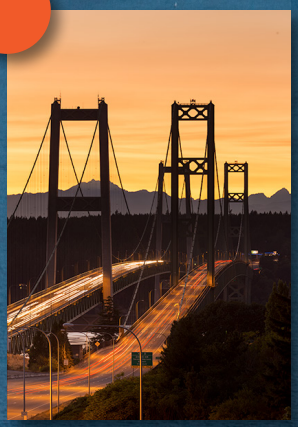
The Regional Transportation Plan — 2018

Appendix J

Regional Freight and Goods Movement



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APPENDIX J: Regional Freight and Goods Movement

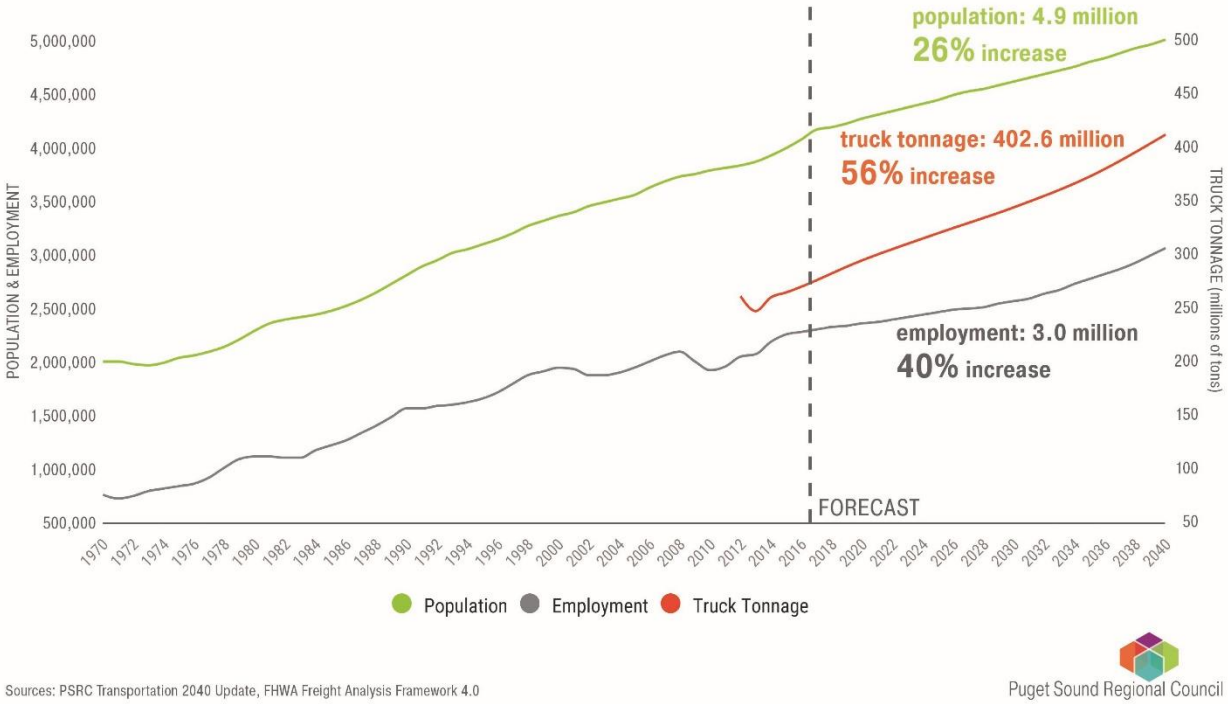
Freight and Goods Movement in a Growing Region

The efficient movement of freight and goods is a vital function for the central Puget Sound's regional transportation system. The Regional Transportation Plan underscores the importance of an efficient freight and goods transportation system in maintaining the region's quality of life, ensuring that businesses can deliver products and services to market, strengthening our economy, and leveraging the central Puget Sound region's strategic position as a critical gateway for international trade.

Why Is Freight Movement Growing in the Puget Sound Region?

It is helpful to understand some of the reasons why freight is moving through the region. Not all regional freight is related directly to regional consumers. Freight that is either of national or international origin or destination is typically discretionary in nature, meaning that it is moving through a supply chain based on factors based on cost and time. For the region, this freight is moving through as a point of transfer to destinations outside the region, state, or the country. Urban, or locally derived freight, is tied to regional population, employment, and economic activity. Both play a role in the regional freight and goods transportation system and provide a key function for the economy. With the region growing in population to reach 4.9 million by 2040, and accompanying employment to reach approximately 3 million jobs, demand for a wide range of freight services can be anticipated to increase as well. To provide context for considering freight growth alongside regional population and employment, refer to Figure 1: Growth in Population, Employment, and Truck Tonnage.

Figure 1: Growth in Population, Employment, and Truck Tonnage



Sources: PSRC Transportation 2040 Update, FHWA Freight Analysis Framework 4.0

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This growth in population and employment will depend on the region's freight system to deliver the goods and services that are needed daily, as well as to support the region's industries and businesses. Increasing demand for freight services means that increasing pressure will be placed on the region's freight transportation system-on the roads, airports, rail lines, and intermodal connectors that provide vital mobility to personal and freight transportation alike. The region will need to look for a variety of innovative solutions to ensure that these growing pressures do not threaten the efficiency and reliability of the region's transportation system, as well as contribute to negative environmental and community impacts.

Other factors influence demand for freight besides those related to regional population and employment growth. Growth in international trade is a driving factor for freight growth in the region. Increases in imports from markets overseas are contributing to freight growth as products are handled in the region and moved to markets throughout the rest of the country. Other contributing factors include changes in national and international supply chain and logistics patterns that are constantly adapting to deliver goods to market in the most cost-effective and time sensitive method available.

The region's deepwater marine ports, airports, and railroads play a strategic role in international freight, providing a competitive gateway for international imports and domestic exports. Much of the cargo moving through the Northwest Seaport Alliance (NWSA) for instance moves through the region because it is strategically located in proximity to Asia. With North American gateways in Southern California, and British Columbia being an increasingly compelling choice for shippers, maintaining the region's strategic competitive advantages will be an important function of the regional freight and goods transportation system as the region plans for future growth.

The Regional Freight and Goods Transportation System

All the functions of the region's freight and goods transportation system are provided by a multimodal network that includes highway, rail, air, marine, and pipeline operations. The regional freight and goods transportation system is unique in that it relies on a complex interrelated and inter-dependent combination of public, as well as private, transportation facilities and services. Additionally, the region's intermodal military system represents an important factor to consider as military equipment is moved by air, rail, highway, and by sea.

What Factors Determine How Freight Moves?

Freight modal choice - This is often a complicated process that includes considerations of the product characteristics, trip characteristics, supply chain needs, costs, and the availability of a particular freight mode.

Product characteristics – These include the size, weight, value, and perishability of the commodity. Commodities that are perishable, high-value, or small tend to be carried by air cargo or truck modes, but will likely not make sense as a rail commodity. Similarly, heavy, low-value, or bulky materials will likely be carried by rail, barge, or truck but are less likely to be an air cargo commodity. Time sensitivity is important, with products where delivery time is less important taking slower choices such as rail, but with products where delivery time is most important taking some form of truck or air freight. High-tech manufacturing components will likely favor truck or air cargo modes to provide safe shipment for the high-value, lightweight materials used in the production process.

Trip characteristics – These include the length of the trip being made and how "in-demand" a product is. According to the 2012 Commodity Flow Survey the average length haul of U.S. freight shipments was about 262 miles. However, the average rail shipment was 905 miles in length, air shipments averaged 1,295 miles in length, and truck trips averaged 227 miles.[1] Shippers that needs to send goods longer distances may be more likely to consider rail freight while those with shorter distances may find trucking to provide the flexibility that is needed.

Supply chain characteristics - Many companies now operate on a "Just in Time" strategy, where on-site inventory is very small and a constant supply of goods serves to replenish raw materials. A product that is part of a "Just in Time" supply chain process will need be shipped with a transportation mode that is relatively fast and reliable, such as truck or air. Materials that are supplying a more traditional, inventory-rich industry will not be as time-sensitive, and could potentially be shipped with a more cost-effective freight mode such as rail or barge.

Availability of freight mode choice - There aren't always a wide variety of freight transportation modes available. The Class 1 railroads[2] have been abandoning or selling right-of-way that have been less profitable than previous times, leaving many communities previously reliant upon rail service without this option.

What are the major components of the regional freight and goods transportation system?

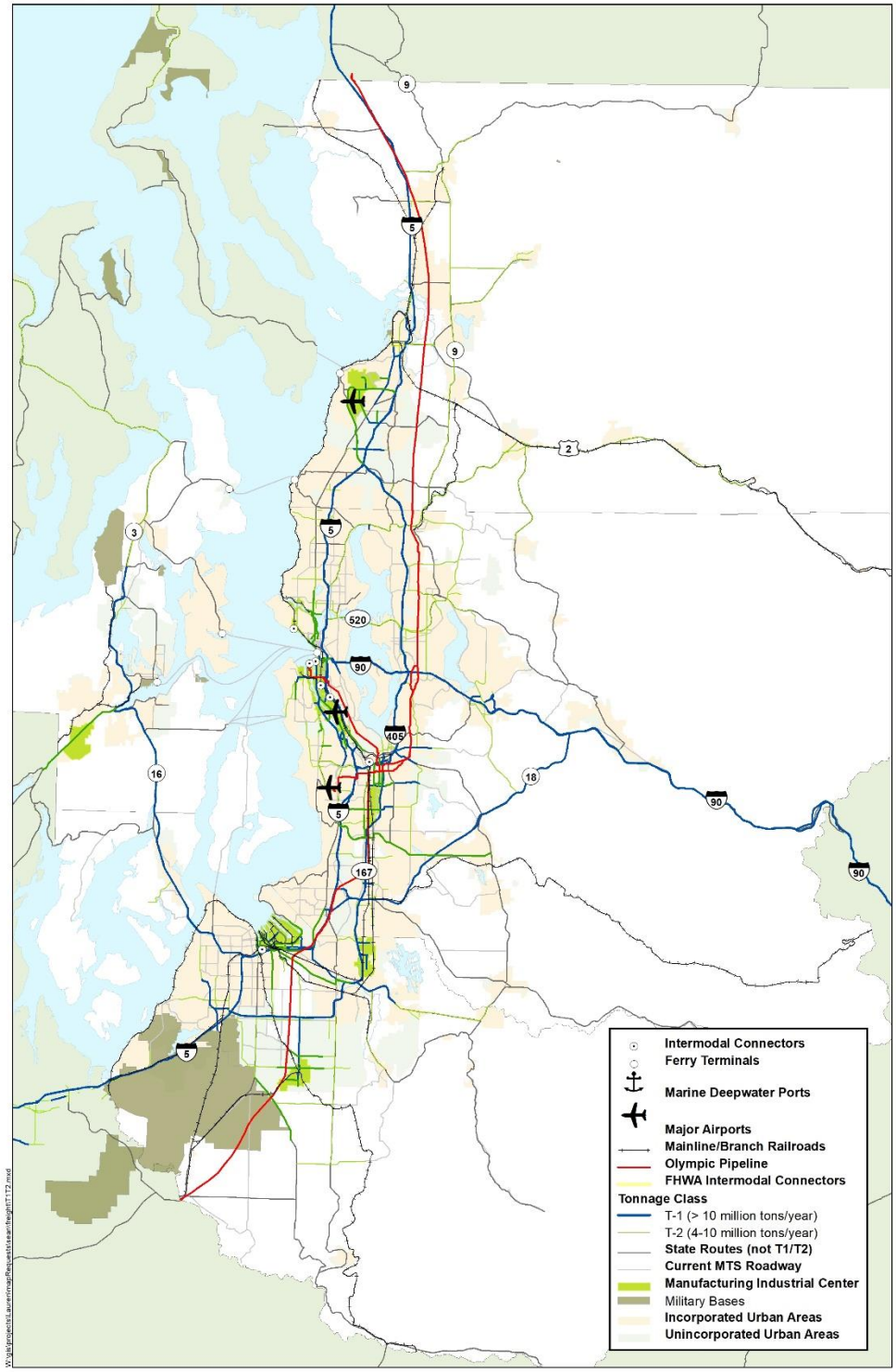
The region's freight and goods movement needs are served by a complex and interrelated system of both publicly and privately owned and managed transportation components. To gain a better

[1] 2012 Commodity Flow Survey, U.S. Census, February 2015.

[2] The Federal Railroad Administration defines the Class 1 railroads as being the 7 primary freight railroads with operating revenues of $433.2 million or more.

understanding of how the regional freight and goods transportation works, it is necessary to consider all of these components together as part of the larger supply chain picture. A comprehensive map showing the major elements of the regional freight and goods transportation system is provided in below in Figure 2: 2017 Regional Freight and Goods Transportation System.

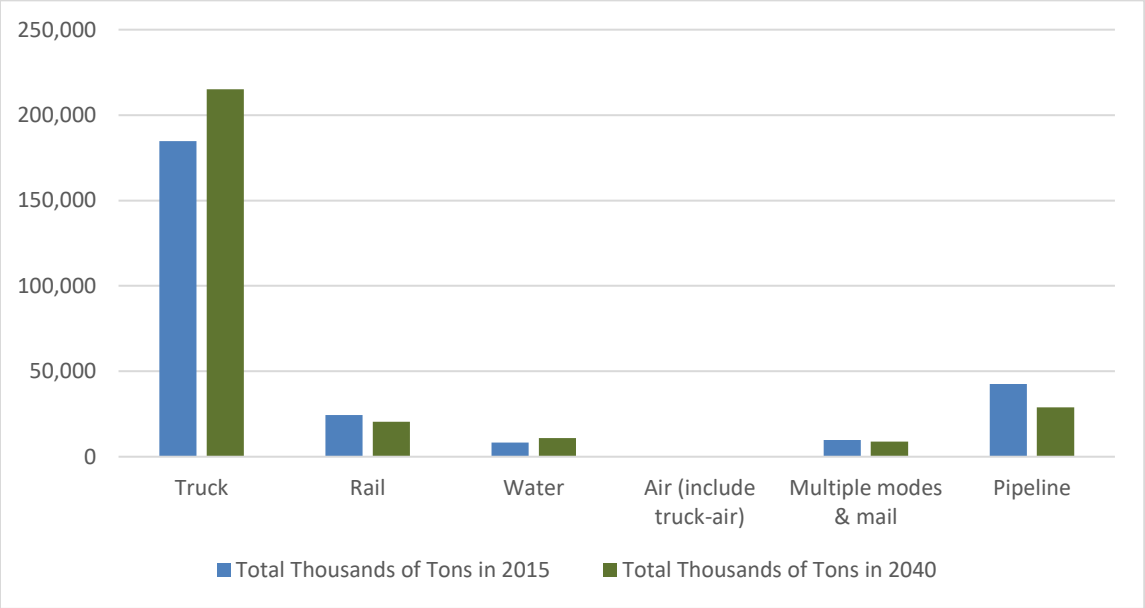
Figure 2: 2017 Regional Freight and Goods Transportation System



Trucking and Regional Distribution - Trucks depend on the regional roadway system

The majority of freight moving in the region moves by truck. Approximately 68% of regional freight movement by weight is moved by truck, and approximately 60% by value.[3] Most of the freight that is trucked through the region either originated from, or is destined for, other locations within Washington State. Models show that these trucks represent more than 160 million tons of freight when compared to the next highest state of origin or destination, Oregon, which represents just under 10 million tons. This data helps to confirm that trucks are typically the most economical and flexible choice for relatively shorter distance trips such as those within the state. Whether goods move long distances across country, or are serving the local delivery system, trucks are the most prevalent mode of choice.

Figure 3: Combined Domestic Freight Growth in Tons by Mode – Central Puget Sound Region (including within Washington State)



Roadway facilities include major trade corridors, as well as national, state, and local roadway links. International and domestic trade for the region is served by infrastructure including Interstates 5 and 405, which provide north-south connectivity to and from the region and the other major economies on the West Coast including the greater Vancouver, BC region, and northern and southern California. Interstate 90 provides east-west connectivity and links the region to major national and international markets. These trade corridors are fed by many national, state, and local roads, and connecting facilities that serve to support local businesses and population by connecting population centers and industries to outlying markets.

