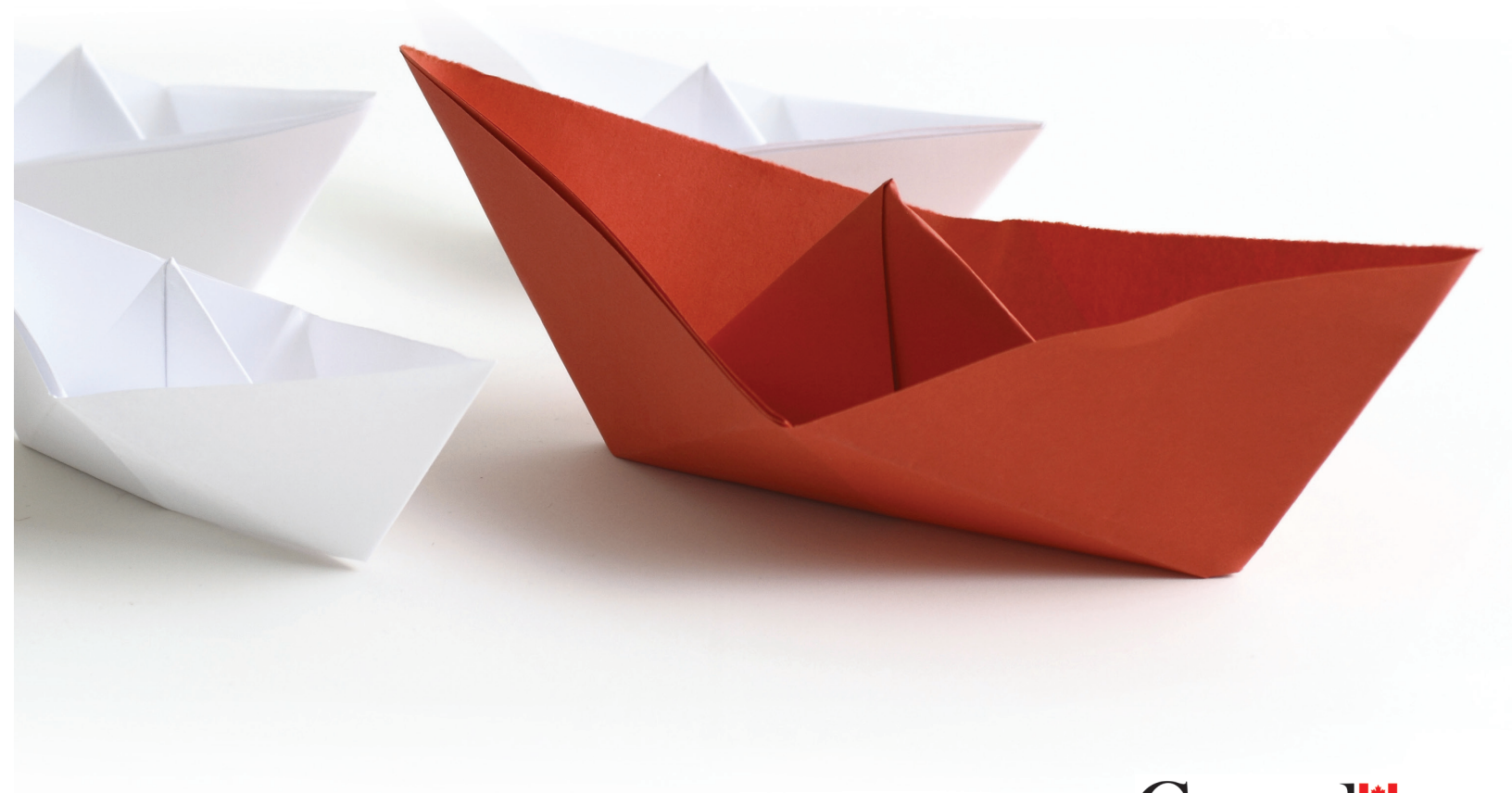




Pathways: Connecting Canada's Transportation System to the World

Volume 2 — Appendices



Canada 

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Canada Transportation Act Review

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Appendix A

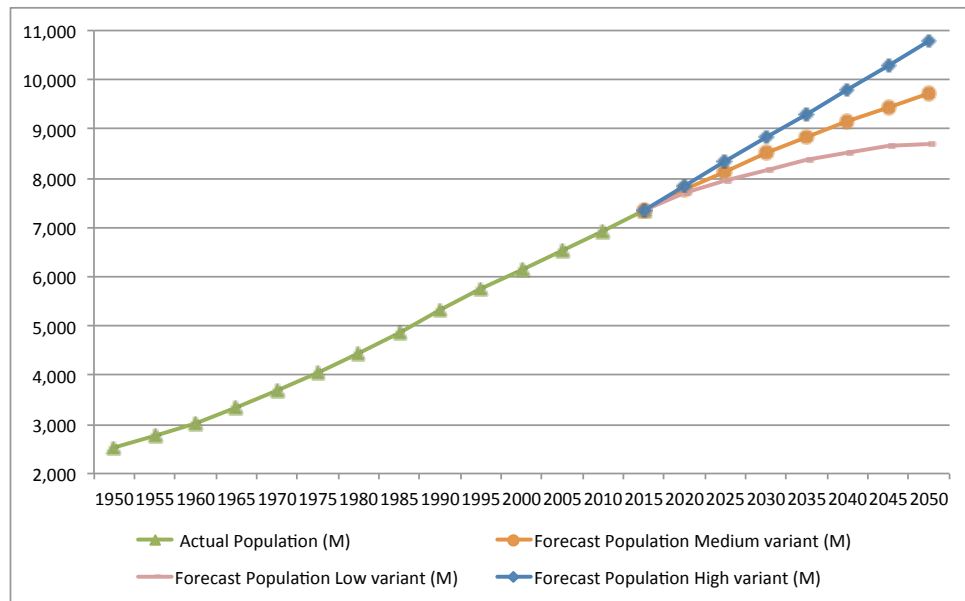
Economic Context

Historically, population and Gross Domestic Product (GDP) have been shown to be strongly linked to growth rates for passenger and freight transport volumes, and these indicators are used as the basic drivers when forecasting aggregate demand for transportation. For population data, the Canada Transportation Act Review has relied on the United Nations (UN) *World Population Prospects (2015 Revision)*.¹ For economic data, the CTA Review drew heavily on the Organization for Economic Cooperation and Development (OECD) *Economic Outlook* and *OECD.stat* extracts,² and International Transport Forum (ITF) *Transport Outlook 2015*,³ with other sources as noted.

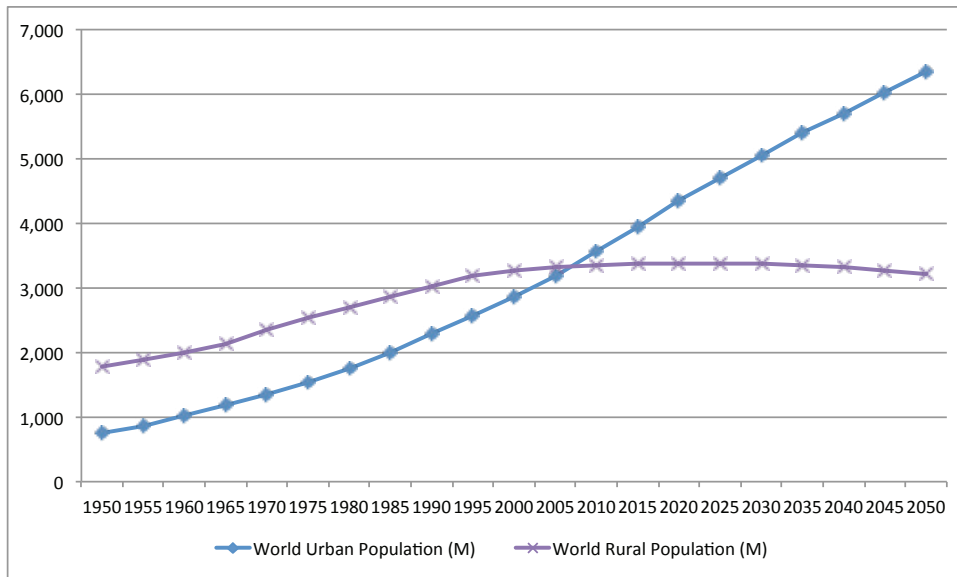
Population Growth

With only a few exceptions, Canada's population growth rate has been declining steadily in the past 60 years, since the peak of the post-World War II Baby Boom. Overall, world population growth has also been declining since it peaked soon after, at just over 2 per cent between 1965 and 1970. Even as the growth rate has slowed, both the total Canadian and world populations have more than doubled since 1960. In the next 30 years, the UN forecasts that the growth rate of the world's population will continue to slow, to 0.6 per cent per year, a rate roughly half of what it is today, and one third of what it was 30 years ago. The total population will continue to climb, to about 9.7 billion inhabitants by 2050 (plus or minus approximately 1 billion, in the high and low variants of the forecast).

**FIGURE 1 –
ACTUAL AND FORECAST
WORLD POPULATION,
1950-2050 (MILLIONS)⁴**



While overall population growth is levelling off, the world's cities will see staggering growth rates, as the global migration towards urban areas will far outpace overall growth.⁵ The proportion of the world's population living in cities will increase from 54 percent to 66 percent by 2045; with the largest urban growth expected in India (over 404 million new urban dwellers), China (nearly 300 million new urban dwellers) and Nigeria (over 200 million new urban dwellers).⁶ New infrastructure will be needed to feed, house and connect these new urban residents in ways that rural populations do not require, driving demand for increased production in agriculture (as well as fertilizer), concrete, steel, and other commodities. Infrastructure will be needed to feed, house and connect these new urban residents in ways that rural populations do not require, driving demand for increased production in agriculture (as well as fertilizer), concrete, steel, and other commodities.



**FIGURE 2 –
ACTUAL AND FORECAST
URBAN AND RURAL
POPULATIONS OF THE
WORLD, 1950-2050⁷
(MILLIONS)**

Thirty years ago, there were 10 mega cities with populations over 10 million, today there are 28 (more than half of which are in Asia), and thirty years from now, there will be more than 40 mega cities. Cities are nodes of wealth-creation that are competing globally, and mobility and connectivity are critical success factors. While the growth in largest cities that is illustrated in the *UN World Urbanization Prospects* maps (Figures 3 and 4, below) will be impressive, the UN forecasts that most new urban dwellers will actually inhabit cities of 500,000 or fewer.

