Inbound/Outbound – Lane Balance Findings and Implications

The ability to identify relative levels of directional distribution with regards to value and tonnage is useful to understand potential trade gaps and better assess the economic return of enhancements to transportation systems. Also, relative to inbound and outbound access and efficiency, directional flow analyses can be used to identify truck related lane balance issues. Lane balance has been identified as one of the more consistent and overarching modal issues throughout the interview and freight forum activities. The measures of lane balance discrepancy are calculated in **Exhibit 35**. The key findings for lane balance relative to the direction of inbound and outbound traffic are as follows:

- There is a lane balance discrepancy of 6,272,824 tons of IPH commodity trade with the South based on outbound tonnage of 9,280,323 versus inbound tonnage of 3,007,499. This represents the highest tonnage difference and also represents the highest magnitude of discrepancy.
- All tonnage discrepancies show increased outbound tonnages over inbound tonnage with magnitudes of discrepancies in lane balance followed by the East, North, and West.

Exhibit 35: IPH Truck Lane Balance Comparison

2007 IPH Truck Freight Flow Lane Balance						
	Tonnage			Value		
Truck Freight Flow Direction	Truck Tonnage	Inbound vs. Outbound Difference	Difference Relative %	Truck Values	Inbound vs. Outbound Difference	Difference Relative %
Inbound						
From West	12,628,000	-1,254,365	-9.9%	$49,816,586,355	-$14,292,594,001	-28.7%
From East	2,412,529	-2,642,130	-109.5%	$9,234,071,885	-$13,682,658,792	-148.2%
From North	620,627	-173,202	-27.9%	$735,807,539	$235,278,921	32.0%
From South	3,007,499	-6,272,824	-208.6%	$19,168,430,874	-$4,151,024,303	-21.7%
Inbound Subtotal	**18,668,655**	**-10,342,521**	**-55.4%**	**$78,954,896,654**	**-$31,890,998,175**	**-40.4%**
Outbound						
To West	13,882,365	1,254,365	9.0%	$64,109,180,356	$14,292,594,001	22.3%
To East	5,054,659	2,642,130	52.3%	$22,916,730,677	$13,682,658,792	59.7%
To North	793,829	173,202	21.8%	$500,528,618	-$235,278,921	-47.0%
To South	9,280,323	6,272,824	67.6%	$23,319,455,177	$4,151,024,303	17.8%
Outbound Subtotal	**29,011,176**	**10,342,521**	**35.7%**	**$110,845,894,829**	**$31,890,998,175**	**28.8%**

Source: 2007 TRANSEARCH™, Global Insight

Lane Balance: Carrier Pricing of Loaded vs. Empty Miles

Origin-destination pairings or "lane" pricing for carriers is influenced by the available capacity in that lane. Where there is empty movement of equipment, there is a general lack of revenue to cover associated costs. As a result, carriers typically reduce the cost or price presented to a shipper to attract goods to the lane or to their company. Those goods may be moved along a path that appears circuitous to the shipper, but provides the greatest opportunity for freight volumes and the lowest number of empty miles as possible. To illustrate the positive attraction effect for the IPH study area, a simple illustration of goods movement between Calgary, AB and Seattle, WA is provided. An evaluation based only on miles traveled, would select the most direct routing, saving costs associated with 13 excess miles in each direction.

Whereas Calgary, AB may be a heavier outbound lane versus inbound to Seattle WA for a given carrier, that carrier may experience 703 empty miles to return the equipment to Calgary. If the carrier has the opportunity to travel on the longer path, over Spokane, these same goods would require 439 empty miles to return the driver and tractor to Calgary, but would have the opportunity to transport the freight, the remaining 280 miles in lieu of an empty transit, **Exhibit 36**.

Exhibit 36: Commodity Volume Movement by Direction

Truck Freight Flow Direction	Truck Tonnage	Inbound vs. Outbound Outbound vs. Inbound
Inbound		
From West	12,628,000	-1,254,365
From North	620,627	-173,202
From South	3,007,499	-6,272,824
Inbound Subtotal	**16,256,126**	**-7,700,391**
Outbound		
To West	13,882,365	1,254,365
To North	793,829	173,202
To South	9,280,323	6,272,824
Outbound Subtotal	**23,956,517**	**7,700,391**

Source: 2007 TRANSEARCH™, Global Insight

As the freight movement between the region and the west are significantly imbalanced, with more freight moving to Spokane than back to the west, the 280 miles of loaded transport reduced the carrier's loss on the backhaul. The empty trailer is currently moving, and with placement of these goods in the "lane", the trailer now has revenue to offset costs. This has the effect of reducing overall costs in the lane and influences carrier pricing needs to maintain acceptable profit margins. This illustration has been overly simplified, as this level of analysis is beyond the scope of this paper. Variables in pricing, commodity, individual carrier capacity, modal capacities, and transit times would influence the specific feasibility of this concept for a given cargo owner.

The freight flow data and comments from regional carriers and shippers suggest there are significant lane balance issues in the IPH study area that need to be assessed. Canada is an opportunity for export from the IPH study area, but should be balanced relative to the population growth forces and related markets of the Southern and Western U.S.

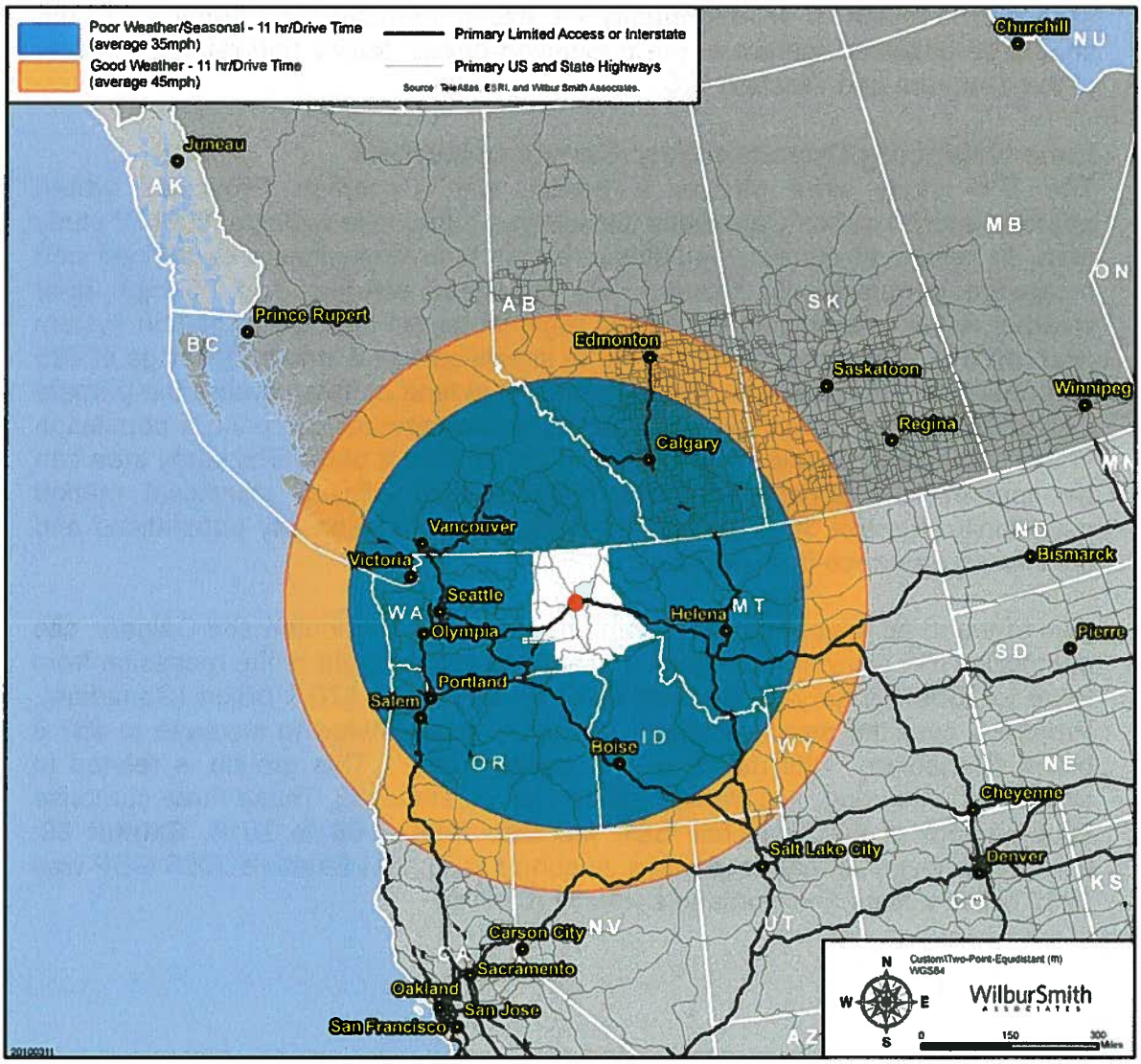
Lane Balancing Opportunities: Canadian Markets

The IPH study area shares a border with Canadian Provinces where approximately 5 million Canadians live within a 1,200 mile radius of the IPH study area. In review of current regulations, an 11 hour drive time was defined and measured geographically using a 45 mph good weather and 35 mph poor weather travel time adjustment for the regional terrain and transportation system (**Exhibit 37**). These measures equate to simplified travel time buffer rings of 495 and 385 miles, respectively. In effect, the travel time buffers capture the primary Canadian cities of Edmonton and Calgary which together comprise a population of over 1.7 million people. These cities, north/northeast of the IPH study area can be competitively served via truck transport and offer a significant market opportunity. **Exhibit 38** presents in tabular form Canadian city populations and their driving distance from Spokane.

Two of the three major markets within one day drive, Edmonton and Calgary, cite optimistic GDP growth percentages, assessed at the height of the recession from 2008 to 2009. Calgary's estimated GDP for 2008 was $70.1 billion (Canadian). Projected over the next five years, this figure is estimated to increase to $87.8 billion (Canadian). This marks a 25.2 percent rise.[14] This growth is related to trade, manufacturing, and transportation and warehousing. These three comprise 28.4 percent of the projected GDP increase from 2008 to 2014, **Exhibit 39**. PricewaterhouseCoopers estimates, in comparison, that Seattle's 2008 GDP was $235 billion dollars and Portland's was $110 billion.

[14] http://calgaryebrochure.com/, 03/12/2010, Calgary Corporate Economic, Calgary's Economic Outlook 2009-2019, 2nd quarter 2009

Exhibit 37: Truck Drive Time Reach



Source: Teleatlas, ESRI, and Wilbur Smith Associates.

Exhibit 38: Canadian Cities Drive Distance from IPH Study Area

Canadian Metro Area	Drive Distance from Spokane (miles)	Population
Kelowna	255	106,707
Lethbridge	377	74,637
Abbotsford	388	123,864
Saanich	391	108,265
Langley	394	117,332
Surrey	400	394,976
Coquitlam	405	114,565
Burnaby	405	202,799
Richmond	408	174,461
Metro Vancouver	413	2,100,000
Calgary	438	988,193
Airdrie	457	28,927
Medicine Hat	480	56,997
Red Deer	526	82,772
Edmonton	620	730,372
Strathcona	632	82,511
St. Albert	632	57,719
Grande Prairie	746	47,076
Wood Buffalo	908	51,496
Swift Current	992	14946
Moose Jaw	1166	32,132

Exhibit 39: Forecast GDP by Industry, Calgary, Alberta

Forecast GDP By Industry
Calgary Economic Region
Source: Calgary Corporate Economics,
Calgary's Economic Outlook: 2009-2019, 2nd Quarter 2009.

Industry	2009 ($ Billions)	2014 ($ Billions)	Change
Agriculture	0.50	0.61	2.2%
Other Primary (Mainly Oil & Gas)	8.95	9.63	7.6%
Manufacturing	5.23	7.22	38.0%
Construction	8.30	11.31	36.3%
Information Culture and Recreation	3.13	4.09	30.7%
Utilities	2.00	3.39	69.5%
Transportation & Warehousing	2.62	3.13	19.5%
Trade	6.00	8.55	42.5%
Finance, Insurance, Real Estate And Leasing	15.36	20.12	31.0%
Professional, Technical & Management	6.95	9.50	36.7%
Accommodation And Food Services	1.52	1.98	30.3%
Education Services	2.31	2.71	17.3%
Health & Welfare Services	2.76	4.25	54.0%
Other Services	1.52	1.96	28.9%
Government Services	1.96	2.36	20.4%
All Industries	68.00	87.80	29.1%

As noted in the freight profile for the IPH study area, nearly all of the NAFTA imports and 95 percent of the exports originating from or coming to the IPH study area involve trade with British Columbia and Alberta. Furthermore, Canadian Government trade statistics estimate that Canada accounted for nearly 12 percent of Washington's foreign export trade and 13 percent of Idaho's, and it was estimated that in 2008, 153,000 jobs in the State of Washington and 33,500 jobs in the State of Idaho were supported by U.S.-Canada trade.

Miles Traveled Implications for Lane Balance

The most significant and common measure of cost for motor carriers is the aggregation of vehicle, maintenance, and personnel costs per mile. One attraction for a given corridor is the ability to reduce overall mileage without detrimental influence on transit times caused by delay and reliability concerns. Aside from length and weight policies, carriers will assess the savings in mileage with the movement of these goods.

Two provinces, Alberta (AB) and Saskatchewan (SK), are potential contributors to the IPH study area logistics hub concept. As compared to destinations in the Western U.S. markets, several key markets emerge as "shortest paths, when processed through the region, **Exhibit 40.**.

Exhibit 40: Shortest Path, City to City, by miles

	Calgary, AB		Edmonton, AB		Regina, SK	
	Inclusive	Exclusive*	Inclusive	Exclusive*	Inclusive	Exclusive*
Seattle, WA	716	**703**	899	**820**	**1,046**	1,171
Portland, OR	**789**	876	**972**	993	**1,119**	1,344
Medford, OR	**1,061**	1,149	**1,243**	1,266	**1,391**	1,617
San Francisco	**1,423**	1,511	**1,606**	1,627	1,753	**1,628**

*Exclusive identifies the shortest route not passing through the region, using roadway with similar functional class

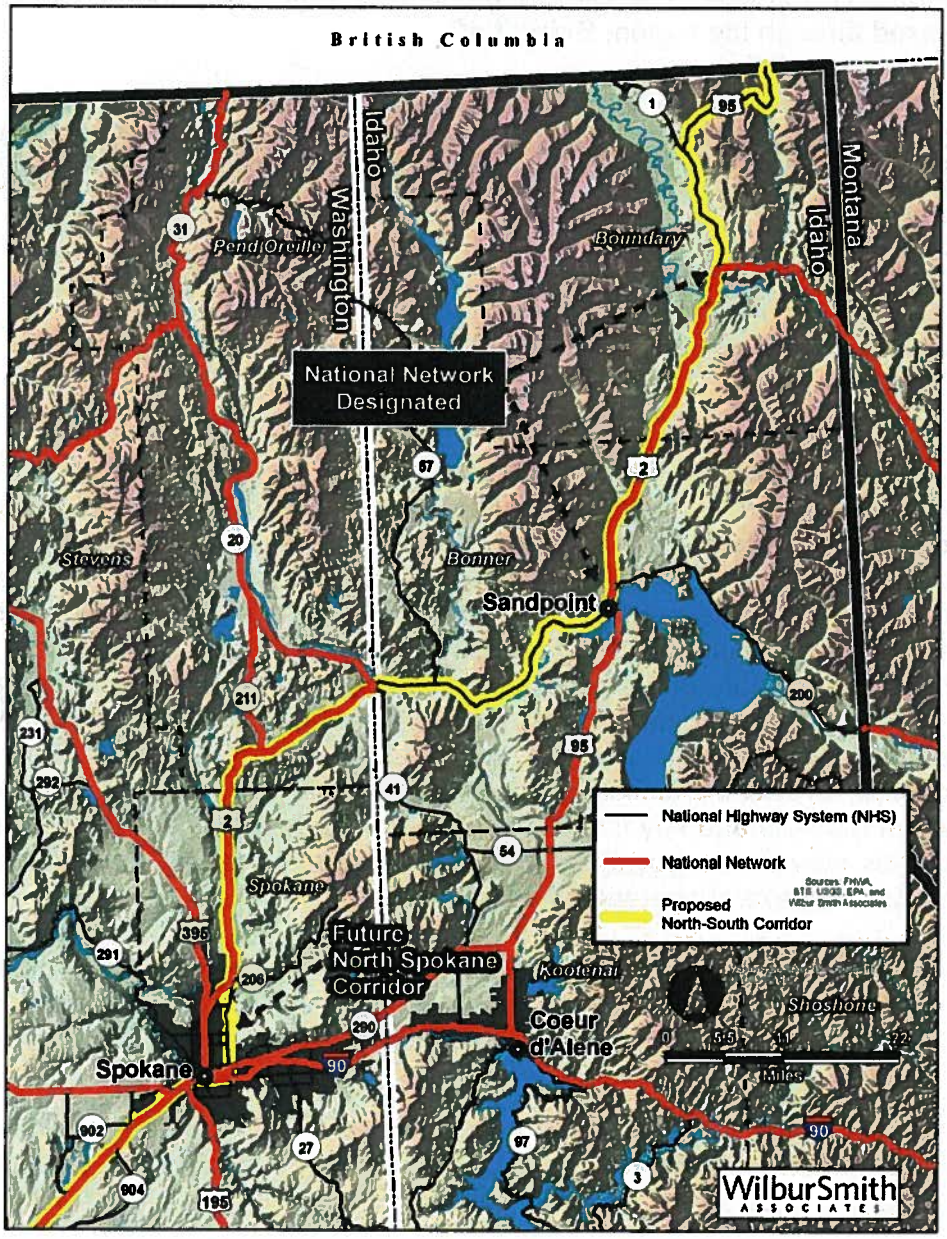
Attracting goods movement to a corridor may not solely be influenced by VMT, as cost advantages, or other operational advantages may also yield benefits to carriers. Other benefits that enhance the rate of travel between two locations, could be associated with eliminating extraneous activities associated with differences in regulatory compliance (e.g., different weight or size limits when crossing a border), and assigning regulatory compliance activities to more natural points of operational activity enhance the movement along a corridor. Changes that generate a lower cost structure to carriers translate to more reliable transit times and lower costs for shippers. A key enhancement to the development of the corridor is the expansion of increased lengths and weights between the Canadian markets and key freight nodes in the study area. The ability to provide continuous service, as governed by the most robust regulations in the corridor could address several operational advantages:

- Reduce the total number of trips: Increased length (volume) would permit additional amounts of freight which "cubes out" to move per trip. Increased weight limits would allow the same benefit for those commodities that "weigh out".
- Continuous transit between the two locations without the need for equipment transfers at transload facilities at the border or warehouse staging to await appropriate equipment.

- The ability to provide continuing customs services related to in-bound transit, further inland, thus reducing the need to slow transit for the remainder of the cargo.

A corridor running between the border facility at Eastport, ID and the Spokane, WA area, associated with the "shortest" route is US-95/US-2 (**Exhibit 41**). The implications of the route segments that are designated as National Network Routes are discussed in the next section.

Exhibit 41: US-2, North-South Corridor Segment



Source: FWHA-ORNL, BTS, USGS, EPA, and Wilbur Smith Associates.

TRUCK SIZE AND WEIGHT

Commercial Motor Vehicles (CMV) are an important mode for moving high-value goods throughout the Northwest U.S., and use various regional roadway networks to transport their cargo. Throughout the Pacific Northwest (Washington, Oregon, Idaho, Montana, Alberta, and British Columbia) there are numerous size and weight regulations that greatly influence regional freight movement. The regulatory environment CMVs face is complicated because several truck configurations are allowed on designated roadways as they operate among several jurisdictions (state, national, local, etc.). Harmonizing regulations in IPH region with those of the surrounding states and provinces will have profound impacts on freight efficiency and could be helpful to encourage seamless interoperability between the road networks in the region's states and provinces.

Regional Roadway Networks Impacting Truck Size and Weight

The regional roadway network is comprised of federal, state, and local roadways that are designated differently according to their intended purpose. The most important of these networks with respect to truck size and weight is often the National Network (NN). The NN of Highways includes: (1) the Interstate Highway System; and, (2) other highways designated by the states in response to the Surface Transportation Assistance Act (STAA) of 1982. The National Network, sometimes referred to as the national truck network consists of highways submitted to FHWA as being capable of safely handling larger commercial motor vehicles. The criteria provided to states for guidance in designating NN routes is found in Chapter 23 of the Code of Federal Regulations (CRF), Section 658.9:

> (1) The route is a geometrically typical component of the Federal-Aid Primary System, serving to link principal cities and densely developed portions of the States.
>
> (2) The route is a high volume route utilized extensively by large vehicles for interstate commerce.
>
> (3) The route does not have any restrictions precluding use by conventional combination vehicles.
>
> (4) The route has adequate geometrics to support safe operations, considering sight distance, severity and length of grades, pavement width, horizontal curvature, shoulder width, bridge clearances and load limits, traffic volumes and vehicle mix, and intersection geometry.
>
> (5) The route consists of lanes designed to be a width of 12 feet or more or is otherwise consistent with highway safety.
>
> (6) The route does not have any unusual characteristics causing current or anticipated safety problems.

(7) For those states where State law provides that STAA authorized vehicles may use all or most of the Federal-Aid Primary system, the National Network is no more restrictive than such law. The appendix contains a narrative summary of the National Network in those States.

The federal vehicle size and weight standards listed in **Exhibit 42**, apply on NN Highways. Some exceptions to federal size and weight limits know as "grandfather rights" were granted to states that allowed higher limits prior to the imposition of the NN standards.

