Technical Assessment of the Aldergrove-Lynden Port of Entry

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Prepared by the Whatcom Council of Governments
For the International Mobility and Trade Corridor Project (IMTC)

1. Introduction

In 2009, as the Canada Border Services Agency (CBSA) developed plans for the replacement of the Aldergrove port-of-entry inspection station, the agency also informed regional stakeholders that because neither the existing or future station has dedicated truck-inspection facilities, they were considering the termination of commercial vehicle services at this location.

With questions of commercial services and other related and adjacent infrastructure implications pending, the International Mobility and Trade Corridor Project (IMTC) has established a subcommittee to complete a technical assessment of the Aldergrove-Lynden port of entry to inform decisions regarding medium term operations and improvement planning for both federal inspection facilities and state and provincial access roads. This report will provide a compilation of available traffic and trade data and serve as a resource to the subcommittee when evaluating the regional interdependencies between cross-border trade, travel, and security.

While Aldergrove-Lynden serves both commercial and passenger-vehicle traffic, this paper focuses on commercial vehicles and trade flow.

The organization of this data compilation is as follows:

- Review of commercial **traffic volume trends** across the three commercial crossing location in the gateway.
- Review of the **commodity flows** moving in the commercial traffic flows.
- The connection of regional cross-border commodity movements to measures of **regional economic output**.
- Review of cross-border **truck trip routing** (origin, crossing location, & destination) and assessment of regional routing efficiency as a function of land-border operations.
- Estimation of additional **truck-kilometers/miles traveled and emissions** if the Aldergrove-Lynden border crossing stopped processing commercial vehicles.
- **Appendices** include **A-E**: cross-border traffic model assignments of 2009 origin-destination data on Cascade Gateway truck trips; **F**: Summary memo of BC Trucking Association survey of membership and regional cross-border carriers; and **G**: Summary memo of a survey conducted by the B.C. Chamber of Commerce & Coalition of Chambers of Commerce and Boards of Trade membership involved in regional cross-border trade."

1.1 Executive highlights

Based on 2008 northbound truck volumes, the Aldergove-Lynden crossing is the second busiest U.S.-Canada commercial crossing in British Columbia (after Pacific Highway).

During 2008, the Aldergrove-Lynden port saw $496 million USD of goods exported from Washington and $38 million USD of goods exported from British Columbia. (Page 6)

Based on 2008 gross domestic product statistics, 21 percent of British Columbia's annual economic output ($32 billion CAD) and 15 percent of Washington's annual economic output ($49 billion USD) is generated by industries that produce exportable goods. These sectors individually, and the export sector collectively, depends on effective international connections, including access to land border ports-of-entry like Aldergrove-Lynden. (Page 8)

Moving from a one-way measurement of exports to illustrate a binational economic connection, the large regional share of wood, metal, and mineral goods that enter British Columbia at Aldergove-Lynden represents sectors (manufacturing and forestry) that comprise 12 percent of Washington's economic output and are inputs into sectors (construction and retail) that make up over 12 percent of British Columbia's economic output. (Page 8)

Based on comparisons of observed crossing choices and shortest-path traffic-model assignments, recent data show that Aldergrove-Lynden is not an "overflow route" for higher-volume crossings in the area. Rather, Aldergrove-Lynden serves a distinct population of carriers and shippers for whom the crossing is on the most efficient route. (Page 10)

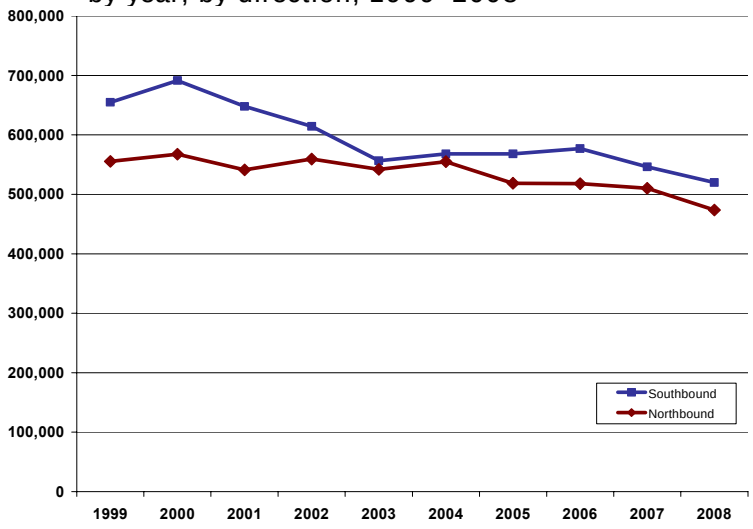
Analysis of an Aldergrove-Lynden closure to trucks estimates that the current population of users would need drive an additional 198,433 km (123,300 mi) per month. In addition to fuel and time costs, this has implications for increasing greenhouse gas emissions both as a function of increased drive distances and more frequent idling at other, now more congested, crossings. (Page 13)

Using established estimates of fuel economy and GHG emission per unit of fuel, it is estimated that cumulative truck travel added by loss of the Aldergove-Lynden route (in both directions) would generate 3.85 kilo tonnes of GHG emissions per year. In terms of BC's Climate Action Plan (CAP) goals, this hypothetical route closure would *cancel out* 0.51 percent of the annual GHG reduction expected from the freight road transportation sub-sector by 2015 (761 kt). (Page 13)

2. Freight vehicle volumes

The first step in this review is to look at the cross-border, annual demand for cross-border truck trips.

Figure 2.1 Total Cascade Gateway truck volumes by year, by direction, 1999-2008

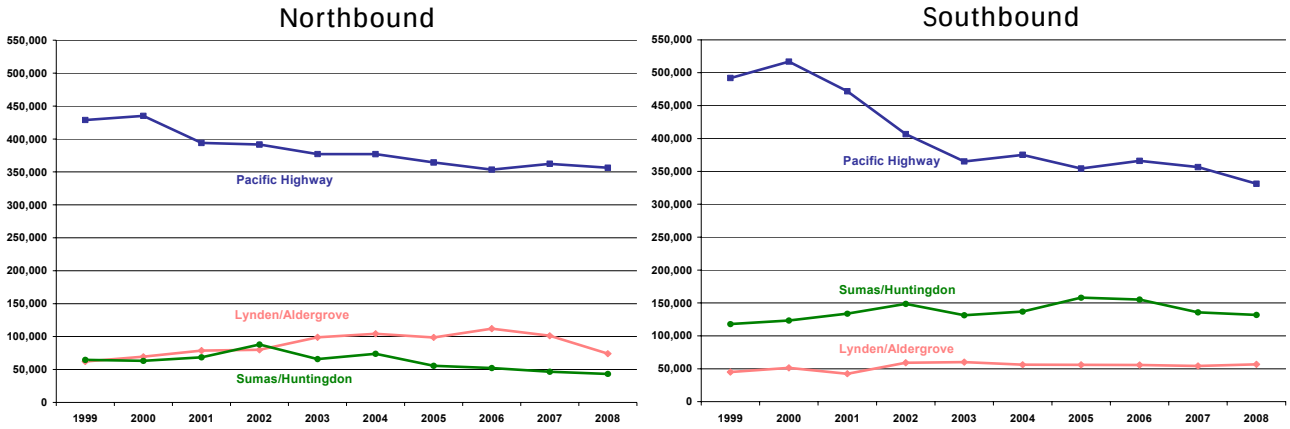


These counts are of all vehicles coming through the truck lanes (loaded, empty, passenger-vehicles with commercial goods, etc.)

Southbound counts are from CBP. Northbound counts are from CBSA (via Statistics Canada). Varying degrees of discrepancy between these two sources has been a consistent feature.

Below (Figs. 2.2 & 2.3), the same commercial vehicle count is plotted on separate graphs by direction and by the three Cascade Gateway commercial ports-of-entry.

Figures 2.2 & 2.3 Cascade Gateway truck volumes by year, by port, by direction, 1999-2008.



2.1 Observations – vehicle volumes

Counting at SB & NB Pacific Highway reflects a balanced flow of vehicles since 2002.

Counts at the other commercial ports (Aldergrove-Lynden & Huntingdon-Sumas) are expected to have a discrepancy because of Lynden's permit-port status. But, even when the combined volumes of Sumas (SB) and Lynden (SB) are compared with the combined volumes of Huntingdon (NB) and Aldergove (NB), there is still a noticeable gap.

The effect of the permit-port status of SB Lynden is seen in the flat and much lower volume there. There is also an effect at SB Huntingdon, shown by the significantly higher SB volumes there than NB. This gap is much larger than the count-discrepancy between the combination of Lynden-Sumas and Aldergrove-Huntingdon volumes.

2000 was the last year of relatively high truck traffic growth in the Cascade Gateway, ending about eight years rapid increases at Pacific Highway and Sumas-Hungtingdon. While volumes declined at those two ports between 2000 and 2006, northbound volume at Aldergrove was an exception—experiencing growth over that same timeframe. The volume data is not sufficient information to base a forecast on.

2.2 U.S permit-port operations at Lynden[1]

As background for this review of volume data and truck-traffic distribution, a good understanding of the Lynden permit-port operation is helpful.

In general, CBP's permit-ports are locations with limited commercial secondary-inspection capacity. The permit-port operation at Lynden is aimed at low-risk, repetitive truck-load shipments. If a shipper wants their goods to travel from Canada to the United States via Lynden, it must request a permit from the CBP area port director in Blaine, WA. Permit approval is contingent on a history of compliance and accurate import transactions, determination of low commodity risk, and an expectation of repetitive shipments. Also, the commodity cannot require any special documentation. Secondary criteria can include the shipper's statement that the commodity is critical to the vitality of the local community and that extensive travel time would be required to enter at Pacific Highway or Sumas. An example of a permitted shipment could be cattle-feed that crosses multiple times per day to local farmers.

Permits are issued to the shipper/manufacturer but all entities related to the entry must be vetted as part of the permit application and cannot change for the permit to remain valid (shipper, importer, broker (if applicable), and carrier). There is no cost for the application or permit.

Permits are not required of trucks that are empty or for informal import entries (shipments valued under $2,500).

Figure 2.4 All three ports by direction

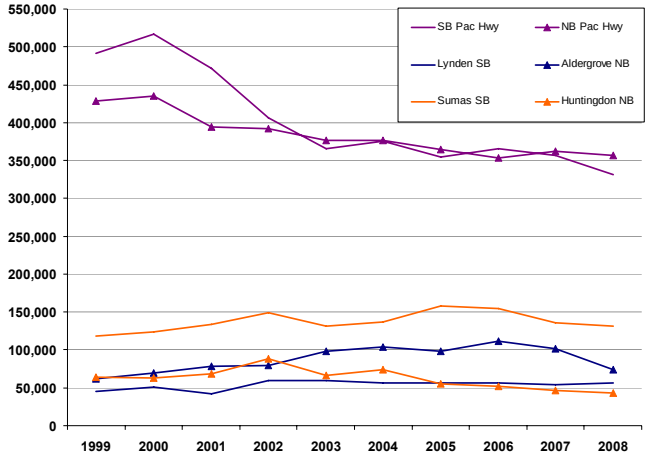
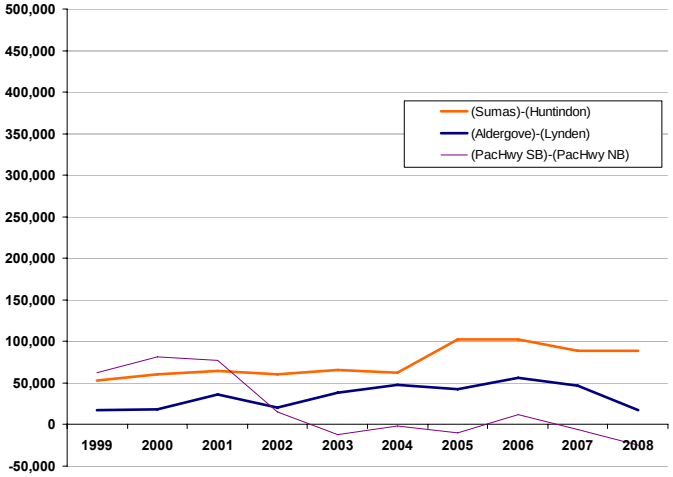


Figure 2.5 Truck flow differences by crossing location



2.2.1 Observations – permit port operations

The first chart above (Fig. 2.4), illustrates the estimated traffic-distribution effect of Lynden's permit-port status. This observation is based on the assumption that, all things being equal, the northbound volumes would be about the same as the southbound volumes – similar to the two Pacific Highway trend-lines (at least since 2002). As expected, the northbound volume at Aldergove is consistently about 50,000 trucks higher than Lynden. Not as widely appreciated is that much of this difference shows up as a directional imbalance at Sumas-Huntingdon.

