Washington State Transportation Commission

Statewide Rail Capacity and System Needs Study

Task 1.2.A – Washington State Rail Traffic

Technical Memorandum

prepared for

Washington State Transportation Commission

by

Global Insight, Inc.

July 11, 2006

www.wstc.com

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Task 1.2.a – Washington State Rail Traffic

Summary

This Technical Memorandum provides an overview of the freight traffic handled across Washington's rail network and its context within the State's and the nation's overall freight transportation activities, recent past and future expectations. Fundamental traffic data was drawn from the Surface Transportation Board's Rail Waybill Sample for railroad traffic and Global Insight's TRANSEARCH Insight for highway, water, and air modes. Traffic was projected for 2015 and 2025 using Global Insight's goods movement forecast. This forecast depicts the demand for goods movement between regions, and is not a general economic projection. It takes into account industry, regional, national and international economic trends to estimate commodity-level trade flows.

In 2004, Washington's overall freight transportation mode shares largely mirrored national trends, except that water traffic comprised 17 percent of terminated volumes instead of 7 percent nationally, with a commensurate reduction in truck market share, from 76 percent nationally to 67 percent for Washington. The vast majority of Washington's rail traffic – 94 percent of total short tons – begins and/or ends its trip outside of the State. Twenty-nine percent travels through Washington, and 19 percent entails cross-border traffic with Canada. Farm products were the most important commodity group handled by rail, amounting to almost 24 million tons in 2004. They were followed by intermodal traffic with 25 percent of total rail tonnage, but the highest number of units. The primary trade flows within the United States are with the Midwestern states, of which the single highest volume point is the Chicago region with its status the North American rail hub. Several nearby states accounted for a significant share as well, lead by Oregon and California.

Most of Washington's recent growth in rail traffic has been driven by Asian trade through the Puget Sound ports. These trends are expected to continue over the next 20 years. By 2015, the railroads will move more than 103.5 million domestic tons of freight, up from 81.5 in 2004, and a 2.2 percent compound annual growth rate. In 2025, it is projected that there will be close to 129.5 million tons moved, a 2.3 percent annual growth over the 10 years from 2015 to 2025, and a steady 2.2 percent growth rate over the 21 years between 2004 and 2025. By 2025, intermodal will account for two out of every five tons and four out five units of rail freight.

Objective

The objective of this Technical Memorandum is to describe the current and projected trends in the State of Washington, focusing on rail traffic and its regions rail, truck, air and water traffic over the next 10 and 20 years. The description of traffic is important to quantify the future state needs for rail transportation. This complements the perspectives from the stakeholders that are being collected as part of the WTC Rail Study work plan, the economic forecast, and the sector-level discussion that reported on elsewhere.

Methodology

The findings and conclusions reported in this Memorandum were developed in the following steps.

The consultants examined and compared 1996, 2003, and 2004 historical intermodal (IMX) and carload rail traffic using the Surface Transportation Board's Rail Waybill Sample.[1] These years were selected to identify and analyze recent trends in rail traffic, categorized primarily by type of traffic (carload and intermodal), geography, and whether it originated, terminated, or traveled through the State of Washington. Traffic was further characterized by commodity, industrial sector, and volume (tons and cars).

Comparing the rail traffic to motor carriage, air, and water required the use of the 2004 TRANSEARCH INSIGHT database. Production of consistent projections for inbound, outbound, and through freight traffic requires a national forecast rooted in regional activity, and associated with international trade. The nested econometric models of Global Insight fulfill this requirement. They are built from business transactions and demographics at the county and industry level, cumulating to global models with complete internal correspondence. They are used in the economic foundations of TRANSEARCH, rendering them consistent again with the base year data employed in this project, and account for significant factors like the coastal shift of Asian trade. The Global Insight forecast of freight transportation is specifically a depiction of freight, and not a general economic projection.

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[1] This Technical Memorandum relies primarily on data provided through the Surface Transportation Board's (STB) Rail Waybill Sample and source data collected by the consultant. The Waybill Sample reasonably reflects traffic volumes of the two major carriers serving Washington (i.e., BNSF and Union Pacific). There are a number of smaller railroads that also operate in the region. Unfortunately, the Waybill Sample's coverage of small railroads is generally incomplete or entirely missing, as the STB does not collect data from railroads terminating fewer than 4,500 carloads. Since traffic data is confidential and proprietary, only general summaries are provided herein. A description of the Waybill Sample file can be found at http://www.stb.dot.gov/stb/docs/2002userguide.pdf.

Forecast data for the years 2015 and 2025 was created by routing the rail traffic and other modes across the respective modal networks. The carload and IMX forecast synthesizes economic growth conditions and trend projections, making adjustments and extensions where appropriate, to bracket the most likely growth rates and freight forecasts for Washington State. The resulting forecast projects the long-term growth through 2025.

Findings

The 2004 mode share of Washington's total inbound, outbound, local, and through tons closely mirrors the mode share of the entire country for rail and air. Washington's terminating tons represent 0.6 percent of all U.S. tons by truck, 1.8 percent by air, 3.0 percent by water, and 1.7 percent by rail. Washington's originating tons represent 0.8 percent of all U.S. tons by truck, 1.2 percent by air, 2.3 percent by water, and 0.8 percent by rail. Washington enjoys more water traffic and less truck traffic compared to the United States in general.

Rail service plays an important role in Washington's economy, handling 16 percent of all intercity traffic. As is the case in most states, truck traffic predominates, with 67 percent of the total market. Given that rail is generally most effective at handling long-haul traffic, relatively little – only 6 percent of all rail tonnage traveled wholly within Washington in 2004. Of the rest, 43 percent of traffic terminated in Washington, 21 percent originated, and 29 percent traveled across the network, neither originating nor terminating within the State. Noteworthy at 19 percent is the significant amount of cross-border trade with Canada that traverses Washington.

Farm products are the most important commodity handled on Washington's rail network from a tonnage standpoint, amounting to almost 24 million short tons in 2004. More than 90 percent of this traffic terminated at Washington ports for export to overseas destinations. The second highest volume commodity at 10.6 million tons, were "miscellaneous mixed shipments," which consist entirely of freight moving in trailers and containers, i.e., intermodal. Intermodal traffic for which commodities are reported in the Waybill Sample amounted to another 5 million tons, such that total intermodal tonnage accounted for approximately 25 percent of all rail traffic. In 2004, 60 percent of IMX traffic was outbound from the State, much of it Asian imports arriving through the Puget Sound ports. Lumber and wood products placed third, totaling 5.3 million tons. Other important rail-hauled commodities were coal, waste and scrap, pulp and paper, transportation equipment, metal products and chemicals.

The highest density trade flows within the United States were with the Midwest: agricultural products heading to Pacific coast ports, and intermodal traffic flitting between Chicago and the coast in both directions. Much of the intermodal traffic does not actually originate or terminate in the Chicago region, but rather is "hubbed" through there, either with a truck dray to the industrial heartland at distances of up to 600 miles from Chicago, or a "rubber tire" interchange with another railroad. Such traffic is nevertheless reported

as either origination or terminating in the Chicago region. The Mountain/western Great Plains states produce the second highest tonnage into Washington after the Midwest, also on account of agricultural production. Nearby states account for a significant share of traffic as well, Oregon with its bulk ports drawing agricultural production from eastern Washington, and California as an important destination for lumber and pulp products. Montana continues to be an important exporter for grain through Pacific coast ports, but very little traffic originating in Washington is destined for Montana.

Although carload traffic continues to represent the majority of Washington traffic from a tonnage perspective, intermodal units have superseded carloads for several years. Whereas a typical railcar loads between 80 and 110 tons, intermodal loads seldom exceed 20 tons, and are often far less. In addition, there is a considerable volume of empty containers headed back to Pacific Coast ports from the interior, for which the railroads are compensated and therefore appear as traffic in the Waybill Sample.

Between 2004 and 2025, overall traffic is expected to increase at a 2.2 percent annual compound rate for tonnage, from 81.5 million in 2004 to 129.5 million in 2025. Not surprisingly, the strongest growth is expected to take place in outbound intermodal volumes, driven by Asian imports, averaging 4.8 percent annually. Inbound intermodal volumes are expected to grow at a somewhat slower rate, averaging 4 percent compounded annually over the 21-year period. This growing flood of intermodal traffic will represent 81 percent of all units by 2025, with carload diminished to only 19 percent. However, from a tonnage perspective, by 2025 carload traffic is still expected to represent 60 percent of all rail traffic, will intermodal at 40 percent, an increase of 15 percentage points from 2004. Carload traffic volumes are expected to be stagnant, averaging only 1.1 percent annual compound growth, with local traffic actually declining. This is not surprising, given the tendency for increasingly longer hauls and the static nature of Washington economic sectors that have been most heavily reliant on short-haul rail service.

■ Traffic Analysis

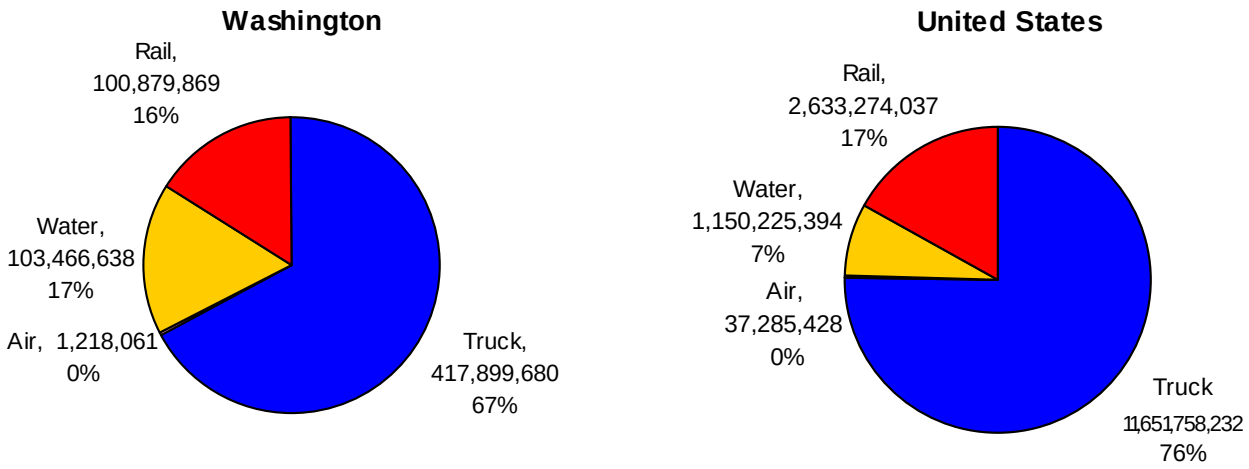
National and Modal Comparison

Washington's terminating tons represent 0.6 percent of all U.S. tons by truck, 1.8 percent by air, 3.0 percent by water, and 1.7 percent by rail. Washington's originating tons represent 0.8 percent of all U.S. tons by truck, 1.2 percent by air, 2.3 percent by water, and 0.8 percent by rail. The 2004 mode share of Washington's total inbound, outbound, local, and through tons closely mirrors the mode share of the entire country for rail and air. Washington enjoys more water traffic and less truck traffic compared to the overall United States.

In 2004, the mode share of Washington was 67 percent truck, 0.2 percent air, 17 percent water, and 16 percent rail for all traffic, inbound, outbound, and local on a tonnage basis.

Figure 1 shows the mode share and tonnage for Washington State and for the United States as a whole.