Exhibit 42: National Network Vehicle Size Standards

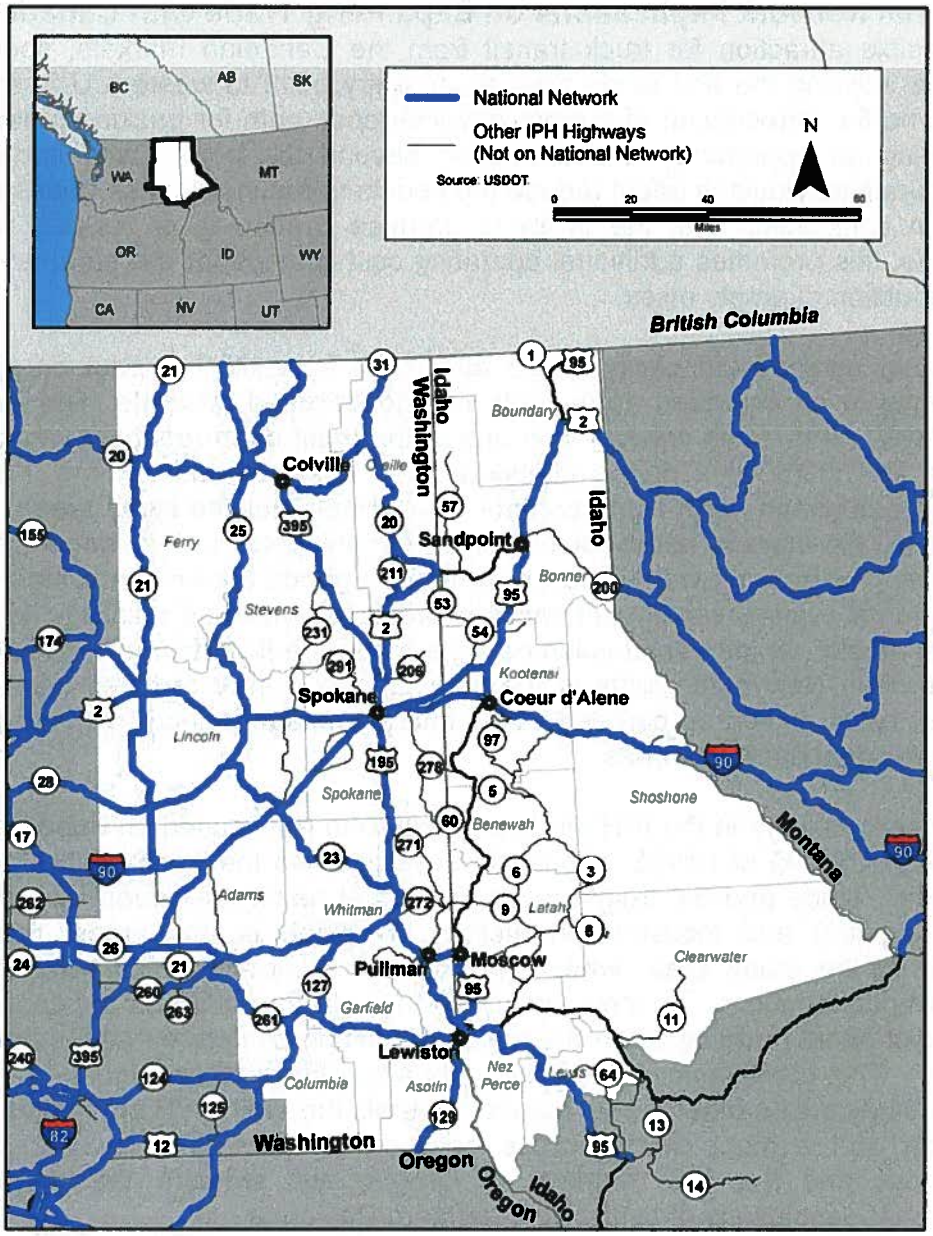
Overall Vehicle Length	No federal length limit is imposed on most truck tractor-semitrailers operation on the National Network. **Exception:** On the National Network, combination vehicles (truck tractor plus semitrailer or trailer) designed and used specifically to carry automobiles or boats in specially designed racks may not exceed a maximum overall vehicle length of 65 feet, or 75 feet, depending on the type of connection between the tractor and trailer.
Trailer Length	Federal law provides that no state may impose a length limitation of less than 48 feet (or longer if provided for by grandfather rights) on a semitrailer operating in any truck tractor-semitrailer combination on the National Network. (Note: A state may permit longer trailers to operate on its National Network highways.) Similarly, federal law provides that no state may impose a length limitation of less than 28 feet on a semitrailer or trailer operating in a truck tractor-semitrailer-trailer (twin-trailer) combination on the National Network.
Vehicle Width	On the National Network, no state may impose a width limitation of *more or less* than 102 inches. Safety devices (e.g., mirrors, handholds) necessary for the safe and efficient operation of motor vehicles may not be included in the calculation of width.
Vehicle Height	No federal vehicle height limit is imposed. State standards range from 13.6 feet to 14.6 feet.
Vehicle Weight	National weight standards apply to commercial vehicle operations on the Interstate Highway System, approximately 40,000 miles of limited access, divided highways that span the nation. Off the Interstate Highway System, states may set their own commercial vehicle weight standards. Federal commercial vehicle maximum standards on the Interstate Highway System are: Single Axle - 20,000 lbs; Tandem Axle - 34,000 lbs; GVW - 80,000 lbs. The Federal Bridge Formula, introduced in 1975 to reduce the risk of damage to highway bridges by requiring more axles, or a longer wheelbase to compensate for increased vehicle weight, may require a lower GVW; depending on the number and spacing of the axles in the combination vehicle.

It should be noted that the NN Highway system is different that the National Highway System (NHS). The NHS was developed by the USDOT in cooperation with states, municipalities and metropolitan planning organizations, as a high priority investment network. The NHS includes the Interstate Highway System, and the Strategic Highway Network (STRAHNET) which is the system of public

highways that provide defense access, continuity and emergency capabilities for defense purposes. Other principal arterials and connector routes are also part of the NHS.

The total National Network system is about 200,000 miles. The segments of the National Network in the IPH study area are shown in **Exhibit 43.**

Exhibit 43: NN Segments in the IPH Study Area



Source: FHWA-ORNL, March 2010.

The truck size and weight regulations applying to the NN and other highways in the IPH study area, as well as those applying to surrounding jurisdictions are summarized in **Exhibit 44.** Of note is the higher gross vehicle limit (GVW) of 105,500 allowed on Interstate and NN routes in Washington and Idaho due to grandfather exemption provisions in federal law. In Washington these higher limits are allowed without special permits, in Idaho special permits are required to travel NN and Interstate routes.

National Network Implications on Expanding Trade with Canada

A possible attraction for truck transit from the Canadian markets, specifically Alberta, utilizing the IPH study area as an entry point to western U.S. markets, would be the introduction of a more advantageous path for trucking productivity. Providing an opportunity for penetration beyond the border with larger truck configurations would in effect reduce trip counts to transport these goods into the U.S. In conjunction with the ability to produce continuing or realized reduced mileage, this promotes additional operating cost savings for the carriers through the reduction of empty miles.

Improved carrier productivity would also have a positive impact on shippers operating in an improved north-south corridor focused on trade. The lack of a high-level, north-south corridor was one of the most often repeated weaknesses of the IPH study area during interviews with shippers and carriers. Failing to pursue a common north-south corridor development for the study area will likely result in the current backhaul condition for shippers in the immediate area continuing or growing worse. Cargo owners for goods currently moving between the external regions would experience improved service and reliability as "freight moves freight", or increased volumes drive carrier participation and investment in the corridor. New participants in the corridor may realize reduced pricing, over current lanes, based on carrier savings and advantage gained by placing goods into traditional backhaul lanes.

Many stakeholders in the IPH study area seem to be focused on debating which highway; US-395 or US-95, should be developed as the north-south trade with Canada. Trade and the freight movements that result are driven by population (consumption) and industry (production). Spokane is the largest production center in the study area, while Calgary and Edmonton offer two promising consumption markets. In combination US-395, US-2 and US-95 appears to offer the most direct route between the major population centers on either side of the border. This combination of routes would also offer better regional connectivity to the study area's other modal assets. Overall, the entire IPH study area stands to gain with a more direct access between the Alberta and Saskatchewan provinces and the U.S. markets of Oregon and western Washington and significant populations of central and northern California.

The process to assign expanded length and weight regulation is compounded by the need to satisfy federal regulation on this segment, **see insert on Exhibit 44.**

Portions of the suggested trade corridor are designated as NN highway segments, such as US-2, north of Spokane to Dover, ID, and the US-95 segment from Sandpoint, ID to Bonners Ferry, ID. Under federal regulations LCV weight limits were "frozen" on the Interstate Highway System, and size limits were "frozen" on the NN by the Intermodal Surface Transportation Efficiency Act (ISTEA):

> *"ISTEA is an acronym for Intermodal Surface Transportation Efficiency Act of 1991. It imposed two separate freezes: (1) on the maximum weight of longer combination vehicles, which consist of any combination of a truck tractor and two or more trailers or semitrailers which operate on the Interstate System at a gross weight over 80,000 pounds; and (2) on the overall length of the cargo carrying units of combination vehicles with two or more such units where one or both exceed 28.5 feet in length on the National Network. The maximum weight of longer combination vehicles and the maximum length of the cargo carrying units of combination vehicles is the weight or length in actual and legal operation in a State on June 1, 1991, as documented in appendix C to 23 CFR 658. Also frozen were the routes and conditions in effect on June 1, 1991, for vehicle combinations subject to the freeze, as shown in appendix C to 23 CFR 658."*[15]

Since no portions of the suggested corridor would operation along interstate routes, it would appear that Washington and Idaho could consider adopting Canadian weight limits of 139,500 lbs. However, length limitations frozen by ISTEA include an overall limit of 68 feet in Washington State. In Idaho the limit is 95 feet. The current length limit for Canadian B-train double LCV configurations is 82 feet.

[15] FHWA, Office of Freight Management and Operations: https://fhwaapps.fhwa.dot.gov/vswp/qa/qa.jsp?category=23%20CFR%20658.23#S0-149

Exhibit 44: Regional Truck Size and Weight Regulations

	Width	Height	Length (Interstate & Designated Federal Routes)				Length (State/Provincial Routes)			Maximum Gross Vehicle Weight Interstate Highways	Maximum Gross Vehicle Weight Other Highways	Single Axle (lbs)	Tandem axle (lbs)
			Semi-trailer in TST	Full Trailer	Dbl Trailer	Overall Dbl LCV Length Limits	Semi-trailer in TST	Full Trailer	Dbl Trailer				
Federal			N/A							80,000		20,000	34,000
WA	102"	14'	53' (1)	53'	61' (2)	68'	53' (1)	53'	61' (2)	105,500 (3)	105,500 (3)	20,000	34,000
OR	102"	14'	53'	40'	NS (4)	68'	53'	40'	(5)	80000 (6)	80,000	20,000	34,000
ID	102"	14'	53'	53'	NS (7)	95'	48' (8)	53'	(9)	80000 (10)	105,500	20,000	37,800 (11)
MT	102"	14'	53'	28'6"	NS (12)	93'	53'	NS	65' (13)	80,000	80,000	20,000	34,000
AB	102"	13'6"	53'		75'5"		53'	41'	82' (14)	87,080 (15)	139,993	20,060	37,480
BC	102"	13'6"	53'		75'5"	82'	48'	41'	82' (14)	87,082	139,993 (16)	20,060	37,480

Abbreviations
TST = tractor semitrailer combination
Note: Table footnotes appear on the following page.

Footnotes for Exhibit 44

(1) Trailers from 53' to 56' require a permit

(2) Trailers from 61' to 68' require a permit

(3) Provided vehicle complies with Federal bridge gross weight formula

(4) Overall length not specified if trailing units, including space between, do not exceed 68' and first semitrailer does not exceed 40'

(5) 75' overall on Group 1 highways; first trailer in combination not to exceed 40'. No overall length limit on Group 1 highways if the measurement from the front of the first trailer to the rear of the second trailer does not exceed 60' (including distance between trailers).

(6) Two consecutive sets of tandem axles may carry a gross load of 34,000 lbs. each if the overall distance between the first and last axle is 36' or more

(7) Overall length is 68' for the trailing unit including space between

(8) 53' on some highways

(9) 68' of trailers allowed on National Network roads. 61' of trailers, or 75' overall, allowed on non-National Network roads

(10) Permit needed to exceed 80,000 lbs. up to 105,500 lbs.

(11) When not over 80,000 lbs. GVW

(12) Length of doubles not specified but trailers are limited to 28'6" each

(13) Not specified when trailer length does not exceed 28' and operated within 10 miles of the interstate, designated, or primary highway; otherwise, 65' overall length

(14) For A Train Doubles

(15) For 5-axle tractor-semitrailer

(16) For 7-axle unit

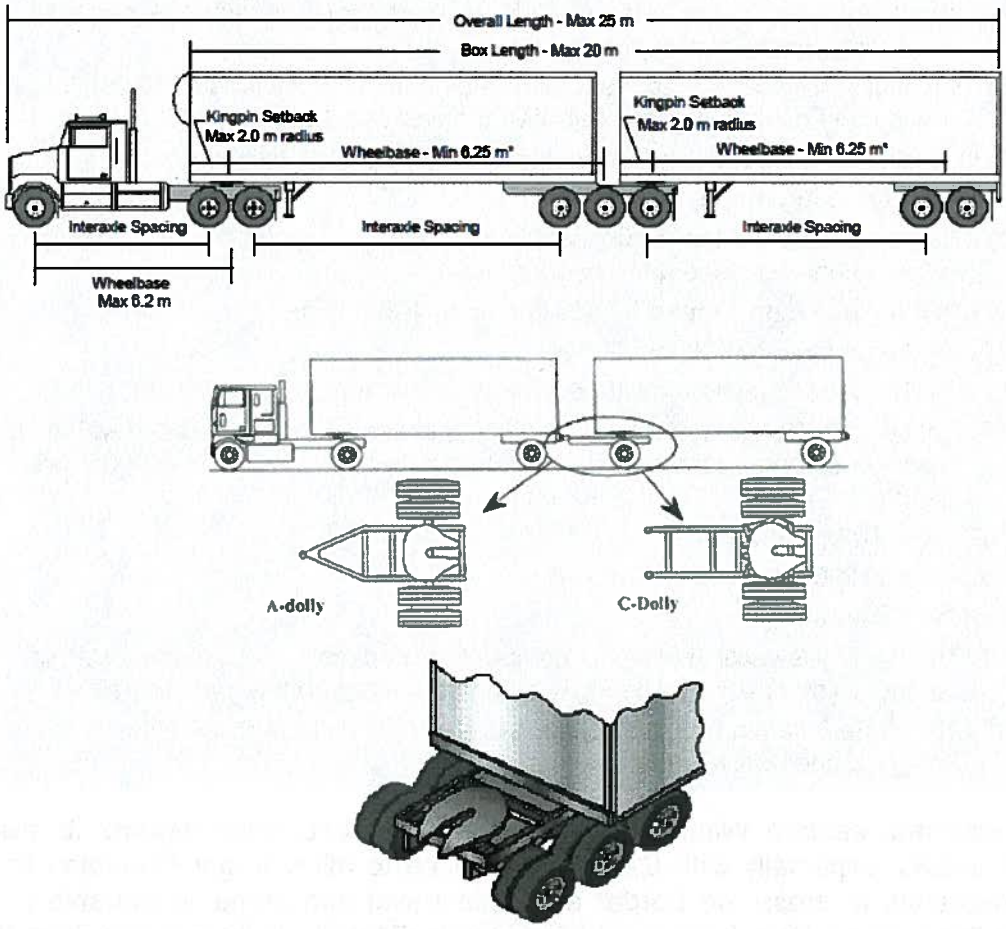
(17) The GVW allowable by overweight permit is subject to the seasonal stability of the roadway and the capacity of the structures on the route of travel.

(18) The State of Idaho has developed 7 overweight levels with varying single/tandem axle weight restrictions

One way that eastern Washington and northern Idaho could expand its trade opportunities, especially with Canada, would be to allow larger Canadian truck configurations to cross the border and then travel into some reasonable point within the region where loads could be deconsolidated. Idaho actually does this on a small segment of US-95. Heavier Canadian lumber trucks are allowed access to a lumber reload center in Eastport where they are loaded onto rail or smaller trucks. A potential opportunity to expand this concept could include a consolidation point near Sandpoint, or even as far south as Spokane. As discussed, for Canadian B-train configurations up to 82 feet in overall length to travel in Washington would require some route segments be removed from the NN designation.

Forming a framework that attract carriers to the Canadian-IPH node would include the identification of a currently utilized configuration to minimize the investment and time necessary to begin operations under the new length and weight regulations. Generally, the configuration utilized in the larger environment of Canada, is the "B-Train" double shown in **Exhibit 45**. Most doubles operating in the U.S. fleet currently utilize an "A-Train" or pintle hook coupling between the two trainers.

Exhibit 45: B-Train Configuration



B-Train

The B-Train configuration has been demonstrated to be a safer coupling, because the fifth-wheel plate between the trailers increases the roll stiffness and the handling capabilities of the configuration. 'B-Train' and 'C-Train' configurations improve stability through "roll couplings." These couplings take advantage of the fact that two adjacent units in a multi-trailer combination roll in different directions during a dynamic lane change maneuver. By making the coupling or hitch more rigid along the roll axis, each unit in the combination "helps" the other counteract excessive roll forces, and improving safety.

To initiate the process for expanding vehicle configurations in the IPH study area, the NN designations would need to be removed from some segments. A north-south corridor configuration could establish a road network that initiates a path for economic development. This development is not simply a benefit-value system for the region, but in collaboration with Canadian, Oregon, California, and private sector stakeholders can significantly impact the movement of freight in these corridors. While Congress has been opposed to broad changes to truck size and weight changes, members have expressed a willingness to consider controlled pilots in specific corridors. Both Maine and Vermont were granted a limited exemption from Interstate weight limits in 2009.

Further expansion of this concept could include the use of "triple" LCV configurations beyond current limits. Currently triple-trailer LCVs are allowed in Idaho, Oregon, Nevada and the province of Alberta, but are not allowed in Washington or British Columbia. Triples configuration is the attachment of three 28-foot trailers to a single tractor. This equipment is popular where it is allowed with carriers such as Yellow-Roadway Corporation, FedEx and UPS allowed with less than truckload and small package. A practical example is following the movement of 28-foot trailers from the California-Oregon border to the Canadian or Idaho borders (**Exhibit 46**). This corridor is one that has previously been identified as a logical selection for truck transport of goods, both domestically and internationally.

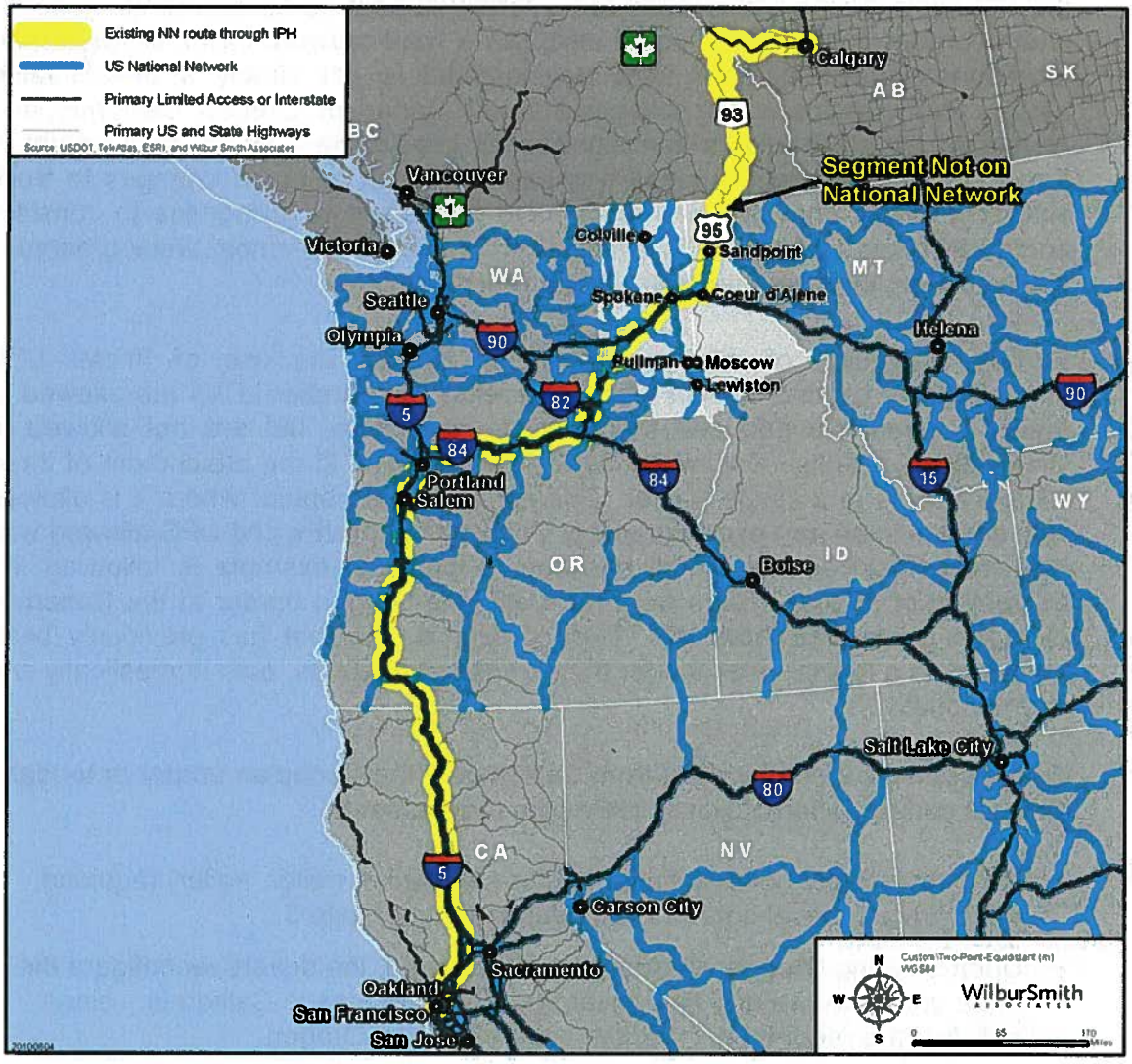
To transport six 28 foot trailers from California to the Canadian border or to Idaho (without consideration of Hours of Service requirements):

- Three twin trailer combinations (tractor-semitrailer, trailer, trailer) requiring three drivers, travel north from California on Interstate 5.
- Upon entering Oregon where triples are allowed, the drivers reconfigure the three units into two and one driver and tractor returns to California – since only two are required to carry the trailers through Oregon.
- Upon reaching the Washington border, a third driver and power unit would again be needed, so the two triple configurations would need to be broken down into three twin trailer configurations once again to access Canada.

As this simple example shows the differences in regulations between states add cost and complexity to carrier operations reducing the attraction of the route in this example.

In each alternative, total VMT for the same amount of goods movement is increased, adding to issues such as air quality concerns, increased road wear and maintenance, and additional compliance monitoring efforts to accommodate the additional trip counts.

Exhibit 46: Triples Route Example



*NOTE: Route is shortest NN route between points

As discussed with LCV double configurations, the exiting ISTEA freeze would prohibit the expansion of triple configurations on designated portions of the NN. However, offering a continuous corridor from the Canadian border through the study area into Oregon where triple LCVs could operate could potentially provide a significant boost to transportation and warehousing activities in the region.

RAILROAD ISSUES AND OPPORTUNITIES

IPH Railroad Issues

Most shippers interviewed in the region expressed general satisfaction with their access to the variety of rail services in the region. A number of shippers who regularly shipped or received goods via container commented that having access to true double-stack intermodal service would be nice, but acknowledged the unlikelihood of the proposition given the proximity of the region to the coast. As discussed earlier, double-stack, container unit trains offer the best service and rates, but to maintain low transit times and high reliability, Class I railroads move these trains between the coast and Chicago with few or no stops. Several shippers interviewed indicated that intermodal services offered in the region had actually improved in recent years based on the length of shipping time and access to containers. Without significant changes in the current market dynamics, for instance a severe decline in Asian imports moving through PNW gateways, the IPH study area will likely continue as a third tier intermodal hub.

One of the biggest challenges noted by some rail shippers who were interviewed was the ability to move products by rail to the east coast. However, some non-traditional alternatives such as Railex and the BNSF container service beginning in Quincy offer good opportunities for shippers in the study region.

Bulk shippers also acknowledged overall satisfaction with access to rail services in the region, however several commented that they felt pricing could be better. However, a number of studies on rail rates have suggested that locations served by two Class I railroads experience better rates that shippers captive to a single railroad. A number of shippers also commented on a capacity constraint between Plummer and Spokane on the UP line. The constraint exists because this segment of rail line cannot accommodate the new weight standard of 286,000 gross lbs. for hi-cube box cars. This constraint limits what can be loaded into railcars that utilize this segment, and has the potential of making the rail a less competitive than other options, like truck.