[3] 2017 FHWA FAF 4.0 Database

Washington State Department of Transportation (WSDOT) maintains a statewide Freight and Goods Transportation System (FGTS) classification that serves as a biannual inventory of all highways, county roads, and city streets with reported tonnage for trucks, with facilities ranked from heaviest at over 10 million gross tons annually (T1), to those carrying much less. This network provides a useful planning tool that PSRC and others use when considering which roads are being used most heavily by trucks. The most recent update was conducted in 2017 which is reflected in Figure 2: Regional Freight and Goods Transportation System.

The WSDOT FGTS classifies roadways using the following categories:
T1: more than 10 million tons per year
T2: 4 million to 10 million tons per year
T3: 300,000 to 4 million tons per year
T4: 100,000 to 300,000 tons per year
T5: at least 20,000 tons in 60 days and less than 100,000 tons per year
Truck freight tonnage values are derived from actual or estimated truck traffic counts and converted into average weights by truck type.

Local Deliveries and Urban Freight - Up to 80 percent of all truck trips in metropolitan areas are generated by deliveries of goods and services in the regional and local distribution system.[4] Regional businesses depend on efficient and reliable regional deliveries, and residents need products from retailers and service providers that all originate on a truck. Demand for the transportation system related to trucking can be anticipated to increase with population and employment growth, as well as from changes in technology and consumer preferences. The tremendous growth in e-commerce for consumer shopping means that more households will be receiving a greater number of deliveries direct to the doorstop resulting in changes in terms of truck trips and distribution patterns that are still being understood. Growth in e-commerce at the national level has changed from approximately 3.5% of all total sales in early 2008, to approximately 8.2% for the second quarter of 2017.[5] Most of these local deliveries are occurring using light or medium trucks that are a familiar sight at restaurants and grocery stores for specialty deliveries, or in neighborhoods receiving deliveries from FedEx or UPS.

Long-Haul Trucking - For goods that are moved longer distances, heavy trucks are the preferred choice. The region sees more than 80,000 heavy truck trips daily, most of which occur in the mid-day period with approximately 23% of these originating or terminating somewhere outside the region. Of the heavy trucks that originate or terminate somewhere outside the region, approximately 38% are delivering freight to this region, approximately 41% are delivering something from here, and approximately 21% are merely passing through the region.[6]

Drayage Trucking - Intermodal cargo movements related to the region's ports sometimes require the transfer of containers between ship and rail, or from ship or rail to transload[7] centers using shorter distance truck movements known as drayage. Drayage trucking occurs to some degree at all the region's cargo ports, including Port of Tacoma, and is particularly dominant at Port of Seattle terminals as containers are moved to and from the ARGO railyard (Union Pacific Railroad), SIG railyard (BNSF Railroad) or other regional transload centers. Exact figures are not available regarding the number of drayage truck trips that occur regionally, but it is estimated that approximately 75% of internationally

[4] 2017 WSDOT Freight System Plan
[5] U.S. Census Bureau News, Quarterly Retail E-Commerce Sales Second Quarter 2017, August 17, 2017
[6] 2017 ATRI Data
[7] Transloading is the process of transferring a shipment from one mode of transportation to another. It is most commonly employed when one mode cannot be used for the entire trip, such as when goods must be shipped internationally from one inland point to another. Such a trip might require transport by truck to an airport, then by airplane overseas, and then by another truck to its destination, Wikipedia 11-22-2017

imported containers are ultimately moved by rail. Only a portion of container imports are loaded directly to rail, with the remainder needing to be loaded onto a drayage truck to complete the trip between the marine terminal and railyard via local streets.[8]

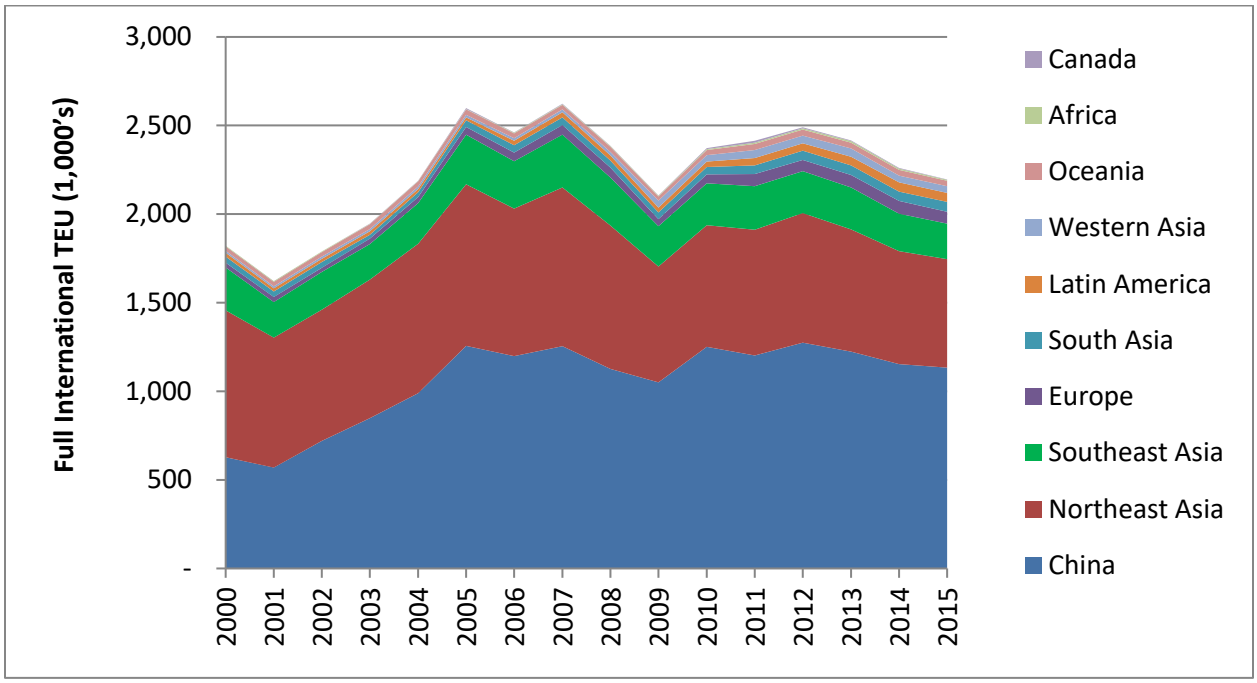
Marine Cargo and Regional Seaports

Marine cargo movement for the state is dominated by trade through the ports of Seattle, Tacoma, and Everett. Historically, the ports of Seattle and Tacoma have been in direct competition since their creation by public referendum at the beginning of the 20th century. To respond to changes in logistics and international trade, and to leverage the combined strategic location in proximity to Asia, the Port of Seattle and Port of Tacoma began negotiations to merge marine cargo operations in 2014 with a merger finalized in 2015 with the approval of the Federal Maritime Commission. The merger resulted in the formation of the Northwest Seaport Alliance (NWSA), which is governed by two separate port commissions elected by Pierce and King County. The NWSA is limited to marine cargo operations, with the Port of Seattle retaining responsibility for Sea-Tac International Airport and Fisherman's Terminal, and the Port of Tacoma retaining responsibility for other industrial land uses not specific to the NWSA. The Port of Everett specializes in high-value cargo, such as the oversized aerospace fuselage equipment for the Boeing Company. The Port of Everett handles 100% of the oversized fuselages for the 747, 767, 777, and soon for the upcoming 777x airplanes. The Port of Everett is ranked as the fifth highest port for exports on the west coast by value, representing $29.3 billion for 2016. Together, the NWSA and the Port of Everett were responsible for a total of $105.4 billion in exports for 2016.[9]

Container Cargo - Intermodal or containerized freight relies on moving freight between, and among, multiple modes of freight transport, including trucking, rail, and marine. The international unit of measurement for the movement of containerized cargo is the twenty-foot equivalent unit, or simply, the TEU. Today, many containers are forty feet in length representing two TEU in volume. Moving freight by container allows for increased efficiency and security for cargo movements, and has helped to make long-distance freight movements less costly for shippers. Most containerized cargo moved through seaports in the region is related to international trade. See Figure 4 for key international trade partners for containerized trade.

[8] 2017, Washington Public Ports Association, Marine Cargo Forecast, BST Associates.
[9] WorldCity, 2017 US TradeNumbers

Figure 4: Pacific Northwest Trade Partners[10]

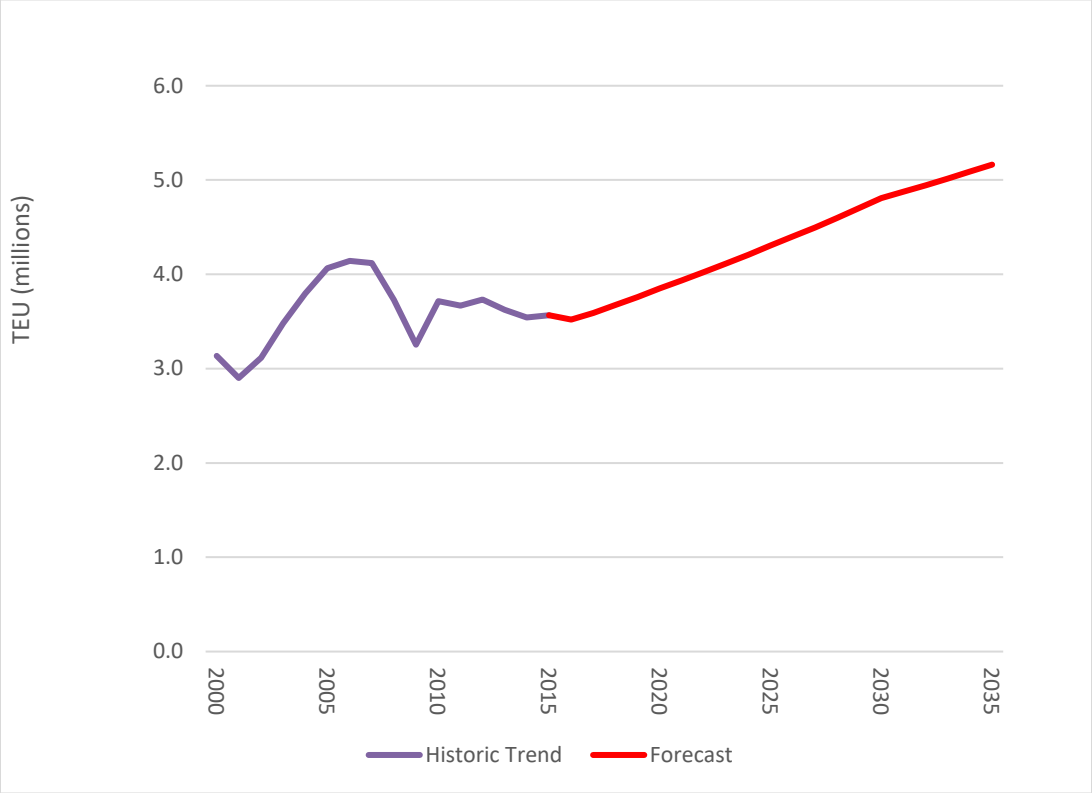


Regionally, container traffic increased between 2001 and 2005, growing from 2.9 million TEU to nearly 4.1 million TEU (including full and empty imports, exports, and domestic containers). After remaining at the 4.1 million TEU level through 2006, volumes fell to less than 3.3 million TEU in 2009, largely attributed to the national economic recession. Annual volumes were approximately 3.7 million TEU or less from 2010 through 2015.[11]

As of spring of 2017, total annual or 2016 containerized cargo through the NWSA was approximately 3.6 million TEU, making the combined containerized activity of Seattle and Tacoma the 4th largest in terms of volume in the country. For 2016, total containerized imports were close to 1.4 million TEU, being led by furniture, industrial machinery and equipment, and vehicles and parts for a total estimated value of $53 billion. For the same year, containerized exports were approximately 984,000 TEU being led by oil seeds, forage products, wood pulp, waste paper, and wood products for a total estimated value of $11.6 billion.[12]

[10] 2017, Washington Public Ports Association, Marine Cargo Forecast, BST Associates. Note: Includes WA and OR ports.
[11] 2017, Washington Public Ports Association, Marine Cargo Forecast, BST Associates, p.22
[12] NWSA presentation, FAST Freight Advisory Committee, PSRC, 6/14/17

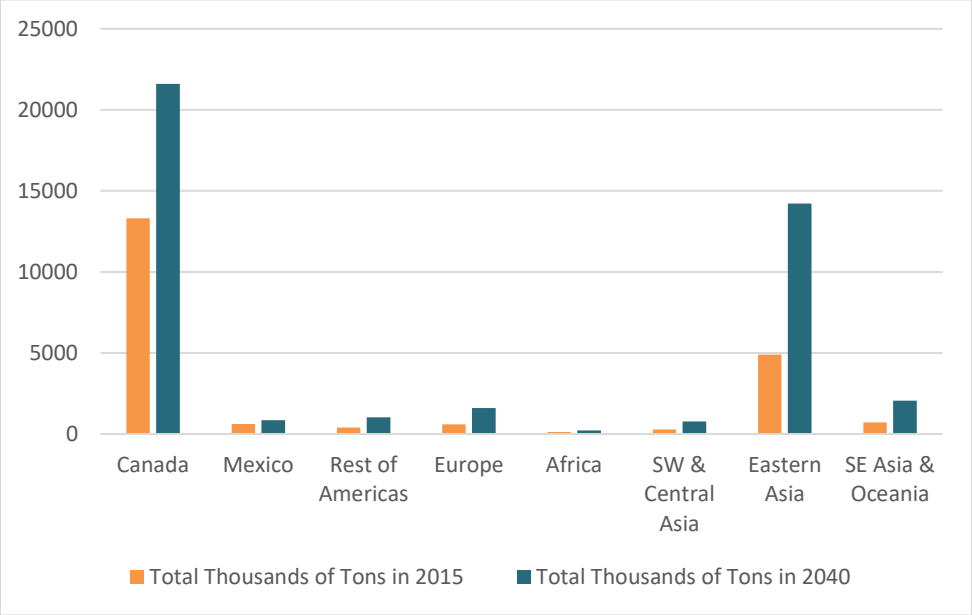
Figure 5: Historic and Forecast Growth in Container Movement[13]



The forecast growth rate in the Washington Public Ports Association (WPPA) Marine Cargo Forecast for water-borne container movements through the region is estimated to be 1.9%, reaching just over 5 million TEU by 2035.[14] See Figure 5: Historic and Forecast Growth in Container Movement for a comparison of historic and forecast data. Higher estimates for growth are provided by the NWSA, calling for container growth from 3.6 million TEU (in 2016) to 6 million TEU by 2025[15]. Much of this growth in freight is based on increasing forecasts for international trade. Growth in international trade is dominated by Canada, and Eastern Asia as shown in Figure 6: Growth in Imports through Central Puget Sound Region (2015-2040).

[13] 2017, Washington Public Ports Association, Marine Cargo Forecast, BST Associates
[14] 2017, Washington Public Ports Association, Marine Cargo Forecast, BST Associates
[15] NWSA presentation, FAST Freight Advisory Committee, PSRC, 6/14/17

Figure 6: Growth in Imports through Central Puget Sound Region (2015 - 2040)[16]



What about other forms of marine cargo that aren't containerized?

