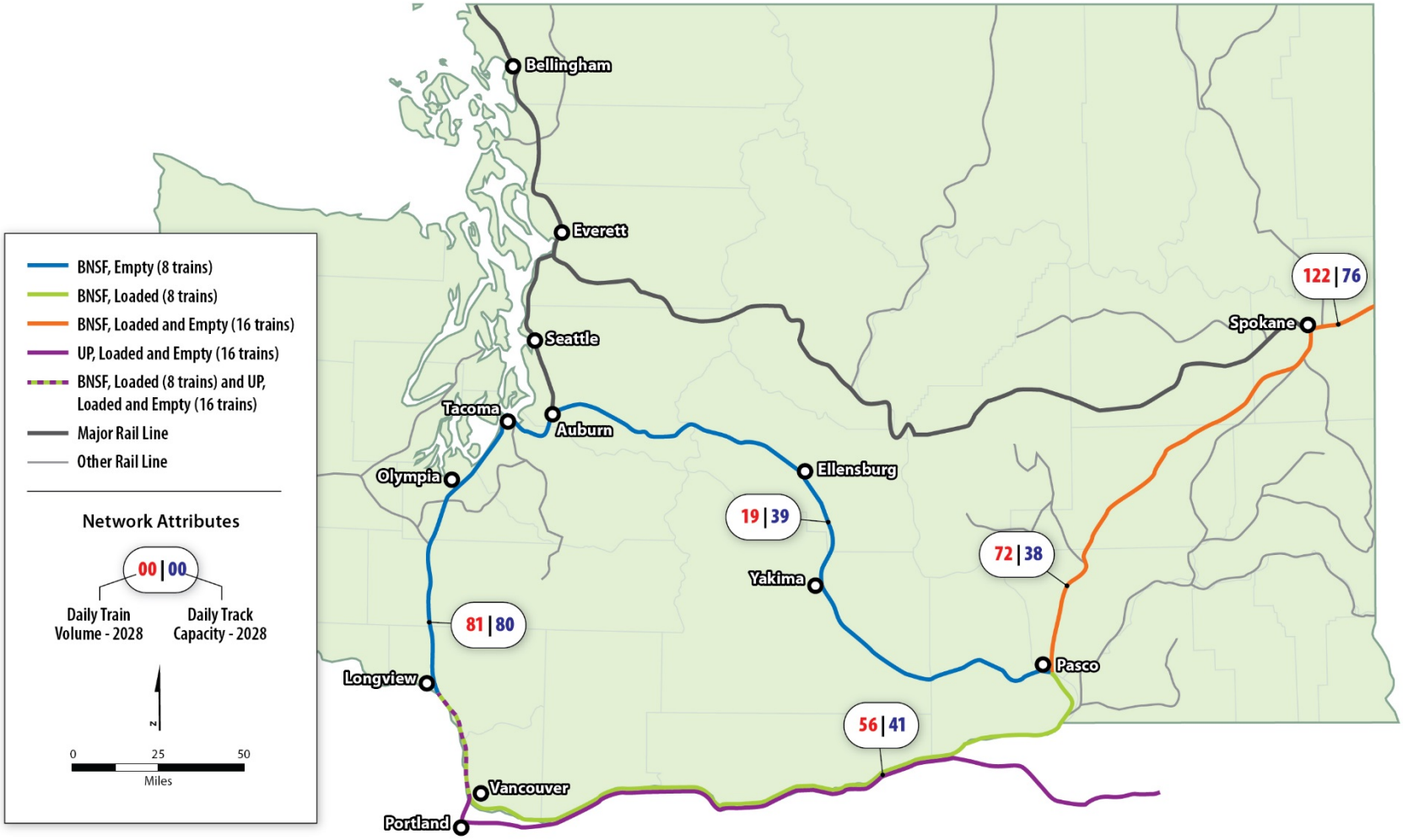
The Proposed Action would add rail traffic to the BNSF main line routes in Washington State, as summarized in Table 5.1-5. Figure 5.1-4 illustrates the projected 2028 rail traffic volume and capacity on BNSF main line routes in Washington State with Proposed Action-related trains. The projected rail traffic assumes that directional running continues per existing BNSF operational policies, by routing westbound-loaded unit trains via Vancouver through the Columbia River Gorge, and eastbound empty unit trains via Stampede Pass.