[1] Information based on interview with CBP, Port of Blaine, WA.

The second chart (Fig. 2.5) illustrates the three ports' relative amount of directional imbalance (the higher-volume direction count minus the lower volume direction count). The plot lines for the Aldergove-Lynden and Huntingdon-Sumas imbalances can serve as high and low estimates of the additional volume that could be expected at Lynden if it was not a permit port. The last plot line, for both directions of Pacific Highway, shows a tendency towards equilibrium with the line staying fairly close to the 0-axis.

Note on counting:

This assessment might feel more complete if the counts of northbound and southbound trucks through the gateway balanced out better. Many factors likely contribute to observed discrepancies—differences in counting methods and associated errors; the counting of personal vehicles as trucks when they travel one way with an import and then the other without commercial goods in the vehicle (when they would be counted as a passenger car); the import of passenger vehicles themselves (a one-way trip); and trucks that cross one direction through a Cascade Gateway port and the other outside of the region. Improvement of counting to account for these and other factors would be an important improvement to base data used for forecasting and systems evaluation.

3. Cascade Gateway freight volume by weight and commodity

While examination of vehicle volume distribution and trends illustrates the degree of recent change and relative pressure on specific facilities, it does not, by itself, sufficiently indicate the connection between these cross-border freight movements and our regional binational economy. As an initial assessment of the economic connections, this section will review summaries of cross-border commodity flow data and state and provincial economic output (GDP).

WCOG has compiled cross-border freight weight and value data from the US Bureau of Transportation Statistics. While both value and weight data are available, this data review will focus on weight. First, weight is a better proxy for vehicle volume (and ultimately our aim is to scale the system to vehicle traffic demand). Second, value of shipped goods is not a good indicator of those goods' importance to the regional economy. Low-value goods have as much potential importance to regional production, employment, and overall economic output as high-value goods.

3.1 Relative commodity distribution

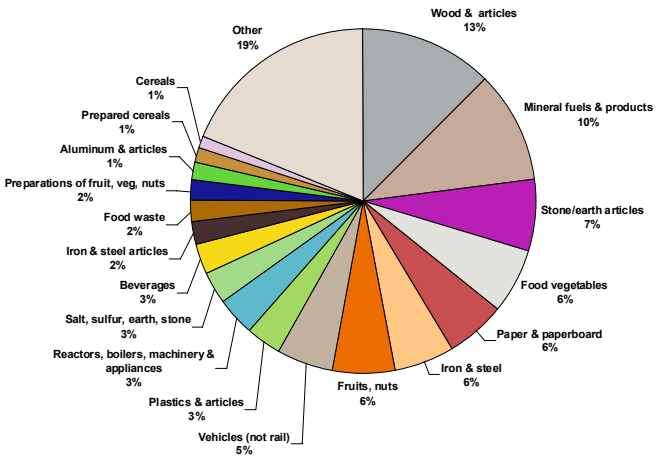
The first step in this review of truck-based commodity flow is to look at the trade flows across the whole Cascade Gateway, by direction. This is summarized for 2007 and 2008 in the pie charts below.

US BTS uses the 2-digit Harmonized Tariff Schedule which consists of 98 commodity categories. In the charts below, the commodities that comprise 80 percent of freight weight are individually labeled. The remainder is labeled as "Other (combined)."

Northbound Canada-U.S. freight is typically reported in $USD only while southbound is reported in both weight and value. BTS has provided WCOG with estimated value-to-weight ratios, by commodity, by mode for 2007 and 2008.[2] These factors were used to convert the northbound value data to weights so that a better comparative assessment could be presented here.

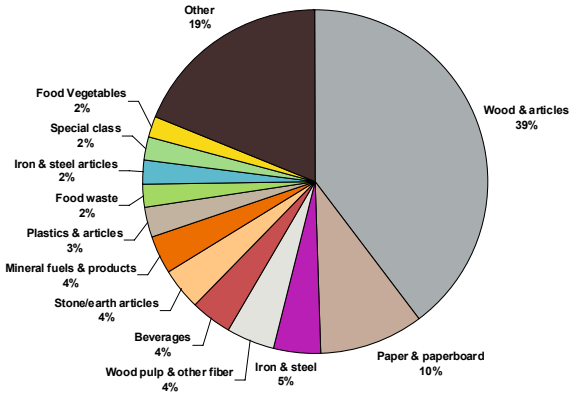
2007 Cascade Gateway (3 POEs) Freight Weight

Figure 3.1 Northbound



$10,526,166,391 (USD) 5,036,941,702 kg

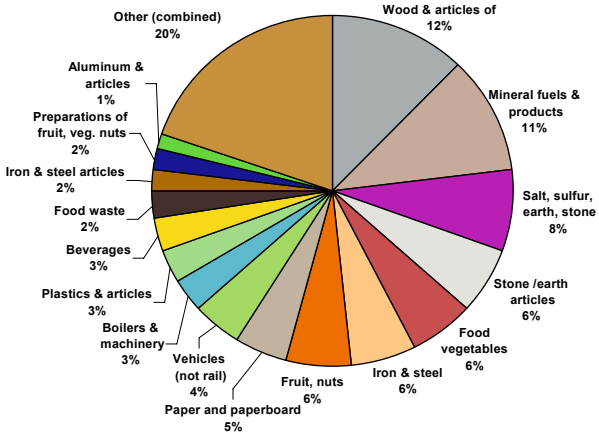
Figure 3.2 Southbound



$7,139,611,260 (USD) 4,391,596,641 kg

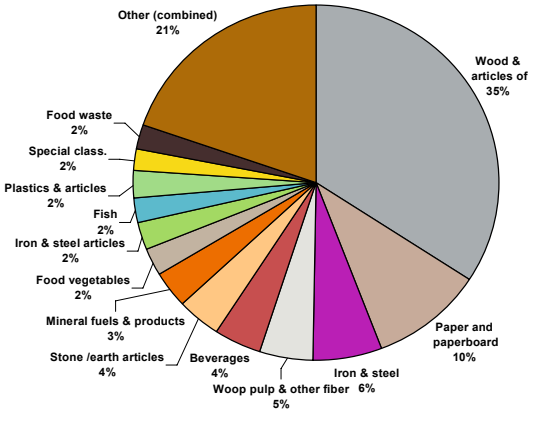
2008 Cascade Gateway (3 POEs) Freight Weight

Figure 3.3 Northbound



$11,747,834,158 (USD) 5,567,708,014 kg

Figure 3.4 Southbound



$6,599,338,794 (USD) 3,595,457,023 kg

[2] The Bureau of Transportation Statistics (BTS) estimated the weight of exports for truck, rail, pipeline, mail and other and unknown modes based on the import weight-to-value ratios that vary by country, mode, and commodity. The import weight-to-value ratios at the six, four, and two-digit HS code commodity detail are applied. Since the weight-to-value ratio of a given commodity drastically change from one year to another, BTS removed the irregular components (outliers) of the import ratios to produce consistent and reliable export weight estimates.

3.1.1 Observations – commodity distribution

The first observation is that the recent northbound trade flow is almost twice as large in both weight and value.

Second, both directions of trade are very diverse. The northbound top 80 percent of freight is comprised of 16 commodity groups. The southbound top 80 percent is comprised of 13 commodity groups.

Lastly, certain commodities appear to be more directional. Predominately northbound commodities include: mineral fuels; salt sulfur earth, & stone; vegetables, fruits, and nuts; vehicles; boilers & machinery; and aluminum. Predominately southbound commodities include paper and wood pulp & fiber.

3.2 Absolute commodity distribution

Because the absolute distributions portrayed above are based on significantly different volumes of freight, it is helpful to show the same distribution in absolute terms as is done on the bar graphs below (Figures 3.5 & 3.6)

2008 Cascade Gateway commodity by weight (2 digit HTS)

Figure 3.5 Northbound (U.S. exports to Canada)

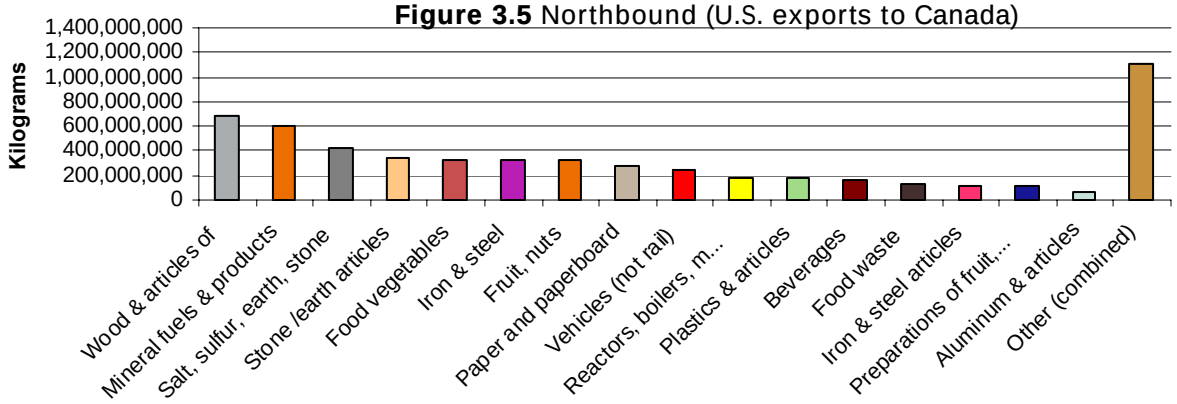
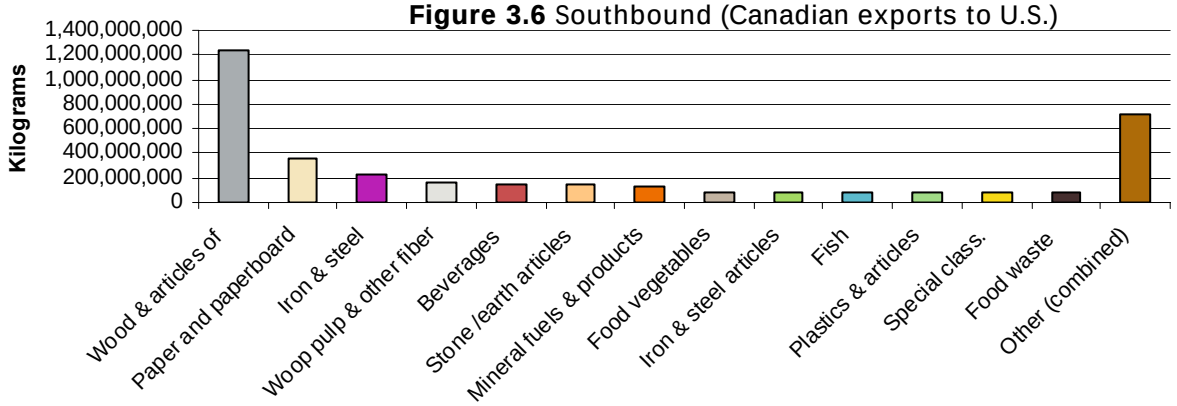


Figure 3.6 Southbound (Canadian exports to U.S.)



3.2.1 Observations – Cascade Gateway absolute commodity distribution

In 2008, while the southbound volume of wood was almost double the northbound volume, this was the single highest-volume commodity (by weight) in both directions.

4. Aldergrove and Lynden shares of Cascade Gateway commodity flow

Having described the contemporary trade-flow characteristics of the Cascade Gateway, this section will examine the portions of that trade-flow that move through the Aldergrove and Lynden port facilities and analyze the connection between these commodity flows and the regional economy.

Table 4.1 (below) first reviews, on the left side, the top Aldergrove commodities, by weight (2008) and the percentage that each of those commodity-flows is of the total Cascade Gateway NB flow of that commodity. Seven of the 98 HTS categories make up 80 percent of the total Aldergrove northbound goods flow.

On the right side of the table, the weight and value of those same northbound commodities is listed for the whole Cascade Gateway. These are not the same commodities that together make up 80 percent of Cascade Gateway commodity flow.

In the center, in the yellow-shaded column, is the percent, by commodity that Aldergove's top commodity volumes are of the whole gateway's volume. So, for example, this analysis indicates that **over 26 percent of the Cascade Gateway's northbound flow of iron and steel goes through Aldergove** (29.7 percent if "*articles* of iron and steel" are included).

