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Washington State's Economy in Relation to Canada and the Border

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WASHINGTON STATE’S ECONOMY IN RELATION TO CANADA AND THE BORDER
ABOUT THE BORDER POLICY RESEARCH INSTITUTE

The BPRI focuses on research that informs policy-makers on matters related to the Canada-U.S. border. Policy areas of importance include transportation and mobility, security, immigration, energy, environment, economics and trade.

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WASHINGTON STATE’S ECONOMY IN RELATION TO CANADA AND THE BORDER

Paul Storer, Ph.D. • David Davidson • Laurie Trautman, Ph.D.

HIGHLIGHTS: FLOWS OF PEOPLE

- Washington State and Canada are connected by many transport facilities: 13 highways, 4 rail lines, 3 ferry routes, 7 pipelines (4 natural gas, 1 crude oil, 1 water, 1 sewer), and 2 electric interties. p. 2

- Four highway crossings (Peace Arch/Douglas, Pacific Highway, Lynden/Aldergrove, and Sumas/Abbotsford) serve the I-5 corridor, connecting the Lower Mainland of B.C. to Western Washington and the lower 48 states. The crossings are collectively called the Cascade Gateway, and with reference to all vehicles that cross the Washington – Canada border, the Cascade Gateway handles 79% of cars, 87% of trucks, 96% of buses, and 86% of trains. The eight highway crossings in Eastern Washington collectively handle just 7% of car traffic. p. 15

- One highway connects Pt. Roberts, Washington, to Canada. A geopolitical oddity, Pt. Roberts is a peninsula of U.S. territory that attaches to Canada, rather than to the U.S. Home to just 1,300 residents, the crossing at Pt. Roberts nevertheless accounts for 14% of car traffic between Washington and Canada. p. 16

- All five crossings in Western Washington (Pt. Roberts together with the Cascade Gateway) are among the 15 busiest along the entire Canada – U.S. border. Of the 120 highway crossings that connect the two countries, the Peace Arch crossing is the busiest, handling an average of 8,300 cars per day. p. 18

- B.C.’s Lower Mainland is home to 3 million people, and the distance and terrain that separates the Lower Mainland from the Canadian interior makes southbound travel (via the I-5 corridor) an attractive option. Lower Mainland residents account for 70 to 80% of the traffic at the Cascade Gateway crossings. The preponderance of Canadians results in a daily pattern of border delays, with large southbound queues in the morning, and large northbound ones in the afternoon as Canadians return home. p. 28

- At the Cascade Gateway, Canadians’ cross-border trips are of a discretionary nature. About 30% are associated with vacation/recreation, while 60% involve shopping (including purchase of gasoline, as well as retrieval of online purchases delivered to U.S. mailboxes). Only 2% are work related. p. 21

- Americans’ cross-border trips are oriented more toward vacation/recreation (58%) and less toward shopping (4%). Work-related trips are more prevalent (15%), and 18% of trips involve visits to family that live in B.C. p. 21

- With the bulk of Cascade Gateway traffic consisting of Canadians involved in shopping, vacation, and recreation, the currency exchange rate influences the amount of travel—traffic is greater when the Canadian dollar is relatively strong. Recently, total annual traffic peaked in 2013 and has since slowly declined, as the Canadian dollar has weakened. p. 21

- In Whatcom County, Washington, abutting the Lower Mainland, Canadian shoppers have a significant impact upon the economy, with between 6 and 16% of taxable retail sales in the county attributable to Canadians. p. 23

- Vacation-related travel is seasonal, so traffic at all Washington – Canada crossings is significantly greater in the summer. At the Cascade Gateway, peak summer volumes are about 50% higher than winter troughs, creating a staffing challenge for customs agencies. p. 18

The full report is available at www.wwu.edu/bpri
More information about each topic can be found at the given page in the report.
HIGHLIGHTS: FLOWS OF GOODS

- Washington's economy is unusually dependent upon exports. In most other states and most large global economies (i.e., the U.S., Canada, France, India, Italy, Japan, U.K.) imports are greater than or equal to exports, when expressed as a fraction of a given economy's GDP. The reverse is true in Washington, with exports equal to a 19% share of state GDP, in comparison to the 12% share associated with imports. p. 3

- Washington's dominant export is aerospace products (think Boeing), with agricultural products and refined energy products rounding out the top three categories. China, the primary export destination, accounts for 23% of exports, about double the share destined for Canada, the second-ranked destination. The roles are reversed with respect to imports, with Canada, source of 31% of Washington's imports, accounting for double the share that originates in second-ranked China. p. 4

- Trade between Washington and Canada is asymmetric in composition. Imports from Canada are skewed toward “resource” categories (e.g., fossil fuels, wood products, live animals), while various types of machinery (aerospace, mechanical, electrical, automotive) weigh heavily in Washington's export stream. Energy products are the primary category in both the import and export stream, with natural gas and crude oil flowing south to Washington refineries and consumers, and refined products sent north to Canada. p. 5

- The asymmetric composition of trade results in a corresponding asymmetry of transportation modes. Imports of resource commodities and fossil fuels heighten the importance of pipelines and railroads, which respectively handle 47% and 10% of Washington's imports from Canada. Just 32% of imports are carried by truck. With respect to exports, 68% are carried by truck and a surprising 12% are carried by vessel (refined fuels barged north from Washington's coastal refineries). p. 7

- Empty loads are a consequence of the asymmetric nature of trade and of transport mode. At the Cascade Gateway, northbound trucks are usually loaded, whereas 50% of southbound trucks are empty. Because most trucking companies engaged in cross-border commerce are based in B.C., a common pattern is an empty southbound trip in the morning followed by a loaded backhaul later in the day. p. 12

- At the Cascade Gateway, the populous Lower Mainland is overwhelmingly the destination of northbound trucks, as well as the origin of southbound ones (i.e., about 91% in each case). But those trucks reach a diverse set of locations in the U.S.—about 60% travel to/from points in Central or Northern Puget Sound, while the remainder travel to/from elsewhere in Washington (17%), elsewhere in the Western U.S. (16%), or elsewhere in the U.S. (6%). p. 11

- While Washington's main Canadian trade partners are the nearby provinces of B.C. and Alberta, the distant provinces of Ontario and Quebec together serve as the destination of 20% of Washington's exports and the origin of 15% of its imports. The importance of partners such as Alberta, Quebec, and Ontario means that a significant share of the goods moving between Canada and Washington is handled at crossings located in states to the east. Similarly, Washington's crossings handle large volumes of trade that is occurring between B.C. and other U.S. states. The main Canada – U.S. crossings, including the Cascade Gateway, are of vital importance throughout North America. p. 9

- Canada is a significant source of both business investment and skilled labor. Many corporations in Washington are linked to Canadian investors/owners, particularly in near-border cities—i.e., 8% of the corporations in Blaine and 4% of those in Bellingham are Canada-linked. With respect to workforce, Canada is among the top five source countries for approved skilled-immigrant labor applications, and Microsoft and Amazon (both Washington-based) are the top- and second-ranked employers of Canadians that receive labor certifications for U.S. residency. p. 24, 26

The full report is available at www.wwu.edu/bpri
More information about each topic can be found at the given page in the report.
The Border Policy Research Institute (BPRI) was launched ten years ago under the guidance of Don Alper, the founding Director, and David Davidson, Associate Director. The principal motivation for the creation of the BPRI was the need for evidence-based research to guide border policy in the aftermath of the 9/11 terrorist attacks. As this report will show, the border is integral to Washington State’s trade relationship with Canada and global markets. Since it was founded, the BPRI has generated a steady stream of applied research and become an institution that is respected and trusted both in Washington State and internationally. Travel, trade, and economics have been at the heart of this body of research, and much of the research has had a focus on the Pacific Northwest. The BPRI has also supported the work of Washington and the Pacific Northwest in developing innovative border policies such as the PACE/NEXUS trusted-traveler program, enhanced drivers licenses, and modifications to the FAST trusted-trader program.

In 2012, Professor William Anderson of the University of Windsor published a report titled “The Border and the Ontario Economy.” Here at the BPRI, we quickly realized the value of using our accumulated body of research pertaining to Washington’s relationship with Canada to develop a similar report. While these two studies have much in common in terms of structure and methodology, there are also differences due to the fact that the province of Ontario and the state of Washington play distinct roles in the Canada – U.S. business and economic relationship.

This report, then, looks comprehensively at the Canada – U.S. border and its impact on the economic relationship between Washington State and Canada. The relationship has significant effects in both directions. Flows of goods, services, assets, and people between Canada and Washington reflect wide and deep economic relationships of mutual benefit. Specific topics to be examined include issues such as cross-border shopping, trade in energy products, border security, and labor mobility. Most of these issues have been examined previously in isolation, but this report combines various research results into a consolidated analysis. The prior research efforts have been the work of many colleagues, including:

- At Western Washington University: Steve Globerman, Mark Springer, Hart Hodges, Matt Roelofs, Anneliese Vance. Dozens of Western students have also contributed to the BPRI through their thesis work, duties as research assistants, and participation in the collection of data through field projects. Mia Nafziger and Brianna Kastning provided outstanding research assistance for this report.

- At other universities: Anne Goodchild, Katie Friedman, Ken Casavant, Eric Jessup.

- At the Whatcom Council of Governments (BPRI’s partner on essentially all field research at the border): Hugh Conroy, Melissa Fanucci, Jaymes McClain.

- Within government: Field research would not have been possible without the support of a succession of officials at U.S. Customs and Border Protection and at the Canada Border Services Agency. The BPRI has also been aided by the staff of the Canadian Consulate (Seattle) and the U.S. Consulate (Vancouver).

- The guidance, feedback, and enthusiastic participation of the External Advisory Board members have contributed significantly to the mission of the BPRI.

- Finally, the willingness of ordinary citizens to participate in surveys has enabled BPRI researchers to assemble datasets that have provided many insights over the years.

Research costs money, and chief among the entities that have helped fund projects are the U.S. Federal Highway Administration, Transport Canada, the Washington State Department of Transportation, the B.C. Ministry of Transportation and, of course, Washington State, which provides the BPRI’s base operating funds. Financial support for this report was provided by the Social Sciences and Humanities Research Council of Canada, by way of a Partnership Grant that funds the “Borders in Globalization” project managed by the University of Victoria.

Like all BPRI publications, this report is intended to be a guide to policy makers and analysts who seek to improve the well-being of the people of Washington as well as neighboring states and Canadian provinces.