Public officials interviewed for the study tended to be more vocal and focused on rail issues and pointed to a number of high profile projects underway to improve the rail network and spur economic development:

- Bridging the Valley (BTV) is a series of projects to address railroad/highway conflicts in the communities between Spokane, WA and Athol, ID. In this project, the existing Union Pacific (UP) operations would be relocated to the Burlington Northern Santa Fe (BNSF) mainline assuming BNSF and UP can negotiate mutually-accepted trackage rights agreements. Additional track would be constructed on the BNSF corridor, which today consists of both single and double track mainline. The Bridging the Valley project when fully funded and implemented will

separate vehicle traffic from train traffic in the 42-mile corridor between Spokane, WA and Athol, ID. Double-tracking of the BNSF route will provide increased rail capacity. The project will also provide grade separation of 19 existing at-grade rail crossings, and a new UP yard in Spokane. The first funded project under this program is a grade separation at Havana Street in Spokane.[16]

- Geiger Spur and a proposed rail transload facility. Spokane County was pursuing a second rail transload facility resulting from the purchase of the Gieger Spur, a portion of BNSF rail line outside the Fairchild Air Force base. At the time of the interview, the new rail line for the spur had been completed and removing the old line from the base was in progress. The county was seeking funds to rehabilitate older portions of the spur. The county was hoping to attract a partner to assist in developing a transload facility to better serve existing business in the area.

Inland Pacific Hub Study Area's Rail Network

Railroads fall into three classifications: Class I railroads have annual revenue in excess of $277.7 million for at least three consecutive years, Class II (regional) railroads have annual revenues greater than $20.5 million but less than $277.7 million, and Class III railroads (short line railroads) have annual revenues below $20.5 million. As the name indicates, short lines operate over a relatively short distance. Short lines serve the larger railroads by collecting and distributing railcars to individual industrial and agricultural shippers and receivers.

The IPH study area has two Class I railroads operating in the region: the Burlington Northern Santa Fe Railway (BNSF) and the Union Pacific Railroad (UP). The two Class I railroads provide mainline service between the Pacific Coast and the Midwest and Southwest. Neither Class I railroad provides contiguous coast to coast rail service, although both have interchange agreements with eastern railroads that enable freight to be moved by rail to all parts of the country. Aside from carload service (boxcars, hopper cars, tank cars, etc.) both railroads have extensive intermodal networks in the western half of the U.S. which are discussed in more detail later in this section

BNSF Railway Network in the IPH Study Area

The BNSF operates three lines connecting to West Coast marine ports. Two of these converge at the Tri-Cities. The first line is the Auburn-Pasco route, which crosses the Cascade Range through the Stampede Pass tunnel and proceeds northeast paralleling US-395 and enters the Inland Pacific Hub at Ritzville and follows I-90 to Spokane, and then continues to Sandpoint and then passing through Bonners Ferry on its way to the Montana border. This line is part of the

[16] http://www.bridgingthevalley.org/

BNSF's primary route for double-stack intermodal traffic from Spokane east to the Midwest.

BNSF's second line is the Vancouver-Pasco line, which runs through southern Washington along the north side of the Columbia River. This route is the primary route for export grain trains from the IPH to the Columbia River ports in Portland and Vancouver. From Pasco, the line joins the first-described mainline to Spokane.

The third BNSF line, the Everett-Spokane line, which passes through the Cascade Tunnel at Stevens Pass, is the BNSF's major northern transcontinental route for double-stack intermodal container trains west of Spokane. It is heavily used, operated at about 70 percent of practical capacity in 2008. It passes through Leavenworth and Wenatchee and enters the Inland Pacific Hub west of Odessa in Lincoln County. It then proceeds east parallel to much of SR 28 and then into Spokane.

The BNSF operates a branch line from Spokane to connect to the Kettle Falls International Railway (KFI). From Spokane, the branch line proceeds northwest to Chewelah, connecting with the KFI before it proceeds to Kettle Falls. From there it splits and runs two lines to British Columbia: one proceeds northwest to Laurier, paralleling US-395; the other runs northeast to the town of Boundary.

From Marshall, southwest of Spokane, the BNSF also connects to two lines into Latah County via the Washington and Idaho Railway (WIR). The first line begins at the Washington border near Potlatch and extends to Princeton, ID. The second line extends to Moscow.

Union Pacific Railroad Network in the IPH Study Area

The UP operates an east-west main line route in northern Oregon, between Portland and Hinkle along the south side of the Columbia River. The east-west primary main line continues east and south from Hinkle towards Pocatello, ID and on to Omaha and Chicago. The Hinkle to Spokane main line follows the Snake River northeast for several miles entering the IPH in southeastern Adams County. From there it parallels I-90 to Spokane. For the last 12 miles of the Hinkle-Spokane line (from Fish Lake to Spokane), the UP operates on the BNSF Lakeside Subdivision via trackage rights.

From the Hinkle-Spokane main line, the UP operates two branch lines: one branch extends from the Tri-Cities to Yakima; the other runs to Riparia in Whitman County to connect to the Great Northwest Railroad (GNWR) leading into Lewiston.

At Spokane, the UP splits. One line runs northeast through the cities of Sandpoint and Bonners Ferry to the town of Eastport linking with the Canadian Pacific Railway. The other line runs southeast connecting to the St. Maries River

Railroad (STMA) at Plummer. Another branch extends from Manito to Fairfield in southeast Spokane County.

Montana Rail Link Network in the IPH Study Area

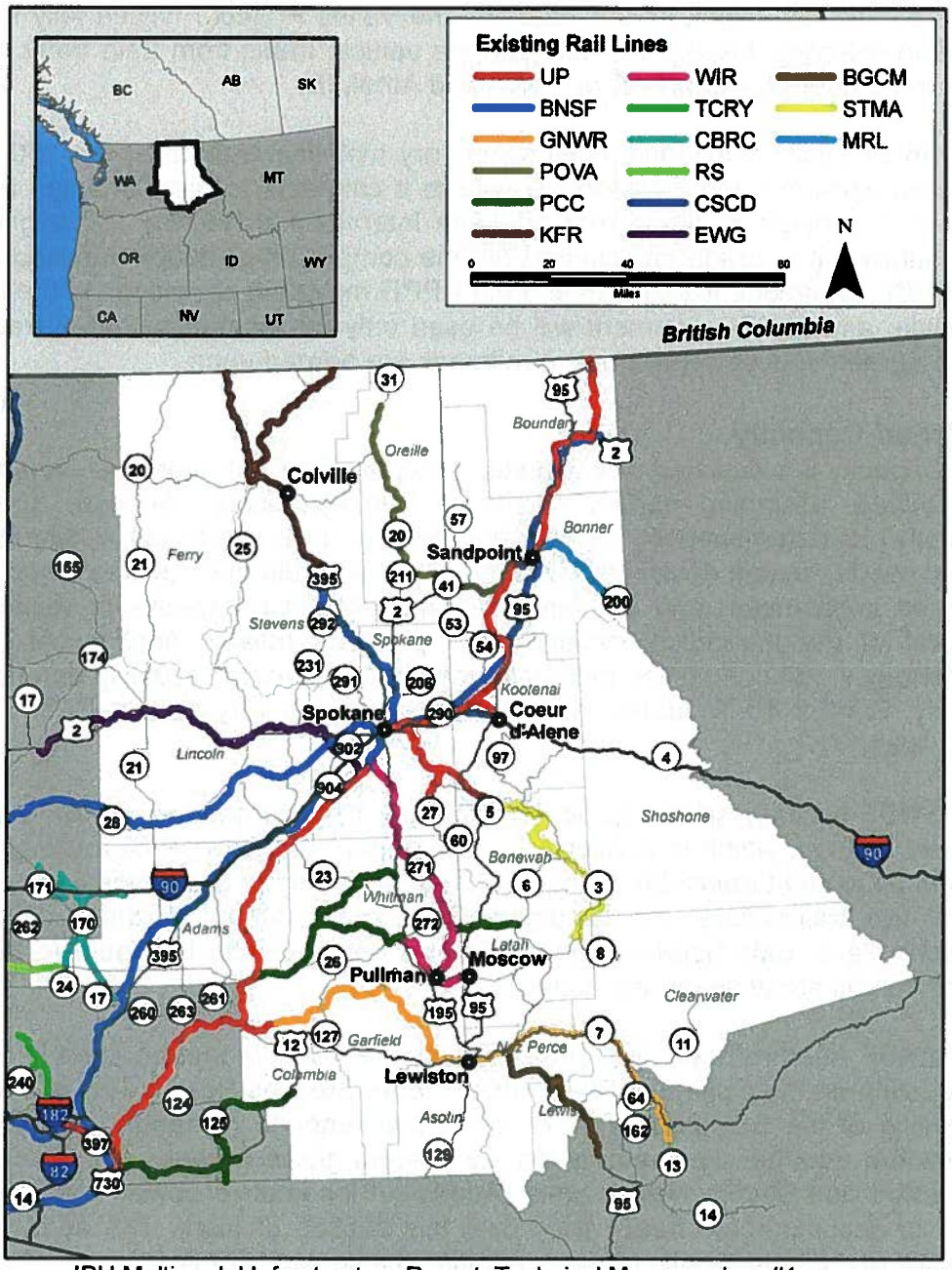
The Montana Rail Link (MRL) is the IPH's only Class II railroad. The MRL connects with the BNSF at Spokane. From Spokane it runs northeast to Sandpoint over BNSF trackage, where it connects with the UP. From Sandpoint the MRL parallels ID SH-200 and proceeds into Montana. The MRL then runs east to Billings, passing through the cities of Missoula, Helena, and Bozeman. MRL currently serves no shippers in Washington or Idaho.

Short Line Rail Network in the IPH Study Area

A total of eight short line railroads serve the IPH study area **(Exhibit 47)**. Short line railroads serving the region include the Kettle Falls International Railway, the Pend Oreille Valley Railway, the Eastern Washington Gateway Railroad, the Washington & Idaho Railroad, the Palouse River & Coulee City Railroad, the Great Northwest Railroad, the St. Maries River Railroad, and the Bountiful Grain and Craig Mountain Railroad. These railroads collectively operate nearly 900 miles of track and reach all parts of the region, with the exception of certain areas within Ferry, Shoshone and Clearwater Counties.

Short line railroads typically serve as short distance haulers between the local freight generators and receivers, or as the connecting line between Class I railroad terminals and local freight generators or receivers. Short line railroads range in length of track from only a few miles exclusively serving a distinct shipper and receiver such as a lumber mill to a wood products manufacturing plant, or the short line railroad's track can span several hundred miles connecting multiple shippers and receivers such as grain elevators with rail terminals at river or ocean ports.

Exhibit 47: IPH Study Area Rail Network



Source: IPH Multimodal Infrastructure Report, Technical Memorandum #1

Sandpoint, Idaho is the junction of two inter-continental railways, the BNSF and UP and one regional railroad, the Montana Rail Link. Near downtown Sandpoint, the BNSF and UP lines over-cross and continue north along US-95 and US-2. The 70-Mile BNSF corridor between Sandpoint and Spokane, WA, known as the "funnel", is somewhat constrained with numerous at-grade crossings and remaining sections of single track along its mainline. Conversion to double-track mainline is planned for most of or the entire BNSF corridor between Spokane

and Athol. This conversion and a series of grade crossing improvements are comprehensively known as the "Bridging the Valley Project." When fully funded and implemented, the project will separate vehicle traffic from train traffic in the 42-mile corridor between Spokane, WA and Athol, ID.

The Union Pacific Railroad's (UP) secondary mainline extends about 150 miles between Spokane and Eastport, ID, where it connects to the Canadian Pacific system. It consists of the former Spokane International Railway (SI) alignment, with numerous at-grade crossings. With the completion of double-tracking along the BNSF alignment, it is anticipated the UPRR may shift operations to the BNSF mainline, and the SI alignment will be used only for local deliveries if trackage rights agreements between the two railroads are agreed upon.

Railroad Capacity

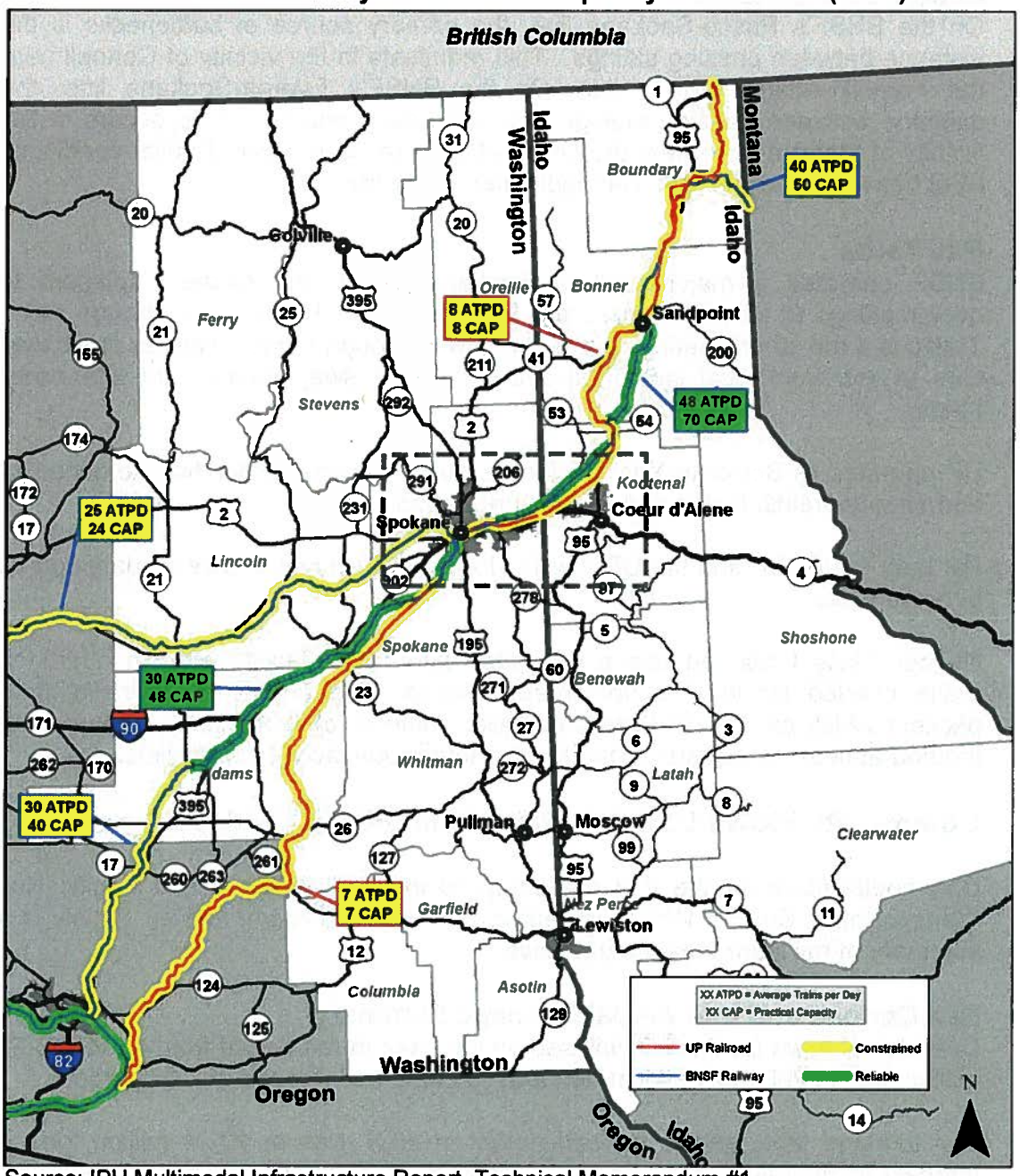
Rail Capacity is calculated in a two-step process. First, a "theoretical capacity" is determined, assuming perfect conditions and operations. Second, "practical capacity" is determined by considering factors such as possible disruptions, signal needs, human decisions, weather, possible equipment failures, supply and demand imbalances, and seasonal demand. Practical capacity is roughly 60 percent of the theoretical capacity and provides reliable service. At higher percentages, rail congestion increases rapidly and service reliability deteriorates quickly. **Exhibit 48** illustrates the rail capacity and activity on the IPH's Class I main lines.

The BNSF typically serves 50 to 60 trains per day (sometimes up to 70 during harvest season, which is capacity) in "the funnel," and the UP/SI route typically serves up to eight trains daily. The BNSF mainline across Stampede Pass serves about five trains daily, the Columbia River route, about 35 trains daily and Stevens Pass route handles about 16 trains per day. The UP route to the Tri-Cities serves about seven trains daily.

The BNSF Auburn-Pasco line across Stampede Pass cannot be used to relieve congestion on the Columbia River route or over Stevens Pass – This is because of ceiling of the Stampede Tunnel is not high enough to handle double stack containers. Another constraint is the 2.2 percent grade between the rail stations of Easton and Martin. Helper units (Additional locomotive power unit) must be used to accommodate heavy train over this section of track. The addition and removal of the helper units requires additional time over this line.

The BNSF operates under constrained conditions on its Everett-Spokane line, as well as between Pasco and Lind and between Sandpoint and Montana. From Lind to Sandpoint, including the Spokane vicinity, the BNSF operates under reliable conditions. The UP operates under constrained conditions on its entire run through the Inland Pacific Hub, from Hinkle to Eastport.

Exhibit 48: IPH Study Area Class I Capacity Constraints (2007)



Source: IPH Multimodal Infrastructure Report, Technical Memorandum #1

At-Grade Railroad Crossings

The Inland Pacific Hub's highway and railway networks intersect at numerous locations. Of the region's 887 at-grade railroad crossings, 878 provide some form of warning. Of these, 507 have cross-bucks only, 158 have flashing lights with gates, 122 have stop signs, and 87 have flashing lights only.

Railroad Bottlenecks

On the BNSF's Pasco-Spokane line, the primary source of bottlenecks is the distance between passing sidings. This manifests in the vicinity of Connell near the Franklin-Adams county line. On the BNSF's Everett-Spokane line, the distance between passing sidings is a secondary source. This occurs in the vicinity of Medical Lake near the Lincoln-Spokane County line. Similar conditions exist between Spokane and Sandpoint near Rathdrum.

Rail Yards

BNSF operates a major yard at Spokane known as Yardley, adjacent to overcrossings at Havana Street and Fancher Road. It is a crew change point. Traffic is a mix of originating, terminating, and through trains. Yardley processes cars to and from local industries and is a block swap location for intermodal trains.

UP operates its Spokane Yard for local industry access, originating, terminating, and through trains. It also serves as a crew change point.

For both the BSNF and the UP, yard capacity at Spokane is a secondary source of bottlenecks.

Neither Class I railroad has a dedicated intermodal facility with an overhead crane needed for loading double-stack trains. The rail yards do have side-packers which can lift containers or trailers onto or off-of flatcars. This loading method appears adequate for the level of intermodal activity that exists.

Commodity Flows Utilizing Rail in the IPH Study Area

Commodity flows for the IPH are analyzed in detail in the Inland Pacific Hub Transportation Study's *Work Element 3.2 - Regional Freight Profile*. Below is a summary of rail intermodal freight flows.

Rail Carload and Intermodal Tonnage Summary

Overall, rail flows for the IPH will see an increase in rail freight from a total 13.27 million tons in 2007 to 13.41 million tons in 2027, an increase of 1.03 percent.

The tonnage table shows carload freight in 2007 was at 12.74 million tons is forecast to decrease to 12.64 million tons in 2027 or 0.78 percent. Intermodal freight in 2007 was at 530,760 tons and is forecast to grow to 763,095 tons by 2027 or 42.7 percent **(Exhibit 49)**. The table shows tonnage for carload and intermodal and the combination of the two. It also shows the amount of growth or contraction between 2007 and 2027:

- Local freight will see a decrease of 48,354 tons.

- West combined inbound and outbound: carload transportation will decrease 496,148 tons or 9.08 percent, and intermodal transport will increase 139,530 tons or 72.58 percent.
- East combined inbound and outbound: carload transportation will increase 341,543 tons or 6.49 percent, and intermodal transport will increase 88,805 tons or 29.93 percent.
- North combined inbound and outbound: carload transportation will increase 337,762 tons or 36.23 percent, and there is no intermodal service to or from the North.
- South combined inbound and outbound: carload transportation will decrease 234,096 tons or 23.8 percent, and there is no intermodal service to or from the South.

Inbound and Outbound Commodities Moved By Rail

Inbound commodities transported into the IPH by rail are shown in (

Exhibit 50). Coal appears to be the largest inbound and outbound commodity. However, coal is not mined in the IPH. Coal is freight merely passing through the region. One railroad brings it into the region, where it is interchanged to another railroad for continuance of the journey. Because of the interchange coal appears as inbound tonnage and again as outbound tonnage. Coal's tonnage was retained in the inbound and outbound datasets to maintain the dataset integrity. The other top commodities clay, petroleum and chemical products (including fertilizers), farm products and lumber.

Outbound commodities focus on lumber and wood products, and farm and food products **(Exhibit 51)**. Over the forecast period these commodities are forecast to decrease in outbound tonnage.

