Recommendations for Increasing Value Creation Capacity within the Logistics Sector at Western Canada's Gateways

ADMN 598

MPA Candidate: Evan Smithanik
Supervisor: Dr. Lynne Siemens

October 21, 2013

ACKNOWLEDGEMENTS

The completion of this project would not have been possible without the support of many outstanding individuals.

I express gratitude to my family for their interest in my research and my success as a professional and an individual. My MPA cohort was a pleasure to learn and work with; their work ethic, intelligence and commitment to public service was admirable and inspirational. I thank current and former colleagues (from several government agencies and entities) who always helped me keep the "end goal" in plain view.

I thank my supervisor Dr. Lynne Siemens for being an excellent mentor and guide through this academic journey. I wish to express my appreciation for the dedication and true professionalism exhibited by the entire faculty and staff at the School of Public Administration. I am also grateful for the opportunity to have worked with such a knowledgeable and thoughtful client representative, Jill Stewart, at Western Economic Diversification Canada.

Most importantly, I thank my wife Aisa – a truly amazing companion. Aisa is just as deserving of any credit I receive for this report. Aisa's support, patience, and encouragement were unwavering throughout the entire project. I also thank our daughter Ainsley for the extra motivation I needed to carry on.

EXECUTIVE SUMMARY

International trade is vital to western Canada's economy. In 2010, the value of internationally traded goods in western Canada totalled $309 billion which equates to 53% of the region's gross domestic product (Statistics Canada [SC], 2012). International trade in western Canada is supported by a vast network of organizations that work together to perform an international commercial transaction. The logistics sector plays a critical role within this network, performing a variety of activities associated with planning, managing, and executing the movement of goods between two parties. Logistics firms can be found throughout western Canada; however, those handling international cargos are primarily found in gateway cities. Positioned near a continent's major entry and exit points and possessing infrastructure such as airports and seaports, gateway cities receive millions of tonnes of cargo each year and make ideal locations for the performance of logistics activities, including transportation services, freight forwarding, warehousing, and other value-added services.

To attract more trade through western Canada's gateways, the Government of Canada created the Asia-Pacific Gateway and Corridor Initiative. Thus far, the initiative has focussed heavily on increasing the volume of cargo that can move through the gateway by developing several large-scale infrastructure projects. The Initiative focusses more on accommodating increased cargo volumes than on improving the value creating capacity of the logistics sector. While these projects address an important dimension of gateway competitiveness, additional projects that strengthen the value creation capacity of the logistics sector would improve another vital dimension of gateway competitiveness: the sector's ability to meet and exceed importer and exporter expectations with regards to the performance of logistics services. Although some projects have attempted to improve value creation capacity, the vast majority have focussed on enhancing volume capacity. This paper recommends eight actions that Western Economic Diversification Canada can undertake to improve value creation capacity within the logistics sector and ultimately lead to increased cargo volumes through western Canada's gateway cities. Western Economic Diversification Canada is the Government of Canada's economic development agency for western Canada.

Methodology

The research question for this report is the following: what actions should government take to strengthen value creation capacity within the logistics sector at western Canada's gateways? The question will be answered using a four-part methodology that includes a literature review, a scan of government initiatives focussed on the logistics sector in western Canada, interviews with industry professionals, and a scan of the world's two top-performing logistics sectors (referred to as the leading jurisdictions scan). The research approach will be qualitative in nature. A literature review will be the foundational element of all research activities, forming the basis of a conceptual framework. The conceptual framework will be used to organize research findings in a systematic fashion. As research activities are performed, barriers to value creation will be uncovered and potential solutions that address the barriers will be identified.

Research Findings

Four broad categories of value creation barriers were identified through the literature review and interviews with industry professionals: responding to labour market challenges, coping with an uncompetitive business environment, driving innovation and improvements in productivity, and coping with inefficiencies and inconsistencies in government service. The literature review uncovered few suggestions for alleviating these barriers to value creation. Instead, ideas for barrier resolution came from interviews with industry professionals and the leading jurisdictions scan. Both sources discouraged direct involvement of government in a firm's day-to-day operations. Rather, government is encouraged to support value creation through initiatives such as information sharing, tax incentives, collaborative strategy development, removal of trade restrictions, and information technology development.

Recommendations

The report provides eight recommendations to Western Economic Diversification Canada for increasing value creation capacity of the logistics sector:

- ***Recommendation 1:*** Within each gateway, replicate Alberta's model for developing a plan to define and address labour market challenges within the logistics and transportation sector.
- ***Recommendation 2:*** Partner with the Supply Chain & Logistics Association of Canada to gather and disseminate existing resources (e.g. research, publications) that address many of the barriers identified in this report.
- ***Recommendation 3:*** Advocate for the use of tax credits to incent investments in employee training and the development of IT solutions.
- ***Recommendation 4****:* Engage with other federal and provincial government agencies, such as the Department of Foreign Affairs and International Trade and Transport Canada to ensure logistics providers are included on trade missions abroad.
- ***Recommendation 5:*** Advocate for the development of actual free-trade zones, similar to those offered at other gateways throughout the world.
- ***Recommendation 6:*** Advocate to Industry Canada and the Asia-Pacific Gateway and Corridor Initiative (Transport Canada) to introduce a logistics competitiveness benchmarking initiative patterned after the World Bank's Logistics Performance Index.
- ***Recommendation 7****:* Partner with Industry Canada to gather information possessed by government that may be of value to the logistics sector; distribute the information on a free-of-charge or on a cost recovery basis.
- ***Recommendation 8:*** Connect logistics providers, including terminals, through a common IT platform. Initial development costs would be covered by government but recovered over time through a marginal user fee.

TABLE OF CONTENTS

TABLE OF TABLES AND FIGURES

1 INTRODUCTION

International trade is vital to western Canada's economy. In 2010, the value of internationally traded goods in western Canada totalled $309 billion which equates to 53% of the region's gross domestic product (Statistics Canada [SC], 2012). International trade in western Canada is supported by a vast network of organizations that work together to perform an international commercial transaction. This network includes importers, exporters, banks, government organizations, port operators and logistics service providers. The logistics sector plays a leading role within the network and consists of firms such as airlines, steamship lines, trucking companies, freight forwarders, warehouse operators, and customs agents. The logistics sector performs logistics activities on behalf of importers and exporters.

The term 'logistics' refers to the activities associated with planning, managing, and executing the movement of goods between two parties (Industry Canada [IC], 2005). Traditional logistics activities include transportation, storage and warehousing, inventory management and customs brokerage. Lesser known activities include freight forwarding and trans-loading. Freight forwarding refers to the coordination of transportation and customs arrangements by a third-party (i.e. the freight forwarder) on behalf of importers and exporters. Trans-loading refers to the movement of cargo from one type of container to another (e.g. from an ocean or rail container to a truck trailer).

Logistics firms create value for customers by performing the mentioned activities and meeting or exceeding the customer's expectations in three key areas: reliability, flexibility, and cost. Reliability is a common expectation of logistics customers; it refers to the consistent performance of a service over time with little or no variance from an agreed upon standard as established between the service provider and the customer. An agreed upon standard could refer to the length of time required to complete a movement of goods from one city to another or the length of time a shipment can remain at a terminal before departure. Flexibility refers to the diversity of logistics services and the accessibility of those services to importers and exporters. Logistics firms create flexibility by offering customers a wide range of solutions for cargo transportation (e.g. by truck, rail, or plane), cargo holding (e.g. warehousing, inventory management), and cargo manipulation (e.g. placing cargo onto pallets, placing labels on cargo, etc.). Logistics firms offer additional flexibility as they allow firms to deviate from an original travel plan and request new logistics services for cargo already in-transit. Customers also expect logistics services to be competitively priced (Rodrigue, 2007; The Tioga Group, 2010).

Logistics firms can be found throughout western Canada; however, those handling international cargos are primarily found in gateway cities. Gateway cities are positioned near a continent's major entry and exit points; they receive millions of tonnes of cargo each year and make ideal locations for the performance of logistics activities, including transportation services, freight forwarding, warehousing, and other value-added services. Cargo volumes moving through western Canada's gateways continue to grow driven by two factors: a finite number of gateways and steadily rising trade volumes (Feller, Shunk, & Callarman, 2006; Morash & Lynch, 2002; Simpson, Siguaw, & Baker, 2001).

Leaders from western Canada's transportation institutes, including the University of British Columbia's Centre for Transportation Studies, Saskatchewan's Organization for Western Economic Cooperation, the University of Manitoba's Transportation Institute, and the University of Calgary's Van Horne Institute believe western Canada's gateway cities and gateway development policies overemphasize the need for infrastructure development while understating the need for increased value creation capacity (Gillen, Parsons, Prentice, & Wallis, 2008). In addition to requiring transportation systems that facilitate uncongested cargo movements, shippers also require service providers that create sufficient value for their needs. As discussed earlier, logistics providers create value for shippers by offering reliable, flexible, and cost-effective services. If logistics providers cannot render services reliably, flexibly, and cost-effectively, shippers may choose competing gateways with superior value creation capabilities. Regardless of the volume capacity at western Canada's gateways, insufficient value creation will cause shippers to select competing gateways in competing countries such as the United States or Mexico. As a result, investments in infrastructure will yield lower-than-expected returns to taxpayers. By overemphasizing infrastructure development and overlooking the importance of value creation, western Canada's gateways will be unable to capture the economic benefits related to expected growth in Asia-Pacific trade. The logistics sector, which plays a key role in gateway economies and international trade, has been identified as a critical partner in strengthening value creation capacity at gateways (Gillen, Parsons, Prentice, & Wallis, 2007).

This study will provide the federal government, specifically Western Economic Diversification Canada, with policy recommendations for strengthening the logistics sector's capacity to create value at western Canada's gateways. It will focus on gateways handling containerized and break-bulk cargo (including lumber, steel products, and project cargos), accommodating international cargos to or from international locations other than the United States, and moving volumes greater than 250,000 twenty-foot equivalent ocean containers and/or 1,000 tonnes of air cargo per year. Based on these criteria, the study will focus on improving the logistics sector's value creation capacity at the gateways of Vancouver, Prince Rupert, Edmonton, and Calgary. On account of not handling break-bulk or containerized cargo, Churchill is excluded from the study. Due to insufficient international air cargo volumes – specifically, volumes to or from international destinations other than the United States – Winnipeg, Saskatoon, Regina and Prince George are excluded from the study (SC, 2009). These criteria have been established to identify which gateways are truly international gateways and have the potential to support a significant level of future logistics activities.

Although recommendations will be directed to a federal government department, recommendations may also inform provincial and municipal government departments concerned with labour market development, transportation, education, and economic development. During the process of developing recommendations, the report will rely heavily on input from professionals in the logistics sector. Prior to presenting research activities, this section will further introduce the concept of gateways, the potential for trade growth through western Canada's gateways, and the role of the logistics sector in seizing growth opportunities related to trade.

1.1 Gateways

From the perspective of importers and exporters, gateways are a continent's major entry and exit points. As stated by Oum & Tongzon (2007), gateways are "nodes in a globalized supply chain that serve as a critical link between geographical areas or regions by providing a system of road, rail, marine and air transportation infrastructure of national significance for international trade" (p.1). Gateways facilitate the movement of cargo into and out of a continent and provide shippers with access to international markets. Gateways accommodate cargo movement by providing critical infrastructure, such as airports and seaports; government services, such as customs and security; business services, such as transportation, logistics, insurance and financial services; and, natural geography, such as proximity to coastlines that facilitates the movement of cargo into and out of a continent. Shippers rely on infrastructure and business services at gateways to carry out their shipping needs (Asia Pacific Foundation of Canada [APF], 2006).

Western Canada possesses four major gateways through which international cargo enters or departs the continent. Although western Canada consists of four provinces (British Columbia, Alberta, Saskatchewan and Manitoba), the region's four international gateways are found only in British Columbia and Alberta. Although newer and smaller gateways are emerging in Churchill, Winnipeg, Saskatoon and Regina, these gateways do not meet the minimum volume criteria to qualify as a gateway in this report. To some degree, the gateways located in British Columbia and Alberta act as international gateways for the entire region of western Canada, including Manitoba and Saskatchewan. As shown in Figure 1, Western Canada's four gateways are Vancouver, Prince Rupert, Edmonton and Calgary. Vancouver and Prince Rupert are important gateways for cargo transported by ocean vessels. Vancouver, Calgary, and Edmonton are critical gateways for air cargo.

Figure 1: Map of Western Canada with four primary gateways

Notably, six other ocean gateways in the United States compete with western Canada to attract ocean-borne cargos destined for the mid-west United States and eastern Canada. They include the Ports of Seattle, Tacoma, Portland, Oakland, Los Angeles, and Long Beach. Figure 2 shows each U.S. west coast gateway relative to Vancouver and Prince Rupert. Two other ports in Mexico (Lazero Cardenas and Manzanillo), as well as a widened Panama Canal, will also provide competition to western Canada seaports.

Although the western United States features several air cargo gateways, they do not compete directly with western Canada's air cargo gateways. The distances between airports in both countries are too great to allow for U.S. and Canadian air gateways to compete head-to-head. Typically, customers ship cargo by air when the shipment is required urgently. If a customer in Calgary imported air cargo through the Seattle airport instead of the Calgary airport, the customer would need to wait an additional day to have the cargo transported by truck from Seattle to Calgary. When possible, air cargo customers prefer to import cargo through airports closest to the destination where final consumption will occur. This is different from ocean cargo, which cannot be shipped by vessel to inland destinations.

Figure 2: Map of Western North America's eight primary ocean gateways

Note. From: "The Geography of Transportation Systems" by J.P. Rodrigue, 2013.

1.2 Potential for Trade Growth at Western Canada's Gateways

The Government of British Columbia expects that cargo volumes through west coast seaports will rise through the rest of the decade. Growth will come as a by-product of trade growth between Asia and North America. At the end of 2011, container volumes through western Canada's ocean gateways reached 3 million twenty-foot equivalent units (TEUs) (Port Metro Vancouver [PMV], 2011; Prince Rupert Port Authority [PRPA], 2012). Forecasters anticipate those volume will reach 6 million TEUs by 2020 (Government of British Columbia [BC], 2012).

Ocean container growth, which is forecasted to grow by 3 million TEUs by 2020, poses new opportunities for western Canada's ocean gateways and the gateway economy as a whole because a substantial portion of new volumes will be 'discretionary cargos'. Imported discretionary cargo is often destined for inland destinations such as eastern Canada (Ontario and Quebec) and the mid-west United States. Due to the similar distance between each west coast gateway and the mentioned destinations, shippers can use their discretion when deciding which gateway to use to reach those destinations. To attract discretionary cargo volumes, gateways cannot rely on proximity to the market as a competitive advantage. Logistics service providers and policy makers must look for other means to differentiate their service offerings in order to attract shippers.

All west coast gateways, including those in western Canada, are competing for new discretionary cargo volumes resulting from overall economic growth and increased trade between North America and Asia. The facilities and businesses that comprise gateways, especially airports and seaports, are positioning themselves to capture new volumes by expanding terminals and engaging in infrastructure development projects. These new projects will provide a signal to shippers that gateways are ready to handle new and growing cargo volumes. Western Canada has been particularly aggressive in pursuing new infrastructure developments in order to attract new shippers and new volumes (Government of Canada [GOC], 2006).

Capturing new volumes will benefit the public and private sectors in western Canada. From a private sector perspective, new cargo volumes lead to new business opportunities and revenue growth. From a public sector perspective, volume growth contributes to job growth and increased tax revenue (Intervistas Consulting, 2012). In their *2010-11 Report on Plans and Priorities*, Western Economic Diversification Canada recognized that gateway competitiveness affects international trading and foreign investment opportunities which, in turn, affect employment levels (Western Economic Diversification Canada [WD], 2010b). Gateway performance can also affect a country's productivity, industrial competitiveness and economic development potential (Goetz & Bandyopadhyay, 2007).

To support western Canada's attempt to attract new cargo volumes, the Government of Canada created the Asia Pacific Gateway and Corridor Initiative (APGCI). The APGCI earmarked nearly $600 million of funding for infrastructure projects that increase the cargo handling capacity at western Canada's gateways (GOC, 2006). The APGCI also included some non-infrastructure measures that support value creation activities at gateways. Major

projects included upgrades to highway, railway, and interchange infrastructure. The APGCI supported the notion that modern, efficient, and well-maintained infrastructure is a key driver of high performing gateways – a necessary condition for attracting new, discretionary cargos (Goetz & Bandyopadhyay, 2007). Western Canada's infrastructure projects, however, were not unlike projects at competing gateways and corridors. Similar projects at competing gateways, including terminal expansion projects, highway expansions, overpass construction, bridge improvements, and rail upgrades are currently underway or planned (Collier's International, 2013). By undertaking projects of a similar nature that focus on cargo capacity maximization, western Canada's gateways were doing little differentiate themselves from their peers.

Western Canada's transportation institutes expressed concerns about the Government of Canada's approach to gateway development, citing that value maximization receives insufficient attention relative to volume maximization. The development of a thriving logistics sector that maximizes value creation for shippers will also be necessary to create thriving international gateways that match world-class gateways in Singapore, Rotterdam, Hong Kong and Los Angeles. Each of these gateways features high-performing transportation infrastructure systems in addition to a full range of logistics services that create high levels of value for their customers. As previously indicated, value creation occurs as the logistics sector provides reliable, flexible and competitively priced services to their customers. According to the transportation institutes, value creation is a critical dimension to gateway competitiveness. This means that shippers choose gateways based on the gateway's ability to create high levels of value. International shippers consider overall gateway performance and attributes, not only volume capacity, as a criteria for selecting international trade routes, making investment decisions, and selecting international suppliers (Heaver, 2007). By failing to foster value creation at gateways, governments may fail to capture new cargo volumes (Gillen, Parsons, Prentice, & Wallis, 2007).

1.3 The Role of the Logistics Sector in Seizing Growth Opportunities

The transportation and logistics sector plays a significant role in value creation at gateways and therefore gateway performance. The sector consists of three smaller sub-sectors including firms that transport cargo, firms that coordinate transportation arrangements on behalf of shippers, and firms that store and manipulate cargo at warehouses prior to final distribution. The three sub-sectors must interface and co-operate in the process of value creation. Each sub-sector must also operate within the constraints and opportunities enabled by available transportation infrastructure. Logistics providers utilize available transportation infrastructure to perform critical services required by shippers. Thus, gateway performance is supported by modern transportation infrastructure in addition to logistics services. Neither logistics services nor infrastructure should be considered as more important than the other with regards to creating competitive, high-performing gateways. According to a recent study, the availability and capability of transportation and logistics services is as important to gateway performance as infrastructure development (Memedovic, Ojala, Rodrigue, & Naula, 2008).

The transportation and logistics sector also plays a vital supporting role in the development of international trade and national economies. Memedovic et al. found that "countries seeking to benefit from globalisation need to address key underlying factors of their logistics capabilities and how they impact on their industrial performances, productivity and competitiveness" (p. 426).To support the development of such capabilities, this study will provide Western Economic Diversification Canada with a list of recommendations for strengthening the logistics sector's capacity to create value at western Canada's gateways.

1.4 Roadmap

The remainder of the report will proceed as follows. In Section 2, the client agency, its objectives, and linkages with gateway development are described. Section 3 presents the project methodology. Section 4 defines key terms and concepts related to the project topic. In Section 5, the need for government action with respect to value creation in the logistics sector is discussed. Section 6 reviews literature related to the research question. Selected literature examines the concept of value, the value creation process, linkages between government policy and value creation, and common barriers to value creation in the logistics sector. Findings from the literature review will be used to create a conceptual framework that illustrates how governments can contribute to the logistics sector's value creation process. In turn, the conceptual framework will be used to guide and organize the project's primary research activities.

The remainder of the report will focus on detecting barriers to value creation in the logistics sector and identifying policy solutions. Section 7 presents a scan of existing and previous government strategies relating to value creation in the logistics sector. It investigates federal government strategies as well as strategies created by provincial governments in western Canada. The purpose of the scan is to outline what actions have already been implemented to improve value creation; this will ensure that recommended actions are not simply a duplication of previous actions. While Section 7 determines what government has already done, Section 8 determines what value creation barriers remain unaddressed and what may be done to address them. It also contains the results of interviews in which industry professionals are asked to suggest government actions that would support the elimination of value creation barriers facing the logistics sector. Section 9 will profile logistics development strategies designed to improve value creation in Germany and Singapore, two of the world's top performing logistics sectors. Strategies from these leading jurisdictions will be scanned to learn what other governments are doing to address value creation barriers similar to those faced in western Canada. Research findings from Section 6, 7, 8 and 9 will be integrated and discussed in Section 10. Section 10 will bring data together from previous sections to provide a detailed list of value creation barriers and potential solutions for addressing the barriers. Section 10 will also include an overarching discussion of research activities that will inform the final recommendations. Final recommendations are contained in Section 11 and will be followed by a conclusion in Section 12.

2 CLIENT AGENCY

The previous section introduced the project and the project objective to provide recommendations for strengthening the logistics sector's capacity to create value at western Canada's gateways. This section will introduce the client agency and demonstrate the importance of the topic to the agency.

2.1 Western Economic Diversification Canada

The client agency for this project is Western Economic Diversification Canada (WD). Formed in 1987 by the *Western Economic Diversification Act*, WD is the Government of Canada's economic development agency for western Canada (British Columbia, Alberta, Saskatchewan, and Manitoba). The organization consists of 462 employees and includes four regional offices (Vancouver, Edmonton, Saskatoon, and Winnipeg), a headquarters (Edmonton), and a satellite office (Calgary). Similar agencies exist in Atlantic Canada, Quebec, Northern Ontario, Southern Ontario, and the North (WD, 2012a).

WD has a mandate to promote the development, diversification, and competitiveness of western Canada's economy. To fulfill this mandate, WD supports and coordinates policies, programs, and projects that foster innovation, business development, and community economic development. The department provides support by means of grants and contributions for not-for-profit organizations. WD also plays an advocacy role in the development of national and regional economic policy. In planning and implementing its initiatives, WD partners with private sector firms, non-government organizations, educational institutions, and various government agencies at the federal, provincial, and municipal level. It should be noted that WD does not directly fund private sector firms (WD, 2010a).

WD utilizes several instruments to promote its objectives to foster innovation, business development, and community economic development. The department encourages innovation by supporting technology commercialization projects that help entrepreneurs prepare new products for international markets. It promotes business development through trade and investment projects. WD's trade and investment projects are designed to help small businesses access global markets and connect with international customers. Business development is also achieved through strategic infrastructure projects "that promote value-added opportunities related to Western Canada's trade gateways and corridors" (WD, 2010a). WD fosters community economic development through programs that encourage participation of First Nations, women, and francophone in the economy. The department also strengthens the economies of local communities through efforts such as the Airport Improvement Initiative and the Mountain Pine Beetle response programs.

WD considers gateway development an important driver of economic development and diversification in western Canada. Over the past decade, trade and investment has been one of the agency's strategic priorities with gateway development playing a major role. WD's commitment to gateway development is demonstrated through several press releases, strategic plans, and investments.

In a press release from 2008, WD announced $1 million of funding for research and infrastructure projects related to gateways, corridors, and strengthening economic ties with Asia. In the press release, WD linked economic success in western Canada with the region's ability to capitalize on Asia's economic growth through gateway development. WD expressed its commitment to "strengthening economic linkages between western Canada and the Asia Pacific region through investments that will support enhanced commercial and economic opportunities" (WD, 2008b). Also in 2008, the previous Minister of Western Economic Diversification, Rona Ambrose, supported WD's involvement in port infrastructure projects. Minister Ambrose announced that port investments would improve the competitiveness of western Canadian businesses and increase international business opportunities. According to WD, such outcomes will increase the number of employment opportunities for western Canadians (WD, 2008a).

A commitment to gateway development is also found in the organization's business plans and other strategy documents. WD's most recent *Corporate Business Plan* outlines the organization's current mandate, vision, priorities, strategic outcomes, and program activities. For 2012-13, WD set the following three priorities: technology commercialization; trade and investment; and business productivity and competitiveness. The priorities most closely related to gateway development are first, trade and investment, and second, business productivity and competitiveness. Under the trade and investment priority, WD will focus on "enhancing small and medium sized enterprises participation in international business development, enhancing value-added opportunities connected to western Canada's gateways and corridors, and enhancing investment attraction". To achieve these priorities, WD will partner with "Foreign Affairs and International Trade, Industry Canada, provincial and local governments and business associations" (WD, 2012b).

Several WD investments in infrastructure and research also demonstrate the organization's support for the development of gateways and other transportation centers. From 2006 to 2008, WD supported several gateway development projects related to ocean and air cargo handling. In general, WD received $400,000 of APGCI funds to launch an initiative called "Seizing the Gateway Opportunity" used to conduct research, attend international trade shows, and embark on study tours (Treasury Board Secretariat of Canada [TBS], 2009a). The initiative allowed WD to conduct a broad consultation in order to better understand the opportunities for gateways and corridors positioned along Asia-Pacific trade routes.

Related to ocean cargo, WD was allocated $30 million to support the Prince Rupert Port Authority in constructing state-of-the-art container handling facilities. The construction effort converted the Port's break-bulk facilities into a world class container terminal capable of transferring 500,000 twenty-foot equivalent container units per year (TBS, 2009b). Over the course of 2006 and 2008, WD received $4 million of APGCI funds to support dredging at the Fraser River. Performed for the Fraser River Port Authority, dredging enabled the port to accommodate larger shipping vessels (TBS, 2009a). Over the last decade, WD has also used its annual grants and contributions (G&C) funds to support other projects with western stakeholders at ocean gateways.

Related to air cargo, WD contributed $760,000 to Port Alberta for the development of a logistics support centre and SmartPort Platform (used for cargo tracking) at the Edmonton International Airport (WD, 2008b). In 2009, the Prince George Regional Airport completed a runway expansion and equipment upgrade that permits an increased number of international and national flights to touch down in the Prince George region. The longer runway also accommodates cargo flights from Asia that require refuelling (Airport-technology.com, n.d.). WD committed $11 million to this project through the Mountain Pine Beetle Infestation Program and Airport Improvement Initiative (WD, 2009a). Reflecting Government of Canada priorities, WD received additional funding through the Airport Improvement Initiative to support improvements at other regional airports in western Canada. Over the last decade, WD has also used its annual G&C funds to support other projects with western stakeholders at western Canada's air gateways, including Winnipeg and Regina.

2.2 Summary

This section introduced the client, WD, and provided a basis for partnering with WD to pursue the project. The section provided several examples through press releases, strategic documents and previous actions to demonstrate the relevance of the project to WD's mandate and priorities. The following section will provide more details about the project by outlining the project's methodology and scope.

3 METHODOLOGY AND PROJECT SCOPE

This project will provide government with recommendations for strengthening the value creation capacity of the logistics sector at western Canada's gateways. The research question for this project is the following: what actions should government take to strengthen value creation capacity within the logistics sector at western Canada's gateways? The research question will be answered using a four-part methodology that includes a literature review, a scan of government initiatives focussed on the logistics sector in western Canada, interviews with industry professionals, and a scan of the world's two top-performing logistics sectors (referred to as the leading jurisdictions scan). The research approach will be qualitative in nature. Below, each component of the four-part methodology will be discussed in greater detail. Following the discussion on methodology, the project's scope will be outlined.

3.1 Project Methodology

3.1.1 Literature Review

The literature review will provide an overview of academic research related to the project's research question. Literature will be obtained by searching online academic research databases, including Google Scholar, EbscoHost (Academic Search Complete) and JSTOR. The review will also incorporate relevant studies provided by the client organization. A general search using the Google search engine as well as search engines on Government of Canada websites will also be conducted. Search topics will include several combinations of the following terms: value, value creation, industrial policy, cluster policy, logistics, logistics sector, barriers, recommendations, and public policy.

The purpose of the literature review is to identify what previous authors have uncovered about the research question. Because the number of similar studies is very small, the literature review will be approached by examining a series of smaller questions or topics that, when examined collectively, will present the current state of research related to the whole research question and ultimately support the development of a conceptual framework. The literature review will examine academic literature on the topic of value, value creation, and sector development policy including industrial policy and cluster policy. Literature will also examine barriers to value creation that presently exist in the logistics sector. Within the discussion of each topic, the review will highlight major themes, contradictions and gaps within the literature while connecting the findings back to the research question. It will inform the development of a conceptual framework and identify the types of government policy that impact value creation. The conceptual framework will be used to organize findings from primary research activities, including industry interviews, and the leading jurisdictions scan.

3.1.2 Scan of Existing Government Strategies

This research activity will summarize government-initiated strategic actions designed to improve value creation capacity within the logistics sector at western Canada's gateway cities. Actions will be those developed by government agencies operating in western Canada. This section introduces all relevant strategies created during the last ten years.

Prior to this period, several strategies appeared to focus purely on port development, roadway development or airport development separately, rather than examining the topic within the broader and more encompassing concept of gateway development. During the last ten years, the concept of gateway development has become an increasingly common trend. Since the general theme of this report is gateway development, only strategic actions created within the last ten years will be examined. The ultimate purpose of this scan is to outline what actions have already been implemented in western Canada; this will ensure that recommended actions are not simply a duplication of previous actions. Each strategy will be summarized and analyzed to reveal the implications of each strategy for the research question.

3.1.3 Interviews

Similar to the literature review, the interviews will identify barriers to value creation. However, interview questions will also be focussed on determining what actions, in the opinion of logistics professionals, governments should take to decrease value creation barriers and increase the value creation capacity of the logistics sector. The interview will consist of ten questions pertaining to the state of the logistics sector in western Canada and potential government actions to support the sector. Responses to interview questions will be organized into themes and incorporated into the conceptual framework. The interviews will be helpful in identifying where current policy falls short and where new policies could be developed to remove the barriers and improve value creation capacity.

The purpose of the interview stage is to gather input from industry professionals pertaining to the research question. Interviews were conducted with logistics professionals at the managerial level in each of western Canada's four gateway cities. Gateway cities were represented as follows: two interviewees from Vancouver; one interviewee from Prince Rupert; and two interviewees from Calgary, one of which is responsible for a logistics firm's branch in Edmonton. The author secured two interviewees from a personal network established while employed in the logistics industry from 2006 to 2008. The three remaining interviewees were obtained through recommendations from Transport Canada. Four interviews were conducted by phone and the fifth interview was conducted in person. Interviews ranged from 45 minutes to one hour in length. The ten interview questions appear below:

1. What are the strengths of the logistics sector in your city and in Western Canada?

2. What are the weaknesses of the logistics sector in your city and in Western Canada?

3. What can government do to help the logistics sector charge less for logistics services?

4. What can government do to help the logistics sector offer more consistent and reliable service for its customers?

5. Are there enough logistics services in your city to meet demand? Are there enough logistics services in western Canada to meet demand?

6. What can government do to increase the variety of logistics services available in your city and in Western Canada?

7. What else could governments do to improve the overall value of logistics services in your city and in Western Canada?

8. What role should government play in growing the logistics sector?

9. What role should the sector play in growing the logistics sector?

10. What challenges to growth does the logistics sector face in your city and in western Canada?

3.1.4 Leading Jurisdiction Scan

A scan of top-performing logistics sectors (Germany and Singapore) will be the third component of the methodology. This component will be referred to as the leading jurisdictions scan. Germany and Singapore are considered leading jurisdictions in terms of logistics performance, especially in creating value for customers by offering reliable, flexible, and competitively priced logistics services. The objective of this section is to learn from the world's leading logistics jurisdictions, searching for plausible solutions to value creation barriers in western Canada's logistics sector. This research activity involves the scanning of relevant government strategies created in Germany and Singapore that pertain to the transportation and logistics sector. Singapore and Germany are considered leading jurisdictions in the logistics industry and recently received the #1 and #4 ranking respectively on the World Bank's Logistics Performance Index (World Bank, 2012). In previous years, Germany and Singapore have frequently been rated #1 and #2 respectively. The Logistics Performance Index rates each country's logistics performance in six key categories: customer clearance efficiency, infrastructure quality, ease of arranging competitively priced shipments, logistics service quality and competence, ability to track shipment location, and frequency of on-time shipment deliveries. Germany and Singapore commonly place near the top of each category. The results of this research activity will inform the development of the recommendations.