Table 5.1-5. Infrastructure Capacity and Projected Rail Traffic

Route Segment	Railroad	Subdivision	Current Traffic Control System[a]	Current Main Tracks[a]	Projected 2028 Capacity (trains/day)[b]	Miles	Estimated Baseline 2015 (trains/day)[b,c]	Projected Baseline Trains 2028 (trains/ day) [b,c,e]	2028 with Proposed Action (trains/ day)	Projected 2028 Capacity Surplus (Deficit)[f]
Idaho/Washington State Line-Spokane	BNSF	Spokane	CTC	2	76	18.6	70	106	122	(46)
Spokane-Pasco	BNSF	Lakeside	CTC	1	38	145.5	39	56	72	(34)
Pasco-Vancouver	BNSF	Fallbridge	CTC	1	41	221.4	34	48	56	(15)
Vancouver-Longview Junction	BNSF	Seattle	CTC	2	80	34.8	50	73	81	(1)
Longview Junction-LVSW Yard (BNSF Spur)	BNSF	LVSW	TWC	1	16	2.1	7	7	23	(7)
LVSW Yard-Project Area (Reynolds Lead)	BNSF	LVSW	TWC	1	16	5.0	2	4	20	(4)
Longview Junction-Auburn	BNSF	Seattle	CTC	2	80	118.6	50	73	81	(1)
Auburn-Yakima	BNSF	Stampede	TWC	1	39	139.6	7	11	19	20
Yakima-Pasco	BNSF	Yakima Valley	TWC	1	39	89.4	7	11	19	20

Notes:
[a] Source Washington State Department of Transportation 2014b.
[b] Source Washington State Department of Transportation 2014b (without improvements), except LVSW rail line segments.
[c] Source: Federal Railroad Administration 2012; Wolter pers. comm.; Port of Longview pers. comm.
[e] Washington State Department of Transportation 2014b.
[f] Projected capacity surplus/deficit without infrastructure improvements or changes in operations. Shaded black values indicate a projected capacity deficit.
CTC = Centralized Traffic Control; TWC = Traffic Warrant Control

Figure 5.1-4. Projected Washington Rail Network Daily Track Utilization in 2028 with Proposed Action-Related Trains



The projected increase in rail traffic relative to capacity is described for segments in Washington State beyond Cowlitz County below.

- **Idaho/Washington State Line–Spokane**. All Proposed Action-related BNSF trains to and from the Powder River Basin would move over this segment. This segment has two main tracks with CTC. Projected 2028 capacity without improvements is 76 trains per day. The capacity concerns for this segment extend beyond Washington State to Sandpoint, Idaho. This potential constraint is identified in the *Washington State Rail Plan* as a key potential chokepoint.

  The projected volume in 2028 is 122 trains per day, including Proposed Action-related trains. The Proposed Action would add 16 trains to a segment that would exceed capacity under 2028 baseline conditions. Without improvements or operating changes, Proposed Action-related trains would contribute to congestion or delays on this segment, or the inability of BNSF to handle its rail traffic. It is expected that BNSF would make the necessary investments or operating changes to accommodate the growth in rail traffic, but it is unknown when these actions would be taken or permitted.

- **Spokane–Pasco**. All Proposed Action-related BNSF trains to and from the Powder River Basin would move over this segment. This segment has one main track and CTC. Projected 2028 capacity without improvements or operating changes is 38 trains per day. This potential constraint is identified in the *Washington State Rail Plan* as a key potential chokepoint.