The movement of the majority of humanity from a subsistence-based rural life to an urban one will drive new demand for transportation, as most basic necessities must be “imported” into cities, rather than be sourced locally. As a result, key success factors will include the development and maintenance of high-quality, efficient and uncongested gateways such as ports and airports connected seamlessly to corridors, whether physical (rail and highways), conceptual (air and marine carrier lines) and virtual (networks of communications, information technology, logistics, finance, and other trade supporting services). These are fundamental for the mobility and exchange of people, goods, services and ideas within a metropolitan region, and connecting to its hinterland and other global cities.

FIGURE 3 – UNITED NATIONS MAP OF PERCENTAGE URBAN AND URBAN AGGLOMERATIONS BY SIZE CLASS, 2014⁸

Percentage Urban

- 80-100%
- 60-80%
- 40-60%
- 20-40%
- 0-20%
- No data

City Population

- 10 million or more
- 5 million to 10 million
- 1 million to 5 million

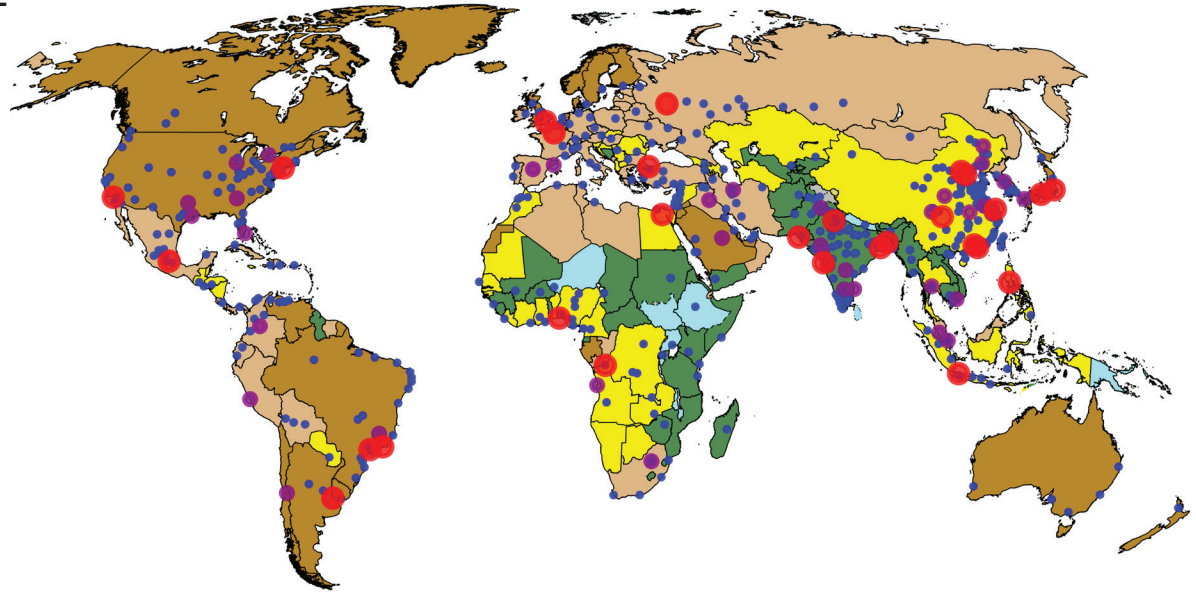


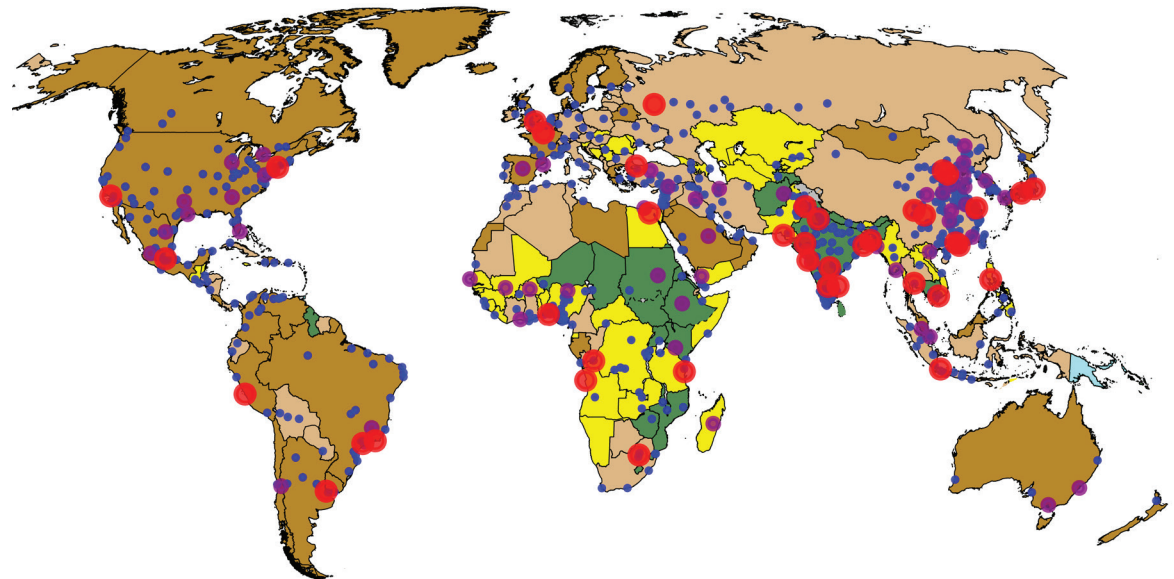
FIGURE 4 – UNITED NATIONS MAP OF PERCENTAGE URBAN AND URBAN AGGLOMERATIONS BY SIZE CLASS, 2030⁹

Percentage Urban

- 80-100%
- 60-80%
- 40-60%
- 20-40%
- 0-20%
- No data

City Population

- 10 million or more
- 5 million to 10 million
- 1 million to 5 million



Data source: World Urbanization Prospects: The 2014 Revision

- The boundaries and names shown and the designations used on the map do not imply official endorsement of acceptance by the United Nations.
- Dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan.
- The final status of Jammu and Kashmir has not yet been agreed upon by the parties.
- Final boundary between the Republic of Sudan and the Republic of South Sudan has not yet been determined.

Over the last thirty years, Canada's population forecast followed the global trend, with the annual growth rate slowing from about 1.4 percent in 1985, to 1 percent today. The forward forecasts are also similar, with the growth rate dropping to 0.5 percent over the next 30 years. This growth rate includes immigration. Without immigration Canada's total population would be shrinking, as it already is in some specific regions of the country. According to the UN forecasts, the total population will reach an estimated 44 million by 2050, (plus or minus approximately 4 million, in the high and low variants of the forecast).

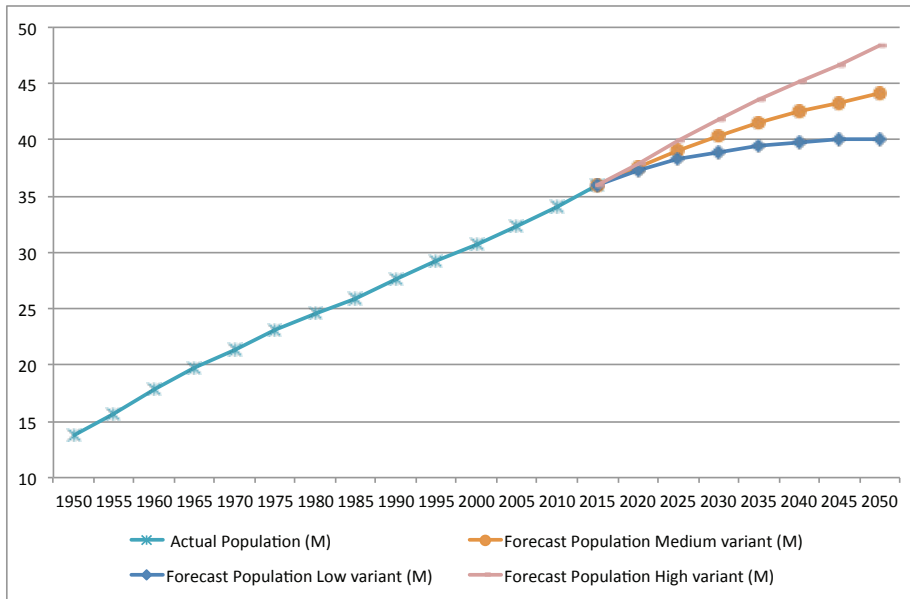


FIGURE 5 – ACTUAL AND FORECAST CANADIAN POPULATION, 1950-2050 (MILLIONS)¹⁰

Economic Growth

Since the 2008-09 economic downturn, growth in much of the world remains slow, particularly in advanced economies. Thirty years ago, the G-7 economies of Canada, France, Germany, Italy, Japan, the United Kingdom, and United States accounted for approximately one half of global GDP, today their share has declined one third (in constant Purchasing Power Parity—PPP—terms), as world GDP has grown as fast, or faster, than the average for the G-7 countries in every year since 1990.¹¹ See Figure 6, below.