Figure 1. Washington State and National Freight Tonnage by Mode, 2004

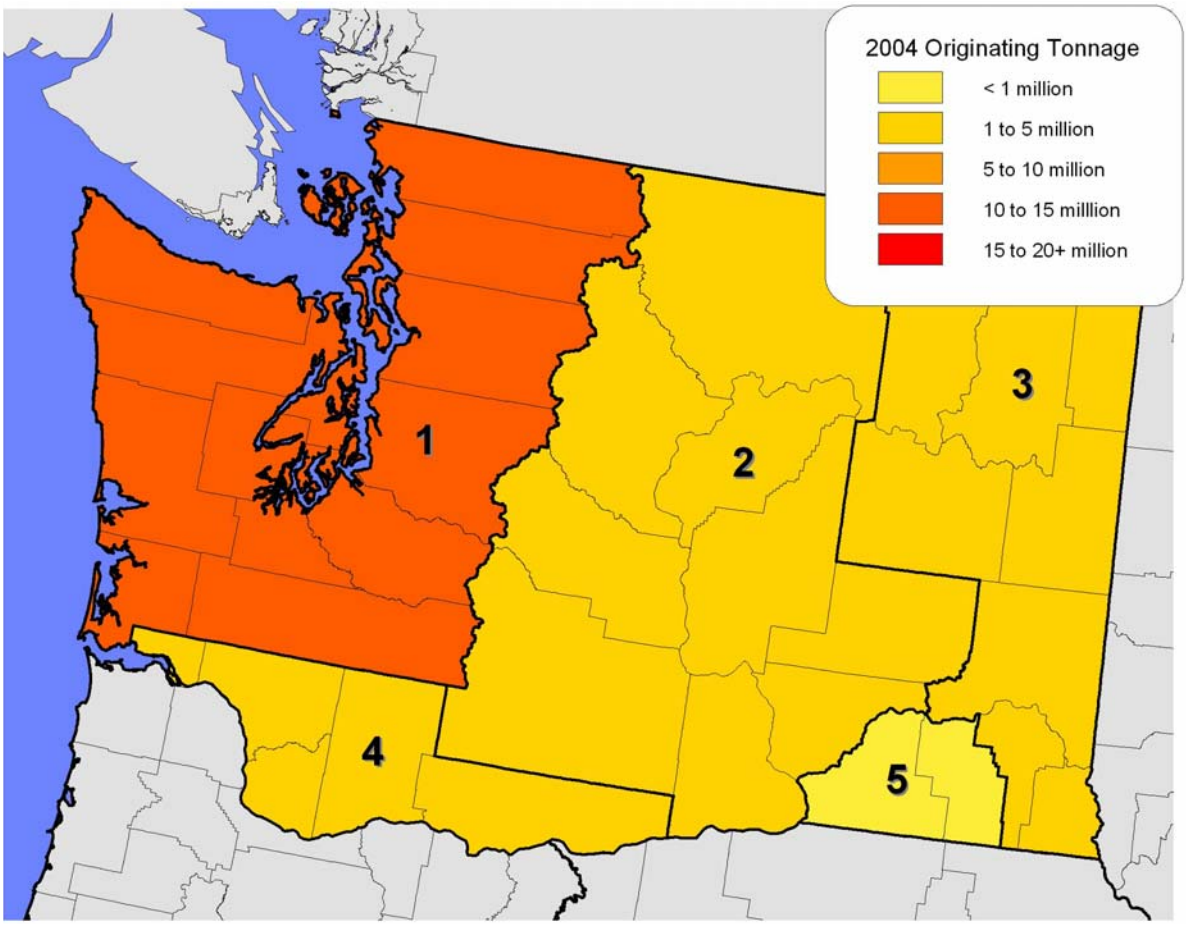


Source: Global Insight, based on 2004 STB Carload Waybill Sample data.

■ Rail Traffic

Figures 2 and 3 depict the geographical distribution by District of originated and terminated tonnage. These districts are defined by economic areas of the U.S. Bureau of Economic Analysis (BEA). District 1, the Seattle, Washington BEA, had the highest originated tonnage, with nearly 25 million tons in 2004. As a venue for much of Washington's port traffic, this is to be expected. District 1 also is the highest receiving District, with more than 14 million terminating tons in 2004, again mostly attributable to international trade. Southern Washington's District 2, the Washington portion of the Portland, Oregon BEA, had the second highest terminating tonnage, much of that attributable to the Port of Vancouver.

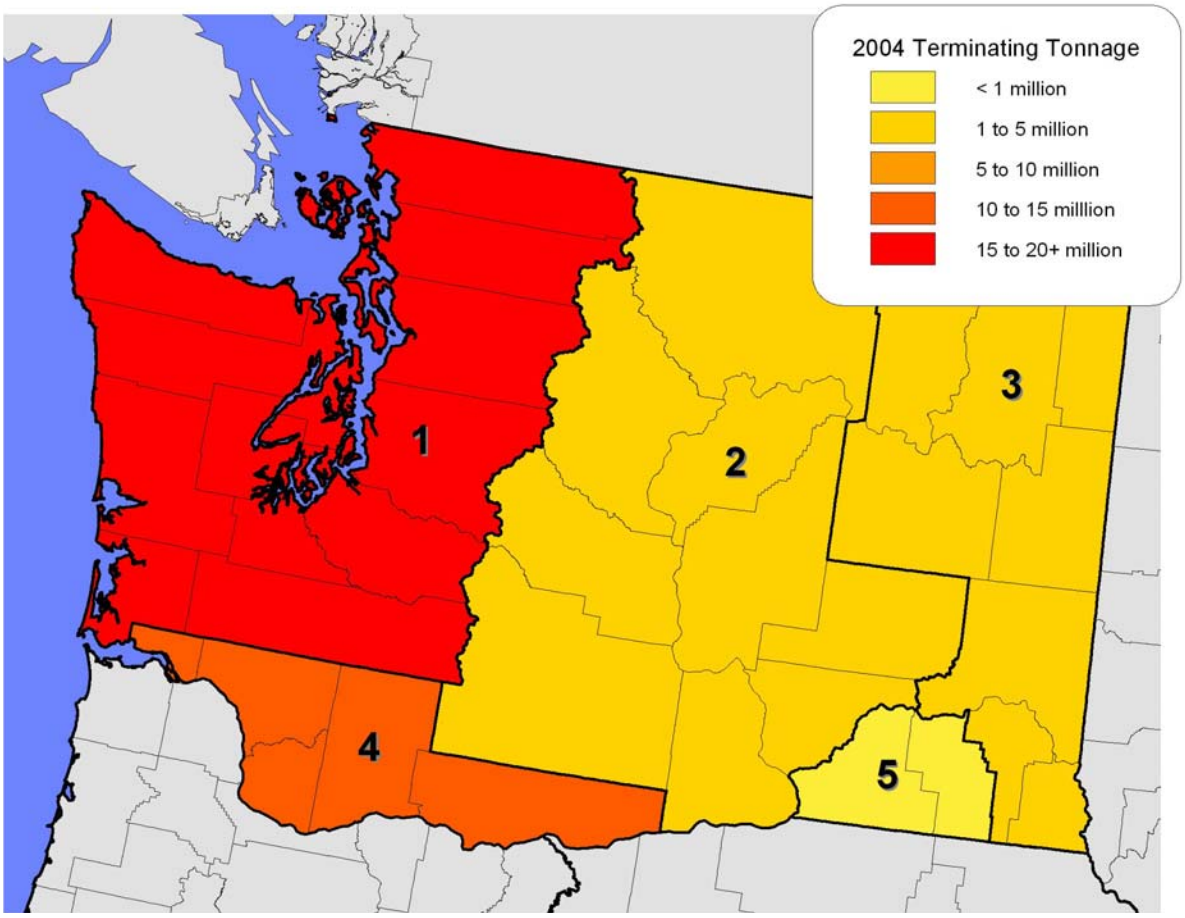
Figure 2. Washington Rail Traffic Origins by District, 2004



BEA districts:

1. Seattle, Washington;
2. Richland, Washington;
3. Spokane, Washington;
4. Portland, Oregon; and
5. Pendleton, Oregon.

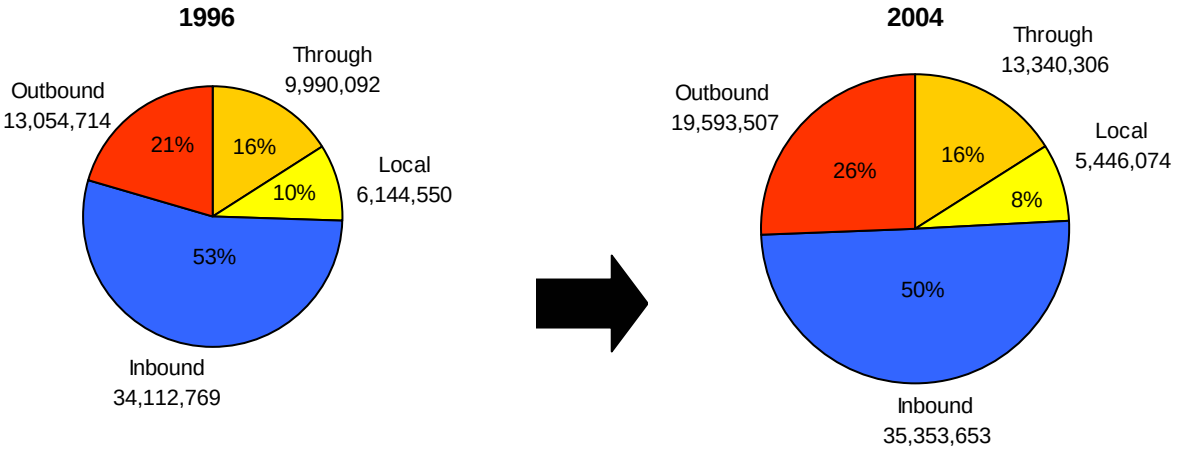
Figure 3. Washington Rail Traffic Terminations by District, 2004



Domestic Traffic

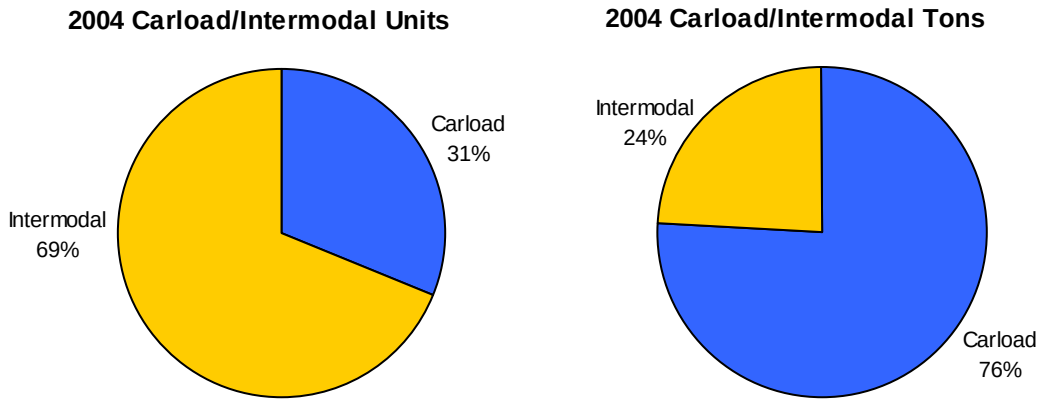
In 2004, Washington's freight railroads moved more than 81 million domestic tons of freight, up from 63 million in 1996. Figure 4 shows the distribution of the inbound, outbound, through, and local shares of Washington's total freight rail tonnage for 1996 and 2004. Of all shares, outbound traffic grew the most between 1996 and 2004. With a boost from increased volumes at Washington's ports and a dominant intermodal market, outbound tonnage grew from 13 million tons to more than 20 million tons, an increase of nearly 60 percent. Through traffic also benefited from the pervasive growth in IMX; through tons grew more than 30 percent, from nearly 10 million tons to more than 13 million tons. Inbound traffic enjoyed a growth rate of 20 percent, while local traffic grew slightly at 5 percent. In 2004, inbound accounted for 50 percent of total traffic (down from 53 percent in 1996), outbound was 26 percent (up from 21 percent in 1996), local contributed 8 percent (down from 10 percent in 1996), and through traffic remained unchanged at 16 percent.

Figure 4. Domestic Freight Tonnage, 1996 and 2004



Washington's 2004 rail freight traffic consisted of 680,202 carloads and 1,500,880 intermodal units (trailers and containers) in 2004.[2] Figure 4 illustrates the share of carload versus intermodal freight rail by total units and total tons. Figure 5 illustrates the share of carload versus intermodal freight rail movements for outbound, inbound, local, and through freight rail movements.

Figure 5. Carload/Intermodal Units and Tons, 2004

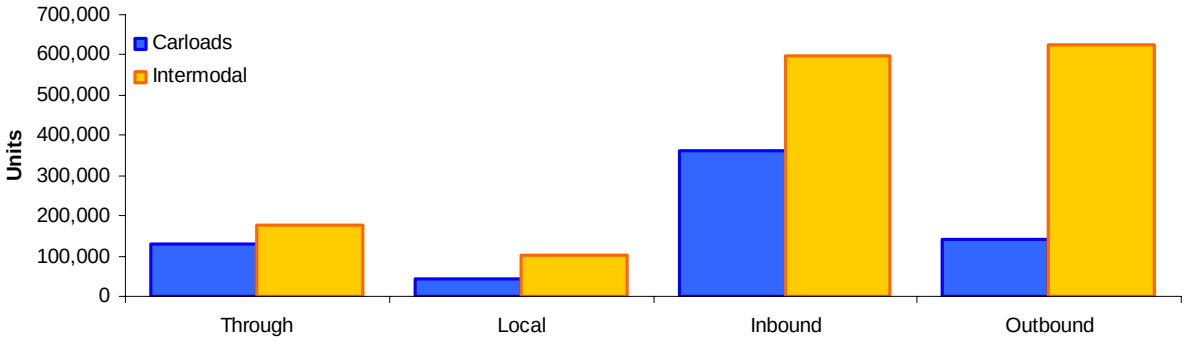


The difference in units moved versus tons moved by carload and intermodal shipments is significant. Whereas more intermodal containers were moved on Washington's freight railroads than carloads, carload traffic dominated the market in terms of tonnage. In 2004, intermodal containers accounted for more than 1.5 million units moved on Washington's

[2] Carload total excludes cars hauling Intermodal units.

freight railroads, while carloads covered only 680 thousand units. In percentages, intermodal accounted for 69 percent of total units and carload consisted of 31 percent. Carload dwarfed intermodal by tons in 2004, accounting for 61.5 million tons, in contrast to 19.7 million tons for intermodal. In percentages, carload consisted of 76 percent of total tons and intermodal consisted of 24 percent.