  The projected volume in 2028 is 72 trains per day, including Proposed Action-related trains. The Proposed Action would add 16 trains to a segment that would exceed capacity under 2028 baseline conditions. Without improvements or operating changes, Proposed Action-related trains would contribute to congestion or delays on this segment, or the inability of BNSF to handle its rail traffic. It is expected that BNSF would make the necessary investments or operating changes to accommodate the growth in rail traffic, but it is unknown when these actions would be taken or permitted.

- **Pasco–Vancouver**. Loaded Proposed Action-related BNSF trains from the Power River Basin would move over this segment. The segment has one main track with CTC. Proposed Action capacity without improvements is 41 trains per day. This potential constraint is identified in the *Washington State Rail Plan* as a significant capacity concern.

  The projected volume in 2028 is 56 trains per day, including Proposed Action-related trains. The Proposed Action would add 8 trains to a segment that would exceed capacity under 2028 baseline conditions. Without improvements or operating changes, Proposed Action-related trains would contribute to congestion or delays on this segment, or the inability of BNSF to handle its rail traffic. It is expected that BNSF would make the necessary investments or operating changes to accommodate the growth in rail traffic, but it is unknown when these actions would be taken or permitted.

- **Vancouver–Longview Junction and Longview Junction–Auburn (outside Cowlitz County)**. This is the same segment described for Cowlitz County. This segment has two main tracks with CTC. Projected 2028 capacity without improvements or operating changes is approximately 80 trains per day. Projected 2028 volume with Proposed Action-related BNSF trains to and from the Powder River Basin is 81 trains per day; therefore, the

projected volume on this segment with Proposed Action-related trains would exceed capacity (80 trains per day).

If all 16 Proposed Action-related trains use the segment between Vancouver and Longview Junction (UP trains), the 2028 volume on this segment would be 89 trains daily and would exceed capacity without improvements (80 trains daily). This would represent a significant adverse impact on the BNSF main line. It is expected that BNSF and UP would make the necessary investments or operating changes to accommodate the growth in rail traffic, but it is unknown when these actions would be taken or permitted.

- **Auburn–Yakima and Yakima–Pasco.** Empty Proposed Action-related BNSF trains returning to the Powder River Basin would move over these segments. With Proposed Action-related rail traffic, the projected rail traffic on these segments is 19 trains per day in 2028. Projected 2028 capacity is 39 trains per day so these segments would not exceed capacity with Proposed Action-related trains in 2028.

Add Rail Traffic on BNSF and UP Rail Routes Outside Washington State

The Proposed Action would add 8 loaded and 8 empty trains per day (16 trains) to existing rail traffic beyond Washington State. The current rail traffic on the BNSF main lines is approximately 25 to 28 trains per day and the capacity is approximately 30 to 75 trains per day, depending on location and track characteristics. The addition of 16 Proposed Action-related trains per day could result in rail traffic on some segments exceeding capacity if no capacity expansions were made. The current rail traffic on the UP route is approximately 8 to 16 trains per day and a capacity of 18 to 75 trains per day, depending on location and track characteristics. Proposed Action-related trains could also result in rail traffic exceeding capacity on some parts of the UP route if no capacity expansions or operating changes were implemented.