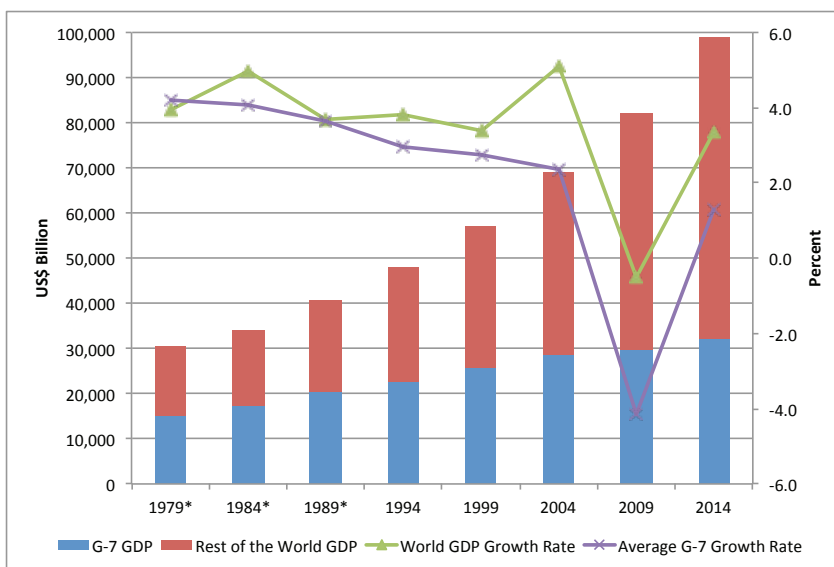
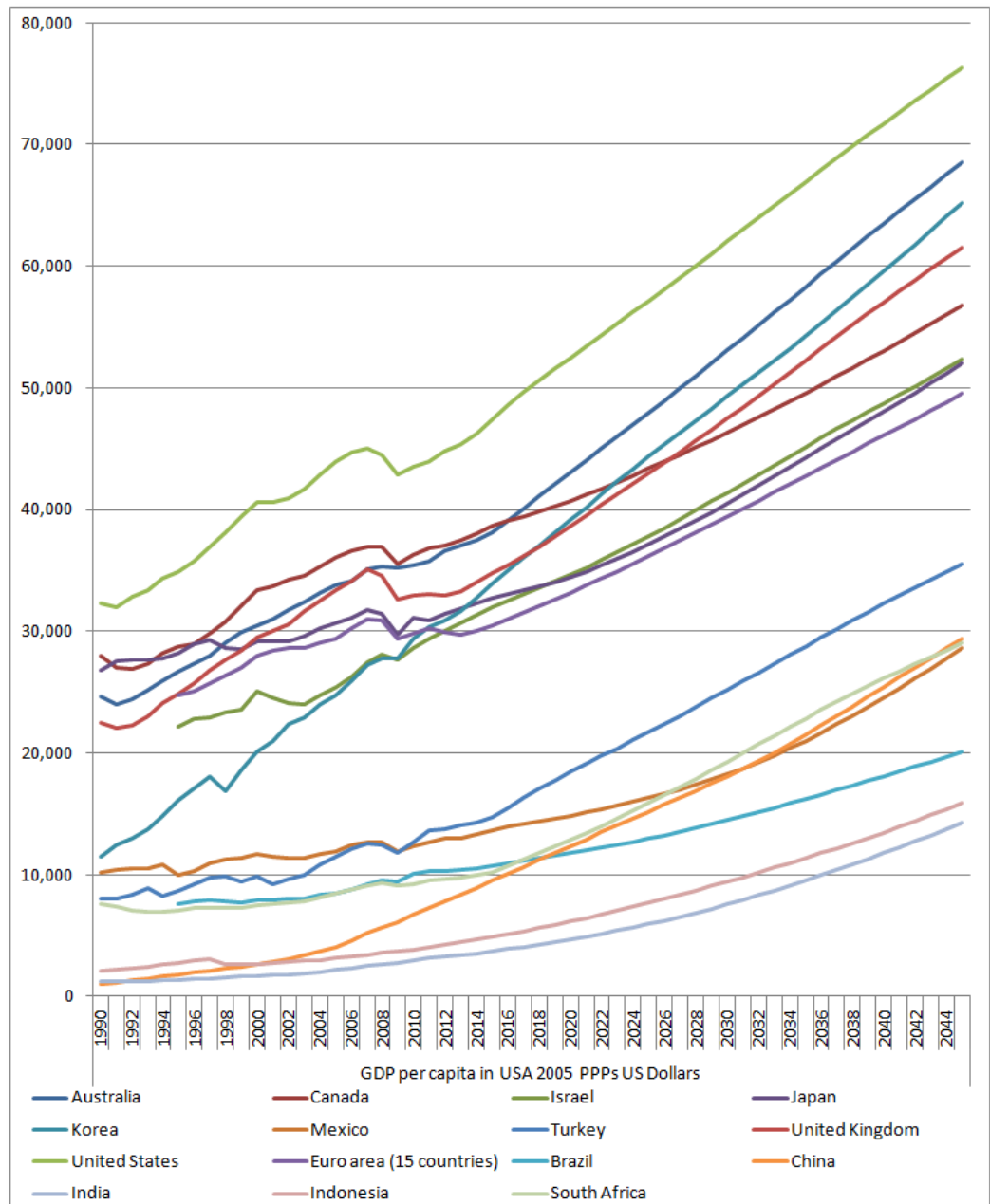


FIGURE 6 – COMPARISON OF WORLD AND G-7 GDP (VOLUME AT CONSTANT PPP AND ANNUAL GROWTH RATES), 1979-2014¹²

In the advanced economies, sluggish growth is likely the new normal. The OECD 2014 *Economic Outlook* forecasts that its member countries' economies will have barely more than doubled over the next 30 years, while emerging economies should see 5-6-fold growth in GDP.¹³ Overall, the ITF trade projections assume that globally, GDP will grow at an annual 3 percent rate, translating into an estimated growth in trade at around 3.5 percent yearly. This is almost half of the previous 6.9 percent growth in trade that characterised the period 1990-2007. By the 2030s, China will be the world's largest economy (having surpassed the United States in the mid-2020s), and India will have grown to the third-largest economy according to OECD projections (see Figures 7-9, below).

Many forecasters continue to see enduring risks, especially for emerging market economies. In China, growth has continued to be led by investments in various types of physical infrastructure, including for transportation. The country's economy has yet to meet its government's objective of transitioning from investment-led growth to a more consumer-driven model of growth.¹⁴ Observers are noting this same phenomenon in many of the world's

FIGURE 7 – OECD ACTUAL AND FORECAST GDP PER CAPITA (US\$ 2005 PPP) FOR SELECT COUNTRIES, 1990-2045¹⁵



developing economies. If it endures, this wider trend could suppress economic and trade growth prospects. Another risk factor for near-term economic growth is the geopolitical uncertainty surrounding conflicts in Eastern Europe, the Middle East and North Africa, each of which has the potential to endure and/or spill over into wider conflicts. If they do, the widespread suffering and destruction risk unleashing mass migrations, disrupted trade routes and supply chains, and so on, that would interrupt forecasted growth, as well as the lives of millions. Further in the future, territorial disputes in the South China Sea could disrupt or even reverse the development of more integrated and wealthy economies in Southeast Asia.

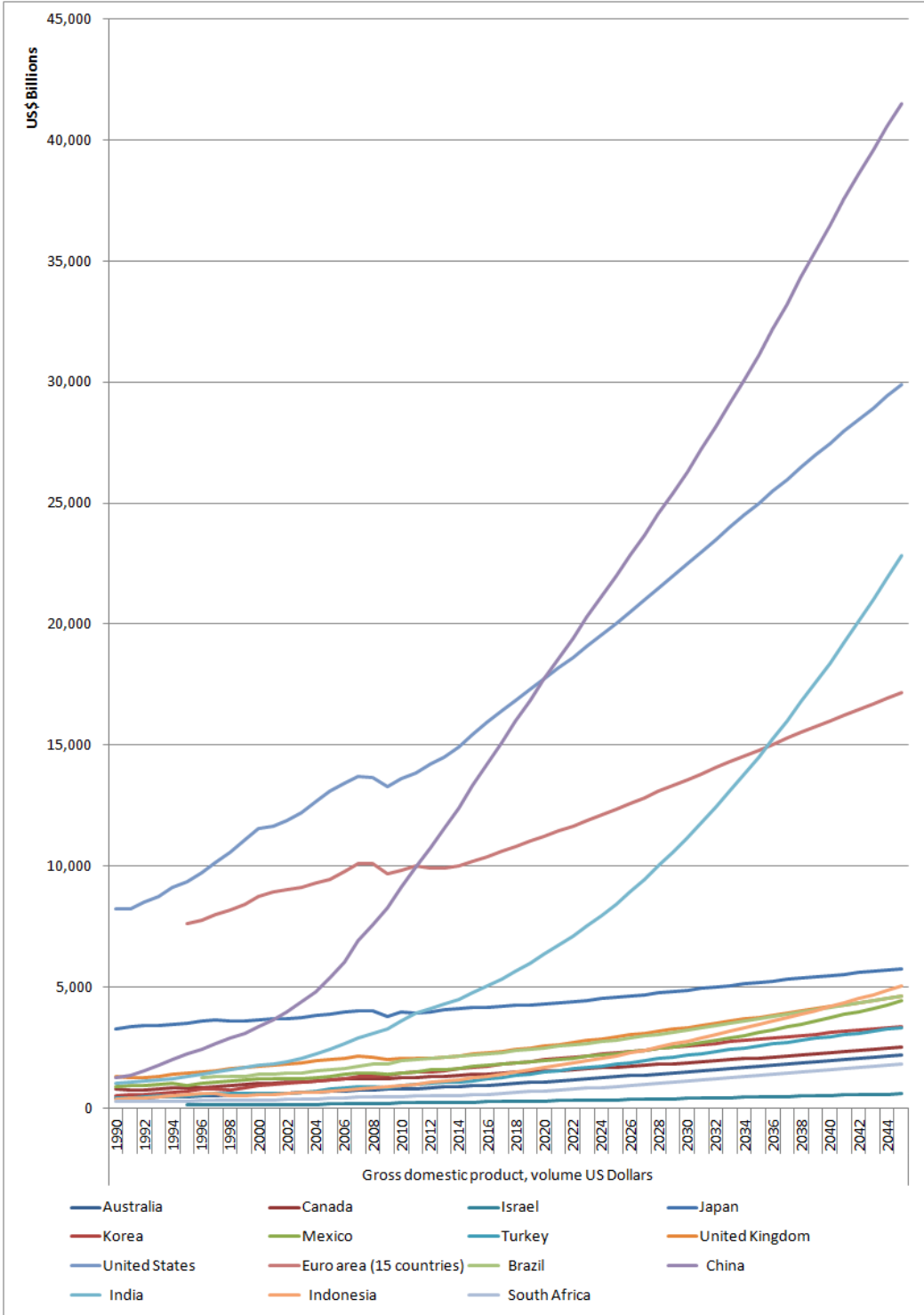
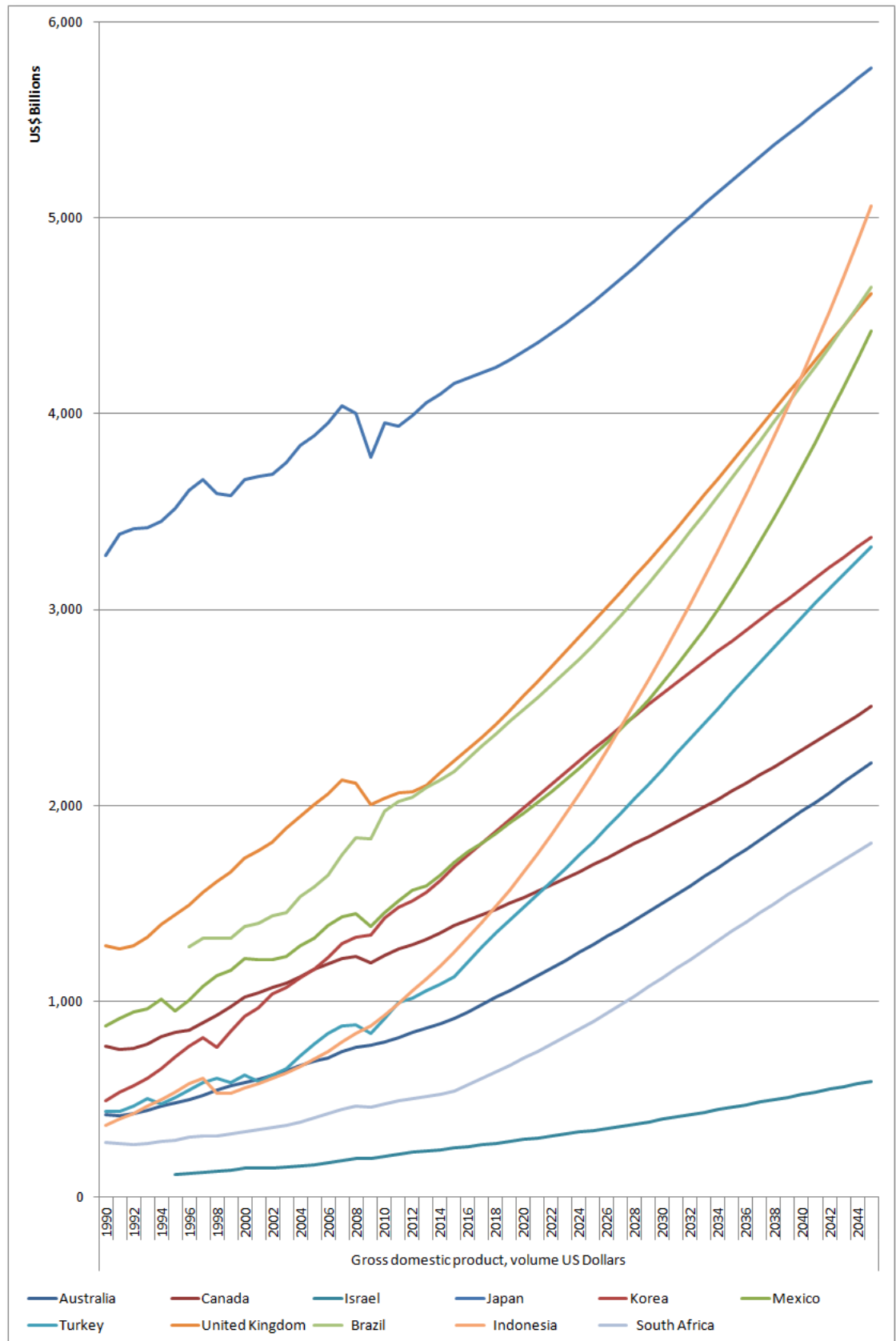