Paul Storer, Ph.D.
May 2015
TABLE OF CONTENTS

Introduction .................................................................................................................................................... 1

Flows of Goods ................................................................................................................................................ 3
  Washington State Trade as a Share of GDP ................................................................................................ 3
  Country Distribution of Washington Trade .............................................................................................. 4
  Trade in Goods: Canada Relative to the World ......................................................................................... 5
  Mode of Transport....................................................................................................................................... 7
  Economic Integration, Intra-industry Trade, and Clusters ..................................................................... 8
  Which Border Crossings Handle Washington’s Trade? ........................................................................... 9
  Flows of Goods Through the Cascade Gateway ....................................................................................... 11
  Expected Future Trade Trends ................................................................................................................ 12

Flows of Services, People, and Business .................................................................................................... 14
  Cross-Border Flows of People: Short-Term Trips .................................................................................. 14
    Traffic Volumes, Crossing Points, Modes, and Trends ...................................................................... 14
    Trip Purposes and Destinations ............................................................................................................. 20
    Where do Canadians Shop? .................................................................................................................. 22
    Economic Impact of Shopping and Tourism ......................................................................................... 23
      How Much Is Being Spent by Canadians in Washington? ............................................................... 23
      Does Cross-Border Shopping Stabilize or Destabilize Border Counties? ...................................... 23
    Cross-Border Flows of People: Migration, Education, and Work Visas ........................................... 24
  Flows of Businesses .................................................................................................................................... 25


Border Management Policies ......................................................................................................................... 31
  Regional Institutions that Influence Policy ............................................................................................. 31
  Initiatives to Improve Flows ..................................................................................................................... 32
    Physical Infrastructure Capacity .......................................................................................................... 32
    Demand Management ........................................................................................................................... 32
    Modifications of At-Booth Processes .................................................................................................... 32
    Optimizing the Usage of Lanes and Booths ......................................................................................... 33

Conclusions: Looking Back and Looking Forward ..................................................................................... 34
Economic ties have spanned the contemporary border between Washington State and Canada for as long as the Pacific Northwest has been inhabited. The native peoples of North America interacted across the border for centuries prior to the arrival of European explorers. In the early 19th century, the major regional European economic entity was the Hudson’s Bay Company. The fur-trading operations of this British-chartered corporation took place throughout its “Columbia Department” (a region that straddled the modern Canada – U.S. border), with outposts at locations such as Fort Vancouver and Fort Nisqually. The contemporary border dates from 1846, when the 49th parallel was established as the boundary between the British and the American portions of the Columbia Department.

Today Washington State shares a long border with Canada and is also a key gateway for Asia-Pacific ocean-going trade. This geographic reality alone suggests that international trade is important to Washington. The state is widely recognized as being greatly dependent on export sales and is the home to highly visible global companies such as Boeing and Microsoft. Washingtonians are generally less aware of the contribution of imports and of the importance of trade with Canada, however.

As of 2014, Canada’s share of Washington’s total international trade in goods (exports plus imports) was 18 percent, which put Canada in second place just behind China at 20 percent.\(^1\) If this calculation is repeated excluding trade in aerospace goods, Canada moves ahead of China. Even with aerospace products, Canada was the largest supplier of Washington’s imports. In addition, Canada’s share of Washington’s exports exceeded that of the entire European Union, as well as that of all the countries of Central and South America combined. Given the importance of trade with Canada, it is crucial to understand how changing conditions at the border affect the economic circumstances of the state. Trade with Canada is often particularly important for smaller businesses in Washington.

Some basic geography and nomenclature is useful. Figure 1 reveals the major transportation modes that connect Washington State to Canada, and more particularly to British Columbia, which is the only province abutting Washington. The figure identifies the thirteen ports of entry (POEs) at which vehicles can move across the border, and also shows that four of those POEs comprise the Cascade Gateway, which serves the Interstate 5 corridor located west of the Cascade Mountains. Abutting the Cascade Gateway to the north is the Lower Mainland of B.C., an urbanized region that is home to about 3 million people, while to the south is Whatcom County, Washington, a rural county with about 210,000 residents. Seattle lies 100 miles south of the border on Interstate 5. Trade and traffic is concentrated west of the Cascades, which is logical given that the vast majority of both Washington’s and B.C.’s populations reside in the coastal regions. Listed below the map are other infrastructure connections, including pipelines (water, sewer, crude oil, and natural gas) and electric transmission lines. The three scheduled-service ferry routes connecting B.C. and Washington are also shown. The figure identifies transportation infrastructure present along the shared B.C. – Washington boundary, but other border infrastructure is also of interest to Washington, as will be discussed below (e.g., border crossings located elsewhere that accommodate Washington’s import/export flows).

\(^1\) USA Trade Online at https://usatrade.census.gov.
INTRODUCTION

FIGURE 1
MAJOR TRANSPORTATION FACILITIES CONNECTING WASHINGTON AND B.C.
WASHINGTON STATE TRADE AS A SHARE OF GDP

A key measure of the importance of goods trade is obtained by looking at the share of trade as a fraction of GDP. As shown in Figure 2, Washington’s exports significantly exceed its imports as a percentage of GDP, which is the reverse of the pattern exhibited by the United States taken as a whole. Washington’s pattern is reminiscent of that of Germany, although with lower levels. Exports as a fraction of GDP are roughly twice as high for Washington versus the remainder of the United States.

FIGURE 2
IMPORTS AND EXPORTS AS A PERCENTAGE OF GDP, 2012 (ORIGIN OF MOVEMENT) ²

COUNTRY DISTRIBUTION OF WASHINGTON TRADE

Figure 3 shows the share of Washington exports destined for each of the state's 10 largest export markets. These data are based on “origin of movement” status through which the U.S. Census Bureau attempts to measure the state of origin of the shipment rather than the point where the exports leave the United States. The data reveal that in 2014 Canada was the second most important destination for Washington's exports and that China was the top destination. As pointed out by the Washington State Department of Commerce in its Summer 2013 Trade Bulletin Update, Canada is the top destination for the state's non-aerospace exports. This distinction is important in part because finished jets are typically exported under their own power and are hence less affected by conditions at the land border.

Figure 4 provides information analogous to Figure 3, but for imports. The data shown in the graph are derived from country classifications of imports allocated to the state of ultimate destination by the Foreign Trade Division of the U.S. Census Bureau. Figure 4 reveals that Canada is the most important source of Washington's imports, well ahead of China (30.7 percent versus 15.9 percent).

**FIGURE 3**
SHARE OF WASHINGTON EXPORTS, 2014

<table>
<thead>
<tr>
<th>Country</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>25%</td>
</tr>
<tr>
<td>Canada</td>
<td>20%</td>
</tr>
<tr>
<td>Japan</td>
<td>10%</td>
</tr>
<tr>
<td>U.A.E.</td>
<td>5%</td>
</tr>
<tr>
<td>U.K.</td>
<td>5%</td>
</tr>
<tr>
<td>Korea</td>
<td>5%</td>
</tr>
<tr>
<td>Mexico</td>
<td>5%</td>
</tr>
<tr>
<td>Taiwan</td>
<td>5%</td>
</tr>
<tr>
<td>Qatar</td>
<td>5%</td>
</tr>
<tr>
<td>Indonesia</td>
<td>5%</td>
</tr>
</tbody>
</table>

**FIGURE 4**
SHARE OF WASHINGTON IMPORTS, 2014

<table>
<thead>
<tr>
<th>Country</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>40%</td>
</tr>
<tr>
<td>China</td>
<td>30%</td>
</tr>
<tr>
<td>Japan</td>
<td>10%</td>
</tr>
<tr>
<td>Taiwan</td>
<td>5%</td>
</tr>
<tr>
<td>Korea</td>
<td>5%</td>
</tr>
<tr>
<td>France</td>
<td>5%</td>
</tr>
<tr>
<td>U.K.</td>
<td>5%</td>
</tr>
<tr>
<td>Australia</td>
<td>5%</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>5%</td>
</tr>
<tr>
<td>Mexico</td>
<td>5%</td>
</tr>
</tbody>
</table>

3 Source: U.S. Census online trade database (https://usatrade.census.gov/)
4 Source: U.S. Census online trade database (https://usatrade.census.gov/)
TRADE IN GOODS: CANADA RELATIVE TO THE WORLD

To categorize global trade flows, customs agencies throughout the world use a common Harmonized Tariff Schedule (HTS). At the most general level of categorization (the 2-digit level), Table 1 identifies the top five categories of goods exported from Washington. The first two columns identify exports to Canada alone, while the second two columns repeat the analysis for the rest of the world (ROW). One obvious pattern is that trade with the rest of the world is much more skewed toward aerospace products. Also, manufactured products such as mechanical machinery and electrical machinery appear in the top five for Canada but not for the rest of the world. At the same time, HTS 10 (cereals) and HTS 12 (oil seeds such as peanuts and soya beans as well as oleaginous fruits) matter more for exports to the rest of the world than to Canada.

TABLE 1
WASHINGTON'S EXPORTS TO CANADA AND TO THE REST OF THE WORLD, 2014

<table>
<thead>
<tr>
<th>TOP 5 EXPORTS TO CANADA</th>
<th>TOP 5 EXPORTS TO ROW</th>
</tr>
</thead>
<tbody>
<tr>
<td>HTS2</td>
<td>Exports</td>
</tr>
<tr>
<td>27, Fossil Fuels</td>
<td>$ 1.6 BN</td>
</tr>
<tr>
<td>88, Aerospace</td>
<td>$ 1.4 BN</td>
</tr>
<tr>
<td>84, Mechanical Machinery</td>
<td>$ 0.9 BN</td>
</tr>
<tr>
<td>85, Electrical Machinery</td>
<td>$ 0.5 BN</td>
</tr>
<tr>
<td>87, Automotive</td>
<td>$ 0.5 BN</td>
</tr>
</tbody>
</table>

TABLE 2
WASHINGTON'S IMPORTS FROM CANADA AND FROM THE REST OF THE WORLD, 2014

<table>
<thead>
<tr>
<th>TOP 5 IMPORTS FROM CANADA</th>
<th>TOP 5 IMPORTS FROM ROW</th>
</tr>
</thead>
<tbody>
<tr>
<td>HTS2</td>
<td>Imports</td>
</tr>
<tr>
<td>27, Fossil Fuels</td>
<td>$ 9.2 BN</td>
</tr>
<tr>
<td>88, Aerospace</td>
<td>$ 1.1 BN</td>
</tr>
<tr>
<td>44, Wood Products</td>
<td>$ 0.8 BN</td>
</tr>
<tr>
<td>01, Live Animals</td>
<td>$ 0.5 BN</td>
</tr>
<tr>
<td>84, Mechanical Machinery</td>
<td>$ 0.3 BN</td>
</tr>
</tbody>
</table>

5 Source: U.S. Census online trade database (https://usatrade.census.gov/)
6 Source: U.S. Census online trade database (https://usatrade.census.gov/)
specialized in turboprop aircraft and regional jets and
the fabrication of aerospace parts such as landing gear.
Washington’s trade with Canada accordingly involves
some element of “building things together.” As a result,
when Boeing purchases landing gear manufactured in
Ontario, the landing gear may later return to Canada as
part of a 737 jet purchased by WestJet.