3.2 Project Scope

As its primary objective, this report will recommend actions for strengthening the value creation capacity of the logistics sector at western Canada's gateways. Four parameters have been established to define the direction and scope of the report. First, the report will examine firms that handle international cargo (excluding cargo movements to the United States). The report will not target firms that engage exclusively in domestic shipping. Second, the report will examine firms that handle cargo transported into or out of Canada by sea or air, not truck. Third, the report will focus on logistics firms operating in gateway

cities in the provinces of western Canada: British Columbia, Alberta, Saskatchewan, and Manitoba. Western Canada's gateway cities are Vancouver, Prince Rupert, Edmonton, and Calgary. Finally, the report will only focus on firms handling cargos suitable for containerization or break bulk shipping (e.g. lumber bales, project cargos) by air or sea. Handlers of bulk cargos, such as coal, grain, ore, and canola, will not be examined.

3.3 Summary

This section provided a review of the four-part approach to the project methodology. The methodology will include a literature review, scan of previous government initiatives, interviews with industry professionals and scan of leading jurisdictions. The purpose and method of each research element was also outlined. The collective purpose of the research activities is to assemble a list of value creation barriers and potential solutions to those barriers. The project scope set out four parameters that will be adhered to throughout the study.

4 FOUNDATIONAL DEFINITIONS RELATING TO SUPPLY CHAINS AND TRANSPORTATION NETWORKS

Readers may be unfamiliar with some concepts presented in this report. Outside the transportation sector, terms such as “supply chain”, “logistics”, and “gateway” have a variety of meanings and can be interpreted differently. To avoid confusion and maintain consistency throughout the report, definitions of important terms will be provided in this section. Definitions will be provided for the following words and concepts: western Canada, supply chains, logistics, and gateways.

Prior to defining the mentioned terms, the concept of value will be discussed briefly. The concept of value will defined more thoroughly in Section 7 (Literature Review). Prior to Section 7 (Literature Review), value will be referred to as a positive customer experience that occurs when a service provider meets or exceeds the customer’s expectations in relation to price paid (McDougall & Levesque, 2000). Value can also be considered as a measure of customer satisfaction. As will be discussed in Section 7, value can be measured in two ways: by measuring the price paid by the customer and by measuring the customer’s perceptions through interviews, surveys or other means. To know if customer expectations have been exceeded, a customer’s expectations must be recorded prior to the performance of a service and later compared to the customer’s satisfaction with the service provider’s actual performance. Value creation occurs when a service provider performs activities for a customer that result in the creation of value – the meeting or exceeding of customer expectations.

4.1 Western Canada

Western Canada is defined as the provinces of British Columbia, Alberta, Saskatchewan, and Manitoba. Although western Canada consists of four provinces, the region’s four international gateways are found only in British Columbia and Alberta. The gateways located in British Columbia and Alberta act as international gateways for the entire region, including Manitoba and Saskatchewan.

4.2 Supply Chain

The life of every tangible product begins in the form of raw materials. Firms transform raw materials into components or ingredients that become the substance of final products. Many different firms from a variety of countries can be involved in this transformation process. Such firms not only include resource extractors and manufacturers, but also warehouse operators, distributors, and retailers (Simchi-Levi, D., Kaminsky, & Simchi-Levi, E., 2003). The network of organizations involved in this transformation process is referred to as the ‘supply chain’. Christopher defines supply chain as “a network of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate customer” (Christopher, 2005 as cited in Stadtler, 2008).

4.3 Logistics

A supply chain's upstream and downstream linkages are connected by logistics activities performed by the logistics sector. The Council of Logistics Management and Industry Canada define logistics as

> "... the process of planning, implementing, and controlling the efficient, effective flow and storage of goods, services and related information from the point of origin to the point of consumption for the purpose of conforming to customer requirements." (Council of Logistics Management, 1998 as cited in Lummus, Krumwiede, & Vokurka, p. 426, 2001; IC, 2005).

Numerous activities, such as the movement of cargo by truck, train, vessel, or plane; cargo storage and warehousing; inventory management; the coordination of cargo movements on behalf of cargo owners; and the performance of value added services such as labelling, basic manufacturing, assembling, and packaging all embody the logistics function. Logistics researchers and government agencies have conducted several surveys of logistics firms and consumers to better understand the types of activities encompassed by the logistics function (Lieb & Bentz, 2005, IC, 2008). Industry Canada has established three sub-sectors of logistics services: asset-based transportation services, asset-based non-transportation services and non-asset based transportation services.

Asset-based transportation services consist of firms that perform transportation activities. Firms belonging to this sub-sector include truck, ocean, air, and rail cargo transport companies. These services include firms that perform warehousing, storage, and inventory management as well as co-manufacturing, co-labelling and co-packaging. Similar to the asset-based transportation services sub-sector, firms belonging to the asset-based non-transportation services sub-sector conduct activities that require employees to physically handle cargo. *Non-asset based transportation service* firms make arrangements for transportation, warehousing, and other services on behalf of their customers. Notably, these firms do not actually own any transportation conveyances or warehouse space. Although non-asset based transportation service firms coordinate and monitor transportation arrangements, they do not handle the cargo at any point. Firms belonging to this sub-sector "integrate the services of different subcontracting companies" and include freight forwarders and customs brokers. Some firms, such as Canadian National Railway, Schenker Logistics, and Kuehne & Nagel perform services that fall under all three sub-sectors (IC, 2008, p. 6).

Lieb and Bentz (2005) prepared a comprehensive list of logistics activities based on a survey of logistics providers and manufacturers in the United States. Logistics activities on their list belong to all three sub-sectors and include the following: after sales service, assembly/installation, carrier selection, consulting services, contract manufacturing, customs brokerage, customer spare parts replenishment, direct transportation service, fleet management, freight forwarding, freight payment, measurement of carrier performance, merge-in-transit, operation of information technology systems, order fulfillment, order processing, product returns, product testing, purchase of materials, rate negotiation,

relabeling/repackaging, shipment consolidation, software selection, tracking/tracing, and warehouse management.

The role of the logistics function is to effectively manage the movement and storage of goods along the supply chain. An example from the automotive sector can illustrate the role of the logistics sector in the supply chain. The supply chain of an automobile manufacturer can be highly complex, sourcing hundreds of parts from a variety of international locations to assemble an automobile. In this example, an automobile manufacturer in Ontario requires weekly orders of tires from a supplier in China. To avoid storing excessive levels of inventory at the plant, the auto manufacturer requires the exact amount of tires required for one week of automobile production.

To connect the two nodes of this supply chain (the tire supplier in China and the auto manufacturer in Ontario), one or more logistics providers may be required to perform several steps that are critical to the tire supplier's and the auto manufacturer's success. In this example, the tire manufacturer in China hires a freight forwarder to coordinate the transportation arrangements from China to Ontario. In turn, the freight forwarder hires several other logistics services to transport the tires to the auto plant by means of various transportation modes. First, the freight forwarder hires a trucking company to position an empty shipping container at the tire manufacturer's factory. After the tire supplier loads the container, the trucking company returns to the tire manufacturer's warehouse and ensures the container's delivery to a nearby seaport in time to make the next vessel voyage. Prior to this, the freight forwarder arranged a reservation on a container vessel from Shanghai to Vancouver. After departing from Shanghai, the freight forwarder contacts its Vancouver partner office to provide the date and time of shipment arrival. To ensure that the Vancouver office can efficiently clear the shipment through customs, the freight forwarder in China sends the Vancouver office all necessary product paperwork and shipment information.

After clearing the shipment through customs at Vancouver, the Vancouver freight forwarder arranges for the container to be picked up from the seaport terminal. The container is then delivered to the freight forwarders' nearby warehouse where the tires will be palletized and wrapped according to the needs of the auto manufacturer. Information about the customer's needs was transmitted through an integrated information system shared by the freight forwarder and the customer. After completing these value-added logistics services, the freight forwarder notifies the auto manufacturer of the shipment's status and arranges for another trucking company to deliver the container to the rail-yard by a scheduled time. After the container has been delivered to the rail yard, the rail provider transports the container from Vancouver to Brampton, the closest rail station to the auto manufacturer's plant. After the rail provider notifies the auto manufacturer about the shipment's arrival, the auto manufacture hires another trucking company to deliver the shipment to the auto plant warehouse located next to the auto plant. The auto plant's warehouse is operated by a third-party logistics provider that manages the auto plant's inventory and ensures that supplies are delivered to the production floor as requested.

The successful delivery of the shipment to the auto manufacturer was made possible through the performance of competent logistics providers, including a freight forwarding company, steamship line, rail provider, warehouse operator and three separate trucking companies. The failure of any logistics provider to effectively perform the requested logistics service could have resulted in late delivery to the auto plant and delayed production. If the logistics provider failed to produce the proper documentation for customs clearance, deliver containers at schedule times, or correctly palletize and label products, the customer would have experienced production disruptions and the supply chain would have been compromised.

Theoretically, supply chains resemble an intricate and smooth flowing network. Logistics activities move cargo quickly and efficiently from one firm to another along the supply chain. In reality, many obstacles such as labour disruptions, weather, difficult terrain, public opposition, customs requirements, and traffic congestion can impede the logistics function. A supply chain and the logistics function must operate within the realities and limitations of these obstacles. In cases of labour disruption at ports, logistics providers must find alternative ports for exporting cargo. Frequently changing customs requirements require logistics providers to keep abreast of the latest regulations. Weather related issues cause logistics providers to seek alternative delivery and routing options. Many of these constraints and challenges often intersect at a geographical construct referred to as a 'gateway' (Hall, 2007).

4.4 Gateways

Most countries possess a gateway and some countries, such as Canada, possess multiple gateways. Many factors within a gateway can interact to impact the effectiveness of an entire supply chain and the competitiveness of trading corridors. Such factors include the infrastructure capacities that facilitate the connection between two modes of transportation (e.g. vessel and rail), the availability of logistics services (e.g. warehousing, trucking companies), and the accessibility of customs agents to allow for cargo release. Definitions for the term 'gateway' are varied. They have emerged from of a variety of subject areas, including geography, transportation studies, supply chain management, and information and communications technology.

Geographers use the term to describe a major entry (or exit) point leading into (or out of) a region (Burghardt, 1971 as cited in Pain, 2007). The term can be used to describe a single entry/exit point (e.g. Vancouver International Airport), a city or region that contains one or more entry/exit points (e.g. Vancouver and British Columbia's lower mainland), or a larger area with numerous entry/exit points (e.g. the entire province of British Columbia). Gateways are places or regions that contain infrastructure and services necessary to provide access to international locations and connections to hinterlands. They connect geographical areas (e.g. continents) separated by restrictive geography (e.g. oceans) that can be difficult to cross (Gillen et al., 2007).

From a more technical geographic perspective, Gillen, Parsons, Prentice and Wallis (2008) describe gateways as regions possessing two characteristics. First, gateways are partially or

completely bordered by restrictive geographies that are difficult to inhabit and develop such as oceans, seas, mountains, and deserts. Second, a substantial number of commercial enterprises and residential dwellings have developed near the restrictive geographies. Using these criteria, western Canada possesses the following gateway cities: Vancouver (located on the east side of the Pacific Ocean), Calgary (located near the eastern side of the Rocky Mountains), and Edmonton (also located near the eastern side of the Rocky Mountains). Although Winnipeg and Churchill might be considered gateway cities using the definition just provided, these cities do not meet the established criteria with regards to the types of cargo and volumes of international cargo handled. These criteria have been established by this study to identify the highest volume gateways in western Canada. For similar reasons, Saskatoon and Regina do not qualify as gateway cities in this report. The criteria will be reviewed later in this section.

From a global supply chain perspective, Oum and Tongzon (2007) define gateways as "nodes in a globalized supply chain that serve as a critical link between geographical areas or regions by providing a system of road, rail, marine and air transportation infrastructure of national significance for international trade" (p. 1). Their definition of gateway also matches closely with the definition offered in Canada's Asia-Pacific Gateway and Corridor Initiative: "A gateway is a system of marine, road, rail and air transportation infrastructure of national significance, within a defined geographical zone" (GOC, 2006). Both definitions consider gateways to be an entire system of infrastructure within a defined geographical zone.

For this project, the working definition of 'gateway' will be informed by all of the above definitions. It will also be defined in a western Canadian context. 'Gateway' will refer to a city or collection of adjacent cities (such as the cities comprising British Columbia's lower mainland) that act as "nodes in a globalized supply chain that serve as a critical link between geographical areas or regions by providing a system of road, rail and marine or air transportation infrastructure of national significance for international trade" (Oum & Tongzon, p. 1, 2007). The term "nationally significant transportation infrastructure" will refer to (i) any airport with direct international cargo movements (excluding to the United States) greater than 1,000 tonnes per year or (ii) any ocean port with total international containerized cargo movements greater than 250,000 twenty-foot equivalent units (TEUs) per year (SC, 2008; SC, 2009). This criterion has been selected as a means to identify the top gateways in terms of current and future potential. The second criteria, a gateway's ports and/or airports must handle containerized or break-bulk cargo to qualify as a gateway for this study. This is because logistics activities are more closely associated with containerized and break-bulk cargos than with bulk cargos. The definition will not treat gateways as an entire system extending beyond major cities and along highways throughout western Canada. Instead, the definition used in this report will be limited to cities in western Canada that possess major entry and exit points for containerized air and/or ocean cargo. According to this definition, western Canada possesses the following gateways for ocean cargo: Vancouver (Port Metro Vancouver) and Prince Rupert (Prince Rupert Port Authority). Western Canada possesses three international gateways for air cargo: Vancouver (Vancouver International Airport – YVR), Calgary (Calgary

International Airport – YYC), and Edmonton (Edmonton International Airport – YEG). Figure 3 below shows all four gateways in western Canada. On account of not handling break-bulk or containerized cargo, Churchill is excluded from the study. Due to insufficient international air cargo volumes – specifically, volumes to or from international destinations other than the United States – Winnipeg, Saskatoon, Regina and Prince George are excluded from the study.

Figure 3: Map of Western Canada with Four Primary Gateways

4.5 Summary

In this section, key terms were explained and defined. Explanations and definitions for western Canada, supply chain, logistics and gateway were provided. Two other critical terms, value and value creation, will be defined more thoroughly in Section 7 (Literature Review). Prior to Section 7 (Literature Review), value will be defined as a positive customer experience that occurs when a service provider meets or exceeds the customer's expectations in relation to price. Value creation will be defined simply as the performance of activities that result in the creation of value (Simpson et al., 2001). In the following section, Section 5 (Context), the context of the research topic will be presented by describing the problem and opportunity associated with value creation and the logistics sector at western Canada's gateway cities. The policy community that impacts value creation in the logistics sector will also be examined.

5 CONTEXT

This section will provide contextual details related to the project topic and, by doing so, illuminate the rationale behind the project and the role of the related institutional players. It will discuss the need for enhancing value creation within the logistics sector and the resulting benefits of pursuing value creation initiatives. This section will also attempt to quantify the opportunity available to the logistics sector in gateway cities. This will be accomplished by calculating the amount of cargo that moves through seaports and airports at western Canada's gateway cities. Section 5 will conclude by outlining the primary institutions that impact the logistics sector and the role of each institution in relation to the sector and the research question. The purpose of this section is to validate the importance of the research topic to the client, the logistics sectors, and Canadians.

5.1 Project Need and Benefits

The logistics sector contributes to western Canada's economic growth and vitality. One of the primary functions of the logistics sector is to keep supply chains moving. An efficient and reliable logistics sector will strengthen the performance of their customer's supply chains. In the context of the logistics sector, efficiency refers to the speed with which services are performed. An efficient logistics sector will ensure that services such as cargo movements (e.g. along road, rail, or ocean), transfer of cargo from one mode of transport to another (e.g. from truck to vessel, vessel to truck, or truck to rail) and cargo handling in warehouses are performed quickly and without delay. Reliability refers to the consistent performance of logistics services over time. Reliability will be established as similar shipments are delivered to customers in the same timeframe and same unblemished condition with little or no variability over a defined period of time. Efficient and reliable logistics services will allow the customer to focus on their own operations without expending unnecessary energy into the management of logistics providers. In addition, efficient and reliable logistics services will allow the customers to meet their own production schedules. If shipments are delayed, damaged or packaged incorrectly by the logistics provider, a manufacturer's production schedule becomes delayed and impairs their ability to finish production in a timely manner. Thus, a reliable and efficient logistics sector supports improved efficiency and reliability of the sectors it serves, ultimately contributing to the competitiveness of the economy as a whole (Arvis, Mustra, Panzer, Ojala, & Naula, 2007).

The logistics sector also makes major contributions to Canada in economic terms. Table 1 provides a breakdown of GDP contributions by the aggregated logistics sector and its sub-sectors. In 2007, the sector contributed $40 billion to the nation's gross domestic product (GDP). According to Industry Canada, asset-based transportation services accounted for approximately $27 billion of GDP in 2007; asset-based non-transportation services accounted for $3 billion of GDP; and non-asset based logistics services accounted for approximately $10 billion of GDP for the same year. To provide perspective, the logistics sector's contributions to GDP are equivalent to the combined contributions of the food manufacturing, paper manufacturing, and wood product manufacturing sectors. Canada's logistics services sector has experienced a GDP growth rate of 47% since 1998. By 2015, GDP generated from the logistics sector is expected to increase by 40% to $56 billion.

Industry Canada predicts that considerable sector growth will stem from increased demand for warehousing and storage services (IC, 2008; SC, 2010).

Table 1: GDP Contributions of the Logistics Sector to the Canadian Economy in 2007

Sub-Sector	Contribution to Canada's GDP
Asset-based transportation services	$27 Billion
Asset-based non-transportation services	$3 Billion
Non-asset based logistics services	$10 Billion
Total	**$40 Billion**

A key driver of logistics sector growth will be the anticipated increase in trans-Pacific trade through west coast seaports. The number of full ocean containers moving from Asia to North America through western Canadian gateway cities is expected to reach 6.0 to 7.0 million twenty-foot equivalent units (TEUs) by 2020 (GOC, 2006). This equates to an increase of approximately 3 million TEUs over the next seven years. The infrastructure necessary to accommodate the increased volumes is either completed, underway, or planned. Western Canada's container handling capacity, which refers to the maximum amount of containers that can realistically move through western Canada's container terminals, will be 8.6 million TEUs by 2020. Growth in container handling capacity will come thanks to planned construction and expansion projects at the Port of Prince Rupert, Port Metro Vancouver, and along the connecting transportation corridors (BC, 2005). Given that western Canada's future container handling capacity exceeds forecasted volumes, it appears that western Canada's infrastructure will be capable of handling increased trade levels. However it is less clear if the logistics sector will offer sufficient value to capture and retain these volumes within a competitive environment.

Ensuring that the logistics sector creates sufficient value for customers, by providing sufficiently reliable, competitively priced and flexible services, is not only vital to the Canadian economy and to the competitiveness of other sectors but also to the competitiveness of western Canada's gateways. Canada's gateway cities, especially port cities, operate in a competitive environment. All major ports along North America's west coast compete for cargo moving from Asia to North America, especially to the mid-west United States and eastern Canada. Although port terminal capacity will be sufficient to handle the increased volumes, western Canada has no guarantee that importers and exporters will choose a western Canadian gateway ahead of a U.S. gateway. The strategic actions of competing North American gateways in Seattle, Tacoma, Los Angeles, Long Beach, Mexico and even the east coast could combine to shift future Asia-Pacific trade volumes away from western Canadian gateways (Brooks, 2007). (A map with each competing gateway is shown on a map in Figure 4).

According to Dresner (2007), the critical drivers of port selection are availability of terminal facilities, such as logistics facilities, warehouses and customs offices, and the total transit time and costs associated with use of the gateway. Each of these drivers relates to

the three drivers of value creation in the logistics sector: flexibility, reliability, and cost. Gateways offering services with such attributes will be more likely to capture and retain growing trade volumes. In many instances, however, ocean and air carriers make the ultimate decision regarding gateway selection. Especially in the ocean shipping industry, international shipping consortiums determine ports of call, routings, timing, scheduling and rates. Final decisions are made based on the carriers overall volumes, costs, and efficiency at ports. Even if importers and exporters wish to move cargo through a particular gateway, the economics must be favourable to the carrier. In addition, shifting trade patterns (e.g. increased trade between Canada and Singapore) can also impact port and airport volumes in spite of value creation capacity within the logistics sector. If Canada increases container trading with Singapore, container volumes at gateways such as Prince Rupert may not necessarily increase since the distance between Singapore and Vancouver is much shorter than the distance between Singapore and Prince Rupert.

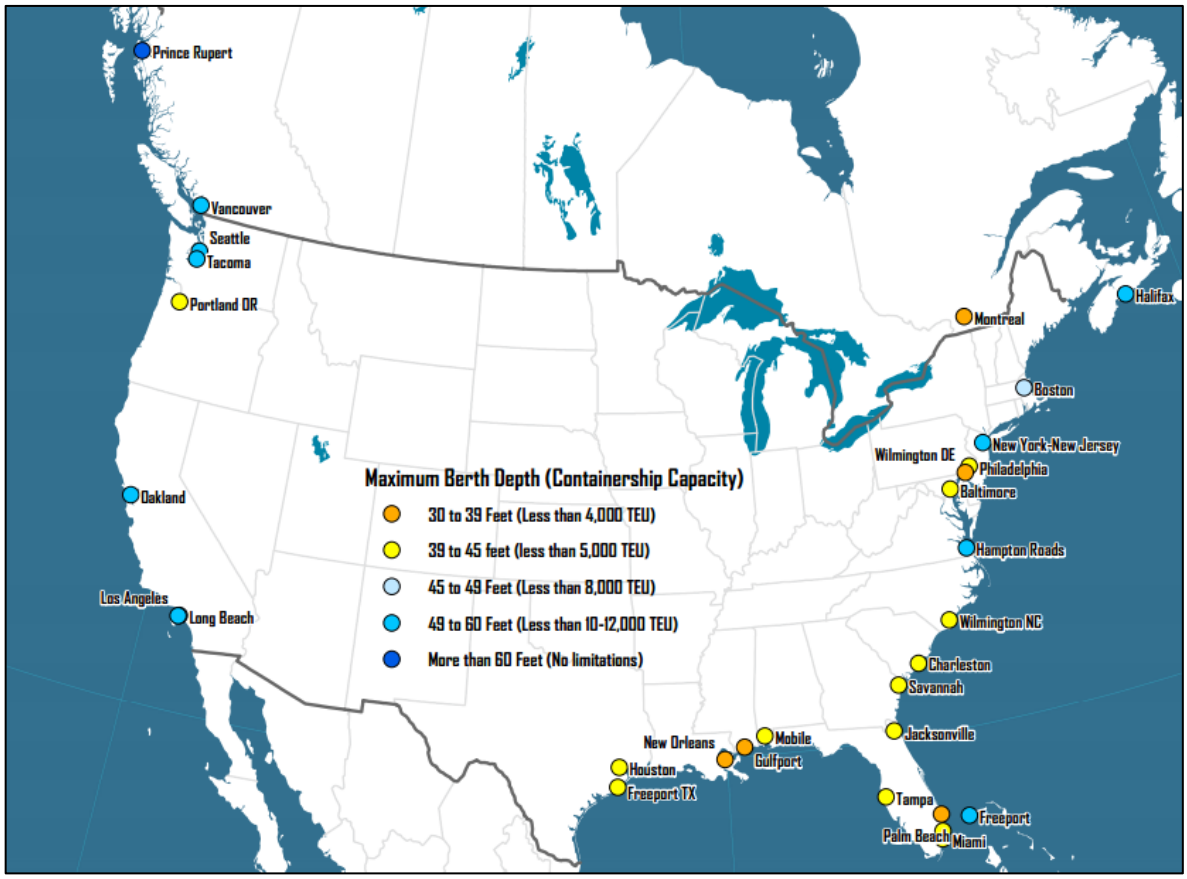

Figure 4: Map of North America's Primary Ocean Gateways

Note. From: "The Geography of Transportation Systems" by J.P. Rodrigue, 2013.

Research suggests the value creation capacity of Canada's logistics sector has room for improvement. The Logistics Performance Indicator benchmark was an index created by

Arvis et al. (2007) for benchmarking logistics efficiency and service quality. The LPI Index ranked Canada 10th out of 150 countries. For Canada to achieve and maintain its goal of becoming the "best transportation network facilitating global supply chains between North America and Asia" (GOC, 2006), the cost effectiveness, reliability, efficiency, and flexibility of logistics services in Canada must exceed those found in the United States (currently ranked 14th) and Latin America. Although Canada tops the United States by four spots, Canada's index score is only 0.06 points greater than the United States. Of the six categories considered by the LPI Index, Canada ranked higher in the following categories: customs performance, ease of arranging international shipments to Canada, and logistics competence and timeliness. Canada ranked slightly lower in terms of infrastructure and cargo tracking (referring to the ability of a shipper to track a shipment at any point in the supply chain). Although the available studies provided no explanations for the lower rankings, it is important to note that the U.S. score topped Canada by a very slim and even negligible margin. In terms of logistics competence, Canada possesses a marginal competitive edge – an edge easily eroded through planned infrastructure investments in the United States.

In addition to capturing the economic benefits from new cargo volumes, there are other benefits associated with supporting economic development at the gateway. Gillen et al. (2008) found that gateway infrastructure and logistics systems "play a transformational role in ... regional productivity" (p. 3). Gateway development also fosters regional economic development by giving domestic firms greater access to foreign markets. Greater exposure to global markets can increase the competitiveness and productivity of domestic firms.

5.2 Opportunities for the Logistics Sector

With trade volumes expected to grow, western Canada's logistics sector will have more opportunities to perform logistics services for shippers and make further contributions to western Canada's economy. The quantity of business opportunities presently available to the logistics sector at western Canada's gateways can be measured in terms of cargo volume. In this sub-section, a breakdown of cargo volume will be provided for each gateway – air gateways followed by ocean gateways. All figures represent international cargo movements, defined as the movement of cargo to and from international locations other than the United States. The purpose of this section is to demonstrate each gateway's relative size, quantify the amount of value-adding opportunities, and pinpoint the type of logistics opportunities that may arise through the coming years.

Most of Canada's non-US trade enters the country by ocean-going vessel. From a tonnage perspective, 61% of international exports departed Canada by vessel and 30% departed by airplane (see Figure 5). Figure 5 also shows 42% of imports entered Canada via ocean gateways; 28% entered through air gateways (Transport Canada [TC], 2009). This suggests that the majority of new logistics opportunities will be linked to ocean cargo. However, the quantity of logistics opportunities and associated economic benefits that stem from air cargo must not be overlooked. With this in mind, cargo volumes at each of western Canada's gateway airports will be reviewed; this will be followed by a review of cargo volumes moving through western Canada's seaports. However, the most recent data

available on air cargo volumes dates back to 2009, a year of economic recession in North America. Since that time, global economic conditions and trade levels have gradually improved. Thus, air cargo volumes must not be considered as a forecast of future volumes; rather, the percentages reflect the distribution of air cargo volumes by type (i.e. import or export) and gateway.

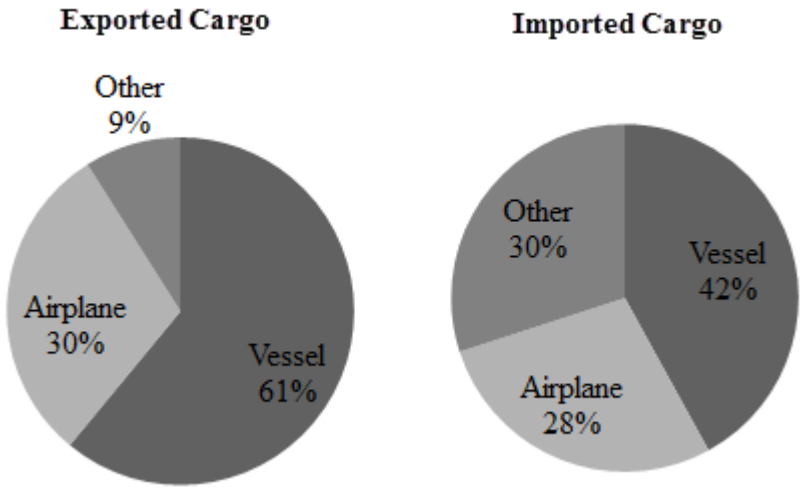

Figure 5: Canadian trade to/from non-US destinations

5.2.1 Air Gateways

To quantify opportunities associated with air cargo, volumes will be examined at each air gateway in western Canada; total international imports and exports will be calculated and compared. Air gateways include Vancouver, Calgary, and Edmonton. In 2009, shippers exported 32,459 tonnes of air cargo from Vancouver to international locations; in the same year, shippers imported 37,686 tonnes through Vancouver (see Figure 6). This means that imports account for more than half (54%) of Vancouver's international cargo; exports equalled 46%. The majority of international cargo moving through Calgary and Edmonton, however, are loaded onto airplanes for export. Exports through Calgary reached 10,620 tonnes or 64% of total international cargo moving through the Calgary International Airport in 2009; imports reached 6,068 tonnes or 36% of international cargo (see Figure 7). In Edmonton, air cargo exports totalled 961 tonnes or 67% of international cargo moving through the Edmonton International Airport; imports accounted for 33% of international cargo, only reaching 463 tonnes (see Figure 8). Historical data indicates that volumes declined at all gateways in 2009 compared to 2007. However, the general mix of import and export movements remained relatively stable (SC, 2007; SC, 2009).

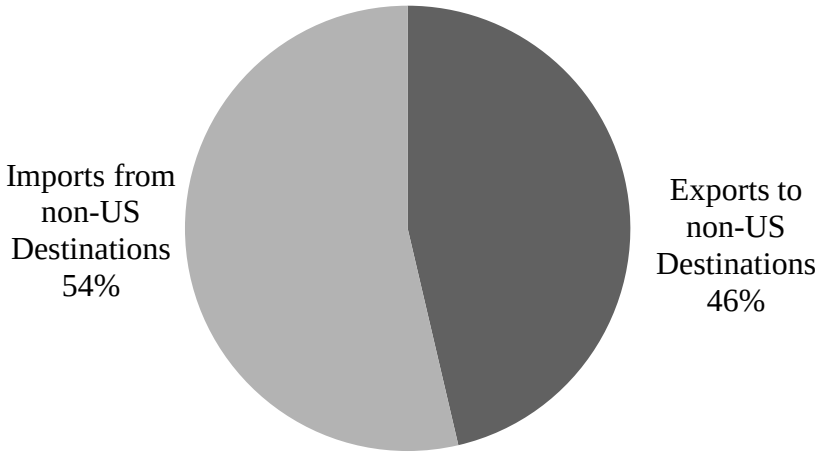

Figure 6: Trade with non-US destinations through Vancouver International Airport (SC, 2009)

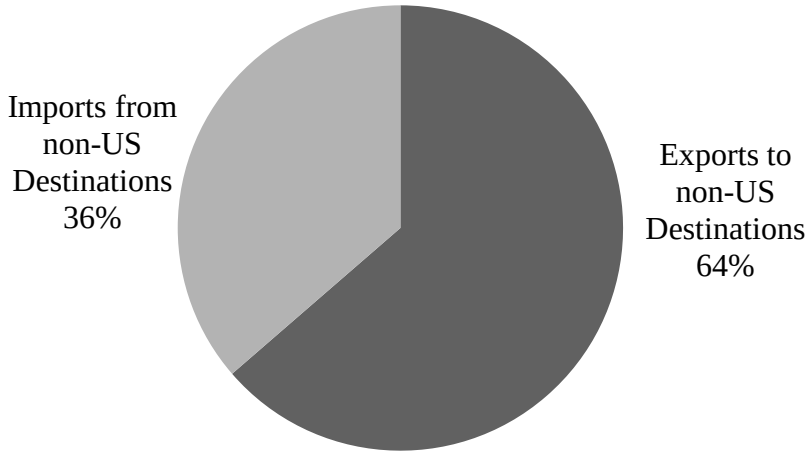

Figure 7: Trade with non-US destinations through Calgary International Airport (SC, 2009)

.