Figure 6. Carloads/Intermodal Units, 2004



With 362,520 units, inbound movements accounted for over half of all carload movements in 2004 (54 percent). The balance between outbound and through carloads was similar, representing 21 percent and 19 percent of total carload movements, respectively. Local traffic yielded 44,490 carloads, approximately seven percent of carload totals. Intermodal units tell a different story, with inbound and outbound accounting for more than 81 percent of all intermodal moves. Through shares of intermodal containers amounted to 12 percent. Local shares of intermodal were comparable with local carload shares, totaling a low seven percent.

Table 1. 2004 Rail Traffic by Type, Tonnage

Type	Inbound	Outbound	Intra	Total	Percent
IMX	6,344,984	8,503,424	2,370,822	17,219,230	25%
Carload	34,629,512	12,196,589	4,095,163	50,921,263	75%
Total	40,974,496	20,700,013	6,465,985	68,140,493	
% of Total	60%	30%	9%	100%	
Percent of Total by Type (IMX/Carload					
IMX	37%	49%	14%	100%	
Carload	68%	24%	8%	100%	

Figure 7 illustrates historic tonnage trends for selected years from 1996 through 2004 for the top 10 freight rail commodities, based on two-digit STCC.[3] The highest tonnage commodity group, driven heavily by exports from Washington and Oregon ports is farm products. This industry is subject to volume fluctuations due to greatly varying conditions in world commodity markets as well as crop/harvest conditions. Overall farm product tonnage has declined slightly in the past decade, with a marked decrease in 2000. The next highest tonnage group is mixed shipments (mostly intermodal), which has enjoyed a relatively steady growth in tonnage during the reported period. Of the remaining commodity groups, lumber, pulp, and paper, food products, coal, transportation equipment, and waste have all increased in tonnage since 1996. Of these, coal showed the steepest increase in tonnage between 1996 and 2000 (likely caused by the construction of new electricity generating capacity and/or mode shift from water). Chemicals and petroleum exhibited a noticeable downward trend.

Figure 7. Washington Rail Tonnage Commodity Distribution, 1996-2004

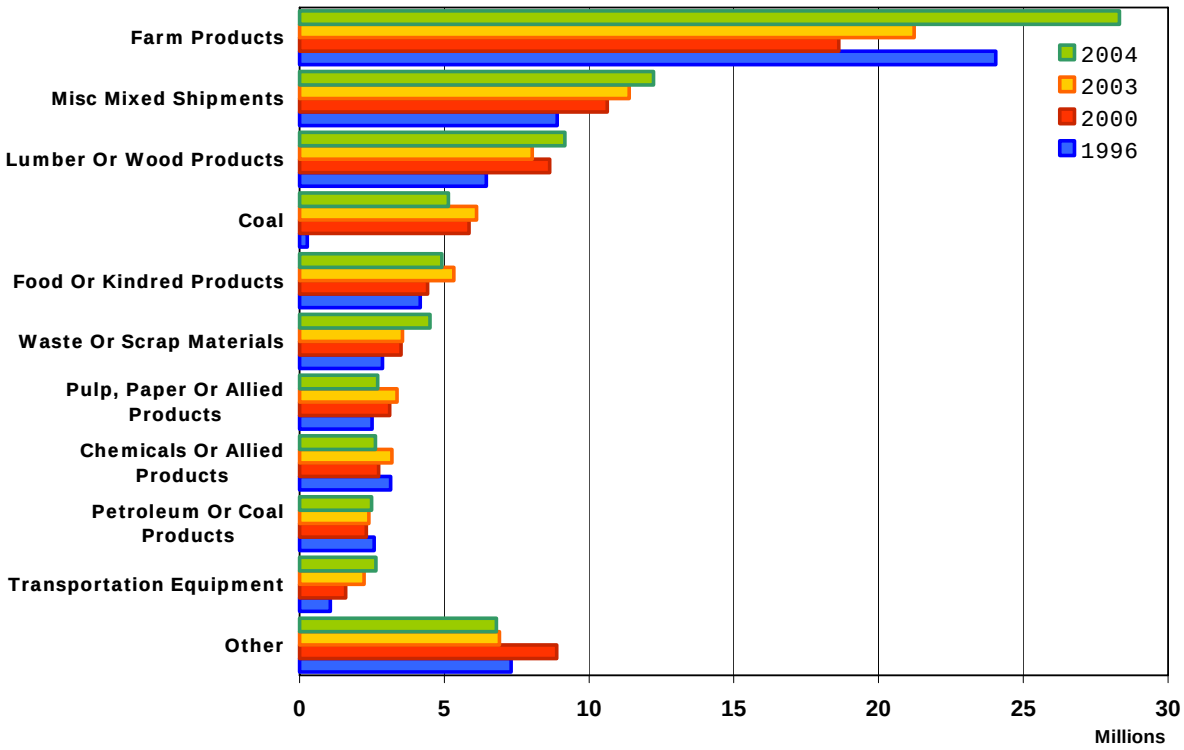


Table 2 displays the top 10 outbound rail commodities in 2004, accounting for 94 percent of all outbound traffic. Miscellaneous mixed shipments rank first, followed by lumber and wood, then by coal. It in not surprising that farm products appear in the list, as agriculture is an important commodity to the State.

[3] STCC: Standard Transportation Commodity Code.

Table 2. Top 10 Outbound Rail Commodities, 2004

STCC	Commodity	2004 Rail Tonnage
46	Miscellaneous Mixed Shipments	6,516,304
24	Lumber or Wood Products	4,506,679
11	Coal	2,142,403
40	Waste or Scrap Materials	1,543,296
26	Pulp, Paper, or Allied Products	1,231,469
20	Food or Kindred Products	1,075,792
37	Transportation Equipment	826,102
1	Farm Products	700,653
33	Primary Metal Products	606,415
28	Chemicals or Allied Products	353,040

Table 3 shows year 2004 outbound rail trade flows (carload and intermodal movements) for other regions of the United States.

Table 3. 2004 Rail Trade Flows, Outbound

	Car		IMX	
Region	Tons	Loads	Tons	Loads
California	2,670,532	29,999	104,776	7,803
East Coast	531,579	8,691	116,359	8,808
Idaho	365,366	4,577	1,777	126
Illinois	3,844,553	52,536	14,154,907	1,118,606
Midwest	1,224,357	21,180	3,868,015	323,211
Mountain/Great Plains	2,798,073	34,665	687,835	57,731
Montana	170,229	2,706	12,334	1,240
Oregon	5,735,875	52,669	2,418,892	100,011
South	1,131,892	17,898	730,944	56,756
Southeast	1,113,150	16,731	829,112	61,459

[a] Washington, Oregon, Idaho, Montana, Illinois, Mountain/Great Plains (Utah, Wyoming, Colorado, New York, Arizona, New Mexico, Kansas, Nebraska, Oklahoma), Midwest (Wisconsin, Minnesota, North Dakota, South Dakota, Iowa, Missouri, Indiana, Ohio), East Coast (eastern states north of South Carolina), Southeast (Georgia, Florida, Alabama Tennessee, North Carolina, South Carolina, Kentucky), and South (everything else, including Texas).

Figure 8 shows the distribution of Washington outbound interstate rail traffic by terminating region in 1996 and 2004. In 2004, Illinois was the most important trading partner, receiving 7.2 million tons, an increase of 136 percent over 1996. This growth was caused by intermodal, with Illinois showing as the destination for most eastbound international traffic from the Puget Sound ports. The actual destination for this traffic is the Chicago region and points farther east that might be reached by highway or a rubber tire interchange to another rail carrier for movement to the eastern United States and Canada. In 2004, Oregon received 4.7 million tons, a compound annual increase of 8.2 percent between 1996 and 2004. The other regions receiving more than one million tons of rail freight from Washington were California, the Midwest and the Mountain/Great Plains states. Traffic destined for Montana experienced the greatest decline between 1996 and 2004, an annual decline of -12 percent.

Figure 8. 1996-2004 Outbound Washington Rail Tonnage, Termination Region

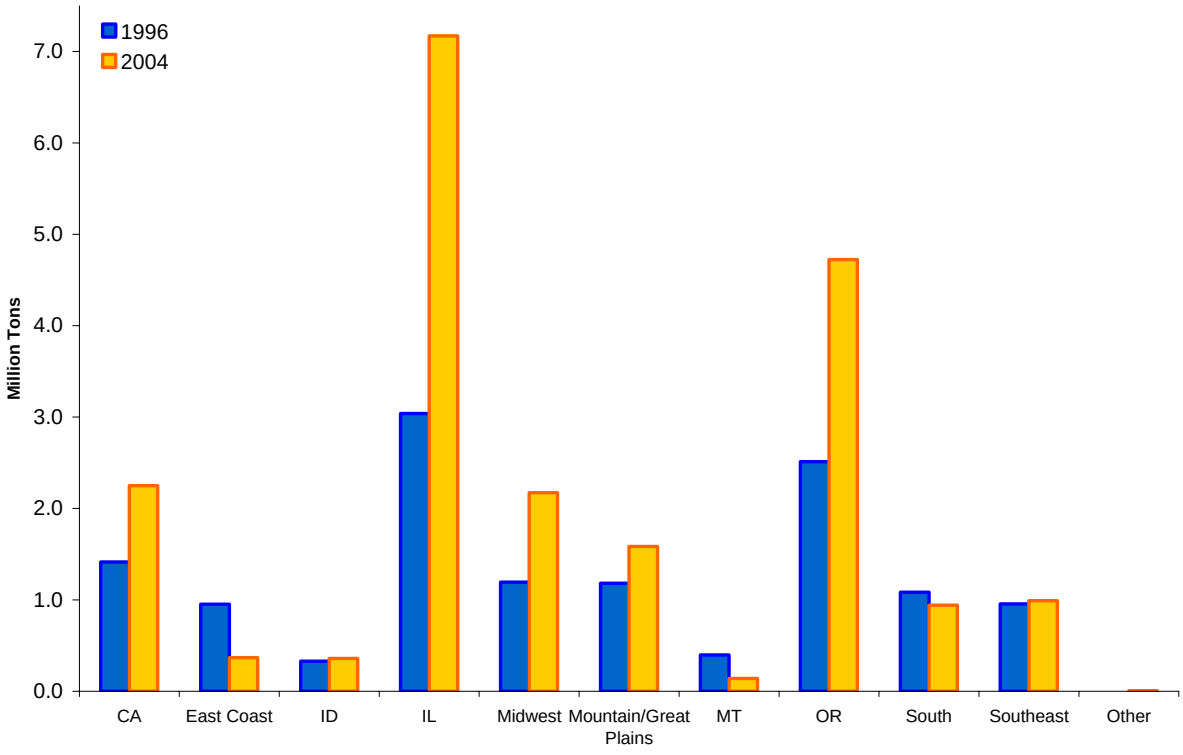


Table 4 displays the top 10 inbound rail commodities in 2004, accounting for 94 percent of all inbound traffic. Farm products dominated rail traffic in 2004 with over 23 million tons of inbound traffic, proving that agriculture is central to Washington. The next highest ranking commodity is intermodal, appearing as miscellaneous mixed shipments with 4 million tons of traffic.

Table 4. Top 10 Inbound Rail Commodities, 2004

STCC2	Commodity	2004 Rail Tonnage
1	Farm Products	23,158,800
46	Miscellaneous Mixed Shipments	4,167,594
11	Coal	3,000,759
20	Food or Kindred Products	2,910,526
28	Chemicals or Allied Products	1,631,522
42	Shipping Containers	1,113,038
24	Lumber or Wood Products	803,000
32	Clay, Concrete, Glass or Stone	567,284
26	Pulp, Paper or Allied Products	564,322
33	Primary Metal Products	533,245

Table 5 shows year 2004 inbound rail trade flows (carload and intermodal movements) for other regions of the United States.