Canada and Washington also specialize within the
category of fossil fuels (HTS 27). While refineries
in Washington import some crude oil from Canada,
some of the refined products are then exported back to
Canada. A prominent example of this specialization
is the shipment of jet fuel to Vancouver International
Airport by truck and by barge from coastal refineries in
Washington. There is currently a proposal to build a new
fuel handling facility on the Fraser River in Vancouver
that would allow the airport to source jet fuel from more
distant locations aboard larger vessels. If this new facility
goes into operation, shipments of jet fuel by truck via the
Pacific Highway crossing could decline.

Trade in electricity also flows in both directions between
Washington and Canada. The terms of the Canada
– U.S. Columbia River Treaty require the United
States to deliver electricity to Canada in payment for
dams built on the Canadian portion of the Columbia
River. As explained by Davidson and Faulds (2013),7
Washington and British Columbia are connected by
four electric transmission lines and the direction of

Table 2 repeats the analysis of Table 1 for imports. The
goods categories that stand out as being different for
Washington’s imports from Canada are HTS 01 (live
animals) and HTS 44 (wood products). The impact of
border conditions on trade between Washington and
Canada is partly dependent on the nature of the goods
traded. As seen in Tables 1 and 2, HTS 27 (basically
oil and gas) is the top 2-digit HTS code for both
Washington’s exports and imports vis-à-vis Canada. In
fact, HTS 27 accounts for about 50 percent (by value)
of Washington’s imports from Canada and for about
25 percent of its exports to Canada. Analysis of the
breakdown of products within HTS 27 reveals that
Washington imports crude petroleum and natural gas
and exports refined products such as jet fuel. These
differences between crude and refined products are
reflected in differences in the mode of transportation.
For imports, almost half the value of trade moves via
pipeline, while for exports the fraction is just 3 percent.

It might seem surprising that the top two import
categories (out of almost 100) for Washington’s trade
with Canada, HTS 27 and 88, are also the top two
export categories. Such similarity seems at first glance
to fly in the face of economic theories in which trade is
motivated by specialization to benefit from comparative
advantage. However, modern theories of international
trade emphasize the importance of specialization in
different types of products within a general category,
such as aerospace. For example, Canada has traditionally

Canada – Washington Aerospace Trade

While oil and natural gas are the two largest categories (by dollar value) for Washington’s 2014 imports
from Canada (see Table 2), the next most important category is HTS 88, which is “Aircraft, Spacecraft, and
Parts Thereof.” This category, at just over a billion dollars in value, accounted for 7.2 percent of the value of
Washington’s imports from Canada. About half of this value was in undercarriages for planes, which reflects the
important role played by aerospace firms in Ontario in providing landing gear for Boeing planes. Most imports
of aerospace products from Canada cross the Canada – U.S. border somewhere to the east of Washington.
Washington also exports about $1.3 billion of aerospace products to Canada. Much of this consists of finished
aircraft, although a precise breakdown isn’t possible because, since 2008, U.S. export statistics for aircraft and
parts are all combined into a single code.

Almost half of Washington's imports from Canada travel by pipeline, reflecting the importance of trade in crude oil and natural gas. Truck traffic is the next most important category, followed by rail. For exports, the role of pipelines is minimal as slightly over two thirds of exports to Canada flow by truck. Shipments by water-borne vessel are used to deliver refined petroleum products. Included in the “Other” category are airplanes that are exported under their own power.

Net flows of electricity depend upon relative demands in British Columbia versus the United States. These relative demands are affected by seasonality, with the use of air conditioners contributing to a net southward flow during the hottest summer months. The direction of net electricity flows will also reflect relative economic conditions on the two sides of the border. The recession of the late 2000s affected the United States more severely than Canada and net flows changed from north-south to south-north between 2008 and 2010. As shown by Davidson and Faulds, net flows had reverted to north-south by 2012 as the U.S. economic recovery gathered steam.

### TABLE 3
SHIPMENT MODES FOR TRADE BETWEEN WASHINGTON AND CANADA

<table>
<thead>
<tr>
<th>MODE</th>
<th>IMPORT SHARE</th>
<th>EXPORT SHARE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Truck</td>
<td>32.1%</td>
<td>67.8%</td>
</tr>
<tr>
<td>Rail</td>
<td>9.6%</td>
<td>3.1%</td>
</tr>
<tr>
<td>Pipeline</td>
<td>46.7%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Air</td>
<td>1.8%</td>
<td>4.4%</td>
</tr>
<tr>
<td>Vessel</td>
<td>5.7%</td>
<td>12.0%</td>
</tr>
<tr>
<td>Mail</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Other</td>
<td>1.0%</td>
<td>12.7%</td>
</tr>
<tr>
<td>Foreign Trade Zone</td>
<td>3.0%</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

**MODE OF TRANSPORT**

Trade between Washington and Canada takes place through three main surface modes: truck, rail, and pipeline. Some trade also moves by air or water. The difference in shipment mode can have important implications regarding the extent of the impediment posed by the border, i.e., imports from Canada that arrive by pipeline will be relatively unaffected by enhanced security procedures at the Canada – U.S. border. At the same time, if exports of energy products to Canada are shipped by truck, then they will be impacted by any delays that have a generalized impact on truck traffic.

Table 3 shows the shares of these modes for Washington's export and import trade with Canada.

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ECONOMIC INTEGRATION, INTRA-INDUSTRY TRADE, AND CLUSTERS

An important characteristic of trade flows is whether traded goods are for final consumption or are intermediate inputs for use in the production of other goods or services. Anderson’s study of Ontario discusses the highly integrated nature of the economic relationship between Ontario and its neighboring states. This trade relationship is the poster child for Stephen Blank’s “making things together” description of trade.

Economists often use the Grubel-Lloyd Index (GLI) to quantify the level of intra-industry trade. A GLI can vary between zero and one, with a value close to one indicating that the magnitude of imports and exports is closely balanced within industries, and that trade is thus largely within industries rather than between them. On the other hand, a GLI value close to 0 indicates that trade is more likely to be inter-industry rather than intra-industry in nature. Table 4 shows our calculations of the GLI for trade between Canada and several states at the 2-digit HTS level.

<table>
<thead>
<tr>
<th>STATE</th>
<th>TRADER</th>
<th>GLI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washington</td>
<td>Canada</td>
<td>0.49</td>
</tr>
<tr>
<td>Michigan</td>
<td>Canada</td>
<td>0.62</td>
</tr>
<tr>
<td>Montana</td>
<td>Canada</td>
<td>0.14</td>
</tr>
<tr>
<td>Oregon</td>
<td>Canada</td>
<td>0.45</td>
</tr>
<tr>
<td>California</td>
<td>Canada</td>
<td>0.28</td>
</tr>
</tbody>
</table>

Trade between Canada and Michigan involves a high degree of shipment of intermediate goods while trade with Montana is more likely to involve finished goods. As a result, Michigan has a high GLI, whereas the value is low for Montana. The value for Washington is closer to Michigan than to Montana but almost the same as for Oregon. As a point of comparison, the low GLI value for trade between Canada and California is interesting and may reflect California’s greater reliance on Mexico as a source of intermediate inputs.

A high level of intra-industry trade can have both positive and negative implications for a border region. On the one hand, intra-industry trade is often associated with a clustering of businesses in the same industry. These clusters can benefit from positive spillover effects derived from access to shared labor pools or the diffusion of knowledge and innovation among value-chain partners. At the same time, high levels of intra-industry trade in intermediate goods are often found in industries that rely on just-in-time inventory management systems. If border delays impact shipments of intermediate goods, the economic costs can be high as production is delayed at the importing firm’s operation. Work by Globerman and Storer (2015) shows some evidence that measures of transportation costs are higher when the GLI is higher, perhaps because of the higher cost of shipping delays when there is a higher level of intra-industry trade. As a consequence, the lower degree of economic integration between Canada and Washington could mean that border delays are less costly for producers there than at the Canada – Michigan crossings.


WHICH BORDER CROSSINGS HANDLE WASHINGTON’S TRADE?

It might seem obvious that the border crossings which matter the most for Washington will be those closest to the state itself. However, an important proportion of Washington’s trade with Canada crosses the border at points far to the east. For example, in 2014 five of the top-10 land crossing points for Washington’s exports to Canada were located outside Washington. These five ports (Eastport, ID, Sweetgrass, MT, Detroit and Port Huron, MI, and Buffalo-Niagara Falls, NY) together accounted for just under 24 percent of the value of Washington’s exports in 2014. In an analogous way, Davidson and Faulds report that 42 percent of Washington’s truck-borne import value in 2012 arrived through a non-Washington port of entry. The importance of crossing points to the east means that Washington’s trade with Canada depends on border policy and conditions at a wide range of Canada – U.S. crossing points.

Tables 5 and 6 include information about Washington’s trade with Canada, broken out by province and by good. The top ranking of British Columbia as a destination for Washington exports reflects proximity and the fact that refined products do not tend to be shipped over long distances (although we still see that they are important exports to Quebec). For imports, Alberta was in the top position because it is a source of crude petroleum. Fossil fuels (oil and natural gas) were the top Washington imports from both Alberta and British Columbia, while aerospace products were the top import from Ontario and Quebec. For Washington exports in 2014, aerospace products were the top products for both Alberta and Ontario while refined fossil fuels were the largest export category for both British Columbia and Quebec.