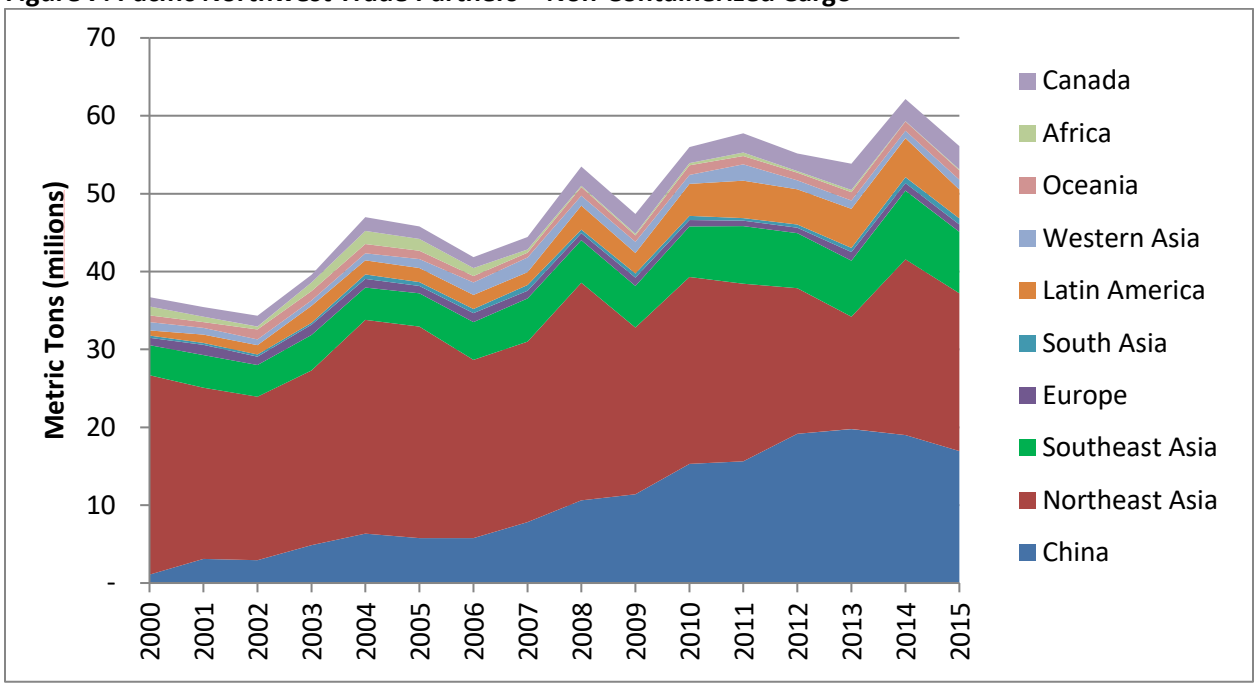
Other common forms of marine cargo that are important to the region's economy include automobiles and roll-on/roll-off (RORO),[17] breakbulk,[18] crude oil, dry bulk, and grain. See Figure 7 for key international trade partners for non-containerized trade. Additionally, tug and barge operations play an important role in moving bulk goods within the region and to Alaska that would otherwise be cost prohibitive to move by truck, and that would add to regional congestion.

[16] 2017 FHWA FAF 4.0 Database

[17] Roll-on/roll-off (RORO or ro-ro) ships are vessels designed to carry wheeled cargo, such as cars, trucks, semi-trailer trucks, trailers, and railroad cars, that are driven on and off the ship on their own wheels or using a platform vehicle, such as a self-propelled modular transporter.

[18] In shipping, break bulk cargo or general cargo are goods that must be loaded individually, and not in intermodal containers nor in bulk as with oil or grain.

Figure 7: Pacific Northwest Trade Partners – Non-Containerized Cargo[19]



Rail Cargo

The region's freight rail system is a vital component of the regional and state economy due to the volume of cargo moved by the Class 1 railroads, providing efficient access to markets overseas for exports, and providing an important entry for imported goods. The availability of reliable freight rail service is an important factor that makes regional ports a competitive gateway for discretionary freight being brought into the U.S.

Much of the region's freight rail is serving the international trade gateway functions of the region's deepwater marine ports. Long-haul rail capacity is provided by two Class 1 railroads: the Burlington Northern Santa Fe (BNSF) and Union Pacific (UP). The BNSF and UP operate four east-west corridors that connect the Pacific Northwest to destinations in the Midwest and eastern states, often through Chicago. The efficient operation of two Class 1 railroads is a key factor for the region's strengths in international trade.

BNSF is the largest Class 1 railroad operating in the state of Washington, with 1,332 miles of track statewide, and handling 502,000 carloadings[20] originating in the state, and 890,000 carloadings terminating in the state for 2016.[21] For the region, BNSF operates rail yards in Auburn, Everett, Seattle, and Tacoma. Intermodal terminals are operated at the South Seattle Intermodal Terminal in Tukwila, and the Seattle International Gateway (SIG) yard. UP, while having a smaller presence statewide than BNSF, provides important Class 1 rail service for the region and the state. UP has 532 miles of track

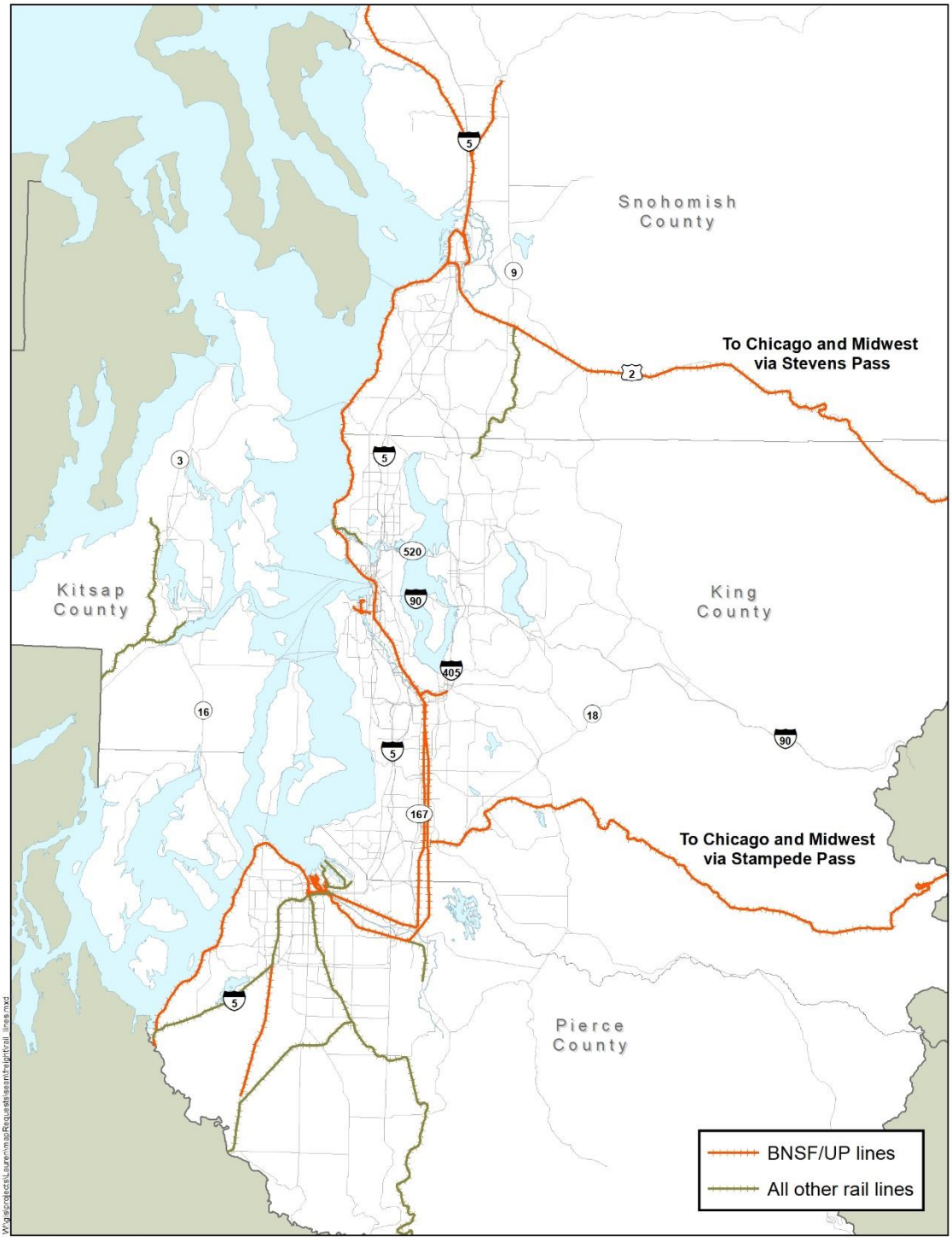
[19] 2017, Washington Public Ports Association, Marine Cargo Forecast, BST Associates. Note: Includes WA and OR ports.
[20] Carloadings - The amount of freight loaded into freight cars during a specified period, Merriam-Webster
[21] BNSF Fact Sheet, Washington State, 2016

statewide, and handled 274,000 carloadings originating in the state, and 268,000 carloadings terminating in the state for 2016.[22]

The region's freight rail lines operate under shared agreements with Amtrak and Sound Transit which have current and future passenger and commuter rail service planned in the region. Several short line railroads currently operate in the region serving more locally based needs, including Ballard Terminal Railroad and Tacoma Rail. Short line railroads provide access to the national rail network for local businesses.

[22] Union Pacific in Washington Fact Sheet, 2016

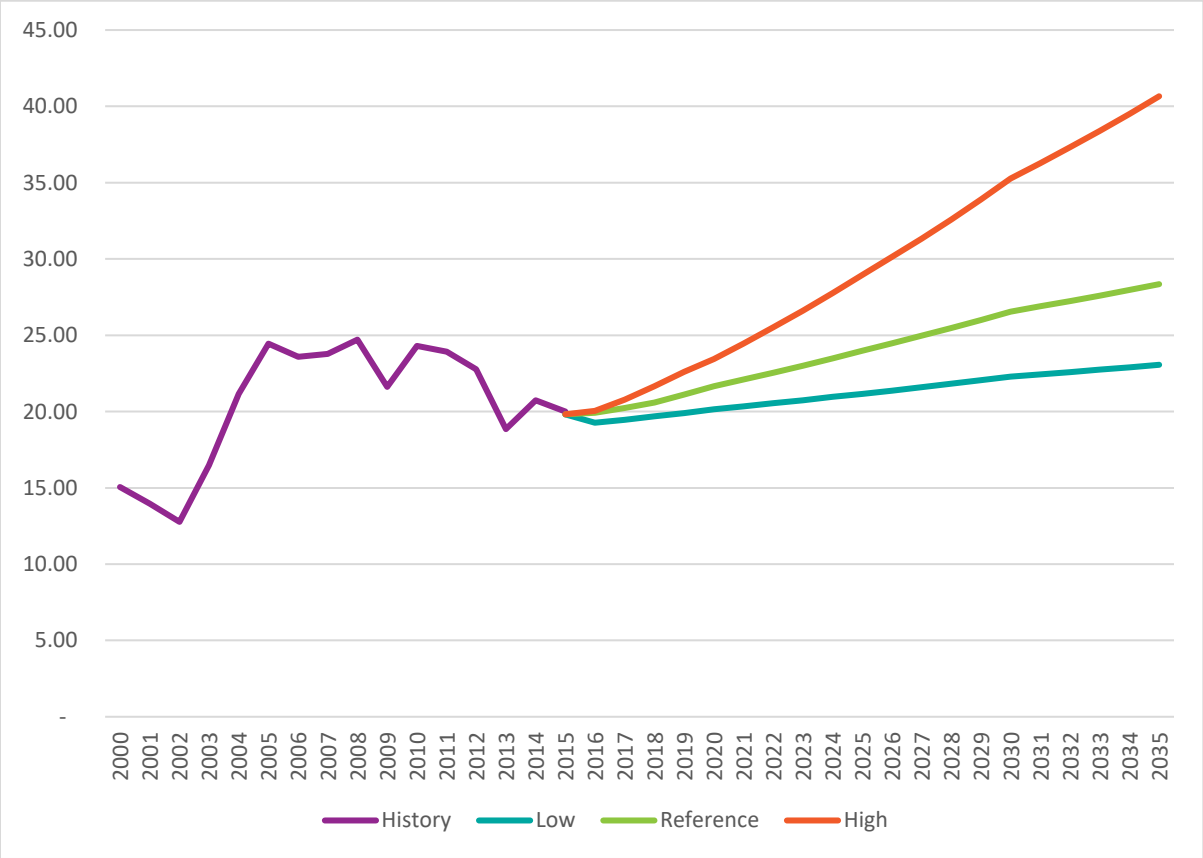
Figure 8: Regional Class 1 Freight Rail System



To look at forecast growth for rail freight for the region, it is useful to examine estimates for waterborne cargo moved by rail as provided for in the 2017 WPPA Marine Cargo Forecast. Forecasts were developed for 2015 to 2035 for major rail corridors in the region. Historic trends show that waterborne cargo moved by rail grew from approximately 15 million metric tons (MMT) annually in 2000 to approximately 20 MMT annually in 2015. Forecasts show this growing to more than 28 MMT by 2035 for the reference case, with a low forecast of 23 MMT, and a high forecast of more than 40 MMT.[23] Waterborne cargo moved by rail is a good way to look at freight rail in the region since it is commonly estimated that roughly 70% of the intermodal cargo coming in through the NWSA goes directly east to other markets.

When considering all freight rail growth, statewide estimates show significant growth as well, and include bulk commodities in addition to the waterborne cargo moved through the region's ports. WSDOT projects statewide freight rail volumes will more than double by 2035 from the 2010 baseline as cargo tonnage is anticipated to grow by more than 130 percent during the period. [24]

Figure 9: Historic and Forecast Central Puget Sound Rail Movement of Waterborne Cargo (Million Metric Tons) [25]



[23] 2017, Washington Public Ports Association, Marine Cargo Forecast.
[24] 2014, Washington State Rail Plan, Integrated Freight and Passenger Rail Plan 2013 – 2035
[25] 2017, Washington Public Ports Association, Marine Cargo Forecast.

Air Cargo

Air cargo is an important and growing component of the regional freight and goods transportation system, carrying high value and time sensitive products to markets throughout the country and internationally. Most of the air cargo in the region is moved through Sea-Tac International Airport, with King County International Airport at Boeing Field hosting operations for UPS and several other smaller carriers. Additionally, while not typically considered air cargo, the facilities of Renton Municipal Airport, Paine Field, and Boeing Field play a key role in the assembly and delivery of Boeing aircraft.

Sea-Tac International Airport is the 3rd largest airport for international cargo on the West Coast excluding Alaska, with 28 airlines providing daily, non-stop service to 88 domestic and 24 international destinations. Twelve international destinations are serviced with scheduled all-cargo carrier services. In 2016, Sea-Tac International Airport moved 366,500 metric tons of total cargo.

The growth of e-commerce is currently reflecting the changing shopping preferences by consumers. Air cargo growth reflects these changing preferences. Growth in domestic air cargo at Sea-Tac International Airport between 2016 and 2017 was approximately 35%, representing new services by freight carriers such as Amazon's Prime Air and DHL.

King County International Airport / Boeing Field (BFI) air cargo activity is currently represented by eight carriers that operate a variety of aircraft with the largest being operated by UPS. Based upon calendar year data for 2014, BFI ranked as the 27th busiest cargo airport in the country, with a recorded air cargo landed weight of 407,629 tons, the majority of which is attributed to UPS operations with almost 61% of the total landed weight of all cargo activity in 2015.[26]

Pipeline

The Olympic Pipeline crosses through the region roughly parallel to Interstate 5. The pipeline, which operates at capacity, is the predominant mode for transporting gasoline, diesel, and jet fuel, accounting for more than half of the fuel originating in Puget Sound refineries and all the jet fuel to Sea-Tac airport. With a throughput capacity of 4.6 billion gallons, the nearly 300-mile line serves distribution terminals in Renton, Seattle, SeaTac, and Tacoma. A map of the Olympic Pipeline is provided in Figure 10: Multimodal Military System and Olympic Pipeline.