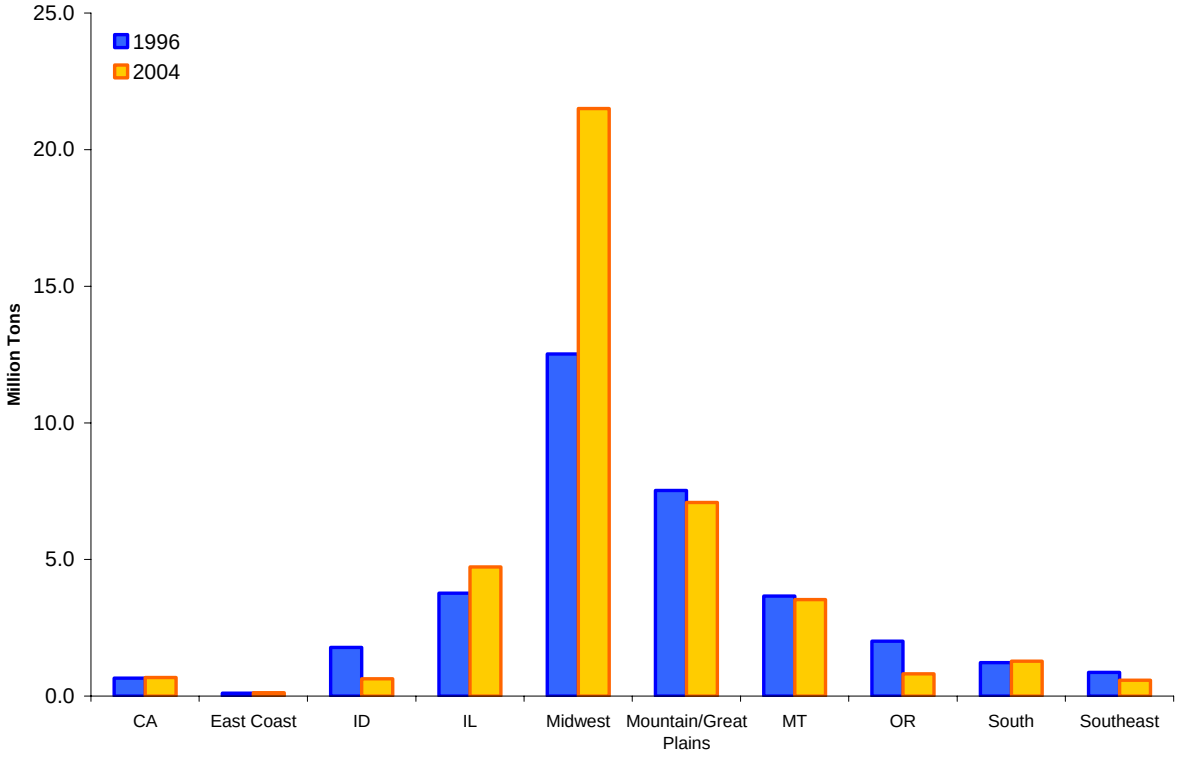
Table 5. 2004 Rail Trade Flows, Inbound

	Car		IMX	
Region	Tons	Loads	Tons	Loads
California	604,584	10,205	508,325	32,186
East Coast	98,297	1,426	55,124	3,305
Idaho	921,585	10,193	-	-
Illinois	546,928	16,062	9,219,010	961,523
Midwest	22,966,290	229,108	3,004,186	240,716
Mountain/Great Plains	8,660,588	86,237	483,790	49,071
Montana	3,431,914	33,172	6,288	1,682
Oregon	958,074	11,680	173,717	15,444
South	1,400,017	24,017	545,909	57,129
Southeast	380,597	5,890	739,743	65,784

Figure 9 shows the distribution of Washington inbound interstate rail traffic by terminating region in 1996 and 2004. In 2004, the Midwest (apart from Illinois) shipped

more than 21.5 million tons by rail to Washington, an increase of 8 percent annually between 1996 and 2004. Other regions shipping more than one million tons of rail freight to Washington include the South, Mountain/Great Plains, Illinois, and Montana. As with traffic outbound from Washington, intermodal volume growth has driven the substantial increase in total volume from Illinois. Washington and the Midwest have experienced largest volume and growth of inbound tons with a seven percent compound annual growth rate over the eight years between 1996 and 2004. Rail traffic originating in Idaho and Oregon experienced the greatest decline in tonnage between 1996 and 2004, and annual decline of -12 and -11 percent respectively.

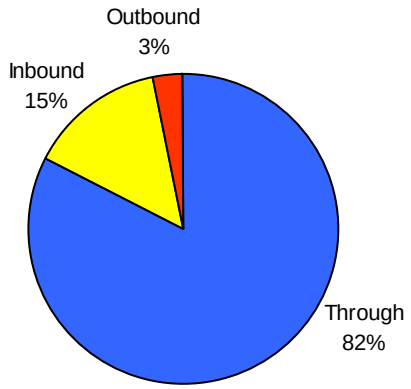
Figure 9. 1996-2004 Inbound Washington Rail Tonnage, Origin Region



North American Cross-Border Traffic

In 2004, more than 19 million tons of freight was cross-border traffic, largely with Canada.[4] Figure 10 shows the distribution of the inbound, outbound, through, and local shares of Washington's total freight rail tonnage for 2004. This includes more than 15.8 million through tons, 2.7 million inbound tons, and 675 thousand outbound tons. In percentages this equates to 15 percent inbound, three percent outbound, and 82 percent through.

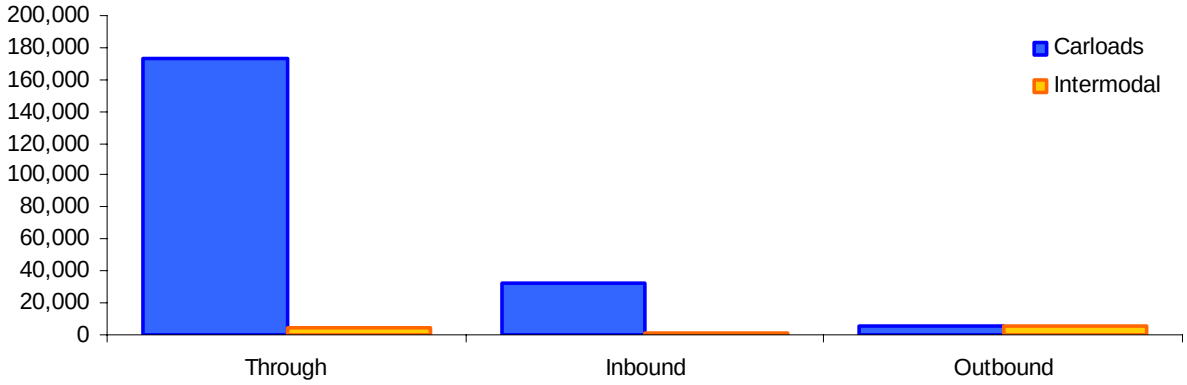
Figure 10. Washington Tonnage by Traffic Type, 2004



[4] Whereas Canadian traffic is readily identifiable in Waybill Sample, traffic destined for Mexico is quite difficult to identify, as most of it is re-billed at the border. Mexican traffic would thus be grouped with the Southern region (Texas), and to a lesser extent, the Mountain/Great Plains region, which has several lower-volume interchanges located in Arizona and New Mexico. Since the vast majority of NAFTA traffic handled by the Washington rail network is Canadian, Mexican traffic was not identified in this analysis.

Figure 11 illustrates the share of carload versus intermodal international freight rail movements for outbound, inbound, local, and through in 2004.

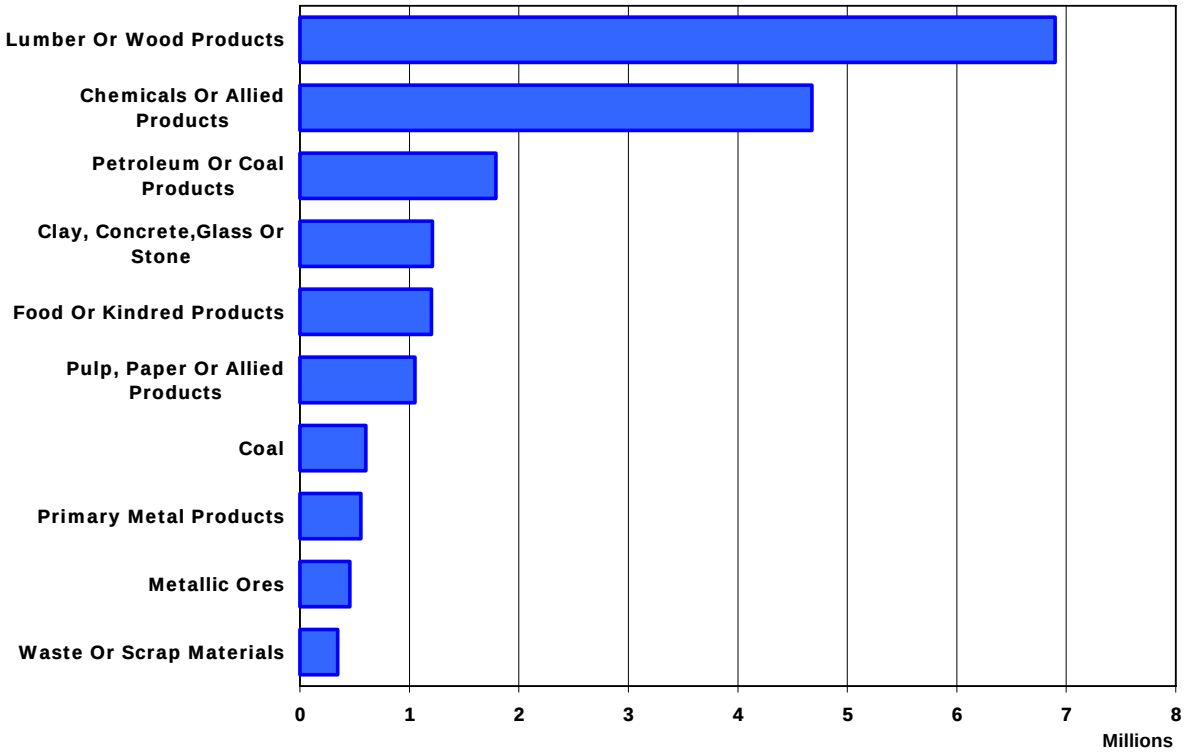
Figure 11. Washington Carloads and Intermodal Units by Traffic Type, 2004



Totaling 19 million tons and close to 212 thousand units, carload dominates the international traffic market, intermodal accounts for close to 200 thousand tons and just 12.4 thousand units. In 2004, the vast majority of cross-border carload volumes consisted of through-traffic, accounting for 82 percent of all traffic. Inbound carloads accounted for 15 percent and outbound for three percent of total carloads. The shares differed for intermodal traffic; through traffic accounted for 40 percent, inbound for 11 percent, and outbound 49 percent.

Figure 12 illustrates Washington's top 10 international freight rail commodities in 2004.

Figure 12. Washington International Freight Rail Commodities, 2004



Washington's rail freight top international commodities are similar to the top commodities that move domestically. Lumber accounts for 6.9 million tons of international traffic and chemical products total approximately 4.7 million tons. Clay/stone, primary metal products and metallic ores are the only commodities that appear here and do not appear in the domestic total top 10 list.

Table 6 displays the top origin and destinations for Washington's international rail freight traffic in 2004. Nine out of 10 of the top lanes originate in Canada, pass through Washington, and terminate in the North East region of the United States. The top lane originating in the United States goes from Montana to British Columbia.

Table 6. Top 10 Origins and Destinations for International Traffic, 2004

Originating	Destination	Rail Tonnage
British Columbia	Oregon	3,322,411
Saskatchewan	Oregon	2,085,816
Alberta	California	1,549,924
Alberta	Washington	1,366,520
British Columbia	Washington	1,059,765
British Columbia	California	981,214
British Columbia	Arizona	654,364
Montana	British Columbia	636,539
British Columbia	British Columbia	606,555
Alberta	Oregon	568,024

■ Traffic Forecast

Forecast data for the years 2015 and 2025 was created by routing the rail traffic and other modes across the respective modal networks. The carload and IMX forecast synthesizes economic growth conditions and trend projections, making adjustments and extensions where appropriate, to bracket the most likely growth rates and freight forecasts for Washington State. The resulting forecast projects the long-term growth through 2025.