TABLE 5
TOP 4 PROVINCES, WASHINGTON EXPORTS TO CANADA, 2014

<table>
<thead>
<tr>
<th>PROVINCE</th>
<th>WASHINGTON EXPORTS</th>
<th>SHARE OF TOTAL</th>
<th>TOP TWO HTS2 COMMODITIES FOR EACH PROVINCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>British Columbia</td>
<td>$6.4 BN</td>
<td>69.5%</td>
<td>HTS 27, $BN 1.5; HTS 84, $BN 0.6</td>
</tr>
<tr>
<td>Ontario</td>
<td>$1.6 BN</td>
<td>17.5%</td>
<td>HTS 88, $BN 0.6; HTS 08, $BN 0.2</td>
</tr>
<tr>
<td>Alberta</td>
<td>$0.8 BN</td>
<td>8.6%</td>
<td>HTS 88, $BN 0.6; HTS 84, $BN 0.06</td>
</tr>
<tr>
<td>Quebec</td>
<td>$0.2 BN</td>
<td>2.5%</td>
<td>HTS 27, $BN 0.04; HTS 85, $BN 0.03</td>
</tr>
<tr>
<td>Rest of Canada</td>
<td>$0.2 BN</td>
<td>1.9%</td>
<td></td>
</tr>
</tbody>
</table>

Another implication of the geographical dispersion of border crossing points is that the two halves of a cross-border production cluster may be quite distant from one another. For example, a recent Brookings Institution study by Parilla and Berube (2013)\textsuperscript{15} showed that the Canadian cross-border partners of the Seattle aerospace cluster are located primarily in the areas around Montreal, Toronto, and Winnipeg. All landing gear for Boeing commercial jets is produced at one of two aerospace firms with significant operations in the Toronto area: UTC Aerospace and Messier-Bugatti-Dowty. Some final assembly of these landing gear components also happens in Everett, WA. Modern communications technology allows clusters to bridge significant distances, meaning that conditions at distant border crossings matter for businesses in Washington.

\begin{table}[h]
\centering
\begin{tabular}{|l|c|c|l|}
\hline
PROVINCE & WASHINGTON IMPORTS & SHARE OF TOTAL & TOP TWO HTS2 COMMODITIES FOR EACH PROVINCE \\
\hline
Alberta & $8.5$ BN & 53.3\% & HTS 27, $\text{XBN} 7.5; \text{HTS} 01, \text{XBN} 0.4 \\
British Columbia & $4.3$ BN & 26.9\% & HTS 27, $\text{XBN} 1.6; \text{HTS} 44, \text{XBN} 0.7 \\
Ontario & $1.8$ BN & 11.5\% & HTS 88, $\text{XBN} 0.6; \text{HTS} 85, \text{XBN} 0.1 \\
Quebec & $0.5$ BN & 3.1\% & HTS 88, $\text{XBN} 0.07; \text{HTS} 84, \text{XBN} 0.06 \\
Rest of Canada & $0.8$ BN & 5.1\% &  \\
\hline
\end{tabular}
\caption{TOP 4 PROVINCES, WASHINGTON IMPORTS FROM CANADA, 2014\textsuperscript{14}}
\end{table}


The focus thus far has been the overall pattern of goods movements, with mention of facts such as the importance of B.C. as a Washington trade partner, the primacy of the trucking mode with respect to non-energy trade with B.C., and the concentration of Washington – B.C. traffic within the Interstate 5 corridor. But much research has also been done to understand the details of freight flows near and through the Cascade Gateway. A 2009 truck-freight study provides insight into the origins and destinations of truck trips, as summarized in Figure 5.16

The Lower Mainland of B.C. is overwhelmingly the source of southbound trips and the destination of northbound ones, with only about 8 percent of cross-border truck trips starting or ending at other points in Canada. Within the U.S., though, a greater range of trip endpoints is evident. While about 60 percent of trips involve endpoints no further south than the Puget Sound region, the other 40 percent include diverse locations throughout the United States. There are distinct kinds of economic interaction that intersect at the border to yield the pattern shown in Figure 5. Asia-Pacific trade entering and leaving North America through Vancouver moves through the Cascade Gateway to points throughout the U.S. Asian trade also reaches Vancouver after entering North America at Seattle/Tacoma and at major seaports in California. B.C.’s highly populated and urbanized Lower Mainland is a major location of consumption and production, so goods flow there from Washington and many other states. California alone accounts for about 25 percent by value of the 2-way trade flowing through Blaine. Other states that individually account for significant flows (i.e., between 1.5 percent and 10 percent by value of either the export or the import flow at Blaine) are Oregon, Texas, Nevada, Utah, Colorado, Arizona, Indiana, Wisconsin, Ohio, Pennsylvania, Tennessee, and

**FIGURE 5**
**ORIGINS AND DESTINATIONS OF TRUCK TRIPS THROUGH THE CASCADE GATEWAY**

study of transportation costs on the Canada – U.S. border by Globerman and Storer (2015) showed evidence consistent with shipping costs rising when cabotage restrictions make it difficult to find backhaul cargo.

EXPECTED FUTURE TRADE TRENDS

Looking forward, trade between Washington and Canada will be impacted by the rates of economic growth in the two jurisdictions and by changes in the industrial structures of the two economies. Another potential impact could come from future trade agreements such as the Trans-Pacific Partnership that is currently being negotiated between a number of Pacific Rim countries, including the United States and Canada.

The BPRI has sponsored two studies of future expected levels of goods trade. A study by Galloway, Casavant, and Jessup (2007) predicted trade growth and corresponding patterns for freight traffic by port and arterial through 2015. Their forecasts were based on linear extrapolations of past trade patterns for broad industry classifications and predicted robust post-NAFTA growth in trade.

Because actual southbound crossing data are now available through 2014, it is possible to look at things in hindsight. Interestingly, there seems to have been a general break in the past trend of truck crossings into Washington from Canada. Actual crossings have been fairly flat since the early 2000s and, as a result, the actual values tend to be lower than prior forecasts.

A more recent study by Globerman and Storer (2014)\textsuperscript{20} looked at overall Canada – U.S. trade patterns and expected experiences at a group of eight major crossings. The Blaine crossing was predicted to have growth in the middle range of that group. Bilateral trade is forecast to grow at a slower rate than in previous years in part because of decelerating economic growth rates in both Canada and the United States since the Great Recession. In addition, imports of lumber products from B.C. are expected to be limited by supply constraints linked to beetle infestation. Globerman and Storer recommend the use of demand-management policies to increase border throughput, rather than investment in physical infrastructure, in part because of the irreversibility of physical investments and in part because of the inherent difficulty of forecasting trade flows.

If there is significant progress on the Trans-Pacific Partnership (TPP), that trade agreement could impact the Canada – Washington relationship in several ways. Canada will likely have to dismantle its supply-management agricultural programs as a condition of participating in the TPP, and such a change in Canadian policy has the potential to open up the Canadian market to U.S. producers in the dairy and poultry sectors. At present, Canadian tariffs are very high on all but a small amount of dairy and poultry imports. In addition, to the extent that the TPP increases trade between the Asian countries and the Pacific Northwest, shipments to U.S. markets could enter through Canadian maritime ports such as Prince Rupert.

Ports on the west coast of Canada already provide an alternative entry point for imports to the United States. While much of this trade enters the United States by rail in the Midwest, a significant amount also enters through border crossings in Washington. In 2014, 17 percent by value of the goods imported through Blaine (almost $2 billion) came from a country in Asia. The recent growth in the share of shipping handled at Prince Rupert has been accompanied by a declining share handled at the ports of Seattle and Tacoma, as shown in Figure 6.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure6}
\caption{SHARES OF PACIFIC NORTHWEST PORT TEUs \textsuperscript{21}}
\end{figure}

\textsuperscript{21} Sources: Prince Rupert, American Association of Port Authorities (AAPA), NAFTA Region Container Traffic (http://www.aapa-ports.org/index.cfm); Ports of Seattle and Tacoma web sites (http://www.portseattle.org/About/Publications/Statistics/Seaport/Pages/10-Year-History.aspx and http://portoftacoma.com/).
FLOWS OF SERVICES, PEOPLE, AND BUSINESS

Data on trade in services are more difficult to obtain than statistics for trade in goods. Trade in services can also be under-measured because there are no physical goods to be counted as they cross the border. Nevertheless, trade in services is substantial. For overall U.S. foreign trade, services are about 30 percent of exports and 17 percent of imports. Trade in services is difficult to allocate to state/country pairs, but service trade between Washington and Canada has the potential to be larger than between Washington and other countries, due to geographic proximity, the similarity of the two economies, and the presence of “national treatment” provisions for service trade in Canada – U.S. free trade agreements. These provisions stipulate that Canadian service providers should be treated no worse than service providers located in another U.S. state. Cross-border service flows also tend to follow trade in goods and movements of people and business capital.

One of the most familiar categories of services trade relates to tourism. Canadian residents purchase services from businesses in Washington when they buy a ticket to attend a Seahawks game or a lift ticket at the Mt. Baker ski area. Restaurants, hotels and bars also provide services to Canadian visitors, as do airports. Reliable estimates suggest that in 2014 Canadians were just over half of the passengers at Bellingham International Airport. Businesses in Washington also provide professional services in areas such as legal, technical, and financial services. At the same time, Washington residents frequently take vacations in Canada, with locations such as Victoria and Whistler being high on the list. Canadian financial institutions are active in Washington through their U.S. subsidiaries. The Royal Bank of Canada conducts retail-level brokerage business and TD Bank makes loans guaranteed by EX-IM bank to support the sale of planes by Boeing.

CROSS-BORDER FLOWS OF PEOPLE: SHORT-TERM TRIPS

People's cross-border trips are made for a variety of purposes and are usually temporary and of short duration. The BPRI has conducted a number of studies that provide insight into the nature and motivation for cross-border trips, and a wealth of historical traffic data is available from transportation agencies.

Traffic Volumes, Crossing Points, Modes, and Trends

This section relies upon data from the U.S. Bureau of Transportation Statistics to describe the flow of people between Washington and B.C. The analysis focuses upon the 13 ports of entry (POEs) located on the Washington – B.C. border as seen in Figure 7, which is a map of the POEs coupled with some basic data related to the volume and type of traffic handled at each. The tabular data in the figure shows that about 93 percent of Washington's cross-border auto traffic flows through the POEs west of the Cascades, which are Pt. Roberts and the POEs of the Cascade Gateway. The POEs can be grouped based upon similarities of traffic patterns, as follows: Cascade Gateway (Peace Arch, Pacific Highway, Lynden, Sumas), small Eastern POEs (Nighthawk, Ferry, Danville, Laurier, Frontier, Boundary, Metaline Falls), Oroville, and Pt. Roberts. Three ferry crossings will also be discussed.

As shown in Figure 8, the overall volume of cross-border automobile traffic has fluctuated considerably over the last two decades, from a low of 4.6 million 1-way trips in 2003 to a peak of almost 9 million in 2013. Prior to 2000, a general decline in overall traffic volumes occurred, which was further exacerbated by the events of 9/11. There was an eight year period of generally subdued travel in the aftermath of 9/11, but traffic rebounded beginning in 2009. There is a relationship between traffic volumes and the currency exchange rate, which will be discussed at a later point.