Table 4.1 The Aldergrove (NB) port-of-entry and specific trade flows

HTS Commodity		Aldergrove (NB) top 80 percent 2008			Aldergrove's Percent of NB Cascade Gateway kg	Cascade Gateway Totals (commodities that match the top 80 percent at Aldergrove) 2008		
Code	Short Description	Value USD	Weight % of Aldgrove NB Total	Weight Kilograms		Weight Kilograms	Weight % of Cascade Gateway NB Total	Value USD
44	**Wood & articles of**	$64,595,884	25.4%	115,682,121	**17.1%**	678,345,572	12.2%	$378,782,230
72	**Iron & steel**	$88,931,706	18.5%	84,208,600	**26.2%**	321,461,586	5.8%	$339,491,777
68	**Stone /earth articles**	$39,738,118	17.7%	80,661,827	**23.1%**	349,293,372	6.3%	$172,079,678
25	**Salt, sulfur, earth, stone**	$9,234,368	11.5%	52,534,194	**15.0%**	418,160,068	7.5%	$73,503,440
73	**Iron & steel articles**	$31,860,655	2.6%	11,675,916	**3.6%**	116,509,034	2.1%	$317,924,015
76	**Aluminum & articles**	$38,033,158	2.3%	10,532,971	**14.5%**	72,773,938	1.3%	$262,777,011
27	**Mineral fuels & products**	$7,335,667	2.1%	9,350,971	**2.0%**	601,096,732	10.8%	$471,549,450
Sub total		$279,729,556	80.1%	364,646,601		2,557,640,301	45.9%	$2,016,107,601
Remaining commodities comb.		$216,654,765	19.9%	90,421,040		3,010,067,713	54.1%	$9,731,726,557
Total		$496,384,321	100.0%	455,067,641	**8.2%**	5,567,708,014	100.0%	$11,747,834,158

Representative shippers and carriers of the high-percentage commodities should be conferred with to understand which, if any, trip logistics factors are determinants of the choice of Aldergrove (stone & earth, iron & steel, wood, aluminum).

Table 4.1 above also illustrates the diversity of commodities moving north at Aldergove. While the *remaining commodities combined* (groupings under 2 percent of combined flow by weight) make up 19.9 percent of the freight weight, that same subset of commodity flow constitutes 44 percent of the trade *value* entering Canada there ($216 million USD).

Table 4.2 Lynden (SB) port-of-entry and specific trade flows

HTS Commodity		Lynden (SB) top 80 percent 2008			Lynden's Percent of SB Cascade Gateway kg	Cascade Gateway SB Total (commodities that match the top 80 percent at Lynden) 2008		
Code	Short Description	Value USD	Weight % of Lynden SB Total	Weight Kilograms		Weight Kilograms	Weight % of Cascade Gateway SB Total	Value USD
27	Mineral fuels & products	$9,816,597	29.2%	14,501,664	**11.7%**	123,571,247	3.4%	$44,934,110
08	Fruit, nuts	$17,206,876	26.9%	13,349,507	**20.7%**	64,624,677	1.8%	$152,707,756
44	Wood & articles of	$4,902,768	23.3%	11,539,141	**0.9%**	1,229,088,823	34.2%	$847,996,205
25	Salt, sulfur, earth, stone	$444,787	10.3%	5,123,005	**10.9%**	47,019,801	1.3%	$6,611,500
Subtotal		$32,371,028	89.7%	44,513,317		1,464,304,548	40.7%	1,052,249,571
Remaining Commodities Comb.		$5,283,179	10.3%	5,098,610		2,131,152,475	59.3%	5,547,089,223
Total		$37,654,207	100.0%	49,611,927	**1.4%**	3,595,457,023	100.0%	6,599,338,794

As discussed in Section 2.2, US CBP operates the Lynden POE as a permit port meaning that carriers must successfully petition the Area Port Director for permission to enter goods here. Empty trucks and informal entries may cross without a permit.

One result of this operational format is that a narrower band of commodities crosses south at Lynden-Aldergrove than crosses north. A second result is that Lynden (SB) serves a smaller share of Cascade Gateway southbound truck trade than the Aldergrove (NB) does for northbound trade.

One commodity group that obviously fits well within the permit regime is fruits & nuts. 20 percent of the Cascade Gateway's 2008 southbound flow of fruits and nuts were entered at the Lynden POE.

5. Links to regional economies

Quantifying the bigger picture connection between regional freight transportation and regional economic vitality (jobs, tax base, economic diversity, sustainable growth, etc.) depends on multiple sources of information and informed interpretation.

Figures 5.1 and 5.2 below summarizes overall economic output for British Columbia and Washington State as measured by gross domestic product (GDP) for 2008. WA and BC use an *almost* matching aggregated short list of the North American Industry Classification System (NAICS)

Figure 5.1 BC 2008 GDP by NAICS

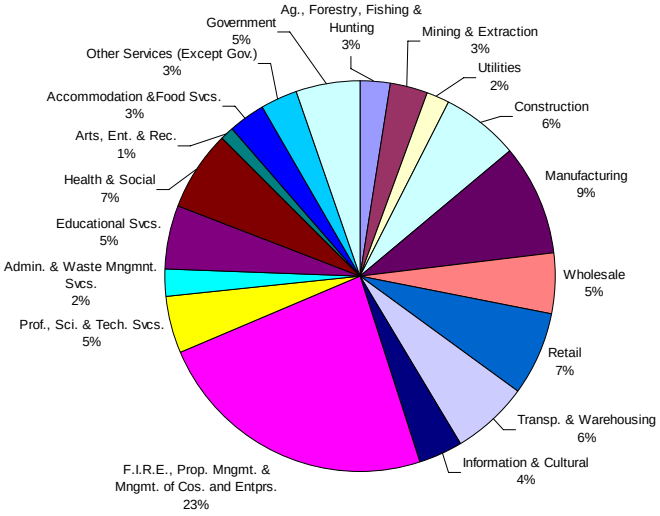
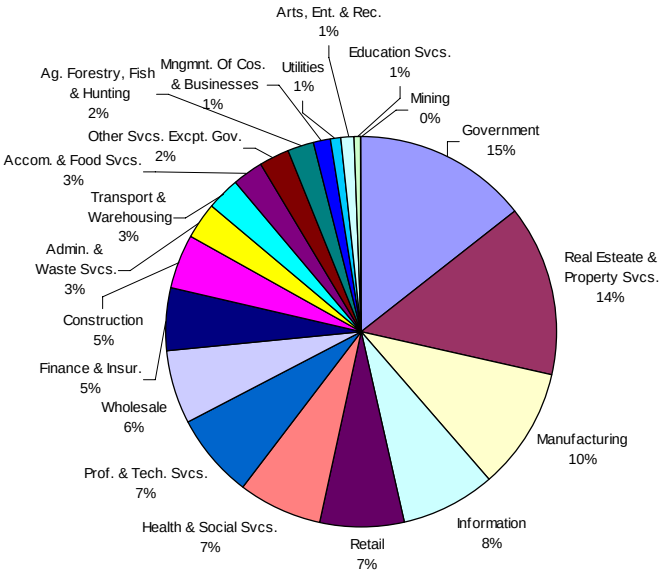


Figure 5.2 WA 2008 GDP by NAICS



5.1 Economic output and the border:

Tables 5.1 and 5.2 below make a simple association between several of the NAICS categories and one or both of two possible characterizations of that industry-type. The first type is **exportable**—industries that produce exportable commodities that could rely on efficient border connections. The second type is general commerce—here indicating those industries that could rely on inputs or customers from across the border. The cumulative percent of GDP associated with these tagged industries is then presented here as the portion of state and provincial economic output that is affected by border management.

Table 5.1

British Columbia GDP ($CAD millions)	Possible Cross-border					
Short Description	**Exportable**	**General Commerce**	**2008**	**Percent**	**Exp. %**	**Gen. Comm %**
Finance & Insur. Real Estate &			$35,327	23.5%		
Manufacturing	X	X	$13,955	9.3%	9.3%	9.3%
Retail		X	$10,091	6.7%		6.7%
Health & Social			$9,855	6.6%		
Transp. & Warehousing	X	X	$9,717	6.5%	6.5%	6.5%
Construction		X	$9,370	6.2%		6.2%
Educational Svcs.			$7,968	5.3%		
Government			$7,846	5.2%		
Wholesale		X	$7,647	5.1%		5.1%
Prof., Sci. & Tech. Svcs.			$7,014	4.7%		
Information & Cultural			$5,702	3.8%		
Other Services (Except Gov.)			$4,638	3.1%		
Accommodation &Food Svcs.		X	$4,618	3.1%		3.1%
Mining & Extraction	X	X	$4,355	2.9%	2.9%	2.9%
Ag., Forestry, Fishing & Hunting	X	X	$3,885	2.6%	2.6%	2.6%
Admin. & Waste Mngmnt. Svcs.			$3,422	2.3%		
Utilities			$3,185	2.1%		
Arts, Ent. & Rec.			$1,852	1.2%		
2008 Total			**$150,447**	**100.0%**	**21.2%**	**42.3%**
Exportable subtotal			$31,912	21.2%		
Commerce subtotal			$63,638	42.3%		

Table 5.2

Washingtond GDP ($USD millions)	Possible Cross-border					
Short Description	**Exportable**	**General Commerce**	**2008**	**Percent**	**Exp. %**	**Gen. Comm %**
Government			$46,940	14.5%		
Real Esteate & Property Svcs.			$45,291	13.9%		
Manufacturing	X	X	$31,995	9.9%	9.9%	9.9%
Information			$25,499	7.9%		
Retail		X	$22,661	7.0%		7.0%
Health & Social Svcs.			$22,457	6.9%		
Prof. & Tech. Svcs.			$21,988	6.8%		
Wholesale		X	$19,478	6.0%		6.0%
Finance & Insur.			$17,078	5.3%		
Construction		X	$14,711	4.5%		4.5%
Admin. & Waste Svcs.			$9,440	2.9%		
Transport & Warehousing	X	X	$9,122	2.8%	2.8%	2.8%
Accom. & Food Svcs.		X	$8,558	2.6%		2.6%
Other Svcs. Excpt. Gov.			$7,755	2.4%		
Ag., Forestry, Fish & Hunting	X	X	$7,037	2.2%	2.2%	2.2%
Mngmnt. Of Cos. & Businesses			$4,348	1.3%		
Utilities			$3,407	1.0%		
Arts, Ent. & Rec.			$2,814	0.9%		
Education Svcs.			$1,822	0.6%		
Mining	X	X	$378	0.1%	0.1%	0.1%
2008 Total			**$324,787**	**100.0%**	**14.9%**	**35.1%**
Exportable subtotal			$48,532	14.9%		
Commerce subtotal			$113,940	35.1%		

5.1.1 Observations – regional cross-border commodities and binational economic connection

The above summaries of 2008 GDP for British Columbia and Washington State first serve to remind that, in terms of overall economic output, both of our economies produce far more services than goods (BC about 23 percent goods and WA about 18 percent goods).

But, when making an economic connection between a border-crossing and regional economic vitality, **the goods** that move through the border crossing are a component of the overall relationship with regional, economic output. At the facility level (where the primary focus is on the inspection of goods, conveyances, and crew coming into the country operating the facility) the goods being examined are imports into the commerce of that country. In the example of the Aldergrove facility, a connection can be made quickly between the large share of Cascade Gateway wood, metal products, and mineral shipment weight (detailed on pg. 5) and British Columbia's construction and manufacturing sectors (as seen above, nine and six percent respectively of BC's 2008 GDP). The goods moving north through Aldergove are also Washington State exports from manufacturing sector industries, a sector that generates ten percent of state GDP.

The northbound shipments through Aldergrove are also carried, for the most part, by trucking firms based in Lower Mainland British Columbia[3]. So, **the transportation** industry revenue and jobs created are another important and connected output.

In a less direct way, these freight flows are the visible component of broader transactions and logistics that require finance, administration, regulation, and distribution. Together, these services represent most of the remaining sectors on the above GDP charts.

The southbound flow of goods through Lynden, fruits and nuts, mineral products (like cement), and earth and stone products (like gypsum wall board), are not only important exports from BC's manufacturing and agricultural sectors but are important inputs into WA's construction, manufacturing, and wholesale and retail distribution sectors.

[3] According to the 2009 IMTC CVO Survey, 66 percent of the trucks crossing northbound at Aldergove are based in British Columbia.

6. Regional freight route links

This section evaluates the characteristics of commercial vehicle demand through the Aldergrove-Lynden crossing: the functional relevance to the overall Cascade Gateway cross border truck volume; the crossing-specific route priorities (model assignments), and regional significance as indicated by the location of trip-ends for commercial movements through the crossing.