Figures 13 and 14 depict the geographical distribution by District of originated and terminated tonnage in 2025. The Seattle, Washington BEA continues to have the highest originating and terminating tonnage over the long forecast. Seattle will take advantage of the large import/export industry. In 2025, the Portland, Oregon BEA also will remain the second highest terminating tonnage, attributable to the Port of Vancouver.

Figure 13. Washington Rail Traffic Origins by District, 2025

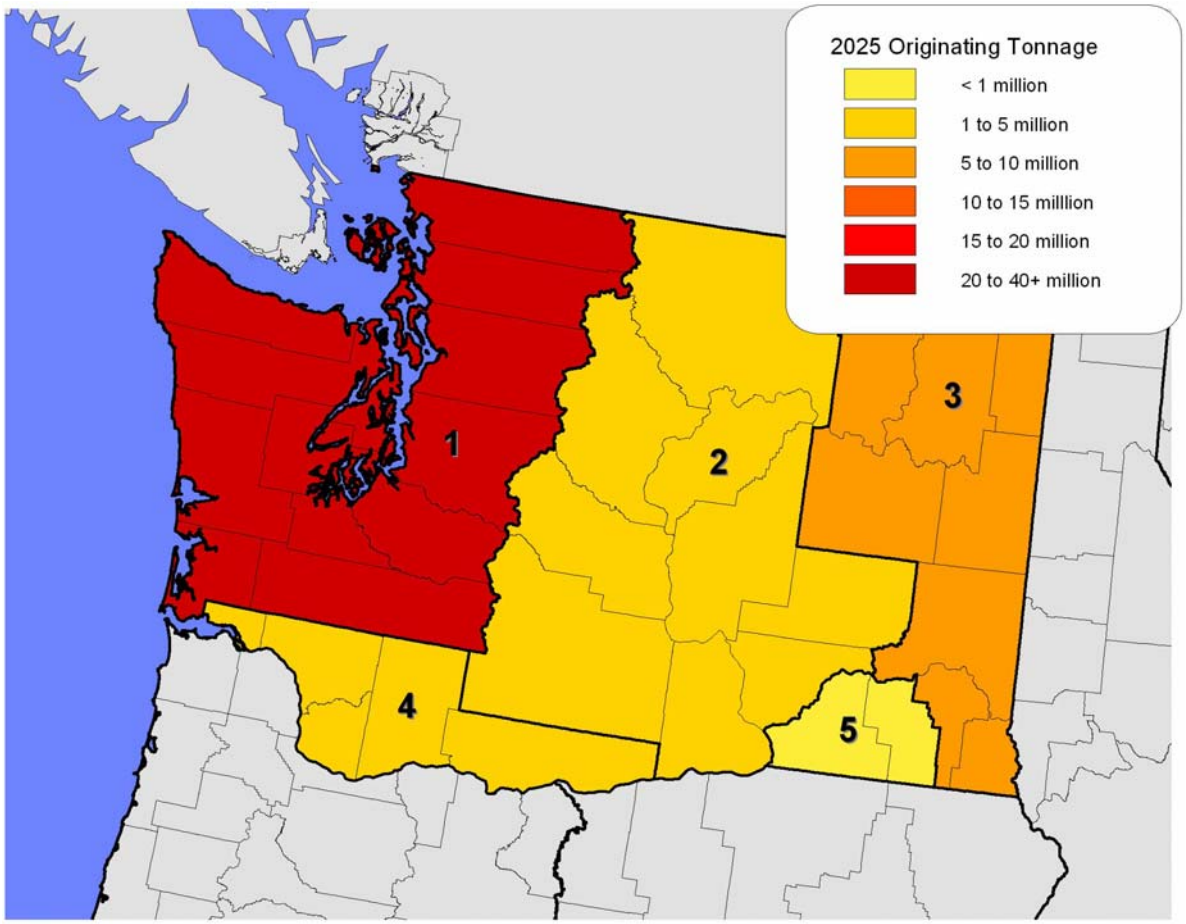
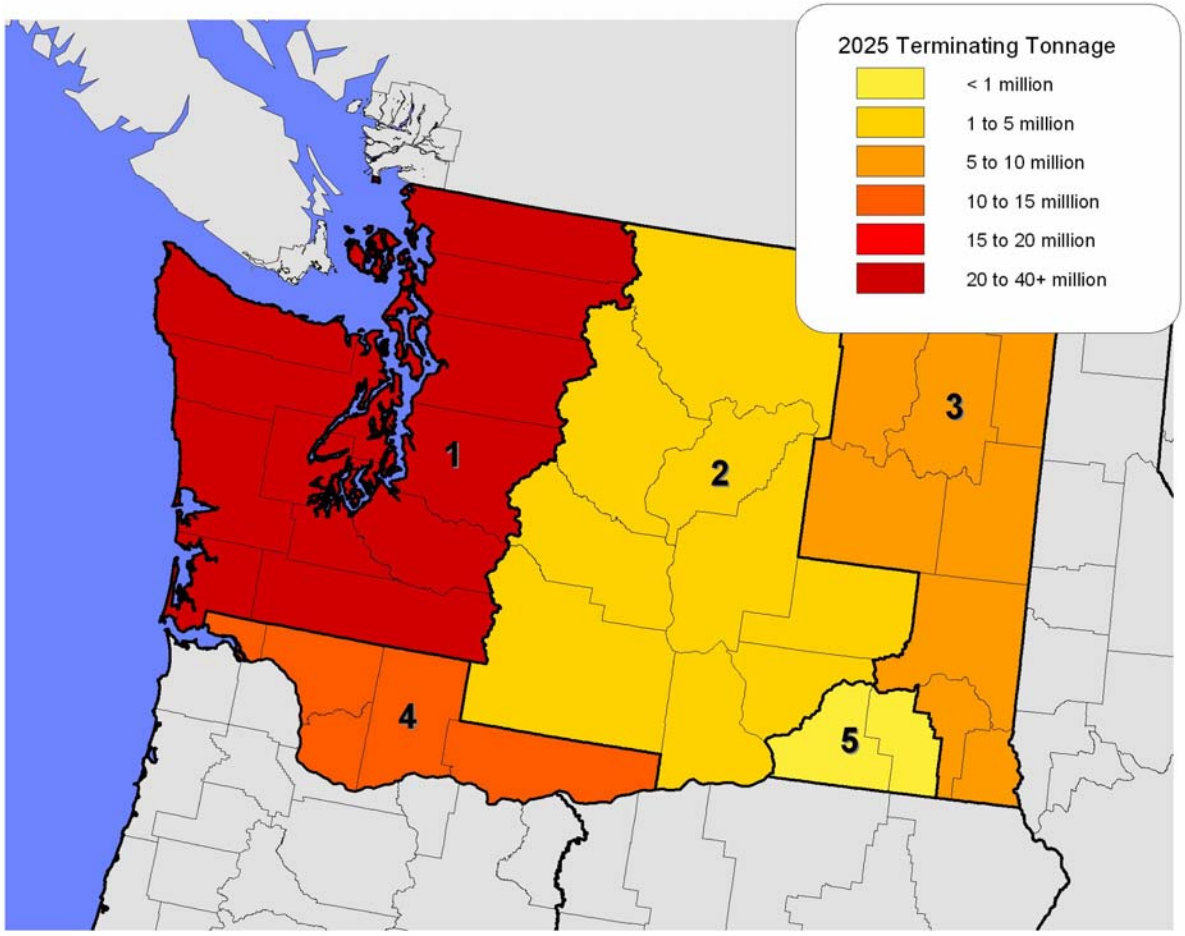


Figure 14. Washington Rail Traffic Terminations by District, 2025



Figures 15 and 16 show the national perspective of carload traffic volumes in annual tons in 2004 compared to 2025. These maps show the carload tons increasing in volume close to the Washington State area and along the Mississippi river region over the long term.

Figure 15. Carload Traffic Volumes in Annual Tons – National Perspective, 2004

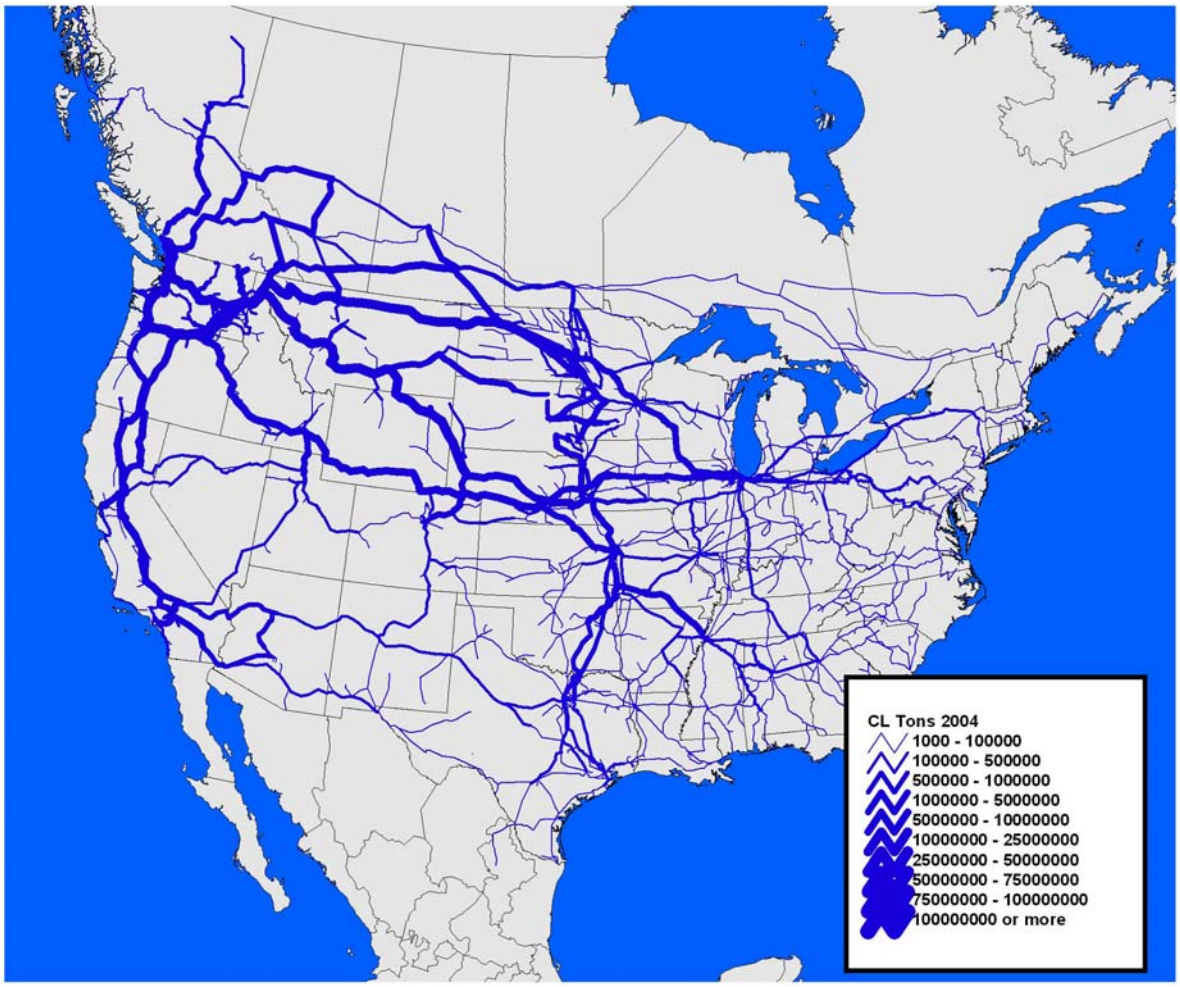
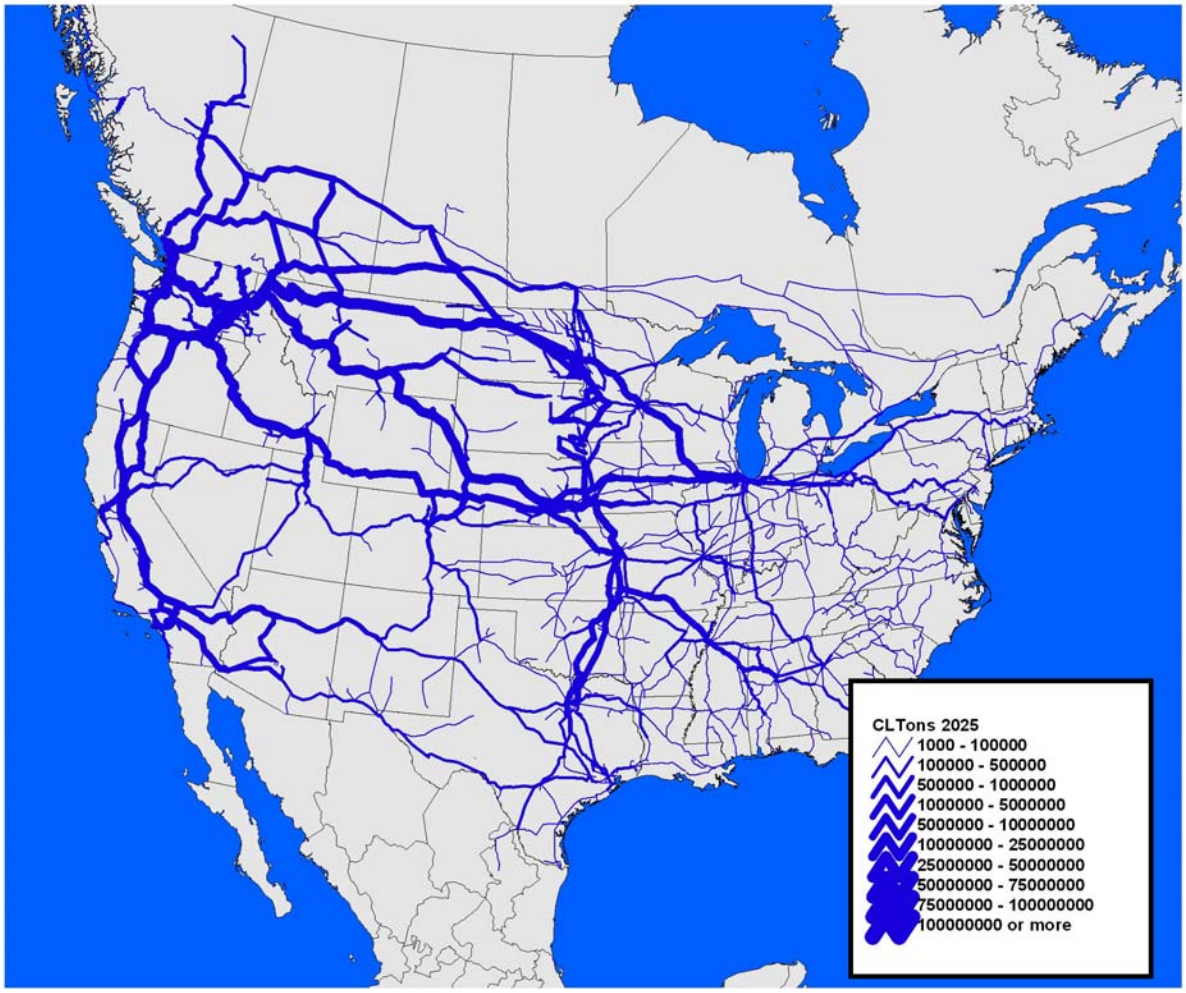