FIGURE 7
POEs AND ASSOCIATED TRAFFIC VOLUMES (2014)

<table>
<thead>
<tr>
<th></th>
<th>Cars 8,560,947</th>
<th>Buses 16,630</th>
<th>Trucks 639,686</th>
<th>Trains 2,979</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>13.9%</td>
<td>1.8%</td>
<td>2.8%</td>
<td>69.7%</td>
</tr>
<tr>
<td>Cascade Gateway (I-5 corridor)</td>
<td>35.4%</td>
<td>91.9%</td>
<td>57.5%</td>
<td>16.3%</td>
</tr>
<tr>
<td></td>
<td>8.5%</td>
<td>4.1%</td>
<td>6.5%</td>
<td>86.0%</td>
</tr>
<tr>
<td></td>
<td>13.2%</td>
<td>96.0%</td>
<td>23.3%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>78.6%</td>
<td>1.0%</td>
<td>4.8%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.1%</td>
<td>0.2%</td>
<td>1.1%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.3%</td>
<td>0.6%</td>
<td>2.9%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.1%</td>
<td>0.6%</td>
<td>0.8%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.6%</td>
<td>0.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.7%</td>
<td>0.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.3%</td>
<td>0.4%</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

FIGURE 8
TREND IN STATEWIDE AUTOMOBILE FLOWS, 13 POEs COMBINED (1995-2014, SOUTHBOUND)
Figures 9 through 11 display detailed traffic patterns during the past decade, which was the period in which statewide traffic volume rose. Oroville, Pt. Roberts and the Cascade Gateway are shown in Figure 9, while POEs (and a ferry) that handle far less traffic are shown in Figure 10 at a vertical scale that is magnified fifteen times relative to Figure 9. Oroville is plotted in both figures to help visualize the difference in scale. The figures show that the increase in traffic did not occur in a uniform manner across all the POEs. The Cascade Gateway POEs experienced rapid growth in the period from July 2008 onward, with the base winter volume in 2013 being about 250,000 per month greater than in 2007. (In comparison, the volume of traffic handled by all other POEs and ferries combined is just 150,000 per month.) Traffic volumes at Pt. Roberts also grew substantially. Focusing on Figure 10, a different pattern is seen, with the Port Angeles ferry (the busiest of the ferries, and representative of the pattern seen at all) experiencing essentially no growth, as was also the case with the combined volume at the seven small Eastern POEs. Oroville exhibited some growth, but at a lesser rate than seen at Pt. Roberts and the Cascade Gateway. Both figures reveal the manner in which volumes vary seasonally at all POEs, with traffic reaching a vacation-related peak in the summer.

In essence, the small Eastern POEs have winter baseline traffic that largely consists of a small, stable population of near-border residents who collectively generate a minor amount of cross-border traffic. That baseline volume is augmented in the summer by vacation travelers from points near and far. In contrast, the Cascade Gateway and Pt. Roberts accommodate the traffic that is generated by the large, growing population of the Lower Mainland of B.C. The baseline volume of such traffic grew dramatically in recent years, and that baseline was then augmented each summer by large volumes of vacation/recreation related traffic. Oroville, serving U.S. Route 97, is a hybrid of the two patterns.

Pt. Roberts, WA

Pt. Roberts is a geopolitical oddity in that it is a U.S. territory that is physically attached to Canada, and not the U.S. The town itself sits on a small peninsula that extends from B.C. south of the 49th parallel, which is the demarcation of the Canada – U.S. border in the Pacific Northwest. U.S. residents of Pt. Roberts must cross an international border twice in order to get to mainland Washington. Residents of Canada cross frequently into Pt. Roberts to purchase gas, dairy products, and access mail boxes used to facilitate the purchase of items from U.S. merchants. 45 percent of the land parcels in Pt. Roberts are owned by Canadians. Because of the unique nature of Pt. Roberts, it ranks as the ninth busiest crossing for personal vehicles on the northern border. The large volume of crossings, however, reflects a relatively small number of individuals, as many cross the border at Pt. Roberts multiple times in a given day.

Thus, this crossing is often omitted from analyses of traffic trends, which are instead derived from examination of the Cascade Gateway, which is more reflective of emerging trade and transportation flows between the U.S. and Canada. Including Pt. Roberts in an analysis would likely produce an over-representation of flows of goods, people, and associated infrastructure needs. Furthermore, because Pt. Roberts is isolated and relatively small (1,300 residents), the economic impact of the border there has a limited impact on the broader Washington economy.
FIGURE 9
MONTHLY AUTO CROSSINGS: CASCADE GATEWAY AND PT. ROBERTS (2005-2014)

FIGURE 10
MONTHLY AUTO CROSSINGS: EASTERN POEs AND PORT ANGELES FERRY (2005-2014)
In Figures 9 and 10 it’s difficult to accurately compare the degree of seasonal peaking and the relative rate of growth between POEs because of the large differences in traffic volumes and the different vertical scales. Figure 11 is designed to support the direct comparison of relative growth rates and peaking factors. For each of the three graphed flows, the traffic volume in January 2005 is set equal to 100 percent, and the subsequent 10 years of traffic are plotted relative to that value. It is apparent that the ferry routes experience huge summer peaks (six times more summer traffic than winter), but have not exhibited year-over-year growth. The small Eastern POEs have peak summer volumes that are roughly double the winter volume, but again, there has been little growth over the years. The Cascade Gateway exhibits the smallest seasonal peaks, but the greatest degree of growth. Remember, of course, that a 50 percent summer peak at the Cascade Gateway equates to about 275,000 cars per month, which is more traffic than is handled by all other POEs and ferries combined.

The growth in traffic at the Cascade Gateway is such that its four POEs, along with Pt. Roberts, now rank among the 15 busiest along the entire northern border (out of 120 total). The Peace Arch POE claims the number one spot. As seen in Figure 12, the recent surge in traffic at the Cascade Gateway was not mimicked at Detroit and Buffalo, the two gateways that historically were the busiest.
In addition to personal vehicles, passengers can cross by rail at Blaine and by bus at most crossings. Passenger volumes on the Amtrak Cascades route (Blaine crossing) followed a declining trajectory from 2000 to 2007, and have since reversed with the number of passengers increasing from 32,106 in 2007 to 72,915 in 2013. The reversal is associated with the addition of a second daily train on the Seattle-to-Vancouver segment. The POEs at Blaine and Sumas handle the overwhelming majority of bus traffic (96 percent of statewide total). Both have experienced a decline in the number of buses and bus passengers since 2000 (See Table 8).

**FIGURE 12**
TRAFFIC VOLUMES AT THREE MAJOR GATEWAYS (1995 - 2014)

**TABLE 8**
SOUTHBOUND FLOWS OF BUSES: NUMBERS OF VEHICLES AND PASSENGERS

<table>
<thead>
<tr>
<th>Year</th>
<th>Buses</th>
<th>Passengers</th>
<th>Buses</th>
<th>Passengers</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>18,104</td>
<td>441,320</td>
<td>1,686</td>
<td>49,298</td>
</tr>
<tr>
<td>2005</td>
<td>12,720</td>
<td>294,564</td>
<td>2,014</td>
<td>48,293</td>
</tr>
<tr>
<td>2010</td>
<td>15,768</td>
<td>332,445</td>
<td>900</td>
<td>30,076</td>
</tr>
<tr>
<td>2013</td>
<td>15,078</td>
<td>314,526</td>
<td>762</td>
<td>27,094</td>
</tr>
</tbody>
</table>
Trip Purposes and Destinations

The data presented in this section is derived from surveys undertaken in 2000, 2007, and 2013/2014. A combined total of over 26,000 interviews were conducted with individuals as they were crossing the border at the Cascade Gateway POEs. Only the questions pertaining to the origin, destination, and purpose of trip will be discussed in this report.

In the last 15 years, trends haven’t significantly changed as far as who is crossing, where people are going, and how long they are staying. The 2013/2014 study found that over 70 percent of travelers were Canadian residents and that roughly 75 percent of trips undertaken through the Cascade Gateway are same day trips. Overall, most Canadians traversing the gateway are coming from the western part of the Lower Mainland (Surrey and points west) and are heading to areas throughout Whatcom County. However, there is a seasonal variation, with winter trips being shorter and more oriented toward shopping while summer trips are longer and geared more toward vacation. Regardless of the season, there has been an increase in the share of trips for shopping and mail pick-up since the first survey was done in 2001.

Table 9 highlights the changes in trip purpose over time by survey year for all participants and by residence for the 2013 survey only. In the 2013 survey, it was found that 8 percent of Canadian trips were for the purpose of picking up mail (a purpose that is included in “Other” purposes in Table 9). Canadians are often motivated to get a U.S. mailbox in order to facilitate the purchase of items from U.S. merchants. 61 percent of Canadians’ trips are thus accounted for if all trip purposes associated with shopping (i.e., gas, shopping, and mail pick-up) are combined. In contrast, shopping accounted for just 4 percent of Americans’ trips, with vacation and recreation instead figuring as prominent trip purposes.

The difference in trip purposes between Canadians and Americans suggests that as the Canadian dollar weakens, the Cascade Gateway should experience a decrease in Canadians crossing south to shop together with an increase in Americans travelling north for recreation and vacation. Figure 13 provides evidence of the relationship between the exchange rate and the travel habits of regional residents. The weakening Canadian dollar in the period prior to 2001 was a time of declining travel by Canadians and of increasing travel by Americans. As the Canadian dollar strengthened, those trends reversed, albeit after a period of generally subdued travel in the aftermath of 9/11. Over the last seven years, during a period of relative weakness of the U.S. dollar, the number of U.S. residents entering B.C. at the Cascade Gateway has remained below levels seen in 2006. Of note is that the very strong Canadian dollar in 2011 – 2013 did not result in travel volumes equivalent to those in the early 1990s; traffic in the post-9/11 period has yet to match peak historic levels.

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24 Recreation encompasses same-day trips, while vacation encompasses longer ones.

25 Trip purpose categories are not consistent across all surveys, and some categories, such as gas, were only included as a separate purpose in the 2013/2014 study. It is inferred that the ‘shopping’ category covered this same purpose in earlier surveys.
### TABLE 9
TRIP PURPOSES BY SURVEY YEAR AND BY RESIDENCE

<table>
<thead>
<tr>
<th>Primary Purpose</th>
<th>July 2000</th>
<th>July 2007</th>
<th>July 2013</th>
<th>Canadian</th>
<th>American</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vacation</td>
<td>24%</td>
<td>31%</td>
<td>15%</td>
<td>11%</td>
<td>31%</td>
</tr>
<tr>
<td>Recreation</td>
<td>46%</td>
<td>22%</td>
<td>20%</td>
<td>19%</td>
<td>27%</td>
</tr>
<tr>
<td>Family Visit</td>
<td>11%</td>
<td>7%</td>
<td>5%</td>
<td>18%</td>
<td></td>
</tr>
<tr>
<td>Shopping</td>
<td>15%</td>
<td>19%</td>
<td>27%</td>
<td>31%</td>
<td>4%</td>
</tr>
<tr>
<td>Gas</td>
<td>15%</td>
<td>19%</td>
<td>18%</td>
<td>22%</td>
<td>---</td>
</tr>
<tr>
<td>Business/work related</td>
<td>9%</td>
<td>10%</td>
<td>4%</td>
<td>2%</td>
<td>15%</td>
</tr>
<tr>
<td>Other 27</td>
<td>4%</td>
<td>7%</td>
<td>8%</td>
<td>11%</td>
<td>5%</td>
</tr>
</tbody>
</table>

### FIGURE 13
EXCHANGE RATE VS. NORTHBOUND ENTRIES AT CASCADE GATEWAY 28

27 Other includes airport, mail, church, healthcare, and school.

Where do Canadians Shop?