Exhibit 49: Rail Carload and Intermodal Tonnage

Rail Carload and Intermodal Tonnage			Local Traffic: Circulates Between IPH Counties		Western Origins or Destinations		Eastern Origins or Destinations		Northern Origins or Destinations		Southern Origins or Destinations		Commodity Total
County	Year	Data	Carload	Intermodal	Carload	Intermodal	Carload	Intermodal	Carload	Intermodal	Carload	Intermodal	
Combined IPH Counties	2007	Tonnage	98,020		560,236	6,560	3,649,196	222,480	788,504		136,040		**5,461,036**
Inbound *	2027	Tonnage	49,666		534,764	8,291	4,417,696	282,968	1,050,633		144,635		**6,488,653**
		% vs 2007	(49.33%)		(4.55%)	26.39%	21.06%	27.19%	33.24%		6.32%		**18.82%**
Combined IPH Counties	2007	Tonnage	98,020		4,904,275	185,680	1,611,812	120,040	143,836		847,560		**7,911,223**
Outbound *	2027	Tonnage	49,666		4,433,599	331,770	1,184,854	148,357	219,469		604,868		**6,972,583**
		% vs 2007	(49.33%)		(9.60%)	78.68%	(26.49%)	23.59%	52.58%		(28.63%)		**(11.86%)**
Combined IPH Counties	2007	Tonnage	98,020		5,464,511	192,240	5,261,008	342,520	932,340		983,600		**13,274,239**
Total *	2027	Tonnage	49,666		4,968,363	340,061	5,602,551	431,325	1,270,102		749,504		**13,411,570**
		% vs 2007	(49.33%)		(9.08%)	76.89%	6.49%	25.93%	36.23%		(23.80%)		**1.03%**
Carload Totals	2007	Tonnage	98,020		5,464,511		5,261,008		932,340		983,600		**12,739,479**
Carload Totals	2027	Tonnage	49,666		4,968,363		5,602,551		1,270,102		749,504		**12,640,185**
		Change	(48,354)		(496,148)		341,543		337,762		(234,096)		**(99,294)**
		% vs 2007	(49.33%)		(9.08%)		6.49%		36.23%		(23.80%)		**(0.78%)**
Intermodal Totals	2007	Tonnage				192,240		342,520					**534,760**
Intermodal Totals	2027	Tonnage				331,770		431,325					**763,095**
		Change				139,530		88,805					**228,335**
		% vs 2007				72.58%		25.93%					**42.70%**
Carload + Intermodal	2007	Tonnage	98,020		5,656,751		5,603,528		932,340		983,600		**13,274,239**
Carload + Intermodal	2027	Tonnage	49,666		5,300,133		6,033,876		1,270,102		749,504		**13,403,279**
		Change	(48,354)		(356,618)		430,348		337,762		(234,096)		**129,040**
		% vs 2007	(49.33%)		(6.30%)		7.68%		36.23%		(23.80%)		**0.97%**

Source: 2007 TRANSEARCH™, Global Insight

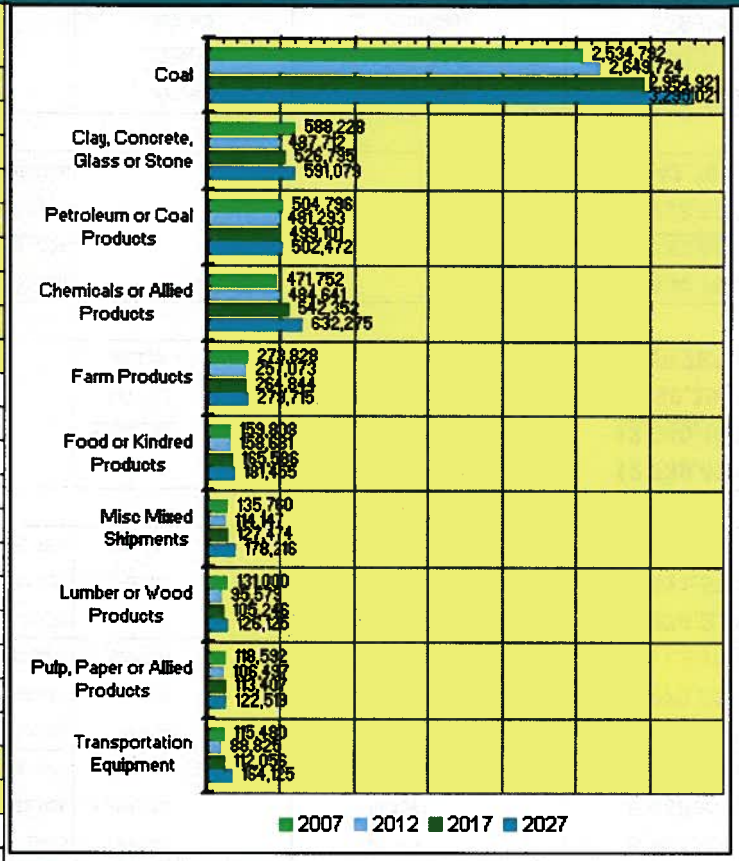
Exhibit 50: Top Inbound Commodities Shipped by Rail (Excludes Local Traffic)

Inbound Directions: All IPH Counties: West, East, North and South From All Origins
Inbound Flows: All Trade Flows from All Countries
Inbound Modes: Rail: All Types

Top 20 Inbound Commodities	2007 Tons	Growth % ►	2012 Tons	Growth % ►	2017 Tons	Growth % ►	2027 Tons
Coal	2,534,792	4.53%	2,649,724	11.52%	2,954,921	11.51%	3,295,021
Clay, Concrete, Glass or Stone	588,228	(17.09%)	487,712	8.01%	526,795	12.20%	591,079
Petroleum or Coal Products	504,796	(4.66%)	481,293	3.70%	499,101	0.68%	502,472
Chemicals or Allied Products	471,752	2.73%	484,641	11.91%	542,352	16.58%	632,275
Farm Products	273,828	(6.12%)	257,073	3.02%	264,844	5.61%	279,715
Food or Kindred Products	159,808	(0.71%)	158,681	4.35%	165,586	9.58%	181,455
Misc Mixed Shipments	135,760	(15.92%)	114,147	11.68%	127,474	39.81%	178,216
Lumber or Wood Products	131,000	(27.04%)	95,579	10.11%	105,246	19.84%	126,125
Pulp, Paper or Allied Products	118,592	(10.20%)	106,497	6.49%	113,407	8.03%	122,519
Transportation Equipment	115,480	(23.08%)	88,825	26.15%	112,056	46.47%	164,125
Primary Metal Products	110,820	(29.39%)	78,252	2.58%	80,272	4.32%	83,738
Waste or Scrap Materials	84,520	16.99%	98,879	8.88%	107,656	15.56%	124,406
Freight Forwarder Traffic	71,280	(15.34%)	60,343	8.31%	65,357	33.56%	87,289
Rubber or Misc Plastics	19,800	1.34%	20,064	(12.82%)	17,492	11.93%	19,579
Small Packaged Freight Shipments	9,000	(15.17%)	7,635	8.94%	8,317	33.32%	11,088
Nonmetallic Minerals	7,840	(11.76%)	6,918	9.04%	7,543	5.31%	7,944
Misc Freight Shipments	7,200	(3.81%)	6,926	13.04%	7,829	41.86%	11,106
Shipping Containers	6,560	(13.89%)	5,649	9.19%	6,168	34.42%	8,291
Metallic Ores	3,960	(6.88%)	3,688	(19.26%)	2,978	40.16%	4,173
Machinery	2,840	(20.48%)	2,258	13.09%	2,554	9.78%	2,803
Total For Top 10 Commodities	5,034,036	(2.18%)	4,924,172	9.90%	5,411,783	12.22%	6,073,002
Top 10's Percent of Total	93.87%		94.35%		94.57%		94.32%
Total For Top 20 Commodities	5,357,856	(2.67%)	5,214,784	9.65%	5,717,948	12.51%	6,433,419
Top 20's Percent of Total	99.90%		99.92%		99.92%		99.91%
Total For All Commodities Inbound	5,363,016	(2.68%)	5,219,065	9.65%	5,722,526	12.52%	6,438,988

Directions: All IPH Counties: West, East, North and South All Origins
Flows: All Trade Flows from All Countries
Modes: Rail: All Types

Comparison Chart For Top 10 Inbound Commodities



Source: 2007 TRANSEARCH™, Global Insight

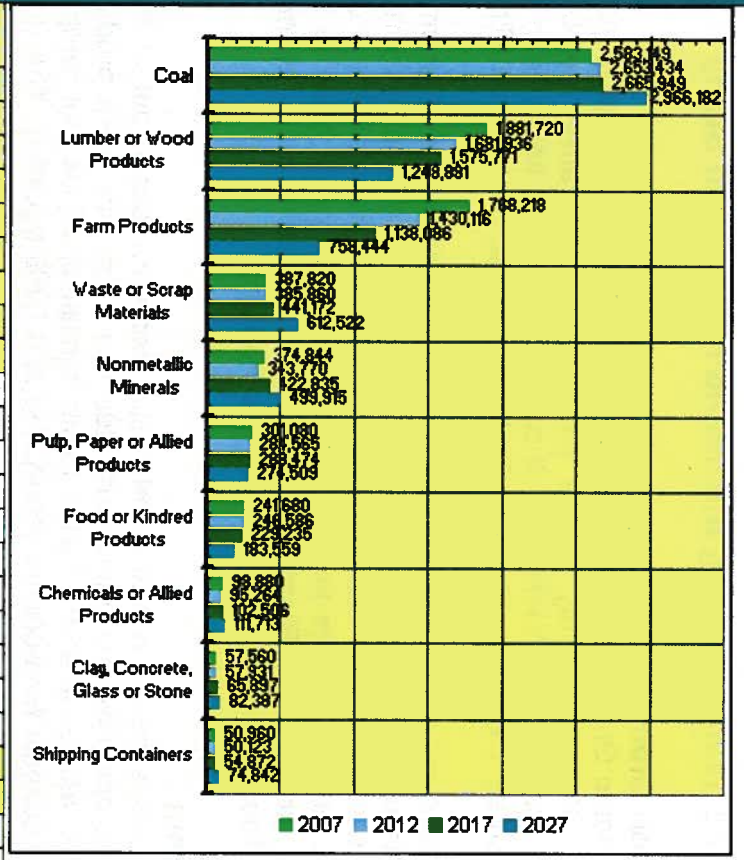
Exhibit 51: Top Outbound Commodities Shipped by Rail (Excludes Local Traffic)

Outbound Directions: All IPH Counties: West, East, North and South to All Destinations
Outbound Flows: All Trade Flows to All Countries
Outbound Modes: Rail: All Types

Top 20 Outbound Commodities	2007 Tons	Growth % ►	2012 Tons	Growth % ►	2017 Tons	Growth % ►	2027 Tons
Coal	2,583,149	2.72%	2,653,434	0.47%	2,665,949	11.26%	2,966,182
Lumber or Wood Products	1,881,720	(10.62%)	1,681,936	(6.31%)	1,575,771	(20.74%)	1,248,881
Farm Products	1,768,218	(19.12%)	1,430,116	(20.42%)	1,138,086	(33.36%)	758,444
Waste or Scrap Materials	387,820	(0.51%)	385,860	14.33%	441,172	38.84%	612,522
Nonmetallic Minerals	374,844	(8.29%)	343,770	23.00%	422,835	18.23%	499,915
Pulp, Paper or Allied Products	301,080	(5.49%)	284,565	1.37%	288,474	(4.84%)	274,509
Food or Kindred Products	241,680	2.03%	246,586	(7.04%)	229,235	(19.93%)	183,559
Chemicals or Allied Products	98,880	(3.66%)	95,264	7.60%	102,506	8.98%	111,713
Clay, Concrete, Glass or Stone	57,560	0.64%	57,931	13.75%	65,897	25.02%	82,387
Shipping Containers	50,960	(1.64%)	50,123	9.47%	54,872	36.39%	74,842
Misc Mixed Shipments	18,240	(8.07%)	16,768	40.14%	23,498	47.62%	34,688
Freight Forwarder Traffic	14,360	(10.22%)	12,893	4.78%	13,508	25.16%	16,906
Transportation Equipment	13,160	17.06%	15,405	22.84%	18,924	43.00%	27,062
Petroleum or Coal Products	7,772	(1.94%)	7,621	32.07%	10,065	30.60%	13,145
Misc Freight Shipments	4,880	(24.67%)	3,676	(9.14%)	3,340	(10.51%)	2,989
Rubber or Misc Plastics	3,880	8.34%	4,204	24.64%	5,239	48.65%	7,788
Primary Metal Products	3,600	5.74%	3,807	18.25%	4,501	27.97%	5,761
Fabricated Metal Products	800	(6.23%)	750	10.54%	829	22.78%	1,018
Small Packaged Freight Shipments	600	(13.06%)	522	0.72%	525	15.55%	607
Total For Top 10 Commodities	7,745,911	(6.67%)	7,229,585	(3.39%)	6,984,796	(2.46%)	6,812,953
Top 10's Percent of Total	99.14%		99.10%		98.86%		98.41%
Total For Top 20 Commodities	7,813,203	(6.63%)	7,295,230	(3.15%)	7,065,227	(2.01%)	6,922,917
Top 20's Percent of Total	100.00%		100.00%		100.00%		100.00%
Total For All Commodities Outbound	7,813,203	(6.63%)	7,295,230	(3.15%)	7,065,227	(2.01%)	6,922,917

Directions: All IPH Counties: West, East, North and South
Flows: All Trade Flows to All Countries
Modes: Rail: All Types

Comparison Chart For Top 10 Outbound Commodities



Source: 2007 TRANSEARCH™, Global Insight

Specialized Trains Serving the Inland Pacific Hub Study Area

Washington Grain Train

The Washington Grain Train, managed by WSDOT, and the Ports of Walla Walla, Moses Lake, and Whitman County serves over 2,500 cooperative members and farmers throughout southeastern Washington. It collects wheat and barley from grain elevators in Warden, Schrag, La Crosse, Prescott, Endicott, Willada, St. John, and Thornton.

BNSF, UP and various short line railroads move the operation's 89 grain cars. Operations are split into two different services. The first operation originates from Moses Lake and transports grain to export facilities on the Columbia River and the Puget Sound. The second operation originates from the Palouse and transports grain to the Wallula barge terminal on the Columbia River. Through these operations, grain reaches export facilities in Seattle, Tacoma, Vancouver, Kalama, and Portland.

RailEX Train

Railex, LLC is a transport and warehousing company based out of Schenectady, New York. Railex operates unit trains dedicated to transporting fresh produce, frozen foods, dried goods, and beverages. Railex trains consist of 55 64-foot temperature controlled cars with electronic temperature monitoring and GPS tracking. The underlying railroads for Railex are the UP and CSX. Railex guarantees five-day service between Wallula and the receiving end of the service, Rotterdam, NY. The trains stay intact from origin to destination, reducing time delays and minimizing product damage and degradation.

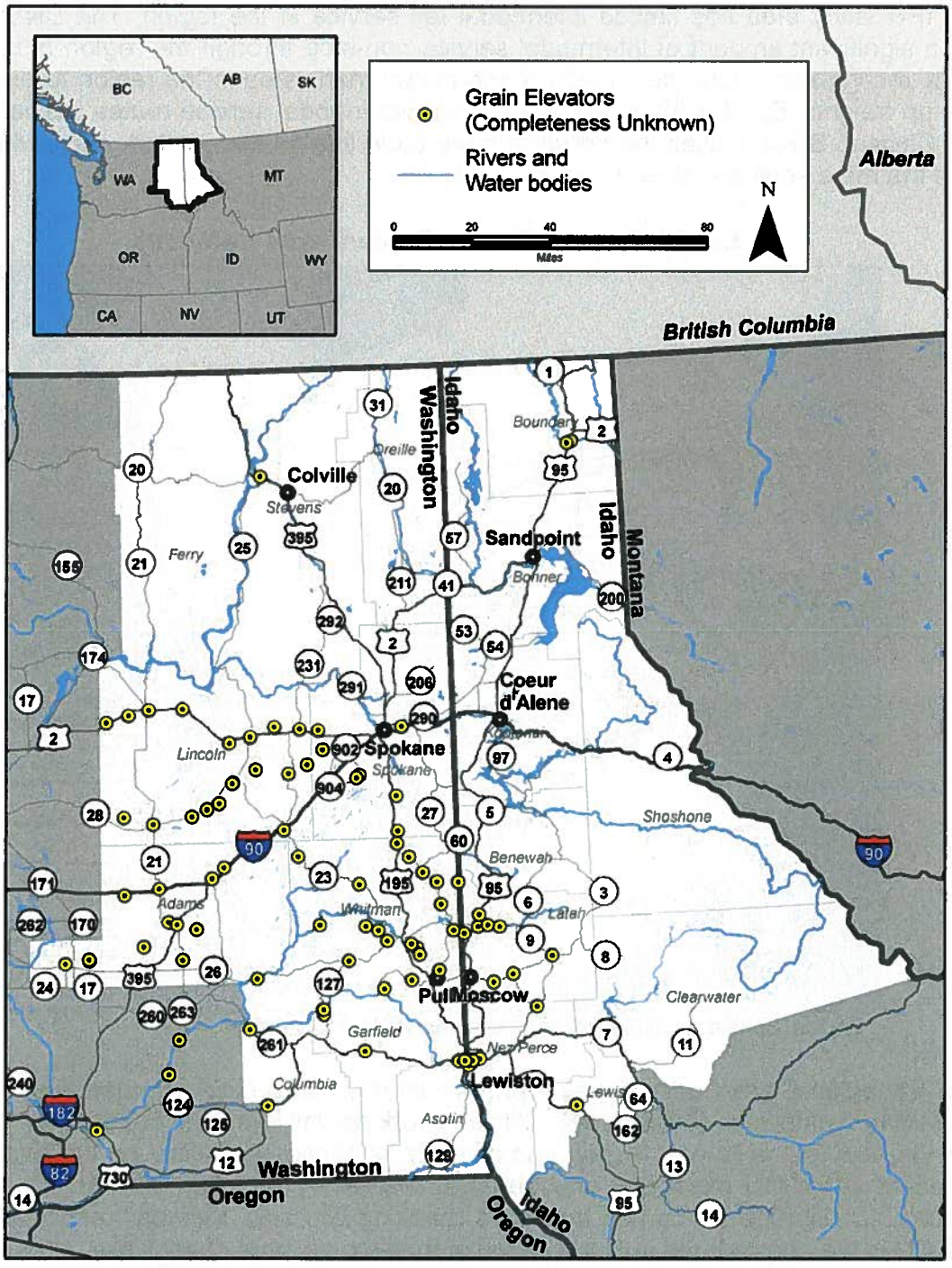
Railex has 220,000 square feet of refrigerated warehouse at Wallula, in Walla Walla County. This facility has 17,500 racked pallet positions, six distinct computer-controlled temperature zones, 19 enclosed refrigerated rail docks, 38 refrigerated truck docks, and a two-mile rail loop track.

Grain Elevators

Grain elevators are fundamental to the economies of farming communities because they store large quantities of wheat, barley, and any other dry commodities before they are sent to consuming markets. During harvest, grain trucks transport the grain from the fields to a nearby elevator. Eventually, the grain is deposited into rail hopper cars to be hauled to ports or production facilities.

Exhibit 52 displays the location of approximately 100 grain elevators in the IPH study area.

Exhibit 52: IPH Grain Elevator Locations

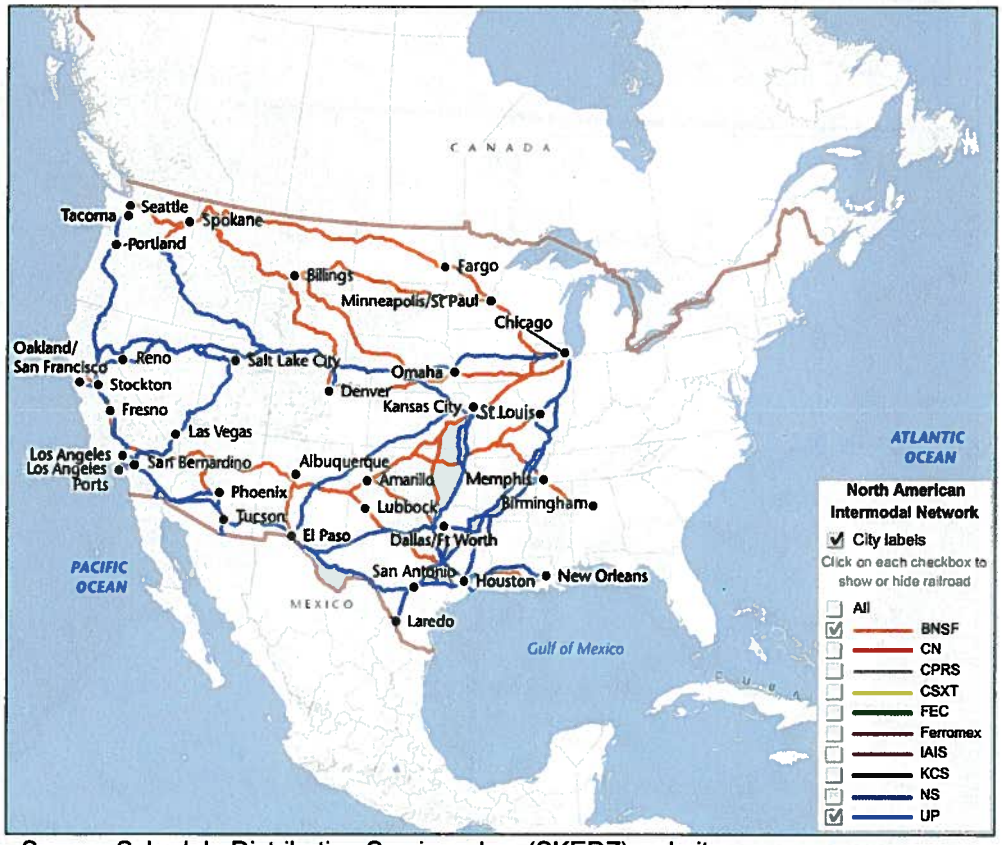


Source: HNTB Corporation. February 2009. BNSF Railway Company, *Grain Elevator Directory dBASE File*, 2006. Farm Net Services, Grain Elevators Directory by State, December, 2010. Wilbur Smith Associates, January 2010.

Intermodal Rail Network Serving the IPH Study Area

The IPH study area has limited intermodal rail service in the region. The BNSF Railway pull a significant amount of intermodal service non-stop through the region but few of the easily recognizable, long double-stack intermodal trains stop in the region to discharge or pick-up freight. **Exhibit 53** shows the existing intermodal service routes between Seattle and Chicago BNSF's uses the northern route (gold line on the network map) while the UP uses the more southern route (blue line).

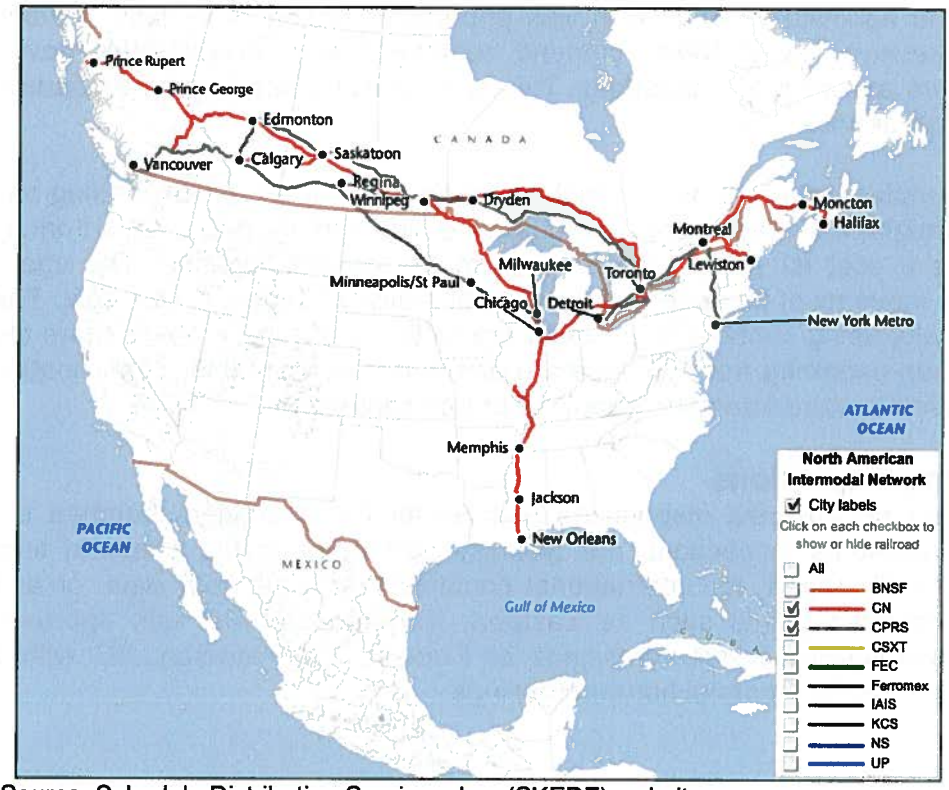
Exhibit 53: BNSF and UP Intermodal Networks



Source: Schedule Distribution Services, Inc. (SKEDZ) website

Two Canadian Class I railroads also provide intermodal service from the Pacific Coast to the Midwest gateways **(Exhibit 54)**. CN's network serves two west coast ports: Vancouver and the new Prince Rupert facility, and extends its service to Halifax on the Atlantic coast. In recent years CN expanded into the U.S. market by merging with the Illinois Central railroad (IC) in 1999 which has mainlines reaching Chicago, Memphis and New Orleans. The CN is the only railroad in North America to serve all three coast lines. CP's intermodal network serves Vancouver on the west coast and the east coast to Montreal. CP has also expanded into the U.S. market by merging with the Soo Line (which owned the Milwaukee Road) in 1985, which provided access to Chicago and the Midwest markets, and the Delaware and Hudson railroad in 1991, which provided access to New York and the Eastern markets.

Exhibit 54: CN and CP Intermodal Networks



Source: Schedule Distribution Services, Inc. (SKEDZ) website

The two maps indicate that currently there is no intermodal service connecting the IPH with Canada via the Eastport, ID border crossing to Kingsgate, BC. There is rail carload connectivity between UP and CP (not shown on these intermodal maps) at the Kingsgate/Eastport border crossing. This crossing is one of the primary interchange points between the CP and the UP.