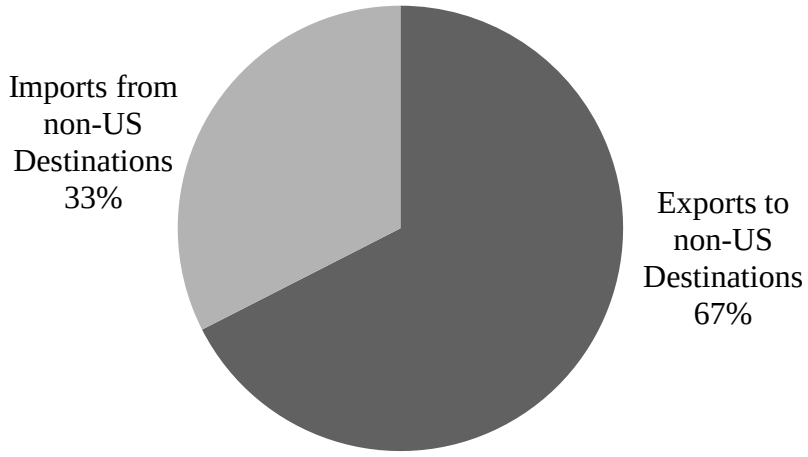

Figure 8: Trade with non-US destinations through Edmonton International Airport (SC, 2009)

The above analysis suggests three primary implications for the logistics sector. First, it is highly likely that volumes for the most recent year will be higher than volumes in 2009 – a year of economic contraction. Second, the majority of opportunities related to the arrival and departure of air cargo in western Canada will be centered near the Vancouver International Airport (see Figure 9). Nevertheless, increased use of long-haul airliners and airport improvements at other western Canadian ports may shift more volumes from Vancouver to Calgary and Edmonton. Presently, many shippers in Calgary and Edmonton must send some cargo by truck to Vancouver due to a lack of long-haul airliners that fly into Alberta. Once in Vancouver, the cargo connects with a direct trans-Pacific flight to Asia. The greater use of long-haul airliners means that more direct flights to Asia will leave directly from inland air gateways, such as Calgary or Edmonton. Third, opportunities in the Vancouver market may stem more from import cargo than export cargo. For logistics providers in Calgary and Edmonton, more opportunities may be generated from export cargo than import cargo.

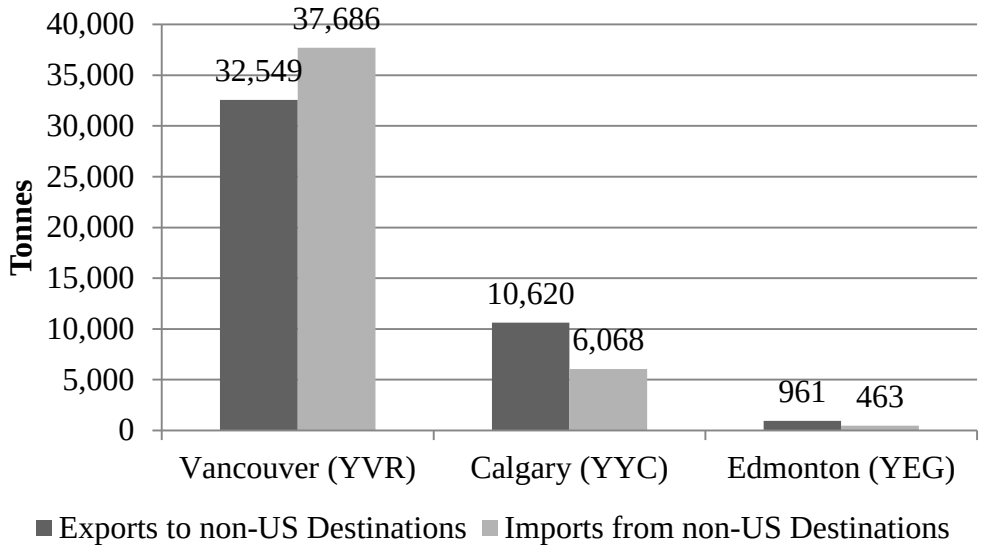

Figure 9: Trade with non-US destinations through western Canada's air gateways (SC, 2009)

5.2.2 Ocean Gateways

In the examination of ocean gateways, a similar breakdown will be conducted to quantify and describe logistics opportunities as they currently exist. In addition to the import-export breakdown used to discuss logistics opportunities related to air cargo, this investigation will also examine seaport capacity for additional insights into future logistics opportunities. In 2012, shippers exported 10.7 million tonnes of containerized cargo through Port Metro Vancouver; import volumes surpassed exports to reach 12.3 million tonnes (see Figure 10). With total trade at 23.0 million tonnes, Port Metro Vancouver still operates well below its 39 million tonne capacity (4.6 million TEUs) (Library of Parliament, 2006; PMV, 2012; World Port Source, 2011). Compared to the previous year, volumes grew by 9.9% and 6.4% for imports and exports respectively. Relative to Port Metro Vancouver, the Port of Prince Rupert experienced similar results in terms of import-export proportions. In 2012, containerized import traffic climbed by 35.5% over 2011 volumes to reach 3.2 million tonnes; export volumes grew 40.4% to nearly 2.5 million tonnes (see Figure 11). With total containerized trade at 5.7 million tonnes, Prince Rupert operates close to its 6.4 million tonne capacity (PRPA, 2010; WD, 2007).

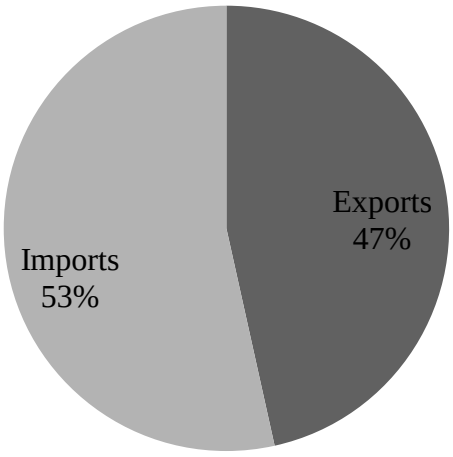

Figure 10: International trade through Port Metro Vancouver (PMV, 2012)

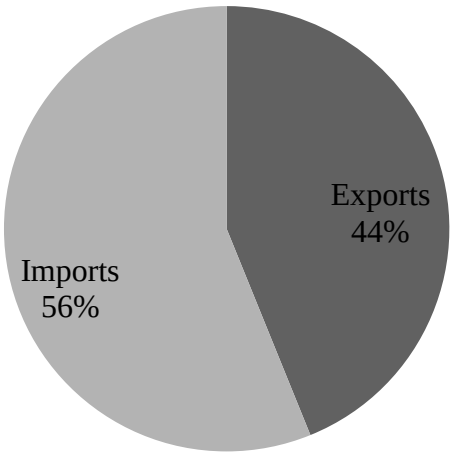

Figure 11: International trade through the Port of Prince Rupert (PRPA, 2012)

Based on the above analysis, Vancouver will continue to generate the majority of opportunities for logistics providers at western Canada's ocean gateways (see Figure 12). Containerized import cargo will be the basis for the majority of logistics opportunities at the Vancouver ocean gateway; however, export movements will still provide a critical mass of opportunities. With total container volumes at PMV reaching 23.0 million tonnes in 2012, Port Metro Vancouver's capacity of 39.0 million tonnes has not yet been reached. This suggests that PMV can accommodate an additional 11 million tonnes of containerized cargo, which translates into potential opportunities for the logistics sector. Based on the

analysis of Prince Rupert's volumes, the majority of logistics opportunities related to containerized cargo at Prince Rupert will also stem from imported cargos; however, opportunities related to export cargo are still significant. With total container volumes at the Prince Rupert gateway reaching 5.7 million tonnes in 2012, Prince Rupert's volumes are nearing capacity of 6.3 million tonnes. This suggests that Prince Rupert can only accommodate 0.6 million tonnes of additional containerized cargo per year without undergoing further expansion.

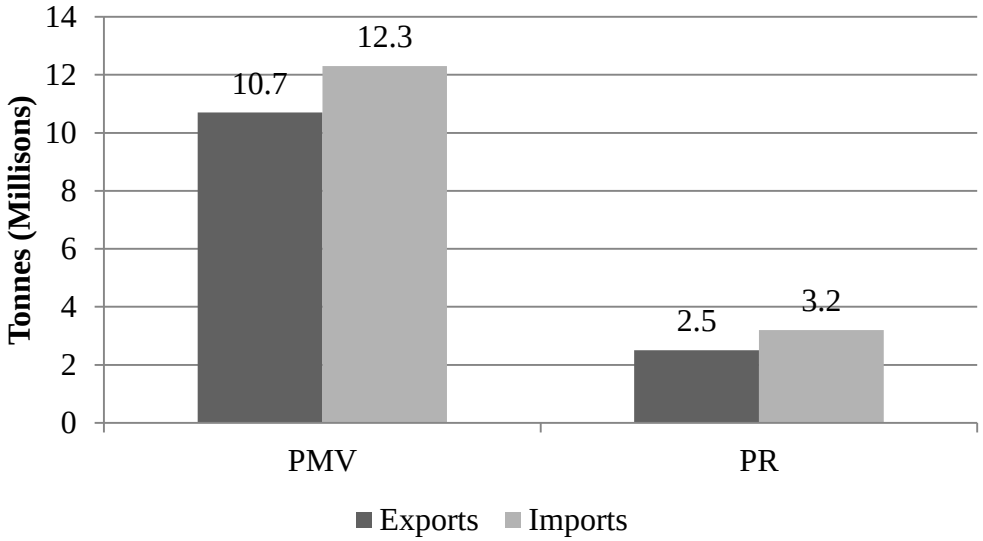

Figure 12: International trade through western Canada's ocean gateways (PMV, 2012; PRPA, 2012)

5.3 Policy Community and Regulatory Context

Government relies on a host of departments and agencies to aid the logistics sector in capitalizing on future opportunities. This section will inventory all government agencies and departments with the potential to impact the logistics sector's value creation capacity. The purpose of this section is lay the groundwork for future discussion about how various government agencies can contribute to strengthening value creation capacity in the logistics sector. This section will inventory agencies at the federal and provincial (including municipal) government levels. Governments often partner and consult with sector organizations when developing policies and programs that may directly or indirectly impact the sector. Therefore non-government agencies, such as sector associations, will also be examined. This section will also review Canadian and United States legislation that directly impacts the logistics sector. The list of agencies examined in this section appears below in Table 2. Following Table 2, each organization listed in the table, the role of the organization, and the potential of the organization to impact the logistics sector will be discussed. To conclude, legislation relevant to the logistics sector will also be discussed.

Table 2: Government and Non-Government Agencies that Impact the Logistics Sector

Federal Government	Provincial Government	Non-Government
• Industry Canada • Foreign Affairs, Trade and Development Canada • Employment and Social Development • Canada Border Services Agency • Transport Canada • Citizenship and Immigration Canada • Finance Canada	• Economic Development • Employment & Skills Development • Advanced Education • Immigration • Transportation	• Canadian Supply Chain Sector Council • Supply Chain Management Association

5.3.1 Federal Government Agencies

Industry Canada: Industry Canada's primary responsibilities are improving the environment for business investment in Canada, growing Canada's trade activities, ensuring a fair and competitive marketplace, and improving innovation. Industry Canada has the potential to impact the logistics sector by providing financing, grants, contributions, loans, and wage subsidies; industry analysis and research tools for small businesses; and market research for importers and exporters (IC, 2013).

Foreign Affairs, Trade, and Development Canada: Within the Foreign Affairs, Trade, and Development Canada department, the "Trade" portfolio is most relevant to the logistics sector. The Trade portfolio is concerned with opening new markets for Canadian businesses, promoting trade between Canada and other countries, and promoting foreign investment in Canada. The Trade group organizes trade events, both in Canada and abroad; provides intelligence on foreign markets; and provides grants and loans to support attraction of foreign investment and support expansion into new markets (Foreign Affairs, Trade, and Development Canada, 2013).

Employment and Social Development: A key role of Employment and Social Development Canada is to create policies that assist Canadians transitioning from school to work and from unemployment to employment. The Skills and Employment Branch engages in initiatives and activities that are relevant to the logistics sector. For example, the Branch leads initiatives that support skills development, labour market participation, and labour market efficiency (Employment and Social Development Canada, 2013).

Canada Border Services Agency: Canada Border Services Agency (CBSA) ensures the safe and efficient movement of goods and people across Canada's borders. CBSA impacts the logistics sector by imposing policies, reporting procedures and other regulations that must be followed when transporting goods into or out of Canada (Canada Border Services

Agency, 2013a). The counterpart agency of CBSA in the United States is referred to as Customs and Border Protection.

Transport Canada: Transport Canada is responsible for ensuring the safety and efficiency of Canada's transportation systems, including road, rail, air, and marine systems. Transport Canada fulfills these functions by engaging in rulemaking, oversight, and outreach. To ensure that transportation systems are efficient, Transport Canada has implemented a National Policy Framework for Strategic Gateways and Trade Corridors. The framework is designed to help key regions in Canada take advantage of their natural geographic attributes to attract international trade. The first initiative under the national policy framework, the Asia-Pacific Gateway and Corridor Initiative, is discussed in more detail in Section 7. All aspects of Transport Canada's mandate, including safety and efficiency, can impact the logistics sector in western Canada (Transport Canada, 2013).

Citizenship & Immigration Canada: Citizenship and Immigration Canada develops programs and policies that contribute to the arrival of new residents and their integration into Canada. Citizenship & Immigration Canada can impact the logistics sector by increasing or decreasing the number of new residents entering Canada with training in logistics and supply chain management (Citizenship and Immigration Canada, 2013).

Department of Finance Canada: Related to the logistics sector, the Department of Finance is responsible for developing policies and legislation related to taxes and tariffs. This includes policies related to the development of new tariffs on imported cargo and the amount of those tariffs. In connection with tariff policy, the Department of Finance is responsible for Canada's Foreign (Free) Trade Zone policies and programs. Free Trade Zones are geographical zones where importers are eligible for exemptions from duties and taxes (Department of Finance Canada, 2013).

5.3.2 Provincial Government Agencies

Ministries pertaining to immigration, employment, economic development and advanced education: In western Canada, provincial governments often combine the portfolios of immigration, employment, skills training, and economic development into one or two ministries. In some cases, the ministries also encompass advanced education. Regardless of name or structure, the ministries' primary goals pertain to the development and diversification of the economy by ensuring alignment between skills development and industry needs, offering services and programs for small businesses, and helping new residents fully utilize skills and training obtained abroad. In British Columbia, these responsibilities are held within the Ministry of Jobs, Tourism, and Skills Training and the Ministry of Advanced Education (BC, 2013a; BC, 2013b). In Alberta, all portfolios belong to the Ministry of Enterprise & Advanced Education (2013). The Ministry of Economy (2013) and the Ministry of Advanced Education (2013) hold these responsibilities in Saskatchewan. In Manitoba, the responsibilities are split between the Ministry of Agriculture, Food & Rural Initiatives (2013) and the Ministry of Entrepreneurship, Training & Trade (2013).

Each of the above Ministries has the potential to impact value creation in the logistics sector. Economic development ministries can encourage the development of small and medium sized logistics enterprises and provide businesses with resources to support innovation and productivity improvements. Ministries focussed on employment, skills development, and advanced education will support the logistics sector by providing timely labour market information and working with industry to development educational programs that create skills required by the logistics industry. Immigration ministries help internationally-trained logisticians and other supply chain professionals effectively transition into the Canadian workforce and obtain relevant employment in the logistics and supply chain sector.

Ministries pertaining to transportation infrastructure: Whereas Transport Canada ensures the safety and efficiency of transportation systems across Canada, provincial governments are responsible for constructing and maintaining provincial highway systems. Each province has a ministry responsible for provincial transportation infrastructure. Transportation ministries have the potential to impact the logistics sector through the enhancement of existing transportation routes and the enforcement of commercial transport restrictions (Western Provincial Transportation Ministers Council, 2005).

Municipal governments: The value creation capacity of the logistics sector can also be impacted by the policies, initiatives, and plans of municipal governments. Municipal governments can impact the logistics sector through the construction of transportation infrastructure in urban areas, design of standards for the separation of traffic from pedestrian activities, and zoning of industrial lands for the performance of logistics activities such as warehousing. These activities can encourage efficient traffic flow through urban areas, help reduce conflicts between logistics providers and residents, and encourage sufficient space for the performance of a wide variety of logistics services. Municipal governments also have authority to tax businesses operating within the municipality (Statutes and Regulations of British Columbia [SRB], 2013).

5.3.3 Non-Government Agencies

Canadian Supply Chain Sector Council: The Canadian Supply Chain Sector Council (CSCSC) has a mandate to work with the sector's stakeholders in developing and addressing the human resources challenges within the sector, especially those related to recruitment and skills development. Although CSCSC receives funding from Employment and Social Development Canada, the Council operates at arm's length from the federal government department (Canadian Supply Chain Sector Council, 2013).

Supply Chain Management Association: A non-profit organization, the Supply Chain Management Association (SCMA) is Canada's association for logistics and supply chain management professionals. SCMA provides supply chain professionals with education, training, professional development and networking opportunities (Supply Chain Management Association, 2013).

Asia-Pacific Gateway Skills Table: The Asia-Pacific Gateway Skills Table is a partnership between educational institutions and industry. The goal of the Skills Table is to ensure a sufficient number of individuals with relevant skills are positioned at western Canada's gateways to support an expected increase in trade volumes (Asia-Pacific Gateway Skills Table, 2013).

5.3.4 Customs Legislation

Customs legislation directly impacts the day-to-day operations of the logistics sector, especially logistics firms engaged in international trade. Customs legislation details the paperwork, security, and tariff requirements that importers and exporters must follow when importing or exporting goods across the border. Importers and exporters expect logistics providers to understand customs legislation and meet the requirements on their behalf. This section will discuss relevant customs legislation in Canada and United States that impacts western Canada's logistics firms.

In western Canada, legislation most relevant to the logistics sector is the Government of Canada's Customs Act. The Customs Act has two primary functions. First, the Customs Act grants CBSA with authority to collect duties and taxes on imported goods. Second, the Act authorizes CBSA to control cargo and passenger movements into and out of Canada. Logistics providers must follow the Act and keep abreast of frequently updated regulations when transporting goods internationally and performing customs clearance activities on behalf of customers. Changing regulations are published frequently in D Memoranda that detail changes to CBSA requirements such as tariffs amounts, tariff classification, reporting, goods valuation processes, and others (CBSA, 2013b).

Western Canada's logistics providers must also be aware of U.S customs regulations when handling U.S. destined import cargo that enters North America through Canadian ports. Several pieces of legislation relate to customs activities in the United States, including the Customs Modernization and Information Compliance Act, the Trade Act, and the 9/11 Act. The Customs Modernization and Information Compliance Act requires shippers to become aware of their own legal obligations with relation to customs reporting; the CBP then audits importers periodically to ensure compliance. Prior to this, the CBP monitored every shipment and calculated tariffs on shippers' behalf. Introduced in 2002, the Trade Act requires importers to submit cargo information prior to cargo arrival at the entry port. In 2007, the United States introduced the 9/11 Act which required all U.S. bound maritime containers to be screened through radiation technology at the foreign port of loading. Western Canada's logistics providers that handle U.S. bound cargo must be aware of each law, understanding their potential impact to logistics operations. The discussed legislation requires logistics providers to understand the import reporting requirements, interact with CBP during audits, and provide cargo information before key deadlines (Congressional Research Service, 2013).

5.4 Summary

In summary, this section discussed the need for improved value creation capacity within the logistics sector and the potential benefits of pursuing initiatives that support value creation. The nature and quantity of opportunities available to the logistics sector at western Canada's gateways were also quantified. Each tonne and container of cargo represents an opportunity for the logistics sector to perform business activities that create value for customers. Forecasted increases to cargo volumes may not be realized if the logistics sector does not create sufficient value for shippers using western Canada's gateways. The section concluded by outlining the key institutions and legislation that influence the logistics sector, their role, and potential impact on the logistics sector.

Now that the project, client, key terms and context have been introduced, the following section will review literature related to the project topic. The literature review will determine what other researchers have uncovered about the research question and support the development of a conceptual framework to guide the study's remaining research activities. The purpose of the remaining research activities is to support the development of evidence-based recommendations that will aid WD in leveraging the opportunities forecasted in this section.

6 LITERATURE REVIEW

As described earlier, the research question for this project is the following: what actions can government take to improve the capacity of the logistics sector to create value for its customers (importers and exporters)? To help address this question, the literature review will explore academic studies on the concept of value, the value creation process, linkages between government policy and value creation, and common barriers to value creation in the logistics sector. Findings from the literature review will be used to create a conceptual framework that illustrates how governments can contribute to the logistics sector's value creation process. The conceptual framework will be constructed throughout the literature review. In later sections, the conceptual framework will be used to organize research findings.

The literature review divides the research question into three sub-questions. First, what is value and how is it created? Second, how can government influence a sector's capacity to create value? Third, what barriers to value creation currently exist within the logistics sector? Each sub-section will now be discussed. At the conclusion of each sub-section, a new phase of the conceptual framework will be presented.

6.1 The Concept of Value and Value Creation

In earlier sections, value was defined as a positive customer experience created when a service provider meets or exceeds the customer's expectations in relation to the price paid. Value could also be defined as a measure of customer satisfaction (McDougall & Levesque, 2000). Value creation was said to occur when the activities performed by the service provider result in the creation of value. For logistics customers, value creation occurs when logistics providers meet or exceed expectations with regards to logistics reliability, flexibility, and cost. To measure the amount of value received by a customer, knowledge of the customer's satisfaction with the performance of logistics services would be required; this information would need to be compared to their original expectations to determine if value creation actually occurred. Such details about customer satisfaction and expectations can only be obtained from the customer, through interviews or surveys.

This sub-section will provide new insights into the definition of value, the concept of value as a measurement of customer satisfaction, and the process of value creation. Throughout the literature review, value and value creation will be discussed generally and in the context of the logistics sector. Key findings will form the foundation of the conceptual framework that will be used to organize research findings throughout the report. This sub-section will begin by reviewing literature that explores definitions of value; then, literature on the process of value creation will be examined; to conclude, findings from both parts will be combined to form the first phase of the conceptual framework. Throughout the sub-section, findings from the literature review will be linked back to the original research question.

6.1.1 Defining Value

Several definitions for the term ‘value’ appear in the scanned literature. Due to the variety and diversity of the definitions, it is necessary to select one definition that is most applicable to the research question. This will ensure that future research activities remain focussed on a common goal. Since logistics customers (importers and exporters) are a focal point of this report, the chosen definition must state the meaning of value from the perspective of the logistics customer. A definition of value from the perspective of the service provider may be misaligned with the customer’s view of value. This may lead to recommendations that fail to result in increased value for logistics customers. In addition, the chosen definition must not require the manipulation of quantitative data that is difficult or even impossible to obtain. For example, value may be defined as the worth of a product or service to a customer and measured as the customer’s willingness to pay. Many challenges exist in attempting to develop recommendations based on this definition. Information on a customer’s willingness to pay is highly confidential; firms would be reluctant to share this data. Willingness to pay could vary considerably depending on the customer, the customer’s industry, and the customer’s corporate strategy. The chosen definition will view value from the customer’s perspective and not require the collection of quantitative data that is difficult to obtain. In selecting the most appropriate definition of value, both criteria will be considered.

Definitions of value fall into two main categories: price-based definitions and preference-based definitions. Price-based definitions treat value as a price that customers assign to the benefits received from a product or service (Porter, 1980; Simpson et al., 2001). Price-based definitions can also be measured from the seller’s perspective, treating value as the revenue received from the sale of a product (Simpson et al.).

Preference-based definitions treat value as a process of evaluation in which the customer compares the benefits of a product or service against their original expectations. The customer generally refers to any recipient of the product or service, whether an intermediate customer or the final consumer. In this report, however, customer refers to the recipient of the intermediate logistics service (importers and exporters) unless otherwise specified. If the customers’ expectations are fulfilled or exceeded, then the customer has received value. Regardless of whether the purchaser is a person or another business, preference-based definitions dictate that the customer, not the seller, ultimately determines value (Feller, et al., 2006; Simpson et al., 2001).

Literature contains various types of preference-based definitions of value, including technical, organizational, and personal value. Technical value (also referred to as ‘use’ value) refers to a product or service’s intrinsic worth as measured against a customer’s needs (Bowman & Ambrosini, 2000). Organizational value refers to secondary benefits derived from factors such as “prestige, reliability... association.... [and] image” associated with the selling firm (Feller et al., p. 2). Personal value refers to the benefit of personal relationships and experiences derived from a transaction. Overall, organizational value and personal value were mentioned less frequently than technical value in the literature.

In this project, a preference-based definition of value will be more suitable than a price-based definition for three reasons. First, the preference-based definitions focus on value from the perspective of a customer (importers and exporters), not the seller. Focussing on value from the perspective of the customer is a key criterion for the selected definition. Some price-based definitions measure value from the seller's perspective. Second, price-based definitions focus more on *quantifying* customer value than *describing* customer value. This project is less concerned with quantifying value and more concerned with understanding the service offerings that lead to the creation of value and ensuring that the logistics sector has the capacity to provide those offerings. Price-based definitions require that confidential quantitative information, such as a customer's willingness to pay, be obtained from logistics customers. Not only would this data be difficult to obtain, it is likely that logistics providers do not possess this information on hand. Third, addressing the research question using a preference-based definition is a more practical, direct approach to discovering how to increase value creation capacity. Use of a price-based definition would eventually lead to a discussion of preference. Increasing a customer's willingness to pay necessitates the improved fulfillment of a customer's needs and preferences. Therefore, use of a preference-based definition allows the researcher to get closer to the nucleus of the issue.

Within the category of preference-based definitions, technical value is the preferred definition. The definition of technical value will be modified slightly and used as the definition of value throughout this project. The definition of value will be as follows: *the intrinsic worth of logistics services as measured against a customer's needs.* In this definition, 'intrinsic worth' refers to the actual benefits received by the customer through the performance of logistics services. 'Customer's needs' refers to the benefits that the customer expected to receive from the performance of logistics services. Metrics for measuring desired and actual benefits vary, depending on the benefits being measured. Some of these metrics will be discussed in the next sub-section (6.1.2) entitled 'value measurement'.

The preference-based definition of 'technical value' has been selected for two reasons. First, other definitions belonging to the preference-based category are unsuitable as they relate more to the final consumer than to a commercial customer such as an importer or exporter. Improving value for commercial customers is the focus of this report. The second reason for selecting technical value is because other definitions are narrow in scope and only encompass one type of customer benefit (e.g. image, prestige and personal relationships). Organizations create organizational value by improving the customer's image or strengthening the customer's feelings of prestige. However, this type of value is not required by importers and exporters who are generally more concerned with function and performance than with form and style. Organizations create personal value by providing customers with the benefit of personal relationships and positive personal experiences. For logistics customers, the development of strong personal relationships with logistics providers is secondary to receiving excellent service in terms of reliability, flexibility, and cost. The definition of technical value encompasses all types of needs and benefits, not only those related to prestige, image, and relationships. Therefore, the

definition can be customized to the needs of logistics customers. As mentioned earlier, logistics customer's primary needs include reliable, flexible, and cost-effective services. Each of these needs will be discussed in section 6.1.2.

6.1.2 Value Measurement

At a later stage in the literature review, findings from this section will be incorporated into a conceptual framework. The first element of the conceptual framework will be labelled as *value measurement*. The value measurement element originates from the selected definition of value: "the worth of logistics services as *measured* against the customer's needs". The definition implies that the customer must undergo a process of value measurement to determine if and how much value has been obtained. The most common needs or expected benefits among logistics customers include delivery reliability, delivery flexibility, low logistics cost, logistics productivity, and delivery speed (Gillen et al., 2008; Morash & Lynch, 2000; Simpson et al., 2001). Metrics can be used to measure most of these benefits.

Reliability refers to the consistency of transit times over a specified period. Transit time is the total time required to move cargo from "point A to point B". Transit time reliability can be determined by measuring the difference between actual transit times and an agreed upon standard. Value is created when transit time reliability is equal to or better than the agreed upon standard over a specified period of time. Logistics productivity is calculated by measuring the logistics providers output (e.g. number of containers unloaded) over a period of time. To determine value created from logistics productivity, the customer must measure actual productivity against desired productivity. Value derived from delivery speed can be measured by comparing the actual speed to complete a delivery against the speed desired by the customer. Value derived through logistics flexibility is a more subjective measure and must be determined by the logistics customer. In the conceptual framework, the process that customers undergo to measure the fulfillment of these expected benefits will be described as value measurement.

6.1.3 Value Creation

The previous discussion examined definitions of value and selected a definition applicable to the research question. In the context of the research question, value was defined as the worth of logistics services as measured against the customers' needs. As customers compare the worth of the performed services against their actual needs, they engage in the process of value measurement. Value measurement became the first component of the conceptual framework. Below, literature on the topic of value creation will be examined. The discussion will uncover perspectives from the literature on how value is created by the firm prior to being measured by the customer. At the end of the discussion, a second component will be added to the conceptual framework that depicts value creation as a pre-cursor to value measurement.

Regardless of the industry or sector, value is created as a firm's employees manipulate materials and perform labour to create products or provide services (Bowman & Ambrosini, 2000). The manipulation of material applies more to the manufacturing of

products than to the performance of services. In manufacturing, value creation occurs as a firm's employees convert inputs (e.g. raw materials or components) into final goods that consumers, including commercial consumers, use and receive benefits from. In service sectors, such as the logistics sector, value is created as a firm's employees perform activities that customers need and receive benefits from. For example, a logistics firm creates value for an importer by retrieving the importer's loaded container at a port, removing the contents, attaching price tags and other labels, storing the merchandise in a warehouse, and sending the merchandise to the importer's store as requested. By performing this activity, the logistics firm desires to create benefits for the importer, such as on-time delivery, resulting in high levels of measured value. Over time, the importer will measure value by looking at indicators of reliability (e.g. variance in total transit time), flexibility (e.g. a subjective measure in which the importer assesses the logistics firm ability to provide multiple services seamlessly), productivity (e.g. a measure of output), and cost (e.g. comparison of budgeted over actual amounts). In the case of both manufacturing and service provision, employees attempt to create value by offering a product or service from which the customer will receive benefits and satisfaction.

Similar to the definitions of value, the types of activities that result in value creation are numerous within the literature. Value is not only created exclusively through traditional business activities such as product manufacturing and service provision, but also through activities such as guarantees and customer service. Through guarantees, customers receive the benefit of peace of mind in case of product malfunction or service failure. Through a guarantee of logistics service, a logistics customer receives a promise that the logistics firm will provide a certain level of service performance. A guarantee allows a customer to 'lock-in' the logistics provider's performance at a specified standard and allows the customer to expect a consistent level of value creation, whether in terms of reliability, flexibility, productivity or cost. Through excellent customer service, customers receive the benefit of prompt and accurate answers to questions that may help customers maximize the overall benefits received from the product or service. Even business practices such as collaboration and effective communication contribute to value creation (Gillen et al., 2008; Horvath, 2001; Simpson et al., 2001). Through collaboration, logistics firms can leverage or insert intelligence into the supply chain from all areas of the network in order to increase value for customers. Creating effective communication channels allows for feedback to flow quickly and smoothly between the service provider and the customer in order to resolve concerns that might be preventing value creation. Each of these mentioned activities (e.g. guarantees, customer service, communication, and collaboration) can happen in tandem with any of the primary logistics activities undertaken by the logistics sector.

For example, a freight forwarder can *guarantee* that all shipments will be delivered to the customer within 24 hours of receiving the cargo. A customs broker can *collaborate* with the customer to develop systems for sharing information that facilitates efficient customs clearance. A trucking company can offer excellent *customer service* by informing customers how to palletize goods to maximize a truckload. However, in spite of these additional methods for creating value, the value creating activities of guarantees, customer

service, communication, and collaboration received less attention than the tradition business activities of manufacturing and service provision in the literature.

Within the literature, two schemes for categorizing value creation activities are used. An examination of each scheme will be helpful in identifying value creation activities related to the logistics sector. Both schemes list value creating activities that would commonly be performed by the logistics and transportation sector; however, the schemes also relate to other sectors. The first scheme captures the many aspects of value creation previously discussed (e.g. traditional manufacturing, service provision, pricing, guarantees, communication) and divides the activities into four categories: relationship, product, distribution, and service activities (Simpson et al., 2001). Value creation activities that relate most to the logistics sector belong to the distribution category and include functions such as rapid order processing, cost efficient inventory management, rapid and reliable delivery, and sufficient distribution coverage. Logistics firms perform these functions by executing the primary logistics activities described by Lieb and Bentz (2005) in an integrated and coordinated fashion, activities such as freight forwarding, order fulfillment, and direct transportation services.

The second scheme for categorizing value creation activities focuses more on core business activities, while paying less attention to the relational activities such as collaboration and communication. Two categories from this categorization scheme relate to value creation in the logistics sector: time value activities and place value activities. Time value activities include business activities that create value using information systems to coordinate product manufacturing and delivery. Place value activities include business activities that provide competitively priced, convenient, and reliable transportation services (Gillen et al., 2008).

The categorization schemes differ by the specificity of the activities described by the authors. The first categorization scheme provided more detailed activities while the second scheme was more generic. However, the two categorization schemes differ little in terms of content. Given the specificity of the activities presented in the first scheme, the activities from the first scheme will be included as value-adding logistics activities within the conceptual framework.