Commodities moved by pipeline are forecast to decline by approximately 32% from 43 million in 2015 to approximately 29 million in 2040. Some combination of factors related to pipeline movement of crude oil is likely contributing to this forecast decline, including a significant decline in crude oil from Alaska, as well as a shift to moving crude oil by rail.[27]

[26] King County International Airport, Master Plan Update, May 2016.
[27] 2017, Washington Public Ports Association, Marine Cargo Forecast, BST Associates

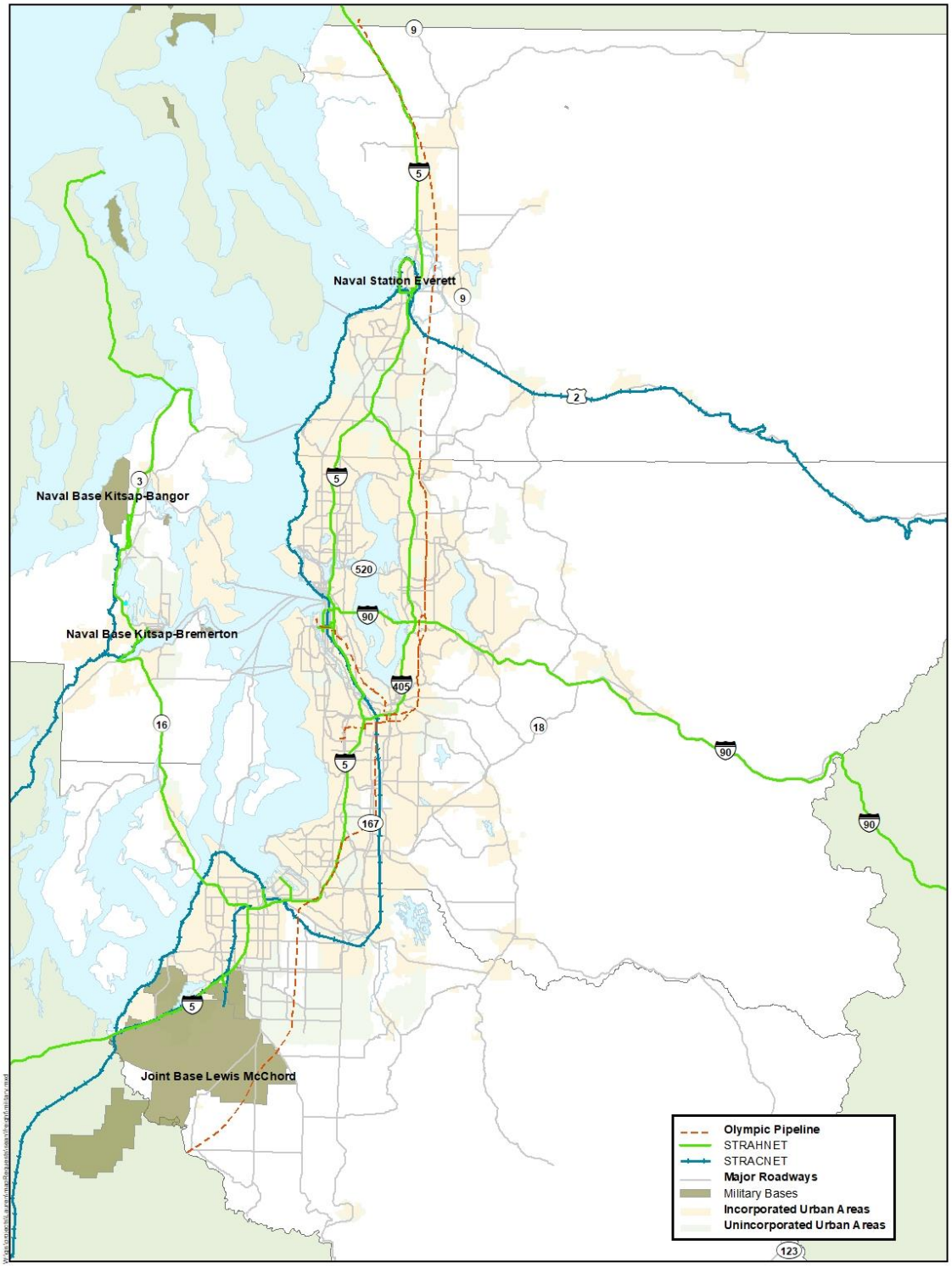
Multimodal Military System

The region's military goods movement system consists of the U.S. Department of Defense's designated Strategic Highway Network (STRAHNET) and Strategic Rail Corridor Network (STRACNET), as well as military bases and sea ports of embarkation.

STRAHNET is a system of public highways that is a key component of U.S. strategic policy. It provides defense access, continuity, and emergency capabilities for movements of personnel and equipment in both peace and war. In the Puget Sound, STRAHNET is primarily comprised of interstates 5, 405 and 90. Similarly, STRACNET rail lines are critical for movement of essential military equipment to ports located around the country as well as to connect one facility to another. A map of the Multimodal Military System is provided in Figure 10: Multimodal Military System and Olympic Pipeline.

Among other military bases, the Puget Sound is home to Joint Base Lewis McChord, the only Department of Defense Power Projection Platform (PPP) on the West Coast. PPPs are defined as Army installations that strategically deploy one or more high priority active component brigades and/or mobilize and deploy high-priority Army reserve component units with a 96-hour response and two full divisions in five to eight days. The Port of Tacoma serves as a sea port of embarkation, whose functions include unloading and temporary storage of munitions from depots, and loading and shipping munitions from the port. If mobilization became necessary, the port would need to handle around 600 containers, and 1,100 vehicles daily.

Figure 10: Multimodal Military System and Olympic Pipeline



Regional Freight and Goods Movement - Forecasts

National, State, and Regional Freight Forecasts and Data

PSRC uses forecasts from several sources to get a more complete picture of the future of freight. Produced and maintained by FHWA, the Freight Analysis Framework (FAF 4.0) is updated every five years with the Census Bureau, Economic Census. The most recent FAF 4.0 model is based on the 2012 Economic Census, which represents surveys of waybill[28] data throughout the country. FAF 4.0 can provide forecasts by freight mode and geography, for domestic and international shipments. FAF 4.0 has limitations, and many measures need to be considered alongside other sources of data and information.

FAF 4.0 forecasts for freight rail are not included in these figures since they do not completely take into consideration the rail activity related to the region's ports, and would present an inaccurate assessment of this activity. Because of the way that FAF 4.0 and the Economic Census are designed, shipments that move from ship to rail, ship to truck to rail, or shipments that are transloaded into different containers are simply not registered in the data for the central Puget Sound region. Estimates for rail growth are included from other sources, including the Washington Public Ports Association Marine Cargo Forecast and the Washington State Rail Plan.

In addition to forecasts from FAF 4.0, PSRC uses new software tools to model land use and travel demand. The new travel demand model, SoundCast, uses the person-level data from the region's land use forecast to predict how different people will use the transportation system based on their needs and preferences. SoundCast includes representation of commercial vehicles as the truck model, including the classifications of medium and heavy trucks.

The truck model defines a truck based on relative weight classes and separates medium and heavy trucks for analysis purposes, which are defined to match the definitions used for collecting truck counts by WSDOT. While these definitions rely primarily on weight, these categories also are loosely correlated to other defining characteristics of trucks for other purposes. The following general categories of trucks are used:

- Medium trucks are defined as single unit, six or more tires, two to four axles and 16,000 to 52,000 lbs. gross vehicle weight; and

- Heavy trucks are defined as double or triple unit, combinations, five or more axles, and greater than 52,000 lbs. gross vehicle weight.

In these definitions, the medium trucks are directly correlated to single-unit trucks collected in the WSDOT truck counts, and heavy trucks are directly correlated to double- and triple-unit trucks in the counts. Although the structure remains similar, many improvements have been made to the forecasting of truck demand in Soundcast. These improvements include:

[28] A waybill is a document issued by a carrier giving details and instructions relating to the shipment of a consignment of goods. Typically, it will show the names of the consignor and consignee, the point of origin of the consignment, its destination, and route.

- Inclusion of hundreds of additional medium and heavy truck counts on both arterials and freeways across the region

- Improved generation of truck trips by providing a crosswalk between the employment that generates truck trips and the underlying land use required for industrial and truck activity

- Improved network attributes including restricting truck activity for parts of the network that do not allow heavy truck traffic

- Updated truck special generators for the Ports of Seattle, Tacoma and Everett

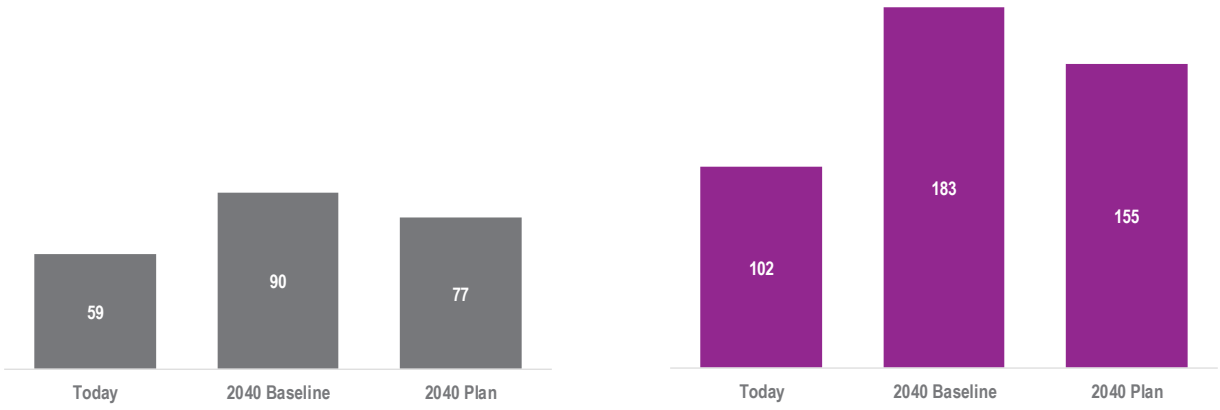
- Updated external truck inputs provided by WSDOT

The inclusion of new truck data was used to further improve the validation of truck activity in the model and was the first of several other improvements for truck modeling planned over the next year. For more information about PSRC's modeling tools, see Appendix R: Analysis Tool Documentation.

How does the Regional Transportation Plan perform for freight?

In 2040, trucks will experience more delay than today, with medium trucks experiencing 77 minutes, or approximately 31% increase in delay, and heavy trucks experiencing 155 minutes, or approximately 52% increase in delay from today. Without the programs and investments in the plan, delay for freight trucks is even worse with medium trucks experiencing 90 minutes, or approximately 53% increase in delay, and heavy trucks experiencing 183 minutes, or approximately 79% increase in delay from today. Increases in delay for trucks reflect the overall increase in total regional congestion, and are not solely reflective of the overall increase in regional truck trips. Figure 11: Medium and Heavy Truck Delay shows the amount of delay that truck drivers are anticipated to experience in 2040. PSRC does not have the ability at this time to model forecast changes to other freight transportation modes, and instead relies on the sources previously cited where applicable.

Figure 11: Medium and Heavy Truck Minutes of Delay – Today, Without the Plan, and 2040



To ensure that the regional freight and goods transportation system can continue to meet the region's needs, system performance for freight will need to be monitored. For more information on the full performance of the plan, refer to Appendix K: System Performance Report.

Projects and Investments in the Regional Transportation Plan

The Regional Transportation Plan includes investments that will support freight movement, ensuring that the region will continue to benefit from international trade, that businesses will be able to get their products to market, and that residents will continue to conveniently receive the products they need. Some examples of strategic freight capacity projects in the regional plan include:

- Pierce County. Canyon Road Freight Corridor Improvements - Connects the planned employment center in Frederickson with the Port of Tacoma and destinations northward.

- Everett. 41st Street Rucker Avenue Freight Corridor - Arterial and access improvements from Port of Everett to I-5 on West Marine View Drive to Rucker Avenue to 41st Street with improvements to better accommodate over-dimensional freight traffic and increasing general freight traffic.

- Seattle. South Lander Street Grade Separation - Develop a grade separation of the roadway and the Burlington Northern mainline railroad tracks between 1st Ave S and 4th Ave S.

- Washington State Department of Transportation. – Puget Sound Gateway Program - The Puget Sound Gateway Program is comprised of two unique projects, SR 509 and SR 167, which together make major improvements to relieve traffic congestion and improve freight mobility. The Gateway Program is key to enhancing the state's economic competitiveness, both nationally and globally, by connecting the state's largest ports to major distribution centers in King and Pierce counties and eastern Washington.

These are just an example of some of the strategic regional capacity projects that have been identified as being important for freight and goods movement. For the full list of regional capacity projects in the plan, see Appendix G: Regional Capacity Projects List. There are other investments in the plan that will support freight, but are considered more programmatic in nature – these can include a variety of operational and preservation improvements on freight routes. In addition, WSDOT has developed a Freight Investment Plan including a variety of key projects in this region; refer to the attachments for more information.

Key Issues for Freight and Goods Movement in the Central Puget Sound Region

As the region continues to grow, it will be of greater importance to monitor key issues and developments related to freight as identified by the private and public sector. Recent plans and studies provide a look at some of the emerging issues that will need to be monitored closely as the region looks ahead to 2040.

Washington State Truck Parking Study

Completed in late 2016, the Washington State Truck Parking Study was undertaken to take a first step at addressing the growing issues related to parking for truck drivers throughout the state. The study examines the reasons truck drivers need to park, some of the emerging issues, the regulatory environment , and provides some different examples of truck parking issues throughout the state. To better understand the differences among types of parking, or reasons for needing to park a truck, the following purposes were considered:

- Ten hour rest breaks – needed by long-haul drivers at night and required by federal law
- Thirty minute rest breaks – needed by drivers during the day and required by law
- Urban local delivery parking – route deliveries with numerous stops throughout the day
- Truck storage – drivers that lack a permanent place to leave the truck after their shift
- Incident-based parking – unplanned due to weather or other disruption

With forecast increases in truck volumes nationwide, it is anticipated that current problems related to truck parking will continue. One area of particular concern in the central Puget Sound region is in the vicinity of North Bend. Long distance truck drivers frequently need to break at North Bend and are forced to fill the on-ramps, off-ramps, and shoulders of I-90 as space is constrained. Pass closures due to weather add to the magnitude of the problem. North Bend residents do not want trucks parking on local streets, and have enacted local bans preventing commercial drivers from doing so.

Hours of service rules are highlighted as one of the greatest outstanding issues for commercial drivers with regards to truck parking. Hours of service rules dictate that the driver must take scheduled breaks to increase safety. This has led to increased demand at private truck stops, but also to increases in drivers stopping their vehicles in unsuitable locations as they attempt to comply with regulations.

A survey conducted in 2015 as part of Jason's Law, enacted in 2012, found that nationally, Washington State has some of the greatest challenges for truck parking. The survey ranked Washington State 44th out of 50 in terms of the number of truck parking stalls per 100,000 daily truck vehicle miles traveled.

Truck Driver Shortages

The American Trucking Association has forecast that there will be a very significant shortfall in qualified truck drivers looking to the future, and that the current shortfall of approximately 48,000 could grow to 175,000 drivers nationally by 2024. There are many reasons for such as shortfall, but challenges such as these have logistics and transportation firms looking for ways to keep freight moving into the future. The industry struggles to attract new people, and age of work force is a significant factor in the shortage with the average age being 49. Women make up only 5.8% of the workforce which has not changed over the years, but minorities now make up 38.65% of the workforce, representing an increase in 12%

from 2001. It is estimated that the country will need approximately 890,000 new drivers by 2025 to meet the growing needs of transportation logistics.[29] Even with changes in technology that may move the trucking industry to greater automation, equipment will still require daily inspection that necessitate trained drivers to carry out. Automation may help to make the trucking industry more productive, and to decrease overall costs, however a skilled workforce of drivers and operators will still be necessary to meet federal requirements and ensure safety.

PSRC Economic Evaluation of Regional Impacts for the Proposed Gateway Pacific Coal Terminal at Cherry Point.

Based on a number of proposals to create new oil, coal, and bulk commodity terminals in the Pacific Northwest, increased attention has been given to what the impacts of more freight rail would be for affected at-grade crossings. To help address these concerns, PSRC examined the impacts of the increased freight rail volume that would result from a new proposed SSA Marine coal terminal at Cherry Point in Whatcom County. The study was completed in 2015, and findings included that the project would result in 18 new trains per day passing through the region.

The study focused on a total of 101 at-grade crossings that are either along the likely north-south route that commodity trains would have served the terminal, or the east-west lines of Stevens and Stampede Pass that would potentially receive additional freight rail volumes as well.