Figure 16. Carload Traffic Volumes in Annual Tons – National Perspective, 2025



Perhaps more interesting is the national perspective of intermodal traffic volumes in annual tons in 2004 compared to 2025, shown in Figures 17 and 18. These maps easily show the intermodal tons increasing in volume. The flow of traffic that will expand the most is between Washington State and Chicago, with traffic linking to the eastern seaboard. The Washington and California routes also will experience an increase in tons, with traffic extending to Texas and the southern region of the United States.

Figure 17. Intermodal Traffic Volumes in Annual Tons – National Perspective, 2004

Figure 18. Intermodal Traffic Volumes in Annual Tons – National Perspective, 2025

■ Domestic Forecast

Washington's freight railroads will continue to grow over the next 10 and 20 years. The railroads are expected to move more than 103.5 million domestic tons of freight in 2015, up from 81.5 in 2004, a 2.2 percent compound annual growth rate. In 2025 it is projected that there will be close to 129.5 million tons moved, a 2.3 percent annual growth over the 10 years from 2015 to 2025, and a steady 2.2 percent growth rate over the 21 years between 2004 and 2025. Figure 19 and Table 7 show the growth of rail tonnage in the forecast years. While local and inbound traffic continue to grow, the will slow to slightly lower levels of growth from 2015-2025 compared to 2004-2015 growth levels. Outbound and through traffic will both grow at higher rates in the more distant future as compared to the next 10 years.

Figure 19. Washington Rail Tonnage Forecast, 2004-2025

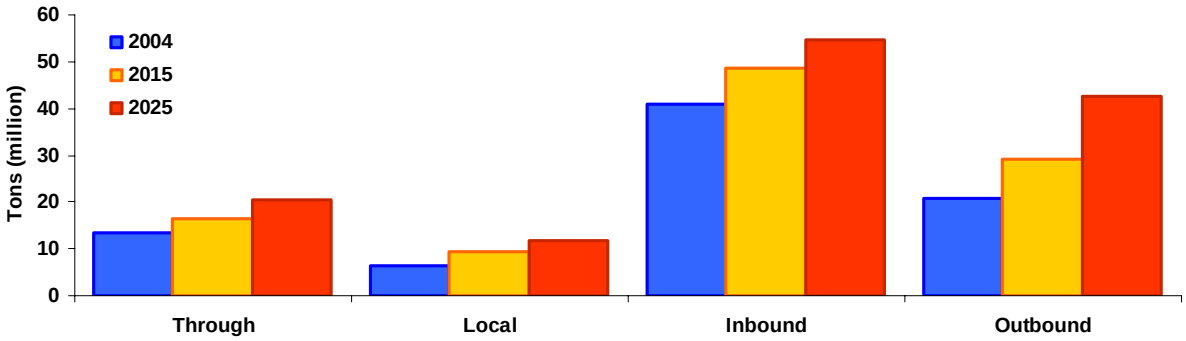
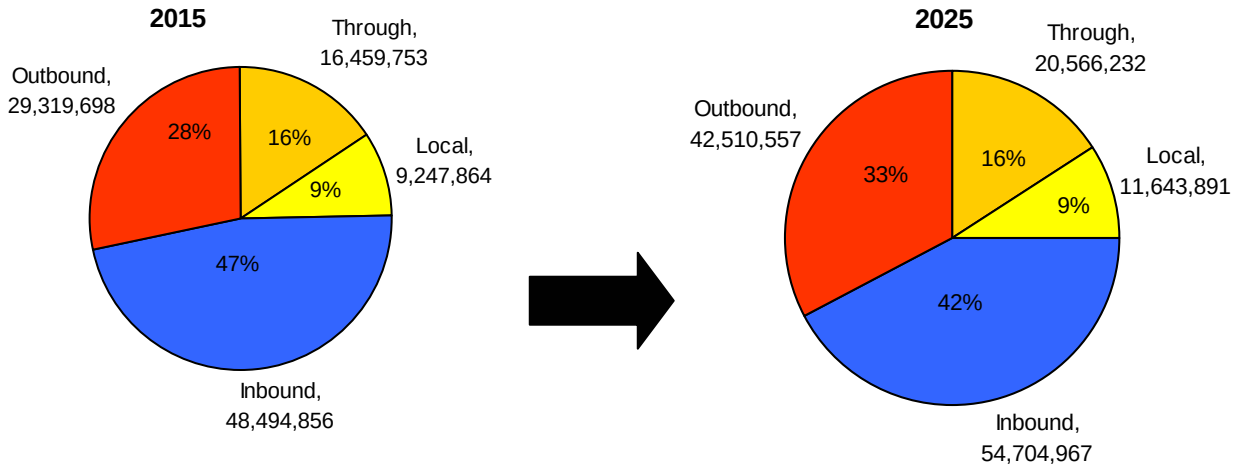


Table 7. Growth of Washington Rail Tonnage, 2004-2025

	Rail Tonnage			Compound Annual Growth Rates		
Class	2004	2015	2025	2004-2015	2015-2025	2004-2025
Through	13,385,771	16,459,753	20,566,232	1.9%	2.3%	2.1%
Local	6,465,985	9,247,864	11,643,891	3.3%	2.3%	2.8%
Inbound	40,974,496	48,494,856	54,704,967	1.5%	1.2%	1.4%
Outbound	20,700,013	29,319,698	42,510,557	3.2%	3.8%	3.5%
Total	81,526,264	103,522,170	129,425,647	2.2%	2.3%	2.2%

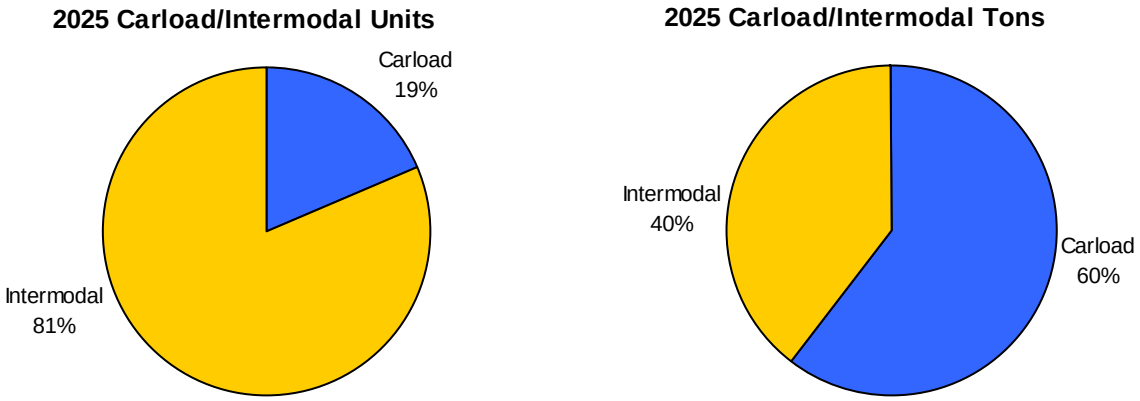
Figure 20 shows the distribution of the inbound, outbound, through, and local shares of Washington's total freight rail tonnage for both forecast years of 2015 and 2025. Of all shares, outbound traffic continues to grow the most between 2015 and 2025, growing from 26 to 28 percent between 2004 and 2015, and expanding to 42.5 million tons – a 33 percent share of freight rail transportation in 2025. Local and through traffic will continue to maintain approximately 9 and 16 percent of the tonnage respectively over the next 10 and 20 years. Inbound traffic will encompass a smaller percent of the traffic as it will claim 47 percent of the tonnage in 2015 and only 42 percent in 2025.

Figure 20. Domestic Freight Tonnage Projections, 2015 and 2025



The difference in units moved versus tons moved by carload and intermodal shipments will continue to be significant, as illustrated in Figure 21. Intermodal containers will continue to increase their share of units on Washington's freight railroads, up from 69 percent in 2004 to 81 percent in 2025. While the share of intermodal tons also will continue to increase, up from 24 percent in 2004 to 40 percent in 2025, tonnage from carload traffic is expected to continue to predominate.

Figure 21. Carload/Intermodal Units and Tonnage Projections, 2025



Local carload traffic will only grow at 0.3 percent over the 11 years between 2004-2015 before experiencing a decline in growth of -1.0 percent over the next 10 years between 2015 and 2025. Inbound, outbound, and through carload traffic will all continue to increase at higher levels over the long term than over the short term. Total carload traffic will grow to 77.8 million tons, a compound annual growth rate of 1.1 percent between 2004 and 2025. Intermodal traffic will enjoy higher levels of growth, up to 51 million in

2005, a 4.6 percent compound annual growth rate between 2004 and 2025. While inbound traffic enjoys the largest share of carload traffic, outbound traffic benefits from the largest share of intermodal traffic. These findings are shown in Table 8.

Table 8. Carload and Intermodal Tonnage Forecasts, 2004-2025

	Rail Tonnage			Compound Annual Growth Rates		
	2004	**2015**	**2025**	**2004-2015**	**2015-2025**	**2004-2025**
Carload						
Inbound	34,629,512	38,677,815	39,968,874	1.0%	0.3%	0.7%
Outbound	12,196,589	15,204,925	19,585,606	2.0%	2.6%	2.3%
Local	4,095,163	4,217,045	3,812,858	0.3%	-1.0%	-0.3%
Through	10,565,393	12,380,634	14,518,630	1.5%	1.6%	1.5%
Total	61,486,656	70,480,419	77,885,969	1.2%	1.0%	1.1%

	Rail Tonnage			Compound Annual Growth Rates		
	2004	**2015**	**2025**	**2004-2015**	**2015-2025**	**2004-2025**
Intermodal						
Inbound	6,344,984	9,817,040	14,736,093	4.0%	4.1%	4.1%
Outbound	8,503,424	14,114,772	22,924,951	4.7%	5.0%	4.8%
Local	2,370,822	5,030,820	7,831,033	7.1%	4.5%	5.9%
Through	2,475,116	3,670,511	5,592,176	3.6%	4.3%	4.0%
Total	19,694,346	32,633,143	51,084,252	4.7%	4.6%	4.6%

Figures 22 and 23 depict the growth of carload and intermodal units by share type. Mirroring tonnage, inbound traffic enjoys higher levels the majority of the carload units, while intermodal units are more evenly distributed between in and outbound traffic, with outbound growing at slightly faster levels.