This section is based on 15 days of observations in 2013 and 2014 of the percentage of Canadian license plates in particular shopping areas along the I-5 corridor. The distribution of Canadian shoppers along the corridor varies. Overall, volumes tend to decrease with distance from the Canadian border for a given type of retail destination. For example, casinos located 14, 40, and 72 miles south of the border had Canadian-plate proportions of 46 percent, 15 percent, and 8 percent, respectively. There is also variation with respect to types of retail establishments, with “big box” stores such as Costco, Target, Wal-Mart, and Ross being heavily visited by Canadians (e.g., roughly 55 percent Canadian plates in Bellingham, 21 miles south of the border). Outlet malls are also popular destinations, with 26 percent Canadian plates present in one such mall located 72 miles south of the border.

Edaleen Dairy

Edaleen Dairy began as a small family business in 1975 and has since expanded to include a dairy plant facility to process and distribute Edaleen milk and dairy products to stores around Washington State. In addition, Edaleen operates convenience stores in Sumas and Lynden, and expanded to Blaine in 2014. Although these stores serve local residents, they are also a major draw for Canadian shoppers. A policy of dairy production quotas in Canada and farm subsidies in the U.S. results in dairy products, such as milk, costing roughly twice as much in Canada compared to the U.S. The expansion of Edaleen Dairy serves as an example of an industry that is ‘boosted’ by the demand from Canadian shoppers, who are motivated to purchase dairy products in the U.S. due to lower prices. As one Edaleen employee stated, “the more people in your customer base, the smoother the economy can be” (Business Pulse, Winter 2015).

Economic Impact of Shopping and Tourism

How Much Is Being Spent by Canadians in Washington?

Groups on both sides of the Canada–U.S. border are interested in estimates of the amount shoppers spend when they cross the border. During periods when the Canadian dollar is relatively strong, the B.C. retail sector sometimes views cross-border shopping as a loss, as suggested by the title of a May 2013 Business Council of British Columbia (BCBC) article: “Surge in Cross Border Shopping Weighs on Retail Sales in BC.” The authors of that study estimate that in 2012, B.C. residents spent between C$1.0 and C$1.6 billion on goods purchased in the United States during trips lasting less than 48 hours. Another C$1.0 billion is added if longer-term trips are included, and the amount would rise further if spending on services such as hotel rooms were included.

Given that the vast majority of cross-border shopping by B.C. residents takes place in Washington, the BCBC estimates of spending can be compared to retail sales in Washington to get ballpark measures of local economic impact. For example, the BCBC retail sales estimates range from about 1 percent to 2.5 percent of total Washington State taxable retail sales. As discussed above, vehicle license plate count surveys conducted by the BPRI have indicated that cross-border shopping is concentrated in border areas, although it is difficult to allocate the Canadian spending precisely by county. If we made the assumption that cross-border shopping only impacted three counties—Whatcom, Skagit, and Snohomish—then the estimated impact of cross-border shopping would be between 6 percent and 16 percent of total taxable retail-level sales in those three counties. While this is a crude measure, it does show the importance of cross-border retail sales for counties close to the Lower Mainland of British Columbia. The BCBC study notes that the proximity of the B.C. population to the border means that B.C. residents are more likely to cross the border to shop than are residents of other provinces.

Does Cross-Border Shopping Stabilize or Destabilize Border Counties?

Over time, cross-border shopping could amplify or mitigate economic fluctuations in border regions. To the extent that cross-border sales account for a large fraction of total activity in a county, fluctuating levels of cross-border shopping could lead to boom-bust cycles with congestion during the booms and idle capacity during the busts. Such a cycle from the strong Canadian dollar of the early 1990s to the weaker dollar of the mid/late 1990s explained a building boom in the retail gasoline sector of northern Whatcom County followed by closures of some service stations. This cyclical effect was particularly marked in Sumas, for example.

It is also possible that the combination of a floating exchange rate and cross-border shopping will help to dampen economic fluctuations. During periods where the Canadian economy performs relatively better than the U.S. economy, as was the case following the recession that began in 2008, then the Canadian dollar will tend to rise in value relative to the U.S. dollar and the resulting transfer of retail spending from B.C. to Washington will work to offset the relatively weaker economic conditions on the U.S. side of the border. The opposite effect would occur if economic conditions were relatively weaker in Canada. To the extent that the stabilizing effect dominates, cross-border shopping can help to “lean against the wind” and reduce the cost of economic fluctuations. Proponents of a floating Canada–U.S. exchange rate rather than a euro-style common currency base much of their argument on this type of “shock absorber” effect related to Canada–U.S. trade.

30 For 2012, the average of monthly exchange rates was C$0.9995 per U.S. This value was so close to parity that we simply rounded to C$1 = $1.
CROSS-BORDER FLOWS OF PEOPLE: MIGRATION, EDUCATION, AND WORK VISAS

Individuals have a variety of reasons for crossing the Canada–U.S. border. While most individuals cross the border to shop or for tourism/recreation reasons, others cross for longer periods to seek an education, a job, or to live in the other country. Such flows typically create mutual benefits. For example, when a university in Washington hires a Canadian faculty or staff member the person being hired and the university both benefit. Faculty and students at the university benefit from the newly hired faculty member who is relocating from Canada.

Companies do not typically release information about the nationality of their employees, but there are several ways to get some insight into the importance of Canadian talent for the economy of Washington. Recent analyses of “feeder schools” by Wired and Slate magazines relied on profiles posted by employees on the professional networking site LinkedIn to investigate the universities and colleges attended by employees. For example, in May 2014 Wired found that the University of Waterloo, in Waterloo, Ontario, was the fourth-largest supplier of Microsoft employees. A visit to LinkedIn on March 2, 2015, would also show that the University of Waterloo is just behind Washington State University (324 employees versus 327) at Amazon. While postings on LinkedIn are not a perfect measure of workforce characteristics, they are generally viewed as quite representative of the workforce in the technology sector. The importance of this single Canadian university for two core Washington employers reveals the contribution of flows of Canadians to the Washington economy.

Data on immigrant visas suggests that graduates of Canadian universities are not simply working at the Canadian facilities of Washington employers. This additional measure of the strong cross-border flows of skilled workers comes from statistics on “labor certifications” approved by the U.S. Department of Labor for foreign workers seeking permanent resident status in the United States. For the 2012 U.S. federal fiscal year, Canada was one of the top five source countries for U.S. immigrants whose labor certification applications were approved. Washington was second, behind California but ahead of New York, in the ranking by state of origin for labor certification applications submitted on behalf of Canadians. The top-10 list of employers for these labor certification applications includes three businesses in Washington State that jointly account for 70 percent of the Canadian applications at top-10 firms. Microsoft was the top employer for Canadians receiving labor certification for U.S. permanent residency and Amazon Corporate was number two.

These statistics show the benefits from the cross-border movement of workers for both Canadian workers and for Washington businesses: the businesses have access to an important source of highly skilled employees, and the workers get well-paid jobs. Some measure of the benefit that Washington employers receive is yielded by the average wage offers made to these Canadian employees: $101,965 for 13 applications from T-Mobile U.S.A., $101,000 for 275 Microsoft certifications, and $88,320 for 39 certifications at Amazon. The fact that Washington employers are willing to make attractive salary offers indicates that they derive great benefit from these Canadian immigrant workers (one of the purposes of the labor certification process is to ensure that U.S. employers are not harming American workers by hiring foreign workers at sub-standard wages).


Mutual Benefits from Cross-Border Flows of Students, Faculty, and Business

In an economy where productivity gains increasingly depend on innovation, flows of knowledge between and within businesses become very important. Spillovers of knowledge and innovation through technology transfers and learning-by-doing are some of the most important features of clusters. It is important for border regions to allow these types of flows despite the presence of an international border. An illustrative example of mutually beneficial flows of knowledge is provided by Pro CNC, a Computerized Numerical Control (CNC) machine shop founded in Monroe, Washington, in 1997. Three of the founders of Pro CNC were from Canada and most of the founders attended Western Washington University (WWU), where they were involved in the Vehicle Research Institute. Interestingly enough, the Vehicle Research Institute itself was founded by Canadian Michael Seal. The story of Pro CNC involves several back-and-forth cross-border flows of knowledge. The arrival of Michael Seal strengthened the engineering technology expertise at WWU which helped to attract the Canadian founders of Pro CNC to WWU. Following three years of strong growth in Monroe, Pro CNC moved to Bellingham where it was acquired by a multinational firm in 2014. Pro CNC has created many jobs for Washington residents and has created value for firms in the state through the production of precision machined parts.

While Morgans provided detailed information for one county in Washington, a centralized source of data on Canadian businesses in Washington is the “Corporations” database available on the website of Washington State’s Secretary of State. The Corporations database provides information about the address of a corporation’s registered agent as well as those of its governing officers. Searching such a database can uncover Canadian-owned firms registered in Washington but will fail to identify unincorporated businesses or businesses with significant Canadian ownership but no Canadian officers. Use of the database therefore provides a lower bound on the total number of Washington businesses with a significant ownership link to Canada.

Labeling as “Canada-linked” any corporation with at least one Canadian address for its registered agent or its governing officers yields a total of 2,255 Canada-linked corporations registered in Washington State out of a total of 443,805 active registered corporations. While Canada-linked corporations are just 0.51 percent of the Corporations registry, they include some larger businesses such as a subsidiary of SNC-Lavalin, an engineering and construction firm that operates worldwide.

Table 10 identifies the ten cities (by address of registered agent) that contain the highest number of Canada-linked corporations. Cities close to the Canada – U.S. border (toward the left of the table) are well-represented in this group, as are government hubs such as Olympia and business/population centers such as Seattle. The table’s bottom row identifies the share of all corporations within a given city which are Canada-linked. As might be expected, Canada-linked corporations are a much larger fraction of all corporations in communities such as Blaine and Bellingham that are located close to the border.

Information is more anecdotal for Washington businesses expanding into Canada, although numbers are still significant. For example, in 1999 Weyerhaeuser paid roughly $2.5 billion to purchase MacMillan Bloedel, which was one of the largest forest products firms in B.C. at the time. Weyerhaeuser later sold many of its Canadian assets in three transactions beginning in 2005. There were several factors motivating these sales, including the Canada – U.S. softwood lumber dispute which intensified in 2002 with the imposition of countervailing and antidumping duties. Other factors included the strengthening of the Canadian dollar relative to its U.S. counterpart. The case of Weyerhaeuser in Canada illustrates many of the benefits and potential costs of operating in Canada.