Major findings from the study include:

- The proposed Terminal may have an impact on rail capacity in the region – depending on whether BNSF responds to the increase in demand for service by increasing capacity.
- Rail freight traffic is already projected to grow in Washington State and in the region – even without the proposed Terminal – from increased rail traffic due to transport of Bakken Oil and other proposed export traffic.
- The most direct economic impacts for the region will be due to increased rail traffic through cities and counties where there are at-grade crossings and where an increase in rail traffic could affect land use, land value and access.
- Economic impacts directly related to gate down-time are the easiest to quantify and vary greatly from location to location within the region.
- Mitigation is possible in most if not all cases, but may be costly.

As of today, the project proposal for Cherry Point has been withdrawn, but the above lessons learned from the study remain relevant for the region as rail freight is forecast to grow.

Joint Transportation Committee (JTC) Road-Rail Conflicts Study

Increases in freight rail volume have resulted in increased congestion as drivers wait for the gates at at-grade crossings for greater lengths of time. Residents are also increasingly concerned about increased noise and safety.

Responding to growing community concerns regarding projected increases in freight rail growth, the legislature called for the JTC to study the various potential impacts for at-grade crossings throughout the state. The purpose of the 2017 study was to understand the nature of impacts and to determine which

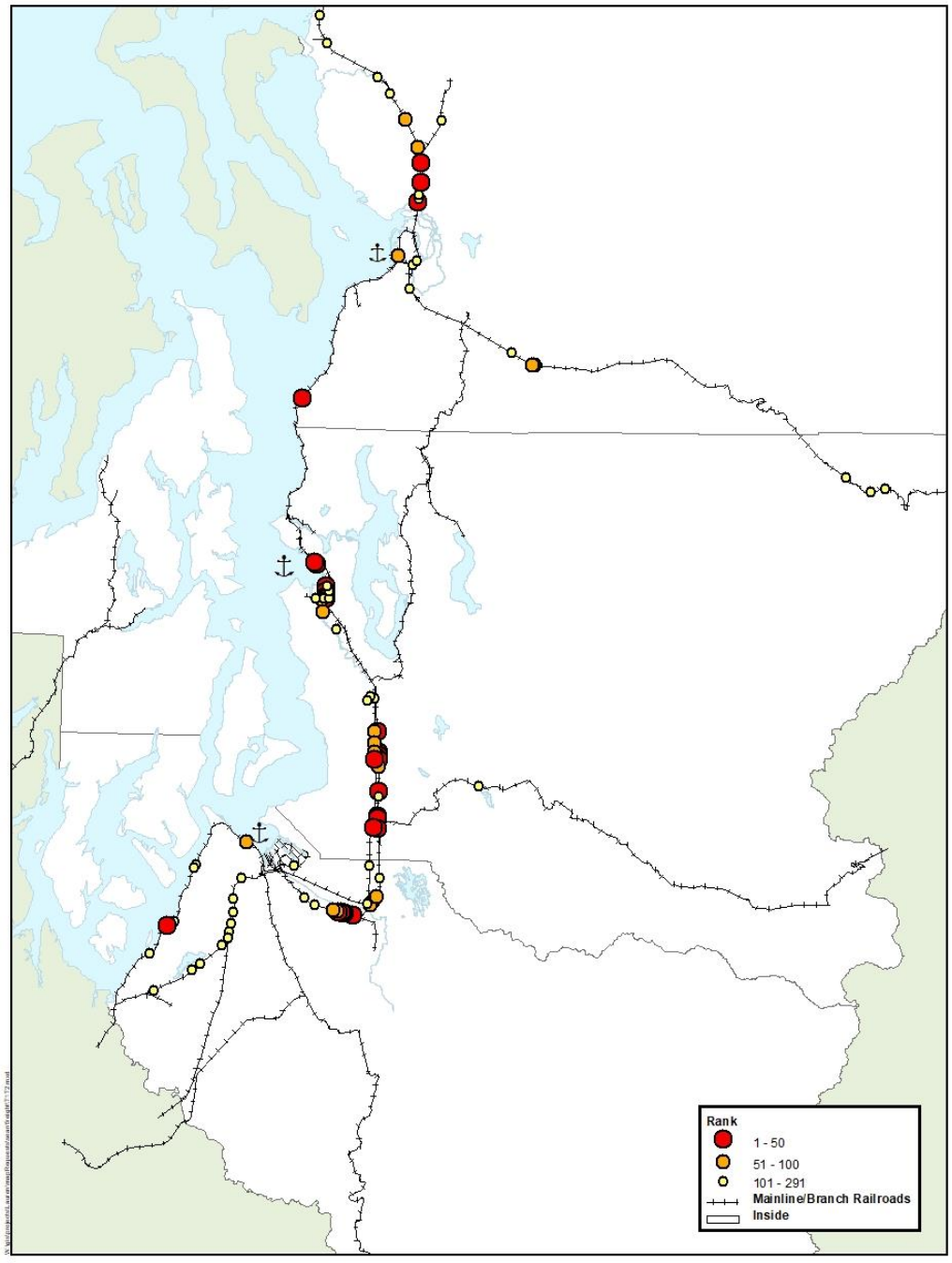
[29] Truck Driver Shortage Analysis, American Trucking Association, 2015

at-grade crossings had the highest potential impacts. Impacts related to mobility, safety, and community were considered as different scenarios were tested that ultimately developed a list of just over 300 most highly impacted at-grade crossings from a total active public inventory of 2,180 at-grade crossings in the state.

Of the 50 most highly impacted crossings when ranked by criteria related to mobility, safety, and community, 28 of them are in the region. A map showing locations for the most highly impacted crossings from this study for the region is provided below in Figure 12: Central Puget Sound Region – Most Highly Impacted Crossings from the JTC Road-Rail Conflicts Study. The full set of data from the JTC Road-Rail Study Crossing Analysis is available through an online mapping application.

http://gisdev.transpogroup.com/jtccrossingstudy/

Figure 12: Central Puget Sound Region – Most Highly Impacted Crossings from the JTC Road-Rail Conflicts Study



Solutions for mitigation of these impacts are not limited to costly grade separations, but can include improved Intelligent Transportation System (ITS) operations, and crossing closures. Furthermore,

corridor-level analysis may potentially reveal that when at-grade crossings are clustered in close proximity, a mitigation project at one strategic at-grade crossing may relieve conflicts at others nearby.[30]

PSRC Industrial Lands Analysis

Undertaken in 2015, PSRC produced an Industrial Lands Analysis Report, providing an updated regional industrial lands inventory, and examining a wide range of factors to better understand the role of industrial lands as the region plans growth to 2040. Findings from the study are particularly relevant because freight and goods movement is so closely linked to industrial land use.

One of the central questions of the Industrial Lands Analysis was to determine if the region has enough industrial land to satisfy employment growth through 2040. Findings concluded that there was sufficient industrial land in the region, but demand is not uniform across all locations.

The study provided the following strategic policy recommendations for industrial lands:

- Ensure an adequate supply of land for industrial uses.
- Simplify regulations to improve permitting efficiency.
- Develop a strategic planning framework for industrial areas.
- Take advantage of Industrial Revenue Development Bonds.
- Facilitate information sharing of best practices.
- Update regional designations.
- Continue to monitor supply and demand for industrial land.
- Align infrastructure planning with industrial land policy.
- Provide support for brownfields cleanups.
- Provide economic development support.

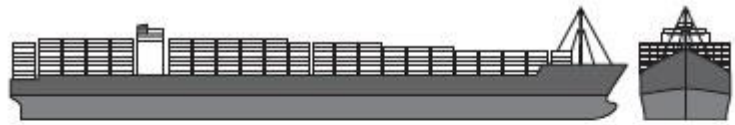
The region has more than 28,000 acres net supply of industrial lands. The study organizes the gross supply of regional industrial-zoned lands into 13 subareas that provide a helpful context for considering the industrial functions for each, and the unique, industrial-related employment that occurs there. The study findings include an examination of how available industrial land has changed since previous analysis in 1998. Many areas with industrial-zoned land have seen conversions to non-industrial uses such as heavy commercial use. They include Bellevue-Redmond, Everett's Snohomish Riverfront Redevelopment area, Renton Landing, SODO's Stadium District, Snohomish industrial zoned land between Everett, Mill Creek, and Lynnwood, and industrial zoned land in Auburn. Other cities and counties have added to the inventory of industrial zoned land, including Arlington, Bremerton, Pierce County, and Tacoma, among others. Regionally designated manufacturing/industrial centers (MICs) are generally protecting industrial land, and many MICs added industrial zoning within their boundaries.[31]

With regional growth forecasts, there will be increasing pressure to convert industrial lands for different use. Industrial lands host many critical functions for the economy that cannot easily be relocated. Monitoring industrial land use and understanding the connection with the freight and goods transportation system will need to be an ongoing priority for the region.

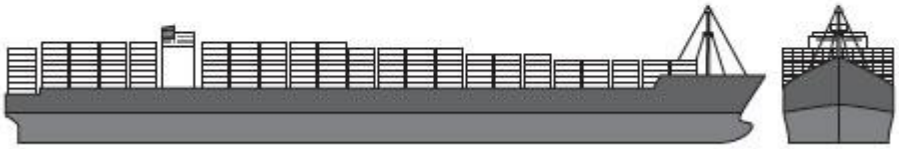
[30] 2017, Joint Transportation Committee, Prioritization of Prominent Road-Rail Conflicts in Washington State
[31] 2015, PSRC Industrial Lands Analysis

Changing Patterns for Trade – Shippers Have New Options

Opening in 2016, the Panama Canal Authority completed a $5.25 billion expansion project that enables larger ships to travel between the Atlantic and Pacific Ocean. Previously, container ships moving through the Panama Canal were limited to a capacity of 5000 containers or TEU. Today, container ships with a capacity of more than 13,000 TEU can make the same trip. This project more than doubles the capacity of the canal to move cargo and is expected to help Panama retain its strategic position in terms of global trade.



Panamax: max. load 5000 containers



Post-Panamax: max. load 12,000 containers

What effect this may have on trade patterns serving markets in North America is unclear. Many of today's imported products into the USA are being shipped from Northeast Asia, with much of this trade entering the United States through West Coast ports where it is transferred to rail as it makes its way to the nation's rail hub in Chicago and population centers on the east coast. For the central Puget Sound region, rough estimates are that approximately 70% of all containerized imports move by rail to Chicago. This intermodal transit time takes a container from China about 18 to 19 days to reach Chicago, taking about 13 to 14 days by ocean and about 5 days by rail. The all water route through the Panama Canal takes longer at about 28 days for the same container to reach Chicago mostly due to the longer distance required for travel.

The USDOT Maritime Administration (MARAD) has been studying potential effects of the Panama Canal expansion, and in November of 2013 released the Phase 1 report of the Panama Canal Expansion Study.[32] The potential effects of the canal expansion project are summarized as follows:

- Carriers serving direct all-water routes between U.S. East Coast and Gulf ports and foreign ports (specifically those in Asia and the West Coast of South America) could provide more cost-competitive services by deploying larger and more efficient oceangoing vessels through the expanded Canal.

- The transition from 5,000 TEU vessels to vessels of up to 13,000 TEU on Northeast Asia - U.S. East/Gulf Coast routes via the Panama Canal may provide savings to shippers; however, a significant amount of transportation cost savings associated with the use of larger vessels is expected to be absorbed by providers of transportation services.

[32] Panama Canal Expansion Study, Phase 1 Report: Developments in Trade and National and Global Economies, USDOT, MARAD, November 2013, p. xv.

- As the average size of vessels serving West Coast ports also increases over time from an average of 6,000 TEU per vessel today to 13,000 TEU (or greater), the cost for transportation to West Coast ports from Asia would also be reduced, with a portion of those savings being passed on to shippers.

For the impact of this project on U.S. trade, two potentially influential factors that may be relevant to the central Puget Sound region include:

More concentrated U.S. port calls – Fewer calls by larger ships would lead to higher peak loads and tend to favor ports that have greater capacity in container handling, storage, and movement to inland destinations.

Readiness of U.S. ports and related infrastructure – Ports and regions that have adequate navigational channel depth and height, terminal handling and storage capabilities, rail connectivity and capacity, and inland transportation systems (specifically, intermodal rail and "last mile" port and terminal connections) will be favorable.

The 2013 MARAD report breaks down the analysis by region and compares advantages and disadvantages of imports from Northeast Asia to the Chicago rail hub accordingly.

> "For inland transportation by rail, the comparison between West Coast and East Coast routes is a 2,300-mile move from a West Coast port on rail and a 1,000-mile rail move from New York, Norfolk, or other East Coast ports. For the West Coast move, this would involve a single Class I railroad— either BNSF, UP or CN—at a higher cost per container than from the East Coast, depending on port and railroad. However, due to longer sailing times and distances, the ocean cost component of a Northeast Asian container delivered to an East Coast port via the Panama Canal is significantly higher than for one delivered to a West Coast port. In general, total transportation cost differentials are unlikely to be overcome, even with the savings due to the use of larger ships via the expanded Panama Canal discussed earlier, and the transportation time advantage will favor transportation via West Coast ports. It is, therefore, unlikely that significant volumes of Northeast Asian goods to Chicago arriving from West Coast ports will be rerouted through the Panama Canal and East Coast ports after the Canal's expansion."[33]

While east coast ports will potentially benefit from this new expansion of capacity, west coast ports still have the advantage in terms of transit time. In general, cargo owners with higher value and more time sensitive shipments may still find the west coast routing to be more competitive due to shorter transit times, while cargo owners with lower value, less time sensitive shipments may find the Panama Canal routing to be preferable.

It is too early to say with certainty to what degree of change the Panama Canal expansion will have on North American and global trade patterns, but the actual decisions to be made by cargo owners remains to be seen. Shipping decisions are complicated and involve many variables, many of which are outside of the influence of local decision makers at the state or local level. In addition to efficiencies in state and local infrastructure as well as port terminal operations, decisions made by cargo owners are influenced

[33] Panama Canal Expansion Study, Phase 1 Report: Developments in Trade and National and Global Economies, USDOT, MARAD, November 2013, p. 121

by global economic trade factors related to commodity and fuel pricing, currency valuation, consumer choices, international trade agreements, subsidies and tariffs, and changing international investment trends. They are influenced as well by more localized issues such as landside system congestion for rail or trucking services, availability of equipment, weather related delays, and labor issues. Supply chain management can plan for predictably slower transit times, but reliability issues that create uncertainty in transit times are harder to plan for and increase costs.

East coast ports like Virginia, Savannah, and Charleston are taking measures to expand capacity in anticipation of the potential new shipping opportunities brought about by the Panama Canal expansion project. Likewise, states in the Northeast as well as the Gulf Coast states are anticipating change as well. While it is unknown if the Panama Canal expansion project will bring changes to the central Puget Sound region, this is an ongoing issue that will need to be watched closely for the region to maintain its strength in global trade, while being adaptable to changes in the future.

The expansion of the Panama Canal is not the only option that may change shipping decisions in global trade in the U.S. The Port of Prince Rupert in British Columbia has expanded container terminal capacity and now offers an option that takes a container from China 12 days ocean shipping, and 4 days by rail to reach Chicago. In 2014, ocean based shipping container volume grew by 11 percent at Prince Rupert as shippers continue to seek faster routes to move goods to and from Asian markets. The Federal Maritime Commission reports that roughly 87 percent of the containers received in Prince Rupert were hauled by rail to the U.S., mostly to Midwest states. As more and more bulk commodity is shipped overseas, those products are leaving the docks in British Columbia, not Washington state.[34]

The Port of Lazaro Cardenas in Mexico offers another option for shippers to reach North American markets. Shippers are also increasingly using the Suez Canal as another all water option for shipping cargo from Asia to the east coast of the United States.

Harbor Maintenance Tax

Ports in the United States are subject to the Harbor Maintenance Tax, which gives Canadian ports a built-in financially competitive advantage. The Harbor Maintenance Tax is assessed on marine cargo that lands at U.S. ports and pays for maintenance dredging of harbors and waterways by the Army Corps of Engineers through the Harbor Maintenance Trust Fund. This tax is not assessed on cargo that is routed through non-U.S. ports and moved into the U.S. by land. The tax is .125% of the value of each container, resulting in an average additional cost per container of $109.[35] This gives a competitive advantage for the Ports of Prince Rupert and British Columbia as shippers are able to choose these gateways for products ultimately destined for U.S. markets.