In summary, an examination of value creation literature reflects some consensus on the logistics sector activities that lead to value creation. Value creation occurs as the logistics sector provides rapid order processing, cost efficient inventory management, rapid and reliable delivery, and sufficient distribution coverage. To increase value creation capacity within the logistics sector, government will need to support and influence value creation activities identified in this section. These activities support the fulfillment of the customer's need for reliable, flexible, and competitively priced services. Based on the literature examined in this section, the act of value creation will become a new component of the conceptual framework. Value creation occurs as the logistics sector performs the discussed logistics activities. The value creation component will precede the value measurement component discussed in the previous section. In the following section, the elements of

value creation and value measurement will be reflected in the first phase of the conceptual framework.

6.2 Conceptual Framework: Phase 1

To this point, the literature review has provided a definition of value based on its applicability to the logistics sector and the research question. The literature review also revealed what importers and exporters expect from logistics services: strong performance in terms of delivery reliability, flexibility, productivity, and cost. Literature on the topic of value creation has been examined to determine the types of logistics activities that create value for customers when performed in accordance with the customer's expectations. In this part, findings from the literature review will be integrated into a conceptual framework. The framework depicts how value is created by the firm and then measured by the customer; in later sections, the framework will depict how government can influence value creation activities in the logistics sector.

The literature contains few frameworks depicting how value is created by the firm and then experienced and measured by the customer. The range of definitions of value leads some authors to focus on developing typologies (Holbrook, 1999; Zeithaml, 1988). Based on the typologies, authors will develop frameworks that represent the relationship between value and other concepts, such as price, quality, or customer loyalty (Parasuraman & Grewal, 2000; Sanchez-Fernandez & Iniesta-Bonillo, 2007; Zeithaml, 1988). Woodruff (1997) presented the only framework to connect a firm's activities (see Figure 13, stage 2) with value creation (see Figure 13, stage 3). The act of tracking how much value the customer receives from the transaction is also shown (see Figure 13, stage 4). These stages belong to a five stage model that begins with strategic planning (see Figure 13, stage 1) and ends with the incorporation of feedback from customers into future strategic plans (see Figure 13, stage 5).

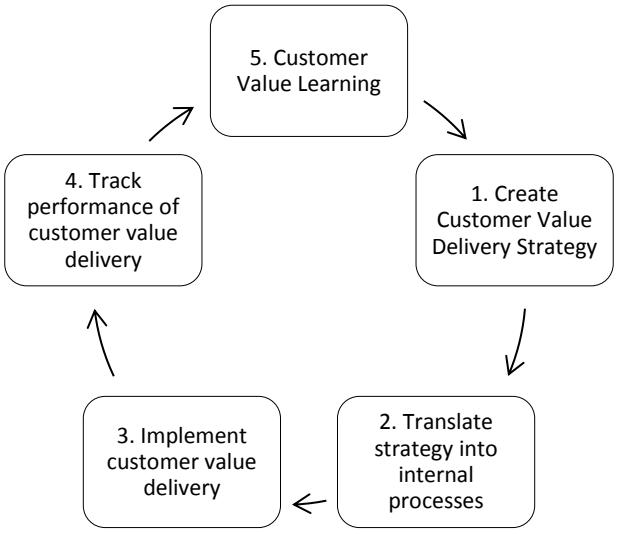

Figure 13: Woodruff's (1997) model depicting the value creation for customers

The Woodruff (1997) framework will be the basis for the first phase of the conceptual framework in this project. The first phase of this project's conceptual framework will only include two of the stages shown in Figure 13; furthermore, the stage description will differ from the original version to better align with the research question, literature review findings, logistics firms, and logistics customers. The stage originally referred to as "implement customer value delivery" will be changed to "value creation activities". The stage previously referred to as "track performance of customer value delivery" will be referred to as "value measurement". These modifications create consistency with terms used previously in the report. Value creation and value measurement both appear in the first phase of this project's conceptual framework in Figure 14.

Figure 14 depicts the first phase of the conceptual framework. The conceptual framework's primary goal is to depict the creation and transfer of value from logistics firms to logistics customers (importers and exporters). The left box, entitled value creation activities, represents the activities performed by logistics firms to create value for logistics customers. Value is created as employees of logistics firms manipulate materials and/or exert necessary labour to offer logistics activities such as: "efficient distribution facility management; rapid and accurate order processing; cost efficient inventory management; rapid and reliable delivery; timely restocking and rotation; and sufficient distribution coverage" (Bowman & Ambrosini, 2000; Simpson et al., p. 123, 2001). The right-hand box, which represents the value measurement stage, depicts how value is received through the performance of logistics activities and measured by the customer against their needs and expectations. In the framework, the term customer refers to importers and exporters of cargo, not final consumers of cargo. Value measurement occurs after the logistics customer has received an opportunity to measure the effectiveness of the logistics activities at fulfilling the supply chain needs. As identified in Section 6.1.2, the top supply chain needs have been identified through surveys of top importers and exporters conducted by Morash and Lynch (2002): delivery reliability, delivery flexibility, logistics cost, and logistics productivity. To accurately measure the effective fulfilment of supply chain needs and creation of value, the customer must be able to quantify their expectations and satisfaction with regards to logistics services. This can be done by using the measurements suggested in Section 6.1.2.

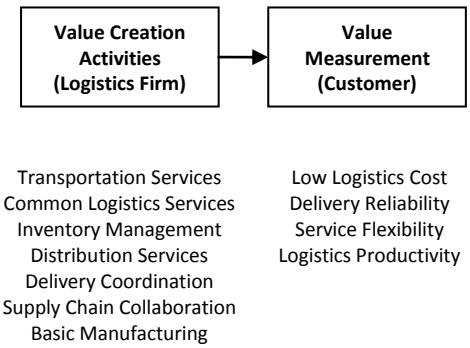

Figure 14: The first phase of the conceptual framework

In summary, this sub-section provided the initial stage of the conceptual framework by modelling how value is created and transferred to the final customer. This is only the first stage of the conceptual framework. The final stage of the conceptual framework will ultimately depict how government can intervene in the value creation cycle in order to support increased value creation capacity within the logistics sector. In the following section, literature will be examined that discusses policy approaches for influencing the value creation processes of firms belonging to a sector.

6.3 Government Policy and the Value Creation Process

The previous section examined literature on the topic of value and value creation in order to lay the groundwork for the first phase of the conceptual framework. The first phase depicted value creation as a precursor to value measurement. Logistics firms create value by performing specialized logistics activities; customers measure value by comparing the benefits received from logistics activities against their original needs and expectations.

This sub-section examines literature on the approaches and policies available to governments seeking to impact value creation within sectors, including the logistics sector. It will address the research question by determining what approaches and tools governments may use to improve value creation capacity within the logistics sector. The work in this section will accomplish three objectives in relation to the research question. First, the findings will support the selection of recommendations that are within the scope and common practice of government. Second, the review will identify policy approaches and instruments deemed most appropriate for the current state of the logistics sector. Policy approaches for developing value creation capacity within a new, fledgling sector may be different from approaches used in mature, more established sectors. Third, findings will identify how public policy interacts with the value creation process introduced in the first phase of the conceptual framework. At the conclusion of the section, findings will be incorporated into the conceptual framework.

Within the literature, two approaches for developing sector capacity have been identified: the industrial policy approach and the cluster policy approach. The industrial policy approach is used to encourage production outcomes and limit competition as a means of growing sectors. Conversely, the cluster policy approach focuses on developing sectors through competition, supporting the sector through the development of physical and institutional infrastructure that benefits all firms in the sector (including foreign-owned firms), encouraging the development of a nation's or region's industrial strengths, and fostering sector-wide productivity gains. Policy areas such as labour policy, transportation policy, capital market policy, immigration policy, and tax policy can used with either the industrial or cluster policy approach. These policy sub-sets can be tailored to either approach (Pack & Saggi, 2006; Porter, 2000; Stanford, 2003). However, some policy areas are more aligned with one approach than the other. Below, both policy approaches will be defined, themes associated with each approach will be discussed, and findings will be linked back to the research question.

Prior to examining literature on government approaches for growing sectors, the range of available policy interventions for developing sectors will be discussed. Policy interventions refer to "deliberate efforts to direct or constrain market outcomes so they become more compatible with social and economic priorities" (Stanford, p. 1, 2003). If placed on a spectrum, the location of an intervention would depend on how much an intervention constrains market outcomes within a sector. An example of a limited intervention would be the creation of laws and regulations that establish basic rules for industry, such as competition laws. Basic competition laws prevent tactics such as price fixing or false advertising, two practices that could significantly increase a firm's revenues if not prevented by law. By preventing such practices, competition laws constrain negative market outcomes. An aggressive intervention might include the creation of a state run firm coupled with restrictions that limit new entrants. By preventing competition and controlling business decisions, this tactic can be used to control market outcomes (e.g. supply of available seats for passengers, ticket pricing) and achieve social and economic priorities (e.g. providing airline services on unpopular routes).

The literature suggests the existence of four levels of intervention. In future discussions, these four levels will be referred to as the hierarchy of intervention as shown in Table 3 below. As mentioned above, the most basic level of government intervention sees the public sector setting rules and guidelines for business through the creation of labour policy, competition policy, and capital market policy. Such policies provide guidelines that firms must operate within when creating value. This level of involvement sees government playing the role of referee, creating the rules and enforcing them as conflicts arise (Levie, 1994 and Lohman, 1998 as cited in Fischer & Reuber, 2003). At the second level of intervention, the public sector enables value creation through skills development policy, research and development policy, and transportation infrastructure. The third level of intervention refers to activities that favour an industry relative to the same industry in other jurisdictions (Levy, 1994; Hallberg, 1999; and Collison, 2000 as cited in Fischer & Reuber, 2003). This level of intervention includes tools such as trade protectionism and subsidies. For example, export subsidies allow governments to create trading advantages over competing countries. Governments can issue export subsidies to exporters from a certain sector as an incentive to increase national export levels. Export subsidies artificially lower the costs associated with exporting, allowing the exporter to price products below market value. As a result, exports from subsidy-issuing countries become more competitive than exports from countries without subsidies. In the fourth and final level of interventions, government has direct control over an industry and includes state-run or government funded firms (McKinsey Global Institute [MGI], 2010). In Canada, state-run firms include Crown corporations. In other nations, such as China, the state often controls transportation and resource firms considered vital to the nation's economic interests. Examples of state owned firms in China include Air China, China Southern, and China Eastern airlines; China National Offshore Oil Corporation (CNOOC); and China Ocean Shipping Company (COSCO).

Table 3: Hierarchy of Government-Sector Interventions

Level 1	Level 2	Level 3	Level 4
Government referees sectors	Government enables sectors	Government protects sectors	Government controls sectors
Examples:	**Examples:**	**Examples:**	**Examples:**
Labour laws Competition laws Capital market laws	Skills dev. policy R&D policy Infrastructure	Export subsidies Import quota	State-operated firms

In the following section, two general approaches for developing sectors will be explored: the industrial policy approach and the cluster policy approach. The industrial policy approach relies on all four levels of interventions. The cluster policy approach relies on levels one and two interventions.

6.3.1 Industrial Policy Approach

Studies commonly define industrial policy as government interventions that impact production structures or market outcomes in order to generate economic benefits that would not have occurred in the absence of the interventions (Pack & Saggi, 2006; Porter, 2000). Industrial policy includes the use of tax incentives or subsidies that encourage capital investment within a specific sector, trade interventions such as tariffs, and limitations on foreign direct investment (G24 Intergovernmental Group, 2003; Klodt, 2000). Export subsidies are an example of industrial policy that can be used to explain the definition of industrial policy in greater detail. Recalling that industrial policy is concerned with impacting market outcomes, export subsidies impact market outcomes by encouraging increased trading activity that, in turn, generates economic benefits for the exporting firms and the jurisdictions in which they operate. Although difficult to prove, the outcome may not have occurred in the absence of the intervention. Pack & Saggi's (2006) definition of industrial policy is not dissimilar to the definition of policy intervention provided earlier by Stanford (2003). In Stanford's definition, policy interventions were described as "deliberate efforts to direct or constrain market outcomes so they become more compatible with social and economic priorities" (p. 1). After comparing Pack & Saggi's definition of industrial policy to Stanford's definition of policy intervention, it may be assumed that all policy interventions related to sector development are a type of industrial policy. As will be shown below, however, other literature reveals that industrial policy interventions are more direct interventions, such as tariffs, subsidies, and government ownership, and are most often ranked as level three and four interventions (Pack & Saggi, 2006; Porter, 2000; Stanford, 2003). In Table 4 below, the hierarchy of government-sector interventions has been expanded to show which policy interventions are most common to the industrial policy approach.

Table 4: Hierarchy of Government-Sector Interventions (Industrial Policy Approach)

Level 1	Level 2	Level 3	Level 4
Government referees sectors	Government enables sectors	Government protects sectors	Government controls sectors
Examples:	**Examples:**	**Examples:**	**Examples:**
Labour laws Competition laws Capital market laws	Skills dev. policy R&D policy Infrastructure	Export subsidies Import quota	State-operated firms
Policy Approach:	**Policy Approach:**	**Policy Approach:**	**Policy Approach:**
Common to industrial policy approach	Common to industrial policy approach	V. common to industrial policy approach	V. common to industrial policy approach

Two primary arguments support the use of industrial policy in its traditional form. Industrial policy, such as tariffs, can protect "infant industries" from larger more established competitors based in other countries. Industrial policies are enacted until the infant industry is sufficiently competitive to operate sustainably in the open market without government support. Second, industrial policy supports emerging industries involved in the development of entirely new groups of products or services. The knowledge required to bring an innovative new product or service into market can be costly to obtain and, once obtained, can be difficult to protect. Other parties may capitalize and profit from the research, requiring the pioneer firm to carry the full financial burden associated with knowledge creation. This situation discourages firms from putting forth the required capital to develop new industries. Thus, policy tools such as subsidies or research and development grants may be considered (Pack & Saggi, 2006).

To gauge the sustainability of the industrial policy approach as a mechanism for building value creation capacity in the logistics sector, an exploration of the arguments for and against industrial policy will be helpful. Several criticisms are levied against industrial policy. Critics of the infant industry argument reply with two counter arguments. The first argument relates to foreign direct investment. Economic benefits may flow more quickly to a country by allowing foreign firms, with expertise in a specific industry, to set up facilities in the host country. Industrial policy prevents productivity gains that could be obtained within a highly competitive environment (Porter, 2000). The second argument relates to market efficiency or the notion that market actors already have the necessary information to recognize profitable opportunities without the need for government interventions. If an industry can become profitable and competitive over time, private investors will recognize this opportunity and be willing to provide the initial investment without government support. In relation to pioneer industries losing knowledge, critics argue that several measures already exist to prevent the sharing of knowledge, including contractual agreements between employers and employees as well as between firms (Pack & Saggi, 2006).

Other critics label industrial policy as irrelevant in a world of international production networks (i.e. international supply chains). Many parties in today's modern production networks constantly and collectively seek to reduce costs, improve products, and modify product offerings to meet customer preferences. This type of collaboration occurs across political and geographical borders. Whereas industrial policies often focus on making an industrial sector competitive in terms of cost, they cannot ensure inclusion of the sector in international production networks. Decisions of inclusion are primarily determined by large players along the production networks, not governments. In addition, the effectiveness of industrial policy is difficult to measure. Due to the nature of industrial policy, a control group cannot be established. In this context, a control group refers to a comparable group left unexposed to the policy intervention. Policy evaluators require a control group to measure the effects of the intervention; however, finding a control group that is comparable in every way to the test group (with the exception of the intervention) is not possible given the uniqueness of each jurisdiction. But without a control group, evaluators may be unable to determine if the intervention caused the positive or negative outcomes observed (Pack & Saggi, 2006).

By review, the overarching research question asks what actions governments can take to improve the capacity of the logistics sector to create value for its customers. The sub-question addressed by this part of the literature review asks what approaches and policies are available to governments seeking to improve value creation. Literature supports the notion that the industrial policy approach is not an appropriate tool for the logistics sector in western Canada. There are three reasons to support this claim. First, while the industrial policy approach involves the use of policies that have an objective to support sector development, these policies have typically been applied to infant industries and not mature industries such as the logistics sector. Second, the industrial policy approach will not guarantee the inclusion of western Canada's logistics firms in international production networks. Third, a lack of evidence to support the effectiveness of industrial policies makes the use of the industrial policy approach controversial.

6.3.2 Cluster Policy Approach

Clusters are defined as a "geographic concentration of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions (e.g., universities, standards agencies, trade associations) in a particular field that compete but also cooperate" (Porter, 2000, p. 16). The defined geographic concentration may include a city, region, or gateway. The cluster policy approach is concerned with government policy that enables the development of sectors within clusters. Cluster policy differs from the industrial policy approach by its acceptance of foreign direct investment and unrestrained competition as key drivers of profitable sectors. In addition, the cluster policy approach resists interventions that have a direct impact on market outcomes, such as subsidies and tariffs. Within the context of the hierarchy of policy interventions introduced earlier, the cluster policy approach utilizes level one and level two policy interventions. Level one interventions refer to basic government interventions such as the establishment of rules and guidelines for sectors labour policy, competition policy, and capital market policy. Level two interventions support value creation through the

development of key inputs and resources such as labour, knowledge, and infrastructure that enable value creation. Examples of level two policy interventions include skills development policy, research and development policy, and transportation infrastructure policy. According to the cluster policy approach, policy interventions should be designed to support the development of clusters, such as a logistics cluster. In Table 5 below, the hierarchy of government-sector interventions has been expanded to show which policy interventions are most common to the cluster policy approach.

Table 5: Hierarchy of Government-Sector Interventions (Industrial & Cluster Policy Approach)

Level 1	**Level 2**	**Level 3**	**Level 4**
Government referees sectors	Government enables sectors	Government protects sectors	Government controls sectors
Examples:	**Examples:**	**Examples:**	**Examples:**
Labour laws Competition laws Capital market laws	Skills dev. policy R&D policy Infrastructure	Export subsidies Import quota	State-operated firms
Policy Approach:	**Policy Approach:**	**Policy Approach:**	**Policy Approach:**
Common to industrial policy approach V. common to cluster policy approach	Common to industrial policy approach; V. common to cluster policy approach	V. common to industrial policy approach; Rarely used in cluster policy approach	V. common to industrial policy approach Rarely used in cluster policy approach

The development of thriving clusters requires related firms and institutions to locate in close proximity, cluster participants to both compete and co-operate where necessary, the inclusion of supporting educational and government institutions, and government policy that enables value-creation. If these mentioned elements are in place, participants derive several benefits from the cluster. Because firms in the cluster are related and complementary (e.g. manufacturers, suppliers, and logistics companies), collaborative interconnections develop and boost the efficiency of firms within the cluster. Clusters are found to increase productivity and innovation at the firm level and encourage the development of locational competitive advantages. For the benefits to be realized, however, direct policy interventions such as limitations on foreign direct investment or foreign competition must be avoided. Unlike the industrial policy approach, the cluster policy approach requires and even thrives on the interaction of competing firms. An assumption of cluster policies is that competition strengthens productivity and encourages the development of supporting institutions and suppliers. The cluster policy approach assumes that synergies can be obtained from co-location regardless of the firm's home country (Porter, 2000).

Government organizations, including educational institutions, play key roles in cluster development and outcomes. Governments and institutions work with cluster firms to remove barriers to value creation faced by the cluster through policies, programs, and outreach. Government organizations enable value creation within the cluster through the following public policy areas: labour market policy, education policy, transportation and infrastructure policy, tax policy, customs policy, and policy related to technological development and scientific innovation. In turn, these policy areas can affect a firm's human resources, capital resources, physical infrastructure, administrative infrastructure, information infrastructure, and scientific and technological infrastructure (Porter, 2000).

Critics of the cluster approach take exception with the definition of the term 'cluster'. They argue that the definition provides little guidance regarding the geographical boundaries of a cluster. Without clear geographic boundaries, a cluster can be a city, region, or even an entire nation. With no spatial limitations, it is problematic to recognize what a cluster looks like and where the cluster begins and ends. Similarly, the definition fails to outline how concentrated the cluster must be or what supporting industries can be counted as participants in the cluster. Without these constraints, it is difficult to identify how cluster-focussed economies differ from economies without a cluster-focus (Martin & Sunley, 2001).

Within the context of the research question, cluster theory provides an alternative to industrial policy for building value creation capacity in the logistics sector. According to cluster theory, growth in value creation capacity will be supported by the following policy areas: labour policy, education policy, transportation and infrastructure policy, tax policy, customs policy, and policy related to technology development and scientific innovation. To be effective, policy interventions must encourage both competition and co-operation among logistics firms and organizations located in the cluster. In addition, appropriate government organizations should be intimately involved with the logistics sectors through collective problem solving and frequent consultations. Locating relevant government offices within close proximity to other members of the cluster will enable improvements in productivity. This contrasts with the industrial policy approach that ignores communication and collaboration, focusing more on manipulating economic outcomes.

Overall, findings from the literature suggest that the cluster policy approach supports the development of value creation capacity in the logistics sector at gateways more effectively than the industrial policy approach. Two main findings support this conclusion. First, the cluster approach focuses on developing the competitive advantages of a specific location, such as a gateway. This project also focuses on developing the logistics sector within a specific zone (i.e. gateways). Industrial policy, however, is more focussed on the development of a sector within a particular political jurisdiction. Second, the logistics sector in western Canada is a mature industry that operates in a competitive environment and works closely with manufacturers and suppliers to support their objectives. The objectives of industrial policy are more aligned with the development of new sectors, not mature sectors such as the logistics sector with a strong customer base and intimate connections with customers from a variety of sectors. Moving forward, the cluster policy

approach and the related policy areas will be the primary mechanisms for strengthening value creation in the logistics sector. The industrial policy approach and mechanisms such as trade tariffs and export subsidies will not be considered as viable recommendations for enabling value creation in the logistics sector.

6.4 Conceptual Framework: Phase 2

The previous section examined two approaches for developing public policy to enhance the logistics sector's value creation capacity: the industrial policy approach and the cluster policy approach. It was concluded that the cluster policy approach is more relevant to developing value creation capacity in the logistics sector than the industrial policy approach. In this section, the conceptual framework will be updated to show the link between cluster policies (referred to as public policy) and value creation activities. Cluster policies refer to public policy areas that support the development of clusters. Public policies supporting the development of clusters include trade policy (excluding tariffs and subsidies), infrastructure, transportation, research and development, labour market, education, and customs policy (Morash & Lynch, 2002; Porter, 2000). In light of these findings, one new box has been added to the conceptual framework: the public policy box (see Figure 15). Public policies impact the performance of value creation activities; in turn, value creation activities directly impact the level of value received and measured by the customer. These relationships are represented by an arrow that connects the public policy box to the value creation box.

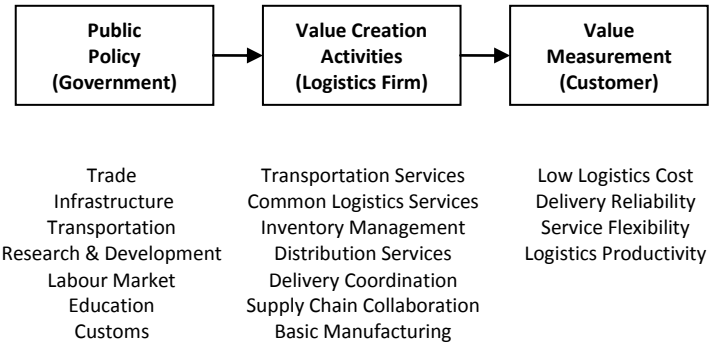

Figure 15: The second phase of the conceptual framework

The link between public policy and the logistics sector's value creation activities is supported by an existing framework established by Morash & Lynch (2002). The framework states that inputs, including government resources, capabilities, and policies, contribute to a logistics providers' business activities (i.e. value creation activities) and outcomes (i.e. customer value). This linkage between public policy and value creation is also supported by the research of Canada's Department of Foreign Affairs and International Trade (DFAIT) (2009) which finds that public policy can impact a country's logistics capabilities.

In summary, this sub-section provided the second phase of the conceptual framework by depicting how public policy is connected to value creation. Two policy approaches to sector development were discussed: the industrial policy approach and the cluster policy approach. The selected policy approach can influence the nature of the public policies chosen by governments to support sectors. Research supported the use of the cluster policy approach as a mechanism for strengthening value creation capacity in the logistics sector. Policies stemming from the cluster policy approach, including trade, infrastructure, transportation, research and development, labour market, education, and customs policy, each can impact the performance of value creation activities in the logistics sector. The next section will discuss common obstacles that interfere with the value creation process.

6.5 Barriers to Value Creation within the Logistics Sector

Up to this point, the literature review has explored academic literature on the concept of value; how value is created and measured; and government approaches and policies for improving value creation generally in the logistics sector. This section contains a review of literature about the common barriers to value creation in the logistics sector, regardless of whether the barriers originate from government, industry or another source. In relation to the research question, this section will uncover issues and challenges that interfere with value creation. This will support the development of recommendations linked to actual value-creation barriers. Value creation barriers within the logistics sector can be divided in four main categories: controlling fuel and labour costs, adopting technology for the coordination and integration of logistics activities, creating visibility of cargo movements along the supply chain, and improving labour productivity. Each barrier will be discussed below. Other factors act as barriers to value creation in the logistics sector. These factors are well-known and include weather incidents, traffic congestion, and infrastructure inadequacy. Such factors, especially traffic congestion and infrastructure inadequacy, relate to infrastructure improvements. Given that existing government strategies have already invested heavily in infrastructure improvements, an analysis of these barriers will not be undertaken.

6.5.1 Controlling Fuel and Labour Costs

The issue of ‘controlling cost’ refers to the challenges associated with reliably predicting the cost of providing a service. One of the most common barriers to value creation within the logistics sector is the challenge of predicting and controlling fuel and labour costs at the firm level (IBM Global Services [IBM], 2009; IC, 2008). The cost of essential inputs, such as fuel and labour, affects all parties along the supply chain including logistics providers themselves and their customers. Along the supply chain, controlling fuel costs becomes a significant challenge when moving cargo from one location to the next, especially over long distances. Ultimately, logistics firms pass on such costs to the logistics customer thus impacting the customer’s perceived level of value. As fuel and labour costs rise, a customer can gradually pay more for logistics services even though the benefits or actual worth of the service has not changed. Fuel and labour costs fluctuate with the market and cannot be reliably predicted. As a result of the fluctuating nature of such costs, it is difficult for logistics service providers to offer customers with reliable price quotations and fixed rates

over the long term. Overall, issues of cost control impact the competitiveness of Canada's logistics sector. According to the World Bank, the overall cost of logistics services in Canada is less competitive than the world's leading logistics jurisdictions. In terms of logistics cost competitiveness, the World Bank's Logistics Performance Index ranked Canada at 32nd place in the latest available rankings (DFAIT, 2009).

6.5.2 Adopting Technology to Co-ordinate and Integrate Logistics Operations

The second barrier to value creation within the logistics sector is low adoption of recent technologies and, in some cases, availability of technology for managing logistics operations. Greater value creation could be achieved through the broader adoption of logistics systems software (Morrison, 2007). Logistics systems software includes programs that allow logistics firms to manage cargo entering and leaving the warehouse, assign warehouse locations to shipments, automatically communicate information to customers about a shipment's location within the supply chain, send notifications to other logistics companies when shipments are ready for pickup or drop-off, and receive notifications from customers that require additional inventory from the logistics provider's warehouse. If implemented, logistics software reduces the amount of time spent handling cargo, reduces errors, and improves labour productivity by automating simple activities (e.g. scanning a bar code to record numbers rather than typing numbers manually). Currently, a substantial proportion of logistics firms, especially small to medium-sized enterprises (SMEs), are not managing logistics functions using logistics systems software. Furthermore, the integration of logistics systems among multiple small and medium sized logistics providers is even less common (DFAIT, 2009). Systems integration, which refers to the connection of two or more companies' logistics software systems, allows two or more logistics firms to share information about a single shipment. This is especially helpful when two or more firms perform services on the same shipment (i.e. a trucking company hands off a shipment to a warehousing company). Information about the shipment, such as the product details, shipper information, consignee information, identification numbers, origin details and destination details, only need to be entered once. Currently, the city-state of Singapore connects the majority of logistics providers to a single IT platform. More details about this system will be forthcoming in later sections.

SMEs lack the financial resources to obtain the latest logistics systems software, which require costly upgrading in future years (APF, 2008). Of logistics providers that possess logistics service software, no common architecture or information technology platform is in place to allow integration and connectivity between the systems (APF, 2006). Similarly, platforms that connect and integrate logistics providers, especially SMEs, to suppliers and customers are also uncommon. Such systems would facilitate improved information sharing between customers and logistics providers and between multiple logistics providers that work together. Through connected systems, the logistics provider and the supplier could be informed of pending product "stock-outs" and take action to replenish the customer's inventory accordingly.

Lack of software adoptiCreon is not the only challenge mentioned in the literature; another concern is availability of software. Availability of technology for implementation by

governments, including information technology that supports the alleviation of transportation bottlenecks, prevents improvements to value creation capacity within the logistics sector. Greater availability and implementation of bottleneck-reducing software would contribute to reduced stock out costs, reduced fuel consumption, shortened queues at borders, improved border security, and improved resource planning for inter-modal transport companies (APF, 2006).

6.5.3 Creating Visibility of Cargo Movements along the Supply Chain

The third category of value creation barriers is related to the second: creating visibility of cargo movements along the supply chain. Logistics customers increasingly want to know the location of their cargo at any point along the supply chain. Customers want logistics providers to utilize visibility systems that allow the customer to track shipments from origin to destination (IBM, 2009). The question of how to utilize modern technology to improve supply chain visibility dates back several years (APF, 2008). Software development firms are now offering new products that allow for improved visibility tracking; however, the software only tracks cargo locations at key milestones and does not provide live location updates.

6.5.4 Improving Labour Productivity

Improving labour productivity is the final category of value creation barriers. Labour productivity refers to output per unit of time. Examples of productivity measurements could include the number of truckloads delivered per day, number of way bills completed per day, etc. Insufficient industry-education linkages and shortages in skilled labour are two challenges that negatively impact labour productivity. The post-secondary education systems in Canada's provinces are reportedly slow to respond to the labour market needs of the logistics industry. For example, supply chain issues and theories are infrequently covered in post-secondary curriculum (APF, 2006). These and other factors contribute to low productivity levels in Canada which, in turn, contribute to relatively high logistics costs (DFAIT, 2009). However, conflicts between labour and management were not cited as a significant barrier to value creation.

6.6 Conceptual Framework: Phase 3

The previous section reviewed academic literature touching on barriers to value creation faced by the logistics sector. Four barriers that negatively impact the performance of value creation activities were identified. Barriers stem from the challenges associated with predicting and controlling fuel and labour costs, adopting technology to co-ordinate and integrate logistics operations, offering customers greater visibility into their supply chains, and improving labour productivity within logistics firms. Addressing these and other barriers to value creation will contribute to strengthened value creation capacity within the logistics sector.

As shown in Figure 16, a new element has been added to the conceptual framework: the value creation barriers box. The box represents the barriers to value creation discussed in the previous section. Barriers such as the challenges associated with controlling fuel costs,

adopting technology to co-ordinate and integrate logistics operations, offering customers greater visibility into the supply chain, and improving labour productivity all impact the ability of logistics firms to perform value creating activities effectively. This will ultimately impact the logistics customer's perception and measurement of value.

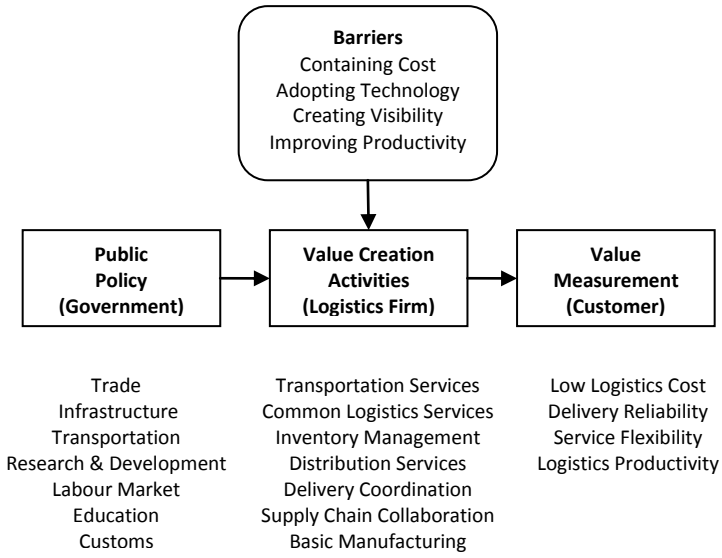

Figure 16: The third phase of conceptual framework

6.7 Summary

In summary, the literature review addressed the research question by examining academic studies related to three smaller components of the research question: what is value and how is it created; what government approaches and policies can be used to impact value creation within a sector, especially the logistics sector; and, what are some of the barriers to value creation within the logistics sector? After reviewing literature pertaining to each component of the research question, findings were integrated into a conceptual framework. Two existing frameworks in the literature supported the formation of the conceptual framework used in this report (Morash & Lynch, 2002; Woodruff, 1997).