6.1 Cascade Gateway & Aldergrove-Lynden truck trip distribution

In June and July of 2009, IMTC participants Border Policy Research Institute, Whatcom Council of Governments, and University of Washington, in cooperation with U.S. CBP and CBSA undertook a commercial vehicle data-collection project at the three commercial vehicle crossings in the Cascade Gateway. Data on over 5,000 cross-border truck trips was gathered including trip origin and destination, crossing used, commodity on board, vehicle type, and more.

Origins and destinations, obtained at the city level, were assigned to traffic zones in the cross-border traffic model for development of a trip matrix. This trip matrix was assigned to the road network using a shortest-path assignment. This type of assignment acknowledges built road capacity, but does not account for underlying congestion. A map graphic of the model assignment, attached as **Appendix A** illustrates a shortest-path distribution of Cascade Gateway truck trips through the three crossings and along shortest-path routes between their stated trip endpoints. Although each survey trip record includes the actual crossing used by the surveyed truck, this assignment let the model choose the crossing location based on shortest path.

As a reference for the assignment result, the following table compares the model-based border crossing selection with the relative share of trip records collected at each of the three crossing locations, *and* the monthly border truck volumes by direction.

Table 6.1

Crossing & Direction	June 2009 Actual		July 2009 Actual		Avg. Jun-July % Dist.	Survey Trip Records		Model Assignment		Assignment vs. Actual	Assignment vs. Survey
	Number	Percent	Number	Percent		Number	Percent	Number	Percent		
Pacific Highway NB	27,740	73.3%	28,194	73.8%	73.6%	1,517	67.8%	1,161	65.2%	-8.3%	-2.5%
Pacific Highway SB	27,083	62.8%	28,110	64.6%	63.7%	1,623	59.3%	1,155	57.6%	-6.1%	-1.8%
Aldergrove NB	6,016	15.9%	5,836	15.3%	15.6%	275	12.3%	241	13.5%	-2.1%	1.3%
Lynden SB	4,313	10.0%	2,305	5.3%	7.6%	294	10.7%	314	15.7%	8.0%	4.9%
Huntingdon NB	4,082	10.8%	4,164	10.9%	10.8%	447	20.0%	378	21.2%	10.4%	1.3%
Sumas SB	11,729	27.2%	13,095	30.1%	28.6%	818	29.9%	537	26.8%	-1.9%	-3.1%
Total NB	37,838	100.0%	38,194	100.0%		2,239	100.0%	1,780	100.0%		
Total SB	43,125	100.0%	43,510	100.0%		2,735	100.0%	2,006	100.0%		

6.1.1 Observations—crossing choice and route choice

First, chart 6.1 indicates that the relative survey sample size at each commercial crossing location was not a strong proxy for a generalized distribution of traffic among the crossings. This is most visible at Huntingdon where 20 percent of northbound survey records were collected versus the 10.8 percent of northbound gateway traffic tallied over June and July. This could be due to a number of variables that caused a higher-than-typical truck volume at that location during the survey days there (day-of-week fluctuations are often acknowledged).

Second, it's important to note, that with the exception of expected variations, the model, using a shortest-path assignment of trips to the road network, produced a very close match to the observed crossing-location choices (quantified in the far right column of chart 6.1). As expected, the largest discrepancies are Lynden (where the model assigned five percent more trips there than were observed) and Sumas (where the model assigned three percent fewer trips than were observed there). This accords with the known impacts of permit-port restrictions on route options (explained in section 2.2).

The most basic implication of the above comparison is that Aldergrove-Lynden is not, primarily, an overflow route for the Pacific Highway border crossing. If this were the case, the shortest path model-assignment would show a much smaller share of trucks using that crossing.

6.1.2 Observations—distribution of origins and destinations for Lynden-Aldergrove trucks

Appendix B (attached) depicts the relative geographic distribution of trucks surveyed specifically at the Aldergrove-Lynden port-of-entry. This analytical tool effectively illustrates which sub-regions, on both sides of the border, make the most use the Aldergrove-Lynden crossing as a connection point for goods movement.

The traffic-analysis zones (TAZs) in the United States with the most concentrated goods-flow connections are immediately south of the border in Lynden, WA, the Seattle area, and "in" the external traffic zone that represents all places to the south of the model's coverage area.

In Canada, the concentrations are spread a bit more but visibly centered to the north of the Aldergrove-Lynden crossing east of Langley. Two green-shaded zones—one north of the Huntingdon-Sumas crossing and one north of the Pacific Highway crossing—would seem to indicate a trade or logistics relationship between those zones and the Lynden, WA area since trip ends south of Bellingham would be more directly accessed by the other two commercial crossings.

6.2 Aldergrove-Lynden as an alternate route

One of the potential benefits of any border crossing is its ability to serve alternate routings during traffic incidents that block primary routes, during times of high congestion on parallel routes, or when other regional border crossings may close altogether due to major disruptions. To illustrate the likely impacts of border closure on cross-border truck traffic routing, the 2009 commercial vehicle survey data (the same trip data portrayed in Appendix A) was re-assigned to the network with the Pacific Highway crossing removed (result attached as **Appendix C**) and again with the Huntingdon-Sumas crossing closed (attached as **Appendix D**).

The resulting route shifts illustrate the expected diversion to the Aldergrove-Lynden crossing as a next-best alternative. The graphics do emphasize the secondary role that all three commercial ports-of-entry serve as an alternate route to the others during peak congestion or more serious incidents.

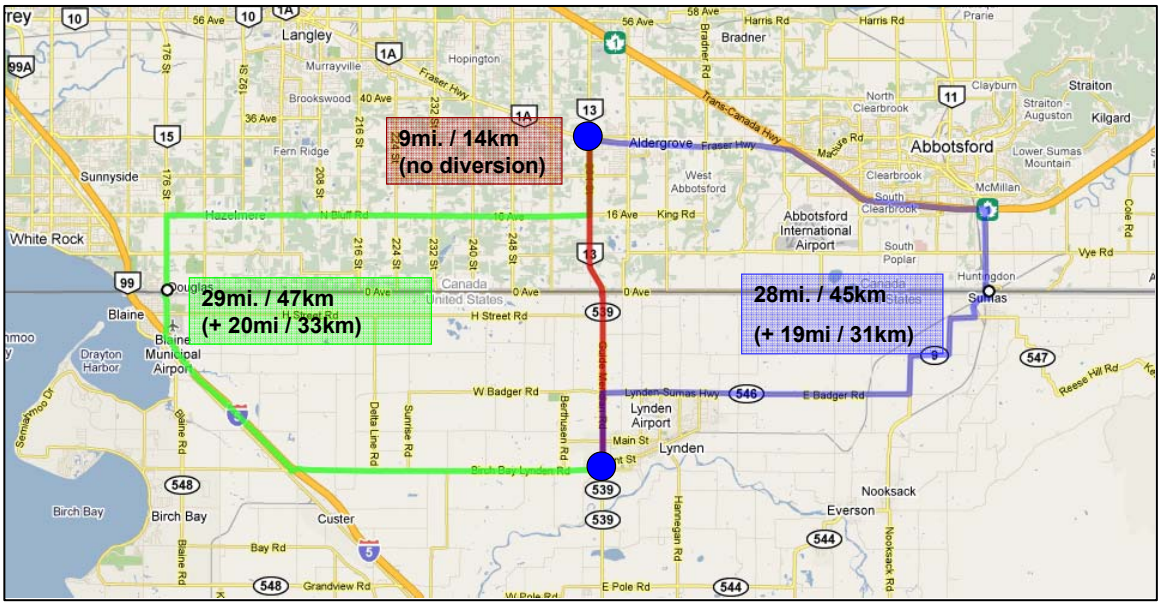
6.3 Transportation system impacts of Aldergrove-Lynden

To complete the model-based evaluation of Aldergove-Lynden, an assignment scenario was run with the crossing removed from the road network. The result is attached as **Appendix E**.

As evidenced in the comparison of actual border crossing location choices with shortest-path model assignments, most trucking companies and drivers chose the crossing that is on their shortest route. Using data-summaries calculated in the regional cross-border travel model, the closure of Aldergrove-Lynden to trucks would result in a 1.2 percent increase in vehicle miles traveled (VMT). This number is based on the total distance driven by the sample population—a large portion of which are making long distance trips.

A better way to assess the impact of closure on VMT would be to conservatively estimate the additional distance that typical Aldergove-Lynden trucks would need to travel to use either Pacific Highway or the Huntingdon-Sumas crossing. The map below illustrates a diversion scenario between trip ends that are close to the border and also near where one of the trip ends is likely to be. Because many trips through Aldergove-Lynden have a trip end much farther from the border crossing, it is estimated that the full diversion (one-half of the total) would be experienced on one side of the border and one-third of the diversion (one third of one-half) would be experienced on the other side: **(.5 + (.33 x .5))=.67**

Chart 6.3.1



The following worksheet, with steps explained in the right column, uses model assignments, historical truck counts by crossing, and the estimates of additional trip distance associated with diversion to an alternate crossing to estimate a monthly total of additional truck VMT associated with a closure of Aldergove-Lynden to commercial traffic (in both directions).

Table 6.3.2: Added truck travel if Aldergrove-Lynden closed to trucks (in both directions)

	All crossings open			2009 CVO data collection records assigned to network and associated border crossing using shortest-path assignment. This is the distribution of those records by crossing location
	PH	**A-L**	**H-S**	
NB	1,161	241	378	
SB	1,155	314	537	
Total	2,316	555	915	
	Aldergrove-Lynden Closed			Modeled scenario that removes the Aldergrove-Lynden crossing. This is the distribution of the 2009 survey trip records to the two remaining crossings. The difference is the absolute share of the survey population diverted from Lynden.
	PH		**H-S**	
NB	1,304		476	
SB	1,329		639	
Total	2,633		1,115	
Diff.	317		200	
	Percent Shift from A-L			The percentage of diverted Aldergrove-Lynden trucks that would likely divert to either Pac. Hwy or Huntingdon-Sumas.
	PH		**SH**	
	61.3%		38.7%	
	Est. Monthly Added VMT			Using 2009 avg. mo. Aldergrove-Lynden 2-way truck volume, this step applies the model-based percents to observed values and estimates diversion volumes.
	PH	**A-L**	**H-S**	
Avg. mo. 2-way trips		9,383		
Diverted per above %	5,753		3,630	
Est. added miles	13.4		12.7	Using estimates of distance to alternate crossings, additional vehicle miles traveled (VMT) is estimated (and also presented as Vehicle Kilometers Traveled (VKT).
Est added VMT	77,093		46,207	
Total added mo. VMT	123,300			
Total added mo. VKT	198,433			

6.4 Greenhouse gas emissions estimate

With the above estimate of the additional, cumulative distance that trucks would travel each month if the Aldergrove-Lynden border stopped processing commercial vehicles, a resulting policy question becomes, how much additional greenhouse gas emissions might result from such a route closure.

The following table uses the above cumulative-distance estimates along with established estimates of average heavy-truck fuel use rates and amount of emissions per unit of fuel to estimate emissions induced if the Aldergove-Lynden border crossing were limited to passenger vehicles.

Table 6.4.1

Estimated additional monthly greenhouse gas (GHG) emissions if Aldergrove-Lynden were closed to commercial vehicles (both directions). Based on 2009 truck volumes. (in metric & imperial units)			
1	Added cumulative distance	198,433 Kilometers	123,300 Miles
2	Distance per unit fuel	2.17 Km/Ltr	5.1 MPG
3	Additional fuel used	91,518 Liters	24,177 Gallons
4	GHG emissions per unit of fuel	3.51 Kg/Ltr	29.29 Lbs/Gal
5	CO2 emmission per unit of fuel	2.66 Kg/Ltr	22.2 Lbs/Gal
6	**Total GHG from diversion**	**321,227 Kg/mo.**	**708,185 Lbs/mo.**
7	**CO2 Component**	**243,437 Kg/mo.**	**536,719 Lbs/mo.**

Source notes: **1)** Estimated diversion distances as calculated above in Table 6.3.2; **2)** United States. Department of Energy. Transportation Energy Data Book: Edition 28. Oakridge National Laboratory. 2009. (www.cta.ornl.gov/data). 5-3. 2007 fuel economy for combination trucks. Given as 5.1 MPG. **4)** GHG emissions per unit of fuel used by Natural Resources Canada as presented regarding the FleetSmart program to the U.S.-Canada Transportation Border Working Group. Presentation slides on-line at: http://www.thetbwg.org/meetings/201004/D25Harvey.ppt . Slide 18. **5)** Transportation Energy Data Book:Edition 28 (above). 11.15. Carbon dioxide emissions from a gallon of diesel fuel. Given as 22.2 pounds per gallon.