BNSF does market Intermodal service in the IPH study area, but it is typically trailer on flatcar (TOFC) service that is marketed through an IMC (Intermodal Marketing Company) like Swift or JB Hunt. Containers are loaded at the transload facility in "The Park" industrial park in Spokane Valley. Service is currently offered from Spokane to St. Paul or Chicago and from St. Paul or Chicago to Spokane.

The only railroad that has operations on both sides of the border within the study area is the Kettle Falls International Railway, LLC. The Kettle Falls International Railway, LLC (KFR) owns and operates over 160 miles of former Burlington Northern Santa Fe trackage in Northeast Washington State and Southeastern British Columbia. KFR operates from the BNSF interchange at Chewelah, WA to Columbia Gardens, BC. A second line operates from Kettle Falls, WA to Grand Forks, BC, before crossing the border again to reach San Poil, WA.

Equipment Balance

A key concept for intermodal transportation is equipment balance. Where loaded containers go for delivery, usually to densely populated areas, after being emptied, that

location is where the empty containers are "made available" for reloading with exports. Rural and agricultural areas with less population density have less demand for inbound freight, receive fewer loaded inbound containers and consequently have fewer empty containers available for reloading. This is a critical issue facing railroads when offering intermodal service.

When empty containers are in high demand in rural areas for loading with agricultural export freight, a supply of empties must be pulled into the deficit area from a surplus area. There is a cost for pulling the empties to the desired location. The cost of the empty inbound move must be added to the shipper's overall transportation cost. This is the major reason why using containers to export products out of rural areas is more challenging and costly than exporting from populated areas that have container consolidation centers that can provide a more adequate supply of empty containers.

Customs Inspections

There are no customs inspections of international containers handled in Spokane rail yards. Customs inspections are typically performed at the seaports such as Seattle, Tacoma or Portland, for international containers arriving from Asia, or at the Canadian border crossing points such as Eastport, ID/Kingsgate, BC with approximately 50,000 annual commercial border crossings or Frontier, WA/Paterson, BC with approximately 22,000 annual commercial border crossings.[17]

[17] Inland Pacific Hub Transportation Study, Technical Memorandum #1, page 29, Border Crossings.

AIR CARGO ISSUES AND OPPORTUNITIES

Many shippers interviewed during the course of the study used express package services offered by FedEx or UPS. Several of the companies interviewed also used freight forwarder air cargo services for international cargo shipments. The primary comment by these shippers was that the existing length of the runway at Spokane International Airport limited the ability for the largest class of aircraft to land at the facility and prohibited direct cargo international cargo flights to and from Asia. Spokane International Airport recently completed the first phase of upgrades to runway 3/21, including a 2,000 foot extension, bringing the total runway length to 12,000 feet.

However, despite the recent extension Spokane International Airport is unlikely to attract direct international cargo flights on a regular basis. Shippers interviewed in the region that use international air cargo services often cited the Moses Lake airfield, a former air force base with a 13,500 foot runway. Several companies noted that during harvest season dedicated air craft fly cherries from Moses Lake to Asia. While the Moses Lake example may seem noteworthy, it is charter service that is meeting a specific demand for a highly valued season crop, and has little or nothing to do with runway length. If the demand existed and the value of the product was such that the market would bear the cost of air transport, shippers in Spokane could likely attract charter service from Spokane International as well.

The composition of the Coeur d'Alene economy, based on its tradition natural resource industries of mining and timber, as well as the emergent tourism industry do not drive the sort of demand required to support air cargo service development. In addition, the difficult access between I-90 and the Coeur d'Alene airport is a significant draw-back for integrated express carriers.

An Overview of Air Cargo Services

Air cargo services are provided by several types of carriers that are differentiated by the services they offer for a wide range of customer demands. There are four basic industry segments in the air cargo industry:

- Integrated express operators
- All-cargo carriers
- Commercial service passenger airlines
- On-demand cargo charter carriers

Integrated express carriers (e.g., FedEx Express, UPS and DHL) operate a fleet of scheduled aircraft, trucks, and couriers offering door-to-door delivery service. These carriers operate extensive hub-and-spoke networks providing expansive geographic coverage. In 2007, integrated express carriers accounted for 63 percent of the U.S. domestic air cargo market, yet held only 14 percent of the international market.[18] (It should be noted that DHL no longer offers domestic express service in the U.S., but does

[18] Boeing World Air Cargo Forecast, 2008/2009.

offer international integrated express services). According to the Spokane International Airport web site all three major integrated express carriers serve the IPH study area; Federal Express, United Parcel Service and DHL Express.

All-cargo carriers (e.g., Atlas Air Cargo, Gemini) generally operate regular schedules of wide-body aircraft from one major airport to another, such as Los Angeles to Tokyo. Due to their airport-to-airport service structure, all-cargo carriers are concentrated in large, high-volume market airports; geographic coverage is limited. Approximately 10 to 15 percent of the world's air cargo traffic is moved by all-cargo carriers, primarily on long-haul international or trans-continental routes. In 2007, scheduled all-cargo operators accounted for 16 percent of the US domestic market.[19]

Commercial service passenger airlines (e.g., Delta, US Airways, United) are scheduled passenger airline operators. Belly-space in passenger aircraft operated by these carriers is generally available to move cargo airport-to-airport. Commercial air carriers account for the majority of international air cargo lift, yet provide limited domestic lift. It is estimated that 50 percent of U.S. international air cargo traffic is moved in the cargo holds of passenger aircraft. However, within the US domestic market, commercial carriers account for only 15 to 20 percent of the domestic air cargo – a market dominated by the integrated express carriers. The air cargo market share of commercial passengers carriers, particularly on domestic routes, has declined significantly due to security measures and restrictions brought about by the terrorist attacks of 9/11. Prior to 9/11, it was estimated that commercial passenger carriers accounted for 25 percent of the domestic air cargo market.

On-demand cargo charter carriers (e.g., Grand Air, Air Cargo Masters) are unscheduled air charter operators moving goods from airport-to-airport. The market share of charter cargo operations is minimal, difficult to gauge and often lumped together with all-cargo carriers. Sporadic and unscheduled operations make tracking tonnage difficult; best estimates put on-demand cargo operator market share at 5 percent domestically and 2 to 3 percent internationally.

Air Cargo Services

Within the four air cargo industry segments previously discussed, carriers offer three primary formats for air-cargo service options:

- Integrated express service
- Freight forwarding
- Airport-to-airport

Integrated express service is provided by carries that move customer materials door-to-door, providing shipment pickup, transport via air or truck, and delivery. Integrated express operators include FedEx Express, UPS, DHL, and the US Postal Service (USPS). Express companies provide next day, document, and small package (2 to 70 lbs.) service

[19] Boeing World Air Cargo Forecast, 2008/2009.

to customers. Increasingly, express operators are transporting "heavy" freight, identified as shipments of more than 70 lbs.

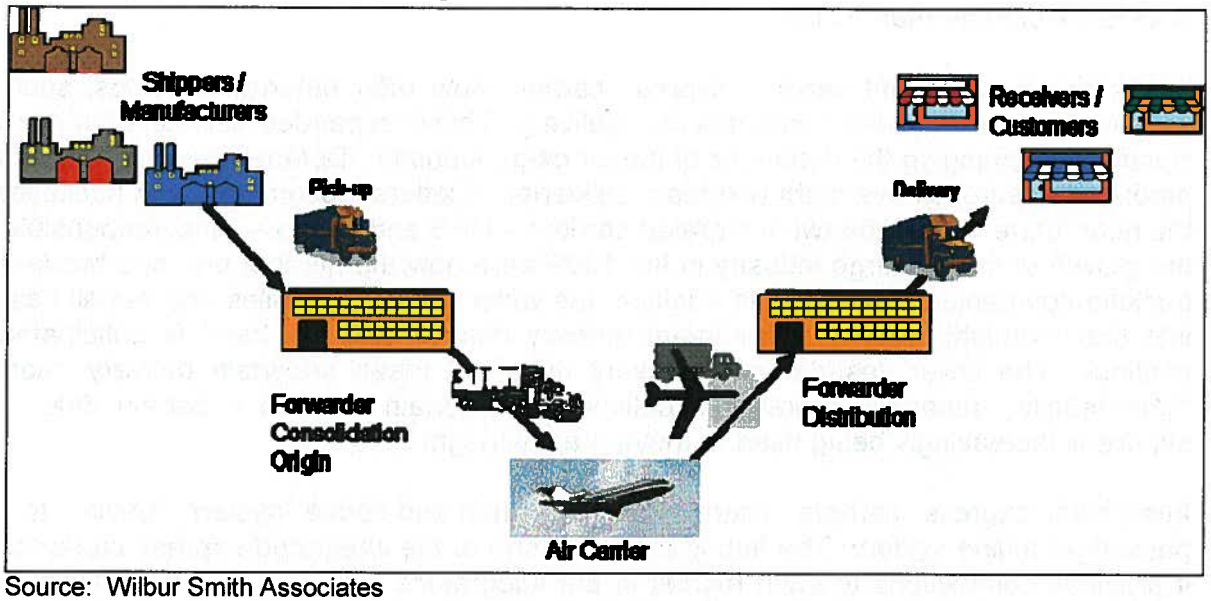
In addition to overnight service, express carriers now offer deferred services, such as second-day and third-day "time-definite" delivery. These expanded service offerings are significantly changing the dynamics of the air cargo industry. Deferred service options are predicted to surpass overnight (express) deliveries of letters, documents, and packages in the near future. In fact the two integrated carriers – UPS and FedEx – most responsible for the growth of the air cargo industry in the 1990's are now the number one and two largest trucking companies in the U.S. In addition, the wider use of facsimiles and e-mail has cut into the overnight letter and document delivery market, and the trend is anticipated to continue. The lower cost-deferred delivery does not mean uncertain delivery; most is "time-definite," meaning guaranteed delivery at a certain time on a certain date. This service is increasingly being used to move "heavy freight."

Integrated express carriers operate using a hub-and-spoke system similar to the passenger airline system. The hub is the backbone to the integrated express carrier since it provides connections to each market in the integrator's system. Each day, flights from around the U.S. arrive at integrator hubs where packages are offloaded, sorted by the destination market, and reloaded onto aircraft.

Traditional integrated express service is focused on small-volume, infrequent shippers or higher-volume shippers moving products to multiple destinations. This market is often termed the "retail" air cargo market; this market includes individual, private, and business-to-consumer (B-to-C) shippers. However, integrated express carriers are now moving into the "wholesale" market, catering to larger freight movements demanded by manufacturing and distribution operations. This traditional freight forwarder and all-cargo-carrier market includes corporate, block-space (guaranteed capacity shippers), and business-to-business (B-to-B) customers.

Freight forwarding is provided by transportation service providers that handle a wide-range of freight, from small packages that are consolidated into container loads, to oversized, one-time freight shipments. The freight forwarder acts as a broker between the shipper and the carrier (i.e., all-cargo, commercial passenger or on-demand charter). The forwarder receives a load from a customer (the shipper) and subsequently tenders the shipment to an air cargo carrier or commercial carrier. The carrier moves the shipment airport-to-airport, and then tenders the shipment to the forwarder's agent at another airport. From this point, the forwarder makes the final delivery to the customer. **Exhibit 55** illustrates the basic steps (moving left-to-right) in a freight-forwarder air cargo shipment.

Exhibit 55: Freight Forwarder Goods Movement Process



Source: Wilbur Smith Associates

Freight forwarders often act as both the carrier and the shipper. From the perspective of the manufacturer or origin shipper, the forwarder is the carrier, because the freight moves under a tariff prepared by the forwarder. Typically, the forwarder consolidates many packages into a container or larger units that are then tendered to either scheduled all-cargo carriers (e.g., Polar Air Cargo) or to commercial passenger airlines (e.g., NWA). From the air carriers' perspective, the freight forwarder is the shipper. In addition to using third-party service providers to move freight from airport-to-airport (i.e., commercial carriers and all-cargo airlines), freight forwarders also often rely on third-party less-than-truck load (LTL) motor carriers to move under consignment to and from the airport.

Airport-to-airport service is provided by all-cargo, on-demand charter and commercial passenger carriers. Freight is dropped off at the airport by the shipper, or the shipper's freight forwarder, and is picked up at the destination airport by the customer, or the customer's agent (i.e., freight forwarder).

All-cargo carriers operate airport-to-airport services for their customers, but do not offer passenger service. All-cargo air carrier examples include Polar Air Cargo, Kitty Hawk, and Northern Air Cargo. All-cargo carriers offer scheduled service to major markets throughout the world using wide-body and/or containerized cargo aircraft.

Commercial airlines also provide air cargo services that tend to vary in scope and size from airline to airline. Industry-wide, between 5 and 16 percent of passenger airline revenues come from cargo. An airline's aircraft fleet is a significant factor in determining the size and amount of cargo the airline can fly. A regional airline with a fleet of turboprop and regional jets cannot accommodate large, bulky shipments. Airlines operating wide-body aircraft, such as the B747, B777, and A300, have containerized lower decks (which allow speed in loading and offloading) and generally are capable of handling large, bulky shipments.

Location Criteria for Air Cargo Airports

The criteria used by air cargo carriers to select and locate an air cargo facility at a specific airport tend to vary with the operational, financial, and strategic objectives of the carrier. Despite varied needs and objectives, it is possible to identify some typical air cargo airport location requirements. These requirements are based on the anticipated use of the air cargo facility and type of air cargo carrier or carriers that may operate there.

Local Market Station Criteria

The prime factor in determining direct air cargo service is strong local production and consumption of air cargo intensive commodities within the served airport's market area. This can be driven by either large population centers or concentrations of industry requiring, providing, or distributing commodities and products that utilize airfreight at the highest rates. Examples of products that utilized high rates of airfreight include:

- Aeronautics - Equipment & Parts
- Automotive - Equipment & Parts
- Pharmaceuticals
- Computers & Computer Components
- Diagnostic Equipment
- Medical Equipment
- Software
- Textiles - Garments
- Perishables - Flowers, Fruit, Vegetables & Fish
- Economically Perishable Materials - Printed Material
- Telecommunications Equipment - Cell Phones, IPhones, etc.
- Photographic Film

Exhibit 56 shows the forecasted growth for IPH study area air cargo commodities. Overall inbound air cargo tonnage in the IPH study area is expected to increase 21 percent between 2007 and 2027. Through 2027 the fastest growing commodity groups are expected to be *Machinery, Misc. Mixed Shipment* and *Transportation Equipment* which is projected to grow 52 percent, 38 percent, and 33 percent respectively. Other high growth air cargo commodities include *Miscellaneous Manufactured Products, Instrument/Photo Equipment* and *Pulp Paper Products.* Outbound air cargo tonnage in the IPH study area is expected to increase nearly 19 percent between 2007 and 2027 (**Exhibit 57**). Through 2027 the fastest growing commodity groups are expected to be *Primary Metal Products, Misc. Mixed Shipments, Machinery* and *Electrical Equipment*. Other fast growing commodities include *Furniture/Fixtures, Instrument/Photo Equipment and Rubber and Plastics.*

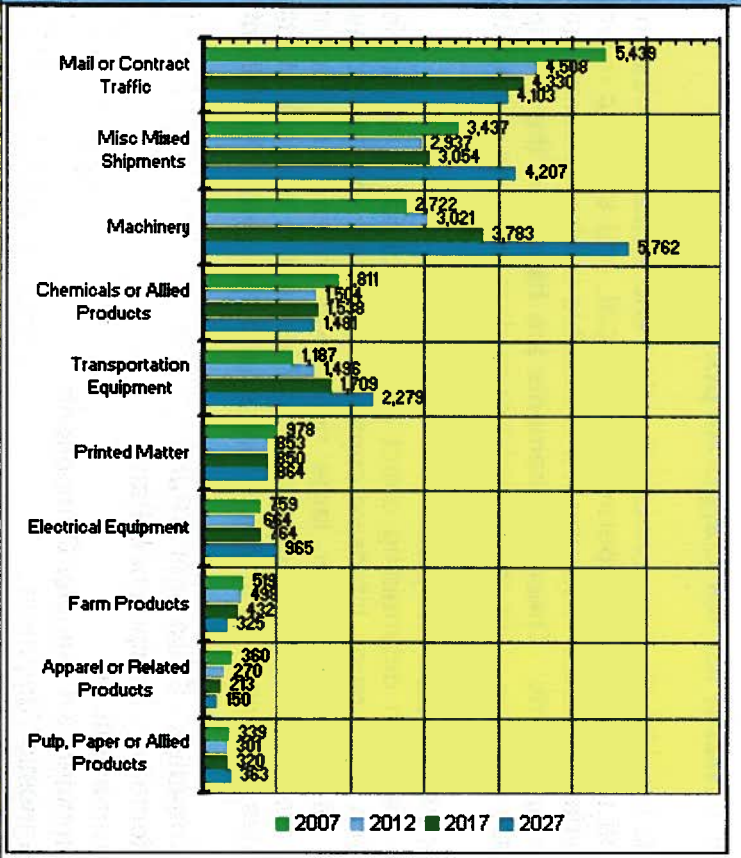
Exhibit 56: Inbound Air Cargo Commodity Forecasts

Inbound Directions: All IPH Counties: All Directions From All Origins
Inbound Flows: All Trade Flows from All Countries
Inbound Modes: Air: All Types

Top 20 Inbound Commodities	2007 Tons	Growth % ▶	2012 Tons	Growth % ▶	2017 Tons	Growth % ▶	2027 Tons
Mail or Contract Traffic	5,439	(17.12%)	4,508	(3.95%)	4,330	(5.23%)	4,103
Misc Mixed Shipments	3,437	(14.55%)	2,937	3.98%	3,054	37.75%	4,207
Machinery	2,722	10.97%	3,021	25.22%	3,783	52.34%	5,762
Chemicals or Allied Products	1,811	(16.94%)	1,504	2.26%	1,538	(3.72%)	1,481
Transportation Equipment	1,187	25.95%	1,496	14.30%	1,709	33.36%	2,279
Printed Matter	978	(12.78%)	853	(0.29%)	850	1.57%	864
Electrical Equipment	759	(12.58%)	664	15.11%	764	26.32%	965
Farm Products	519	(4.18%)	498	(13.17%)	432	(24.86%)	325
Apparel or Related Products	360	(25.05%)	270	(21.15%)	213	(29.37%)	150
Pulp, Paper or Allied Products	339	(11.10%)	301	6.42%	320	13.44%	363
Instrum, Photo Equip, Optical Eq	338	26.31%	427	24.34%	530	50.87%	800
Rubber or Misc Plastics	269	(3.85%)	259	11.30%	288	35.50%	391
Food or Kindred Products	236	0.93%	239	2.49%	245	4.84%	256
Fresh Fish or Marine Products	221	(1.03%)	219	2.73%	225	5.82%	238
Fabricated Metal Products	204	(7.77%)	188	10.18%	207	21.30%	251
Misc Manufacturing Products	74	7.64%	80	20.60%	96	44.35%	139
Clay, Concrete, Glass or Stone	28	(28.51%)	20	(2.01%)	20	(12.60%)	17
Textile Mill Products	25	11.46%	28	9.98%	31	0.20%	31
Primary Metal Products	18	(51.36%)	9	(16.69%)	7	(29.52%)	5
Leather or Leather Products	17	(3.21%)	16	(15.67%)	14	(19.29%)	11
Total For Top 10 Commodities	17,551	(8.55%)	16,050	5.87%	16,993	20.64%	20,500
Top 10's Percent of Total	92.37%		91.45%		91.01%		90.49%
Total For Top 20 Commodities	18,982	(7.63%)	17,534	6.40%	18,656	21.35%	22,639
Top 20's Percent of Total	99.91%		99.91%		99.91%		99.93%
Total For All Commodities Inbound	19,000	(7.63%)	17,550	6.39%	18,672	21.33%	22,655

Directions: All IPH Counties: All Directions From All Origins
Flows: All Trade Flows from All Countries
Modes: Air: All Types

Comparison Chart For **Top 10 Inbound** Commodities



Source: 2007 TRANSEARCH™, Global Insight

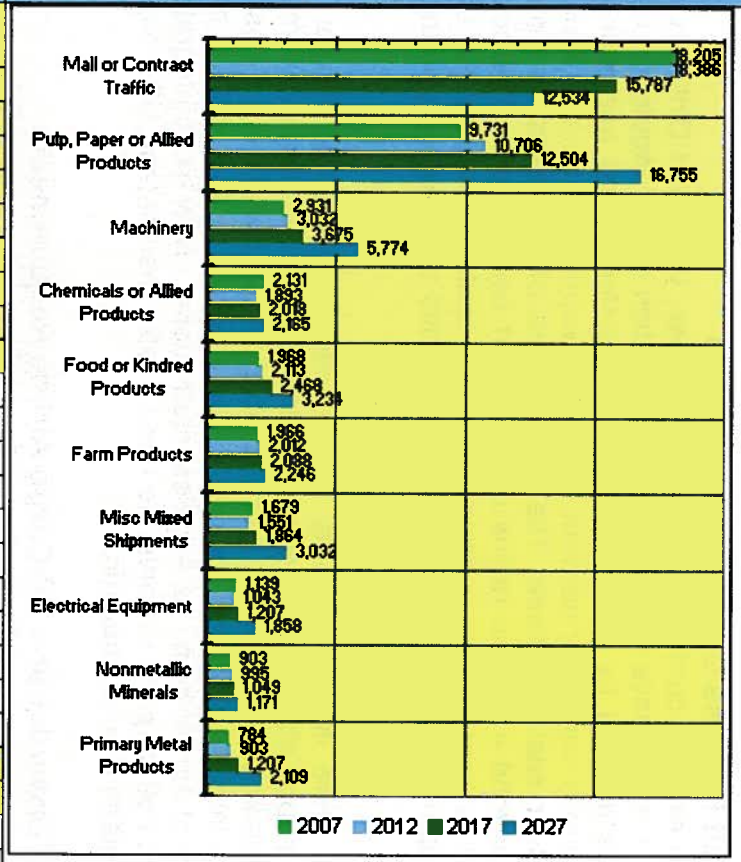
Exhibit 57: Outbound Air Cargo Commodity Forecasts

Outbound Directions: All IPH Counties: All Directions to All Destinations
Outbound Flows: All Trade Flows to All Countries
Outbound Modes: Air: All Types

Top 20 Outbound Commodities	2007 Tons	Growth % ▶	2012 Tons	Growth % ▶	2017 Tons	Growth % ▶	2027 Tons
Mail or Contract Traffic	18,205	1.00%	18,386	(14.14%)	15,787	(20.61%)	12,534
Pulp, Paper or Allied Products	9,731	10.02%	10,706	16.80%	12,504	34.00%	16,755
Machinery	2,931	3.43%	3,032	21.22%	3,675	57.12%	5,774
Chemicals or Allied Products	2,131	(11.19%)	1,893	6.60%	2,018	7.30%	2,165
Food or Kindred Products	1,968	7.37%	2,113	16.82%	2,468	31.04%	3,234
Farm Products	1,966	2.31%	2,012	3.77%	2,088	7.60%	2,246
Misc Mixed Shipments	1,679	(7.62%)	1,551	20.16%	1,864	62.63%	3,032
Electrical Equipment	1,139	(8.42%)	1,043	15.70%	1,207	53.99%	1,858
Nonmetallic Minerals	903	10.25%	995	5.39%	1,049	11.63%	1,171
Primary Metal Products	784	15.27%	903	33.54%	1,207	74.77%	2,109
Fabricated Metal Products	704	11.43%	784	18.57%	930	38.04%	1,284
Furniture or Fixtures	608	22.85%	747	36.51%	1,020	77.95%	1,814
Lumber or Wood Products	403	4.03%	419	10.96%	465	21.28%	564
Instrum, Photo Equip, Optical Eq	387	3.70%	402	27.37%	512	67.46%	857
Rubber or Misc Plastics	300	1.78%	305	23.27%	377	47.42%	555
Petroleum or Coal Products	170	14.04%	194	19.59%	232	30.37%	302
Apparel or Related Products	151	(45.19%)	83	(20.21%)	66	(42.74%)	38
Misc Manufacturing Products	118	1.31%	120	17.51%	141	48.80%	209
Clay, Concrete, Glass or Stone	59	(2.16%)	58	5.71%	61	13.90%	70
Printed Matter	17	(4.74%)	16	8.36%	17	16.49%	20
Total For Top 10 Commodities	41,437	2.89%	42,635	2.89%	43,866	15.99%	50,879
Top 10's Percent of Total	93.38%		93.12%		91.95%		89.86%
Total For Top 20 Commodities	44,354	3.17%	45,762	4.20%	47,686	18.68%	56,592
Top 20's Percent of Total	99.95%		99.96%		99.95%		99.95%
Total For All Commodities Outbound	44,376	3.17%	45,782	4.21%	47,708	18.68%	56,618

Directions: All IPH Counties: All Directions to All Destinations
Flows: All Trade Flows to All Countries
Modes: Air: All Types

Comparison Chart For **Top 10 Outbound** Commodities



Source: 2007 TRANSEARCH™, Global Insight

Integrated Express Carrier Requirements

Integrated express carriers, (i.e., FedEx Express, UPS, and DHL) providing door-to-door overnight service, have the most stringent location criteria requirements. Due to tight time constraints dictated by commitments to the customer and operational demands of the carrier's tightly controlled network, integrated express carriers typically serve the airport nearest their customer base. The market area of an integrated express carrier rarely extends beyond a 60-mile radius of the airport being served. The core market for most integrated express carriers is based on large population centers that drive document and parcel shipments (though industry concentrations are typically a component of this core market).