As a whole, the conceptual framework revealed how government interacts with the value creation process of the logistics sector. The conceptual framework established the main components of this process which, to summarize, are listed here once again. First, government policy influences value creation activities performed by the firm. Subsequently, logistics firms create value for logistics customers by performing value creating activities. In turn, logistics customers measure the value they receive by comparing the worth of the benefits of the logistics services against their original expectations. The conceptual framework also depicts that, along the way, barriers to value creation have emerged that hinder the potential for logistics firms to perform logistics

activities that create value for logistics customers. Throughout the remainder of the report, the conceptual framework will be used to organize research findings.

In the following three sections, the results of primary research activities will be presented. Combined, the research activities will uncover more details about the barriers to value creation faced by the logistics sector in western Canada and the potential solutions for addressing the barriers. While some value creation barriers were introduced in the literature review, the next three sections will use other research methods, including interviews, to identify additional barriers. Each of the research activities will support the formation of a list of value creation barriers and accompanying solutions for addressing the barriers. The list of value creation barriers and potential solutions will form the basis for final recommendations.

The next section, Section 7, will be instrumental to the process of developing final recommendations and will profile and discuss federal and provincial government strategies already initiated that support the development of value creation capacity within the logistics sector. It will ensure that the recommendations developed in this report are not replications of previous government actions. Section 7 will also investigate the degree to which current government strategies actually address value creation barriers in the logistics sector. At this section's conclusion, the findings will be examined within the context of the conceptual framework.

7 GOVERNMENT INITIATIVES IN WESTERN CANADA

This section will summarize strategic actions taken by governments in Canada, especially those in western Canada, with a direct or indirect objective to improve value creation capacity within the logistics sector. This section introduces all relevant strategies created during the last ten years by governments operating in western Canada. Government strategies are investigated which have already been implemented or which are in the process of implementation. Notably, with the exception of Alberta, no jurisdiction has developed a strategy with a specific focus on the logistics sector. Most jurisdictions have created strategies relating to port development, gateway development, or corridor development that impact the logistics sector as a by-product of the strategy's primary goals.

Each strategy reviewed in this section will be summarized and analyzed to reveal the implications for this study. This section will ensure that the recommendations brought forward in this report are not simply replications of previous government actions. At the conclusion of this section, research findings will be summarized within the context of the conceptual framework. Any new findings relating to policy, value creation barriers, value creation activities, and value measurement (the main components of the conceptual framework) will be added to the conceptual framework. Below, five strategies will be examined including the British Columbia Ports Strategy, the Pacific Gateway Strategy Action Plan, the Asia Pacific Gateway and Corridor Initiative, the Workforce Strategy for Alberta's Supply Chain Logistics Industry, and the Western Canada Transportation Infrastructure Strategy for an Economic Network.

7.1 British Columbia Ports Strategy

The Government of British Columbia created the British Columbia Ports Strategy (BCPS) in March 2005. The BCPS had two objectives related to cargo movement: maximize growth of container traffic from Asia to British Columbia and maximize export opportunities for British Columbia and its regions. The strategy envisioned that British Columbia would become the "leading gateway for Asia-Pacific trade" and the "most competitive port system on the west coast" (BC, p. 2, 2005).

The BCPS also established several growth targets for container and bulk traffic at British Columbia's west coast ports. It anticipated that 9 million containers would pass through British Columbia ports by the year 2020. British Columbia's market share for west coast container traffic was predicted to jump from 9.3% in 2005 to 17% in 2020 (BC, 2005). These numbers were to be achieved following the implementation of several strategic actions.

Strategic actions were organized around three themes: building transportation infrastructure, improving competitiveness, and increasing port performance. The BCPS' strategic actions focussed primarily on port authorities and terminal operators; however, some actions had indirect linkages to the logistics sector. One such action called for tax relief of terminal operators as a means to stimulate investment. New investments, such as terminal expansions, have the potential to benefit the logistics sector if the developments lead to increased cargo volumes requiring logistics services. Another action called for

government to support the implementation of leading edge technologies at port terminals (BC, 2005). Such technologies might impact the efficiency of terminals and encourage faster handover of cargo from terminals to logistics companies; however, if new technologies are not compatible with logistics companies' information systems, the benefits of new technology at terminals might not be fully realized.

An examination of this strategy has revealed that the BCPS focussed primarily on infrastructure development and volume maximization instead of value creation. Only two actions touched on the improvement of value creation capacity: port investment policy changes and technology upgrades at port terminals. In doing so, the strategy failed to fully consider how the performance of the entire supply chain, including aspects of value creation in the logistics sector, will influence the capture and retention of new volumes. Although some infrastructure projects may contribute indirectly to improved value creation in the logistics sector (e.g. new overpasses support more timely and reliable deliveries), value creation was not the focus of the BCPS.

7.2 Pacific Gateway Strategy Action Plan

The Pacific Gateway Strategy Action Plan (PGSAP) recognized that gateways are an important link in a larger transportation and supply chain network. According to the PGSAP, growth in gateway volumes and international trade depends partly on the capabilities of corridors that connect Canadian firms to the gateway. The PGSAP supplements the BCPS by recommending additional infrastructure and policy initiatives that will help support the achievement of BCPS growth targets. The strategy also expands its focus to include highway and airport infrastructure, some of which extend into the other provinces of western Canada (Pacific Gateway Strategy Action Plan – Industry Advisory Group [PGSAP IAG], 2006).

PGSAP recommendations were developed by an Industry Advisory Group. The Industry Advisory Group included multiple government and private organizations including agencies from all provincial governments in western Canada, the City of Richmond, Transport Canada, WD, TransLink (public transit authority in British Columbia's lower mainland), Canadian National Railway, Canadian Pacific Railway, the Vancouver International Airport Authority, several terminal operators, Port Metro Vancouver, and the Prince Rupert Port Authority (PGSAP IAG, 2006).

Unlike the BCPS, the PGSAP goals focussed more on gateway development than port development. Strategic goals included the following:

- Planning and implementing infrastructure projects that facilitate growth and efficiency improvements at western Canada's corridors and intermodal linkages;
- Introducing programs and policies that improve traffic flows throughout the Pacific Gateway system; and,
- Turning western Canada's key airports into major North American entry points for cargo and passengers (PGSAP IAG, 2006).

The PGSAP contains several policy recommendations that pertain to value creation in the logistics sector. To encourage labour productivity, which can impact logistics cost and reliability, the PGSAP supported research on labour relations at gateways. Specifically, research to identify "best practices that promote and/or foster a positive labour environment with minimal disruption" was supported (PGSAP IAG, 2006, p. 44). The PGSAP also recommended the development of a strategy for recruiting individuals that possess the skills needed in a gateway economy; called for new educational programs to foster the development of skills considered most critical in the new gateway economy; and supported the adoption of a border security initiative with the potential to improve logistics reliability. The latter initiative encouraged the adoption of a risk-based security program that utilizes computer technology to target higher risk cargo without delaying lower risk cargo.

Notably, the PGSAP recommended the exploration of foreign trade zones in British Columbia as well as the alignment of provincial and federal regulations to allow for smoother implementation of a free-trade zone. The free-trade zone concept allows for the performance of logistics activities on certain import cargos without the need to pay duties – an initiative that would provide cost savings to shippers. The PGSAP also encouraged the signing of a new Open Skies Agreement that would allow more international carriers to fly into Vancouver International Airport. Both policies had the potential to increase cargo moving through western Canada and to create more demand for logistics services (PGSAP IAG, 2006; Wilson & Summerville, 2008).

The mentioned strategic actions have several implications that pertain to this study. While these actions may have indirectly impacted value creation capacity in the logistics sector, the actions do not focus specifically on the logistics sector. In the future, more work can be done to target the specific needs of the logistics sector with special emphasis on value creation. But the needs of the logistics sector must also be examined within the context of a larger transportation and supply chain system. Supporting the logistics sector must not come at the expense of other sectors; rather, strategic actions must support other sectors by strengthening the logistics sector. Secondly, the actions mark the beginning of a significant amount of work that addresses labour-related issues at gateways, such as productivity and skill shortages. Third, the actions demonstrate a recognized need for improved information technologies that not only provide benefits to security but also efficiency and logistics reliability.

7.3 Asia-Pacific Gateway and Corridor Initiative

In 2006, the Government of Canada introduced the Asia Pacific Gateway and Corridor Initiative (APGCI). The Initiative, which remains in effect today, aims to create the "best transportation network facilitating global supply chains between North America and Asia" (GOC, 2006). The APGCI intends to accomplish this task by "boosting Canada's commerce with the Asia-Pacific region, increasing the Gateway's share of North America bound container imports, and improving the efficiency and reliability of the Gateway for Canadian and North American networks". The APGCI differs from the PGSAP by examining the strategic importance of western Canada's gateways to national interests.

Many of the PGSAP's recommendations and suggestions for infrastructure improvement are integrated into the final APGCI strategic document.

Although led by the Minister of International Trade, the Initiative involves participation from Transport Canada, Western Economic Diversification Canada, Canada Border Services Agency, Parks Canada, Employment and Social Development, provincial governments, and private industry. The APGCI also partners with municipalities directly affected by gateway projects. Examples of partnering municipalities in British Columbia include Delta, Langley, and Surrey (TC, 2007).

The APGCI organizes its strategic actions around five key themes: strategic infrastructure, private investment and innovation, security and border efficiency, new gateway governance models, and policy renewal. The Government of Canada is delivering APGCI through a combination of infrastructure investment, policy, and regulatory instruments (GOC, 2006). Strategic actions from each of the key themes will be listed below.

> **Infrastructure Projects:** Infrastructure projects have included railroad overpasses and underpasses, highway twinning, river dredging, and perimeter road projects (GOC, 2006).
>
> **Policy Renewal:** In terms of policy renewal, the Initiative calls for increased gateway marketing, research into the availability and use of empty containers for exporting, integration of lower mainland ports, and collaboration with stakeholders to address key skill shortages at gateways. The APGCI also funded a consortium for the purpose of generating discussion, awareness, and research on the topic of gateway development (GOC, 2006).
>
> **Regulation:** APGCI recommended amendments to the *Canada Transportation Act* and the creation of a new *Canada Airports Act* (GOC, 2006).

The Government of Canada recently released a document outlining APGCI progress. The report described several planned actions that relate to value creation at gateways. APGCI has set aside $57 million for competitiveness measures that include international marketing, public engagement, stakeholder consultations, marine container inspection programs, the Asia-Pacific Gateway Skills Table, the Value-Added Gateway project, performance indicators, system analysis, and air cargo mapping (GOC, 2010).

The strategic actions of the APGCI have two implications that pertain to this study. First, the APGCI actions do not have a specific focus on the logistics sector. More work could be done with a specific focus on the logistics sector – a key component of efficient gateways. Second, the Government of Canada has set aside funding for projects that improve gateway competitiveness beyond infrastructure development. This suggests that the Government's strategic focus may be shifting from a volume-orientation to a value-orientation.

7.4 Workforce Strategy for Alberta's Supply Chain Logistics Industry

In Alberta, stakeholders from the logistics sector received provincial government support to create a sector-wide strategy that addresses the sector's labour and skill shortages. The strategy, entitled *A Workforce Strategy for Alberta's Supply Chain Logistics Industry* (WSASCLI), is the product of collaboration among businesses in the supply chain and logistics industry. During the development of this strategy, government played only a facilitator role by inviting industry representatives to strategy development meetings, facilitating meetings, recording notes, and writing the final strategy. Industry representatives developed the strategy and industry will ultimately decide whether or not to implement the twenty-five actions created under the strategy (Government of Alberta [AB], 2009). Actions were based around four themes: inform, attract, perform/develop, and retain. If implemented, several actions could have an impact on the logistics sector (AB, 2009).

Under the *inform* category, partners would revitalize the industry's image through a communication campaign and provide more information to employers about employee training and education programs. Under the *attract* category, partners would launch a communications program to attract logistics professionals from other provinces and countries. Resources would be created that help employers find and hire internationally-trained logistics professionals. Such resources will serve two purposes. First, the resources will help employers learn how to create awareness of available positions among internationally-trained professionals. Second, the resources will help logistics firms understand how to evaluate foreign credentials and assist internationally-trained individuals integrate into their new work roles. Under the *perform/develop* category, industry would provide more financial support for programs that foster greater inclusion of under-represented groups in the logistics sector, including women, aboriginal persons, and persons with disabilities. Partners would also increase support for logistics training programs offered at post-secondary institutions. Under the *retain* category, industry would encourage the development of human resources strategies that facilitate knowledge transfer from older to younger workers in the logistics industry (AB, 2009).

The strategic actions found in WSASCLI have implications for this study. Unlike other strategies, this strategy focussed specifically on the supply chain and logistics sector. WSASCLI demonstrated that a strategy focussed on a specific-sector is not unprecedented. It also shows that Alberta's logistics sector is ahead of other provinces at developing a labour force development strategy. In addition, the WSASCLI involved industry during the development of the strategy to a greater extent than any other government initiative or strategy reviewed in this section. In developing any recommendations that relate to the labour force, the WSASCLI would become a critical reference point.

7.5 Western Canada Transportation Infrastructure Strategy for an Economic Network

The Western Canada Transportation Infrastructure Strategy for an Economic Network (TISEN) is a coordinated plan for addressing deferred maintenance of western Canada's

most strategic transportation corridors and multi-modal connection points. Ministers of transportation from each of the four western Canadian provinces authored this strategy. Combined, these Ministers make up the Western Provincial Transportation Ministers Council. The Ministers strategically selected highways, railways, airports and seaports that support export growth, facilitate the development of value-added manufacturing activities, expand and diversify regional economies, integrate multi-modal infrastructure, and reflect the needs of all users (Western Provincial Transportation Ministers Council [WPTMC], 2005). *Figure 17* below features a map of western Canadian routes and ports selected by the Council.

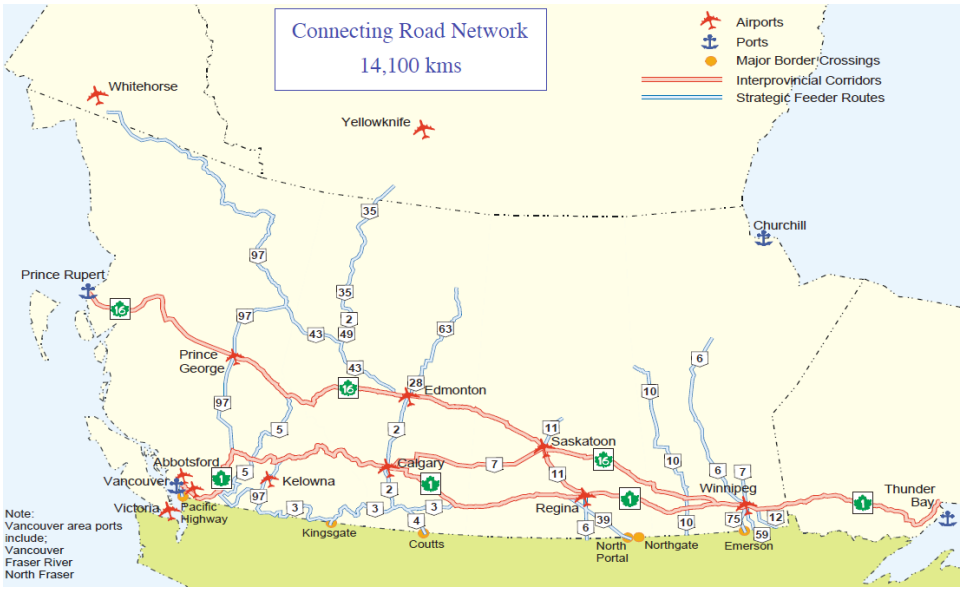

Figure 17: Western Canada Infrastructure targeted for upgrades

Note. From: "Western Canada Transportation Infrastructure Strategy for an Economic Network" by Western Provincial Transportation Ministers Council, 2005.

The transportation ministers hoped to achieve a united front in petitioning the federal government for assistance to fund upgrades to key transportation infrastructure, especially highways, ports, railways, and airports. The ultimate goal of the strategy was to obtain necessary funding for new projects and to introduce a model for sustainable transportation infrastructure maintenance moving forward. The types of projects selected included the following: replacement of railway bridges, adding rail capacity at bottleneck sections, modifying bridges and tunnels to accommodate double-stacked trains, conversion of port infrastructure to accommodate container shipping, port infrastructure development and enhancement, adding terminal capacity and upgrading runways at airports, twinning highways and completing freeways, and constructing perimeter roads. The Council ensured that proposed projects aligned with national interests, including federal government goals to promote international trade and export development (WPTMC, 2005). As a result, many of the projects have been included in the APGCI strategy discussed earlier.

Similar to the BCPS and PGSAP, the TISEN document focussed primarily on infrastructure development at gateways and along corridors. In a departure from infrastructure, TISEN supported policies such as rent relief for airports, the liberalisation of international air policy, and the elimination of debt limits for port authorities (WPTMC, 2005). These policies could increase the volume of cargo moving through western Canada's gateways which could benefit the logistics sector.

The TISEN document has several implications for this study. As with the other strategies discussed in this section, the actions do not focus specifically on the logistics sector. This highlights the need for new actions that focus specifically on the logistics sector. Second, the TISEN document illustrates that gateway development is a process requiring co-operation throughout western Canada, not only at gateway cities.

7.6 Conceptual Framework: Phase 4

In this section, research findings on previous and current government strategies will be discussed in relation to the conceptual framework. Emphasis will be placed on examining the research findings as they pertain to two elements of the conceptual framework: public policy and value creation barriers. Both elements will be reviewed and, where necessary, incorporated into a revised conceptual framework.

In examining the types of public policies that were recommended by the strategies, public policy categories included transportation and infrastructure, labour market, customs, international trade, information technology and taxation. The latter two categories are new additions to the framework based on policy initiatives discussed in the British Columbia Ports Strategy. The British Columbia Ports Strategy recommended tax relief for terminal operators to encourage investment. In terms of information technology policy, another action called for government to support the implementation of leading edge technologies at port terminals (BC, 2005). New additions to the conceptual framework are shown in italicized text in *Figure 18* below.

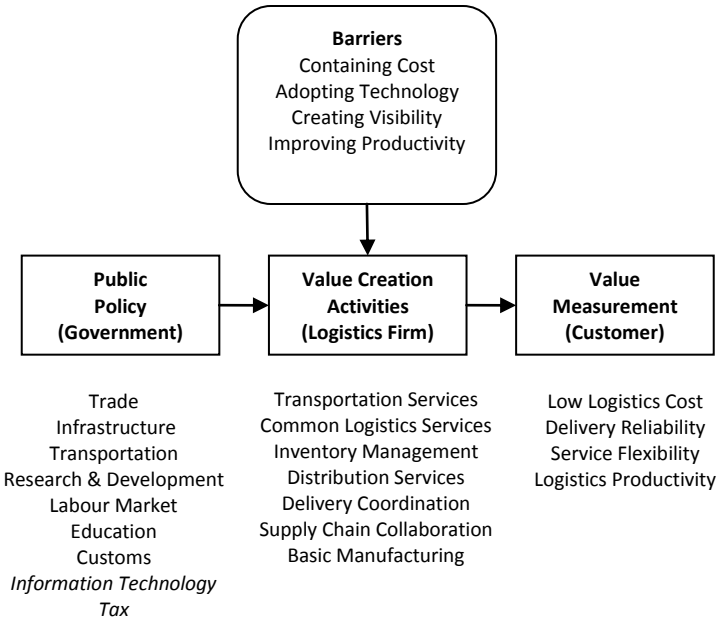

Figure 18: The fourth phase of the conceptual framework

7.7 Summary

Based on the scan of Canadian jurisdictions, several conclusions can be drawn that relate to the research question. First, very few strategies have actions with a specific focus on the logistics sector, not to mention value creation in the logistics sector. Similarly, very few actions focus on value creation generally. Actions may have an impact on elements of value creation, such as reliability, but these are not the primary goals of the strategies. Any new strategic actions could be improved by taking the logistics sector and its value creating capacity into consideration. However, actions should not support the logistics sector in isolation, but rather as a key supporting element within larger transportation and supply chain systems. Second, a significant amount of effort has already been placed into labour force development at gateways and within the logistics sector; therefore, it may be more efficient to direct energy towards other issues or begin evaluating the overall effectiveness of past strategic actions related to the labour market. Third, several strategies recognize a need to utilize modernized and even state-of-the-art information systems in order to achieve security and efficiency improvements. This may demonstrate an opportunity to achieve greater value creation in the logistics sector. Fourth, most initiatives involve infrastructure development as their primary objective. This supports claims of previous authors that government strategy has been more focussed on volume maximization than value creation (Gillen et al., 2007). A table listing the name of each strategy and the implications of the strategies are presented in Table 6 below:

Table 6: Overview of Government Strategies Related to the Logistics Sector

Strategy	Implications for Project
British Columbia Ports Strategy	• Previous strategies benefitted ports, not necessarily the logistics sector. • There is a need for strategic actions with a specific focus on the logistics sector and its role within the larger supply chain.
Pacific Gateway Strategy Action Plan	• Demonstrates a recognized need for information technologies that improve supply chain efficiency and reliability. • There is a need for strategic actions with a specific focus on the logistics sector and its role within the larger supply chain.
Asia-Pacific Gateway and Corridor Initiative	• Government of Canada's strategic focus may be shifting from a volume-orientation to a value-orientation. • There is a need for strategic actions with a specific focus on the logistics sector and its role in within the larger supply chain.
Workforce Strategy for Alberta's Supply Chain Logistics Industry	• Shows that sector-specific strategies are not unprecedented. • Alberta is ahead of other provinces at developing a labour force development strategy specifically for the logistics sector.
Western Canada Transportation Infrastructure Strategy for an Economic Network	• Illustrates that gateway development is a process requiring co-operation throughout western Canada, not only at gateway cities. • There is a need for strategic actions with a specific focus on the logistics sector and its role within the larger supply chain.

To summarize, this section synthesized the strategic actions already taken by governments in western Canada to strengthen value creation capacity in the logistics sector over the last ten years. Section 8 will build on the findings of this section by determining what remains to be done to strengthen the value creating capacity of the logistics sector at western Canada's gateways. To accomplish this task, professionals from the logistics sector will be interviewed and asked to identify potential government actions for improving value creation capacity.

8 INTERVIEWS WITH LOGISTICS PROFESSIONALS

Section 7 (Government Initiatives in Western Canada) examined strategies that have strengthened the logistics sector's value creation capacity in western Canada. Section 8, will examine what remains to be done, from the perspective of logistics firms, to strengthen value creation capacity in the sector. To obtain the perspective of logistics firms, interviews were conducted with five logistics professionals working in western Canada's gateway cities: Vancouver, Prince Rupert, Edmonton, and Calgary. The interviews were designed to uncover value creation barriers in the logistics sector from the perspective of industry professionals and gather suggestions on how government can improve value creation capacity within the sector.

This section contains a summary of participant responses to interview questions. Section 3 (Methodology and Project Scope) contains the full list of interview questions. Several questions required the interviewee to discuss barriers to value creation and suggest actions that government could implement to alleviate those barriers. In particular, interviewees were asked what government could do to encourage improved delivery reliability, lowered logistics costs, and increased logistics flexibility as a means to improving value creation capacity. Most of the interviewee suggestions relate to all three elements (reliability, cost, and flexibility); therefore, interview suggestions have not been organized by these elements. Instead, interviewee suggestions are organized according to the value creation barriers that the suggestions attempt to address. As a result, four barrier categories have been created: labour market challenges; business environment competitiveness; innovation and productivity; and, government and regulatory procedures. Below, interview responses will be summarized and organized around the four themes just mentioned. In future sections, these four themes will be used to organize all barriers to value creation mentioned in this report. Previous barriers to value creation uncovered in the literature review (containing cost, adopting technology, creating visibility, and improving productivity) will be rolled up into the four broader categories just introduced. In each section, the interview findings will be stated; a more detailed discussion and critique of interview findings will be provided in Section 10 (Discussion).

Prior to discussing barriers to value creation as uncovered by interview participants, two significant observations will be made. Overall, interview participants felt government should play a limited role in improving the value-creation capacity of the logistics sector. According to participants, governments should provide indirect support to the sector by fostering an efficient labour market, implementing efficient cargo-screening/security procedures, and providing incentives for research and development to improve productivity within the sector. Although uncommon, recommendations for direct government interventions through the use of subsidies or tariffs were mentioned. Some participants identified unique challenges that may be difficult for government to resolve (e.g. lack of competition among rail providers, labour agreements that restrict port terminal hours of operation at certain ports, etc.) or that are outside any government agency's mandate. This has two implications for the project, the client, and other government departments. First, government actions that involve direct interventions with the firm's everyday business operations may not be well received by logistics firms in western Canada. Second, not all

barriers brought forward by interviewees can be addressed by government agencies; the resolution of some barriers will be the responsibility of the private sector.

Of all barriers, interviewees mentioned skill shortages and recruitment challenges more frequently than any other. These barriers were also frequently targeted through government initiatives mentioned in Section 7 (Government Initiatives in Western Canada). Other barriers pertained to insufficient financial resources at the firm level. Financial support was requested for training, research and development, and information technology upgrades. Interviewees requested financial support, either directly or through tax incentives. Other barriers revolved around the theme of streamlining government procedures and regulations, such as cumbersome reservation systems or inconsistent service levels at CBSA. Inadequate highway infrastructure and misaligned provincial transportation regulations were also mentioned as impediments to value creation. Due to the broad range of barriers and limited government resources, government will need to set priorities and select actions that have the potential to address multiple issues. Below, all interviewee comments will be summarized and discussed according to the four new value creation barriers.

8.1 Labour Market Challenges

The labour market challenges category is broad, encompassing areas such as recruitment, skills development, and union-management relations. Labour market challenges comprise issues such as skill shortages, access to training, inadequate linkages between industry and educational programs, expensive labour rates, and inflexible labour agreements. Each challenge, some of which are beyond the control of logistics firms and governments, impact the logistics firm's ability to provide reliable, competitively priced, and flexible services. Each challenge will be discussed and analyzed below; interviewee suggestions for addressing this barrier will also be discussed.

Mentioned by all participants, the logistics industry in western Canada has been challenged to recruit individuals with logistics-specific skills as well as new post-secondary graduates with an interest in the logistics sector. Many areas in western Canada, especially Alberta, have experienced economic growth in spite of uncertain economic global conditions. In this context, western Canada's logistics firms are challenged to compete with other sectors to attract skilled workers. Participants believed that government could do more to assist the sector in creating awareness of the sector's available employment opportunities. However, prior to recommending government involvement, the role of government in creating awareness of employment opportunities within a particular sector should be contemplated. This question will be discussed in more detail in Section 10 (Discussion).

Another category of labour market challenges focusses on skills development and industry-education linkages. Participants noted that logistics employers are required to hire individuals without logistics experience and provide on-the-job training due to skill shortages. Several participants felt that the number of training programs offered by public and private educational institutions does not meet industry demand. In regions with a growing logistics presence, such as Prince Rupert, individuals must travel long distances to participate in specialized logistics training programs. This makes developmental training

less likely to occur in these areas. As a solution, interviewees proposed the use of tax credits to incent logistics organizations to enroll employees in training programs.

Participants in Alberta observed a lack of institutional connections between the logistics industry and educational institutions at the secondary and post-secondary level. This is expected to improve in some communities, such as Calgary, that have developed logistics councils that bring together representatives from industry and post-secondary institutions to improve the relevancy of educational training to industry needs. Led by representatives from the logistics sector, the Calgary Logistics Council is creating new supply chain management curriculum for local secondary and post-secondary institutions.

Participants also noted that labour costs and work condition stipulations negotiated in labour agreements between terminal operators and unions are hurting the logistic sector's competitiveness relative to other countries. According to one interviewee, labour costs at lower mainland terminals far exceed those at competing ports in Seattle and Tacoma. At one lower mainland terminal, labour agreements stipulate that employees cannot continue working past a certain time of day. Trucks waiting to discharge cargo must leave if they have not progressed to the front of the line by the cut-off time of 4:30 pm. These types of labour stipulations are found to affect the reliability and efficiency of logistics firms. Participants felt that labour agreements in the lower mainland must be more flexible, allowing the extension of truck gate hours beyond 4:30 pm.

8.2 Business Environment Competitiveness

The second category of interviewee comments are organized around the theme of business environment competitiveness. According to participants, three barriers negatively impact the competitiveness of the business environment. In turn, these barriers hinder value creation among logistics firms. The three barriers identified by the interviewees include identifying potential markets abroad, competing without free-trade zones, and coping with insufficient rail carrier competition. Each barrier will be discussed below.

According to interviewees, logistics firms are challenged to pinpoint potential markets and customers abroad. To support the sector, interviewees suggested that governments organize logistics-specific trade missions abroad. Trade missions would help western Canadian logistics firms establish connections with foreign firms wishing to access Canadian markets. If such missions already occur, these participants had no knowledge of them.

Another participant felt that the presence of free-trade zones would increase the marketability of western Canada's gateways. Free-trade zones, which exempt certain imported goods from duties and taxes, are presently offered at competing gateways such as Seattle, Portland, and Los Angeles (Intervistas Consulting, 2011). Other well-known free-trade zones in the United States include Madawaska, Maine; Joliet, Illinois; and Savannah, Georgia. Free-trade zones improve competitiveness in two ways. First, the existence of a free-trade zone makes the entire gateway, and the logistics providers within the gateway, more attractive to shippers that must choose from several possible gateways. With respect to duties and taxes paid by shippers, gateways with free-trade zones cost less to use.

Second, several organizations work together, including public and private sector organizations, to market the free-trade zone. Whereas government promotion of individual firms may be considered unfair, government agencies can freely promote government mandated free-trade zones. Trade missions could become an excellent platform for government and participating logistics firms to share information about free trade zones with shippers abroad.

Another participant felt that value creation capacity within the logistics sector would increase if rail providers faced more competition. Presently, there are two rail providers in western Canada: Canadian National (CN) and Canadian Pacific (CP). Some gateways in western Canada, such as Prince Rupert, receive service from only one rail provider. The interview participant felt that increased rail competition would lead to greater efficiency and lower costs. These cost reductions would then be passed on to logistics providers that use rail services. In spite of the potential cost benefits to shippers, the addition of another rail provider may yield unintended outcomes, such as increased costs or even reduced service levels. The challenges associated with this issue will be discussed more in Section 10 (Discussion).

8.3 Innovation and Productivity Improvements

Participants expressed satisfaction with government's recent infrastructure investments at gateways. Moving forward, participants felt that governments must develop infrastructure more expeditiously in order to keep pace with population and cargo volume growth. Participants also offered suggestions for future strategic investments that do not pertain to transportation infrastructure, such as research and development programs, technology upgrading, land levelling, and information sharing. Making improvements in these areas may enable greater innovation and productivity within the logistics sector. For each suggestion, participants expressed the importance of limiting government involvement in a firm's day-to-day operations. Government's main role would consist of determining projects worthy of receiving financial assistance; industry would be responsible for spending the funds in accordance with program criteria. Each suggestion will now be discussed.

Overall, the logistics industry spends very little on research and development. Participants encouraged government to explore policies or programs that would provide logistics firms with financial or in-kind support for research and development that improves productivity and generates innovative business solutions. Firms would then conduct research that best aligns with the firms interests. Prior to offering financial assistance, however, understanding why logistics firms invest so little on research and development would be imperative.

Interview participants would also welcome government assistance in obtaining the latest logistics systems software, especially software that allows for shipment information to be shared across logistics firms. Participants claimed that system purchase prices are prohibitively expensive, especially for small and medium sized enterprises. This claim echoes the findings in the literature review, which states that many small and medium sized

enterprises lack the necessary resources to obtain and maintain logistics software (APF, 2008). In addition, firms capable of purchasing the latest logistics software often find that no common architecture or information technology platform is in place to allow integration and connectivity between the systems (APF, 2006).