6.4.1 GHG emissions in context

The Government of British Columbia released its Climate Action Plan (CAP) in June of 2008. (http://www.livesmartbc.ca/government/plan.html) The Action Plan sets targets for greenhouse gas reduction and policy measures to reduce emissions in each major economic sector. Examples include legislation and education to enact revenue-neutral carbon tax, a regional cap and trade system, emissions standards for vehicles, regulation of landfill gas emissions, a low-carbon fuel standard, and incentives for green community development.

A analysis of BC's CAP[4] estimated that, for the transportation sector, policy implementation would result in an annual reduction in C02e emissions of between 2,400 and 3,300 kilo tonnes (kt) by 2015 (range is a function of energy price scenarios). This represents a reduction of between 9 and 11 percent in GHG for the transportaton sector.

Looking back at the estimate of induced GHG emissions in Table 6.4.1 above – 321,227 kg/mo - and converting it to kt and expanding to an annual volume, the same estimate in comparable terms is that 3.85 kt of GHG per year would be introduced from a closure of Aldergrove-Lynden to trucks (321,227 kg x 12 = 3,854,724 kg = 3.85 kt).

Within the transportation sector, base-case GHG emissions specifically for British Columbia's *freight road transportation* sub-sector were estimated to be 7,600 kt in 2007[5]. Applying a 10 percent GHG reduction associated with BC's CAP policies, an annual 761 kt reduction in GHG should be attributable to the freight road subsector by 2015. Thus, the estimated emissions induced by truck diversions from Aldergrove-Lynden (3.85 kt GHG/yr) would counteract 0.51 percent of the expected reductions.

7. Conclusions

Based on 2008 northbound truck volumes, the Aldergove-Lynden crossing is the second busiest U.S.-Canada commercial crossing in British Columbia (after Pacific Highway).

During 2008, the Aldergrove-Lynden port saw $496 million USD of goods exported from Washington and $38 million USD of goods exported from British Columbia. (More on page 6)

Based on 2008 gross domestic product statistics, 21 percent of British Columbia's annual economic output ($32 billion CAD) and 15 percent of Washington's annual economic output ($49 billion USD) is generated by industries that produce exportable goods. These sectors individually, and the export sector collectively, depends on effective international connections, including access to land border ports-of-entry like Aldergrove-Lynden. (More on page 8)

Moving from a one-way measurement of exports to illustrate a binational economic connection, the large regional share of wood, metal, and mineral goods that enter British Columbia at Aldergove-Lynden represents sectors (manufacturing and forestry) that comprise 12 percent of Washington's economic output and are inputs into sectors (construction and retail) that make up over 12 percent of British Columbia's economic output. (More on page 8)

Based on comparisons of observed crossing choices and shortest-path traffic-model assignments, recent data show that Aldergrove-Lynden is not an "overflow route" for higher-volume crossings in the area. Rather, Aldergrove-Lynden serves a distinct population of carriers and shippers for whom the crossing is on the most efficient route. (More on page 10)

Evaluating a closure of Aldergrove-Lynden to trucks (in both directions) would require that the current population of users drive an additional 198,433 km (123,300 mi) per month. In addition to fuel and time costs and increased road wear, this has implications for increasing greenhouse gas emissions (both as a function of increased drive distances and increased idling time at other crossings)

Using established estimates of fuel economy and GHG emission per unit of fuel, it is estimated that cumulative truck travel added by loss of the Aldergove-Lynden route (in both directions) would generate

[4] British Columbia Climate Action Secretariat, *A Quantitative Analysis of British Columbia's Climate Action Plan*. By MKJA, MK Jaccard And Associates Inc. 2008. Table 11. http://www.livesmartbc.ca/attachments/appendices.pdf

[5] Natural Resources Canada, Office of Energy Efficiency, Transportation Sector British Columbia and Territories, Table 11: Freight Road Transportation Secondary Use and GHG Emissions by Energy Source. http://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/tablestrends2/tran_bct_11_e_4.cfm?attr=0

3.85 kilo tonnes of GHG emissions per year. In terms of BC's Climate Action Plan (CAP) goals, this hypothetical route closure would *cancel out* 0.51 percent of the annual GHG reduction expected from the freight road transportation sub-sector by 2015 (761 kt).

Introduction to appendices

The following appendices are map graphics that illustrate the routes used by cross-border commercial vehicles between their trip origins on one side of the border and their destination on the other side of the border.

The portrayed flows only represent cross-border commercial vehicles. "Domestic" traffic and passenger-vehicle traffic is not portrayed.

The trip-records that the graphics are based on come from surveys of cross-border commercial vehicle drivers conducted during June and July of 2009 at all three Cascade Gateway ports-of-entry in both directions. Over 5,000 records were gathered. Over 3,500 records had origins and destinations that could be usefully matched with the traffic analysis zones (TAZs) used in the cross-border traffic model. Those are the records plotted on the maps – assigned to the underlying transportation network (roads and border crossings). Thus, the assignment and corresponding volumes of flows (indicated by ranges of line-thickness), represent *proportional distribution* of cross-border commercial vehicle volume, not actual volumes relative to a unit time. These measures could be easily estimated by applying the corresponding percentage to observed monthly volumes (or daily, or hourly, etc.)

With the exception of Appendix B, the network assignment plots are created using an all-or-nothing assignment. This routine assigns the trip records to the road network using the shortest path between the two given trip end points.

For these analyses, even though the survey records include the actual crossing used, the first step of evaluating the individual utility of the commercial crossings relative to each other and to the regional transportation system was more effectively pursued by blending all records irrespective of the crossing where they were collected. This is to say that the portrayed volumes at each border crossing (and on each road segment for that matter) is not based on where the driver was interviewed but rather on where the model routed the truck based on the assumed preference of shortest distance—making the most efficient trip. As it turned out (more detail on page 10), with the exception of southbound traffic at the Lynden crossing (a permit port), model-based crossing selection matched very closely with observed distribution of Cascade Gateway truck trips among the crossings.

Note: Traffic volumes portrayed are commercial-vehicle trip records (trip origin & trip destination) collected at the region's three truck border crossings. While this graphic portrays proportionate cross-border routing, it is important to point out:

- Data does not include domestic traffic or any passenger vehicle traffic.
- Counts at borders or road segments are not adjusted to survey period base counts.
- Counts are distributed survey records, not observed volumes within a unit of time.
- Routes are assigned by the model on shortest-path criteria and may not match the actual route and border-crossings used. (though initial comparisons show a good fit).

APPENDIX A

Cascade Gateway Commercial Vehicle Assignment

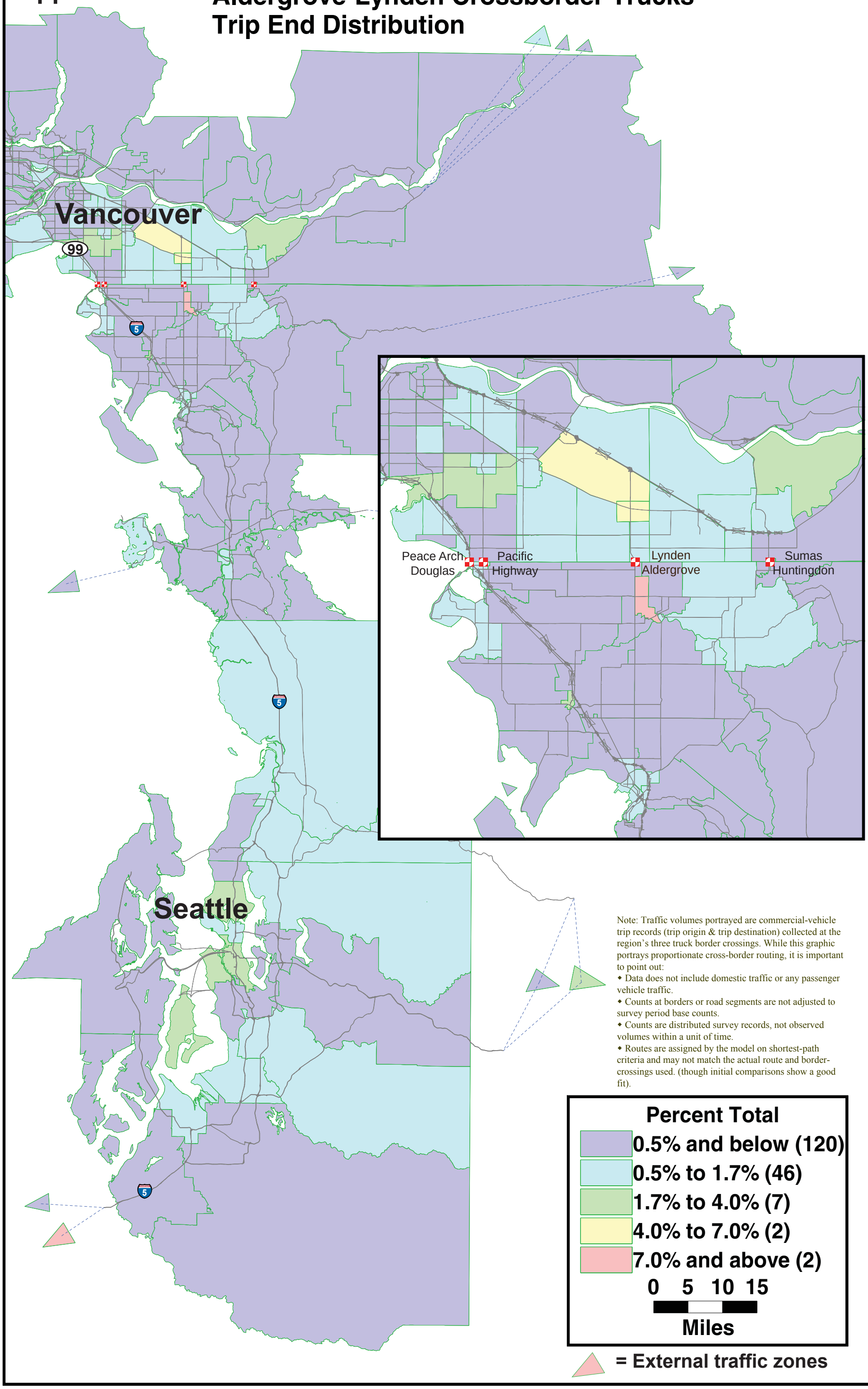
- 0 to 5
- 5 to 300
- 300 to 625
- 625 to 1250
- 1250 to 2500
- Other

0 2 4 6

Miles

Appendix B

Aldergrove-Lynden Crossborder Trucks
Trip End Distribution



Note: Traffic volumes portrayed are commercial-vehicle trip records (trip origin & trip destination) collected at the region's three truck border crossings. While this graphic portrays proportionate cross-border routing, it is important to point out:

- Data does not include domestic traffic or any passenger vehicle traffic.
- Counts at borders or road segments are not adjusted to survey period base counts.
- Counts are distributed survey records, not observed volumes within a unit of time.
- Routes are assigned by the model on shortest-path criteria and may not match the actual route and border-crossings used. (though initial comparisons show a good fit).