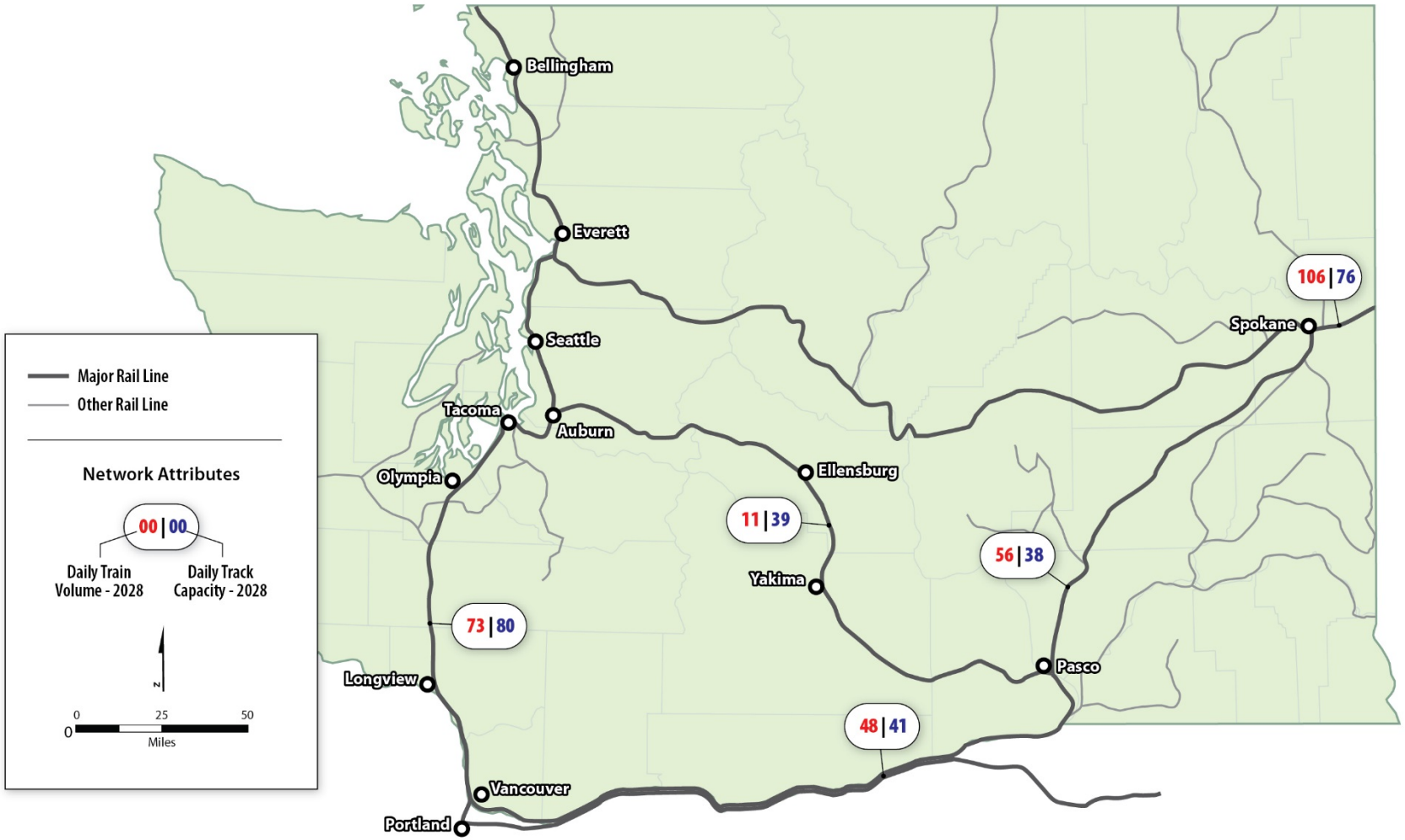
5.1.5.2 No-Action Alternative

Under the No-Action Alternative, the Applicant would not construct the proposed coal export terminal. The Applicant would continue with current and future increased operations in the project area. The project area could be developed for other industrial uses including an expanded bulk product terminal or other industrial uses. The Applicant has indicated that, over the long term, it would expand the existing bulk product terminal and develop new facilities to handle more products such as calcine petroleum coke, coal tar pitch, and cement.

The Applicant's planned growth under the No-Action Alternative would require approximately 2 additional trains per day on the Reynolds Lead, BNSF Spur, and BNSF main line in Cowlitz County regardless of whether the coal export terminal is constructed. The existing infrastructure on the Reynolds Lead, BNSF Spur, and BNSF main line would provide sufficient capacity to handle the projected growth in baseline traffic and investments to increase capacity would not be necessary.