FIGURE 8 – OECD ACTUAL AND FORECAST GDP FOR SELECT COUNTRIES, 1990-2045¹⁶

Forecasts for these countries enlarged in Figure 9

**FIGURE 9 –
OECD ACTUAL AND
FORECAST GDP FOR
SELECT COUNTRIES,
1990-2045¹⁷**



According to the OECD and ITF, the largest economies in Africa will benefit from the rapidly increasing sizes of working age populations, which will enable significant growth. Meanwhile, many European and Asian economies will experience declines in their workforces, and will have to find other bases to maintain growth, such as: innovations from research and development.

International Trade Flows

The shape of Canada's transportation sector, and its contribution to Canadian prosperity, is profoundly influenced by global trends. For example, while the United States remains Canada's largest trading partner – 77 percent of Canadian exports, by value in 2014 – that share is down from nearly 85 percent in the early 2000s.¹⁸ Canada's largest trading partners generally correlate with the largest economies in the world, as illustrated in Figure 10. When cross-referencing the top 15 countries by GDP with Canada's top trading partners by value, 11 of the top 13 largest economies were also among Canada's 15 trading partners. India and Indonesia are outliers, ranking 3rd and 8th in global GDP, respectively, while only ranking 11th and 20th in Canada's overall international trade

FIGURE 10 – 2014 GDP RANKINGS AND CANADA'S INTERNATIONAL TRADE RANKINGS BY TOTAL TRADE VALUE¹⁹

IMF 2015 GDP ranking ²⁰	Country	Statistics Canada Trade Ranking ²¹	Combined Imports & Exports	% of Canadian Overall Trade
1	China	1	United States	66.0%
2	United States	2	China	7.5%
3	India	3	Mexico	3.3%
4	Japan	4	United Kingdom	2.4%
5	Germany	5	Japan	2.3%
6	Russia	6	Germany	1.8%
7	Brazil	7	Korea Republic	1.1%
8	Indonesia	8	Italy	1.0%
9	United States	9	France	0.9%
10	France	10	Netherlands	0.7%
11	Mexico	11	India	0.6%
12	Italy	12	Taiwan	0.6%
13	Korea Republic	13	Brazil	0.5%
14	Saudi Arabia			
15	Spain			
16	Canada	20	Indonesia	0.3%

Emerging economic powers such as Brazil, China, India and Indonesia are driving competition and redefining business models that require restructuring of companies' global supply chain strategies. These trends lead to greater demand for raw materials and energy, and alter traditional international trade and travel patterns. For example, Canadian exports to the United States grew by 14 percent in the past decade while exports to the rest of the world surged by 65 percent. India's economy has grown to the 3rd largest globally. While Canada-India trade accounts for less than one percent of Canada's overall exports and imports in 2014, this trade has been growing quickly, from \$5.8 billion in 2013 to \$6.4 billion in 2014. Canada and India entered the ninth round of negotiations for a Canada-India Comprehensive Economic Partnership Agreement in March 2015, which would boost trade growth prospects with India.²²

The OECD and ITF forecasts suggest that while overall global freight movements will continue to increase, more and more of these movements will be shipments among the so-called emerging economies in Asia, Latin America and Africa. This will be the result of the continued geographic fragmentation of production, as well as increased consumption in these countries, each of which will drive up trade volumes in excess of the counter-trends being observed for the increased near-sourcing of production.

Supply chains and trade flows are becoming increasingly globalized into complex networks. The OECD has shown that the fragmentation of production and the global nature of supply chains mean any impact on value added is multiplied in each production stage. An example of a contemporary global supply chain is that of the Boeing 787-Dreamliner aircraft. It involves an integrated network of engineering and design firms, suppliers, logistics firms and shipping companies in 10 countries, moving components using all modes of transportation, for their ultimate assembly in Everett, Washington, into a completed aircraft. This does not even take into account the sourcing of the materials that the components are made of, such as aluminium that may be smelted in Canada from bauxite that has been mined in Jamaica.

Tracking where the value is created in these complicated networks of production that span multiple countries is extremely difficult. In part, this is because the value is increasingly embedded in knowledge-driven activities, like software and databases; intellectual property; and economic competencies. Global value chains and the rise of knowledge-based capital raise a host of policy issues, which are difficult to assess to the extent that current trade statistics are overlooking value added at some links in the global chain. The OECD and World Trade Organization have jointly undertaken an Initiative on Global Value Chains to develop new measures for value-added trade. After years of work, data is now available for 2009, only. Over the coming years, this baseline will enable new and more sophisticated observation of increasingly complicated global trade than current statistics allow. Since the 2008-09 economic downturn was particularly disruptive for global trade, by happenstance, this starting point is especially interesting, as the future development of global value chains can be measured against a world-wide low point. However, it will take many years to accumulate enough data to accurately use historical trends for future forecasting.

Over the last 15 years, there has been a marked shift in the composition of Canada's exports, from manufactured goods to resources, both as a relative share of total exports and in absolute terms. For example, the Conference Board of Canada reports that from 2001 to 2013, the Canadian economy saw a \$40 billion decline in annual exports of motor vehicle parts (along with smaller declines in aerospace and other manufactured goods) at the same time as a \$40 billion increase in metals and a \$50 billion increase in energy products.²³ With the exception of base metals, which are exported more widely, nearly all of this change was found in Canadian trade with the United States, and the drop in the value of cross-border auto manufacturing for Canada was more than offset by the rise of Canadian energy exports to the United States. Over that period there was an overall decline of the value of Canadian exports per tonne ("value density") of about 20 percent, while the value density of imports increased by 20 percent.²⁴ One consequence of this is that the critical transportation interfaces that pose risks for efficient Canadian trade have changed from Canada-United States border crossings (especially the bridges in southern Ontario) to pipelines and rail-marine links.

The forthcoming Conference Board of Canada report *Building for Growth: Trade, Rail and Related Infrastructure*, suggests that since transportation costs make up a larger portion of the cost of lower-value trade, the competitiveness of Canadian exports will depend to a greater extent on the efficiency of transport as commodities take on a greater share of outbound trade. That said, the importance of transportation costs when global firms decide where to locate production is not limited to lower-value goods. To illustrate, a 2013 OECD survey of business leaders found that transportation costs and capacity issues were more important barriers to participation in global value chains than trade policies. Firms based in countries with high transportation costs and bottlenecks will be hard-pressed to compete for participation in global just-in-time value chains, since outsourcing and/or off-shoring a process or input only makes sense if it can be delivered reliably and at a lower cost than keeping it in-house or nearby.

Myriad factors facilitate the increasing complexity of supply chains. These include the progressive removal of global trade barriers by governments and multilateral initiatives, the rapid development of industrial capacity and transportation infrastructure in emerging economies, and improvements in logistics services, technologies and systems. All of these help to reduce the transaction costs associated with globalized supply chains. The result is that trade between countries has been consistently growing faster than global output. Inter-firm trade in intermediate goods and parts, and the exchange of similar goods are taking on a greater and greater share of international trade flows. Based on ITF and OECD data, the ratio of trade in manufactured goods to the production of these same goods was twice as high in 2010 as it was in 1990. The sharp dip in trade that resulted from the 2008-09 economic downturn has barely disrupted the overall trend, as world trade regained its previous growth rate within a year, and has continued at that pace so far this decade.