Figure 22. Carload Units Forecast, 2004-2025

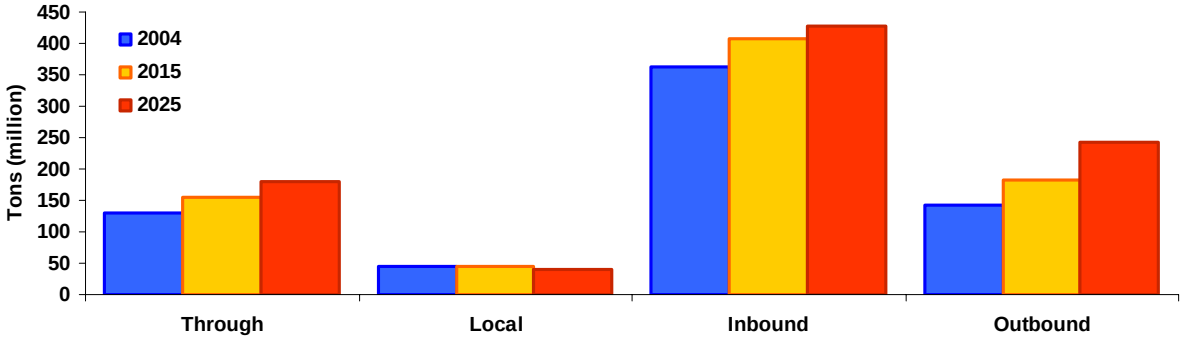
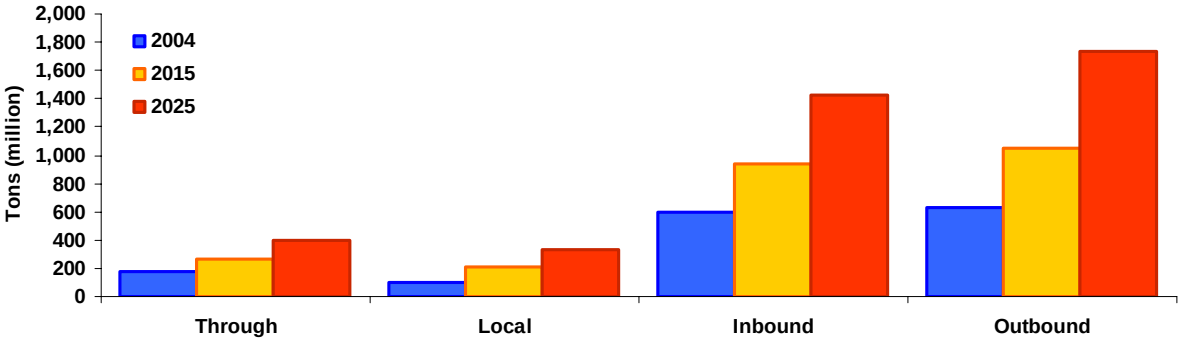
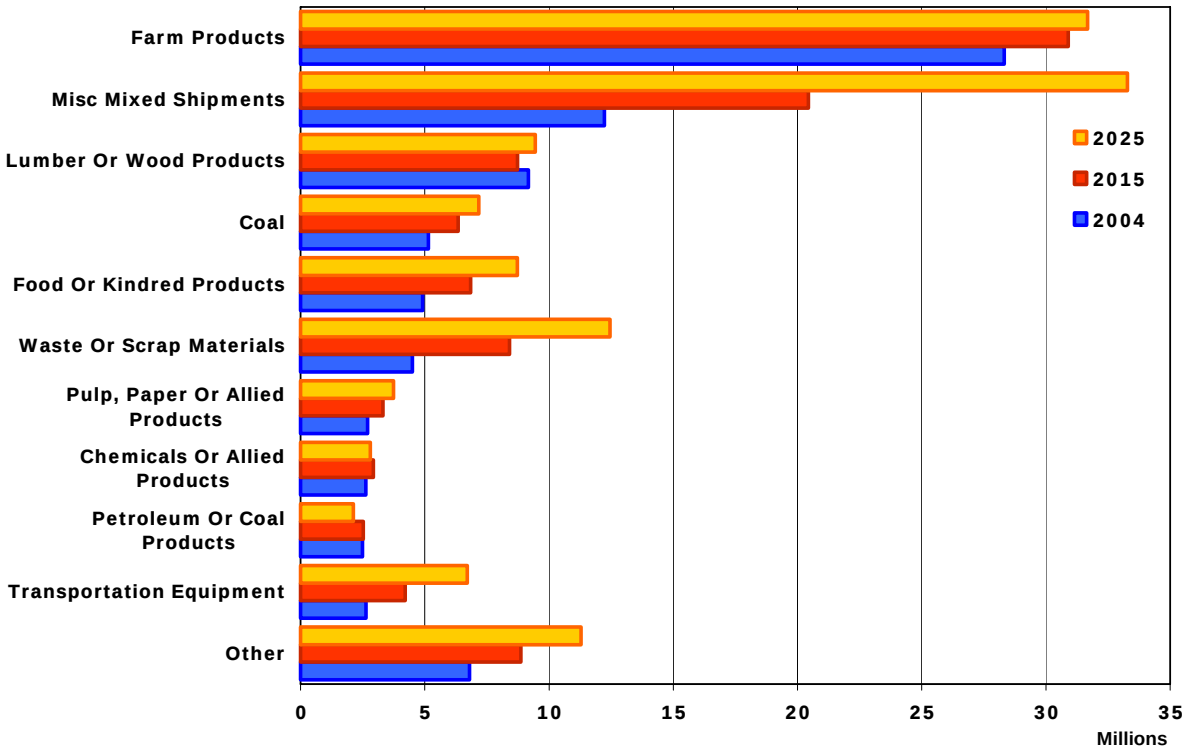


Figure 23. Intermodal Units Forecast, 2004-2025



The distribution of traffic tonnage by commodity through the forecast years is shown in Figure 24. Farm products continue to be a significant tonnage commodity group, growing to more than 31.6 million tons in 2025, up from 28.3 in 2004. Not surprisingly, the fastest growing commodity will be miscellaneous mixed shipments, primarily in the form of imports, increasing from 12.2 million tons in 2004, to 30.9 million in 2015, and 31.7 million in 2025. This amounts to a 4.9 percent compound annual growth rate between 2004 and 2025.

Figure 24. Washington Rail Tonnage Commodity Distribution Forecast, 2004-2025



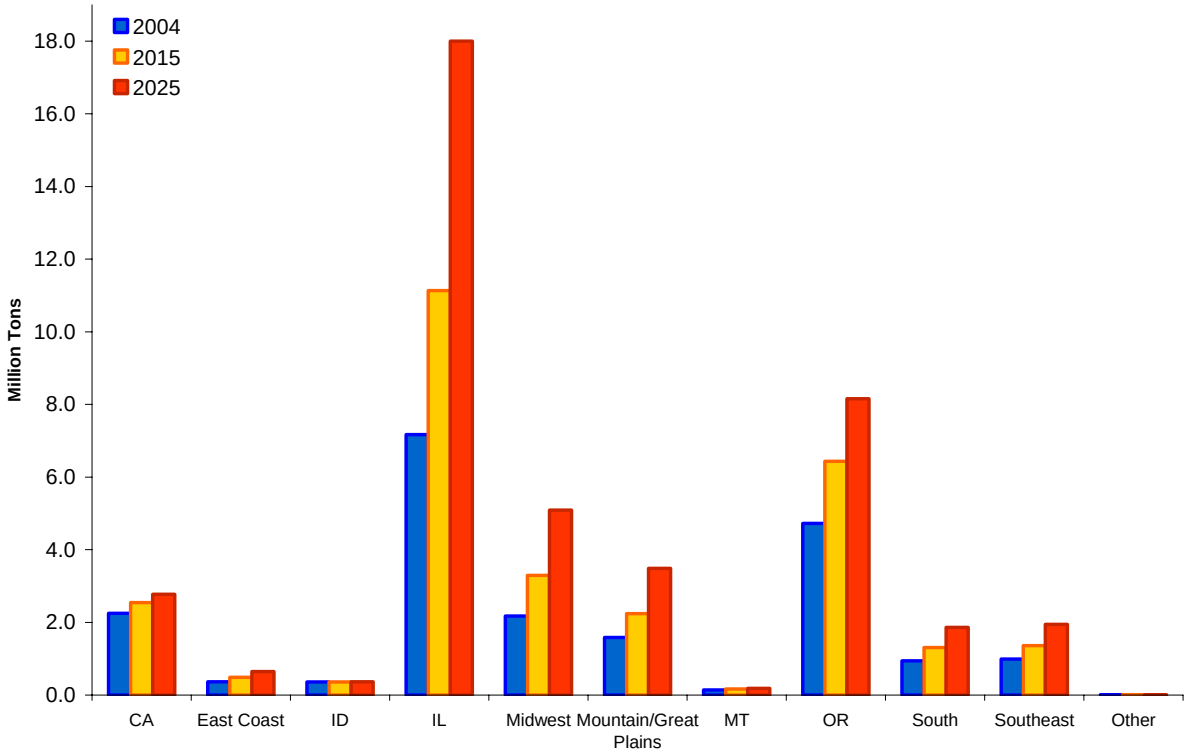
The shifting prominence of rail commodities over the forecast horizon is displayed in Table 9. Miscellaneous Mixed Shipments persist as an important commodity to Washington as it creates the highest outbound tons with 6.5 million in 2004, 11.3 million in 2015, and 19.0 million in 2025. Lumber, coal, and waste are top outbound commodities, and the transportation equipment industry in particular climbs in rank throughout the period.

Table 9. Shifts in Outbound Commodity Rank over Forecast Horizon, 2004-2025

		Rail Tonnage			Compound Annual Growth Rate		
STCC	Commodity	2004	2015	2025	2004-2015	2015-2025	2004-2025
46	Miscellaneous Mixed Shipments	6,516,304	11,309,371	19,060,968	5.1%	5.4%	5.2%
24	Lumber or Wood Products	4,506,679	4,072,939	4,183,956	-0.9%	0.3%	-0.4%
11	Coal	2,142,403	2,743,497	3,184,686	2.3%	1.5%	1.9%
40	Waste or Scrap Materials	1,543,296	2,377,099	3,260,635	4.0%	3.2%	3.6%
26	Pulp, Paper or Allied Products	1,231,469	1,556,870	1,752,517	2.2%	1.2%	1.7%
20	Food or Kindred Products	1,075,792	1,662,293	2,389,104	4.0%	3.7%	3.9%
37	Transportation Equipment	826,102	2,090,719	4,523,959	8.8%	8.0%	8.4%
1	Farm Products	700,653	997,648	1,385,204	3.3%	3.3%	3.3%
33	Primary Metal Products	606,415	677,274	597,161	1.0%	-1.3%	-0.1%
28	Chemicals or Allied Products	353,040	381,960	367,654	0.7%	-0.4%	0.2%
32	Clay, Concrete, Glass or Stone	271,622	347,709	424,730	2.3%	2.0%	2.2%
29	Petroleum or Coal Products	218,645	204,522	165,249	-0.6%	-2.1%	-1.3%
14	Nonmetallic Minerals	145,824	127,358	129,050	-1.2%	0.1%	-0.6%
44	Freight Forwarder Traffic	89,966	154,064	253,629	5.0%	5.1%	5.1%
30	Rubber or Miscellaneous Plastics	86,670	99,325	109,988	1.2%	1.0%	1.1%
35	Machinery	78,206	107,854	209,598	3.0%	6.9%	4.8%
41	Miscellaneous Freight Shipments	54,405	98,216	155,831	5.5%	4.7%	5.1%
10	Metallic Ores	45,546	60,509	58,630	2.6%	-0.3%	1.2%
34	Fabricated Metal Products	32,704	37,623	24,175	1.3%	-4.3%	-1.4%
23	Apparel or Related Products	25,372	17,536	11,846	-3.3%	-3.8%	-3.6%
47	Small Packaged Freight Shipments	24,642	41,313	67,668	4.8%	5.1%	4.9%
9	Fresh Fish or Marine Products	20,918	18,784	17,361	-1.0%	-0.8%	-0.9%
36	Electrical Equipment	19,216	32,176	53,417	4.8%	5.2%	5.0%
42	Shipping Containers	16,084	25,332	41,361	4.2%	5.0%	4.6%
39	Miscellaneous Manufacturing Products	14,910	16,652	16,975	1.0%	0.2%	0.6%
43	Mail or Contract Traffic	13,440	13,379	12,639	0.0%	-0.6%	-0.3%
19	Ordnance or Accessories	8,568	10,245	11,858	1.6%	1.5%	1.6%
27	Printed Matter	7,564	8,822	9,815	1.4%	1.1%	1.2%
48	Waste Hazardous Materials	7,364	11,072	13,939	3.8%	2.3%	3.1%
22	Textile Mill Products	6,452	7,101	5,679	0.9%	-2.2%	-0.6%
25	Furniture or Fixtures	5,702	6,215	6,299	0.8%	0.1%	0.5%
8	Forest Products	1,820	1,786	1,546	-0.2%	-1.4%	-0.8%
31	Leather or Leather Products	936	280	89	-10.4%	-10.8%	-10.6%
45	Shipper Association Traffic	800	1,295	1,968	4.5%	4.3%	4.4%
38	Instruments, Photo Equipment, Optical Equipment	484	858	1,373	5.3%	4.8%	5.1%

Illinois is the most prominent terminating region of commodities from Washington with close to 18 million outbound tons in 2025, up from 11 million in 2015, a 4.9 percent compound annual growth rate over the 10 long-term forecast years (Figure 25).