Ports in the region are further disadvantaged since they are naturally deep and do not usually require much, if any, maintenance dredging. Dredging needs vary across the country, with Louisiana receiving approximately one fifth of the funding from the HMTF. For this region, the ports of Seattle and Tacoma receive just over one cent for every dollar paid by shippers into the HMTF, meaning that revenue collected on cargo moved through the region is helping to maintain ports on the east coast that are in

[34] Auburn Reporter, Expanded Panama Canal among challenges for Washington Ports, Don C. Brunell, 10/19/17
[35] Federal Maritime Commission, Study of U.S. Inland Containerized Cargo Moving Through Canadian and Mexican Seaports, 2012

direct competition. It is for these reasons that the NWSA advocates for permanent reform of the HMTF.[36]

Technology

The transportation industry is making tremendous changes to incorporate new technologies that will improve fuel efficiency, vehicle emissions, safety, and travel times. With great potential to realize significant cost savings on fleet operations, increasingly the freight and logistics industries are leading the way on innovations in vehicle technologies. Concepts such as truck platooning led by companies such as Volvo are being seriously tested to gain savings from fuel efficiency on long distance truck trips. Companies such as Seattle-based Convoy.com are implementing new mobile application based platforms for matching shippers with independent carriers. Both Cummins and Tesla are revealing heavy duty tractor trailers in 2017, with other leading fleet manufacturers soon to follow.

Freight Advanced Traveler Information System (FRATIS)

The Northwest Seaport Alliance has recently implemented a tool called Dray Q to provide information to drayage drivers in the region. DrayQ provides truck drivers real-time information about wait times in and around marine cargo terminals, and DrayLink will interconnect the drayage community to better dispatch, track and record container moves from pickup to delivery.

The apps were designed specifically for, and in partnership with, the port industry to align with the U.S. Department of Transportation's Connected Vehicle Freight Advanced Traveler Information System (FRATIS) architecture and StrongPorts initiative.

DrayQ is the first mobile app in the market to use Bluetooth technology to provide real-time estimates of drayage truck wait times at ports and terminals. The app also provides trend information and traffic camera views at the touch of a fingertip.[37]

As with technological changes related to personal transportation, technology also is changing how regional, national, and international supply chains operate. PSRC will continue to monitor technology changes. For a full report on technology in transportation, please review Appendix N: Technology.

[36] Northwest Seaport Alliance, Harbor Maintenance Tax Issue Paper, 2016.
[37] Northwest Seaport Alliance website, 10/24/2016

Air Quality / Environment

Protection of the natural environment in the region is of great importance, and is one of the underlying tenets of all regional planning efforts. The movement of freight and its reliance on trucks, trains, ships, and other modes has the potential to result in negative impacts on the natural environment. Understanding the type and extent of these impacts is therefore an important function of any examination of the regional freight and goods transportation system. Equally as important is to understand the mitigation methods, technologies, and actions that may be put in place to alleviate or mitigate the impacts of freight movement. Some examples of projects that have received PSRC's federal funding, among other sources, include the following:

Northwest Ports Clean Air Strategy

In 2013, the Port of Seattle seaport, the Port of Tacoma and Port Metro Vancouver, Canada, updated the Northwest Ports Clean Air Strategy (Strategy). The goal of the Strategy is to reduce diesel and greenhouse gas emissions in advance of, and complementary to, applicable regulations. The ports have worked with the Puget Sound Clean Air Agency, the U.S. EPA, Environment Canada, Washington State Department of Ecology, and industry and community stakeholders to craft and implement the strategy. While the strategy outlines shared performance measures, each port has implemented emission reduction programs appropriate to its operations. Goals of the strategy include:

- Reduce diesel particulate matter (DPM) emissions per ton of cargo by 80 percent by 2020 to decrease health impacts on adjacent communities.
- Reduce greenhouse gas emissions (GHGs) per ton of cargo by 15 percent by 2020 in order to limit contributions to climate change and reduce associated environmental, health and economic impacts.
- Performance targets for six maritime industry sectors including ocean-going vessels, harbor vessels, cargo-handling equipment, trucks, locomotives/rail transport, and port administration.

Regional Clean Port Truck Program

To help meet the goals of the Northwest Ports Clean Air Strategy, the Puget Sound Clean Air Agency, and the ports of Seattle and Tacoma have been working to replace older, high polluting, diesel drayage trucks hauling containers in and out of the ports of Seattle and Tacoma. Through the Clean Truck Project, dray truck owners receive a financial incentive to scrap old trucks that meet the program's eligibility requirements and replace them with trucks that meet U.S. Environmental Protection Agency (EPA) emission standards for 2007 or newer engine years. The amount of the incentive varies based on the model year and cost of the new vehicle the owner selects for upgrade. So far, nearly 410 trucks have been scrapped and replaced through this program.

New Developments – Federal and State Federal Programs and Planning

New Federal Programs for Freight

The two most recent federal, multi-year surface transportation bills have made significant progress in establishing freight and goods movement as a critical function of the nation's transportation infrastructure. With the passage of MAP 21 in 2012, and later with the FAST Act of 2015, freight and goods movement has become more of a prominent focus for national policy and funding programs.

MAP-21

Under MAP-21, the groundwork was established for future freight programs through key provisions that called for policy development as well as planning and analysis to have a greater understanding of the degree to which freight and goods movement is integrated throughout the broader transportation system.

Key provisions for freight established in MAP-21 included:

- USDOT to establish a national Primary Freight Network
- USDOT to develop a National Freight Strategic Plan
- Improvement of data and analysis capabilities for USDOT
- Encouraged states to develop state freight plans and to establish state freight advisory committees.

While MAP-21 did not include dedicated funding in relation to these provisions, these helped prepare states, MPOs and other key stakeholders for future provisions seen in the FAST Act.

FAST Act

With regards to freight and goods movement, the FAST Act builds upon the provisions established in MAP-21 while providing for two new funding programs with specific eligibility for freight projects. The FAST Act also responds to public comment and feedback to more explicitly recognize the multimodal nature of freight and goods movement. The funding programs are:

- FASTLANE competitive grants established at $4.5 billion over 5 years (now with modified eligibility known as INFRA grants)
- National Highway Freight Program formula funds established at $6.3 billion over 5 years and apportioned to states.

Other key provisions for freight established in the FAST Act include:

- USDOT to establish a national Primary Highway Freight System, including Critical Urban and Rural Freight Corridors as determined by states and MPOs
- USDOT to establish a national Multimodal Freight Network
- Carries forward and builds upon USDOT requirement to develop a National Freight Strategic Plan, now with greater emphasis on multimodal freight

- Carries forward and builds upon requirement to improve data and analysis capabilities for USDOT
- Requires states to develop state freight plans and to establish state freight advisory committees.

Nationally Significant Freight and Highway Projects

The FAST Act established the Nationally Significant Freight and Highway Projects (NSFHP) program to provide financial assistance to nationally and regionally significant freight and highway projects that align with the program goals:

- Improve the safety, efficiency, and reliability of the movement of freight and people;
- Generate national or regional economic benefits and an increase in global economic competitiveness of the U.S;
- Reduce highway congestion and bottlenecks;
- Improve connectivity between modes of freight transportation;
- Enhance the resiliency of critical highway infrastructure and help protect the environment;
- Improve roadways vital to national energy security; and
- Address the impact of population growth on the movement of people and freight.

As defined in the FAST Act, the NSFHP program (later named FASTLANE for FY16, followed by INFRA for subsequent award years), provided $4.5 billion in funding for the life of the bill to fund highway, bridge, rail-highway at-grade crossing projects as well as grade separations. The central Puget Sound region received funding in the initial FY16 competition, with Strander Boulevard in the City of Tukwila receiving a $5 million award, and the Lander Street grade separation in the City of Seattle receiving a $45 million award.

The original FASTLANE program emphasized projects that could demonstrate economic benefit, improvements to mobility, and benefits to safety, community, and the environment. The INFRA program modifies the program using new criteria to emphasize projects that implement innovative partnerships to leverage federal funding.

While this program is not exclusive to awards for freight projects, benefits for freight and goods movement on the designated Primary Highway Freight System is one eligibility criterion.

National Highway Freight Program

The FAST Act establishes a new National Highway Freight Program to improve the efficient movement of freight on the National Highway Freight Network (NHFN, described in greater detail later in the document) and to support the following goals.

- Investing in infrastructure and operational improvements that strengthen economic competitiveness, reduce congestion, reduce the cost of freight transportation, improve reliability, and increase productivity;
- Improving the safety, security, efficiency, and resiliency of freight transportation in rural and urban areas;
- Improving the state of good repair of the NHFN;
- Using innovation and advanced technology to improve NHFN safety, efficiency, and reliability;
- Improving the efficiency and productivity of the NHFN;

- Improving state flexibility to support multi-state corridor planning and address highway freight connectivity; and
- Reducing the environmental impacts of freight movement on the NHFN.

The National Highway Freight Program (NHFP) is a formula program, providing $6.3 billion over the life of the FAST Act. Approximately $96 million is available for the state of Washington to award to projects that contribute to the efficient movement of freight on the designated National Highway Freight Network.

Eligible projects shall contribute to the efficient movement of freight on the NHFN, and be identified in a freight investment plan included in a state freight plan. NHFP funds may be obligated for one or more of the following:

Development phase activities including planning, feasibility analysis, revenue forecasting, environmental review, preliminary engineering and design work, and other preconstruction activities.

- Construction, reconstruction, rehabilitation, acquisition of real property (including land relating to the project and improvements to land), construction contingencies, acquisition of equipment, and operational improvements directly relating to improving system performance.
- Intelligent transportation systems and other technology to improve the flow of freight, including intelligent freight transportation systems.
- Efforts to reduce the environmental impacts of freight movement.
- Environmental and community mitigation for freight movement.
- Railway-highway grade separation.
- Geometric improvements to interchanges and ramps.
- Truck-only lanes.
- Climbing and runaway truck lanes.
- Adding or widening of shoulders.
- Truck parking facilities
- Real-time traffic, truck parking, roadway condition, and multimodal transportation information systems.
- Electronic screening and credentialing systems for vehicles, including weigh-in-motion truck inspection technologies.
- Traffic signal optimization, including synchronized and adaptive signals.
- Work zone management and information systems.
- Highway ramp metering.
- Electronic cargo and border security technologies that improve truck freight movement.
- Intelligent transportation systems that would increase truck freight efficiencies inside the boundaries of intermodal facilities.

What is a Freight Project?

Many people think of large scale highway capacity expansion or grade separation projects when thinking about freight investments. The NHFP project eligibility list is useful to provide examples of the different types of investments for freight and goods movement, many of which may be eligible for funding through PSRC. In addition to capacity projects, ITS, parking facilities, and other programmatic investments all make up an important part of a comprehensive approach to keeping freight and goods moving.

- Additional road capacity to address highway freight bottlenecks.
- Physical separation of passenger vehicles from commercial motor freight.
- Enhancement of the resiliency of critical highway infrastructure, including highway infrastructure that supports national energy security, to improve the flow of freight.
- A highway or bridge project to improve the flow of freight on the NHFN.

National Highway Freight Network

The FAST Act established the designated National Highway Freight Network (NHFN) to strategically direct federal resources and policies toward improved performance of highway portions of the U.S. freight transportation system.

The designated NHFN includes the following subsystems of roadways:

Primary Highway Freight System (PHFS): This is a network of highways identified as the most critical highway portions of the U.S. freight transportation system determined by measurable and objective national data. Additionally, any other Interstate portions not already designated through the criteria are on the PHFS. For the State of Washington, this total was approximately 817 miles, with about 220 miles in the region. Additionally, states and MPOs have the ability to designate corridors and highway segments, allowing for key state and local input based on planning and priorities.

Critical Rural Freight Corridors (CRFCs): These are public roads not in an urbanized area which provide access and connection to the PHFS and the Interstate with other important ports, public transportation facilities, or other intermodal freight facilities. In the region, WSDOT led this process in consultation with PSRC and MPOs throughout the state.

Critical Urban Freight Corridors (CUFCs): These are public roads in urbanized areas which provide access and connection to the PHFS and the Interstate with other ports, public transportation facilities, or other intermodal transportation facilities. The FAST Act provided for MPOs with greater than 500,000 population to designate Critical Urban Freight Corridors in consultation with states, and provided for states to lead the designation process in consultation with MPOs for urbanized areas with less than 500,000 in population. In the region, PSRC led the designation process in consultation with WSDOT and other members.

Critical Urban Freight Corridor Designation Process

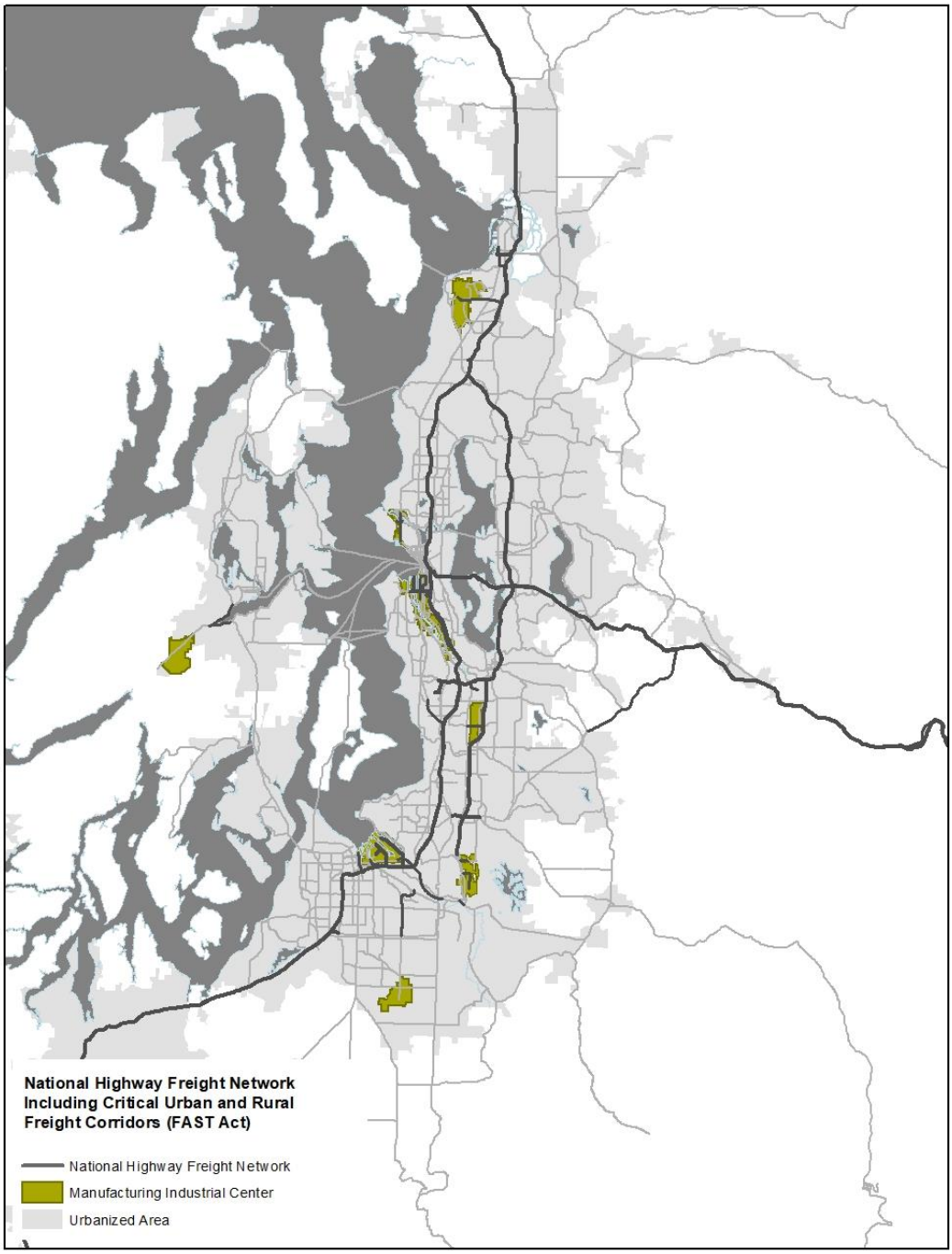
In January of 2016, PSRC began the process of identifying potential Critical Urban Freight Corridors by initially consulting with WSDOT, who would be leading the process for the rest of the state outside the region. As defined in the FAST Act, total statewide designations were very limited in the number of total centerline miles, so it was essential to establish close coordination throughout the corridor identification process. To this end, both PSRC and WSDOT developed a Memorandum of Understanding committing both parties to developing a process for corridor identification that would ultimately be within the limits established under the FAST Act, and that would look at land use and transportation criteria.