Percent Total

- 0.5% and below (120)
- 0.5% to 1.7% (46)
- 1.7% to 4.0% (7)
- 4.0% to 7.0% (2)
- 7.0% and above (2)

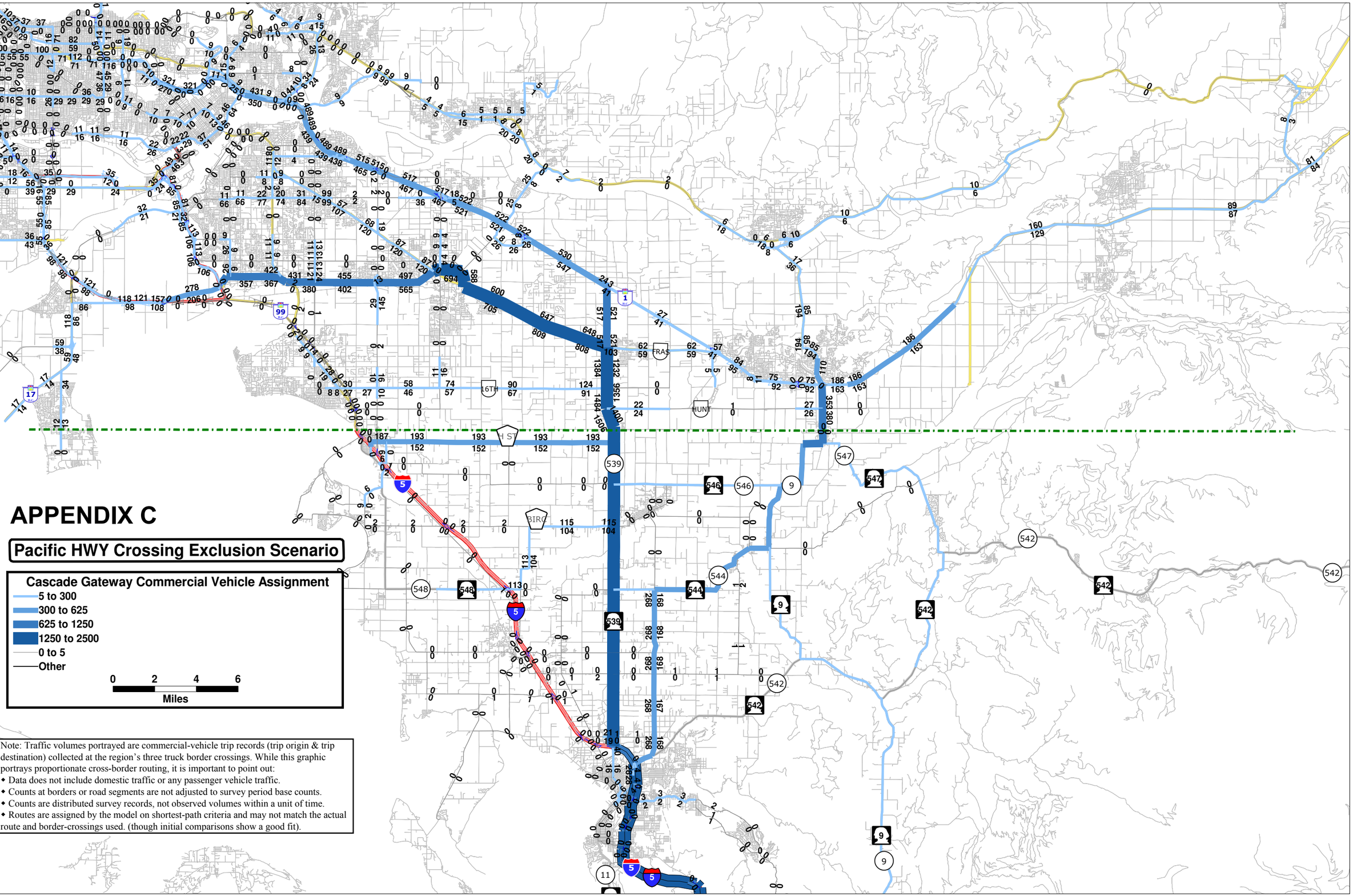
0 5 10 15

Miles

= External traffic zones

APPENDIX C

Pacific HWY Crossing Exclusion Scenario

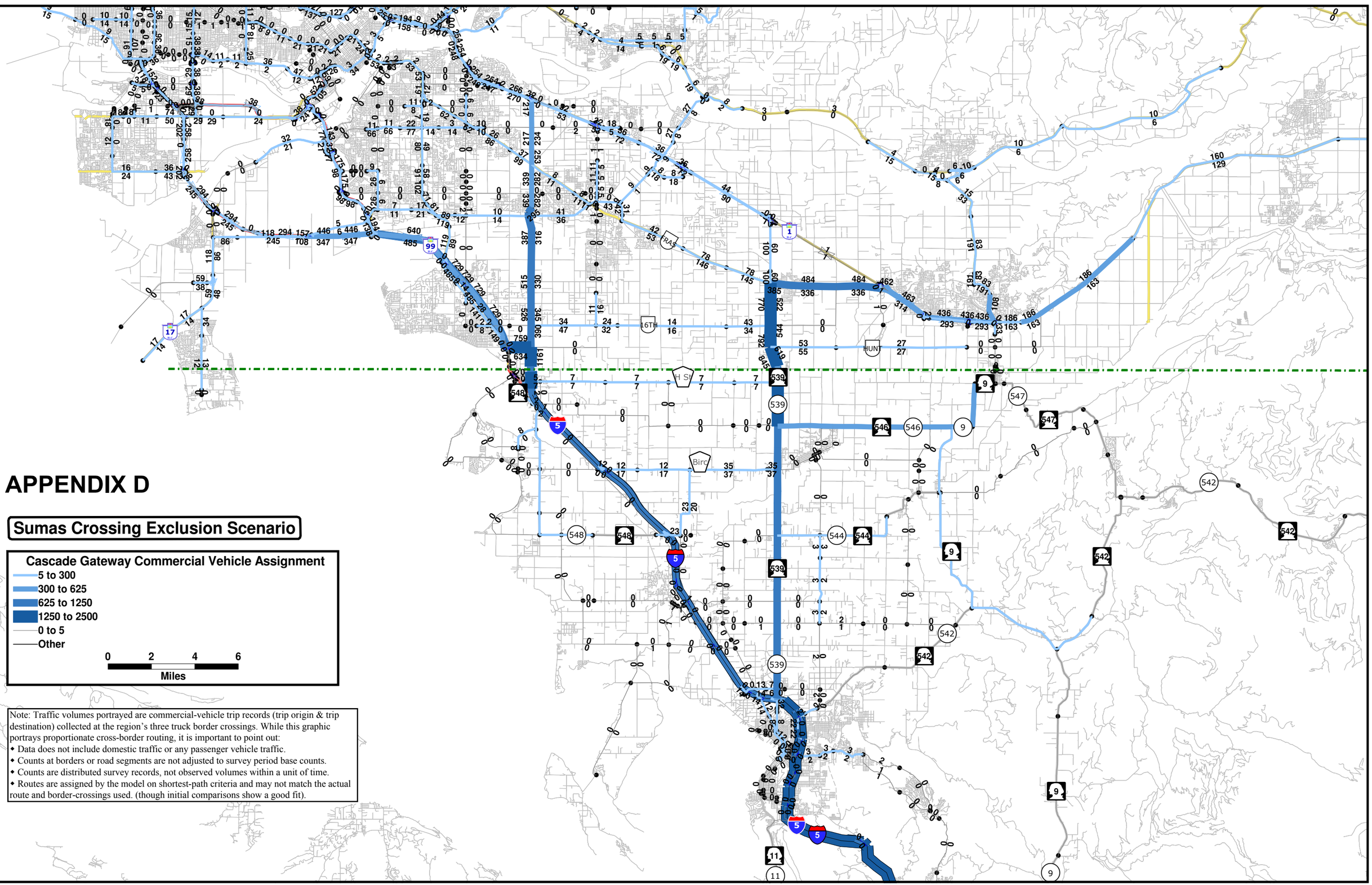


Note: Traffic volumes portrayed are commercial-vehicle trip records (trip origin & trip destination) collected at the region's three truck border crossings. While this graphic portrays proportionate cross-border routing, it is important to point out:

- Data does not include domestic traffic or any passenger vehicle traffic.
- Counts at borders or road segments are not adjusted to survey period base counts.
- Counts are distributed survey records, not observed volumes within a unit of time.
- Routes are assigned by the model on shortest-path criteria and may not match the actual route and border-crossings used. (though initial comparisons show a good fit).

APPENDIX D

Sumas Crossing Exclusion Scenario



Note: Traffic volumes portrayed are commercial-vehicle trip records (trip origin & trip destination) collected at the region's three truck border crossings. While this graphic portrays proportionate cross-border routing, it is important to point out:

- Data does not include domestic traffic or any passenger vehicle traffic.
- Counts at borders or road segments are not adjusted to survey period base counts.
- Counts are distributed survey records, not observed volumes within a unit of time.
- Routes are assigned by the model on shortest-path criteria and may not match the actual route and border-crossings used. (though initial comparisons show a good fit).

APPENDIX E

Lynden Crossing Exclusion Scenario

Cascade Gateway Commercial Vehicle Assignment

- 5 to 300
- 300 to 625
- 625 to 1250
- 1250 to 3000
- 0 to 5
- Other

0 1.5 3 4.5

Miles

Note: Traffic volumes portrayed are commercial-vehicle trip records (trip origin & trip destination) collected at the region's three truck border crossings. While this graphic portrays proportionate cross-border routing, it is important to point out:

- Data does not include domestic traffic or any passenger vehicle traffic.
- Counts at borders or road segments are not adjusted to survey period base counts.
- Counts are distributed survey records, not observed volumes within a unit of time.
- Routes are assigned by the model on shortest-path criteria and may not match the actual route and border-crossings used. (though initial comparisons show a good fit).

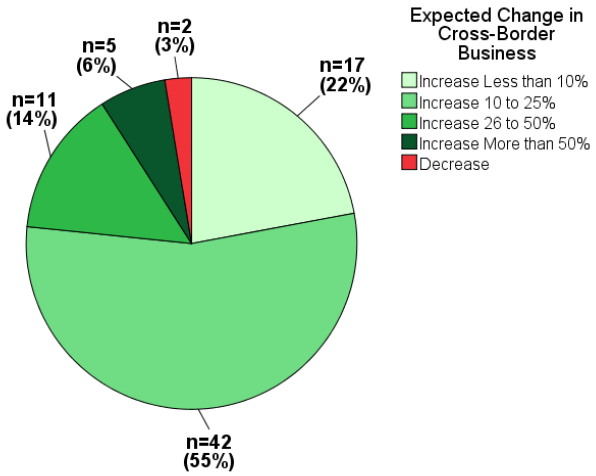
Cross Border Survey 2009 – Summary of Results

There were 154 responses to the survey (sum of BCTA and BCCC results). Of these 78 were from the target population of companies (i.e., companies with private or for-hire fleets, excluding motor coaches).

Growth in Cross-Border Business

Over 75% of respondents indicated that they expect an increase of up to 25% in cross-border business over the next 5 to 10 years. Only 2 respondents indicated that they expect a decrease.

Figure 1: Expected Growth in Cross Border Business



Expect to Move or Stay at Current Location

Most respondents indicated that they do not expect to move their primary terminal to a new location within the next 5 to 10 years. In fact, 62 respondents (86%) indicated that they intend to stay at their current location, 4 (6%) indicated that they expect to move, and 6 (8%) that they are uncertain.

Of those respondents that indicated that they expect to move:

1 is currently in Delta and provided Surrey or Langley as a potential new location.

1 is currently in Burnaby and provided “East Lower Mainland” as a potential new location.

1 is currently in Kelowna and intends to relocate in Kelowna.

1 is currently in Surrey, but did not provide a new location.

Respondents provided the following reasons for moving:

To expand (n=3).

To be closer to customers/operational reasons (n=2)

To be more convenient for their employees (n=2)

To find a more truck friendly environment (n=1)

Primary versus Preferred Border Crossing

Pacific Highway was the primary crossing for the highest proportion of companies in the northbound direction of travel. It was followed by Aldergrove and Huntingdon. Approximately 20 percent of respondents indicated that their company uses multiple northbound crossings.

Table 1: Primary by Preferred Border Crossing (Northbound)

	Preferred Crossing				
Primary Crossing	Pacific Highway	Aldergrove	Huntingdon	**Total**	**%**
Pacific Highway	32	0	2	**34**	**45**
Aldergrove	0	18	0	**18**	**24**
Huntingdon	0	2	5	**7**	**9**
Multiple Crossings	6	7	3	**16**	**21**
Pac Hwy or Aldergrove	*2*	*3*	*0*	***5***	***7***
Pac Hwy or Huntingdon	*3*	*0*	*0*	***3***	***4***
Aldergrove or Huntingdon	*0*	*2*	*1*	***3***	***4***
All three	*1*	*2*	*2*	***5***	***7***
Total	**38**	**27**	**10**	**75**	**100**
%	**51**	**36**	**13**	**100**	
3 missing responses					

This order did not change when respondents were asked to pick a preferred crossing in the northbound direction (i.e., "best" crossing). However, 36% of respondents chose Aldergrove as their preferred crossing, which is an increase of 12% relative to the proportion that indicated using it as their primary crossing (net change of 9 respondents).

The change was the result of respondents that indicated using multiple crossings "committing" to Aldergove or "diverting" from their primary crossing to Aldergrove as a preferred choice.

7 respondents that indicated using multiple crossings committed to Aldergrove (+9%).

2 respondents diverted from Huntingdon to Aldergrove (+3%).

Pacific Highway was also the primary crossing for the largest proportion of respondents in the southbound direction of travel. Unlike the ranking of primary crossings in the northbound direction, Lynden (Aldergove) and Sumas (Huntingdon) were evenly ranked in the

southbound direction. As was the case in the northbound direction, 20% of respondents indicated using multiple crossings in the southbound direction.