A number of manufacturing-sector businesses from Washington have operations in Canada. For example, PACCAR has a plant in Ste-Thérèse, Québec, which manufactures Peterbilt and Kenworth trucks. The Winnipeg plant of Boeing Canada specializes in manufacturing composite parts and assemblies of

### Table 10

<table>
<thead>
<tr>
<th></th>
<th>BLAINE</th>
<th>LYNDEN</th>
<th>BELLINGHAM</th>
<th>EVERETT</th>
<th>SEATTLE</th>
<th>BELLEVUE</th>
<th>SPOKANE</th>
<th>WENATCHEE</th>
<th>OLYMPIA</th>
<th>TUMWATER</th>
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<td>Road miles to border</td>
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<td>4</td>
<td>24</td>
<td>83</td>
<td>111</td>
<td>111</td>
<td>112</td>
<td>140</td>
<td>171</td>
<td>173</td>
</tr>
<tr>
<td>Population</td>
<td>4,684</td>
<td>11,951</td>
<td>80,885</td>
<td>103,019</td>
<td>608,600</td>
<td>122,363</td>
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<td>31,925</td>
<td>46,478</td>
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<td>67</td>
<td>29</td>
<td>432</td>
<td>18</td>
<td>428</td>
<td>48</td>
<td>49</td>
<td>21</td>
<td>319</td>
<td>229</td>
</tr>
<tr>
<td>% Canada-linked corps.</td>
<td>8.1%</td>
<td>1.7%</td>
<td>4.2%</td>
<td>0.3%</td>
<td>0.6%</td>
<td>0.2%</td>
<td>0.2%</td>
<td>0.6%</td>
<td>1.0%</td>
<td>1.5%</td>
</tr>
</tbody>
</table>

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34 Washington State Secretary of State Corporations Database ([http://www.sos.wa.gov/corps/AllData.aspx](http://www.sos.wa.gov/corps/AllData.aspx)).
commercial aircraft, and its 1,600 employees produce components used in both the 787 and the 737 MAX. In 2007, Microsoft created its Vancouver Development Center (VDC) in Vancouver, B.C., and this software development center has been very successful. The theme for the VDC is “Destination for the World’s Best,” and the VDC benefits from the dynamic ethnic diversity of Vancouver and Canada’s immigration policies which reward employment-related skills and qualifications. By locating this development center in B.C., Microsoft is able to avoid restrictive U.S. immigration policies while recruiting highly skilled talent from around the globe. In addition, these workers are employed just a few hours from Microsoft’s main campus in Redmond, Washington.

There are other examples of the manner in which federal policies have influenced patterns of business development in the Cascade Gateway binational region:

- U.S. restrictions on imports of some Canadian softwood lumber have caused Canadian companies to develop value-added facilities in Whatcom County (and elsewhere in the U.S.). Low value-added wood is imported to the U.S. to avoid the restrictions, and processing of the wood is then undertaken in the U.S.

- Canada and the U.S. have different standards with respect to the maximum allowable weight of a truck, with the Canadian weight significantly greater. This has resulted in the development of re-load facilities in the Lower Mainland—both truck-to-rail, and truck-to-truck—that bring shipments into compliance with U.S. limits.

Several key retailers from Washington are active in the Canadian market. Costco has more warehouses per capita in Canada than in the United States and U.S. Costco locations in border states are often quite popular with Canadian shoppers. The Canadian operation of Amazon, Amazon.ca, is popular and competes against Canadian booksellers and on-line retailers. Nordstrom recently opened its first Canadian location in Calgary and a second store opened in Ottawa in March 2015. Nordstrom is opening stores individually with opening dates spread over time. This strategy contrasts significantly with Target’s unsuccessful expansion into Canada. Target recently announced that it will close all 133 of its stores in Canada: its experience highlights the logistical and operational challenges of operating in the Canadian retail environment. Despite these challenges, Nordstrom has announced the launch of six Canadian locations through spring 2017. Such expansion plans reveal a perceived benefit to entering the Canadian market for this highly-respected Washington business.
The many examples of flows of goods, services, people, and capital between Washington and Canada are de facto evidence of the benefits derived from such flows. In order to make these benefits as large and as widespread as possible, the border needs to function as smoothly as possible and to impose as few costs as feasible, consistent with the security missions of U.S. and Canadian border agencies. Unfortunately, there is evidence that increased scrutiny and security at the border has led to a “thickening” of the border that jeopardizes the benefits derived from the Washington – Canada business and economic relationship. This section of the report will examine previous studies and measures of border costs using data on levels of flows and delays associated with these flows. We will begin by looking at measures of delays at the border and then consider statistical analyses of border thickening.

FIGURE 14
AUGUST WEEKEND WAIT-TIMES OVER THE COURSE OF A DAY (2013)

Wait-time figures are collected for Cascade Gateway traffic through the use of in-lane detector loops that can measure the flow through inspection booths and the approximate length of queues. Several years of data at five-minute intervals are available through an on-line Cascade Gateway Border Wait Time Data Warehouse.35 Figure 14 shows Cascade Gateway average passenger vehicle delays by hour of day for the eight weekend days in August 2013. Weekends in August were chosen due to expected high levels of travel at that time of the year. These graphs show evidence of lengthy delays in the mid-morning for southbound flows and in the late afternoon for northbound flows. Similar patterns are also found for weekdays in August.

Based upon data from the same loop-based system, average delays for trucks at the Pacific Highway crossing are 8 to 12 minutes. The delays are significant and are broadly consistent with a delay of 11 minutes reported by Roberts et al using U.S. Customs and Border Protection data for Fiscal Year 2012. Roberts et al (discussed in detail at a later point) report much shorter average delays at the Buffalo and Detroit crossings (2.3 minutes at the Lewiston Bridge and 4.6 minutes at the Ambassador Bridge).

Of potentially greater importance in this era of just-in-time delivery, delays for trucks are at times subject to significant uncertainty. Studies by Goodchild, Globerman, and Albrecht (2007)36 and Goodchild, Albrecht, and Leung (2008)37 showed evidence of significant variability in wait times for trucks at the Pacific Highway crossing. For example, while average wait times were about 22 minutes for a fleet of trucks studied in 2005/2006, ten percent of the trips took over 47 minutes (and some took much longer). Despite this variability, survey results did not reveal a great deal of concern about the costs of this uncertainty about shipping times. One potential reason for this lack of concern might be that the nature of goods traded in the Cascade Gateway region does not involve a high degree of trade in goods destined for just-in-time manufacturing facilities. At the same time, trade does involve perishable commodities (such as fresh fish) for which delays do matter. Increased availability of consistent time-series data on variability and predictability of delays could provide useful measures of the effectiveness of border policies and procedures.

Turning to statistical studies, Globerman and Storer (2008, 2009),38,39 established the pre-9/11 relationship between trade and economic factors such as exchange rate at several border ports of entry (including Blaine, WA) and looked for changes to this relationship after 9/11. These studies showed evidence of a sizeable post-9/11 downward shift in U.S. imports through Blaine that persisted for several years. The impact at Blaine seemed to last longer than at ports such as Detroit where trusted-trader programs such as FAST provide greater benefits for large firms such as automakers. Globerman and Storer (2011)40 also looked at measures of freight costs reported on customs forms and found that a pre-9/11 trend of declining cost either decelerated or reversed following 9/11.

Survey evidence of the impact of post-9/11 security measures was reported in a BPRI-sponsored study by Vance (2012).41 Survey respondents were involved in cross-border trade and were located in either Whatcom County or the Lower Mainland of B.C. While there was some indication of negative impacts of enhanced security on both sides of the border, these effects were more pronounced for the firms in B.C. Survey respondents indicated a certain level of optimism that they would be able to adapt to the new regulatory regime at the border through actions such as enrolling in the FAST program or using third-party logistics firms such as UPS. The fact that FAST utilization rates have been low in the Pacific Northwest suggests that firms might have been overly optimistic regarding the ability of FAST to mitigate increased border costs.

38 Globerman, Steven and Paul Storer (2008), The Impacts of 9/11 on Canada-U.S. Trade, Toronto: University of Toronto Press.
The potential impact of increased security for flows of cross-border shoppers was examined by Hodges (2007). This statistical study linked cross-border shopping flows to factors such as exchange rates and relative prices of goods. As was found for goods, there was evidence of a significant and persistent downward shift after 2001. Hodges did find some evidence that security measures were not the only factor impacting cross-border shopping trips to Whatcom County by Canadians.

An interesting analysis of border flows was conducted by the Homeland Security Center of Excellence at the University of Southern California. This study (Roberts et al, 2014) was published in the academic journal Transport Policy and looked at the monetary return associated with adding an additional border agent at 33 locations: 17 land passenger vehicle ports, 12 land freight ports, and 4 passenger airports. The land crossings were distributed between the northern and southern borders and the northern border ports included Peace Arch and Pacific Highway. This monetary return associated with increased staffing comes from the reduction in delays that would be facilitated by the addition of a border officer as well as the monetary value of time saved and the increased level of transactions due to reduced transportation and travel costs.

The Roberts et al study begins by estimating the decrease in wait time attributable to the addition of one agent. This reduced wait time figure is then used to calculate the dollar value of time saved and the value of increased GDP. For example, using 2012 figures for wait times at Peace Arch and Pacific Highway, there are estimated wait-time reductions of 49 percent and 62 percent for personal vehicles, which translates into $1.4 million and $1.2 million in value of time saved. These reduced delays would induce 65,125 and 55,394 new trips by Canadians into the U.S. through Peace Arch and Pacific Highway (as well as trips by Americans to Canada). For freight, there is an estimated 83 percent reduction in the wait time for the most congested 8 hours at Pacific Highway. These effects are also predicted to produce 8 new jobs and to increase U.S. GDP by just under $800,000 as a result of the additional staffing at the Pacific Highway truck crossing.

These estimates are subject to caveats regarding assumptions and estimates embedded within the calculations. For example, the added agent is assumed to generate 153 additional work days per year which are all allocated to the most-congested 8-hour shifts. In practice, it is unlikely that hours can be allocated that precisely. Even if the realized benefit of additional staff is below the maximum possible benefit, the potential benefits reveal the value of border activities. It must be true, for example, that the benefit derived from cross-border shopping and recreation exceeds the value of time lost due to delays. This study reveals substantial benefits from cross-border transactions, most of which accrue to regions in the proximity of a land port.

While Roberts et al studied a hypothetical increase of staffing at 33 border POEs, their results can be compared to the measured benefits of an actual policy change implemented at the southbound Pacific Highway crossing in 2012. As described by Springer and Davidson (2015), a project to reallocate the dedicated FAST lane was evaluated in 2011 and implemented in 2012. The project essentially increased the number of available commercial booths by one, from two to three. Comparison of average wait times for non-FAST trucks before and after the policy change shows a reduction from 51 to 16 minutes despite an increase in traffic arrival rates. Average delays for FAST trucks increased by much less from 3.7 to 8.7 minutes. Taken together, these changes in delays show percentage wait-time reductions of similar magnitude to those considered by Roberts et al and we can therefore expect large GDP and time-savings benefits similar to those found for the hypothetical addition of a border agent. The rate of return for the policy adopted at Pacific Highway is likely to be even higher than the border agent policy since it required no ongoing expenditure on additional resources.