Typically, there is little flexibility for the integrated express carrier to relocate to an alternate airport short of a geographical shift in customer base (movement or expansion of the surrounding market area). For example, as the population of Los Angeles grew and expanded inland, integrated express carriers began to shift service eastward to Ontario International Airport from Los Angeles International. Now most integrated express carriers operate at both airports to serve the Los Angeles market (and UPS established a regional hub at Ontario International Airport).

Freight Forwarder and All-Cargo Airline Requirements

Freight forwarders (e.g., Eagle Global Logistics and Panalpina) and all-cargo airlines (e.g., Kalitta Air, and Polar Air Cargo) have less stringent location criteria when selecting an airport for cargo operations. Freight forwarders usually define their market areas by individual customers rather than large population or industrial centers. Long-term, independent consolidation and distribution stations (other than international gateway facilities) are virtually nonexistent in the freight forwarder community; these services and facilities are contracted to third-party operators. In essence, the freight forwarder's customer location is its local market station, and the nearest airport is the consolidation point.

Since freight forwarders generally do not operate under the same time constraints as an express integrator, the forwarder can be more selective than an integrator when choosing an airline or airport. Depending on the size and service commitment of the shipment freight forwarders truck shipments anywhere from 200 miles to 600 miles to an airport. By not having fixed hubs/station networks throughout the nation, freight forwarders can maintain a high degree of responsiveness and flexibility in fluctuating market conditions. But, the absence of a network also limits the freight forwarder's ability to handle numerous small shipments transiting through multiple origins and destinations. Forwarder operations differ from the integrated express carriers in the following ways:

- Provide airport-to-airport versus door-to-door service
- Have higher usage and reliance on truck feeder service
- Do not offer express service
- Catchment area can extend 600 miles from an airport and cover several market areas

Since forwarders and all-cargo airlines generally operate under more flexible time constraints than an integrated express operator, there is more flexibility in terms of the location of the airport used to serve the market area. Selection criteria for an all-cargo airline tend to be:

- Access to interstate highways to facilitate trucking
- Location of transportation and distribution infrastructure
- LTL trucking services and facilities
- Core customer base

These criteria are usually found at primary airports in a given market and are evidenced by the almost universal co-existence of integrated express carriers, all-cargo airlines, and freight forwarders at every major airport in the nation. All-cargo carriers rely on freight forwarders to generate cargo, thus all-cargo carriers will tend to locate at airports with demonstrated freight forwarder cargo volume. If the volume within a given market is not sufficient to economically justify dedicated, scheduled air service, forwarders truck cargo to the nearest airport with available lift or will charter ad-hoc lift as needed. Note that if time allows, trucking is almost always the preferred and most economical option being 75 to 90 percent cheaper than air transport.

Air Cargo Hub Criteria (Regional, National and International)

Central access relative to U.S. population centers is the over-riding consideration for air cargo carriers seeking to establish or relocate a hub operation. **Exhibit 58** lists the top 20 cargo airports in North America. Note that Seattle/Tacoma International at 20th is the closest major air cargo hub to the IPH study area.

National Hubs must be centrally located to U.S. population centers, and centrally located geographically to allow fluid hub-and-spoke network operation. National hubs must also have superior access to multiple interstate highways since feeder truck activity used to the extent possible to reduce the overall cost of network operations. In North America, the Ohio Valley Regional has become the standard for national hub operations. Examples of national hubs located in, serving flights bound for both domestic and international routes, located in or near, the Ohio Valley are the following:

- FedEx Express
- UPS
- Louisville, KY
- BAX Global
- Memphis, TN
- DHL Worldwide Express
- Cincinnati, OH
- Toledo, OH

Exhibit 58: Top 20 North American Cargo Airports **

Airport Name	2003 ACI Cargo N.A. Rank	2003 ACI Cargo World Rank	Cargo Hub	Cargo Gateway	Total Air Cargo Carriers	Cargo Ramp Space (acres)^	# of Cargo Bldgs	Warehouse Space (sq. ft.)
Memphis Int'l	1	1	Yes		17	176	0	4,200,000
Ted Stevens Anchorage Int'l	2	4	Yes	Yes	28	204	4	200,000
Los Angeles Int'l	3	6	Yes*	Yes	34	170	24	2,100,000
Miami Int'l	4	22		Yes	36	85	14	2,400,000
JFK International	5	11		Yes	38	94	37	4,100,000
Louisville Int'l	6	12	Yes		3	300	2	4,000,000
Chicago O'Hare Int'l	7	13	Yes*	Yes	27	67	15	2,615,433
Indianapolis Int'l	8	20	Yes*		5	23	5	1,700,000
Newark Liberty Int'l	9	21	Yes*		12	41	11	1,450,000
Hartsfield Atlanta Int'l	10	11		Yes	17	58	12	1,800,000
Dallas/Ft Worth Int'l	11	25	Yes*	Yes	20	52	30	2,600,000
Metro Oakland Int'l	12	28	Yes*	Yes	4	38	5	400,000
San Francisco Int'l	13	31		Yes	15	54	11	845,000
Ontario Int'l	14	34	Yes*	Yes	16	52	5	676,000
Philadelphia Int'l	15	35	Yes*	Yes	6	111	8	67,500
Cincinnati/N. Kentucky	17	39	Yes*		5	124	8	450,000
George Bush Intercont.	18	21		Yes	13	58	26	880,000
Boston-Logan Int'l	19	43		Yes	24	38	9	550,000
Seattle/Tacoma Int'l	20	45	Yes	Yes	22	46	17	850,000
Average					**18**	**94**	**13**	**1,678,102**

Source: Air Cargo World Airports Directory, Airports Council International-North America (ACI-NA), AirNav.com, Wilbur Smith Associates.

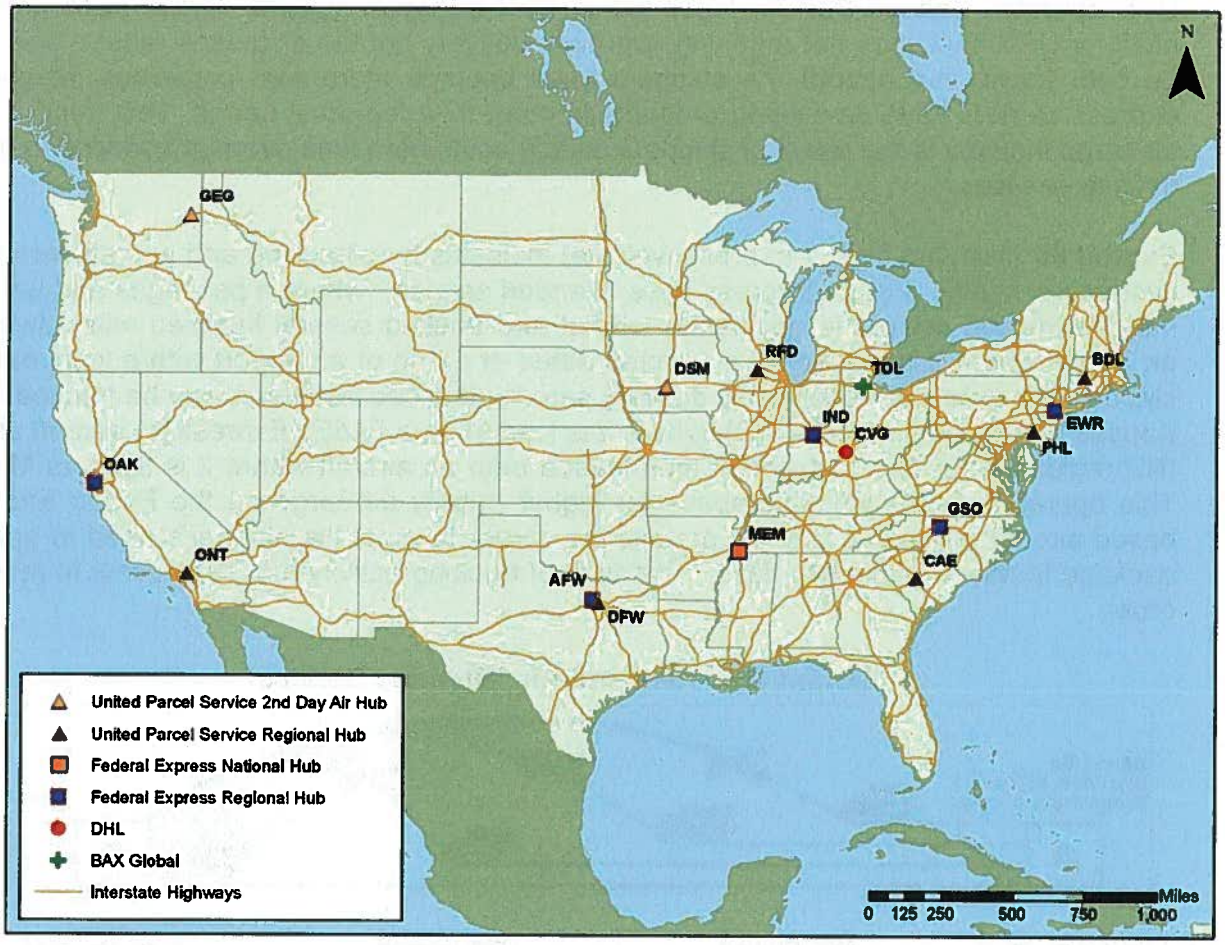
^Multi-use ramp area reported by some airports.

*Regional hub

**Honolulu ranks 16th in North America but was not included in this analysis due to its unique island location.

Regional Hubs – Regional hub location criteria are more dependent on a carrier's network structure than market characteristics (population and industry). Regional hubs were developed by integrated express carriers to divert cargo away from congested national hubs by facilitating intra-region freight flow. Regional hubs, as their name implies, serve a region of the country as a central collection, sort, and distribution facility. **Exhibit 59** depicts the location of FedEx Express, UPS and DHL regional hubs.

Exhibit 59: Integrated Express Carrier Regional Hubs



Source: Wilbur Smith Associates

The size and scope of operations for the largest air cargo carriers, FedEx Express and UPS, logistically prevents their operation from a single national hub. Each of these carriers operates regional sort centers on the east and west coast, as well as several sort centers across the country. Regional hubs, unlike their national hub counterparts, tend to concentrate more heavily on trucking operations for deferred material or intra-region movement of freight. While air cargo aircraft serve these facilities, their primary function is to facilitate truck-to-truck and air-to-truck freight transfer, whereas the national hub's main function is to facilitate air-to-air transfer of air cargo. DHL is the only integrated express carrier which operates a single national hub.

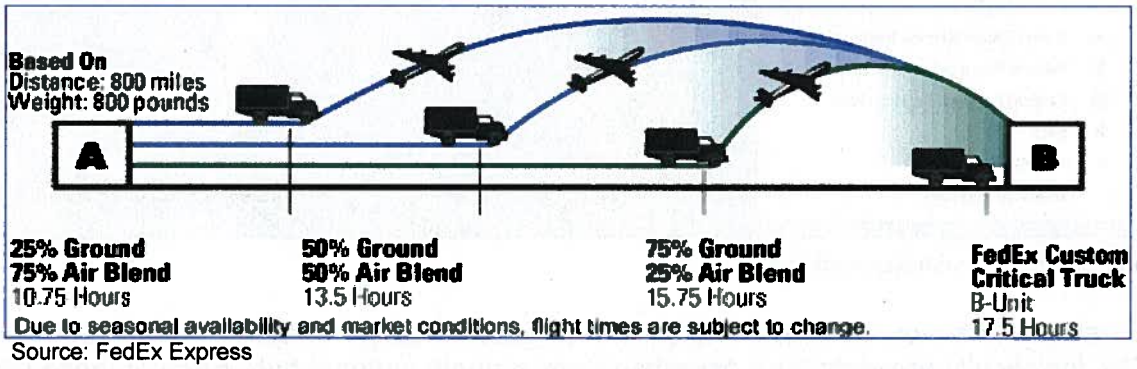
Because regional hubs differ in focus from national hubs (i.e., truck and air operations), there is an added dimension to site selection criteria for a regional hub: direct or easy access to the Interstate Highway System. It is essential that the regional hub facility be in proximity to multiple interstate facilities that provide easy and rapid access to the markets served.

Second-Day Air Hubs

UPS operates Second-Day Air Hubs within their transport system. These hubs provide airlift for UPS packages not requiring overnight delivery but the distances require shipping on both trucks and aircraft. As shippers have become more cost conscious integrated express carriers have developed products to meet their logistical needs. This trend in the air cargo industry is the result of shippers cutting costs from time overnight service to time-definite services.

Exhibit 60 (from the FedEx Express website) indicates how trucking and aircraft serve the customers' needs. FedEx Express uses "blended service," where a packages and parcels may be trucked out of the originating market and trucked several hundred miles away to an airport where it is loaded on an aircraft either at a hub or an airport with a local market station. For example, second-day delivery parcels destined for Miami may be trucked from Kansas City to Indianapolis (IND), where it is loaded on a FedEx Express jet aircraft at the IND regional hub. The package is then loaded onto an aircraft where it is flown to Miami. This operation saves valuable space for higher priority air cargo on the FedEx Express based aircraft in Kansas City yet permits the carrier to meet the shipper's need to get the package to Miami within two days. This type of trucking activity may also occur in reverse order.

Exhibit 60: Truck and Air "Blended Service"



Source: FedEx Express

Similar to the logic provided in the example above, UPS has developed second-day air hubs in its network. For example, Des Moines International Airport functions as a second-day air hub for UPS as does Spokane International Airport. In the mid-90's, UPS established a second-day Hub at Des Moines International. Currently, there are 38 UPS flights per/week and they employ around 150 people. UPS is the primary air cargo carrier at the Des Moines International Airport. It operates Boeing 757s, 767s, and Airbus 300s at the airport. Flights arrive from Rockford, Newark, Ontario (California), Oakland, Sacramento, Omaha, and the Louisville hub. These flights then depart for Philadelphia, Ontario (California), Long Beach, Sacramento, Spokane, Omaha, and the Louisville hub. In Spokane, the second-day hub operations are not as extensive as Des Moines but still serve a vital role for UPS. UPS operates inbound and outbound flights into Spokane from Portland and Seattle's Boeing Field as well as their Regional Hub in Dallas (DFW) and their Midwest second-day hub in Des Moines. Aircraft used in Spokane by UPS include Airbus 300-6 and Boeing 767-300.

West Coast Airports Air Cargo Roles

Focusing on the Western U.S. regional hub development, FedEx Express, and UPS both have west coast regional hubs. FedEx Express' regional hub facility is located at Oakland International Airport while UPS regional hub is located in Ontario, California. Over 90 percent of air cargo activity at both airports is related to integrated express carrier activity. The remainder is associated with passenger airlines. It is noteworthy to point out that the airports in Oakland and Ontario do not have any all-cargo carriers (i.e., Polar Air Cargo) operating at their airports. UPS' operations at Ontario, and its proximity to Los Angeles, also allow the carrier to have minimal operations at Los Angeles International Airport (LAX).

DHL formerly operated a regional hub in Riverside, California but closed this facility in 2008 as a result of their reorganization. DHL currently does not operate a regional hub anywhere in the U.S.

Anchorage International Airport serves as an intercontinental hub for FedEx Express, UPS and to a lesser extent DHL. Anchorage has unique rights for exchange of cargo between international carriers so that cargo arriving from aircraft originating in Europe, Asia and North America may be transloaded between aircraft.

Other major airports along the west coast may not function as a cargo hub but act as international gateways for air cargo to be transported on passenger airlines, integrated express carriers and all-cargo carriers or freighters. These airports include San Francisco International, Portland International, Seattle-Tacoma International and to a certain degree Vancouver International Airport.

San Francisco International – SFO functions as an international cargo gateway and large market station for the integrated express carriers. Passenger airlines also transport a considerable amount of air cargo in the belly compartments of aircraft. Several major domestic and international air carriers operate through SFO. In 2008, United Airlines was the largest carrier of international merchandise imports and the second largest carrier of exports. The top air carriers were United Airlines, Asiana Airlines, China Airlines, and Eva Airways. Of the three North American integrators – only FedEx Express & DHL operate at SFO.

In spite of having its major western region hub at nearby Oakland International Airport, FedEx Express operates three days weekly service to Tokyo Narita from SFO, as well as six weekly flights to Asia via Anchorage. FedEx Express also operates morning departures to its Memphis hub bypassing the regional hub in Oakland with packages originating in San Francisco. UPS serves the Bay Area by operating air cargo aircraft flights out of Oakland and San Jose.

Portland International – PDX is largely a domestic cargo airport with little international cargo activity. In 2008, approximately 90 percent of PDX's freight was carried in integrated express carriers. Integrators FedEx Express (49 percent), UPS (24 percent) and DHL (ABX's 7 percent) account for almost 80 percent of annual freight at PDX.

The only foreign passenger carrier Lufthansa provides belly cargo capacity on its scheduled flights to Europe, while Delta/Northwest operates internationally from PDX to Tokyo and to Amsterdam.

Seattle-Tacoma International – SEA's international freight accounts for 33 percent of total air cargo. Korean Air is the largest air cargo freighter operator at SEA and the aircraft on this route is shared with a stop in SFO. Luxembourg-based Cargolux serves SEA with four weekly freighters which stop in Calgary on the way over to Prestwick, Scotland. SEA's only other foreign freighter operator is Taiwan-based China Airlines. SEA also has service in the belly compartment of passenger aircraft to Europe on British Airways, SAS Scandinavian and Air France. SAS uses SEA as its main U.S. western region gateway, trucking in freight from both LAX and SFO to feed the operation.

Asian passenger carriers with belly cargo capacity include EVA Air and South Korea-based Asiana Airlines (2.0 percent). SEA also had substantial volumes of international freight transported by US belly carriers Delta/Northwest Airlines and United Airlines.

Vancouver International –
Vancouver (YVR) is subject to a different bilateral aviation environment and (due to its international border with the U.S.) is incapable of efficiently competing with either Seattle or Portland as a regional distribution hub beyond Canada.

Freight Forwarders
Freight forwarders do not operate hubs (national or regional) in the same manner as an express air cargo integrators or all-cargo airlines. Since freight forwarders rely heavily on third-party operators (commercial passenger carriers, all-cargo airlines, LTL trucking) to move material, the forwarders themselves have very little influence on where their third-party contractors locate hub, warehouse, or distribution facilities. The freight forwarder (with the exception of Panalpina in Huntsville, Alabama) locates where ever there is a critical mass of air cargo lift, trucking operations, warehouse, and distribution facilities. Generally, these transportation facilities and services tend to reach critical mass in major market areas near, or on, international airports with widebody and cargo aircraft service. These markets are generally also served by an extensive network of highways and interstates. Some larger examples include the following (western examples):

- Seattle-Tacoma (serving West Coast, Asia and Europe)
- San Francisco (serving Asia and Europe)
- Los Angeles International (serving West Coast and Asia)
- Vancouver International (serving Western Canada and Northwest U.S., Europe and Asia)

International Gateways: Location criteria for an international gateway tend to be facility and service-oriented. The primary driver for international gateway selection is an abundance of wide-body lift to international destinations by three sources:

- Commercial passenger carriers (e.g., Delta, United, Lufthansa)
- Express integrators or all-cargo airlines (e.g., UPS, FedEx Express, DHL)
- All-cargo carriers - scheduled or chartered (e.g., CargoLux, Polar Air Cargo)

Lower deck/belly space on commercial passenger carriers provides approximately half of all international air cargo movement in and out of the U.S. The heavy use of commercial passenger carriers is evident when examining the top U.S. international air cargo gateways in comparison to the largest international passenger embarkation/debarkation airports. **Exhibit 61** lists the top 20 continental non-hub U.S. international gateways by total tonnage. The majority of the largest gateways coincide with airports exhibiting heavy international passenger traffic. The exception to this rule applies to Memphis, Louisville, Rockford, Indianapolis, Oakland and Ontario which function primarily as national or regional hubs for integrated express carriers. It is noteworthy to point out that the integrated express market reflects a matured network and has experienced relatively little expansion in the last decade. The most recent regional hub in the U.S. is the addition of FedEx Express's regional hub in Greensboro North Carolina which provides connections for air cargo traffic in the Northeast US and Southeast US.