Some BNSF main line segments would exceed capacity in 2028 if BNSF does not make capital investments or operating changes to expand capacity. Projected 2028 baseline traffic volumes are included in Table 5.1-5 and illustrated in Figure 5.1-5.

Figure 5.1-5. Projected Washington Rail Network Daily Track Utilization, 2028 Baseline Conditions without Proposed Action–Related Trains



5.1.6 Required Permits

No permits related to rail transportation would be required for the Proposed Action.

5.1.7 Potential Mitigation Measures

This section describes the potential mitigation measures that would reduce impacts related to rail transportation from construction and operation of the Proposed Action. These mitigation measures would be implemented in addition to project design measures, best management practices, and environmental compliance that are assumed as part of the Proposed Action. Impacts on vehicle safety at grade crossings and measures by the Applicant to mitigate such impacts are discussed in Section 5.3, *Vehicle Transportation*.

5.1.7.1 Applicant Mitigation

The Applicant will implement the following mitigation measures to mitigate impacts on rail transportation.

MM RT-1. Coordinate with LVSW about Operations on the Reynolds Lead and BNSF Spur.

To address potential impacts to rail capacity on the Reynolds Lead and BNSF Spur, the Applicant will coordinate with LVSW before each identified operational stage (Stage 1a, Stage 1b, and Stage 2) that will change average daily rail traffic on the Reynolds Lead and BNSF Spur. The Applicant will prepare a report to document the coordination with LVSW and changes to average daily rail traffic. The report will be submitted to LVSW and Cowlitz County at least 6 months before the change in average daily rail traffic.

MM RT-2. Coordinate with BNSF and UP about Operations on Main Line Routes.

To address potential impacts to rail capacity on main line routes in Washington State, the Applicant will coordinate with BNSF and UP before each identified operational stage (Stage 1a, Stage 1b, and Stage 2) that will change average daily rail traffic on main line routes in Washington State. The Applicant will prepare a report to document the coordination with BNSF and UP and changes to average daily rail traffic. The report will be submitted to BNSF, UP, and Cowlitz County at least 6 months before the change in average daily rail traffic.

Impacts on vehicle safety at grade crossings and measures by the Applicant to mitigate such impacts are discussed in Section 5.3, *Vehicle Transportation*.

5.1.7.2 Other Measures to Be Considered

The following measures should be considered by LVSW, BNSF, and UP to expand capacity to accommodate Proposed Action-related trains.

- **LVSW.** Consider improvements to track infrastructure or changes in operations to increase track capacity and service along the Reynolds Lead and BNSF Spur. This could include installing traffic control systems, installing a new switch from the BNSF Spur to Reynolds Lead, upgrading rail, adding new main track, or adding siding.

- **BNSF and UP (in Washington State).** Consider improvements to track infrastructure or changes in operations to increase track capacity. This could include upgrading main track, adding new main track, or extending or adding siding.
- **BNSF and UP (outside Washington State).** Consider improvements to track infrastructure or changes in operations to increase track capacity and service. This could include upgrading main track, adding new main track, extending or adding siding, or installing new traffic control systems.

Impacts on vehicle traffic delay and vehicle traffic safety at grade crossings and measures to mitigate such impacts are discussed in Section 5.3, *Vehicle Transportation*.

5.1.8 Unavoidable and Significant Adverse Environmental Impacts

Without improvements to increase capacity, the Reynolds Lead; BNSF Spur; and three segments on the BNSF main line routes in Washington State (Idaho/Washington State Line–Spokane, Spokane–Pasco, and Pasco–Vancouver) are not projected to have the capacity to handle the projected baseline rail traffic and Proposed Action-related rail traffic in 2028. BNSF could address capacity issues with capital improvements or operational changes, but it is unknown when these actions would be taken or permitted. Therefore, with existing infrastructure and using the methods to identify potential baseline rail traffic in 2028, the Proposed Action could result in a significant adverse environmental impact on rail transportation.