PSRC worked extensively with staff from the state, cities, counties, and public ports to develop a set of corridors that were consistent with the Regional Transportation Plan and the VISION 2040 Regional Growth Strategy, while also being strategic in looking at specific critical freight needs that could benefit from funding through the life of the FAST Act. The technical work took place through the FAST Freight Advisory Committee, and final designation of the region's Critical Urban Freight Corridors was approved by the Executive Board in July 2016. In September 2016, PSRC received official FHWA certification. A list of the final designated Critical Urban Freight Corridors is included in this appendix as Attachment 1.

Critical Rural Freight Corridors were mostly designated outside the central Puget Sound region, with the exception of the portion of SR 18 from the boundary of the urban growth area to I-90.

These additional corridor designations are an important tool for MPOs to identify key locations that are important for freight. Whether they are first or last mile connections for the regionally designated Manufacturing / Industrial Centers, or are facilities with a high volume of heavy truck movement, having the ability to provide direct input helps to ensure that strategic regional priorities are eligible for federal funds.

Figure 13: Designated National Highway Freight Network Including Critical Urban and Rural Freight Corridors



National Multimodal Freight Network

The FAST Act builds on requirements to designate highways and roads that are vital for the movement of freight, to now recognize that freight movement is multimodal in nature, integrating rail, air, pipeline, shipping, navigable waterways, and intermodal connectors, in addition to roadways. While not linked directly as a criteria for any funding, the FAST Act calls for the development of a new National Multimodal Freight Network (NMFN). The NMFN is to include the following key elements**:**

- The National Highway Freight Network (NHFN)
- Class 1 railroads
- U.S. public ports that have total annual foreign and domestic trade of at least 2 million short tons
- U.S. inland and intracoastal waterways;
- The Great Lakes, the St. Lawrence Seaway, and coastal and ocean domestic freight routes;
- The 50 U.S. airports with the highest annual landed weight; and
- Other strategic freight assets, including strategic intermodal facilities and other freight rail lines.

As of today, USDOT has yet to designate a NMFN. As this process moves forward, USDOT will solicit input from stakeholders, including multimodal freight system users, transportation providers, MPOs, local governments, ports, airports, railroads, and states through a public process.

National Freight Strategic Plan

The FAST Act requires the establishment of a national freight strategic plan in consultation with state DOTs, MPOs, and other appropriate public and private transportation stakeholders. As of today, USDOT has yet to publish a national freight strategic plan, or to outline the process for developing one that meets the requirements as established in the FAST Act.

The national freight strategic plan will include:

- The condition and performance of the Network;
- Barriers to improved freight transportation performance (and opportunities to overcome the barriers);
- Forecasts of freight volumes for the succeeding 5-, 10-, and 20-year periods;
- Major trade gateways and national freight corridors that connect major population centers, trade gateways, and other major freight generators;
- Bottlenecks on the network that create significant freight congestion;
- Corridors that access energy exploration, development, installation, or production areas;
- Corridors that access major areas for manufacturing, agriculture, or natural resources;
- Best practices for improving the performance of the network, including critical commerce corridors and rural and urban access to critical freight corridors; and
- Best practices to mitigate the impacts of freight movement on communities.
- A process for addressing multistate projects and encouraging jurisdictions to collaborate; and strategies to improve freight intermodal connectivity.

Within 5 years of completing the national freight strategic plan, and every 5 years thereafter, USDOT must update the plan and publish it on its website.

State Planning - Washington State Freight System Plan

The Washington State Freight System Plan provides a comprehensive overview of many of the key issues facing Washington State regarding freight and goods movement. The Washington State Freight System Plan covers some of the broader economic context for understanding freight and goods movement, updated data and forecasts, examination of emerging issues, a Freight Investment Plan that meets state and federal requirements, and a Marine Ports and Navigation Plan. The plan takes a multimodal approach, looking at all freight transportation modes in the context of the broader economy. The plan features a supply-chain approach, examining products with production throughout the state, and looking at the key components of the freight and goods transportation system that are relied upon to get these products to market. This approach is a particularly valuable consideration for the central Puget Sound region since products made in Washington are often dependent on the region's freight and goods transportation system to arrive at final markets.

The Washington State Freight System Plan provides updated data in the context of new requirements and funding opportunities that will be beneficial for the region. The plan provides a key framework for freight and goods movement through the following key functional roles within the broader transportation system:

- Global Gateways, which provide freight access to international markets;
- Made in Washington, the freight that is manufactured or produced in Washington; and
- Delivering Goods to You, representing local freight delivery for business and residents

To receive funding under the National Highway Freight Program (NHFP), the FAST Act requires each state to develop a state freight plan, which must comprehensively address the state's freight planning activities and investments. Among other requirements, state freight plans must cover a five-year period and provide a fiscally constrained "freight investment plan" that includes a list of projects and a description of how NHFP funds will be invested.

While the FAST Act marks the first time that a state freight plan is a requirement for certain federal funding (NHFP), Washington State has been developing state freight plans for many years, the most recent being the Washington State Freight System Plan finalized in fall of 2017.

The WSDOT Freight Investment Plan was developed in response to the new federal funding for the NHFP. Funding from the first two fiscal years of the program was appropriated by the legislature to three projects in WSDOT's preservation program, two of which are in the region. Direction for the remaining awards for NHFP funds was provided by the Washington State Legislature, who in 2016 required that WSDOT "in conjunction with the stakeholder group, must provide a list of prioritized projects for consideration for funding in the 2017-2019 biennium."[38] WSDOT led a process with cities, counties, ports, and MPO/Regional Transportation Planning Organizations (RTPO) to develop criteria for eligibility consisting of presence on the National Highway Freight Network (NHFN), being listed in a regional long range plan or has a letter of support from the MPO/RTPO, as well as looking at project costs and readiness. As a statement to the outstanding need for investments related to freight and goods movement, more than $2 billion in investments were identified in the region. Of the projects that were awarded funding in the region, many have been identified for many years as freight investments that have broad corridor-wide benefits, such as the Lander Street Grade Separation in the City of

[38] House Bill 2524 Section 218 (4) (b)

Seattle. Programs such as this will be a critical component of funding for projects that benefit freight and goods movement in the future. The full lists of eligible roadway and multimodal freight projects in the Freight Investment Plan for the region are included as attachments to this appendix. These include projects listed on PSRC's regional capacity project list, as well as projects that are not required to be on the regional capacity project list and are programmatic in nature. Attachments 2 and 3 are the Tier 1 multimodal and roadway projects considered for the 2017-2019 biennium. Attachment 4 is the Tier 2 and 3 multimodal and roadway projects that are longer range, and which may be considered for future NHFP awards.

Figure 14 shows projects in the region funded by the NHFP from the first five fiscal years of available funding. This table shows how NHFP funds have been invested and matched with other state and local funding sources.

Figure 14: National Highway Freight Program Funded Projects

FY	Project	Agency	Type	NHFP $	Total Cost
2016	I-5 SB 88th St to SR 531	WSDOT	Roadway	$3,650,000	$4,026,000
2017	I-90 / 468th Ave SE to W Summit Rd EB	WSDOT	Roadway	$22,308,000	$27,709,000
2018	South Terminal Modernization Project Phase II	Port of Everett	Roadway	$1,812,000	$50,100,000
2018	S Lander St Grade Separation and Railway Safety Project	City of Seattle	Roadway	$3,000,000	$125,000,000
2018	Pacific Highway E/54th Ave E Intersection Improvements	City of Fife	Roadway	$2,000,000	$9,262,000
2018	142nd Ave & 24th St	City of Sumner	Roadway	$4,707,000	$5,547,000
2018	Replace anchor cables on floating bridges	WSDOT	Roadway	$159,000	$1,989,000
2019/2020	Port Community Technology System	NWSA	Multimodal	$1,500,000	$6,000,000
2019/2021	Taylor Way Rehabilitation	City of Tacoma	Roadway	$8,895,000	$13,474,000

Regional Freight Planning – Looking Forward

PSRC has a long established track record of incorporating freight and goods movement into the planning process. PSRC has sponsored the Regional Freight Mobility Roundtable since 1996, administered the FAST Corridor Partnership that funded and completed strategic freight investments, and continues to convene a technical planning advisory group in the FAST Freight Advisory Committee. PSRC will continue to incorporate freight and goods movement into the planning process by leveraging existing groups, while looking for new resources as the Regional Transportation Plan is implemented.

Approved PSRC Critical Urban Freight Corridors July 28, 2016

Jurisdiction / MIC	Route Name	Section Description	Length (miles)	Criteria Met
Port of Everett	41st / Rucker	41st from I-5 to Rucker, then Rucker from 41st to Pacific Ave.	1.47	T-1, connects Port of Everett
City of Everett, Snohomish County/Paine Field	SR 526	Sr 526 to I-5. Paine Field / Boeing freight access/egress	3.73	T-2, connects Paine Field MIC
Seattle / Ballard Interbay North MIC	Ballard Interbay North MIC Corridors	15th Ave W, W Emerson Pl, W Nickerson St, 15th Ave W, W Galer	3.25	T-2 and some T-3, within and connecting Ballard Interbay North MIC
Seattle/ Duwamish MIC	Duwamish MIC Corridors	Alaskan Way S, East Marginal Way S, S Atlantic St, SR-519, S Hanford St, 1st Ave S, S Lander St, 6th Ave S, S Industrial Way, 4th Ave S	4.67	T-1, T-2, and some T-3, within and connecting Duwamish MIC
Sea-Tac / International Air Cargo	S. 154th / 160th	S. 154th, S. 160th, Air Cargo Road. Corrects designated network to reflect actual freight access routes	0.63	T-3, access / egress for Sea-Tac International Airport Air Cargo
Tukwila	Strander	SR 181, SW 27th, Strander new facility. Planned grade separation of BNSF and UP tracks	1.05	On FMSIB active project list
Kent / Kent MIC	South 212th	S. 212th St. Planned grade separation of BNSF and UP tracks	1.36	T-2, segment is in Kent MIC and crosses UP and BNSF lines
Sumner / Pacific MIC	SR 410, Stewart Rd, 142nd Ave E, 24th St E	142nd Ave E, 24th St E, Stewart Rd to 8th, SR 410 Connecting SR 167 to intersection of Traffic Ave and SR 410	2.99	T-1, connects to southern portion of Sumner / Pacific MIC
Pierce County / Frederickson MIC	Canyon Road Extension	New facility from N Levee Rd to Canyon Rd	4.58	Will complete connections between I-5 and the Frederickson MIC
Tacoma / Port of Tacoma MIC	Puyallup Avenue Bridge Connection	Puyallup River Bridge and Portland Ave	1.27	T-1, enhances connections in the Port of Tacoma MIC
WSDOT	SR167 Extension / SR 509 Spur	SR 167 Extension between I-5 and SR 512, and between I-5 and SR 509.	6.36	New facility
WSDOT	SR 509	SR 509 Extension from I-5 to S 188th St.	2.82	New facility
Kitsap County / SKIA MIC	Gorst Interchange	SR 3 up to and including SR 3/SR 304 interchange and SR 16 from south of the SR 16 / SR 166 interchange to the SR 16/SR3 interchange	4.24	T-1, and T-2, connects the SKIA MIC
		Total Approved Regional Critical Urban Freight Corridors	**38.42**	

T1: more than 10 million tons per year
T2: 4 million to 10 million tons per year
T3: 300,000 to 4 million tons per year

2017 WSDOT Freight Investment Plan - National Highway Freight Program - Tier 1 roadway projects (funding request at $445.5 m Puget Sound Region Only)