Exhibit 61: Top Non-Hub International Gateways (2008)

Rank	ID	City	Airport	2008 Landed Weight Cargo	Change from 2007
1	MEM	Memphis	Memphis International	19,500,093,674	-0.22%
2	ANC	Anchorage	Ted Stevens Anchorage International	17,951,597,580	-15.02%
3	SDF	Louisville	Louisville International-Standiford Field	10,445,498,827	0.14%
4	MIA	Miami	Miami International	6,988,513,672	-5.94%
5	LAX	Los Angeles	Los Angeles International	5,751,595,501	-16.17%
6	IND	Indianapolis	Indianapolis International	5,128,484,161	-3.32%
7	JFK	New York	John F Kennedy International	4,444,315,500	-13.10%
8	ORD	Chicago	Chicago O'Hare International	4,206,916,900	-4.42%
9	OAK	Oakland	Metropolitan Oakland International	3,484,046,450	-3.83%
10	EWR	Newark	Newark Liberty International	3,453,120,325	-7.84%
11	DFW	Dallas-Fort Worth	Dallas/Fort Worth International	3,228,104,260	-7.95%
12	ONT	Ontario	Ontario International	2,699,776,864	-3.19%
13	PHL	Philadelphia	Philadelphia International	2,527,521,975	-8.12%
14	ATL	Atlanta	Hartsfield - Jackson Atlanta International	2,334,922,810	-7.44%
15	HNL	Honolulu	Honolulu International	2,064,028,654	-8.97%
16	SFO	San Francisco	San Francisco International	1,549,361,900	-25.43%
17	IAH	Houston	George Bush Intercontinental/Houston	1,508,589,067	-1.93%
18	SEA	Seattle	Seattle-Tacoma International	1,493,544,435	8.03%
19	RFD	Chicago/Rockford	Chicago/Rockford International	1,419,957,532	-3.70%
20	PHX	Phoenix	Phoenix Sky Harbor International	1,350,082,904	-5.08%

Source: FAA - Calendar Year 2008 Air Carrier Activity Information System

Seattle ranks 18th among continental U.S. non-hub gateways, primarily due to the volume of belly-freight transported by passenger flight operations from the airport. Factors contributing to the reliance on commercial passenger carriers for air cargo include:

- Competitively priced airport-to-airport service
- Developed international networks
- Domination of international air cargo markets by freight forwarders

Passenger carrier networks cater to the passenger traffic, regardless of the demand for cargo lift. Demand for international passenger lift, as would be expected, is focused on large population centers. Each of the top international gateways listed in **Exhibit 58** is located in a densely populated area of the U.S. International cargo lift provided by commercial passenger carriers, accounting for 50 percent of international capacity, is nearly always tied to international passenger airports located in major population centers.

Seldom will a passenger carrier change or end an international passenger route due to the lack of air cargo traffic. Strict focus on passenger service, which drives most market and financial decisions, inadvertently subsidizes air cargo movement by passenger revenues. Since the plane is essentially "paid for" by passenger revenues, a commercial passenger carrier can exercise substantial pricing advantages over all-cargo and express integrators when flying international air cargo.

Freight forwarders currently control about 80 percent of international air cargo tonnage and are naturally attracted to the larger international airports. At these airports, forwarders can gain access to highly-developed domestic and international air networks, negotiate highly competitive air service rates, and achieve proximity to large market areas with vital transportation/distribution infrastructure. Freight forwarders utilize either scheduled aircraft (all-cargo carriers or commercial passenger belly space) or operate charter aircraft on a regular basis to serve markets large enough to support dedicated aircraft.

All-cargo carriers offering international airport-to-airport service also tend to operate at large, commercial airports in major metropolitan areas. Airport-to-airport service relies on ancillary service companies such as freight forwarders, LTL trucking companies, and customs brokers. Due to the international freight volumes generated by commercial passenger carriers, the ancillary companies required to service airport-to-airport air cargo provided by all-cargo carriers are currently in place at large international airports. These airports have achieved a "critical mass" of carriers, trucking, infrastructure, and forwarders that make these airports attractive in terms of cost, efficiency, and flexibility.

Chartered and contracted aircraft flying on international routes can be operated either on a scheduled basis or an on-demand basis. For the purposes of evaluating the support needed for an international gateway facility, it is necessary to focus on scheduled contract aircraft. Scheduled contract aircraft are generally for use by express integrators or freight forwarders. Express integrators use these aircraft to supplement their own fleet of aircraft and provide added flexibility as air cargo demand fluctuates. These aircraft will serve either the integrator's national hub directly or an international gateway that has a surrounding market area large enough to support a dedicated aircraft (e.g., New York metro area and Los Angeles metro area).

Integrated express carriers move a majority of their international traffic directly from their respective national hubs. International-bound material is collected from locations throughout the U.S. via the integrator's domestic network and consolidated at the national hub for transit on an integrator-owned or operated aircraft. Through the utilization of the domestic network to collect, consolidate, and distribute international freight via the express integrator's national hub, the integrator has essentially created a catchment area for its national hub spanning the entire nation. This fact explains why Memphis (FedEx Express

hub), Indianapolis (FedEx Express hub), Louisville (UPS hub), Cincinnati (DHL hub), and Dayton (Menlo hub) are in the top 25 list of international cargo gateways, despite their location at airports with limited or no international passenger service.

Air Cargo Development

When selecting an airport for air operations, fostering the growth and development of air cargo requires an understanding of the criteria, strategic factors, and decision-making process utilized by air cargo carriers and shippers for air operations. The expansion and evolution of the air cargo industry, in terms of both volume and service levels, require air cargo carriers to continually review not only the capacity of existing operations; but also the opportunities in new markets (customer base), new service offerings, or growth in the airports catchment area. The following sections examine potential growth and development scenarios and their associated impacts on transportation infrastructure in the IPH study area

Local Market Growth

Local market growth, or growth within an airport's catchment area, will likely drive most increases in air cargo activity within the IPH study area. The local market growth scenario assumes that current air cargo route and network structure will remain static (i.e., no hub or gateway development) moving into the future and that only the natural growth rate (accepted forecast factors associated with an airport's catchment area) will drive increased usage of existing air cargo airports. Increased volume transiting existing air cargo airports, whether driven by market growth or carrier network development, will place infrastructure demands on both airside air cargo facility capacity and landside access routes handling the additional truck traffic. The primary airside concern for the IPH study area air cargo operators will be adequate ramp space for simultaneous aircraft operations, equipment storage and maintenance areas, ramp (airside) access points for trucks and courier vans, and aircraft handling capabilities (either self-handle or third-party contractors).

Economic development activities within air cargo market areas (e.g., location of auto manufacturing plant) or air cargo development plans (e.g., construction of a regional air cargo distribution center) can also dramatically increase regional air cargo growth rates beyond the local market's natural growth rate.

Hub and Gateway Development

Hub development potential for the IPH study area airports remains limited within the realm of existing express integrators and all-cargo carriers. Simply put, the U.S. air cargo industry and air cargo networks are mature and well developed with limited potential for major hub development outside of the existing network structure. The IPH study area's proximity to existing national and regional hubs limits the geographic and network necessity to expand hub operations to the east of Seattle/Vancouver, Spokane International will continue to act as consolidation points for smaller surrounding markets.

International gateway development potential is predicated upon two factors: 1) The availability of international commercial service flights (lift) out of Spokane International and 2) Demand-driven needs from regional shippers in the IPH study area. Wide-body commercial lift (passenger service) is the core component in attracting and sustaining

international air cargo service. Absent such international commercial passenger service, it is likely that international air cargo will continue to be drayed (trucked) to alternate airports such as Seattle for international air transit.

Increasing Market Capture

In 2008, the state of Washington ranked 4th and Idaho ranked 38th among all states in total export trade by dollar value.[20] **Exhibit 62** and **Exhibit 63** display the top commodity exports, and export destinations for both Idaho and Washington by dollar value for 2006 – 2009.[21] In 2009, Idaho accounted for more than one-third of all U.S. export of electronic integrated circuits. Washington accounted for one-half of all U.S. exports of Civilian Aircraft, Engines and Parts. Top export countries for both states include Canada, China and South Korea. The IPH study area should seek to capitalize on and expand existing high-value export products as one strategy for seeking expanded air cargo services.

[20] U.S. Census Bureau, U.S. International Trade in Goods and Services, series FT-900; http://www.census.gov/compendia/statab/2010/tables/10s1269.xls

[21] Export data specific to the 19 IPH study area counties was not available.

Exhibit 62: Top Export Commodities for Idaho and Washington by Dollar Value

ID	Description	2006 Value	2007 Value	2008 Value	2009 Value	'06 % Share	'07 % Share	'08 % Share	'09 % Share	% ▲, '08 – '09
--	**Total IDAHO Exports and % Share of U.S. Total**	**3,727**	**4,703**	**5,005**	**3,880**	**0.4**	**0.4**	**0.4**	**0.4**	**-22.5**
---	**Total, Top 25 Commodities and % Share of State Total**	**798**	**3,699**	**3,750**	**2,990**	**21.4**	**78.6**	**74.9**	**77.1**	**-20.3**
Rank										
1	MEMORIES, ELECTRONIC INTEGRATED CIRCUITS	0	1,618	1,737	1,338	0	34.4	34.7	34.5	-23
2	ELECTRONIC INTEGRATED CIRCUITS	0	1,068	811	539	0	22.7	16.2	13.9	-33.6
3	PARTS & ACCESSORIES FOR ADP MACHINES & UNIT	Ida	304	201	174	10.5	6.5	4	4.5	-13.1
4	SILVER, SEMIMANUFACTURED	1	0	88	126	0	0	1.8	3.3	43.8
5	LEAD ORES AND CONCENTRATES	45	71	86	89	1.2	1.5	1.7	2.3	2.7
WA	**Description**	**2006 Value**	**2007 Value**	**2008 Value**	**2009 Value**	**'06 % Share**	**'07 % Share**	**'08 % Share**	**'09 % Share**	**% ▲, '08 – '09**
--	**Total WASHINGTON Exports and % Share of U.S. Total**	**42,391**	**52,089**	**54,498**	**51,739**	**4.1**	**4.5**	**4.2**	**4.9**	**-5.1**
---	**Total, Top 25 Commodities and % Share of State Total**	**30,155**	**38,263**	**39,480**	**40,086**	**71.1**	**73.5**	**72.4**	**77.5**	**1.5**
Rank										
1	CIVILIAN AIRCRAFT, ENGINES, AND PARTS	22,140	27,524	21,426	26,253	52.2	52.8	39.3	50.7	22.5
2	SOYBEANS, WHETHER OR NOT BROKEN	1,365	2,322	4,469	3,717	3.2	4.5	8.2	7.2	-16.8
3	CORN (MAIZE), OTHER THAN SEED CORN	1,071	1,518	3,118	1,414	2.5	2.9	5.7	2.7	-54.7
4	OIL (NOT CRUDE) FROM PETROL & BITUM MINERAL	973	896	1,932	1,218	2.3	1.7	3.5	2.4	-37
5	WHEAT (OTHER THAN DURUM WHEAT), AND MESLIN	888	1,260	2,211	1,140	2.1	2.4	4.1	2.2	-48.5

Note: Figures in millions of US Dollars
Source: U.S. Census Bureau, Foreign Trade Statistics: http://www.census.gov/foreign-trade/aip/elom.html

Exhibit 63: Top Export Destinations for Idaho and Washington by Dollar Value

ID	Country	2006 Value	2007 Value	2008 Value	2009 Value	2006 % Share	2007 % Share	2008 % Share	2009 % Share	% Change, 2008 - 2009
---	**Total IDAHO Exports and % Share of U.S. Total**	**3,727**	**4,703**	**5,005**	**3,880**	**0.4**	**0.4**	**0.4**	**0.4**	**-22.5**
Rank	**Total, Top 25 Countries and % Share of State Total**	**3,596**	**4,559**	**4,797**	**3,764**	**96.5**	**96.9**	**95.8**	**97**	**-21.5**
1	Canada	564	609	952	743	15.1	12.9	19	19.1	-22
2	Taiwan	172	304	347	652	4.6	6.5	6.9	16.8	88.2
3	Singapore	484	1,092	1,280	415	13	23.2	25.6	10.7	-67.6
4	China	593	723	394	388	15.9	15.4	7.9	10	-1.6
5	Korea, South	275	198	200	295	7.4	4.2	4	7.6	47
WA	Country	2006 Value	2007 Value	2008 Value	2009 Value	2006 % Share	2007 % Share	2008 % Share	2009 % Share	% Change, 2008 - 2009
---	**Total WASHINGTON Exports and % Share of U.S. Total**	**42,391**	**52,089**	**54,498**	**51,739**	**4.1**	**4.5**	**4.2**	**4.9**	**-5.1**
Rank	**Total, Top 25 Countries and % Share of State Total**	**36,482**	**46,054**	**48,660**	**47,645**	**86.1**	**88.4**	**89.3**	**92.1**	**-2.1**
1	China	5,282	7,311	8,310	9,113	12.5	14	15.2	17.6	9.7
2	Canada	6,239	7,673	9,238	6,791	14.7	14.7	17	13.1	-26.5
3	Japan	5,542	6,196	7,590	5,567	13.1	11.9	13.9	10.8	-26.7
4	United Arab Emirates	2,615	2,116	2,155	2,763	6.2	4.1	4	5.3	28.2
5	Korea, South	2,272	2,747	3,261	2,034	5.4	5.3	6	3.9	-37.6

Note: Figures in millions of US Dollars
Source: U.S. Census Bureau, Foreign Trade Statistics: http://www.census.gov/foreign-trade/aip/elom.html

Spokane International Airport Domestic Air Cargo Activity

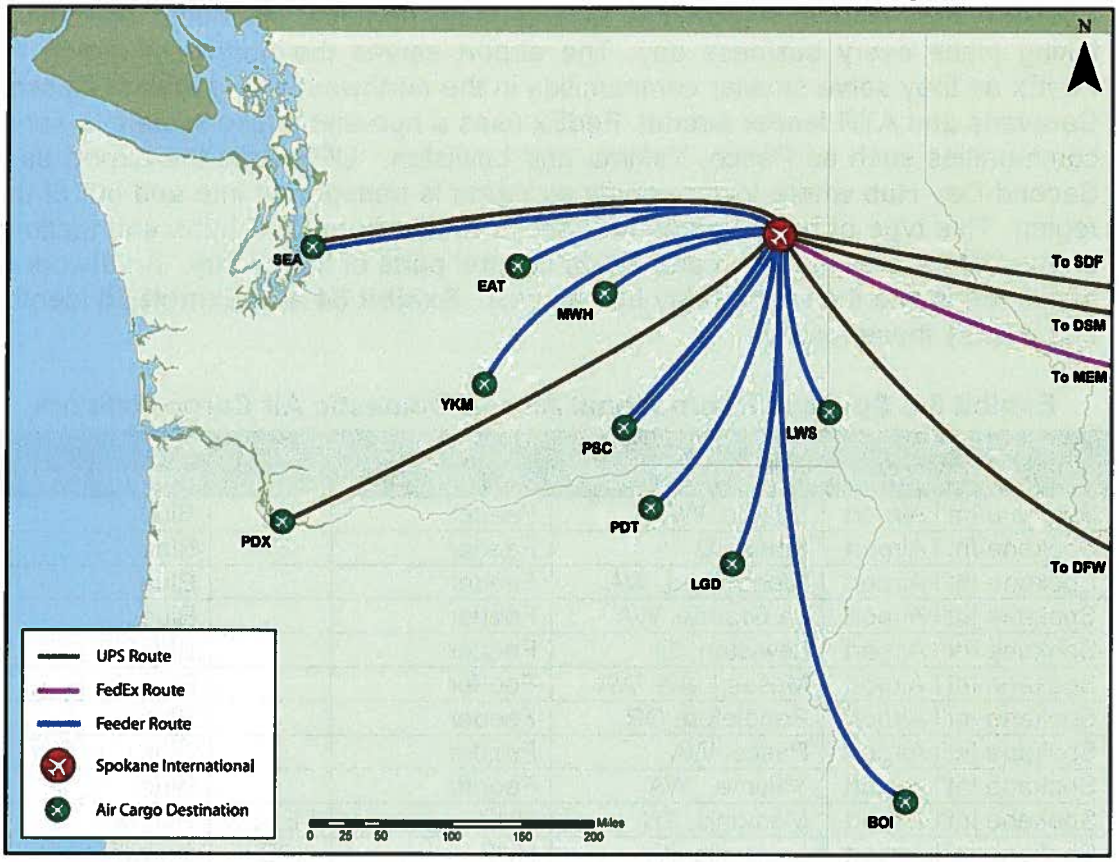
Spokane International Airport has considerable domestic air cargo operations taking place every business day. The airport serves the northwest region for FedEx as they serve smaller communities in the northwest with a fleet of Cessna Caravans and ATR feeder aircraft. FedEx uses a hub-and-spoke system to serve communities such as Pasco, Yakima and Lewiston. UPS uses the airport as a Second-Day Hub where lower-priority air cargo is transported into and out of the region. This type of hub requires four spoke routes from UPS hubs and stations on the West Coast, Midwest and South Central parts of the county. A network of trucks feeds into the second-day hub as well. **Exhibit 64** and **Exhibit 65** identify and display these routes.

Exhibit 64: Spokane International Airport Domestic Air Cargo Network

Airport Routes		Route Type	Carrier	Route Color
Spokane Int'l Airport	Seattle, WA	Feeder		Blue
Spokane Int'l Airport	Boise, ID	Feeder		Blue
Spokane Int'l Airport	Wenatchee, WA	Feeder		Blue
Spokane Int'l Airport	La Grande, WA	Feeder		Blue
Spokane Int'l Airport	Lewiston, ID	Feeder		Blue
Spokane Int'l Airport	Moses Lake, WA	Feeder		Blue
Spokane Int'l Airport	Pendleton, OR	Feeder		Blue
Spokane Int'l Airport	Pasco, WA	Feeder		Blue
Spokane Int'l Airport	Yakima, WA	Feeder		Blue
Spokane Int'l Airport	Memphis, TN	HUB	FEDEX	Purple
Spokane Int'l Airport	Louisville, KY	HUB	UPS	Brown
Spokane Int'l Airport	Dallas/Fort Worth	HUB	UPS	Brown
Spokane Int'l Airport	Portland, OR	Station	UPS	Brown
Spokane Int'l Airport	Seattle, WA	Station	UPS	Brown
Spokane Int'l Airport	Des Moines, IA	Hub (2nd day)	UPS	Brown

Source: Federal Aviation Administration, IFR records

Exhibit 65: Spokane International Airport Domestic Air Cargo Network



The IPH study area has a good base of air cargo services to build on. The best option for the region is to likely focus on increasing its market capture through attracting a business with significant air cargo demands, or continuing to attract numerous small air cargo users.

Runway length is a key consideration for international air cargo operations. Analysis of U.S. airports where FedEx, UPS, and DHL have scheduled cargo jet flights indicates the average length of the primary runway at these airports averages over 10,000 feet in length. U.S. Airports where FedEx operates have an average runway length of 10,230 feet, while UPS runways average 10,410 feet, and DHL runways average 11,460 feet. However, these runway lengths include airports with some of the longest runways in the world such as Denver International with a 16,000 foot long runway and New York's JFK International with a runway over 14,000 feet in length. These runway lengths skew the data to a degree. FedEx and UPS operate at some airports with less than 7,000 feet of runway length. FedEx has scheduled Boeing 727 service into Huntington, West Virginia and Roanoke, Virginia which have primary runway lengths of 6,517 and 6,800 feet respectively. Spokane International Airport's primary runway length of 9,001 feet is adequate to accommodate mid-size cargo jets such as the B727, B757 and large cargo jets such as the B747. The airport's master plan calls for

extending the runway to 11,000 feet in length and eventually adding a third runway.

PORT AND WATERWAY ISSUES AND OPPORTUNITIES

The port authorities in the IPH study area provide a crucial economic development tool, as their enabling legislation allows them to acquire property, development industrial parks, and provide economic incentives to potential businesses. In those regions that have Ports, they are a vital tool to the economic development efforts of the region and in many cases own most if not all of the industrially developed property that could provide a location for future business and industries

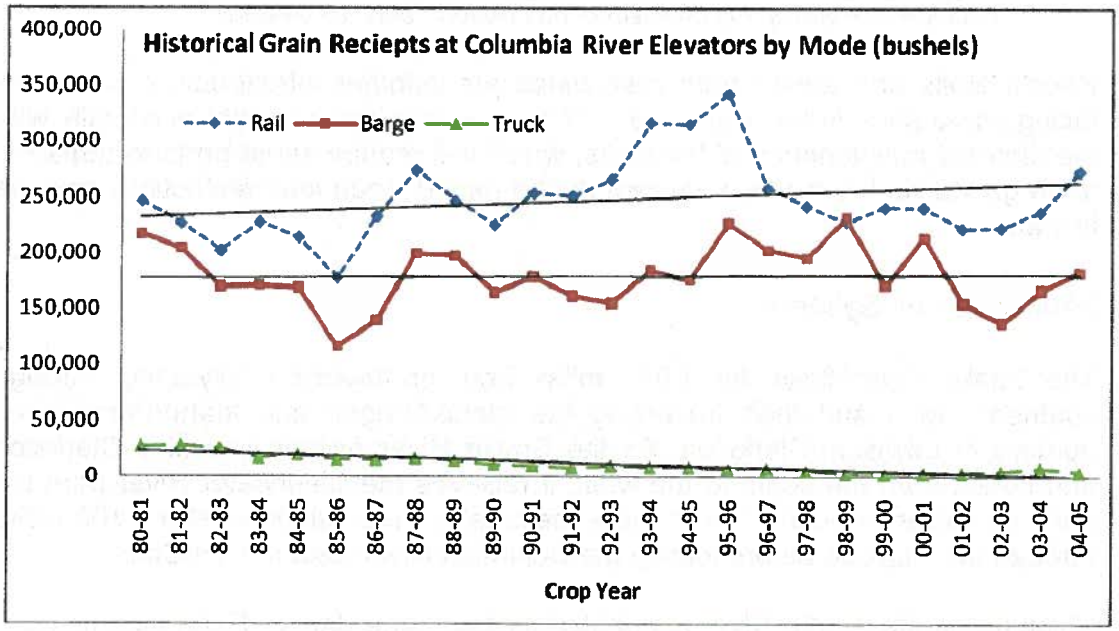
In an area heavily based on natural resource industries like agriculture and timber production, water transport often provides the most efficient means of transporting heavy goods, and provides a competitive option to rail and truck transport.

New opportunities may also result from a recent project to deepen the Columbia River channel from 40 to 43 feet deep. As a result of this navigational improvement larger TEU vessels could navigate the channel to Portland, OR. If/after a vessel operator commits to using Portland as a port of call (instead of Tacoma or Seattle) there will be more containers shipped inbound to the IPH, making more containers available for outbound transit down Lewiston to Portland for export. The barge trip is less expensive than the highway trip so it will reduce transportation costs, and interject additional competition and make containerized products originating in the IPH study area more competitive.

There are several constraints impacting future opportunities for port facilities in the IPH study area. The most notable constraint maybe the changing nature of agriculture away from bulk, raw grain movements to more value-added and specialized identity preserved shipments. Agriculture is one of the primary users of the study area's port facilities. The working paper *Economic Basis Analysis and Freight Dependent Industries* examined agriculture industry trends in the study area in greater detail. One notable finding from a study by Washington State University is that over the past twenty-five years the volume of grain moving by all modes through the Columbia River grain elevators has remained relatively flat (**Exhibit 66**).

Lower land values, cheap labor and improved transportation systems in countries such as South America will continue to challenge the traditional bulk or "fungible" grain market of the U.S. The trend in American agriculture production is toward more value added products such as bio-fuels, livestock and poultry production and semi-finished or finished food products from grain such as potato flakes and pasta. Many of these products are moving toward containerized transport, and to that extent the container on barge facility at Lewiston is well position to capture increases in this type of traffic.

Exhibit 66: Columbia River Elevator Grain Receipts (1980-81 to 2004-05)[22]



Other challenges facing ports on the Columbia/Snake River system is the ability to maintain the aging infrastructure that enables commercial navigation, and environmental activism. A lock maintenance project scheduled to begin in December of 2010 funded by the American Recovery and Reinvestment Act of 2009. While the planned lock maintenance is a beneficial investment that will benefit the long term viability of the Snake-Columbia River System, but the outage is expected to last 14 weeks which may driver away some shippers in the short term.