One participant felt that governments should provide financial support for land levelling. Section 7 (Government Initiatives in Western Canada) revealed that governments are presently unaware of this need. At gateways with rocky and undeveloped terrain, land development can be challenging and costly. Some logistics firms may be willing to expand their businesses, but cannot afford development costs. To improve this situation, participants suggested that government share land levelling costs with firms seeking to develop land for logistics and warehousing purposes. However, actual demand for land levelling may be limited to a single gateway. As well, the private sector is already investing in land levelling despite interviewee claims that costs are prohibitively high. The issues will be discussed in more detail in Section 10 (Discussion)

Participants encouraged government to share intelligence more readily with logistics firms. Similar to the need for land levelling, Section 7 (Government Initiatives in Western Canada) revealed that governments are presently unaware of this need. Government departments, such as Transport Canada; the Department of Foreign Affairs, Trade, and Development; and Canada Border Services Agency, may be storing market information for their own purposes and not realize its value to private sector firms, including logistics firms. Canada Border Services Agency possesses data relating to trade, including specific details on imports and exports, which could provide the logistics sector with significant market intelligence. U.S. Customs Border and Protection releases cargo manifest data for all import shipments to the public. This means that shipment information, including details about the shipper, consignee, commodity, origin, and destination, are all available for public and commercial use. Participants urged government agencies in Canada to review information depositories, seeking information that may provide value to the private sector. Where private sector firms could benefit from the data, the information could be shared freely or on a cost-recovery basis. Information sharing would require government agencies to scan departments, looking for relevant and non-confidential data suitable to share with industry. In return, firms would be required to discuss their information needs openly with government officials.

8.4 Government and Regulatory Streamlining

Participants expressed several concerns relating to the availability and quality of government services and the disharmony of provincial transportation regulations. Concerning government services, most comments pertained to Canada Border Services Agency (CBSA). Participants did not criticize CBSA service levels in relation to service levels at the equivalent agency in the United States (Customs and Border Patrol); rather, criticisms were based on participant experiences, needs, and expectations pertaining to CBSA. According to participants, unexpected and random cargo inspections lead to late deliveries. According to one participant, the reliability of logistics sector services would increase if CBSA inspected 100 percent of cargo. By implementing a 100 percent

inspection rate, shippers would not be required to adjust manufacturing schedules due to random inspection-related delays. In spite of the potential benefits, introducing a 100 percent inspection rate may result in negative outcomes. This issue will be discussed more in Section 10 (Discussion).

Participants also stated that reliability is also affected as CBSA applies different standards for screening cargo in different customs locations (Canadian Sailings, 2012). For example, agents at some ports were found to be stricter with applying CBSA policies than equivalent offices elsewhere in western Canada. Participants felt that greater logistics reliability will be achieved as CBSA applies a more consistent standard for flagging and screening cargo. It was noted that many CBSA agents are unfamiliar with processing requirements for special cargo documents such as an ATA Carnet[1]. In addition, participants believed that logistics reliability would improve as CBSA cargo clearance offices remained open 24 hours per day, seven days per week. Interviewees stated that a 24-hour schedule would mirror the realities of today's commercial environment. Similar to the suggestion of 100 percent inspection rates, however, a 24-hour clearance office would need to be justified on a cost-benefit basis.

Concerning disharmony of regulations, the arrangement of cargo movements across several provincial jurisdictions can be very challenging and time consuming for freight forwarders. Each provincial government has separate rules governing oversize cargo movements. For this reason, interviewees also noted that greater inter-provincial alignment of transportation regulations would contribute to increased logistics reliability. Interviewee responses were echoed by the literature (DFAIT, 2009). However, achieving greater inter-provincial regulatory alignment would require significant time and compromise among jurisdictions. Given the magnitude of the barrier, an in-depth analysis of this issue should be handled in a separate report.

8.5 Conceptual Framework: Phase 5

In this sub-section, interview findings will be discussed in relation to the conceptual framework. Research findings will be incorporated into two elements of the conceptual framework: public policy and value creation barriers. Each element will be reviewed and, where necessary, incorporated into a revised conceptual framework.

Regarding public policy, logistics professionals identified several categories of government policy that impact value creation capacity of the logistics sector. New policy categories previously unidentified in the conceptual framework include policy on information sharing, innovation (research and development), environment, and competition. These new policy categories have been added underneath the public policy box of the conceptual framework. In addition, logistics professionals also identified many new barriers to value creation not mentioned in the previous research activities. As mentioned in the introduction to this section, the complete list of barriers is too lengthy to add to the conceptual framework;

[1] The ATA Carnet is like a "passport for cargo", allowing cargo such as trade show exhibits or sports equipment to move easily across multiple borders

therefore, barriers have been grouped into the following four themes: labour market challenges, business environment competitiveness, innovation and productivity, government and regulatory procedures. Additions to the conceptual framework, including new public policy categories and value creation barriers, have been added to the latest phase of the framework in Figure 19. New additions to the conceptual framework have been italicized.

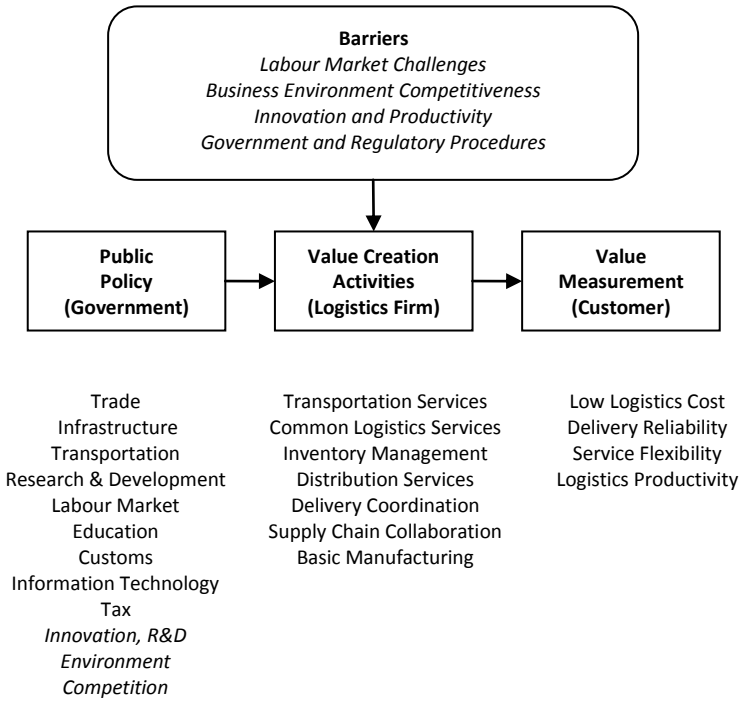

Figure 19: The fifth phase of the conceptual framework

8.6 Summary

This section summarized the results of interviews with logistics professionals. The objective of holding interviews with logistics professionals was to identify value creation barriers and how government could assist the logistics sector in overcoming those barriers. While the previous section identified what government has done to improve value creation capacity, this section outlined what still needs to be addressed. Logistics professionals identified many diverse barriers to value creation and offered several ideas for addressing the barriers. While the barriers have been added to the conceptual framework and grouped according to themes, potential solutions have not been added. Solutions to barriers will be discussed after all research activities have been completed; this discussion will occur in Section 10 (Discussion). The following section, Section 9 (Leading Jurisdiction Scan), will outline strategic actions pursued in two prominent logistics jurisdictions outside Canada: Germany and Singapore. The scan will identify strategic actions, also referred to as potential solutions, in other jurisdictions that face similar value creation barriers as western Canada.

9 LEADING JURISDICTIONS SCAN

This section will examine government strategies implemented in Germany and Singapore designed to increase value-creation capacity in the logistics sector. Singapore and Germany are considered leading jurisdictions in the logistics industry and recently received the #1 and #4 ranking respectively on the World Bank's Logistics Performance Index. In previous years, Germany and Singapore frequently rated #1 and #2 respectively (World Bank, 2012). Over the past decade, the governments of Singapore and Germany created strategies for improving the logistics sector's value creation capacity. Section 9 will identify strategic actions from each of these countries that, if implemented in western Canada, could address the value creation barriers identified in this report. This section complements Section 7 (Government Initiatives in Western Canada) and Section 8 (Interviews with Logistics Professionals) by outlining potential solutions to the value-creation barriers identified in those sections.

Germany recently developed the Freight Transport and Logistics Plan, a five-pillared approach to improving the efficiency, economic sustainability, and flexibility of the transportation and logistics sector. In Singapore, several government agencies have aligned to transform the country's transportation sector into a global hub for integrated logistics. The combined agencies are referred to as the Working Group on Logistics. The Working Group is responsible for coordinating government's actions to create a global logistics hub. The strategic actions of each government will be described below. After outlining each strategy, implications for this report will be discussed.

9.1 Freight Transport and Logistics Action Plan – Logistics Initiatives for Germany

Freight Transport and Logistics Action Plan – Logistics Initiatives for Germany (FTLAP) is Germany's national strategy to grow the logistics industry (Federal Government of Germany [FGG], 2010). FTLAP's three primary objectives that relate to the logistics sector are as follows: to maintain Germany's standing as a major logistics center; to improve intermodal transportation infrastructure; and to foster training opportunities in the transportation sector (FGG, 2010).

Several sub-objectives and actions have been assigned to each of the primary objectives. The first objective, to maintain Germany's standing as a major logistics center, will be achieved through four sub-objectives and actions. First, ports will be upgraded to become "multifunctional logistics sites" (p. 10) that provide diversified logistics services and serve all relevant transportation modes (FGG, 2010). Port upgrading will include optimization of information technology and greater connectivity of information systems between ports. Second, Germany will reinforce the country's reputation as a logistics center by building the sector's labour force. This will be accomplished by directing more long-term unemployed individuals to logistics-specific training courses. In addition, logistics-specific courses will be revamped to reflect the evolving needs of the logistics and ports sector. Third, Germany will take efforts to enhance the overall competitiveness of the country's airports; however, the efforts were not clearly outlined in the strategy. Fourth, it plans to improve communication and co-operation between government and industry stakeholders.

This will be accomplished by setting up regular stakeholder meetings with participants from relevant government ministries and the logistics sector.

The second objective of Germany's plan is to improve intermodal transportation infrastructure. This goal will be accomplished by creating and implementing new technologies that facilitate greater use of the entire transportation system by shifting more cargo to railways and waterways, two modes that are presently under-utilized in the country. The new technologies will be fostered by the improvement and expansion of existing technology development funding programs. Germany will also commission a quantitative study to determine the proportion of cargo that could potentially be moved by multimodal transport. Multimodal transportation is the movement of cargo by two or more transportation methods under one-contract. The study will be undertaken in collaboration with the private-sector. Logistics sector associations in Germany will also receive €190,000 for the marketing of multimodal transportation (FGG, 2010).

The final pillar of Germany's plan is the fostering of training opportunities in the transportation sector. Germany recognizes a shortage of skilled workers in the logistics industry as a whole. To address the shortage, Germany plans to increase the awareness of logistics careers (especially among young people) and improve vocational training opportunities for individuals interested in logistics careers. To create awareness, government and industry are partnering to produce "targeted publicity campaigns ... to improve the image of the ... logistics sector" (FGG, p. 42, 2010). To improve training, government will undertake a review of existing educational programs to ensure that current training matches the needs of industry. As well, government will offer prizes to education institutions demonstrating "best practices" in designing and delivering logistics training programs (FGG, 2010).

Overall, an examination of FTLAP reveals that Germany and western Canada face similar value-creation barriers, such as skill shortages, perceived disconnects between educational programs and industry, and a need for greater adoption of technology for the coordination of cargo movements between logistics providers. Barrier similarity suggests that Germany's strategic actions could be considered in western Canada. These barriers exist in both countries regardless of the political and geographical differences between Canada and Germany. However, applying Germany's strategic actions in a Canadian context should be pursued carefully. Some strategic actions align well with Canada's political and social context. This includes Germany's proposal to act as a coordinator/facilitator between government and logistics stakeholders, to create awareness of logistics professions (provided any initiative is led by the sector association), and to direct unemployed individuals to the logistics sector. Strategic actions such as direct financial support to firms for technology upgrades and financial awards to educational institutions following best practices may be less appropriate in the Canadian context. When suitable, the policy ideas brought forward in this section will be considered when developing final recommendations.

9.2 Working Group on Logistics: Developing Singapore into a Global Logistics Hub

In 2003, the Singapore government's Working Group on Logistics announced its strategy to establish a global integrated logistics hub. The hub would offer "robust maritime, aviation, and land transport capabilities supporting the global economy" (Government of Singapore [GOS], p. 5, 2003). The ambitious strategy, referred to as Global Integrated Logistics Hub (GILH), focusses on the development and support of all aspects of logistics services, including maritime, land, and air transportation as well as warehousing and distribution. Concerning asset-based non-transportation services, the strategy aims to develop warehousing and distribution services that are "tightly integrated with customer and transportation facilities" (GOS, p.5, 2003). GILH intends to attract the "mind and management" of key international transport and logistics companies (p.17) as well as supporting financial and insurance services. GILH also seeks to establish Singapore as a centre for logistics research excellence and to maximize logistics and supply chain management skills.

Overall, GILH includes 33 actions for accomplishing its vision. Actions are grouped into two categories: physical hub measures and virtual hub measures. Physical hub measures include decreasing seaport fees, decreasing airport landing and parking charges, reducing costs for airport land leases, removing levies on foreign workers, expanding free-trade zones to include logistics warehouses, removing stipulations on bonded warehouses in order to maximize available warehouse space, and reviewing foreign worker quotas. Singapore also plans to review the free-trade zone regulation that restricts the transport of air containers on roadways (GOS, 2003).

To create a virtual logistics hub, Singapore will pursue actions that develop information technology within the logistics sector. Tax deductions will be offered to organizations that create information technology solutions that address logistics sector needs. Singapore will also develop an integrated and common information technology platform for multimodal companies. This will allow complementary logistics firms to share cargo information more efficiently and avoid unnecessary data entry (GOS, 2003).

Actions will be taken to make Singapore a thought-leader in developing supply chain and logistics solutions. To make Singapore a center for thought-leadership, government will aggressively lobby for global supply chain management conferences and attract leading information technology service providers to Singapore. Logistics and supply chain management skill sets will be improved by designing a Masters in Business Administration program with a focus in shipping. Educational roadmaps that outline the steps to obtaining a career in logistics and supply chain management will also be created (GOS, 2003). Since the original announcement, at least two Masters in Business Administration programs have been created with a focus on supply chain and logistics. The S P Jain School of Global Management created the Global Logistics & Supply Chain Management concentration within the existing Masters in Business Administration Program; the Auston Institute of Management offers a Masters in Logistics and Supply Chain Management (Auston Institute of Management, 2013; S P Jain School of Global Management, 2013).

One disadvantage with regards to Singapore's policies is the lack of available policy evaluations. Western Canada's policy makers can look to leading jurisdictions, such as Singapore and Germany, for policy ideas; however, developing a list of best practices is not presently possible. Nevertheless, a list of promising approaches can be developed.

An examination of the GILH strategy reveals that Singapore has an aggressive and pragmatic plan to become a leading global logistics hub. The strategic plan suggests that Singapore, in spite of political and social differences, share similar value creation barriers with western Canada, including barriers related to skill shortages, implementation of technology, and government regulations. To increase value creation capacity, Singapore focuses on reducing costs for logistics companies (e.g. reducing seaport and airport fees, enlarging free-trade zones to include all logistics warehouse), simplifying rules and regulations (e.g. removing levies on foreign workers, removing restrictions on air cargo container movements), and increasing productivity (e.g. introducing common IT platforms, and developing new educational programs). Notably, the policy of providing financial support for updating IT platforms and infrastructure is common to both Germany and Singapore. Singapore also used tax credits to incent commercial behaviours that would benefit the logistics sector (e.g. tax credits for software companies). The policy ideas brought forward in this section will be considered when developing final recommendations.

9.3 Conceptual Framework: Phase 6

In this section, findings from the leading jurisdictions scan will be discussed in relation to the conceptual framework. Overall, the leading jurisdiction scan contributes no new detail to the conceptual framework; however, research findings reinforce the existing framework as developed in previous sections. The scan found no new categories of public policy that impact value creation activities. Similarly, the scan did not reveal any value creation barriers previously unidentified. Notably, both Germany and Singapore's plans chiefly followed a cluster approach to developing policy solutions; however, Germany utilized an industrial policy approach in one instance. Neither strategy proposed limits on foreign competition, a sign of the cluster policy approach. Germany demonstrated adherence to a cluster policy approach by supporting the communication between government, institutions and all stakeholders in the logistics industry. However, Germany followed the industrial policy approach by attempting to direct more traffic to underutilized transport modes. Singapore demonstrated a cluster policy approach as indicated by its objective to become a leading global integrated logistics hub, a goal that requires openness to international production networks. Singapore also demonstrates its cluster policy approach by fostering the diversification and depth of industries and institutions that support the logistics sector. Although the leading jurisdiction scan offers no new contributions to the conceptual framework, the scan reinforces the existing framework and reveals that the cluster policy approach prevails in leading jurisdictions. The existing diagram of the conceptual framework is provided below in Figure 20.

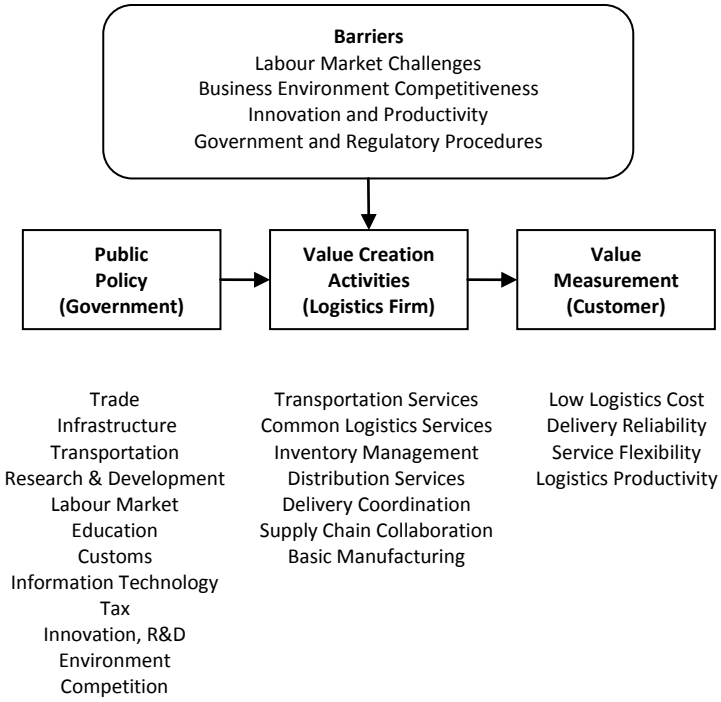

Figure 20: The sixth phase of the conceptual framework

9.4 Summary

Germany and Singapore are some of the world's leading jurisdictions in relation to logistics sector performance. This section examined strategies created by governments in Germany and Singapore that were intended to increase value-creation capacity in their respective logistics sectors. The objective of the section was to research solutions to value creation barriers introduced by leading logistics jurisdictions. Among the findings include the realization that the value-creation barriers faced by Germany and Singapore resemble the value-creation barriers found in western Canada's logistics sector. Skill shortages, outdated IT technology, and complex government regulations were some of the barriers experienced abroad. Solutions ranged from awareness generation campaigns to tax incentives and direct financial support for new equipment. Overall, these and other solutions appear to be transferable to a western Canadian context given the similarity between value creation barriers. Together with suggestions from interviewees in the previous section, strategic actions examined in this section will contribute to the development of final recommendations.

The next section, Section 10 (Discussion), will integrate and analyze the work of Sections 6 (Literature Review), 7 (Government Initiatives in Western Canada), 8 (Interviews with Logistics Professionals) and 9 (Leading Jurisdiction Scan). Section 10 (Discussion) will outline a final list of barriers to value creation by integrating findings from each of the mentioned sections. All of the potential solutions identified in the mentioned sections will be organized by the barriers they address. Final recommendations to WD will be presented in Section 11 (Recommendations).

10 DISCUSSION

The purpose of this section is three-fold: to summarize the value-creation barriers identified throughout the report; to connect barriers with potential solutions also identified throughout the report; and to highlight general observations that should be considered when developing final recommendations. In this section, research findings from Sections 6 (Literature Review), Section 7 (Government Initiatives in Western Canada), Section 8 (Interviews with Logistics Professionals), and Section 9 (Leading Jurisdiction Scan) will be integrated and analyzed. The conceptual framework will be updated at the conclusion of this section.

This section will proceed as follows. First, value creation barriers will be gathered from previous sections and grouped according to categories introduced in Section 8 (Interviews with Logistics Professionals). Second, possible solutions that have the potential to mitigate or remove these barriers will be presented. Solutions will be obtained from the scan of government initiatives in western Canada (Section 7), interviews with industry professionals (Section 8), and the leading jurisdictions scan (Section 9). Solutions will be grouped according to the barriers they can potentially mitigate. Third, the conceptual framework will be updated with the details presented in this section. Lastly, "barrier-solution" bundles will be analyzed as a whole; this analysis will yield a series of factors to consider prior to developing final recommendations.

10.1 Summary of Value Creation Barriers

Four categories of value creation barriers were introduced in the literature review: cost containment, adopting technology to co-ordinate and integrate logistics operations, creating visibility of cargo movements along the supply chains, and improving labour productivity. After completing interviews with industry professionals, several new barriers were introduced. The previous barrier categories introduced in the literature review became too narrow to encompass the new barriers uncovered during interviews with industry professionals. For purposes of simplification, all barriers are now grouped into four overarching themes: labour market challenges, business environment competitiveness, innovation and productivity, and government procedures and regulations. These are the same themes introduced in Section 8 (Interviews with Industry Professionals). The previous barrier of cost containment resides in the new theme of "business environment competitiveness". All other previous barriers are included in the new theme "innovation and productivity". The following list outlines the four overarching themes and the barriers that belong to each theme.

Theme #1: Labour Market Challenges:

1. Economic growth in other sectors has increased competition for limited labour supply.
2. Logistics employers face skill shortages caused by a lack of logistics and supply chain management training programs; at some gateways, employees must travel long distances to receive training.

3. Logistics employers have difficulties recruiting new staff and attracting people into the logistics industry.
4. A disconnect exists between the logistics industry and the education system.
5. Shippers experience high labour costs and prohibitive hours of operation at some port terminals.

Theme #2: Business Environment Competitiveness:

6. Firms face difficulties in locating and connecting with potential customers in foreign markets.
7. Western Canada lacks free-trade zones, a feature that gives gateways in the United States a marketing advantage.
8. Lack of awareness exists among logistics firms, governments, and other stakeholders about the competitiveness of Canada's logistics industry relative to other countries.
9. The configuration and condition of western Canada's highway infrastructure prevents the shipment of oversized project cargo through western Canada's gateways; instead large project cargos must be shipped through more distant competitor ports, most commonly Houston, Texas.
10. Rail and air transportation providers lack competition, leading to increased cost and lower service levels.

Theme #3: Innovation and Productivity:

11. Small and medium sized firms are unable to afford modern logistics management IT systems that allow for integration among co-operating firms.
12. Logistics providers are unable to provide logistics customers with exact information on a shipment's location in the supply chains at any given moment.
13. Limited know-how and funding exists within the logistics industry to improve productivity (output per unit of time).
14. Land reclamation and levelling projects are prohibitively expensive.
15. Government agencies do not share potentially valuable information with the private sector, including import cargo manifest details.

Theme #4: Government and Regulatory Procedures:

16. Some practices at Canada Customs (e.g. not offering 24-hour clearance services at seaport and airports, inconsistent application of policy), have a negative impact on logistics reliability and efficiency.
17. Lack of harmony between provincial transportation regulations creates a significant regulatory burden on logistics providers.

10.2 Connecting Barriers with Potential Solutions to Improve Value Creation

In this section, one or more solutions will be assigned to each of the sixteen barriers to value creation just identified. Solutions are derived from the scan of government initiatives in Canada (Section 7), interviews with logistics professionals (Section 8) and the leading jurisdictions scan (Section 9). Solutions derived from Section 7 stem from initiatives that

are planned, underway, or implemented in western Canada. Solutions derived from the leading jurisdictions scan in Section 9 relate to initiatives that are planned, underway or implemented outside Canada. Solutions derived from interviews with industry professionals in Section 8 are not linked to any current government initiative; instead, they are solutions derived from experienced professionals in the logistics sector. Below, each barrier will be listed and connected to a solution derived from the research activities in this report. Barriers have been organized around the four themes already mentioned: labour market challenges, business environment competitiveness, innovation and productivity, and government services and regulations.

10.2.1 Theme #1: Labour Market Challenges

Barrier 1: Economic growth in other sectors has increased competition for limited labour supply. The leading jurisdiction scan recommended immigration as the primary source for addressing labour supply issues. Singapore's Global Integrated Logistics Hub Plan (GILH) recommends removing levies on foreign workers and reviewing foreign worker quotas to determine if quota increases can be accommodated. An alternative to relying on foreign labour is providing training opportunities for unemployed Canadians in sectors with shortages. As mentioned in the leading jurisdictions scan, Germany is presently undertaking this strategy.

Barrier 2: Logistics employers face skill shortages caused by a lack of logistics and supply chain management training programs; at some gateways, employees must travel long distances to receive training. This barrier has already been addressed by several government actions. The PGSAP proposed the creation of new educational programs to support development of gateway skills. The APGCI carried out this PGSAP initiative by establishing the Asia Pacific Gateway Skills Table and organizing collaborative meetings with stakeholders to address key skill shortages. Alberta's WSASCLI, which was co-ordinated by the Government of Alberta but designed by industry, increased support for logistics training and post-secondary programs and promoted the development of knowledge transfer strategies within logistics organizations.

Interviewees proposed the use of tax credits to incent logistics organizations to offer third-party training programs for their staff in remote locations such as Prince Rupert. However, little has been done by the sector in Prince Rupert to assess and address this challenge. Strategies for addressing this barrier may be pursued by industry and does not necessarily require government intervention.

Barrier 3: Logistics employers have difficulties recruiting new staff and attracting people into the logistics industry. Similar to barrier two, this barrier has been addressed by several government actions. In Alberta, the WSASCLI provided resources that assist employers with finding and hiring internationally-trained professionals, developed a communications program to attract logistics professionals from outside provinces, and offered financial support for programs that foster better inclusion of under-represented groups in the logistics industry. In Singapore, the GILH plan included the creation of educational roadmaps that outline the steps to obtaining a career in the logistics and supply

chain management industry; in Germany, the FTLAP would direct more long-term unemployed individuals to logistics specific training courses and improve the sector's image through advertising campaigns. Although not mentioned during any of the research activities, the sector could also attract more labourers through wage increases.

Interviewees felt government could be doing more to assist the sector in creating awareness of employment opportunities within the logistics sector. Prior to recommending any government involvement, the role of government in creating awareness of employment opportunities within a particular sector should be contemplated. No federal government or provincial agency appears to have a mandate for creating awareness of employment opportunities within a particular sector. While some departments such as Employment and Social Development Canada and employment ministries at the provincial level collect and distribute data on the labour market, this is much different than creating awareness of employment opportunities within a particular sector. Government interventions that create awareness in one sector may be considered unfair to other sectors. It may be more suitable for sector associations or individual firms to develop their own initiatives that utilize labour market information collected by government. Governments looking to support the sector may follow Alberta's lead by bringing together sector stakeholders and facilitating the development of a sector-wide strategy to create awareness of employment opportunities.

Barrier 4: A disconnect exists between the logistics industry and the education system. To help resolve this barrier, the PGSAP proposed the creation of new educational programs to support the development of gateway skills. In Germany, the FTLAP included measures to review existing post-secondary education programs to ensure current training programs match industry needs. Germany also offered prizes for educational institutions that demonstrate best practices in designing and delivering logistics training programs.

Barrier 5: Shippers experience high labour costs and prohibitive hours of operation at some port terminals. Interviewees felt that governments should intervene to address this value creation barrier. In comparison to competing sea ports, labour costs are purportedly higher at lower mainland ports. Unfortunately, such costs of doing business are confidential and this information cannot be validated by external sources. Regardless of their demands, neither logistics providers nor governments exert control over the negotiation of rates and working stipulations between unions and private sector terminals.

10.2.2 Theme #2: Business Environment Competitiveness:

Barrier 6: Firms face difficulties in locating and connecting with potential customers in foreign markets. The Canadian government's APGCI called for increased gateway marketing efforts. Interviewees suggested that logistics companies should receive more opportunities to participate on trade missions. This suggests that APGCI administrators might consider allocating more marketing resources towards trade missions. The leading jurisdictions scan offered no solutions in connection with this barrier. Importantly, WD and the Department of Foreign Affairs, Trade and Development reported that trade missions have been organized that included firms from the logistics sector. This indicates a potential need to improve awareness of trade missions.

Barrier 7: Western Canada lacks geographically-defined free-trade zones, a feature that gives other gateways in competing countries (e.g. the United States) a marketing edge. Supported by the Government of British Columbia, the PGSAP called for an exploration of free-trade zones in Canada and a greater understanding of how provincial and federal regulations must be aligned to support free-trade zones. The Government of Canada's APGCI also called for the preparation of a free-trade zone feasibility study. Industry professionals advocated for the creation of spatially- or geographically-defined free trade zones that resemble the model used in the United States. Interviewees argued that this model would allow for improved marketability of free-trade zones as well as the seaports and airports that manage them. Currently, free-trade zone benefits (tariff and tax reductions) are available at any location in Canada; however, interviewees desired the replacement of this current model with free-trade zones that are geographically tied to smaller regions or cities.

A report commissioned by the Government of British Columbia estimated that $5.1 billion of trade would begin to flow through British Columbia's gateways with the creation of a free-trade zone in Vancouver and Prince Rupert (Intervistas Consulting, 2011). Since all cargo moving through free-trade zones requires the performance of logistics activities, this means that market opportunities for the logistics sector would grow tremendously. But while free-trade zones might improve gateway competitiveness, the Government of Canada would lose significant revenues during a period of fiscal restraint. The logistics sector would need to demonstrate that the economic benefits exceed the loss in revenues.

Barrier 8: Lack of awareness exists among logistics firms, governments, and other stakeholders about the competitiveness of Canada's logistics industry relative to other countries. The APGCI developed gateway performance indicators that measure seaport and airport performance on a regular basis; however, logistics sector performance is not captured by these metrics. Industry interviews and the leading jurisdictions scan offered no other solutions in connection with this barrier. The leading jurisdictions scan also offered no solutions in connection with this barrier.

Barrier 9: Rail and air transportation providers lack competition, leading to increased cost and lower service levels. Some interviewees felt that government should intervene in the rail industry to encourage greater competition along western Canada's rail corridors. The desired outcome is reduced costs and improved service levels. Currently, there are only two rail carriers operating in western Canada: Canadian National (CN) and Canadian Pacific (CP). In spite of the potential cost benefits to shippers, the addition of another rail provider may yield unintended outcomes. CN considers its rail corridor from Prince Rupert to Manitoba as the least congested connection to the mid-west U.S. from the west coast. The company can presently handle all cargo moving along the corridor – approximately 22 million tonnes per year (PRPA, 2012). Two rail carriers presently handle approximately 120 million tonnes per year moving along the rail lines to Port Metro Vancouver. While the introduction of additional rail carriers along the northern corridor might deflate prices in the short term, overall volumes may be insufficient to support two

carriers over the long term. Revenue reductions caused by price competition could lead to decreased service and maintenance levels. Two other issues prevent the addition of new rail carriers to any rail corridor in western Canada, whether starting from the Vancouver or the Prince Rupert gateway. First, the owner of any existing rail line would be unwilling to share the line with another company unless significant financial gains could be realized. Second, the addition of another carrier may increase congestion on some rail lines, (especially lines in the lower mainland) and impact transit times and delivery reliability. This means that one element of value creation (i.e. cost) would be improved at the expense of another (i.e. reliability).

10.2.3 Theme #3: Innovation and Productivity Improvements:

Barrier 10: Small and medium sized firms are unable to afford modern logistics management IT systems that allow for integration among co-operating firms. The British Columbia Ports Strategy (BCPS) provided support for the implementation of leading edge technologies at port terminals. In Germany, the FTLAP calls for greater connectivity of information systems between ports. In Singapore, the GILH plan proposed the development of an integrated technology platform for multimodal companies. Interview respondents offered no solutions in connection with this barrier.