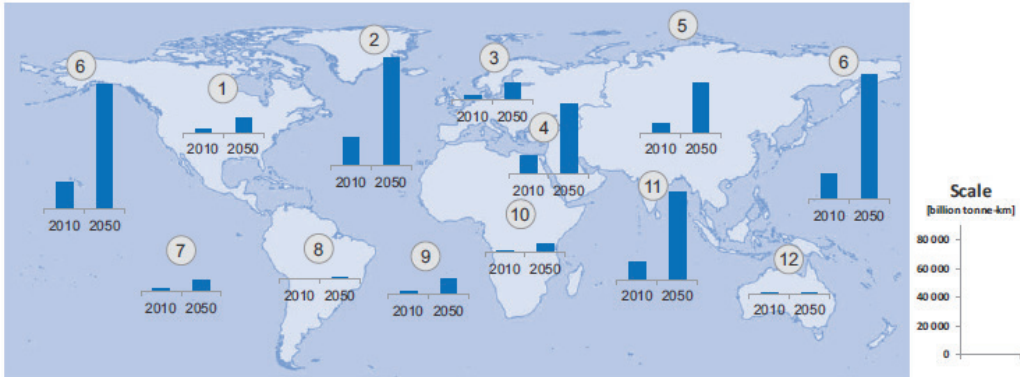


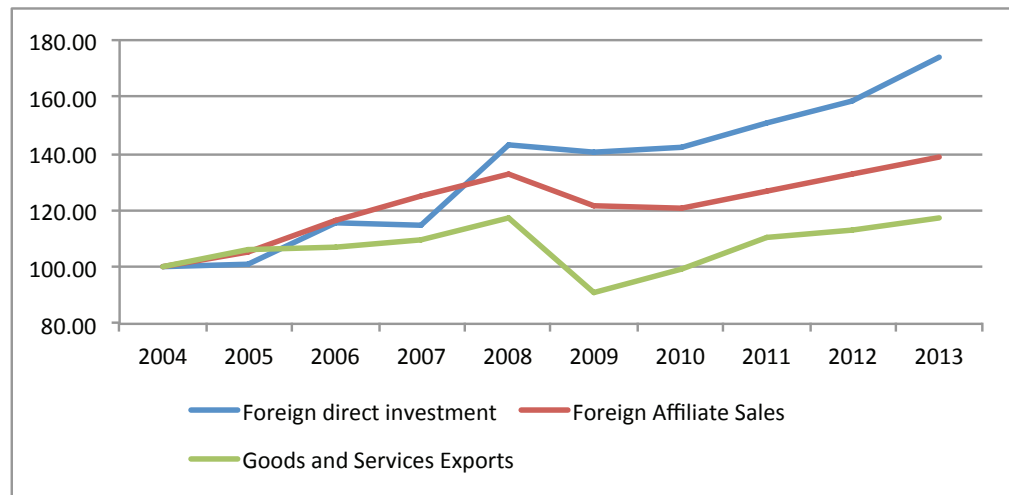
FIGURE 11 – ITF FORECAST INCREASE IN FREIGHT VOLUMES BY REGION²⁵

1) North America; 2) North Atlantic; 3) Europe; 4) Mediterranean and Caspian Sea; 5) Asia; 6) North Pacific; 7) South Pacific; 8) South America; 9) South Atlantic; 10) Africa; 11) Indian Ocean; 12) Oceania.

The ITF baseline forecast is that world trade will grow by a factor of 3.4 by 2050, which would translate into world freight volumes growing by a factor of 4.3 over the same period, measured in tonne-kilometres. However, the ITF forecasts that freight volumes could be up to 20 percent higher if important progress is made on multilateral trade liberalization. In this scenario, most of the increased freight volumes would be in Africa, with smaller, but still important increases in South Asia and South America.

One example of the ways Canadian firms may be participating in this trend is in the rapid growth that has been observed of Canadian companies conducting overseas business via subsidiaries set up in foreign countries, rather than through shipments of goods made in Canada. A recent report published by the Institute for Research on Public Policy²⁶ found that sales by these overseas affiliates have grown much faster than exports: rising by nearly 40 percent from 2004 to 2013, while goods and services exports grew by only 17 percent. As a result the annual sales by overseas affiliates of more than \$500 billion exceeded Canada's total exports of \$472 billion in 2013. While this offshore output may be displacing some Canadian exports, this participation in global value chains contributes income and to the development of networks and expertise within Canada as well. As is the case with Canada's trade in general, while the United States market represents the largest share of Canada's foreign-affiliate sales (48 percent in 2013), sales in emerging markets have grown ten times faster over the past ten years (to account for 28 percent). Lastly, the report found that mining, oil and gas, and agriculture made up only about 20 percent of foreign-affiliate sales in 2013, compared with about 40 percent of Canada's exports, meaning foreign-affiliate operations are less subject to the volatility in commodity markets, providing some counter-cyclical insulation to the performance of Canadian firms.

**FIGURE 12 –
CANADA'S EXPORTS,
FOREIGN AFFILIATE SALES
AND FOREIGN INVESTMENT,
2004-13 (INDEX, 2004 = 100)²⁷**



However, the latest international research from the ITF finds that the relationship between GDP and freight tonne-kilometres successively decreases as per capita incomes grow. Reasons for this decoupling include: the increasing importance of services relative to manufacturing, and the increasing production and trade of lighter-weight goods (such as electronic devices) that may reduce the actual tonnages shipped to and from advanced economies. Also, in the pursuit of lean supply chains that rely on low transportation costs to reduce inventory needs and support just-in-time inventory, many United States and European firms may be more likely to source components from Mexico and Eastern Europe, respectively, rather than from China and Southeast Asia. Re-shoring of some production back to North America is expected, especially as manufacturing increasingly goes digital (e.g. 3-D printing). Similarly, rising transportation costs may also increase adding value in closer proximity for lower-value goods, including resources. Both of which would reduce the transport intensity of GDP and could slow forecast growth in trade volumes. Alternatively, the ITF predicts that renewed progress towards multilateral free trade could increase the growth rate in trade volumes by up to 20 percent.

Productivity

Over the next 30 years, the OECD forecasts that Canada's economy and labour efficiency will grow at a slower rate than many key competitors. Barring changes that would improve Canadian productivity and output, the GDP per person of countries such as the United Kingdom and Australia will surpass Canada. The Conference Board of Canada states that Canada's productivity is negatively affected by "...weaker inward and outward foreign direct investment, low R&D intensity, a weak innovation record, and the relatively small percentage of Canadians with advanced degrees in science and technology." Measures that enhance the efficiency, reliability and price of transportation, and also foster collaboration and innovation, are among the ways for Canada to increase productivity and competitiveness.

The World Economic Forum's 2015-2016 Global Competitiveness Index assesses the competitiveness landscape of 144 countries.²⁸ Canada's 13th place ranking leaves it in the middle among developed countries, ahead of France, Australia, and New Zealand, yet trailing much smaller advanced economies such as Switzerland, Sweden, Norway, and Denmark. These four countries achieve higher average GDPs per capita, in spite of their much smaller populations, markets and natural resource endowments, while also experiencing harsh winter conditions, and remote terrains, similar to those in Canada.

FIGURE 13 – GLOBAL COMPETITIVENESS INDEX TOP 15 RANKED COUNTRIES²⁹

GCI Overall Rankings	Country	2014 GDP in billions US\$	2014 Population in million	GDP per capita in US\$	Share of world GDP
1	Switzerland	712	8.1	87,475	0.44%
2	Singapore	308	5.5	56,319	0.42%
3	United States	17,419	319.0	54,597	16.14%
4	Germany	3,859	81.1	47,590	3.45%
5	Netherlands	866	16.9	51,373	0.74%
6	Japan	4,616	127.1	36,332	4.40%
7	Hong Kong SAR	289	7.3	39,871	0.37%
8	Finland	271	5.5	49,497	0.21%
9	Sweden	570	9.7	58,491	0.42%
10	United Kingdom	2,945	64.5	45,653	2.36%
11	Norway	500	5.2	97,013	0.32%
12	Denmark	341	5.6	60,564	0.23%
13	Canada	1,789	35.5	50,398	1.48%
14	Qatar	210	2.2	93,965	0.30%
15	Taiwan, China	530	23.4	22,598	1.00%
Average (top 15 only)		2,348	47.8	55,277	2.15%

In 2009, the OECD ranked Canada low among its members for participation in global value chains in terms of the percentage of the country's exports that are part of global value chains, either "upstream" (that is with inputs where value was added overseas) or "downstream" (where value produced in Canada is an input in another country's exports).³⁰ It may not be surprising that the export industry where Canada contributes the greatest inputs to global value chains (upstream participation) is mining and metals. The sectors where Canadian exports have the most global inputs (downstream participation) are transportation equipment, chemicals and minerals.

Increasing Canada's participation in global trade is one way to counter the forecast decline in the relative prosperity of Canadians vis-à-vis some global competitors. Gaining preferential access for Canadian firms to trade and investment markets is a critical piece of that strategy. Since 2006, Canada has concluded free trade agreements with 38 countries, increasing the total from 5 to 43, the latest being the entry into force of the Canada-Korea Free Trade Agreement, and the successful conclusion of negotiations on the Canada-European Union Comprehensive Economic and Trade Agreement (with 28 nations) and the Trans-Pacific Partnership Agreement with 11 other Asia-Pacific nations.³¹ Guided by the *Global Markets Action Plan*, Canada has also recently enacted a Canada-China Foreign Investment Promotion and Protection Agreement, and smaller trade and investment agreements with a number of other markets.

For Canadian industries to seize the opportunities from these new agreements, they require the transportation infrastructure and logistics services to integrate their supply chains and deliver goods to market. Gateways must have the capacity to process imports and exports reliably and efficiently. This requires that they be seamlessly integrated with inland corridors (marine, road and rail) that offer fluid and competitive options for shippers to reach commercial and manufacturing centres. In addition to freight, Canada also requires the international air access and competitive air carrier services that will deliver investment and high value trade in services.

Ensuring that transportation and logistics systems are well-integrated into production supply chains will help Canada overcome the forecasts for slow growth in a mature economy. Canada's geographic position is well-situated to serve as a hub for global trade flows. Increased volumes of travellers and freight can be leveraged to lower incremental transportation costs in the country as a whole, and can also create new opportunities for other sectors of the economy to add value, from directly-related sectors like warehousing and logistics, to manufacturing, the higher level services such as communications and information technology, insurance, finance and so on. These sectors tend to develop in synergistic clusters around transportation hubs.

Energy prices are another wildcard in the forecasting model. While there is a general consensus around a medium-term forecast of \$50-60 per barrel, statistics from the United States Energy Information Administration 2015 *Annual Energy Outlook*³² show steady growth is likely over the longer term, from 2020 to 2040. However, real markets will fluctuate wildly a number of times during that period, based on variables like geopolitical risks and short-term market conditions. Using their moderate ("Reference") oil price forecast, the United States Energy Information Administration projects that fuel use will increase in the air mode and heavy vehicles sector (as traffic in both modes will continue to increase at or above economic growth rates), and only incremental improvements in fuel efficiency are likely in the sectors without transformational change in propulsion technology. Meanwhile light duty vehicles offer both significant room to improve fuel use (e.g. with increased deployment of electric power trains), and their overall use is forecast to level off—or even decline—over time.