Table 2: Primary by Preferred Border Crossing (Southbound)

	Preferred Crossing				
Primary Crossing	Pacific Highway	Lynden	Sumas	**Total**	**%**
Pacific Highway	25	3	0	**28**	**39**
Lynden	2	12	0	**14**	**20**
Sumas	2	3	10	**15**	**21**
Multiple Crossings	4	6	4	**14**	**20**
Pac Hwy or Lynden	*1*	*1*	*0*	***2***	***3***
Pac Hwy or Sumas	*3*	*1*	*2*	***6***	***9***
Lyden or Sumas	*0*	*3*	*2*	***5***	***7***
All three	*0*	*1*	*0*	***1***	***1***
Total	**33**	**24**	**14**	**71**	**100**
%	**47**	**34**	**20**	**100**	
7 missing responses					

When asked about southbound preferences, Pacific Highway remained the highest ranked crossing. However, there was a strong preference for Lynden over Sumas. Lynden was chosen as the preferred crossing by 34% of respondents, up from 20% of respondents that picked it as a primary crossing (net change of 10 respondents).

3 respondents from Pacific Highway and Sumas respectively diverted to Lynden (+8.5%)

6 respondents that indicated using multiple crossings committed to Lynden (+8.5%)

2 respondents diverted from Lynden to Pacific Highway (-3%)

The differences in proportions between primary and preferred crossings suggest that there is a gap between commercial carrier preferences and the actual border crossings that they use.

Importance of Proximity, Primary Terminal Location, and Border Crossing Preferences

The majority of respondents indicated that the proximity of their main terminal/yard to their primary border crossing is either critical or very important (65%, n=50). Another 22% (n=17) indicated that it is somewhat important. Most respondents also indicated that their primary terminal for cross-border operations is located in the South Fraser Region (67%, n=42). Using company addresses from BCTA's membership database, the South Fraser Region is also the terminal location for 46% of all BCTA members that provide cross-border service.

Table 3: Primary Terminal Location

Region	Survey		BCTA Members	
	n	%	n	%
North Fraser *(Burnaby)*	3	4.8	40	14.4
South Fraser	42	66.7	126	45.5
Langley, Pitt Meadows, Maple Ridge	*12*	*19.0*	*30*	*10.8*
Delta	*8*	*12.7*	*22*	*7.9*
Surrey	*8*	*12.7*	*33*	*11.9*
Abbotsford, Mission	*8*	*12.7*	*34*	*12.3*
Aldergrove	*6*	*9.5*	*7*	*2.5*
WA – I-5 Corridor (Blaine, Bellingham, etc)	5	7.9	6	2.2
WA – East of I-5 Corridor (Lynden)	2	3.2	2	0.7
Vancouver Island	2	3.2	21	7.6
Outside Pacific Gateway Region	9	14.3	82	29.6
Total	**63**	**100.0**	**271**	**100.0**

The regions were aggregated into four zones based on the preferred border crossing for the largest proportion of companies in each region. For example, over 75% of respondents with primary cross-border terminals in Burnaby, Delta, Surrey, or along the I-5 Corridor in Washington State indicated that Pacific Highway is their preferred northbound and southbound crossing. As such, the 4 "regions" form a single zone with a preference for the Pacific Highway crossing (see Table 4, Zone 1).

Table 4: Preferred Border Crossing by Terminal Location

	Companies		Preferred Border Crossing					
	n	%	Northbound	n	%	Southbound	n	%
Zone 1	24	38.1	**Pacific Highway**	**19**	**83**	**Pacific Highway**	**18**	**75**
Burnaby, Delta, Surrey			Aldergrove	4	17	Lynden	6	25
WA I-5 Corridor			Huntingdon	0	0	Sumas	0	0
			Total	23	100	Total	24	100
Zone 2	12	19.0	**Aldergrove**	**7**	**58**	**Lynden**	**6**	**50**
Langley, Pitt Meadows,			Huntingdon	3	25	Sumas	3	25
Maple Ridge			Pacific Highway	2	17	Pacific Highway	3	25
			Total	12	100	Total	12	100
Zone 3	16	25.4	**Aldergrove**	**10**	**67**	**Lynden**	**10**	**63**
Aldergrove, Abbotsford,			Huntingdon	4	27	Sumas	6	38
Mission, WA East of I-5			Pacific Highway	1	7	Pacific Highway	0	0
			Total	15	100	Total	16	100
Zone 4	11	17.5	**Pacific Highway**	**7**	**64**	**Pacific Highway**	**6**	**55**
Vancouver Island			Huntingdon	3	27	Sumas	5	45
Outside Gateway			Aldergrove	1	9	Lynden	0	0
			Total	11	100	Total	11	100
Total	**63**	**100.0**	**Total**	**61**	**100**	**Total**	**63**	**100**

Chi-square tests confirmed an association between terminal location and preferred border crossing in both directions of travel. Respondents in Zone 1 and 4 preferred Pacific Highway and those in Zone 2 and 3 preferred Aldergrove/Lynden.

Northbound: Pearson Chi-square: 30.287, Cramer's V: 0.498 (max 1), sig. 0.001

Southbound: Pearson Chi-square: 32.398, Cramer's V: 0.507 (max 1), sig. 0.001

Other Factors Affecting Border Crossing Choice

Table 5: Northbound

Reason	Northbound		Southbound	
	n	%	n	%
Located on Shortest Route	65	83.3	58	74.4
24-hour Service	43	55.1	41	52.6
Has Broker Facilities	32	41.0	32	41.0
Driver Chooses Crossing	23	29.5	24	30.8
Has Truck Parking	23	29.5	20	25.6
Has FAST Lane	16	20.5	16	20.5
Adequate Secondary Inspection Facilities	16	20.5	14	17.9
Accommodates Over-dimensional Loads	14	17.9	11	14.1
Directed by Customer to Use Crossing	11	14.1	11	14.1
Can process DG/HazMat	10	12.8	9	11.5

Several respondents also provided "other" reasons for choosing a particular crossing:

Fast processing times – Aldergrove (n=4)

Specifically chose to locate their primary cross-border terminal near a given crossing (n=5).

- Pacific Highway (n=1), Aldergrove (n=2), Huntingdon (n=2)

Best access to Fraser Valley – Huntingdon (n=1)

Respondents that indicated 24 hour service is a factor that drives crossing choice also appeared to favour Pacific Highway as a preferred crossing. Chi-square tests confirmed that this association is significant in the southbound direction of travel and *indicative* in the northbound direction of travel.

Northbound: Pearson Chi-square: 5.296, Cramer's V: 0.266 (max 1), sig. 0.071 (*indicative*)

Southbound: Pearson Chi-square: 7.337, Cramer's V: 0.311 (max 1), sig. 0.026

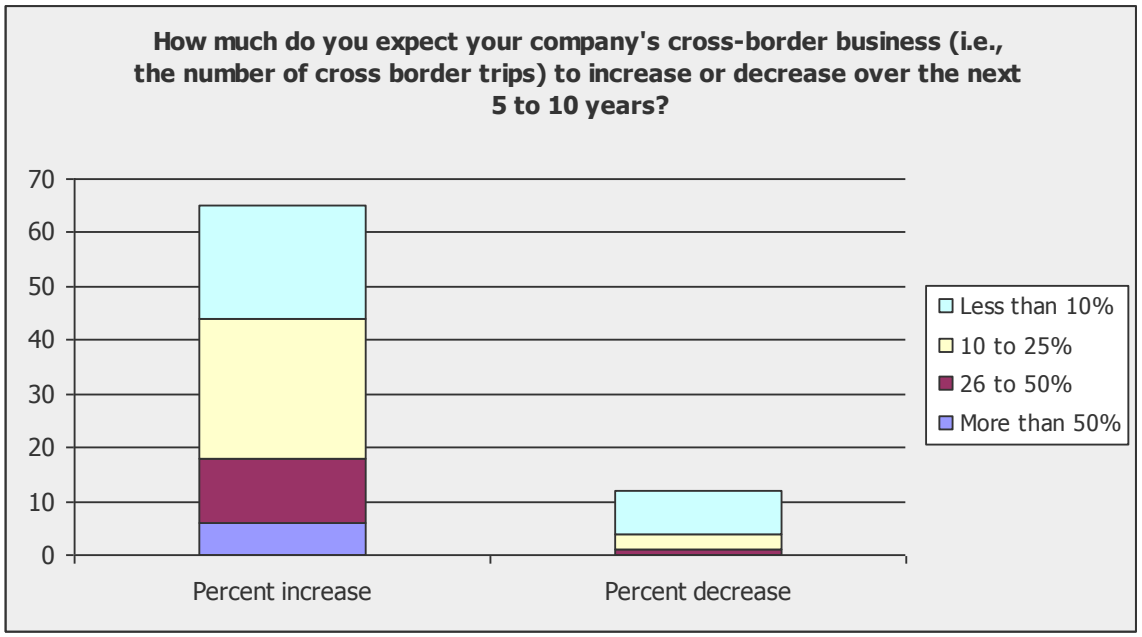
BC Chamber of Commerce & Coalition of Chambers of Commerce and Boards of Trade

Cross Border Survey 2009 – Summary of Results

There were varying responses to the survey questions, the answers to which some were skipped either for reasons of being considered irrelevant, non-applicable or unknown.

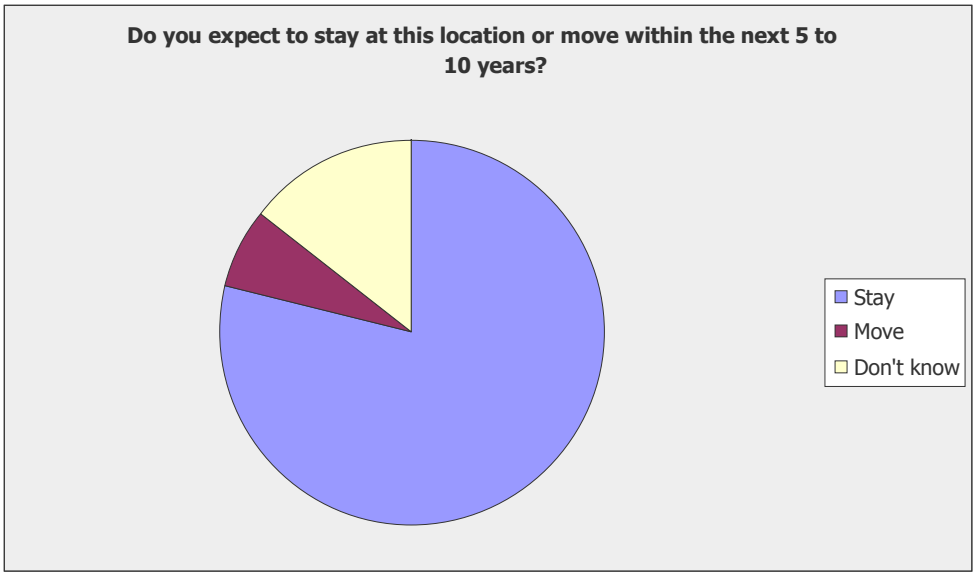
Growth in Cross-Border Business

Over 84 per cent of respondents indicated that they expect an increase in cross-border business over the next 5 to 10 years.



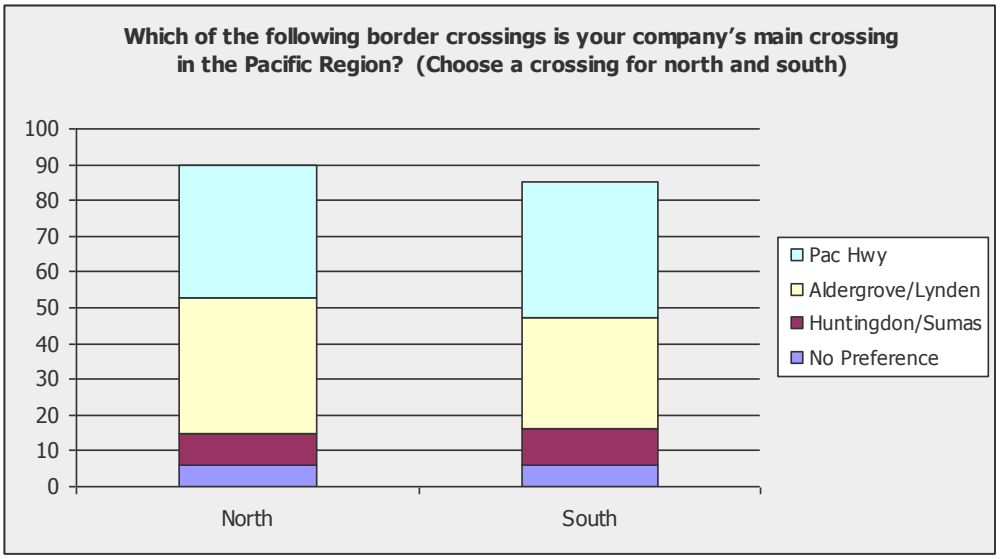
Expect to Move or Stay at Current Location

Most respondents indicated that they do not expect to move their primary location to a new location within the next 5 to 10 years. There was a high expectation that respondents would not be moving their primary location with 79% indicating that they would not be moving their location in the next 5 to 10 years with only 6.5% expecting to move and a further 14.5% unsure.