Figure 25. 2004-2025 Outbound Washington Rail Tonnage, Termination Region



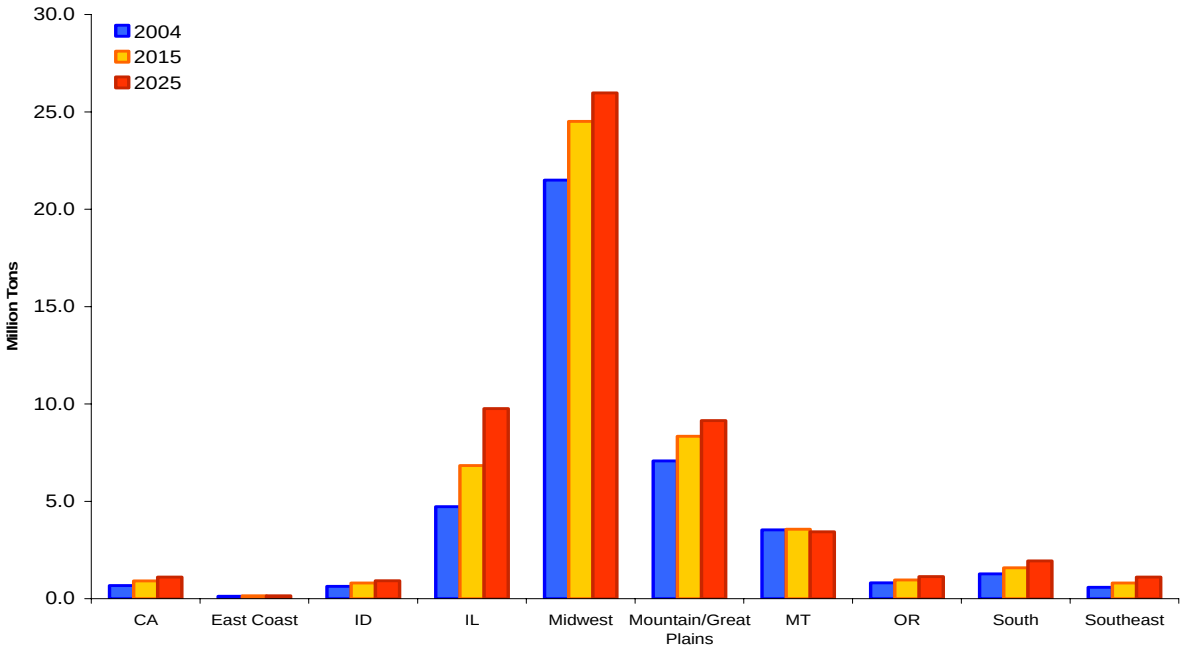
As expected, farm products remains the most important inbound rail commodity over the forecast period, as it creates the highest inbound tons to Washington with 23.1 million tons in 2004, 24.8 million in 2015, and 24.3 million in 2025. Miscellaneous mixed shipments, coal, food, and chemicals industries are all top inbound commodities over the forecast horizon. While some commodities shift slightly in rank, there are no industries which change significantly in rank. These findings are shown in Table 10.

Table 10. Shifts in Inbound Commodity Rank over Forecast Horizon, 2004-2025

		Rail Tonnage			Compound Annual Growth Rate		
STCC	Commodity	2004	2015	2025	2004-2015	2015-2025	2004-2025
1	Farm Products	3,158,800	24,788,615	24,341,543	0.6%	-0.2%	0.2%
46	Miscellaneous Mixed Shipments	4,167,594	6,701,119	10,342,469	4.4%	4.4%	4.4%
11	Coal	3,000,759	3,600,411	3,988,647	1.7%	1.0%	1.4%
20	Food or Kindred Products	2,910,526	4,004,983	4,890,859	2.9%	2.0%	2.5%
28	Chemicals or Allied Products	1,631,522	1,824,071	1,756,439	1.0%	-0.4%	0.4%
42	Shipping Containers	1,113,038	1,790,233	2,757,773	4.4%	4.4%	4.4%
24	Lumber or Wood Products	803,000	689,844	687,283	-1.4%	0.0%	-0.7%
32	Clay, Concrete, Glass or Stone	567,284	678,733	832,328	1.6%	2.1%	1.8%
26	Pulp, Paper or Allied Products	564,322	569,805	569,788	0.1%	0.0%	0.0%
33	Primary Metal Products	533,245	598,571	558,695	1.1%	-0.7%	0.2%
37	Transportation Equipment	531,743	614,475	697,046	1.3%	1.3%	1.3%
29	Petroleum or Coal Products	529,284	563,212	530,871	0.6%	-0.6%	0.0%
40	Waste or Scrap Materials	389,499	688,006	945,555	5.3%	3.2%	4.3%
14	Nonmetallic Minerals	270,853	278,761	274,627	0.3%	-0.1%	0.1%
44	Freight Forwarder Traffic	232,952	371,128	564,957	4.3%	4.3%	4.3%
10	Metallic Ores	121,227	163,432	154,307	2.8%	-0.6%	1.2%
36	Electrical Equipment	105,226	133,877	196,471	2.2%	3.9%	3.0%
41	Miscellaneous Freight Shipments	5,624	144,619	245,447	6.1%	5.4%	5.8%
47	Small Packaged Freight Shipments	57,700	63,003	94,400	0.8%	4.1%	2.4%
30	Rubber or Miscellaneous Plastics	43,840	52,376	52,592	1.6%	0.0%	0.9%
34	Fabricated Metal Products	32,446	30,319	39,124	-0.6%	2.6%	0.9%
35	Machinery	25,480	33,117	58,868	2.4%	5.9%	4.1%
25	Furniture or Fixtures	24,354	32,598	42,673	2.7%	2.7%	2.7%
23	Apparel or Related Products	21,794	15,191	11,011	-3.2%	-3.2%	-3.2%
27	Printed Matter	21,172	19,040	19,419	-1.0%	0.2%	-0.4%
43	Mail or Contract Traffic	19,320	18,647	18,248	-0.3%	-0.2%	-0.3%
39	Miscellaneous Manufacturing Products	7,062	9,865	14,121	3.1%	3.7%	3.4%
22	Textile Mill Products	7,030	7,809	6,849	1.0%	-1.3%	-0.1%
38	Instruments, Photo Equipment, Optical Equipment	3,136	5,404	8,473	5.1%	4.6%	4.8%
31	Leather or Leather Products	1,724	847	395	-6.3%	-7.3%	-6.8%
45	Shipper Association Traffic	1,366	2,212	3,360	4.5%	4.3%	4.4%
9	Fresh Fish or Marine Products	900	534	328	-4.6%	-4.8%	-4.7%
19	Ordnance or Accessories	674	-	-	N/A	N/A	N/A

The Midwest is the most prominent region of inbound commodities to Washington with close to 26 million outbound tons in 2025, up from 24.5 million in 2015, a modest 0.6 percent compound annual growth rate over the 10 long-term forecast years (Figure 26).

Figure 26. 2004-2025 Inbound Washington Rail Tonnage, Origin Region



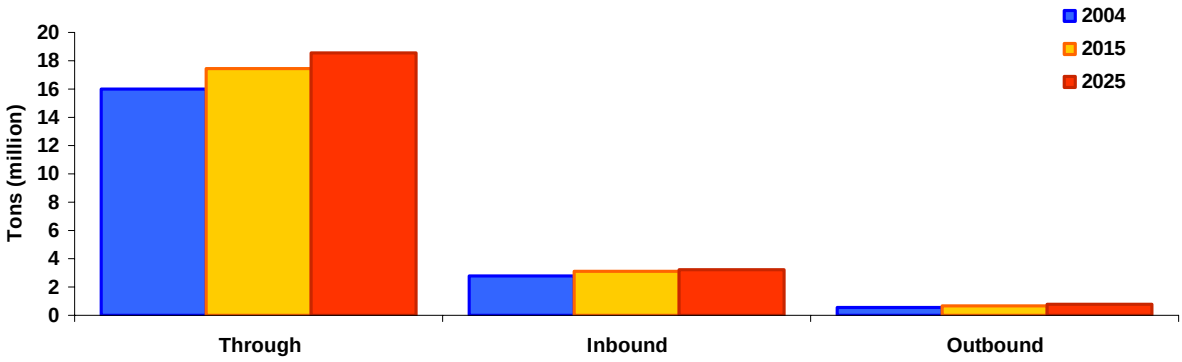
■ North American Cross-Border Forecast

More than 18.5 million tons of freight is 2025 cross-border traffic, primarily with Canada. This is an increase from 21.3 million in 2015, a 0.6 percent growth rate between 2015 and 2025, and a 0.7 percent annual increase in the 21 years between 2004 and 2025 (Table 11 and Figure 27). Through traffic represents the majority of cross-border traffic at 18.5 million tons in 2025. An additional 3.2 million tons are inbound traffic, and .8 million tons are outbound traffic.

Table 11. Cross-Border Tonnage Forecast by Traffic Type, 2004-2025

	Rail Tonnage			Compound Annual Growth Rates		
Class	**2004**	**2015**	**2025**	**2004-2015**	**2015-2025**	**2004-2025**
Through	15,981,439	17,461,745	18,507,192	0.8%	0.6%	0.7%
Inbound	2,797,538	3,111,580	3,220,985	1.0%	0.3%	0.7%
Outbound	574,628	692,291	766,690	1.7%	1.0%	1.4%
Total	19,353,605	21,265,617	22,494,867	0.9%	0.6%	0.7%

Figure 27. Washington Carload and Intermodal Unit Projections by Traffic Type, 2004-2025



The shifting prominence of rail tonnage of the top origin and destination lanes for Washington's international rail freight traffic over the forecast period are shown in 11. The origin destination pairs show British Columbia, Saskatchewan, Alberta, Oregon, and California as the regions creating the highest rail tonnage.

Table 12. Shift of Top Origin Destination Pairs, 2004-2025

State		Rail Tonnage		
Origin	**Destination**	**2004**	**2015**	**2025**
British Columbia	Oregon	3,322,411	3,518,435	3,902,518
Saskatchewan	Oregon	2,085,816	2,288,856	2,160,844
Alberta	California	1,549,924	1,771,485	1,925,419
Alberta	Washington	1,366,520	1,449,986	1,372,822
British Columbia	Washington	1,059,765	1,244,898	1,426,738
British Columbia	California	981,214	1,002,640	1,066,933
British Columbia	Arizona	654,364	623,882	657,242
Montana	British Columbia	636,539	788,544	903,886
British Columbia	British Columbia	606,555	785,155	770,748
Alberta	Oregon	568,024	653,524	668,689
British Columbia	Texas	514,288	490,331	514,306
British Columbia	Illinois	368,078	376,585	399,887
British Columbia	Nevada	309,338	317,924	334,835
Oregon	British Columbia	292,890	355,297	407,171
Alberta	Idaho	260,107	288,796	287,807
Saskatchewan	Washington	248,343	265,910	250,003
British Columbia	Colorado	227,788	233,811	248,316
British Columbia	Missouri	227,124	217,404	228,040
California	British Columbia	196,730	208,222	182,288
Saskatchewan	California	190,010	221,952	246,647