No matter which forecasts are used, energy prices will be volatile, and short term fluctuations can have pronounced long-term impacts on investments in the production of new energy supplies, as well as on downstream decisions by transportation providers and users regarding infrastructure, fleet and modal choices and related emissions. The impacts of energy supplies and prices on transportation demand are complicated, especially when the potential of short-term high prices to spur longer-term technological innovation is factored in. For example, as a result of the current slump in oil prices, producers are delaying or cancelling future oil and gas developments. A decrease in future supply may in some cases lead to sudden price shocks down the line, with various consequences. Large transporters such as airlines have been re-investing in fuel-efficient fleets of aircraft that have recently come online (e.g. the Boeing 787 and Airbus 380, with very low per-passenger operating costs) after being designed in response to the peaks of the last energy price cycle. As a result, these players may be well-equipped to weather fluctuations over the next decade. At the same time, individuals in Canada and the United States have been responding to the recent low gasoline prices by increasing their purchases of larger personal cars and trucks, with more powerful (and less fuel efficient) engines that will drive up demand for gasoline in the short term.³³

Notes

- ¹ United Nations, Department of Economic and Social Affairs, 2015, *World Population Prospects (2015 Revision)*, (New York: 2015), accessed on July 15, 2015, online: <http://esa.un.org/unpd/wpp/>.
- ² OECD, OECD.Stat, available at <http://stats.oecd.org/>.
- ³ OECD/ITF, *ITF Transport Outlook 2015*, (Paris: OECD Publishing/ITF, January 27, 2015), accessed on July 15, 2015, online: <http://dx.doi.org/10.1787/9789282107782-en>.
- ⁴ Source: CTA Review with United Nations *World Population Prospects (The 2015 Revision)* data.
- ⁵ United Nations, Department of Economic and Social Affairs, Population Division, *World Urban Prospects: 2014 Revision, Highlights*, (New York: 2014), accessed on October 21, 2015, online: <http://esa.un.org/unpd/wup/highlights/wup2014-highlights.pdf>.
- ⁶ *Ibid.*
- ⁷ Source: CTA Review with United Nations World Urbanization Prospects (2014 Revision) data.
- ⁸ United Nations, Department of Economic and Social Affairs, World Urbanization Prospects (2014 Revision), (New York: 2014), accessed on October 27, 2015, online: <http://esa.un.org/unpd/wup/>.
- ⁹ *Ibid.*
- ¹⁰ Source: CTA Review with United Nations *World Population Prospects (The 2015 Revision)* data.
- ¹¹ OECD, "May 2014, Long-term Baseline Projections," *Economic Outlook*, No 95, accessed on July 15, 2015, online: <http://stats.oecd.org/>.
- ¹² Source: CTA Review with OECD "May 2014, Long-term Baseline Projections" data, accessed on July 15, 2015. Note: GDP estimated for Germany from 1979-1989.
- ¹³ OECD, "May 2014, Long-term Baseline Projections," accessed on July 15, 2015.
- ¹⁴ OECD/ITF, 2015, *op. cit.*
- ¹⁵ Source CTA Review with OECD "May 2014, Long-term Baseline Projections" dataset, accessed on July 15, 2015.
- ¹⁶ Source CTA Review with OECD data, *ibid.*

- 17 Source CTA Review with OECD data, *ibid*.
- 18 Statistics Canada, *Merchandise imports, exports and trade balance, customs and balance of payments basis for all countries, by seasonal adjustment and principal trading partners* (Ottawa: Statistics Canada, Table 228-0069) Note: table derived from Statistics Canada database in dollar value. Seasonal adjustment has been applied to the data, which is consistent with normal statistical practices. Accessed on October 23, 2015, online: <http://www5.statcan.gc.ca/cansim/a26?lang=eng&retrLang=eng&id=2280069&tabMode=dataTable&srchLan=-1&p1=-1&p2=9>.
- 19 Knoema, *World GDP Ranking – GDP based on PPP valuation* (Source: International Monetary Fund World Economic Outlook), 2014 and 2015 rankings accessed on November 2, 2015, online: <http://knoema.com/nwnfkne/world-gdp-ranking-2015-data-and-charts>.
- 20 *Ibid*.
- 21 Statistics Canada, *op. cit*.
- 22 Foreign Affairs, Trade and Development Canada, *Canada-India Free Trade Agreement Negotiations*, (Ottawa: Foreign Affairs, Trade and Development Canada, modified March 2015) accessed on November 2, 2015, online: <http://www.international.gc.ca/trade-agreements-accords-commerciaux/agr-acc/india-inde/index.aspx?lang=eng>
- 23 Conference Board of Canada, *Building for Growth: Trade, Rail and Related Infrastructure*, forthcoming.
- 24 *Ibid*.
- 25 OECD/ITF, 2015, *op. cit*, at 76.
- 26 Daniel Koldyk, Lewis M. Quinn, Todd Evans “Chasing the Chain: Canada’s Pursuit of Global Value Chains” in Stephen Tapp, Ari Van Assche, Robert Wolfe, eds, *Redesigning Canadian Trade Policies For New Global Realities* (Institute for Research on Public Policy, 2015) accessed on October 21, 2015, online: <http://irpp.org/wp-content/uploads/2015/05/AOTS6-koldyk-et-al.pdf>.
- 27 Reproduced by the CTA Review with permission, original source: Stephen Tapp, “Canada’s changing links to the global economy” *Policy Options*, (Institute for Research on Public Policy, May 22, 2015) accessed on July 15, 2015, online: <http://policyoptions.irpp.org/2015/05/22/canadas-changing-links-to-the-global-economy/>.
- 28 World Economic Forum, *Global Competitiveness Report 2015-16*, (Geneva: September 2015), accessed on October 15, 2015, online: <http://reports.weforum.org/global-competitiveness-report-2015-2016/competitiveness-rankings/>.

- ²⁹ *Ibid.* Note: GDP as a share of world GDP based on purchasing power parity as a percentage of world GDP.
- ³⁰ OECD, *Global Value Chains (GVCs): Canada*, (Paris: OECD Publishing, 2009) accessed on March 20, 2015, online: <http://www.oecd.org/sti/ind/GVCs_percent20-percent20CANADA.pdf.
- ³¹ Foreign Affairs, Trade and Development Canada, *Canada's Free Trade Agreements* (Ottawa: Foreign Affairs, Trade and Development Canada, October 2015), accessed on November 1, 2015, online: <http://www.international.gc.ca/trade-agreements-accords-commerciaux/agr-acc/fta-ale.aspx?lang=eng>.
- ³² United States Energy Information Administration, *Annual Energy Outlook 2015*, accessed on July 15, 2015, online: <http://www.eia.gov/forecasts/aeo/>.
- ³³ For example: Timothy Cain, "Ford F-series continues Canadian sales dominance," *CTV News*, (October 16, 2014), accessed on July 15, 2015, online: <http://www.ctvnews.ca/autos/ford-f-series-continues-canadian-sales-dominance-1.2056816>; and Chris Woodyard, "Pickups rule top 20 best-selling vehicles of 2014," *USA TODAY* (January 6, 2015), accessed on July 15, 2015, online: <http://www.usatoday.com/story/money/cars/2015/01/06/pickups-best-selling-vehicles-2014/21334373/>.

Appendix B

Governance

Infrastructure

INFRASTRUCTURE FUNDING PROGRAMS SINCE 1994¹

In recent years, the Government of Canada has dedicated significant sums of public money to renew, maintain, and upgrade transportation infrastructure, in large part through cost-sharing programs.

Canada Infrastructure Works Program (1994-1999)

The Canada Infrastructure Works Program (CIWP) was introduced in 1994 as a temporary, cost-sharing program. The CWIP had 2 primary objectives: 1) to maintain and develop infrastructure in local communities; and 2) to stimulate the Canadian economy and create jobs.

The CWIP was a collaborative arrangement that involved all three levels of government—federal, provincial and (for the first time) municipal. In some cases, the program included the private sector. The federal government entered into separate agreements with each province and territory, and criteria for project selection and the financial and operational responsibilities programs varied.

The Auditor General's 1999 review of the program indicated the need for tighter controls and stronger program targeting.

Canada's Various Infrastructure Programs (2000-2006)

Building on the successes of the CIWP, the Government of Canada expanded its commitments to funding infrastructure via various cost-sharing programs.

Several of these were administered by the newly created Infrastructure Canada, established to address infrastructure challenges in Canada. The Department was responsible for federal efforts to enhance Canada's public infrastructure through strategic investments, key partnerships, sound policies, and research.

Federal initiatives were divided into several funding allocation groups, including: the Infrastructure Canada Program (ICP), the Canada Strategic Infrastructure Program (CSIF), the Border Infrastructure Program (BIF), the Strategic Highway Infrastructure Program (SHIP), FCM Green Funds, Cultural Spaces Canada Program, and the Affordable Housing Program.

Building Canada Plan (2007-2014)

In Budget 2007, the Government of Canada launched the 7-year, \$33 billion Building Canada Plan, a unified approach, incorporating previous successful infrastructure programs, and creating new ones to address local and regional infrastructure needs. The multi-faceted Building Canada Plan focused on three themes: growing Canada's economy, promoting a better environment, and creating prosperous communities. Areas of focus included cleaner air and water, safer roads, public transit, and other key national priorities.

One of the key objectives of the Plan from the funding perspective was to provide stable, flexible, and predictable funding to municipalities, provinces and territories. Over half of

the funding was provided as base funding for municipalities, such as funding programs that transfer portions of federal gasoline tax revenues and rebate municipalities for the Goods and Services Tax (GST).

The Building Canada Plan is comprised of several components: Municipal GST Rebate, Gas Tax Fund, Building Canada Fund, Public-Private Partnerships Fund, Gateways and Border Crossings Fund, Asia-Pacific Gateway and Corridor Initiative, and the Provincial-Territorial Base Funding.

In February 2009, the Federal Government established PPP Canada Incorporated—a Crown corporation with the mandate to foster public-private partnership (P3) opportunities through the \$1.25 billion P3 fund.

The challenge with all these infrastructure funds is they are not transportation specific. As such, transportation needs are weighed against all the other infrastructure needs in the territory, and in the North other infrastructure needs often take priority.

— *Government of Yukon, Submission to the CTA Review, April, 2015*

New Building Canada Plan (2015-present)

When the Building Canada Plan expired in 2014 it was replaced by the 10-year New Building Canada Plan. Delivered in Budget 2013 along with the Economic Action Plan 2013, the New Building Canada Plan was the most comprehensive infrastructure plan in Canadian history. In partnership with provinces, territories, municipalities, and private sector, the objective of the Plan was to foster economic growth while promoting a cleaner environment and building roads, bridges, subways, and other public infrastructure.

The \$53 billion New Building Canada Plan comprises four components. The first includes the \$32.2 billion Communities Improvement Fund, which includes a renewed Gas Tax Fund and the GST Rebate for Municipalities. The renewed Gas Tax Fund includes indexing at 2 percent per year, giving municipalities greater certainty and flexibility to invest into infrastructure projects.