Barrier 11: Logistics providers are unable to provide logistics customers with exact information on a shipment's location in the supply chains at any given moment. To encourage the development of new IT solutions and software, Germany's FTLAP proposes an expansion of existing technology development funding programs. In Singapore, the GILH plan offers tax deductions to organizations that create information technology solutions that address logistics sector needs. No Canadian government initiative provides a solution to address this barrier. As well, interview respondents offered no solutions in connection with this barrier.

Barrier 12: Limited know-how and funding exists within the logistics industry to improve productivity (output per unit of time) and research and development. No government initiative from a Canadian government or a leading jurisdiction provides a solution to address this barrier. Participants encouraged government to explore policies or programs that would provide logistics firms with financial or in-kind support for research and development that improves productivity and generates innovative business solutions. Prior to offering financial assistance, however, understanding why logistics firms invest so little on research and development would be imperative. If the sector places little value on research and development, then awareness campaigns may be more effective than grant or other programs offering financial assistance. Regarding productivity, WD has reported several productivity improvement projects; however, the projects were not isolated to the logistics sector. This indicates a potential need to improve awareness of productivity related resources.

Barrier 13: Land reclamation and levelling projects are prohibitively expensive. An interviewee expressed that government should provide support for reclaiming environmentally damaged land and levelling green-field areas in preparation for the

construction of warehousing facilities. The actual need for land levelling across western Canada may be questionable however. Information from commercial real estate websites reveals that the supply of land and facilities for logistics facilities in Calgary, Edmonton, and British Columbia's lower mainland is plentiful (Avison Young, 2013). This may only be a factor in Prince Rupert, where hundreds of hectares of undeveloped land are available near the city. Much of this land consists of rock, marsh, and muskeg, making development more expensive than flatter surfaces at other gateway cities. Although development costs in Prince Rupert may exceed costs at other gateway cities, the slated development of roads and other terminals at Prince Rupert through the current decade indicates that development costs may not actually be prohibitively expensive.

Barrier 14: Government agencies do not share potentially valuable information with the private sector, including import cargo manifest details. Interviewees suggested that governments should share market information collected during its day-to-day operations (e.g. customs data, fuel and energy cost forecasts) with the private sector. The information could be offered on a no-charge or cost-recovery basis. Regardless of the benefits, however, concerns over confidentiality may limit government's ability to act on this suggestion. Information considered valuable to the private sector, such as Customs data, may be valuable because of the sensitive nature of the data. Although some information may be confidential, other work such as analyst reports and other research could provide significant benefits to firms and not breech confidentiality agreements.

10.2.4 Theme #4: Government Service and Regulatory Streamlining:

Barrier 15: Some practices at Canada Customs (e.g. not offering 24-hour clearance services at seaport and airports, inconsistent application of policy), have a negative impact on logistics reliability and efficiency. Interviewees offered several suggestions to address this barrier. First, all cargo should be examined as a means to improve logistics reliability. In spite of the potential benefits, introducing a 100 percent inspection rate may result in negative outcomes. Although shipment reliability may increase, CBSA's operational costs would rise to unsustainable levels. Rather than delaying a few random shipments, a 100 percent inspection rate would slow the transit time of all shipments entering Canada. Thus, the improvement to reliability may cause greater harm to shipment speed and efficiency. Second, interviewees suggested the introduction of new initiatives to at all CBSA offices across Canada to ensure consistency in service delivery. Third, CBSA offices at high demand cargo gateways should remain open 24 hours per day and seven days per week. Similar to the suggestion of 100 percent inspection rates, however, a 24-hour clearance office would need to be justified on a cost-benefit basis. The increase to CBSA labour costs may make 24-hour operations unfeasible. In addition, many customs clearance, transportation, and warehousing companies are not available overnight to clear and retrieve the cargo after regular working hours.

Barrier 16: Lack of harmony between provincial transportation regulations creates a significant regulatory burden on logistics providers. The leading jurisdiction scan produced several solutions in connection with this barrier. Singapore's GILH plan proposed the removal of space stipulations on bonded warehouses in order to maximize

available warehouse space; the review of free-trade zone regulations that restrict the transport of air containers on roadways; and, the expansion of free-trade zones to include all logistics warehouses. No government initiative from a Canadian government provided a solution to address this barrier. Similarly, no interview respondent suggested a solution for this barrier. Achieving complete inter-provincial regulatory alignment would require significant time and compromise among jurisdictions. Given the magnitude of the barrier, an in-depth analysis of this issue should be handled in a separate report.

10.3 Conceptual Framework: Phase 7

This sub-section will incorporate the synthesized material in Section 10 (Discussion) into the next phase of the conceptual framework. The updated conceptual framework appears below in Figure 21. To incorporate the material from Section 10 (Discussion), a new element has been added to the conceptual framework. The new element, entitled “policy solutions to value creation barriers”, should not be counted as a new step in the framework, but rather a more detailed view of the existing public policy box. The policy solutions box contains a high level summary of potential solutions to value creation barriers. Policy solutions can be linked back to one or more of the public policy categories that appear underneath the public policy box. Potential solutions originated from interviews with industry professionals and the leading jurisdiction scan. High level groupings of solutions include the following: information sharing, best practices research, free trade zones, port fee reductions, benchmarking, awareness creation, IT connectivity support, tax incentives, government service review, consultation with sector stakeholders, training program review, foreign worker quota review, and alignment of provincial transportation regulations. Obtained from research activities in previous sections, the solutions added to the conceptual framework represent some of the latest tactics and actions for removing value creation barriers in the logistics sector.

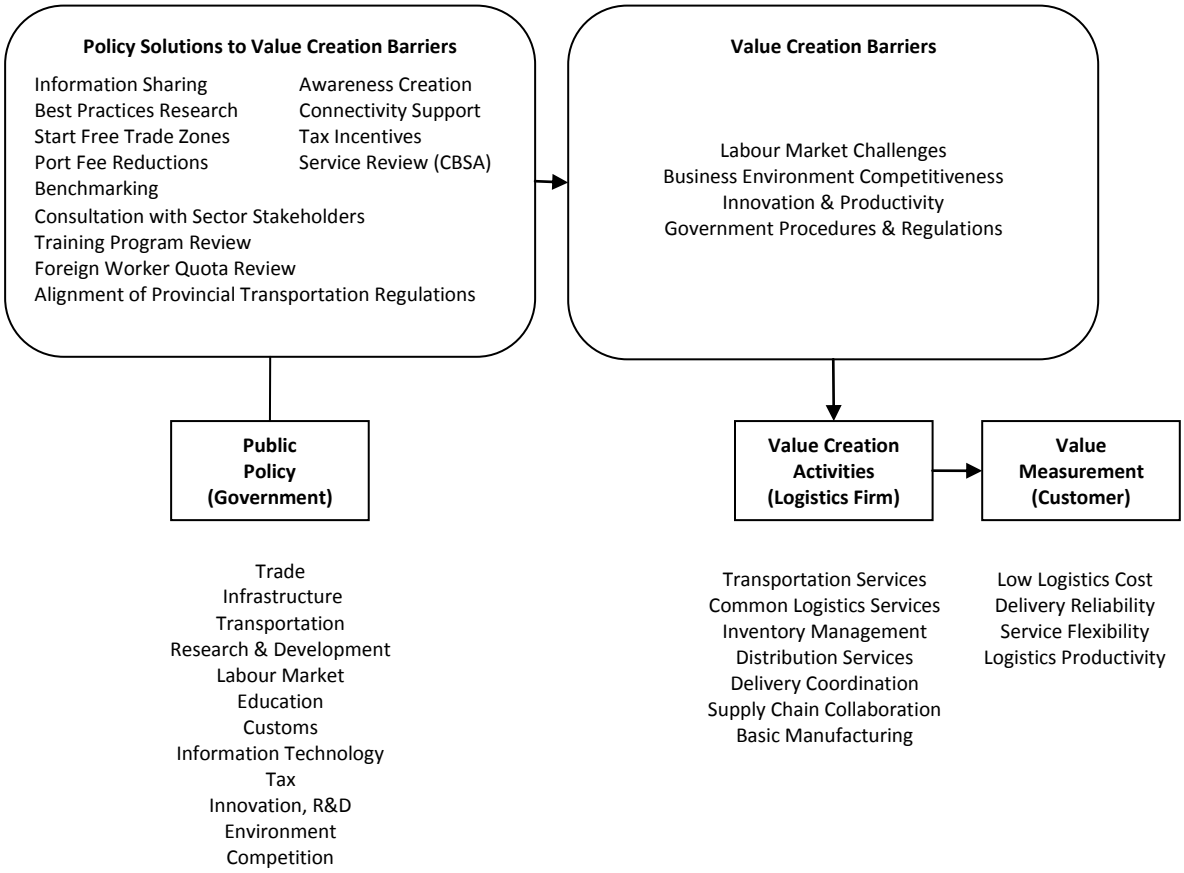

Figure 21: The seventh phase of the conceptual framework

10.4 Key Considerations & Implications

In the previous sub-section, all sixteen barriers were presented and matched with potential solutions obtained from the scan of government initiatives in western Canada (Section 7), interviews with logistics professionals (Section 8), and leading jurisdictions scans (Section 9). In this sub-section, all research from previous sections will be analyzed to establish a series of key considerations to inform the final recommendations. The section will be presented as a series of observations. Following each observation, considerations and implications related to the observation will be described.

> ***Observation #1:*** *Many of the identified barriers fall under the jurisdiction of several government agencies and jurisdictions.*

Jurisdictions responsible for the identified barriers include federal, provincial and even municipal governments. Non-profit organizations and quasi-government organizations such as port authorities and sector associations are also responsible. With regards to some barriers (e.g. labour market, transportation, productivity, research and development) multiple levels of government have an interest, both politically and constitutionally. For

other issues, jurisdiction is clear: CBSA service consistency is a federal responsibility; port authorities (a federally-created agency) hold responsibility for port reservation systems.

Implications: To fully address value creation barriers, WD will be required to work with other government agencies (e.g. Transport Canada, Industry Canada, Foreign Affairs and International Trade, Canada Border Services Agency) and possibly other levels of government (e.g. provincial and federal).

> ***Observation #2:*** *Some value creation barriers are already being addressed by government*

Government is already working to address numerous barriers to value creation, including several barriers mentioned by interviewees. This indicates that participants may be unaware of existing government initiatives and how these initiatives benefit the logistics sector. This may also indicate that initiatives have not yet achieved the expected impact on the logistics sector. For example, some interview participants noted that labour costs, union restrictions on working hours, and labour disputes act as a hindrance to value creation at their gateway. Participants encouraged government to implement actions for the alleviation of these issues. Unfortunately, participants were unaware of the PGSAP and the corresponding research related to best practices in labour relations and disruption prevention.

Implications: A critical component of any option or recommendation should be to communicate with stakeholders about previous initiatives; care should be taken to avoid the duplication of services and solutions.

> ***Observation #3****: Very few evaluations of previous strategies have been conducted*

Overall, very few reports have been published which evaluate the effectiveness of the strategies discussed in this paper. The Asia-Pacific Gateway and Corridor Initiative is an exception, recently producing the status update document entitled *The Asia Pacific Gateway and Corridor Initiative Reaches a Milestone* (2010). Similar documents could not be found for strategic action plans in Germany and Singapore.

Implications: If any recommendation resembles an action previously undertaken by government, the recommendation should call for an informal evaluation of the previous action's effectiveness.

> ***Observation #4****: Some value creation barriers are currently unknown to government and not highlighted in the literature.*

Participants identified several value creation barriers that government agencies may not yet be aware of. Interview participants felt that governments, including agencies such as Transport Canada, International Trade, and port authorities, possess market information that could be valuable to the logistics sector. None of the government initiatives examined in this report, including those outside Canada, had made a priority to share market

information with the logistics sector. Based on the findings of Section 7 (Government Initiatives in Western Canada), governments are also unaware of the desire for assistance with land levelling and reclamation.

Implications: Even though government agencies may be unaware of certain value-creation barriers, new barriers must not automatically supersede existing barriers in terms of priority. This issue also emphasizes the need for prioritization and continual dialogue with stakeholders to uncover new barriers as they arise.

> ***Observation #5:*** *Previous initiatives in western Canada have not actively discussed productivity improvements and IT infrastructure upgrades*

Literature and interview participants discussed two related issues not sufficiently mentioned in the provincial and national strategies: IT infrastructure upgrades and productivity improvements. Only the BCPS recommended financial support to upgrade IT infrastructure at ports. The international strategies discussed the issue of IT infrastructure more frequently than the Canadian strategies. The Singapore and Germany strategies both sought to improve the connectivity between ports and multimodal companies. Germany promised to expand technology development programs to envelop the logistics sector. Singapore offered tax deductions to software companies that develop products to address the logistics sectors' IT needs. Each of these initiatives has the potential to benefit multiple sectors (e.g. IT sector, logistics sector, supply chain management sector).

Implications: IT infrastructure development and upgrades are priorities for the world's leading logistics centers. IT policies in these centers are creating synergies between complementary sectors and sub-sectors. There may be opportunities for implementation of similar policies in western Canada. It is highly likely that these policies will also impact sector productivity.

> ***Observation #6:*** *The constructs of volume and value are inter-related, not mutually exclusive.*

Project research revealed more about the concepts of volume and value. In literature such as Gillen et al. (2008), volume and value are treated as distinct and unrelated outcomes that stem from separate projects and policies. However, several interviewees felt that value creation capacity could be fostered through new infrastructure projects. Such participant responses show that a relationship exists between volume and value-oriented initiatives. Projects that increase cargo volumes can also enhance the logistics sector's ability to create value for logistics customers.

This concept can be demonstrated using an example. Infrastructure improvements can increase trucking efficiency which, in turn, results in more on-time deliveries to logistics firms engaging in warehousing and inventory management. As the warehousing firm receives cargo in a timely fashion, they have adequate time to perform their unique logistics activities. After performing warehousing activities, the warehousing firm arranges

for timely cargo delivery to the final customer. As on-time deliveries are made consistently, a logistics service becomes increasingly reliable. Thus, infrastructure projects contribute to service reliability, a key element of value creation in the logistics sector. Improved infrastructure also contributes to reduced cost for importers and exporters by reducing traffic congestion and lowering the fuel consumption of transportation companies. These cost savings can be passed on to logistics providers and the final customer.

Implications: This research project will provide recommendations for improving value creation capacity in the logistics sector apart from transportation infrastructure projects; however, the reader should not conclude that transportation infrastructure projects cannot increase value creation capacity.

10.5 Summary

The purpose of this section was to integrate and analyze the findings from Sections 6 (Literature Review), Section 7 (Government Initiatives in Western Canada), Section 8 (Interviews with Industry Professionals) and Section 9 (Leading Jurisdiction Scan). Based on an integrative analysis, a final list of value creation barriers and potential actions for addressing the barriers was created. While solutions were identified for the majority of value creation barriers, some barriers remain unaddressed. Unaddressed barriers exist because of the nature of the barriers (e.g. systemic barriers, barriers are beyond the mandate of government) or because the research activities yielded no potential solutions. After organizing and matching solutions with value creation barriers, the identified solutions were incorporated into the conceptual framework in Figure 21. All solutions are public policy solutions and could be enacted by government if necessary. The section concluded by discussing the study's findings to this point and by presenting six general observations that could influence the nature and type of recommendations presented in Section 11 (Recommendations). The next section, Section 11 (Recommendations), will present WD with a list of recommendations in relation to the research question. Recommendations will address value creation barriers; incorporate the potential solutions recommended by interviewees and identified during the leading jurisdiction scan; and, incorporate the observations outlined in Section 10 (Discussion).

11 RECOMMENDATIONS

The research question for this report has been the following: what actions should WD take to strengthen the logistics sector's capacity to create value for importers and exporters at western Canada's gateways. Answering this question has involved several steps: identifying previous government actions that have impacted the sector's value creation capacity; identifying current barriers to value creation faced by the sector; and gathering suggestions for eliminating the barriers and strengthening value creation capacity. Each step has contributed to an understanding of how to improve the sector's value creation capacity.

Section 11 (Recommendations) will complete the process of addressing the research question by providing WD with final recommendations for improving value creation in the logistics sector at western Canada's gateways. Each recommendation will follow a similar structure. First, the recommendation will be stated and explained. Second, the barrier(s) addressed by the recommendation will be identified and the rationale for selecting the recommendation will be stated. Third, the implementation of the recommendation will be discussed. Recommendations will incorporate the observations noted in Section 10 (Discussion). Notably, some barriers mentioned in earlier sections were considered outside the scope of this project; these barriers will not be addressed by the below recommendations. In addition, several recommendations require WD to advocate for new or revised policies before other core departments, such as Employment and Social Development; Finance; and the Canada Revenue Agency. Since WD may not have the resources or expertise to drive policy changes in core departments, it will be imperative for WD to partner with other federal government departments, such as Industry Canada or International Trade, with relevant provincial government ministries, and sector associations.

11.1 Recommendations

> **Recommendation 1:** Within each gateway, replicate Alberta's model for developing a plan to define and address labour market challenges within the logistics and transportation sector. Two aspects of the model make it superior to other strategies listed in this report. First, the Alberta model focussed exclusively on labour market needs in the logistics sector. Second, the Alberta model involved industry in the development of the strategy to a greater extent than any other model.

Interviews revealed that the logistics sector is challenged to recruit skilled staff, create awareness of logistics opportunities, and find relevant training opportunities for their employees. As mentioned in Section 6 (Government Initiatives in Canada), the Province of Alberta is coping with labour market barriers through the *Workforce Strategy for Alberta's Supply Chain Logistics Industry (WSASCLI).* Alberta created an industry-led strategy by bringing together stakeholders from industry and education. Together, stakeholders identified labour market challenges faced by the logistics sector in Alberta and developed a plan of action to address the challenges. Responsibility for implementing the strategic actions rested primarily with the stakeholders.

The same approach could be applied at current and potential gateway cities in western Canada. Although provincial governments have responsibility for the labour market, WD could support the initiative by creating awareness of Alberta's approach among other provinces, partnering with provinces to facilitate the development of industry-led labour market strategies, and becoming a clearinghouse of best practices and resources that could aid provinces in developing industry-led labour market strategies. Provincial governments would lead strategy development discussions with support from WD; meanwhile, participating stakeholders would be responsible for producing and implementing the strategic actions. Stakeholders would discuss any relevant labour market challenges, including those identified by interviewees in this report: skills shortages, linkages between education and industry, and training opportunities for employees in more remote areas such as Prince Rupert.

WD would add value by identifying gateways that have similar challenges and facilitating the sharing of resources, ideas, and approaches for resolving the challenges. WD would also become a clearinghouse of best practices and resources that could aid provinces in developing industry-led labour market strategies. Where necessary, WD would support provinces in advocating for policy changes before federal government agencies. This would involve interfacing or partnering with departments such as Citizenship and Immigration Canada, Human Resources and Skills Development Canada, and Transport Canada. During the strategy development phase, WD would present information to industry participants about resources, regulations and policies already developed by government to address the challenges faced by the sector. Notably, much time and attention has already been directed to this issue by government, whether through the Pacific Gateway Strategic Action Plan, Asia-Pacific Gateway and Corridor Initiative, and Asia Pacific Gateway Skills Table.

This study's research activities support the selection of this recommendation. The Alberta model is the most successful in western Canada (and Canada) in terms of industry participation during the development phase. No other strategy involved industry to the extent of Alberta's *WSASCLI*. In addition, *WSASCLI* is the only strategy focussed exclusively on the logistics and supply chain sector in all of Canada. The model supports industry in creating and implementing their own strategy, a philosophy that aligns with the requests of interviewees. This approach would require frequent meetings between the representatives of the logistics sector and government agencies. The practice of frequent government meetings with logistics sector stakeholders is also being adopted by the leading jurisdiction of Germany (FGG, 2010)

> **Recommendation 2:** Partner with the Supply Chain & Logistics Association of Canada to gather and disseminate existing resources (e.g. research, publications) that address many of the barriers identified in this report.

Interviews revealed that some industry professionals are unaware of resources that have already been prepared by government to address value creation barriers. Recommendation #2 calls for WD to partner with a sector association such as the Canadian Supply Chain

Sector Council or the Supply Chain Management Association to gather and electronically distribute existing resources that address barriers to value creation. Resources could be posted on the WD or sector council website. Alternatively, the website could provide links to other websites already housing the materials. Creating a page of value creation resources would make the resources more accessible while increasing awareness of the importance of value creation at gateways. Since many of the materials and reports are already funded by government agencies, this would ensure that the public receives value for money by maximizing exposure to the resources.

> **Recommendation 3:** Advocate for the use of tax credits to incent investments in employee training and the development of IT solutions.

Findings from the interviews revealed the need for better access to training opportunities for employees in remote areas such as Prince Rupert. In general, interviewees observed an increase in the number of individuals currently employed in the logistics sector that lack prior logistics experience. Insufficient experience can negatively impact productivity, which in turn can impact the reliability of cargo movements – a criterion used by customers when measuring the value of logistics services. Lack of knowledge, key skills, and training can also impact a firm's ability to offer new and innovative services (logistics flexibility). Literature also revealed the need for improved software solutions that offer customers more visibility as cargo moves through the supply chain. Customers and logistics firms would like to utilize this type of software, but few solutions are available.

Employee training and software development may increase as companies are incented to engage in these activities through the use of tax credits. This recommendation calls for WD to advocate for greater use of tax incentives to encourage activities that would facilitate greater value creation in the logistics sector. To accomplish this task, WD would be required to interface with the federal Department of Finance to discuss the rationale behind the proposed actions. Three arguments could be advanced to persuade the Department of Finance that tax credits are an effective method to incent desired behavior. First, tax credits impact a company's bottom line within the same tax year, providing a short-term financial incentive to make investments in training and technology. Training alone provides a return-on-investment without the need for tax credits; however, the time frame for financial return is much longer. Second, other options, such as awareness generation, may be less effective at reaching the private sector. Tax incentives may resonate more with a profit driven private-sector than educational campaigns. Third, the concept of using tax incentives to encourage IT firms to develop software solutions for the logistics sector has been used in Singapore, one of the leading jurisdictions discussed in this report. Currently, no similar tax incentives are offered for the logistics sector in Canada.

> **Recommendation 4**: Engage with other federal and provincial government agencies, such as the Department of Foreign Affairs and International Trade and Transport Canada to ensure logistics providers are included on trade missions abroad.

Interviewees expressed concern that logistics firms, especially medium-sized and small logistics firms, are not considered for trade missions organized by government. While some logistics firms may have attended trade missions in the past, interviewees were unaware of such events. There may be a need to generate more awareness of trade missions or broaden this list of invitees. Greater inclusion of logistics firms on trade missions would help the sector to develop connections with shippers in other nations, especially China, Japan, Korea, Vietnam, and other Asia-Pacific economies. Logistics companies would receive an opportunity to discuss the value-added logistics services that could be performed in western Canada should shippers choose to use the corresponding gateways and corridors. In addition, shippers in other countries could gain first-hand knowledge about the competencies of the logistics sector in western Canada. Logistics companies would also provide potential shippers with anecdotes and evidence to counter any negative ratings received by Canada on the global Logistics Performance Index.

> **Recommendation 5:** Advocate for the development of geographically-defined free-trade zones, similar to those offered at other gateways throughout the world.

According to interviewees, western Canada's (and Canada's) lack of geographically-defined free-trade zones is a significant barrier to value creation in the logistics sector. A report commissioned by the Government of British Columbia estimated that $5.1 billion of trade would begin to flow through British Columbia's gateways with the creation of a free-trade zone in Vancouver and Prince Rupert. Since all cargo moving through free-trade zones requires the performance of logistics activities, this means that market opportunities for the logistics sector would grow tremendously.

Without geographically-defined free-trade zones, western Canada's logistics sector is less competitive than competing gateways, such as Tacoma and Los Angeles, that are able to use free-trade zones as a marketing tool to promote the sector and the gateway as a whole. Although Canada has programs similar to free-trade zones, such as duty deferral and avoidance programs that allow import cargo to be manipulated prior to re-export to the United States, these programs are available to shippers all across Canada and not only within specified free-trade zones. Interviewees favoured the concept of specified free-trade zones within gateway cities, believing that a specified free-trade zone could be marketed more effectively than the current model. Improved marketing potential could generate greater interest in western Canada's gateways resulting in greater cargo volumes and greater demand for logistics activities at the gateway. Greater demand for logistics activities would decrease the cost and increase the range and diversity (flexibility) of services offered at the gateway.

This recommendation would require WD to advocate for the introduction of geographically-defined free-trade zones in western Canada before the federal Department of Finance. A body referred to as the Free Trade Zone Coalition, which consists of port authorities (airport and seaports) and rail transportation providers, recently made a similar recommendation to the Department of Finance. Although the Department of Finance has not yet agreed to introduce specified free-trade zones, WD's advocacy for specified free-

trade zones may increase the probability of policy change. Specified free-trade zones have been successfully implemented in China, Japan, and most notably in the United States. As discussed in Section 8 (Interviews with Industry Professionals), examples of successful free trade zones in the United States that compete with Canada include Seattle, Portland, and Los Angeles (Intervistas Consulting, 2011)

> **Recommendation 6:** Advocate to Industry Canada and the Asia-Pacific Gateway and Corridor Initiative (Transport Canada) to introduce a logistics competitiveness benchmarking initiative patterned after the World's Bank Logistics Performance Index.

Research activities identified a lack of awareness among logistics firms, governments and other stakeholders about the competitiveness of Canada's logistics industry relative to other countries. Industry Canada's logistics performance report is produced infrequently, most recently in 2008; the next publication date for this report is unknown. Infrequent tracking of logistics sector performance will limit government's understanding of the effectiveness of policies designed to increase the sector's value creation capacity. The World Bank's Logistics Performance Index, however, produces annual rankings for each country's logistics performance. Annual rankings can change from the one year to the next, reflecting how quickly a country's logistics competitiveness can change. Uncovering any downward trends in logistics competitiveness as early as possible provides more time for the sector and government to work together and make necessary changes.

This recommendation calls for the development of an annual logistics benchmarking program that incorporates elements of the World Bank's Logistics Performance Index (DFAIT, 2009). A customized benchmarking index would compare Canada's performance with the United States on an annual basis. Areas of comparison would be the key components of value creation: cost, reliability and flexibility. Indicators would be developed for each of the components and would be based on survey data collected from logistics providers and customers. In addition, the benchmarking program would allow logistics customers and logistics providers to share comments about how to improve the logistics sector in western Canada.

> **Recommendation 7**: Partner with Industry Canada to gather information possessed by government that may be of value to the logistics sector; distribute free-of-charge or on a cost recovery basis.

A barrier to value creation identified by interviewees and research with Foreign Affairs, Trade and Development Canada relates to information sharing (DFAIT, 2009). Government may possess research, materials, databases, and other information that could support the logistics sector in the process of value creation; however, this information is not available to the private sector. Although the exact nature of the information is unknown, resources may contain data of value to the logistics sector. Resources could contain data that, if obtained by the logistics sector, would aid in conducting market research.

This recommendation would require WD to partner with Industry Canada in leading a project to collect information from within government that may provide benefits to the logistics sector. Industry Canada is an ideal partner for this project given their role to provide industry with resources that support import and export activities. The project would require government departments to remove any confidential data from the resources before submitting to the project team. Resources could then be organized on the Industry Canada website with links on the WD website and Canada Supply Chain Sector Council website; information could be available on a free-of-charge or cost recovery basis.

> **Recommendation 8:** Connect logistics providers, including terminals, through a common IT platform. Initial development costs would be covered by government but recovered over time through a marginal user fee.

The literature review identified the adoption of technology as a barrier to value creation, specifically technologies and software to assist with the coordination of logistics activities between multiple parties. This recommendation mitigates the value creation barrier by creating an IT platform that could be shared by port authorities, terminal operators, carriers, and logistics service providers throughout western Canada. The platform would be patterned after a similar initiative in Singapore and Germany and allow basic shipment information to be shared with every organization that joins the initiative. Shipment information such as weights, volumes, commodity type, container numbers, travel mode (e.g. air, ocean, rail, etc.), origin city, destination city, and routing would be available over the same IT platform.

The platform would allow shipment details to be entered only once, regardless of how many logistics and transportation parties handle the shipment in western Canada. By centralizing data entry, productivity would increase as logistics firms save time and reduce the frequency of data-entry errors. At the same time, the technology would support greater collaboration among supply chain participants (Horvath, 2001).The platform would be capable of communicating with existing cargo management systems to retrieve the necessary shipment information. Small logistics firms that are unable to afford cutting-edge cargo management software would be able to adopt the platform as a basic cargo management system. The software would be developed by a software engineering firm in collaboration with supply chain and logistics sector associations. The software engineering firm would be selected through a competitive bidding process managed by WD. Initial development costs would be paid by WD and recovered over time through a marginal user fee.

Achieving buy-in from the logistics sector could be a significant barrier to the success of this recommendation. Sector buy-in requires logistics firms to clearly understand the business benefits of the IT platform, to experience limited business disruption during implementation, and to receive clear system training and user-guides. To accomplish this, the logistics sector must trust that the needs of the sector have been fully contemplated during the software development process. Consequently, it is recommended that WD

acquire the assistance of an IT specialist from a top logistics firm to co-lead the project. It is also recommended that WD invite a team of logistics professionals from across western Canada to manage the selection and monitoring of the software engineering firm charged with designing the software. The team would work under the leadership of a WD project manager and the IT co-lead specialist mentioned earlier. In addition, the software engineering firm would be required to test software with several focus groups of logistics sector employees to ensure ease of use and relevance.

11.2 Summary

This section provided WD with eight recommendations for strengthening the value creation capacity of the logistics sector. Recommendations focussed on incorporating the observations generated in Section 10 (Discussion) and are based on an analysis of the preceding research activities in Section 6 through 9. Recommendations are based on ideas obtained from logistics professionals, literature, and an examination of other jurisdictions. Recommendations need not be implemented sequentially or in any particular order. In the following section, Section 12 (Conclusion), the report's purpose will be reviewed, the report's findings will be summarized, and suggestions for future research will be presented.

12 CONCLUSION

The objective of this project has been to provide WD with policy recommendations for increasing the logistics sector's capacity to create value for importers and exporters at western Canada's gateways. By improving the sector's capacity to create value, western Canada's gateways will become more competitive relative to other gateways and international trade through western Canada's gateways will grow. The research question has been answered using a four-part methodology that included a literature review, scan of government-led initiatives targeted at the logistics sector in western Canada, interviews with industry professionals, and a scan of the world's two top-performing logistics sectors (referred to as the leading jurisdictions scan). This work resulted in the creation of four deliverables: a literature review of similar academic work relating to the research question; a review of existing government strategies related to the logistics sector; a synthesis of interviews with managerial staff at logistics firms at western Canada's gateway cities; and a leading jurisdictional scan of government strategies related to the logistics sector. All deliverables contributed to the development of eight recommendations for improving the logistics sector's value creation capacity at western Canada's gateways.

The research activities contributed to the development of recommendations in several ways. First, research activities supported the development of a conceptual framework depicting the relationship between public policy and value creation activities within the logistics sector. The conceptual framework guided the research process by providing a framework to engage in research activities and organize research findings. Second, the research activities enabled the creation of a list of evidence-informed value creation barriers that currently exist within the logistics sector. Third, research activities uncovered potential solutions to the value creation barriers. Solutions were obtained through interviews with industry professionals and the leading jurisdiction scan. Finally, all deliverables including the list of barriers and proposed solutions were analyzed and discussed to identify existing policy gaps and other considerations to be addressed through the final recommendations.

Research activities revealed several barriers to value creation within the logistics sector. The first series of barriers relate to the labour market. Logistics firms face skill shortages when attempting to recruit new staff, lack access to training programs in some locations, and perceive that the sector's needs and educational programs are mismatched. The second theme relates to the competitiveness of the business environment. In relation to this theme, the sector lacks information about its competitiveness relative to other countries and believes the sector is disadvantaged without specified and marketable free-trade zones as exist in other countries, including the United States and Singapore. The third series of value creation barriers pertain to making improvements in service innovation and productivity. Logistics firms, especially small and medium-sized enterprises, are constrained by the high cost of new information technology that would improve the connectivity of logistics firms as well as productivity. The sector also lacks software solutions to address critical customer needs, such as the cargo visibility. The fourth value creation barrier pertains to government services and regulatory streamlining. Logistics efficiency and reliability is restrained by irregular service levels at CBSA and incongruent transportation policies between

provinces. A variety of policy solutions for addressing the mentioned barriers surfaced during the research activities. Nearly fifteen types of policy solutions were brought forward and included the following: information-sharing, best practices research, free-trade zones, port fees, benchmarking, sector consultation, program review, quota reviews, interprovincial policy alignments, awareness creation, connectivity support, tax incentives, and service review.