No.	Project Name	Location Description	Brief Description	Project Owner	Total Project Cost
Tier 1 Construction					
29	6th Ave S / Industrial Way Intersection Reconstruction	Duwamish Manufacturing Industrial Center, 6th Ave S & S Industrial Way	Replace damaged/failing concrete panels and enhance intersection design	City of Seattle	$1,000,000
9	Nickerson St Reconstruction	Ballard Interbay Manufacturing Industrial Center, 15th Ave W - 13th Ave W	Replace damaged/failing concrete panels for maritime industry access route	City of Seattle	$12,500,000
11	Pacific Highway E/54th Ave E Intersection Improvements	Pacific Highway E/54th Ave E intersection	Construct a 2nd westbound left-lane turn lane, new signal poles, illumination and other intersection improvements.	City of Fife	$2,800,000
39	142nd Ave & 24th St	142nd Ave; 24th Street E to Tacoma Ave	This project resurfaces 142nd Ave E and 24th St E in phases. This corridor connects the north and south sections of the Sumner/Pacific Manufacturing Industrial Center to SR 167.	City of Sumner	$5,574,000
52	S Lander St Grade Separation	Duwamish Manufacturing Industrial Center, 1st Ave S - 4th Ave S	Construct a grade separation to replace an at-grade crossing over active BNSF railroad tracks	City of Seattle	$140,000,000
125	I-90/Floating Bridges - Replace Anchor Cables	090	Replace anchor cables on the Lacey V Murrow and Homer M Hadley floating bridges.	WSDOT	$5,774,209
137	I-90/468th Ave SE to W Summit Rd WB - Rehab Concrete	090	The concrete pavement on Westbound I-90 from Snoqualmie Summit to North Bend is rough and deteriorated, causing a poor ride, and shortening the life of the pavement. By replacing severely deteriorated panels and grinding full width this project will extend the pavement life and provide a smoother ride. The purpose of this project is to replace severely deteriorated panels, and grind the concrete surface full width. This project will also restore basic safety features such as signing and striping.	WSDOT	$23,049,488
128	I-90/EB Winery Rd Bridge - Deck Overlay	090	The project will overlay the bridge deck of the EB Winery Rd Bridge 90/80S to preserve the structure.	WSDOT	$922,659
119	I-90/S Fork Snoqualmie Bridge E of North Bend EB - Deck Rehabilitation	090	The bridge deck on the S. Fork Snoqualmie Bridge on eastbound I-90 east of North Bend is showing signs of deterioration from normal wear. This project will repair and resurface the existing bridge deck to maintain structural integrity, continue safe operation of the highway, and extend the life of the bridge.	WSDOT	$1,234,745
124	I-90/Lacey V Murrow Bridge - Electrical Rehabilitation	090	Replace the electrical switchgears and five pairs of transformers, separating the neutral and grounding conductors on the Lacey V Murrow Bridge. Reinstall the three submersible fuses. Perform fault current and arc flash hazard analyses on all medium voltage equipment.	WSDOT	$1,280,178
117	I-5/Southbound SR 531 Interchange - Paving	005	This project will mill on I-5 mainline and inlay with 0.15' HMA, between MP 205.27 to MP 206.67 in the southbound direction.	WSDOT	$1,289,790
129	I-405/SB SR 900 to Coal Creek Pkwy SE - Paving	405	The project will resurface I-405 SB mainline and selected ramps, and rehabilate the bridge decks of Br 405/23W and 405/25W.	WSDOT	$1,513,062
135	SR 167/Northbound Pierce County Line to 15th St SW - Paving	167	This project will resurface SR 167 Northbound Mainline and the SR 167 Northbound to Ellingson Rd Off-ramp.	WSDOT	$1,598,460
133	I-5/SR 532 & 300th St NW Interchange Ramps - Paving	005	This project will mill and fill the ramps at I-5/SR 532 and I-5/30th St NW interchanges with Hot Mix Asphalt (HMA). Required minor safety work will include striping and upgrading the existing guardrail as needed.	WSDOT	$2,649,514
130	I-5/SB S Lucile St to Spring St - Pavement Repair	005	Provide pavement repair through select panel replacements and diamond grinding concrete pavement surfaces full width. Maintain roadway drainage through grinding and paving the inside and outside shoulders, adjusting catch basins/junctions boxes as needed, as well as paving 2 mainline ramps and 6 SBCD ramps.	WSDOT	$6,897,468
134	I-5/Stillaguamish River Br to Hill Ditch Br - Concrete Pavement Rehab	005	The project will rehabilitate the concrete pavement of the NB and SB lanes of I-5, including diamond grinding and panel replacement in lanes 1 & 3, and diamond grinding, panel replacement & reconstruction in lane 2.	WSDOT	$17,561,440
3	Tideflats Area Transportation Study Update	Generally corresponding to the Regionally-designated Port of Tacoma Manufacturing and Industrial Center.	Building on prior planning studies such as the Tideflats Area Transportation Study and the Tideflats Area ITS Architecture Plan, develop a prioritized list of capital investments.	City of Tacoma	$400,000
72	West Marine View Drive (Highway 529) Bulkhead Rebuild	Everett, Washington	Rebuild aging bulkhead that is supporting the southbound lanes of Highway 529 that accesses Naval Station Everett and the Port of Everett	Port of Everett	$1,500,000
126	I-90/West of Snoqualmie Pass Interchange - Paving	090	The existing pavement in this section of I 90 (Exits 34,42,45,& 47) is deteriorating and needs rehabilitation due to structural condition. This project will rehabilitate (or repave) the roadway per recommendations from the materials report to extend the life of the pavement.	WSDOT	$1,670,251
Tier 1 construction total (PS Region Only)					$229,215,265
Tier 1 Right of Way					
75	8th St E/54th Ave E Intersection Improvements	8th St E/54th Ave E Intersection	Add westbound left turn lane and reconstruct eastbound approach to a 3-lane roadway.	City of Fife	$2,880,000
47	Taylor Way Rehabilitation	Taylor Way from the Fife/Tacoma City border to E. 11th St./Alexander Ave.	Reconstruct roadway to heavy haul standards, remove/upgrade rail crossings, widen SR509/Taylor Way intersection, install fiber/ITS/ signal improvements, new sidewalks, lighting/curb ramps, channelization	City of Tacoma	$21,385,540
49	SR 410 Traffic Ave/E Main	State Route 410; Traffic Ave and East Main Interchange	This project increases freight mobility by reconfiguring two intersections and adding travel lanes and multimodal access across SR 410 to the Sumner/Pacific MIC.	WSDOT	$26,411,500
94	Stewart Road Bridge	Stewart Road Bridge; Butte Rd and 142nd Ave E	Freight mobility is improved by replacing the undersized bridge, adding travel lanes and multimodal access across the White River and railroad crossing. This corridor connects the Lake Tapps area to SR 167 and West Valley Hwy in the north section of the Sumner/Pacific MIC.	City of Sumner	$25,000,000
63	I-5 and 54th Ave E Interchange Improvement Project	I-5/54th Ave E I-5 Interchange and nearby streets	Rebuild I-5 Interchange and nearby intersections.	City of Fife	$53,000,000
105	E Marginal Way Reconstruction and Safety Enhancements	Duwamish Manufacturing Industrial Center, S Atlantic St - Diagonal Way S	Reconstruct to heavy haul standards, add advanced traffic management systems, and incorporate separated bicycle and pedestrian facilities while maintaining freight efficiency	City of Seattle	$60,000,000
37	Tideflats Area ITS backbone	Generally corresponding to the Regionally-designated Port of Tacoma Manufacturing and Industrial Center.	ITS improvements consistent with near-term ITS improvements identified in the 2016 Tacoma Tideflats Emergency Response Plan	City of Tacoma	$3,700,000
Tier 1 ROW Total (PS Region Only)					**$192,377,040**
Tier 1 Preliminary Engineering					
89	Portland Avenue	Portland Avenue from I-5 to Lincoln	Upgrade Pavement, rehabilitate bridge deck, install signal at SR-509 ramp terminal	City of Tacoma	$8,200,000
150	I-90/468th Ave SE to W Summit Rd WB - Replace Concrete Panels	090	The existing concrete pavement on westbound I-90 between North Bend and Snoqualmie Pass summit is deteriorating due to wear and tear. This project will replace select concrete panels to extend the life of the pavement.	WSDOT	$3,240,923

2017 WSDOT Freight Investment Plan - National Highway Freight Program - Tier 1 roadway projects (funding request at $445.5 m Puget Sound Region Only)

No.	Project Name	Location Description	Brief Description	Project Owner	Total Project Cost
146	I-5/Northbound SR 104 Vicinity to 212th St SW Vicinity - Paving	005	Resurface this section of I-5 northbound mainline by milling the existing surface and inlaying with 0.15 ft. of Hot Mix Asphalt (HMA). Includes approximately 8 on and off ramps within the project limits.	WSDOT	$3,914,200
90	E Marginal Way / S Hanford Street Intersection Improvements	E Marginal Way / S Hanford Street Intersection	Upgrade the signal, lengthen the northbound right-turn lane, improve the railroad crossing pavement, and evaluate the need for railroad crossing gates. The project also includes rebuilding the intersection and its approaches to Heavy Haul route requirements	City of Seattle	$8,600,000
	Tier 1 PE Total (PS Region Only)				**$23,955,123**

Roadway: project is partially located on NHFN.*

Tier 1 Total (PS Region Only) **$445,547,428**

2017 WSDOT Freight Investment Plan-National Highway Freight Program(All Tier 1 eligible multimodal projects in PSRC only, funding request at $693m)

No.	Project Name	Location Description	Brief Description	Project Owner	Total Project Cost
Tier 1 Construction					
12	Port Community Technology System	NWSA facilities, Seattle Duwamish and Port of Tacoma MICs	Implement an electronic platform that allows for the secure exchange of information between the NWSA and private, as well as public, sector stakeholders to improve the efficiency of the NWSA-related supply chain. This will cover NWSA terminals, trucks, rail and waterways; and their interactions with each other.	Northwest Seaport Alliance	$10,000,000
15	Terminal 5 Access Improvements	Terminal 5 is located in the Duwamish MIC, north of the West Seattle Bridge on the west side of the west Duwamish Waterway, and just east of Harbor Avenue in West Seattle.	The project includes truck gate, ITS and intersection improvements in the S. Spokane St/East Marginal Way/Hanford corridor to facilitate truck access and minimize traffic impacts.	Northwest Seaport Alliance	$5,000,000
25	South Terminal Modernization Project II	Everett, Washington	Strengthen the remaining 560-feet of the South Terminal, install 700-feet of crane rail to support 2, 100-foot gauge gantry cranes, and construct a double rail siding to support the cargo operations.	Port of Everett	$55,000,000
17	Terminal 18 Truck Access Improvements	Terminal 18 is located in the Duwamish MIC, north of S. Spokane St on the east side of Harbor Island in Seattle	This project will reconfigure the southern edge of the NWSA's Terminal 18, and adjacent public right-of-way, to relocate the terminal truck entrance's security check and optical character recognition equiment. It will increase the capacity of the security check and eliminate truck queues on public streets.	Northwest Seaport Alliance	$5,000,000
20	Blair Hylebos Rail Improvements	Port of Tacoma MIC, Blair Hylebos Peninsula	Track improvements specific to future dry bulk export terminal requirements and connection to arrival/departure track infrastructure and direct mainline infrastructure.	Northwest Seaport Alliance	$7,000,000
64	North Sea-Tac Cargo Facility Access	TBD, north of Sea-Tac Airport, between Des Moines Mem'l Dr & 24th Ave S, and betw SR518 & S 136th St	Rehabilitation of existing arterials to support new cargo land uses north of Sea-Tac Airport	POS/City of SeaTac	$50,000,000
	Tier 1 construction total (PS Region Only)				**$132,000,000**
Tier 1 Right of Way					
58	Arrival/Departure Tracks	Port of Tacoma MIC	In order to increase cargo velocity through terminals, it is necessary to arrive and depart longer trains of 8,000' in tact. This project would extend a number of SR-509 rail corridor tracks 1,300' east, construct a new railbridge across Wapato Creek, and relocate utilities. This phase provides two track connections from existing support yard to future Bulk Export facility and connects the easterly end of the existing Pierce County Terminal Intermodal Yard to the SR-509 corridor arrival and departure tracks.	Northwest Seaport Alliance	$45,000,000
62	North Intermodal Yard Alignment	Port of Tacoma MIC, General Central Peninsula	Align North and South Intermodal Yards	Northwest Seaport Alliance	$50,000,000
66	Terminal 5 Improvements	Terminal 5 is located in the Duwamish MIC, north of the West Seattle Bridge on the west side of the west Duwamish Waterway, and just east of Harbor Avenue in West Seattle.	The completed project will upgrade the terminal's dock and power supply to accommodate larger cranes, additional refrigerated container storage and future shorepower, and increase the depth of the berth to accommodate larger ships. The grant requested portion of this project includes truck gate, ITS and intersection improvements in the S. Spokane St/East Marginal Way/Hanford corridor, container movement and power supply improvements to facilitate truck access and minimize traffic impacts.	Northwest Seaport Alliance	$275,000,000
24	Duwamish Rail Corridor Project	Seattle, Duwamish MIC, existing rail lines on the south side of Spokane Street from Terminals 5 and 18 through the south end of Argo Yard	Create improved direct rail access from the Port marine terminals T-5 and T-18 to UP and BNSF mainlines	Northwest Seaport Alliance	$16,000,000
60	T-5 Rail Improvements	Terminal 5 is located in the Duwamish MIC, north of the West Seattle Bridge on the west side of the west Duwamish Waterway, and just east of Harbor Avenue in West Seattle.	Intermodal Yard and Rail Enhancements	Northwest Seaport Alliance	$40,000,000
	Tier 1 ROW Total (PS Region Only)				**$426,000,000**
Tier 1 Preliminary Engineering					
56	South Terminal Modernization Project III	Everett, Washington	The Port of Everett is exploring a cleanup action plan for the South Terminal Mill A site that restores the health of the Puget Sound, while also modernizing the Port of Everett Seaport to meet 21st Century Infrastructure Needs. The net result would be a minimum of a 1,100 foot berth and -45 MLLW operational depth.	Port of Everett	$135,000,000
	Tier 1 PE Total (PS Region Only)				$135,000,000
	Tier 1 Total (PS Region Only)				**$693,000,000**

2017 WSDOT Freight Investment Plan-National Highway Freight Program(Tier 2 and 3 projects in PSRC only)

No.	Project Name	Brief Description	Project Owner	Total Project Cost
Tier 2 and 3 (Construction, ROW, and PE)				
79	Ballard Bridge Seismic Improvements	Ensure seismic resiliency for existing structure on regionally significant freight route facility	City of Seattle	$8,800,000
97	S. 212th Street BNSF Railroad Grade Separation	Provides a critical, grade-separated link through the commercial/industrial/central area of Kent. Links the valley warehouse/industial center to SR 167 and I-5.	City of Kent	$40,000,000
152	SR 167/SR 410 to SR 18 - Congestion Management	This section of SR 167 experiences severe congestion and operational problems due to high traffic volumes. By re-striping the existing roadway to create a NB HOV lane, installing lane control signing, CCTV cameras, data stations, ramp meters, variable message sign and illumination, this project will reduce congestion and improve motorist safety.	WSDOT	$13,015,000
27	Lower Spokane St Freight-Only Lanes Pilot	Pilot project to design, implement, and evaluate freight-only lanes on the corridor	City of Seattle	$450,000
55	POT Road Interchange Modification - Phase III	New 34th Avenue E bridge over I-5, reconstruct northbound I-5 exit and entrance ramp connectors with POT Road, 20th St E improvements, and two new signal installations (Phase 3).	City of Fife	$27,500,000
32	S Hanford Railroad Crossing Rehabilitation	Reinforce active rail crossings with concrete grade crossing systems	City of Seattle	$2,000,000
113	Ballard Bridge Replacement	Replace structure to increase capacity and improve access	City of Seattle	$520,000,000
83	W Emerson St Freight Safety Improvements	Redesign and construct interchange improvements to reduce modal conflicts	City of Seattle	$4,800,000
30	SR 519 / Edgar Martinez Dr S Freight Operations Improvements	Reconstruct intersections for optimized freight operations	City of Seattle	$900,000
76	4th Ave S ITS Implementation	Provide adaptive traffic signalization for optimized freight operations	City of Seattle	$2,500,000
84	S Atlantic St / SR 519 / Edgar Martinez Dr S Corridor ITS Implementation	Provide adaptive signal control for optimized freight operations following Alaskan Way Viaduct Replacement project	City of Seattle	$5,000,000
91	Terminal 91 Uplands Access	Rehabilitation of existing avenues to support industrial land uses in the T-91 Uplands	POS/City of Seattle	$10,000,000
95	W Galer St Interchange Ramp	Construct additional ramp to improve access over BNSF mainline tracks and storage yard	City of Seattle	$23,000,000
80	S Atlantic St Reconstruction	Replace damaged/failing concrete panels	City of Seattle	$3,700,000
111	South Access	New construction of a 2-lane ltd access arterial connecting the planned S Airport Link roadway to the planned extension of SR509 to I-5.	POS	$247,203,000
157	I-5/Marysville Vicinity - Ramp Meters	I-5 experiences congestion due to the uncontrolled flow onto the highway from the interchange on-ramps at 4th St. and 88th St. This project will install ramp meter systems on the I-5 northbound and southbound on-ramps from 4th St. and 88th St. in the Marysville vicinity. The new meters will ease the congestion experienced by the travelling public.	WSDOT	$1,790,000
156	I-5/SB Corson Ave to Mercer St - Mobility Improvements	Southbound I-5 experiences severe congestion between Corson Ave and Mercer St. Providing dynamic operation of the SB I-5 Mercer St. to Corson Ave. HOV Lane, installing electronic signing to display the HOV lane status, adding ramp metering to southbound I-5 from Yale St. and southbound I-5 collector-distributor lane ramp metering will improve mobility along the corridor.	WSDOT	$5,200,000
151	I-5/NB Seneca St to Olive Way - Mobility Improvements	NB I-5 between Seneca St & Olive Way experiences severe congestion. Providing an additional NB lane between Seneca St and the Olive Way off ramp will improve mobility along the corridor.	WSDOT	$6,500,000
168	I-5/NB I-90 to SR 520 - Active Traffic Management	NB I-5 between I-90 & SR 520 experiences severe congestion. Installing metering on the Cherry St to NB I-5 ramp and the NB I-5 collector-distributor ramp, and extending the Active Traffic Management System on NB I-5 to SR 520 will improve mobility along the corridor.	WSDOT	$13,600,000
166	I-5/WB SR 512 to NB I-5 On Ramp - Mobility	A high volume of westbound SR 512 morning traffic to northbound I-5 disrupts traffic flow on I-5 and causes large traffic back-ups on SR 512 between Steele Street Interchange and I-5 for both Truck and GP traffic. Widening the on ramp to two lanes and constructing an auxillary lane on SR 512 from E Steele St may reduce traffic congestion and increase traffic mobility.	WSDOT	$17,500,000

2017 WSDOT Freight Investment Plan-National Highway Freight Program(Tier 2 and 3 projects in PSRC only)

No.	Project Name	Brief Description	Project Owner	Total Project Cost
165	I-5/NB Express Lanes Northgate Vic. - Merge Revision	The merge onto NB I-5 from the NB I-5 Exprress Lanes creates congestion on both mainline I-5 and the Express Lanes. Constructing a new ramp for general purpose traffic from the Express Lanes to NB I-5 just north of NE 92nd St and eliminating the general purpose exit at its current location at NE 103rd St will improve the mobility of the corridor.	WSDOT	$22,600,000
162	SR 167/8th St E to 15th St SW - Northbound HOT Lanes	SR 167 between 8th St E and 15th St SW experiences severe congestion during peak traffic periods. Constructing a new High Occupancy Toll lane in the northbound direction will improve the efficiency of the corridor by providing single occupancy vehicles the option of choosing to use the HOT lane.	WSDOT	$33,000,000
	Tier 2 and 3 Total			**$1,009,058,000**