The second component of the Plan is the \$14 billion New Building Canada Fund. This includes the National Infrastructure Component and the Provincial-Territorial Infrastructure Component. The \$4 billion National Infrastructure Component is designed to support investments in projects deemed of national significance or projects that will have a strong impact on Canada's productivity growth and economic well being. Under the \$10 billion Provincial-Territorial Infrastructure Component, base funding is provided for each province and territory for national, regional and small communities. Projects under these programs with a value of greater than \$100 million were now required to undergo a P3 screen.

The third component of the New Building Canada Plan is the \$1.25 billion renewed P3 Canada Fund, and the fourth component includes funding through existing infrastructure programs.

**FIGURE 1 –
FEDERAL FUNDING
COMMITTED SINCE 2006
FOR TRANSPORTATION
INFRASTRUCTURE²**

Infrastructure Canada (INFC) Funded Programs Transportation categories since 2006	Federal Contribution Amount
Building Canada Fund (BCF) Total	\$2,328,322,746
BCF MIC	\$2,035,790,032
BCF-CC & BCF-Top up	\$287,165,443
BCF LUCC	\$5,367,261
New Building Canada Fund (NBCF) Total	\$1,833,891,291
NBCF – NIC	\$1,169,767,000
NBCF – NRP	\$615,690,664
NBCF – SCF	\$48,433,627
Border Infrastructure Fund (BIF)	\$0
Canada Strategic Infrastructure Fund (CSIF)	\$451,400,500
Tuktoyaktuk to Inuvik Highway (Tuk)	\$200,000,000
Infrastructure Stimulus Fund (ISF)	\$1,697,738,419
Municipal Rural Infrastructure Fund (MRIF)	\$104,085,277
Public Transit Fund (PTF)	\$0
TOTAL	\$6,615,438,223

Infrastructure Canada (INFC) Funded Programs Public Transit Categories since 2006	Federal Contribution Amount
Building Canada Fund (BCF) Total	\$2,955,919,000
BCF MIC	\$2,955,919,000
BCF-CC & BCF-Top up	\$0
BCF LUCC	\$0
New Building Canada Fund (NBCF) Total	\$857,042,304
NBCF – NIC	\$0
NBCF – NRP	\$854,568,165
NBCF – SCF	\$2,474,139
Border Infrastructure Fund (BIF)	\$0
Canada Strategic Infrastructure Fund (CSIF)	\$463,000,000
Tuktoyaktuk to Inuvik Highway (Tuk)	\$0
Infrastructure Stimulus Fund (ISF)	\$270,166,513
Municipal Rural Infrastructure Fund (MRIF)	\$7,933,333
Public Transit Fund (PTF)	\$400,000,000
TOTAL	\$4,954,061,150

Transport Canada (TC) Funded Programs / Contribution Agreements

Asia Pacific Gateway and Corridor Initiative (APGCI)	\$ 909,553,934
Gateways and Border Crossings Fund (GBCF)	\$2,077,449,803*
Grade Crossing Improvement Program (GCIP)	\$92,216,065
Grade Crossing Closure Program (GCCP)	\$1,185,000
Remote Passenger Rail Program (RPRP – formerly known as Regional and Remote Passenger Rail Services Class Contribution Program)	\$160,390,000
Security and Prosperity Partnership (SPP)	\$3,317,981**
Strategic Highway Infrastructure Program (SHIP)	\$18,747,253**
TOTAL	\$3,262,860,036
TOTAL FEDERAL AMOUNT (INFC & TC)	\$14,832,359,409

Transport Canada (Annual) Contribution Programs

Outaouais Road Agreement (ORA) Contribution Program	\$99,518,775**
Confederation Bridge (Statutory Payment)	\$584,119,939**
Victoria Bridge (Statutory payment)	\$25,813,770**
TOTAL	\$709,452,484

Notes to Figure 1:

For present purposes, federal funding for transportation infrastructure excludes regular capital funding for transportation assets owned by Transport Canada or managed by others on its behalf (e.g. ports, airports, VIA Rail, the St. Lawrence Seaway, etc.). Figures provided are based on funding commitments rather than actual money paid (unless otherwise noted).

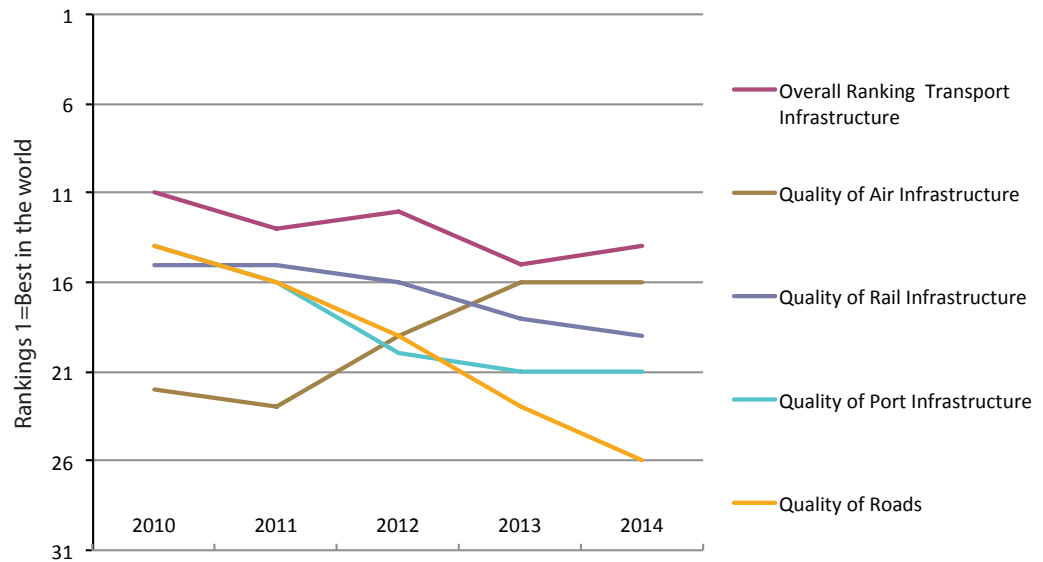
* Amount includes funds transferred to federal capital projects in support of GBCF objectives but does not include money delivered for studies.

** Amount shown reflects actual amounts paid from April 1, 2006 to September 30, 2015.

The myriad programs, along with decisions that shift funding between programs, or change the eligibility guidelines, as well as the direct involvement of multiple parties in selecting projects on a case-by-case basis, all combine to make it difficult to track and evaluate the benefits of recent transportation infrastructure spending.

Notwithstanding these recent investments, pressures continue for the maintenance, improvement and/or replacement of Canada's aging capital stock of transportation infrastructure in the face of increasing traffic levels and risks associated with historic application of minimum fixes. Vast quantities of baby-boom-era facilities are 50 to 60 years of age. Many are operating at capacity levels which exceed the original intended use, such as a number of federal bridges, or are due for costly upgrading and/or replacement, such as marine infrastructure on the St. Lawrence Seaway.

**FIGURE 2 –
WORLD ECONOMIC
FORUM INFRASTRUCTURE
COMPETITIVENESS AND
QUALITY RANKINGS
FOR CANADA³**



As noted in Figure 2 above, Canada shows declining global rankings on the quality of all types of transportation infrastructure except air. All levels of government are faced with budgetary decisions regarding infrastructure priorities. Government resources dedicated to transportation infrastructure are significantly lower than what many believe is sufficient to remain competitive. The calculation of transportation infrastructure needs and gaps is difficult to do, as data on existing value, usage, investments, and real and future needs are not collected. Proponents for more transportation infrastructure investments include provincial and territorial governments, shippers, transportation providers, and groups such as the Canadian Chamber of Commerce and Canada West Foundation.

Several submissions to the CTA Review spoke to the need for federal leadership on transportation to ensure sufficient and reliable transportation services to support Canada's long-term economic growth, including, in particular, "trade-enabling" infrastructure. One of the challenges is how to define it.

Research completed by IBI Group on behalf of the Review with respect to defining Canada's "critical trade-related infrastructure" concluded that there was a lack of data on international trade movements in Canada for this to be done adequately. This included: lack of uniform marine traffic data; lack of recent origin-destination movements for truck movements across Canada; a need to depend on United States data sources for trans-border flows; and little current data on the value of trade good handled by specific facilities.

A National Infrastructure Plan

The CTA Review was asked in the terms of reference how the federal government could encourage greater private sector investment in transportation infrastructure. Submissions from stakeholders were largely silent on this point (although there was general agreement that greater investment is required).

According to the ITF⁴ and reinforced by a number of global think tanks, to invest efficiently in transport infrastructure, policy and decision makers need to have, at minimum, key information on:

- **Existing infrastructure inventory:** the type, amount (i.e. stock), location, physical condition, and capacity of transport infrastructure, categorized by mode;
- **Use and performance:** the effectiveness and efficiency of the transport infrastructure in moving people and goods, as well as reducing the undesirable consequences (e.g. accidents);
- **Factors affecting the performance of the transport infrastructure:** such as the aging of, and the increasing demand on, the infrastructure;
- **Economic drivers:** trends and developments that may affect economic growth and impact demand for transportation; and
- **Investment impacts and trade-offs:** the costs and impacts of competing investment choices.

A transportation infrastructure plan based on macro-analyses of future and evolving needs would create a critical framework for planning and investment, while allowing the flexibility for quick reaction to changing logistical requirements and new technology developments. Several jurisdictions have already initiated new infrastructure approaches in order to better align infrastructure spending with national macroeconomic policies, and pursue more strategically their planning and investment activities. Three comparable jurisdictions were examined (Figure 3).