After analysing the results of all research activities, including the list of barriers and potential solutions, key observations were developed for consideration prior to developing the final list of recommendations. Overall, six observations were brought forward that pertained to the nature of value creation barriers, existing policy gaps, and the effectiveness of previous and current initiatives. The attitude of interviewees towards government policy was a notable observation. During interviews, interviewees hesitated to suggest any direct government involvement in a firm's day-to-day value creation processes. Another critical observation related to past government initiatives. In general, interviewees were unaware of much of the work already implemented by government to support value creation in the logistics sector. These and other observations supported the development of recommendations.

Research activities supported the development of eight recommendations to strengthen value creation capacity within the logistics sector at western Canada's gateways. The recommendations will support value creation activities by addressing the barriers to value creation identified in this report. Recommendations involve the implementation of smart practices from other jurisdictions within western Canada and abroad; the leveraging of partnerships with sector councils and other federal government departments; the improvement of information dissemination; and the advocacy of measures to improve western Canada's trade competitiveness.

WD's Trade & Investment Policy Unit can use this report to gain a stronger understanding of the role of the logistics sector in creating supply chain value, to inform future advocacy agendas, to inform future APGCI investment decisions, and to spark discussion about the future direction of the APGCI strategy. This report will also provide WD with additional insight into the needs of logistics providers across western Canada.

This project identified several issues and gaps related to value creation in the logistics sector. Some issues received only a brief discussion in this report; however, they may become the focal point of future studies. Interview participants raised several concerns regarding government policy, practices, and legislation worthy of further exploration. The most notable issues include the misalignment of provincial transportation regulations for oversize load movements, the inconsistencies in service levels at CBSA, and the difficulty in obtaining logistics training at smaller, developing gateways. Although touched on briefly in this report, each issue could benefit from a more thorough problem analysis and review of smart-practices from other jurisdictions. Each issue affects value creation at gateway cities and, if explored further, would become an appropriate supplement to this report.

APPENDIX A: INTERVIEW RESPONSES

Question 1: What are the strengths of the logistics industry in your city? In Western Canada?	
Participant A	• New entrants can enter the logistics market relatively easily in western Canada.
Participant B	• In western Canada's smaller gateway cities, logistics partners (e.g. terminal operators, truck drivers, warehouses) are within close proximity. Developing professional relationships and resolving supply chain problems, such as lost cargo, can happen quickly in smaller markets.
Participant C	• Western Canada has an extensive and efficient rail distribution network. • Air gateways provide direct access to a many large cities around the world. • Trucking companies in Canada offer extensive service to the U.S. and vice versa.
Participant D	• The strength of the logistics sector at western Canada's ocean gateways is their geographical location. The ocean gateways are the most convenient point to ship goods out of or into western Canada. The sector possesses no specific competencies that make it stand out above competing countries.
Participant E	• The strength of the logistics sector at western Canada's ocean gateways is their geographical location. • The logistics sector at Western Canadian gateways, especially ocean gateways, is very proficient at handling the movement of lumber and other wood products.

Question 2: What are the weaknesses of the logistics industry in your city? In Western Canada?	
Participant A	• Certain regions of western Canada, especially Saskatchewan and Alberta, are experiencing significant economic growth. Economic growth is straining labour markets in the logistics sector. The sector is challenged to find skilled labour to fill vacancies. Baby boomer retirement will place additional pressure on a strained labour market.
Participant B	• The logistics sector labour force lacks many critical skills. In communities such as Prince Rupert, employees must travel long distances to participate in training and development opportunities. • The logistics sector requires new port developments (e.g. break bulk facilities in Prince Rupert) before complementary value-added logistics firms can be established. • Western Canada has no free trade zone.

Participant C	• Due to highway and railway infrastructure restrictions, freight forwarders are challenged to move over-dimensional cargo through the Rocky Mountains into Alberta and Saskatchewan. In some cases, large project cargos must be offloaded at ports in Texas and transported into Canada through the mid-west United States. • Freight forwarders often experience lower shipping costs by moving Canadian bound project freight through the United States than through Canada. • Many employees in the industry's workforce lack the experience and skills sets required by employers. • The sector is challenged to attract new people into the industry.
Participant D	• Labour costs are an impediment to the industry's competitiveness, especially in the lower mainland of British Columbia. Due to labour expenses, trans-loading costs are much higher in Vancouver than Montreal or Tacoma. • Hours of operation at some port docks are limited by union contracts. Some docks cannot stay open 24 hours per day. Near the end of shifts, trucks dropping off cargo are often turned away. Other ports without similar limitations are more competitive. At docks where high value cargo is loaded and trans-loaded, similar contracts are not in place. • Port reservation systems are confusing and do not appear to reduce congestion.
Participant E	• Infrastructure to access ports in the lower mainland is congested; accessing ports in downtown Vancouver is very difficult.

Question 3: What can government do to help the logistics industry charge less for logistics services?	
Participant A	• Governments should review immigration policy with an objective of increasing the labour supply. As the supply of labour increases, wages will decrease. • Governments need to reduce the "regulatory burden" created from tax and environmental policies. Lengthy application and reporting procedures can be expensive to follow and divert attention away from core business activities.
Participant B	• Governments should implement measures that help keep fuel costs down. This can include the construction of shorter, more direct routes to ports, airports, and rail yards and improved access to major highways from industrial sites.
Participant C	• Governments should limit their involvement in this area.

Participant D	• Governments should not have direct involvement in this area. • Governments should focus on mitigating market failures and enforcing laws. • Governments should take initiatives to prevent wages from escalating too quickly. • Governments should encourage the development of agencies such as Pulse Canada. • Governments must encourage more competition for certain services, such as commodity terminals. Increased competition will increase efficiency and reduce costs for consumers.
Participant E	• Government should provide infrastructure that supports the efficient movement of goods. As movement can occur more efficiently, trucking costs and fuels costs are reduced. These savings will be passed to asset-based non-transportation logistics firms as well as non-asset based transportation firms.

Question 4: What can government do to help the logistics industry offer more consistent and reliable service for its customers?	
Participant A	• Government should limit its direct involvement in this policy area. • Government should ensure marketplaces work efficiently and in accordance with the law. • Government intervention should interfere only when absolutely necessary.
Participant B	• Programs such as "Beyond the Border" are an excellent way for governments to improve consistency and reliability of the sector.
Participant C	• Transport Canada's planned initiatives to increase Canada's air cargo volume will be difficult to implement because Transport Canada has no control over its partners (private sector firms and provincial governments). • Reliability and consistency will be achieved as Canada Customs inspects 100% of cargo. Unexpected and random cargo inspections are the main reason for late deliveries to customers. • Reliability and consistency will be achieved as Canada Customs applies consistent standards for screening cargo from port to port. Agents at some ports are far stricter than agents at other ports. • Reliability and consistency will be achieved as Canada Customs agents deliver similar levels of service from port to port. Many agents are unaware how to handle special cargo documents (e.g. ATA Carnet). • Reliability and consistency would be improved if Canada Customs services were offered 24 hours per day and 7 days per week.
Participant D	• Government should limit its direct involvement in this area. • Government should allow industry to improve reliability and consistency on its own.

Participant E	• Government should limit its direct involvement in this area. • Government could improve reliability and consistency by encouraging more competition within the rail transport industry. Some shippers only have one rail provider to select from.

Question 5: Are there enough logistics services in your city to meet demand? Are there enough logistics services in western Canada to meet demand?	
Participant A	• Yes, there are sufficient services available in both western Canada and Alberta; however, service quality is limited by their ability to find and retain qualified staff.
Participant B	• Yes, in Prince Rupert and western Canada there are sufficient services to meet demand.
Participant C	• There are sufficient services available in major gateways; however, shippers have a hard time finding logistics firms that offer service in rural areas.
Participant D	• In the Lower Mainland, there are sufficient services to meet demand. Bottlenecks occur due to slow turnaround time of vessels at ports. • Increases in productivity and efficiency of existing firms should come before the addition of new firms. Some labour laws and union stipulations stifle progression of productivity and efficiency improvements.
Participant E	• Overall, a sufficient amount of logistics providers operate in the Lower Mainland. Unfortunately, many providers are "fly-by-night" operators that offer services at unsustainably low prices. Eventually, these firms become insolvent. The Lower Mainland lacks logistics providers with sound business models.

Question 6: What can government do to increase the variety of logistics services available in your city? Western Canada?	
Participant A	• Government should not attempt to influence the mix of logistics services in western Canada. This will be determined by the marketplace. • Government should be concerned with ensuring the marketplace operates efficiently.
Participant B	• Government should assist firms in reclaiming and preparing land for construction. In some areas of western Canada (e.g. Prince Rupert), preparation of landscapes for construction can be very expensive.

Participant C	• Government should not attempt to intervene in this area. The entrepreneurial spirit in western Canada is strong. Entrepreneurs will determine if new or additional services should be offered. • Government should do more to help attract qualified individuals into the logistics industry. Many individuals presently employed in the logistics sectors are under-qualified for their positions.
Participant D	• Government should limit its direct involvement in this area. • Government should remove as much regulatory interference as possible, • As much as possible, government should give the private sector control over business functions.
Participant E	• Government should limit its direct involvement in this area.

Question 7: What else could governments do to improve the overall value of logistics services in your city? Western Canada?	
Participant A	• Government should encourage the development of supply chain management training programs. • Government should encourage logistics organizations to provide staff training in supply chain management through the use of tax credits. • Government should routinely monitor the competitiveness of Canadian industry regulations relative to the United States. It may be found that U.S. tax policy is more attractive to potential investors and entrepreneurs. • If government departments possess information that could benefit the logistics industry, government should begin providing or selling that information to firms. Government departments that may have such information include the Department of Foreign Affairs and International Trade, Transport Canada and Customs Border Services Agency.
Participant B	• Government could provide firms with financial assistance to purchase and implement the latest information technology (e.g. container management database software)
Participant C	• Arranging cargo movements across several provincial jurisdictions can be very challenging and time consuming for freight forwarders. For example, each provincial government has different rules oversize cargo movements. Governments should work to achieve more provincial alignment of transportation policies. A single regulator might be a promising solution.
Participant D	• Government can do little to assist the industry. Compared to countries, throughout the world, the U.S. and Canadian logistics industry are some of the most advanced.

Participant E	• Government should encourage the simplification of port operations. For example, a terminal operator at a Lower Mainland port has implemented a complicated container reservation and delivery system. Some logistics firms have one or two full time employees dedicated to making delivery reservations. Making bookings takes a lot of time. The system requires careful planning since containers must be booked at least two days in advance. Cancelling reservations is time-consuming and costly. • The security protocol for delivering containers is complex and confusing.

Question 8: What role should government play in growing the logistics industry?	
Participant A	• Government should play a minimal role in sector growth.
Participant B	• Government should help build markets for western Canadian exports by organizing trade forums. • Government should create free-trade zones.
Participant C	• Government should act as a regulator and investment partner. • Government provide tax incentives that encourage industry growth.
Participant D	• Government should assist manufacturing and natural resource sectors in finding markets for value-added products. • Governments should facilitate meetings between potential buyers and sellers of western Canadian products (e.g. trade missions). • Governments should help expose Canadian firms to value-added markets.
Participant E	• Government need not play a direct role. • Governments can work with ports to simplify delivery procedures at western Canadian ports (specifically in the lower mainland). • Governments have role to provide adequate infrastructure and simplify the export process.

Question 9: What role should industry play in growing the logistics industry?	
Participant A	• Industry must do a better job monitoring its competitiveness relative to competing countries.
Participant B	• Industry firms must work together and with government more effectively to solve the challenges addressed earlier in the survey.
Participant C	• Industry should be leading and driving initiatives to grow the sector.
Participant D	• Similar to governments, industry must identify international markets for value-added products and travel abroad to meet with potential customers face-to-face. • Ultimately, industry should be responsible for organizing its own trade missions.

Participant E	• Industry has a role to provide high quality service. • Industry must discourage the proliferation of "fly-by-night" businesses that employ unsustainable pricing models.

Question 10: What challenges to growth does the logistics industry face in your city? In western Canada?	
Participant A	• Industry faces incredible staffing challenges in the short and long-term. • Industry lacks financial resources for research, development and innovation. Resource constraints could be reduced through tax credits that encourage innovation in the logistics industry.
Participant B	• Industry struggles to understand the needs of its trading partners.
Participant C	• The industry lacks connections to secondary and post-secondary education programs development.
Participant D	• The industry is challenged to cope with escalating union wages. • The industry is challenged to access promote products in foreign markets without financial assistance.
Participant E	• The industry is constrained by infrastructure that struggles to keep pace with growth of population and cargo volumes. • The industry is challenged to improve its productivity.

BIBLIOGRAPHY

Airport-technology.com, (n.d.). *Prince George airport, British Columbia, Canada.* Retrieved April 20, 2010, from http://www.airport-technology.com/projects/princegeorgeairport/

Arvis, J., Mustra, A., Panzer, J., Ojala, L., & Naula, T. (2007). Connecting to compete: Trade logistics in the global economy. In World Economic Forum, *The Global Enabling Trade Report* (pp. 53-65).

Asia Pacific Foundation of Canada. (2006, November). *Embracing the future: the Atlantic gateway and Canada's trade corridor.* McMillan.

Asia Pacific Foundation of Canada. (2008, June). *Building a gateway economy: the role of three service sectors in western Canada.* Edmonton.

Asia Pacific Gateway Skills Table. (2013). *About us.* Retrieved September 2, 2013 from http://www.apgst.ca/about-us/

Auston Institute of Management. (2013). *MBA in logistics and supply chain management.* Retrieved June 5, 2013 from http://www.auston.edu.sg/old0513/mba-in-logistics-and-supply-chain-management/

Avison Young. (2013). *Metro Vancouver industrial overview – spring 2013.* Retrieved 5 June 2013 from http://www.avisonyoung.com/sites/default/files/content-files/Offices/Vancouver/Research/2013/Vancouver_IndustrialOverview_Spring2013.pdf

Bowman, C. & Ambrosini, V. (2000). Value creation versus value capture: towards a coherent definition of value in strategy. *British Journal of Management. 11*(1), 1-15.

Brooks, M. (2007). *Gateways and Canada's ports policy: Issues and impediments.* Retrieved December 1, 2010, from Asia-Pacific Gateway and Corridor Research Consortium Web site: http://www.gateway-corridor.com/roundconfpapers/papers.htm

Canada Border Services Agency. (2013a). *About us.* Retrieved September 2, 2013 from http://www.cbsa-asfc.gc.ca/agency-agence/who-qui-eng.html

Canada Border Services Agency. (2013b). *Acts, regulations, and other regulatory information.* Retrieved September 2, 2013 from http://www.cbsa-asfc.gc.ca/agency-agence/actreg-loireg/legislation-eng.html

Canadian Supply Chain Sector Council. (2013). *Mandate.* Retrieved September 2, 2013 from http://www.supplychaincanada.org/en/mandate

Citizenship and Immigration Canada. (2013). *About us.* Retrieved September 2, 2013 from http://www.cic.gc.ca/english/department/mission.asp

Collier's International. (2013). *North American port analysis.* Retrieved August 28, 2013, http://www.colliers.com/en-us/us/insights/port-report-form

Community Charter, Statutes and Regulations of British Columbia (2013). Retrieved from the BC Laws website: http://www.bclaws.ca/EPLibraries/bclaws_new/document/ ID/freeside/03026_00

Congressional Research Service. (2013). *U.S customs and border protection: trade facilitation, enforcement, and security.* Washington, DC: Jones & Rosenblum.

DeanMcMann.com. (2010). *Customer intimacy as a business model: linking service delivery to value creation.* Retrieved July 20, 2010 from http://www.deanmcmann. com/2010/07/customer-intimacy-linking-service-delivery-to-value-creation.html

Department of Finance Canada (2013). *About finance Canada.* Retrieved on September 2, 2013 from http://www.fin.gc.ca/afc/index-eng.asp

Department of Foreign Affairs and International Trade. (2009). *Logistics and the competitiveness of Canadian supply chains.* Montreal: Roy.

Dresner, M. (2007). *Assessing productivity and performance at seaports: the importance for gateways.* Retrieved June 15, 2013, from Asia-Pacific Gateway and Corridor Research Consortium Web site: http://www.gateway-corridor.com/roundconfpapers/ papers.htm

Employment and Social Development Canada. (2013). *HRSDC branches.* Retrieved September 2, 2013 from http://www.hrsdc.gc.ca/eng/about/branches/index.shtml

Federal Government of Germany. (2010). *Freight transport and logistics action plan – logistics initiative for Germany*, Retrieved November 2, 2012 from http://www.bmvbs.de/cae /servlet/contentblob/64858/publicationFile/45243/action-plan-freight-transport-and-logistic.pdf

Feller, A., Shunk, D., & Callarman, T. (2006, March). Value chains versus supply chains. *BP Trends.*

Fischer, E. & Reuber, A. (2003). Support for rapid growth firms: a comparison of the views of founders, government policy makers, and private sector resource providers. *Journal of Small Business Management.41*(4).346-365.

Foreign Affairs, Trade and Development (2013). *About the department.* Retrieved September 2, 2013 from http://www.international.gc.ca/department-ministere/index.aspx?view=d

G24 Intergovernmental Group on Monetary Affairs and Development. (2003, October). *Reinventing industrial strategy: the role of government policy in building industrial competitiveness* (QEH Working Paper Series No. 111). Lall.

Gillen, D., Parsons, G., Prentice, B., & Wallis, P. (2007). *Pacific crossroads: Canada's gateways and corridors.* Retrieved April 21, 2010, from Asia-Pacific Gateway and Corridor Research Consortium Web site: http://www.gateway-corridor.com/roundconfpapers/papers.htm

Gillen, D., Parsons, G., Prentice, B., & Wallis, P. (2008). *The dimensions of value added in gateways and corridors: Adding value to national and international logistics system.* Retrieved April 21, 2010, from Asia-Pacific Gateway and Corridor Research Consortium Web site: http://www.gateway-corridor.com/roundconfpapers/papers.htm

Government of Alberta. (2009). *A workforce strategy for Alberta's supply chain logistics industry.* Edmonton.

Government of British Columbia. (2005). *British Columbia ports strategy: final.* Victoria, BC: Ministry of Small Business and Economic Development & Ministry of Transportation

Government of British Columbia. (2012). *The Pacific gateway transportation strategy 2012 – 2020.* Victoria, BC: Ministry of Transportation and Infrastructure

Government of British Columbia. (2013a). *Revised 2013-14 – 2015-16 service plan.* Victoria, BC: Ministry of Advanced Education

Government of British Columbia. (2013b). *Revised 2013-14 – 2015-16 service plan.* Victoria, BC: Ministry of Jobs, Tourism, and Skills Training

Government of Canada. (2006). *Canada's Asia-Pacific gateway and corridor initiative.* Retrieved October 16, 2010, from http://www.pacificgateway.gc.ca/media/documents/en /APGCI_Launch_Booklet.pdf

Government of Canada. (2010). *Canada's Pacific gateway.* Retrieved May 19, 2010, from http://www.pacificgateway.gc.ca/index2.html

Government of Singapore. (2002). *Report of the working group on logistics: developing Singapore into a global integrated logistics hub.* Retrieved November 2, 2011, from http://app.mti.gov.sg/data/pages/507/doc/ERC_SVS_LOG_MainReport.pdf

Goetz, A. & Bandyopadhyay, S. (2007). *Regional development impacts of trade corridors: recent experience from the United States.* Retrieved June 9, 2012, from Asia-Pacific Gateway and Corridor Research Consortium Web site: http://www.gateway-corridor.com/roundconfpapers/documents/Bandyopadhyay_and%20_Goetz_Regina.pdf

Hall, P. (2007). *Global logistics and local dilemmas.* Retrieved October 5, 2010, from Asia-Pacific Gateway and Corridor Research Consortium Web site: http://www.gateway-corridor.com/roundconfpapers/papers.htm

Heaver, T. (2007). *Tying it all together: the future of logistics in and through gateways.* Retrieved June 9, 2012, from Asia-Pacific Gateway and Corridor Research Consortium Web site: http://www.gateway-corridor.com/roundconfpapers/documents/Heaver_ Trevor_Vancouver.pdf

Holbrook, M. (1999).*Consumer value: a framework for analysis and research.* London: Routledge

Horvath, L. (2001). Collaboration: the key to value creation in supply chain management. *Supply Chain Management: An International Journal. (6)*5, 205-207.

IBM Global Services. (2009, January).*The smarter supply chain of the future: global chief supply chain officer study.* Somers, NY: Robert W. Moffat, Jr.

Industry Canada. (2005). *Logistics/ supply chain management: Industry overview and statistical profile.* Retrieved October 16, 2010, from http://www.ic.gc.ca/eic/site/dsib-logi.nsf/eng/h_pj00142.html

Industry Canada. (2008). *State of logistics: the Canadian report 2008.* Retrieved October 16, 2010, from http://www.ic.gc.ca/eic/site/dsib-logi.nsf/eng/h_pj00458.html

Industry Canada. (2013). *About us.* Retrieved September 2, 2013, from http://www.ic.gc.ca/eic/site/icgc.nsf/eng/h_07017.html

Intervistas Consulting Inc. (2011, March). *Feasibility of a British Columbia foreign trade zone (FTZ) program – final report.* Vancouver.

Intervistas Consulting Inc. (2012, March). *Port of Prince Rupert: Economic impact study update.* Vancouver.

Klodt, H. (2000). Industrial policy and the east German productivity puzzle. *German Economic Review.* 1*(3),* 315-333.

Library of Parliament (2006). *Trends in containerization and capacity at Canadian ports.* Retrieved December 1, 2010 from http://www2.parl.gc.ca/Content/LOP/Research Publications/prb0575-e.htm

Lieb, R., & Bentz, B. (2005). The use of third-party logistics services by large American manufacturers: The 2004 survey. *Transportation Journal. (35)*8, 5-15.

Lummus, R., Krumwiede, D., & Vokurka, R. (2001). The relationship of logistics to supply chain management: Developing a common industry definition. *Industrial Management & Data Systems. (101)*8, 426-432.

Martin, R., & Sunley, P. (2003). Deconstructing cluster: chaotic concept of policy panacea? *Journal of Economic Geography. (3),* 5-35.

McDougall, G. & Levesque, T. (2000). Customer satisfaction with services: putting perceived value into the equation. *Journal of Services Marketing. (14)*5. 392-410.

McKinsey Global Institute. (2010, March). *How to compete and grow: a sector guide to policy.* San Francisco.

Memedovic, O., Ojala, L., Rodrigue, J., & Naula, T. (2008). Fuelling the global value chains: What role for logistics capabilities? *International Journal of Technological Learning, Innovation and Development. (1)*3. 353-374.

Mentzer, J., Flint, D., & Kent, J. (1999). Developing a logistics service quality scale. *Journal of Business Logistics. (9).*

Ministry of Enterprise & Advanced Education. (2013). *About us.* Retrieved September 2, 2013, from http://eae.alberta.ca/ministry/about.aspx

Ministry of Economy. (2013). *Ministry overview*. Retrieved September 2, 2013 from, http://www.economy.gov.sk.ca/Overview

Ministry of Advanced Education. (2013). *Ministry overview*. Retrieved September 2, 2013 from http://www.ae.gov.sk.ca/ministry-overview/

Ministry of Agriculture, Food, & Rural Initiatives. (2013). *About MAFRI.* Retrieved September 2, 2013 from http://www.gov.mb.ca/agriculture/about/index.html

Ministry of Entrepreneurship, Training & Trade. (2013). *Minister's message.* Retrieved September 2, 2013 from http://www.gov.mb.ca/ctt/min_message.html

Morash, E., & Lynch, D. (2002). Public policy and global supply chain capabilities and performance: a resource-based view. *Journal of International Marketing. (10)*1, 25-51.

Morrison, W. (2007). *Gateways and corridors: ten messages.* Retrieved April 21, 2010, from Asia-Pacific Gateway and Corridor Research Consortium Web site: http://www.gateway-corridor.com/roundconfpapers/papers.htm

Norbury, K. (2012, July 11). Freight forwarders carry the weight of security rules. *Canadian Sailings.* Retrieved June 5, 2013 from http://www.canadiansailings.ca/?p=4368

Oum, T., & Tongzon, J. (2007). *The role of port performance in gateway logistics.* Retrieved April 21, 2010, from Asia-Pacific Gateway and Corridor Research Consortium Web site: http://www.gateway-corridor.com/roundconfpapers/papers.htm

Pacific Gateway Strategy Action Plan Industry Advisory Group. (2006, April). *Pacific gateway strategy action plan.* Victoria.

Pack, H. & Saggi, K. (2006). Is there a case for industrial policy? A critical survey. *The World Bank Research Observer, (21)*2, 267-297.

Parasuraman, A. & Grewal, D. (2000). The impact of technology on the quality-value-loyalty chain: a research agenda. *Journal of the Academy of Marketing Science. 28*(1), 168-174.

Pain, K. (2007).*Global cities, gateways and corridors: Hierarchies, roles, and functions.* Retrieved October 5, 2010, from Asia-Pacific Gateway and Corridor Research Consortium Web site: http://www.gateway-corridor.com/roundconfpapers/papers.htm

Pieterse, J. (2005). *Value creation generates wealth.* Retrieved January 16, 2013 from http://it.toolbox.com/blogs/enterprise-design/value-creation-generates-wealth-6048

Port Metro Vancouver. (2011). *Statistical Overview.* Retrieved August 14, 2012 from Port Metro Vancouver Web site: http://www.portmetrovancouver.com/Libraries/ABOUT_Facts _Stats/PMV_2011_ Stats_Overview.sflb.ashx

Port Metro Vancouver. (2012). *Facts & stats.* Retrieved October 5, 2010, from Port Metro Vancouver Web site: http://www.portmetrovancouver.com/en/about/factsandstats.aspx

Porter, M. (1980). *Competitive strategy.* New York: Free Press

Porter, M. (2000). Location, competition, and economic development: local clusters in a global economy. *Economic Devlopment Quarterly.* 14*(15).* 15-34.

Prince Rupert Port Authority (2012). *Monthly performance statistics – December 2012.* Retrieved January12, 2013, from http://www.rupertport.com/trade/performance

Raines, P. (2001). *The cluster approach and the dynamics of regional policy-making.* (Regional and industrial poloicy research paper, No. 47). United Kingdom: University of Strathclyde, European Policies Research Centre.

Rodrigue, J. (2013). *The geography of transport systems* (3rd ed).United States: Routledge

Sanchez-Fernandez, R. & Iniesta-Bonillo, M. (2007). The concept of perceived value: a systematic review of the research. *Marketing Theory. 7*(4). 427-451.

Simchi-Levi, D., Kaminsky, P., & Simchi-Levi, E. (2003). *Designing and managing the supply chain – concepts, strategies, and case studies* (2nded.) New York: McGraw-Hill

Simpson, P., Siguaw, J., & Baker, T. (2001). A model of value creation: supplier behaviours and their impact on retailer perceived value. *Industrial Marketing Management, 30*(January/February), 119-134.

S P Jain School of Global Management. (2013). *Global logistics & supply chain management.* Retrieved June 5, 2013 from http://www.spjain.org/gmba/ specialization_glscm.asp

Stadtler, H., & Kilger, C. (2008). *Supply chain management and advanced planning – concepts, models, software and case studies* (4thed.). Berlin: Springer

Stanford, J. (2003, May). *Industrial policy in an era of free trade: what isn't, and is, possible?* Paper presented at the Analytical Political Economy Conference, Hartford, CT.

Statistics Canada. (2009). *Air carrier traffic at Canadian airports. Statistics Canada Catalogue no. 51-203-X.* Retrieved October 30, 2010 from http://www.statcan.gc.ca/pub/51-203-x/51-203-x2009000-eng.pdf

Statistics Canada. (2008). *Shipping in Canada. Statistics Canada Catalogue no. 54-205-X.* Retrieved October 30, 2010 from http://www.statcan.gc.ca/pub/54-205-x/54-205-x2008000-eng.pdf

Statistics Canada. (2007). *Air carrier traffic at Canadian airports. Statistics Canada Catalogue no. 51-203-X.* Retrieved July 12, 2013 from http://www.statcan.gc.ca/pub/51-203-x/51-203-x2007000-eng.pdf

Statistics Canada. (2012). *Canada year book 2012.Statistics Canada Catalogue no. 11-402-XPE.* Retrieved April 6, 2013 from http://www.statcan.gc.ca/pub/11-402-x/2012000/pdf/front-preliminaires-eng.pdf

Supply Chain Management Association. (2013). *About SCMA.* Retrieved September 2, 2013 from http://scmanational.ca/en/about-scma

The Tioga Group Incorporated. (2010). *Improving marine container terminal productivity: development of productivity measures, proposed sources of data, and initial collection of data from proposed sources.* Moraga, CA

Transport Canada. (2007). *Government of Canada announces improvements to the Roberts bank rail corridor*. Retrieved November 30, 2010, from http://www.tc.gc.ca/ eng/mediaroom/ releases-nat-2007-07-gc024e-4807.htm

Transport Canada. (2009). *Transportation in Canada addendum.* Retrieved April 16, 2011 from, http://www.tc.gc.ca/media/documents/policy/addendum2009.pdf

Transport Canada. (2013). *About us.* Retrieved September 2, 2013, from http://www.tc.gc.ca/eng/aboutus-whatwedo.htm

Treasury Board of Canada Secretariat. (2009a). *2008-2009 DPRs – Horizontal initiatives.* Retrieved April 20, 2010, from http://www.tbs-sct.gc.ca/dpr-rmr/2008-2009/info/hi-ih-eng.asp#wco

Treasury Board of Canada Secretariat. (2009b). *Western economic diversification Canada – foundations (conditional grants),* Retrieved April 20, 2010, from http://www.tbs-sct.gc.ca/rpp/2008-2009/inst/WCO/wco07-eng.asp

Western Provincial Transportation Ministers Council. (2005). *Western Canada transportation infrastructure strategy for an economic network,* Retrieved October 5, 2010 from http://www.transportation.alberta.ca/2301.htm

Western Economic Diversification Canada.(2007). *Prince Rupert container terminal opening new world of opportunities.* Retrieved September 29, 2011 from http://www.wd.gc.ca/eng/ 77_9573.asp

Western Economic Diversification Canada. (2008a). *Access west – winter 2008, Message from the Honourable Rona Ambrose* .Retrieved May 28, 2010 from http://www.wd.gc.ca/eng/10232.asp

Western Economic Diversification Canada. (2008b). *Federal investments strengthen Canada's Asia-Pacific gateway and corridor opportunities.* Retrieved May 19, 2010, from http://www.wd.gc.ca/eng/77_10623.asp

Western Economic Diversification Canada. (2009a). *Prince George airport runway expansion completed thanks to government of Canada funding.* Retrieved April 20, 2010, from http://www.wd.gc.ca/eng/77_11174.asp

Western Economic Diversification Canada. (2010a). *WD corporate business plan: 2009/10 to 2011/12.* Retrieved May 19, 2010, from http://www.wd.gc.ca/eng/11677.asp

Western Economic Diversification Canada. (2010b). *Western economic diversification Canada 2010-2011 estimates: report on plans and priorities.* Retrieved June 9, 2012 from http://www.tbs-sct.gc.ca/rpp/2010-2011/inst/wco/wco-eng.pdf

Western Economic Diversification Canada. (2012a). *The department.* Retrieved May 19, 2010, from http://www.wd.gc.ca/eng/36.asp

Western Economic Diversification Canada. (2012b). *WD corporate business plan: 2010/11 to 2012/13.* Retrieved August 14, 2012, from http://www.wd.gc.ca/eng/12256.asp

Wilson, G. & Summerville, T. (2008). Transformation, transportation or speculation? The Prince Rupert container port and its impact on northern British Columbia. *Canadian Political Science Review, 2(4),* 26-39

Woodruff, R. (1997). Customer value: the next source for competitive advantage. *Journal of the Academy of Marketing Science. 25(*2), 139-153.

World Bank. (2012). *Logistics performance index.* Retrieved August 15, 2012, from http://lpisurvey.worldbank.org/international/global?sort=asc&order=Timeliness#data table

World Port Source. (2011). *Port metro Vancouver.* Retrieved September 29, 2011, from http://www.worldportsource.com/ports/CAN_Port_Metro_Vancouver_220.php

Zeithaml, V. (1988). Consumer perceptions of price, quality and value: a means-end model and synthesis of evidence. *Journal of Marketing. 52*(3), 2-22.