While extraordinary efforts have been made on the Columbia/Snake River system to maintain the native salmon runs, many environmentalists view salmon restoration efforts as a complete failure, and commercial uses of the river as an inhibitor to other forms of economic development:

> *"Lewiston's "port" also places a hangman's noose around the fish of Oregon's Imnaha, Grande Ronde, Wenaha, Lostine, Minam, Wallowa, and Powder rivers, Idaho's South and Main Clearwater, North, South and Middle Salmon, Selway, Rapid, Lochsa, and many more, strangling the economies of towns throughout the region, along the Columbia, and up and down the Pacific Coast. In 1993 the sport fishery for just one Snake River species—the summer steelhead—generated $90 million and created 2,700 jobs, even with the run in semi-ruins. (The same year the Lewiston port directly employed 22 people.) The four dams' removal, according to the Army Corps, will create 12,000 new jobs. Economic studies say dam removal would generate long-term billions. Yet subsidy*

[22] Ken Casavant, Marcia Gossard and Eric Jessup; *Grain Receipts at Columbia River Grain Terminals 1980-1981 to 2004-2005.* Washington State University. Nov. 2005 (Chart by WSA).

recipients and their political supporters have constructed a pro-dam propaganda machine that views any criticism of this deadly "port" as treason.[23]

Weight limits and spring road restrictions are another infrastructure challenge facing some ports in the study area. This issue has come to light especially with the planned maintenance of the locks, which will require some ports to transport more goods via the highway system during period when load restrictions may be in place.

Snake River System

The Snake River flows for 1,040 miles from northwestern Wyoming through southern Idaho and then traversing the Idaho/Oregon and Idaho/Washington borders to Lewiston-Clarkston. As the Snake River passes Lewiston-Clarkston and bends from the south to the west, it receives the Clearwater River from the east, its largest tributary. From there the Snake River winds west for 160 miles through the Palouse before joining the Columbia River near the Tri-Cities.

Shipping on the Snake River is enabled by four large dams. From east to west, proceeding downriver, these include the Lower Granite Lock and Dam, the Little Goose Lock and Dam, the Lower Monumental Lock and Dam, and the Ice Harbor Lock and Dam. The dams accommodate a shipping channel fourteen feet deep and 250 feet wide. They are owned and operated by the U.S. Army Corps of Engineers. Prior to their completion in the 1970s, products from the region were transported by truck and rail to the Tri-Cities, Portland, and other destinations.

Agricultural products are among the main goods transported on the Snake River. Grain, mainly wheat, accounts for more than 85 percent of the cargo. Other products include peas, lentils, forest products, and petroleum.

The U.S. Army Corps of Engineers plans during late 2010 to early 2011 to start work on a $10 million project for replacement of Lower Monumental Lock and Dam's downstream navigation lock gate. In recent years, inspections of the gate revealed structural fatigue and required annual welding repairs to continue reliable operations. Replacing the gate will include fabrication and construction work, employing an estimated 523 people. Fabrication of the gate is estimated to take seven to 10 months. Local agencies, Ports, shippers, carriers, and logistics providers have banned together to investigate ways participants continue to get their products to market by truck and/or rail during the anticipated 12 to 16 week closure. The closure duration is not a permanent change, but it will initiate investigation into alternative means to move product into and out of the region. Innovative ideas such as more use of short line rail to move wheat to Pasco and then on to the Pacific Northwest ports could become a normally considered routing instead of truck. If service and economics prove acceptable, it could spur

[23] Sierra club magazine; *Second Coming.* David James Duncan. © 2008: http://www.sierraclub.org/sierra/200003/salmon1.asp

longer term studies for investment in the short line rail system to improve track, rail equipment and facilities in the region.

Agricultural products are among the main outbound goods transported on the Snake River. Grain, mainly wheat, accounts for more than 85 percent of the cargo that travels down river to the seaports in the Portland, OR and Vancouver, WA area. Other products include peas, lentils, and forest products. For example, J.R. Simplot, an Idaho agribusiness, uses the container barge service to Portland to export refrigerated containers full of chilled or frozen potato products and other chilled processed food products.

Inbound products traveling upriver from Portland and Vancouver include petroleum, fertilizers, and a variety of containerized freight that arrives on containerships at Portland's Terminal 6, which is located 105 miles inland from the Pacific coast. At Terminal 6 containers get transloaded onto barges for river transport.

Highway distance from the Portland area to Lewiston is approximately 340 miles, or about eight hours truck traveling time. Barge service travel duration is approximately 51 hours. However, the trade off for barge service is the lower cost which can benefit less time-sensitive freight. Although varying, barge service has an acceptable time frame because it can reduce transit costs by 25 percent or more depending on the season, truck availability and the rise or fall of the fuel surcharge.

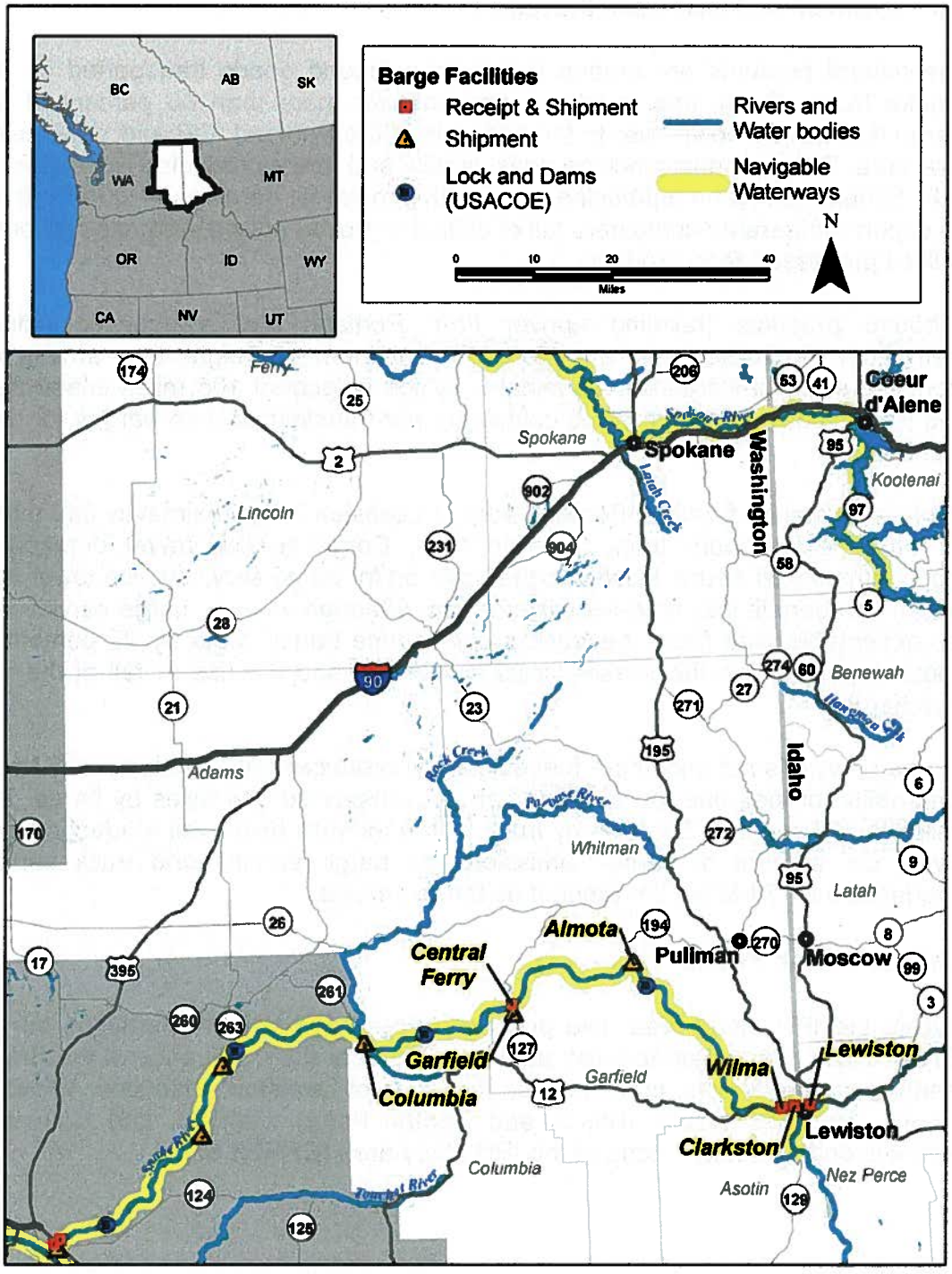
Barge service is not only more fuel efficient, it produces fewer emissions[24]. Using one gallon of fuel, one ton of cargo can be transported 514 miles by barge, 202 miles by rail and only 59 miles by truck. On a ton/mile basis, rail produces about twice the amount of carbon emissions as barge service and truck service produces over 74 times the amount as barge service.

Snake River Ports

Within the IPH study area, five port authorities have freight operations on the Snake River. From east to west starting in Idaho at the confluence of the Snake and Clearwater Rivers, these include the Ports of Lewiston, Clarkston, Whitman County (includes Wilma, Almota and Central Ferry), Garfield, and Columbia, which is on the western edge of the IPH study area **(Exhibit 67)**.

[24] Tidewater Transportation Services web site, http://www.tidewater.com/transport.php#benefits

Exhibit 67: Snake River Port and Dam System



Source: USACE, RITA/BTS, and VECTOR-Vanderbilt University; National Waterway Network, NTAD 2009. EPA and USGS-NHD, 2004. USGS-EROS Ortho-photography, 2006. BTS Associates, *Lower Snake River Transportation Study Final Report*. June 2003. WSDOT, *Washington State 2010-2030 Freight Rail Plan*, December 2009.Wilbur Smith Associates, January 2010.

Port of Lewiston

The Port of Lewiston is located at the confluence of the Snake and Clearwater Rivers. It is the easternmost port on the Columbia/Snake River system. Located 465 miles from the Pacific Ocean, it is the most inland port on the west coast.

The Port's intermodal connections include highway and rail. US-12 provides connections to Montana to the east and both Walla Walla and the Tri-Cities to the west, while US-95 and US-195 provide connections to I-90 and Spokane-Coeur d'Alene to the north. US-95 provides connections to I-84 and southwest Idaho to the south. The Great Northwest Railroad connects the Port to the main lines of the BNSF and the UP.

The Port is served by both barge and tug lines and accommodates the transfer of both containerized cargo and a variety of bulk commodities. Grain shipments are the chief commodity handled. Over 90 percent of the lintels and soybeans grown in the Palouse are exported. Heredity preserved, soft white wheat is exported in containers out of the port. Lewis-Clark Terminal and CLD Pacific Grain have a combined storage capacity of 6.2 million bushels (186,000 tons).

The Port can handle oversized, heavyweight cargo which can be rolled off the barges, eliminating the need for a heavy lift crane. With a permit, the oversized cargo can move along US 12 to cross Idaho without height restrictions to reach Montana and beyond. The route from Asia via Portland, up the Snake River to Lewiston, and on US 12 to Montana is envisioned to become part of the growing supply chain for heavy equipment, large tanks and wind turbines.

Containerized traffic at the Port of Lewiston is dependent upon the availability of container loading at the Port of Portland. Shippers in the area prefer to take advantage of the lower cost of river barge shipping but when loading space on the containerships in Portland is not available, they must use truck drayage to Seattle/Tacoma for containerized exports. The Snake River channel is currently being dredged to a depth of 43 feet. This will enable larger containerships to reach Portland, increasing the number of container slots available for loading. Eventually this will increase the amount of containerized freight moving out of Lewiston to Portland.

A potential opportunity for Lewiston is to act as a roll-on/roll-off (Ro-Ro) interchange point to bring in oversized cargoes such as large tanks for bio-fuel producers or wind turbine blades up the river. Cargoes destined for Montana could be placed on trailers at the coast and rolled on to barges. At Lewiston the trailers could be rolled off of the barges and then use US 12 across ID to Montana with only one oversized permit and without any overhead obstructions.

Port of Clarkston

The Port of Clarkston, headquartered in the City of Clarkston, Asotin County, is the farthest inland port in Washington State. The port resides on the south bank

of the Snake just downriver from the Port of Lewiston. It is approximately 460 miles from the mouth of the Columbia River. The port has intermodal connections to highways but no rail access. US-12 runs east-west along the southern boundary of the port property and SR-128 borders on the west.

The Port of Clarkston operated mainly as a port for pleasure craft and cruise boats that journey up Hell's Canyon, America's deepest gorge. The tourist boat season is during the late spring, summer and fall. The Port of Clarkston operates one of the largest cranes on a navigable river east of Portland. The crane is capable of moving logs, containers, and other cargo. "*As a far inland seaport, many large yachts are sent up the river from Portland and loaded on trucks bound for Texas, Indiana, and other inland states. Boats have been moved that are up to 78 feet in length and weigh more than 90,000 pounds.*"[25]

Port of Whitman County

The Port of Whitman County, headquartered in Colfax, has three waterfront facilities on the Snake River: Wilma, Central Ferry, and Almota.

Wilma Facility

The Wilma facility is located on the north side of the Snake River directly across from Clarkston. Of the Whitman County Port's three facilities on the Snake River, Wilma is the largest and busiest. Wilma's service area covers an estimated 200-mile radius. Wilma's intermodal connections include highway and rail. SR-128 connects Wilma to US-12 to the south and US-95 to the east. The Great Northwest Railroad connects it to the UP main line at Riparia.

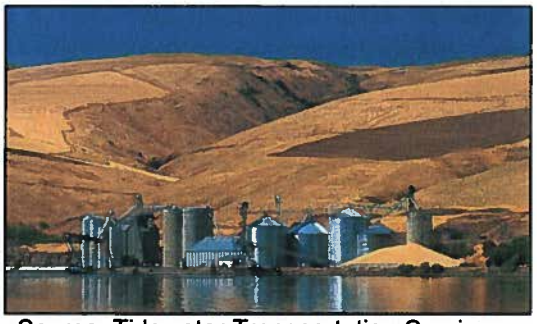
The average annual daily truck traffic to and from Wilma is approximately 100 trucks per day, peaking at 300 trucks per day during harvest. The full spectrum of products transported to the facility include wood chips, hog fuel, timber, soft white and hard red wheat, dry peas and lentils, and other grains. The port has a large conveyor crane for off-loading wood sawdust that is used in the manufacture of tissue paper.

Wilma's grain storage capacity is approximately 4.6 million bushels (138,000 tons).

[25] Port of Clarkston Website: http://portofclarkston.com/on-the-water/crane/

Almota Facility

The Almota facility is located thirty miles downriver from Wilma, west of the Lower Granite Lock and Dam. Of the Port's three sites, Almota is the smallest. Almota's service area covers a 50-mile radius encompassing farming communities in Whitman, Garfield, and Latah Counties. Almota's connections include highway and a potential for rail. SR-194 and Almota Road connect Almota to US-195 to the east and SR-26 to the west. Through construction of a siding, the Great Northwest Railroad would connect the facility to Lewiston to the east and the UP main line at Riparia to the west.



Source: Tidewater Transportation Services, http://www.tidewater.com/data/20040115.pdf

Almota serves as a trans-shipment point for local white wheat and is an alternative to direct rail service. Almota's grain storage capacity is approximately 3.7 million bushels (111,000 tons). However, the Almota site, consisting of 11 acres, is constrained with no capacity for expansion. In addition, access to the facility via Almota Road, has a seven percent grade and drops 1,250 feet. The road is closed to truck traffic during the spring thaw, slowing the local economy. Local authorities believe the Port's could expand its service area and boost its capacity for grain intake with the completion of the Wawawai - Lower Granite Dam road project.

Central Ferry Facility

The Central Ferry facility is located twenty miles downriver from Almota. Central Ferry's service area reaches into Whitman, Spokane, Garfield, and Columbia counties. Central Ferry's intermodal connections include highway and rail. SR-127 connects to SR-26 to the north and US-12 to the south. The Great Northwest Railroad connects Central Ferry to Lewiston to the east and the UP main line at Riparia to the west.

The average annual daily truck traffic to and from Central Ferry is approximately 60 trucks per day, peaking at 125 trucks per day during harvest.

Central Ferry is a major trans-shipment point for local white wheat. Central Ferry has a grain storage capacity of approximately 4.6 million bushels (138,000 tons).

Port of Garfield

The Port of Garfield, headquartered in Pomeroy, operates a grain elevator directly across from Central Ferry on the south side of the river. The elevator has

no intermodal connections and is accessible only by SR-127 which connects to WA SR-26 to the north and US-12 to the south. The facility dock is exclusively leased for barging grain to market.

Port of Columbia

The Port of Columbia, headquartered in Dayton, operates a grain elevator barge loading facility at Lyons Ferry, located approximately 20 miles downriver from Central Ferry. Connections include highway and potential for rail. The facility has direct access from SR-261 to SR-260. SR-260 connects with east-west SR-26 or north-south US-395. SR-261 also connects with US-12 to the south. The UP's Hinkle-Spokane mainline passes directly through Lyons Ferry, and a branch line runs east to Riparia to connect with the Great Northwest Railroad. The rail line could be accessed through the construction of a siding which would then enable rail connections west to the Tri-Cities, north to Spokane, and east to Lewiston.

Commodity Flows Utilizing the Snake River Ports

Commodity flows for the IPH are analyzed in detail in the Inland Pacific Hub Transportation Study's Work Element 3.2 - Regional Freight Profile. Below is a summary of freight flows moved on barge on the Snake River in the IPH study area.

Inbound and Outbound Commodities Moved by Water

Inbound commodities transported into the IPH by water are shown in (**Exhibit 68**). Petroleum and coal products appear to be the largest inbound commodity. The petroleum commodity group includes fertilizer which is used by the agricultural industry. Other top commodities farm and food products, nonmetallic minerals and scrap products brought into the area for processing and/or transshipment, and lumber.

Outbound commodities focus on farm and food products, as well as waste and scrap, and are shown in **Exhibit 69**. Over the forecast period the farm commodity tonnage decreases while at nearly a proportional rate food and kindred products increase. This could be an indication of a change in the finished state of the agricultural products that are exported from the region.

Exhibit 68: Inbound Commodities Transported by Water

Inbound Directions: Southern Counties: Local and West From All Origins
Inbound Flows: All Trade Flows from All Countries
Inbound Modes: Water: All Types

Top 20 Inbound Commodities	2007 Tons	Growth % ►	2012 Tons	Growth % ►	2017 Tons	Growth % ►	2027 Tons
Petroleum or Coal Products	1,113,993	22.23%	1,361,647	20.25%	1,637,335	31.99%	2,161,061
Farm Products	166,228	11.92%	186,047	10.89%	206,310	19.01%	245,523
Nonmetallic Minerals	114,049	1.51%	115,773	18.72%	137,441	23.38%	169,571
Waste or Scrap Materials	78,088	9.17%	85,251	8.37%	92,389	33.13%	123,002
Food or Kindred Products	35,411	16.87%	41,386	12.27%	46,464	11.61%	51,859
Lumber or Wood Products	11,829	60.09%	18,937	45.19%	27,495	49.09%	40,991
Fresh Fish or Marine Products	4,952	13.12%	5,601	11.22%	6,230	19.13%	7,422
Misc Freight Shipments	4,662	15.37%	5,379	18.80%	6,390	56.94%	10,029
Chemicals or Allied Products	2,123	86.98%	3,969	61.68%	6,417	78.41%	11,449
Total For Top 9 Commodities	1,531,335	19.11%	1,823,991	18.78%	2,166,471	30.21%	2,820,907
Top 9's Percent of Total	100.00%		100.00%		100.00%		100.00%
Total For All Commodities Inbound	1,531,335	19.11%	1,823,991	18.78%	2,166,471	30.21%	2,820,907

Source: 2007 TRANSEARCH™, Global Insight

Southern Counties: Local and West From All Origins
Directions:
Flows: All Trade Flows from All Countries
Modes: Water: All Types

Comparison Chart For Top 10 Inbound Commodities

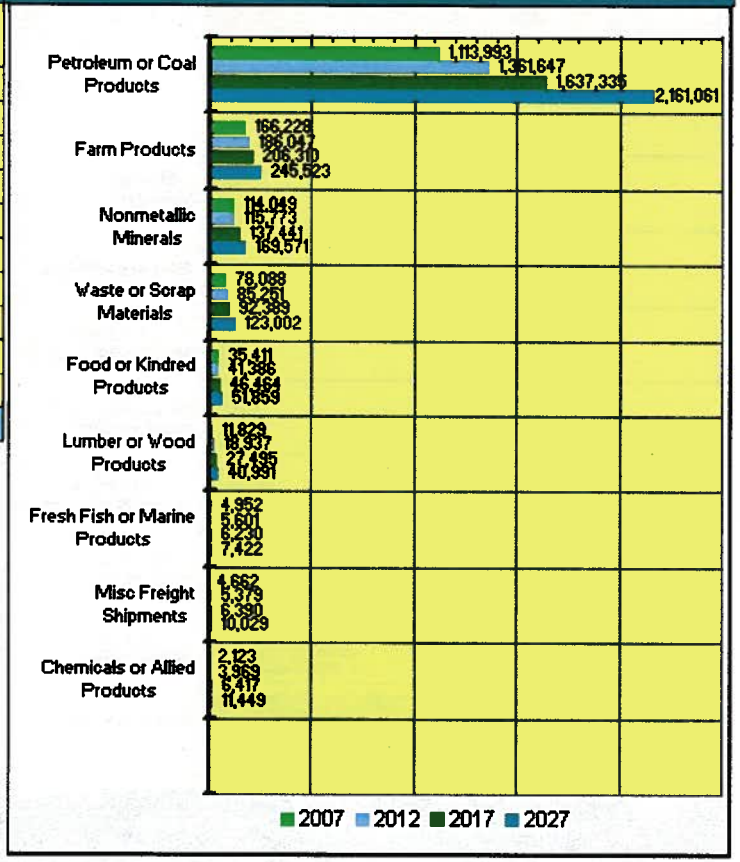


Exhibit 69: Outbound Commodities Transported by Water

Outbound Directions: Southern Counties: Local and West to All Destinations (water only)
Outbound Flows: All Trade Flows to All Countries
Outbound Modes: Water: All Types

Top 20 Outbound Commodities	2007 Tons	Growth % ►	2012 Tons	Growth % ►	2017 Tons	Growth % ►	2027 Tons
Farm Products	1,941,452	(6.30%)	1,819,217	(12.22%)	1,596,880	(23.75%)	1,217,659
Food or Kindred Products	647,320	26.38%	818,097	18.00%	965,343	15.58%	1,115,751
Waste or Scrap Materials	421,918	9.17%	460,626	8.37%	499,193	33.13%	664,600
Fresh Fish or Marine Products	41,756	3.99%	43,422	6.18%	46,103	(5.88%)	43,394
Clay, Concrete, Glass or Stone	4,891	22.67%	6,000	21.76%	7,306	29.80%	9,483
Pulp, Paper or Allied Products	353	(10.01%)	317	(9.30%)	288	(27.61%)	208
Tobacco Products	313	(51.28%)	152	(9.99%)	137	(60.64%)	54
Nonmetallic Minerals	215	29.94%	279	(13.83%)	240	(47.48%)	126
Total For Top 8 Commodities	3,058,218	2.94%	3,148,110	(1.04%)	3,115,490	(2.06%)	3,051,275
Top 8's Percent of Total	100.00%		100.00%		100.00%		100.00%
Total For All Commodities Outbound	3,058,218	2.94%	3,148,110	(1.04%)	3,115,490	(2.06%)	3,051,275

Source: 2007 TRANSEARCH™, Global Insight

Directions: Southern Counties: Local and West to All Destinations
Flows: All Trade Flows to All Countries
Modes: Water: All Types

Comparison Chart For Top 10 Outbound Commodities