REGIONAL INSTITUTIONS THAT INFLUENCE POLICY

There are several major border-related planning and policy institutions in the Washington – B.C. region.

- The International Mobility and Trade Corridor (IMTC) forum, hosted since 1997 by the Whatcom County Council of Governments, brings together a number of government agencies with an interest in enhancing the efficiency of the border. Initiatives implemented by IMTC include surveys of border conditions, the collection and public dissemination of border delay information, and the development of a prioritized and regionally approved list of projects (both planning and infrastructure) that improve mobility while preserving security. Agencies on each side of the border then use the list to make coordinated border infrastructure improvements.

- The bi-national Pacific Northwest Economic Region (PNWER) promotes communication between legislators in a large region (Montana, Idaho, Oregon, Washington, Alaska, B.C., Alberta, Saskatchewan, Yukon Territory, Northwest Territories) and has taken the lead in soliciting input from the private sector to support the federal BTB and RCC processes.

- For almost a decade, the Governor of Washington and Premier of B.C. have scheduled joint cabinet meetings that have resulted in a series of agreements regarding border-related issues. An offshoot of the Governor-Premier forum is the Joint Transportation Executive Committee (JTEC), which meets more frequently with a goal of coordinating border-related work between the Washington State Department of Transportation and the B.C. Ministry of Transportation.

- The BPRI itself is an important regional institution. The BPRI has collected and analyzed border-related data and helped design and conduct regional pilot projects. Mentioned in the next section are two examples of how the BPRI’s evidence-based policy research has led to improvements relevant to Washington State.
INITIATIVES TO IMPROVE FLOWS

Initiatives designed to facilitate mobility at the border have been pursued by both federal and regional institutions. These initiatives fall into four broad categories, as discussed below.

Physical Infrastructure Capacity

Significant investment has been made in inspection facilities at the border, together with the approaching federal, state and provincial roads. Improvements to physical infrastructure are difficult to implement and very expensive, often unfolding over periods of 6 to 15 years. The region is fortunate that Vancouver was host to the 2010 Olympic Games, leading to heightened political visibility of pending regional infrastructure projects. Funding was found, worthy projects were accelerated, and about $450 million was spent on Cascade Gateway facilities and approach-roads in the period between 9/11 and the 2010 games. Both the Canadian and U.S. inspection facilities at Peace Arch were completely rebuilt. Today there are a total of 55 automobile inspection booths serving the Cascade Gateway (northbound and southbound, all four POEs combined), which is 28 percent more than existed in 2001. And investments continue, with a completely rebuilt Canadian facility at Lynden/Aldergrove slated to soon enter service.

Demand Management

Efforts have been made to alter the pattern of demand for passage through the border. One effort involves the provision of an alternate transportation mode; Washington has provided financial support for the Amtrak train that runs twice per day in each direction between Seattle and Vancouver. The train helps relieve demand at the highway POEs. A second effort involves attempts to alter the behavior of automobile drivers, which is done with an Advance Traveler Information System (ATIS). The ATIS provides real-time information about the expected wait-time in each direction at each Cascade Gateway POE. Information is disseminated via websites, cellphone apps, and highway message signs. This facilitates peak smoothing (a traveler delaying a trip to avoid a lengthy lineup) and trip diversion (a traveler diverting to a nearby POE that has a shorter lineup).

Ongoing maintenance of the ATIS system is needed in order to ensure system accuracy. If accuracy is allowed to degrade, travelers will lose trust in the system and will revert to behaviors that result in worse overall throughput.

Modifications of At-Booth Processes

Initiatives have also been directed at enhancing the at-booth processes applicable to each vehicle. Foremost among such efforts is the trusted-traveler program, NEXUS. A NEXUS member is vetted by both Canadian and U.S. border agencies and is then issued with a card containing an RFID (radio-frequency identification) chip. A dedicated highway lane and inspection booth are provided for NEXUS travelers. The RFID card is queried upstream of the booth, and information about the traveler is available to the inspector prior to the car’s arrival at the booth. At the booth, no handling of documents is required, and the driver is subject to an abbreviated interview (because of his/her trusted status). Throughput at a NEXUS booth is about three times greater than at a standard booth. Washington provided grass-roots leadership on development of trusted-traveler programs. For example, the precursor to the NEXUS trusted traveler program was the PACE program, operating at the Peace Arch crossing for several years prior to 9/11. PACE grew out of a stakeholder meeting held in Canada House on the Western Washington University campus. Perhaps as a result of the early experience with PACE, this region continues to have the highest NEXUS utilization rate in the nation. About one-third of the traffic at Peace Arch and Pacific Highway makes use of NEXUS, versus around 20 percent at the Ambassador Bridge and 18 percent at the Buffalo-Niagara Peace Bridge. NEXUS was first deployed at Peace Arch and Pacific Highway, and uptake at those POEs was so strong that regional officials pondered whether the program would also be of benefit at Sumas and Lynden. At the request of the inspection agencies, the BPRI gathered NEXUS-related data in both the 2008/2009 and the 2013/2014 iterations of its driver-interview field projects, providing agencies with information regarding the potential market. Efforts are now underway to provide NEXUS facilities at all four Cascade Gateway POEs.

RFID can be used to reduce the at-booth processing time of even a non-trusted traveler. For such a traveler, a normal interview must still be conducted, but the physical handling of documents can be avoided in the same manner as achieved by NEXUS. Alternate kinds of RFID-enabled documents are available, and there's about a 30 percent reduction in at-booth processing-time for a traveler that uses such a document. Recently, the BPRI has proposed a regional pilot project in which RFID-enabled passport cards would be issued free of charge to Canadians in the Lower Mainland. There is evidence that such a project would lead to greatly diminished lineups.46

The best known alternate RFID-enabled document is the Enhanced Driver’s License (EDL), which serves as an important example of how a state can affect federal policy. In 2005, the U.S. government promulgated the Western Hemisphere Travel Initiative (WHTI), which increased the level of security required of documents that would allow entry to the U.S. While Washington State had no direct control over the formulation or implementation of the federal legislation, state leaders successfully lobbied for inclusion of state-issued EDLs in the list of acceptable border-crossing documents. Washington was the first jurisdiction to issue EDLs, and utilization rates continue to rise at a solid pace (e.g., there were 12 percent more Washington EDLs circulating in 2014 than in 2013). EDLs are about seven percent of all licenses in Washington. Enhanced licenses also seem to be popular in other states on the northern border. For example, in 2015 they are roughly 11.8 percent of all licenses in Vermont and 8.8 percent in Michigan. EDL programs have been less successful in Canadian provinces, perhaps in part because Canadians are more likely to hold a passport.

Optimizing the Usage of Lanes and Booths

It’s important to make the best use of precious physical infrastructure capacity—the finite group of inspection booths and approaching highway lanes. The IMTC forum has sponsored studies of this topic, with the foremost example being a study of usage of the commercial booths at the Pacific Highway crossing. FAST (Free and Secure Trade) is a trusted-trader program analogous to NEXUS, and as of 2011 dedicated FAST booths and approach lanes existed at Pacific Highway in both the north- and southbound direction. Utilization of the booths was low, though, while long queues existed for the non-FAST traffic. The BPRI gathered time-and-motion data and constructed a simulation model of the POE, demonstrating that overall throughput would be considerably improved if the dedicated FAST booths were instead made available for processing of non-FAST trucks.47 U.S. Customs piloted the concept in 2011, demonstrating the validity of the modeling results. The B.C. Ministry of Transportation ultimately changed the channelization of the southbound staging-area at Pacific Highway in order to support a new booth-usage scheme. A similar effort is now underway with respect to the northbound truck facilities at Pacific Highway.

Most recently, the IMTC forum has begun to investigate “dynamic lane management,” which is the on-the-fly modification of the use of a lane and booth in order to best accommodate the flow of vehicles arriving at a POE. The flow varies over time, both in volume and in type of vehicle. For example, on a summer weekend the volume of bus traffic is relatively high, while truck traffic is relatively low. An approach lane used by trucks during the week can be repurposed to buses over the weekend, thereby improving traffic management and throughput.


This report has described a dynamic and multi-faceted business and economic relationship between Washington State and Canada. This relationship remains strong despite the fact that checkpoints exist at the Canada – U.S. border, and that the extensive process of physical and regulatory dissolution of borders that is ongoing within the European Union is not envisioned in North America. The benefits from the Washington – Canada relationship are broadly shared. Canadian consumers benefit from shopping opportunities both in Washington and at Canadian locations of Washington retailers. Flows of talent and high-tech inputs from Canada contribute to the success of world-class Washington businesses such as Microsoft and Boeing. Energy products flow over the border in both directions and are used by producers and consumers. BPRI surveys show significant levels of cross-border travel for recreation or vacation purposes.

While there are clear benefits to cross-border flows, we also find evidence of costs. Delays at the border result in wasted time and transaction costs that discourage exchanges that would otherwise be of mutual benefit. In some cases these costs provide opportunities to increase well-being through policy innovations. For example, the study by Roberts et al discussed above showed that the addition of one additional commercial-traffic border agent position at Pacific Highway would speed up crossings and lead to eight new jobs in the region near (but not at) the border. This 8:1 “job multiplier” ratio is impressive. Similar benefits might accrue to programs such as the “FAST First” trusted-trader lane reconfiguration program evaluated by BPRI and implemented by U.S. Customs and Border Protection.

Going forward, the challenge is to continue to expand the benefits of cross-border interactions while reducing costs and maintaining the level of border control desired by North Americans. Achieving this objective is likely to involve the enhancement of Canada – U.S. intelligence cooperation and the improvement of risk management techniques, with a goal of reducing the scope of activities that need to be conducted at the physical border.

Technology will play a key part in this risk management process but care must be taken not to put too much faith in technology alone. Technology might be most successful when it is a complement to the human presence at the border, rather than a substitute. For example, the availability of RFID for border crossers might greatly increase the productivity of border agents.

Over time, the composition of cross-border trade will change and this will affect the priorities for placement of staffing and of physical infrastructure at the border. Public officials need to monitor these changes but must also recognize that some changes in the structure of trade will be unpredictable. Policies such as demand management methods might permit the level of flexibility needed to adapt quickly to changing circumstances at the border. It is difficult to predict, for example, how the expansion of 3-D printing techniques will affect cross-border trade in parts and intermediate inputs. Exchange of computer programs through the internet might take the place of shipments of some parts by truck.

The economic relationship between Washington and Canada has changed radically since the fur-trading days of the Hudson’s Bay Company, but one constant has been the many mutually beneficial flows. An important challenge for regional and national policy makers is to continue to build a border that preserves and nurtures the many benefits that flow between Washington State and Canada.