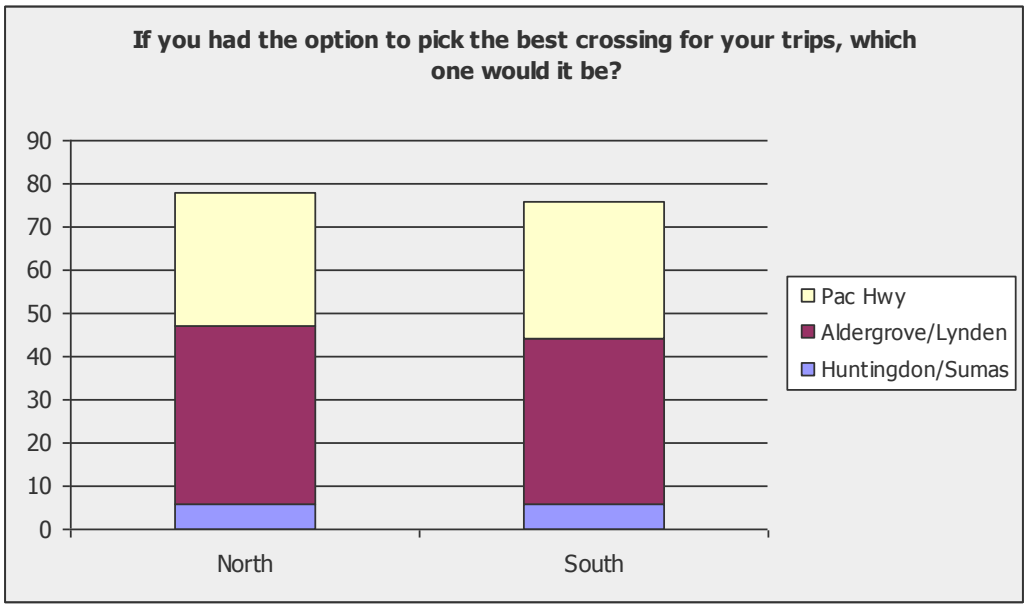


Primary versus Preferred Border Crossing

Respondents indicated that Pacific Highway and Aldergrove/Lynden were basically equal as the **primary crossing** northbound at 37% and 38% respectively and Pacific Highway preferred by 38% southbound - with Lynden/Aldergrove as a second choice at 31% and Sumas/Huntingdon as a poor third choice with only 10% of respondents using this crossing as their main crossing in the Pacific Region.

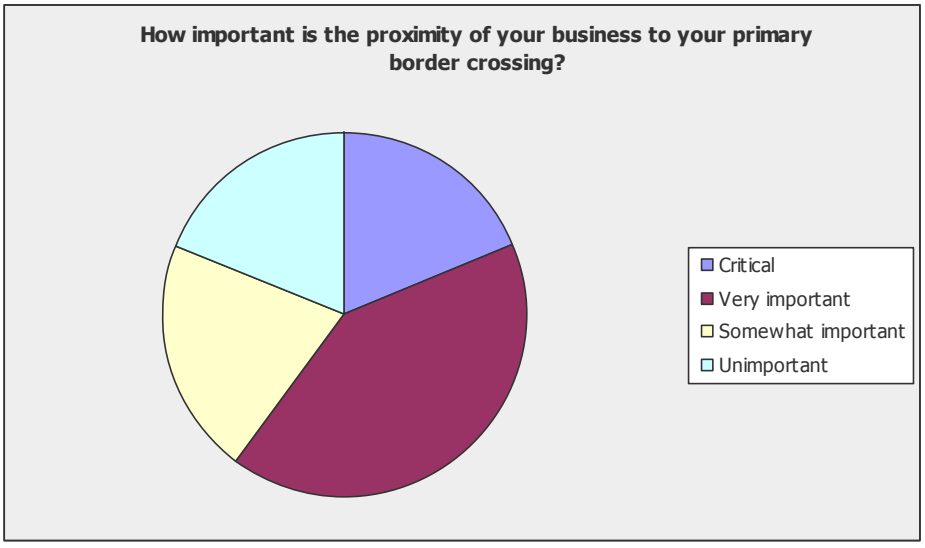


If respondents had the option to pick a **preferred crossing**, 53 per cent chose Aldergrove/ Lynden for northbound traffic and 50 per cent chose Lynden/Aldergrove for southbound traffic as compared with less than 10 per cent in relation to Huntington/Sumas. It is noted that Pacific Highway was less favorable as compared with Aldergrove/Lynden.



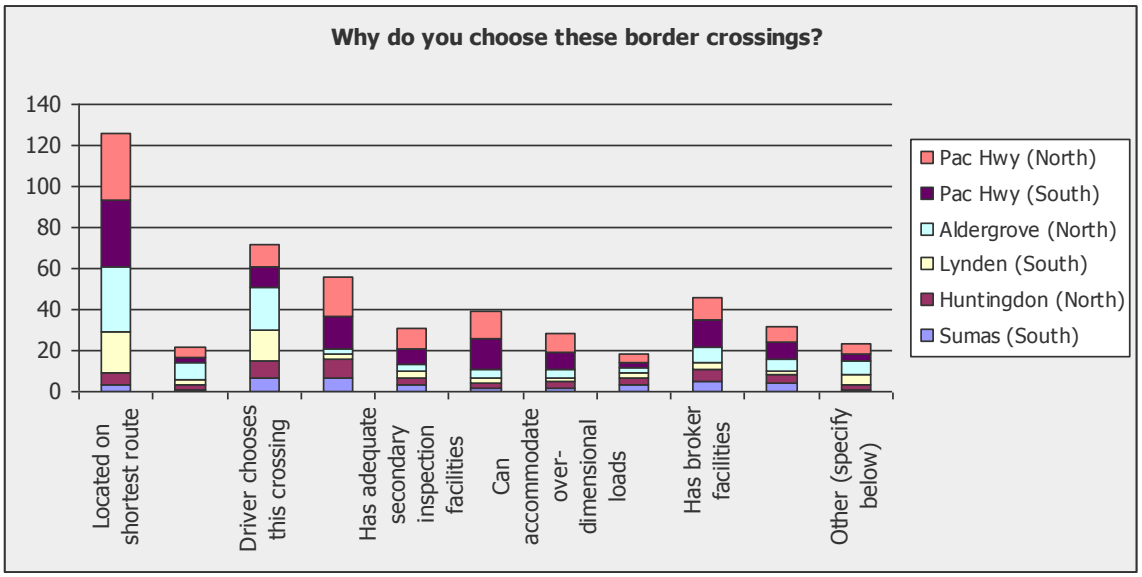
Importance of Proximity of Business in relation to Border Crossing

The majority of respondents indicated that the proximity of their business in relation to the border crossing was either critical (18.8%) or very important (41.3%) while only the minority (18.8%) indicated that proximity was unimportant.



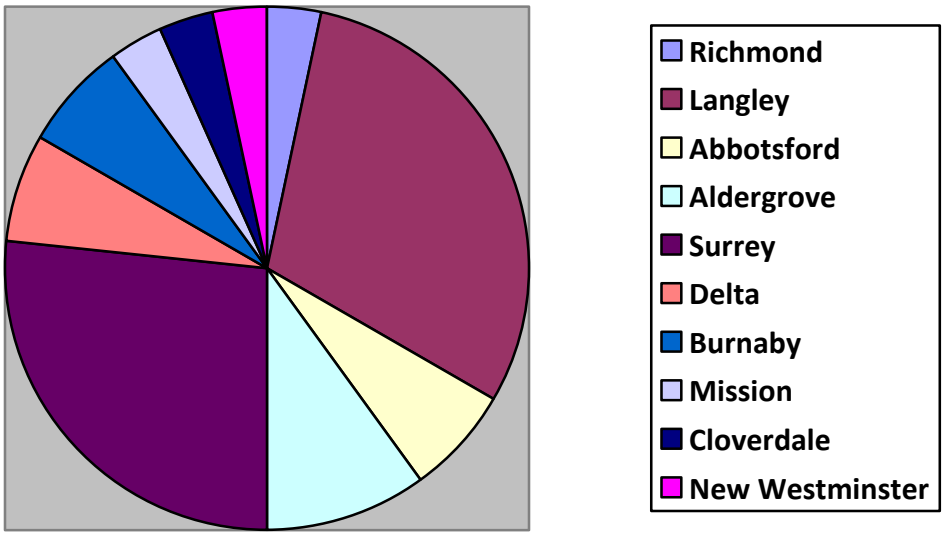
Other Factors Affecting Border Crossing Choice

The majority of respondents indicated the primary choice of border crossing was in relation to it being the shortest route and the second choice was that the crossing provides 24/7 commercial service. It should be noted that one of the questions is flawed in relation to "broker facilities" as Customs clearance can be accommodated "electronically" at any of the crossings in question. Also the questions as to whether the driver or the customer controls or selects the border crossing is somewhat dubious inasmuch as such is more frequently determined by collective consultation. Invoice documentation originating with the seller and/or shipper initiates the process which is in most cases electronically transmitted to the Customs Broker. Pre-Arrival electronic manifesting to Customs by the importing carrier provides routing and corresponding shipment identification reference. Communication to the Customs Broker confirms the port at which Customs clearance is to be arranged.



RESPONDENTS IDENTIFABLE GEOGRAPHIC LOCATION:

The following graph represents participating respondents which have been allocated on a geographical origin basis:



As we can see there is good distribution on a regional basis from the respondents to the survey. The largest response was from Langley which represented 30% of the responses, followed by Surrey with 27% of the responses and then Aldergrove with 10%. Of the other communities Abbotsford, Delta and Burnaby each provided 7% of the respondents with the remaining communities, Mission, Cloverdale, Richmond and New Westminster each providing approximately 3% of responses.

OVERVIEW SUMMARY:

The B.C. Chamber of Commerce has previously been the recipient of serious concern and corresponding alarm from amongst our membership over the 2009 expressed potential future closing of the Port of Aldegrove to commercial traffic. The importance of this crossing and port of entry is again demonstrated by respondents participation with the Cross Border Survey 2009 outlined above. The volume of traffic entering British Columbia at this crossing is outlined in the following table which outlines statistics for 2008 in which it is noted that Aldegrove handled 74,040 trucks during 2008 and as such was the 2nd busiest crossing in all of British Columbia.

	2008 Northbound Cross-border Trucks			
Rank	Port_Name	US State		Northbound Trucks
1	P HWY	WA	Pacific Highway	356,380
2	**ALDER**	**WA**	**Aldergrove**	**74,040**
3		ID	Kingsgate*	46,006
4	HUNTG	WA	Hungtingdon	43,286
5	OSOYS	WA	Osoyoos	39,075
6	PATSN	WA	Paterson	20,046
7		MT	Roosville*	17,768
8	NELWY	WA	Nelway	10,752
9		ID	Rykerts*	8,523
10	BO BA	WA	Boundary Bay	5,327
11	CASC	WA	Cascade	4,862
12	CHOPK	WA	Chopaka	852
13	CARSN	WA	Carson	234
14	VIC	WA	Victoria	133
15	MIDWY	WA	Midway	73
16	SIDNY	WA	Sidney	19
17	WAN	WA	Waneta	6
18	DOUG	WA	Douglas	0
		*	Total truck count from 2004	

Obviously, greater emphasis needs to be placed on the volume of trucks handled at the Port of Aldergrove in relation to the congestion and border delay impact of potentially diverting 74,000 plus trucks per annum to alternate border crossings - which ports of entry are frequently already confronted with serious congestion, delay and wait times.

Additionally it is important to recognize that, within the Cascade Gateway as a system, “alternate” crossings should continue to be maintained and available when and as required. The State of Washington has improved and widened State Route 539 from Bellingham to Lynden. All but five miles closest to the border have now been completed. Aside from the primary crossing at Blaine/Pacific Highway, SR 539 is the closest, most advanced and convenient alternate routing to the Lower Mainland of British Columbia and as such should be the principal choice for an “alternate” gateway.