**FIGURE 3 – TRANSPORTATION INFRASTRUCTURE APPROACHES
IN COMPARABLE JURISDICTIONS⁵**

<p>UNITED KINGDOM'S NATIONAL INFRASTRUCTURE PLAN (NIP)</p>	<p>CONSIDERATIONS</p>
<p>Infrastructure United Kingdom (a unit within Her Majesty's Treasury) provides focus on the United Kingdom's long-term infrastructure priorities and facilitates long-term investment in infrastructure by public and private sectors.</p>	<ul style="list-style-type: none"> • A co-ordinated, targeted approach to choose the right infrastructure in the right places, although does not include programs specific to aid export trade.
<p>The National Infrastructure Plan was introduced in 2010 as a broad vision of the infrastructure investment required to underpin the United Kingdom's growth. The key objective is to provide a comprehensive plan for strategic infrastructure required at local, regional and national levels in line with the United Kingdom's long-term economic plan. The Plan covers transport and gateways, communications, energy, water, science and research projects funded by public and/or private sector.</p>	<ul style="list-style-type: none"> • Provides an ambitious rolling 10-year infrastructure plan and vision for the United Kingdom. The infrastructure pipeline is updated on a six-month basis. Recently, investment decisions have been devolved to Scotland and Wales.
<p>The Plan: (1) sets out a 10-year plan in line with the United Kingdom's long-term economic plan, and identifies the government's strategic objectives and top 40 priority investments that are vital for economic growth; (2) establishes a pipeline of planned public and private projects to better inform industry and investors; (3) seeks investments from the private sector; and (4) monitors infrastructure delivery to ensure projects are delivered on time and on budget.</p>	<ul style="list-style-type: none"> • Top 40 priority infrastructure investments reveal what infrastructure projects the United Kingdom needs and why. Investments are selected on the basis of 3 main criteria: potential contribution to economic growth; nationally-significant investment that delivers substantial new or replacement infrastructure with enhanced quality, sustainability and capacity; and projects that attract or unlock significant private investment.
<p>Investment decisions are guided by a more uniform transportation investment appraisal process.</p>	<ul style="list-style-type: none"> • Annual reporting provides details of government-funded projects (e.g. rationale for selection, current status, funding value, construction dates, recent progress, etc.), thereby adding a level of transparency.
<p>Initiatives to attract private investment include: government guarantees to ensure projects have access to private financing, equity financing, European Investment Bank debt financing, and P3s.</p>	<ul style="list-style-type: none"> • Seeks to align the investment criteria for transportation infrastructure with those of other infrastructure investments. • Advocates are requesting a longer-term horizon: certain experts recommending a new organization with statutory independence and the ability to plan at least 25 to 30 years forward. • Does not address how the government plans to coordinate the delivery of infrastructure; the "Top 40" list of projects is not accompanied by a real plan for execution/completion. • The National Infrastructure Plan 2014 includes a detailed analysis of the role of private sector financing, although does not put forward clear ideas for attracting new private financing.

**EUROPEAN UNION
COMMON TRANSPORTATION STRATEGY**

The European Union's strategic transportation infrastructure plan is the 2011 White Paper on Transport (*Roadmap to a Single European Transport Area: Towards a competitive and resource efficient transportation system*). The Paper's general objective is to define a long-term strategy to help the European Union's transport system achieve the overall vision/goals of the Common Transport Policy.

Included in its proposed 10 objectives are:

- Complete the core network of strategic infrastructure by 2030 (designation of a Single European Transport Area, which will unify Europe's fragmented transportation network into nine integrated, connected corridors deemed critical to economic growth, including telecommunications and proposed energy networks); and
- Move towards full application of 'user pays' and 'polluter pays' principles in order to generate revenues and ensure financing for future transport investments.

In addition to direct funding, including subsidies for both passenger and freight requirements, the investment plan includes programs designed to develop new financial instruments through the private sector, and suggests finding new sources or mechanisms for funding transportation projects, including expanded application of user fees.

A new European Fund for Strategic Investments was also established to mobilize private investment.

CONSIDERATIONS

- The White Paper provides an all-encompassing, long-term vision for the European Union stretching out to 2030 for the core network planning and 2050 for other objectives (a unified vision to unite diverse nations).
- The objectives of the White Paper are in line with other European Union institutions and departments, i.e. to support trade between member states.
- A Guide on Cost-Benefit Analysis assists member states to prioritize projects and maximize the contribution of infrastructure investments to the economic and social development of regions and cities.
- A strategic plan with identified corridor improvement requirements form the basis on which individual projects are identified for European Union subsidies.
- Many different levels and structures of governments and agencies are involved with the process.
- New member states do not have significant infrastructure assets, reflecting a large and daunting disparity. Structural and Cohesion Funds help address technical, administrative and financial disparities between Member States, and aim to create a level playing field.
- Not clear from where the required money will come (€315 billion of additional finance over the next three years).
- Despite the objective of expanding the Investment Plan to Member States, National Promotional Banks, regional authorities and private investors, there is no 'call to action' to mobilize financial resources.
- Recent improvements to the program include the development of comprehensive strategic plans that identify core networks for all modes, as well as specific improvements required for those networks. Subsidies to European Union members are provided based on their paying their portion of project costs.

**FIGURE 3 – TRANSPORTATION INFRASTRUCTURE APPROACHES
IN COMPARABLE JURISDICTIONS (CONTINUED)**

INFRASTRUCTURE AUSTRALIA'S NATIONAL INFRASTRUCTURE PLAN	CONSIDERATIONS
<p>Infrastructure Australia was established in 2008 to improve national productivity through a new coordinated approach to planning, funding and implementing long-term infrastructure priorities and needs (an independent statutory authority located within the Department of Infrastructure and Regional Development).</p> <p>Functions include: advising all levels of government, investors, and infrastructure owners; assessing current and future needs and priorities related to nationally-significant infrastructure (including transport, energy, communications and water); addressing policy, pricing and regulatory issues that impact the use of infrastructure; developing options and reforms for more efficient use of existing networks; and pursuing private infrastructure financing.</p> <p>In 2008, Infrastructure Australia identified a new national approach, including 7 national themes to provide a framework to address Australia's infrastructure gap. Key objectives are to encourage better use of existing infrastructure, advancing national priorities, and assessing future infrastructure costs.</p> <p>The National Infrastructure Plan (50-year) identifies the Government's strategic objectives and infrastructure priorities, and provides a basis for the creation of a single national infrastructure fund, replacement of grant funding with private investment, sale or lease of assets to invest in new infrastructure, wider applications of user pay systems, and improvements to project governance and procurement processes to reduce costs.</p>	<ul style="list-style-type: none"> • Infrastructure Australia is chiefly an advisory body designed to introduce a coordinated, targeted approach and link efforts by all levels of government; it is not a source of funds. • The National Infrastructure Plan provides an ambitious 50-year co-ordinated infrastructure plan and national vision for Australia. It introduced a number of reforms, such as establishing funds to address national infrastructure priorities, and incorporating plans to pursue innovative private investment through debt financing, equity financing and other hybrid instruments. It also promotes asset recycling (privatization of state-owned assets such as ports and regional airports to fund new infrastructure). • Provides an infrastructure pipeline of potential projects and a Priority List which adds a level of transparency to project selection and prioritization. No specific targets for trade-related infrastructure. • Eligible projects must support the Government's strategic priorities; clearly identify why the project should be prioritized against other proposals; and be backed by comprehensive and robust demand/price forecasting and economic cost-benefit analysis. • Priorities and recommendations of the National Infrastructure Plan are non-binding, and may not reflect the preferences of other levels of government or different jurisdictions, despite efforts to coordinate through the Council of Australian Governments. • Continues to face challenges to increase the level of private sector investment; some public resistance to the sale of government assets, and paying tolls and user charges. • Project costs and construction times are quite high compared to similar projects overseas, likely because recent construction booms have resulted in labour and skills shortages and upward pressure on wages. • The Government recently initiated plans to improve the decision-making processes of Infrastructure Australia to improve the lack of transparency around funding, and to introduce a 15-year pipeline of major projects that would be revised every 5 years.

Infrastructure Financing

The pension fund industry has become the single largest source of savings in the global economy, and at the end of 2014, pension assets for the 16 largest pension markets was estimated at over US\$ 36 trillion. The United States, United Kingdom, Japan and Australia have the largest pension markets: Canada ranks 5th with approximately US\$1.5 trillion in global pension assets.⁶

At the end of 2014, assets for the Top 100 pension funds in Canada totalled CA \$1.1 trillion.⁷

Province	Pension Investor Name	Assets (US\$ Billion)
Federal	Canada Pension Plan Investment Board	\$226.8
Québec	Caisse de dépôt et placement du Québec	\$200.1
Ontario	Ontario Teacher's Pension Fund	\$140.0
British Columbia	British Columbia Investment Management Corporation	\$114.0
Federal	Public Sector Pension Investment Board	\$93.7
Alberta	Alberta Investment Management Corporation	\$80.0
Ontario	Ontario Municipal Employees Retirement System	\$65.1
Ontario	Healthcare of Ontario Pension Plan	\$51.6
Ontario	Ontario Pension Board	\$18.8
Ontario	OPSEU Pension Trust	\$16.0
New Brunswick	New Brunswick Investment Management Corporation	\$11.6
Nova Scotia	Nova Scotia Pension Services Corporation	\$7.1
Manitoba	Healthcare Employees' Pension Plan	\$5.4
Alberta	Alberta Pensions Services Corporation	\$4.6
TOTAL		\$1,034.8

**FIGURE 4 –
CANADA'S PUBLIC PENSION
PLAN RANKINGS, JULY 2014⁸
(LARGEST CANADIAN PUBLIC
INVESTORS BY ASSETS
UNDER MANAGEMENT)**

A July 2013 analysis completed by the OECD⁹ found that Canadian pension funds are among the most expert investors in infrastructure in the world. The average asset allocation of roughly 5 percent to infrastructure is second only to Australia. However, most of the capital is invested overseas, given the lack of large-scale privatization of public infrastructure assets in Canada.

The federal government has invested efforts in promoting the public-private partnership (P3) model as a method of leveraging private funding for new infrastructure projects. However, the projects available are generally of a size that is not of interest to Canada's large pension funds and other institutional investors.

In 2014, the OECD conducted a study to address an apparent global contradiction: that is, governments having difficulty attracting private sector funding for necessary infrastructure investments, at the same time as private capital is looking for investment opportunities to meet target allocations. The research, based on interviews with prominent global infrastructure investors, revealed that there were significant differences in perception between investors and governments, although there was a general willingness to work together to find ways to improve the situation. Consequently, the authors of the report developed a set of recommendations for governments that might serve as a blueprint (or resource) for attracting more private money (see Figure 5, below).

**FIGURE 5 –
INFRASTRUCTURE
POLICY BLUEPRINT¹⁰**

Infrastructure Strategic Vision	Policy and Regulatory Enablers	Investor Value Proposition
Create a credible infrastructure projects pipeline	Limit renegotiation risk	Analyse project returns from investors' perspective: focus on financial returns
Define a viable role for investors, consider the value of brownfield capital recycling	Create an efficient, predictable and standardized procurement process	Create a robust risk allocation methodology
Communicate the potential value of, and safeguards around, private-sector involvement	Facilitate predictable project permitting processes	Conduct market sounding with investors
	Review and assess tax policy	

Many stakeholders also suggested the establishment of an infrastructure bank as a mechanism to combine specialized infrastructure expertise with the ability to raise very large sums of capital from a number of private and public sources for large-scale infrastructure projects. This would allow the smaller pension funds and other institutional investors to participate in large infrastructure projects. Such an initiative would require substantial seed money, but is an idea worth consideration by the proposed Advisory Committee on Transportation and Logistics.

System Governance

BACKGROUND ON THE COMMODITY SUPPLY CHAIN TABLE

The Commodity Supply Chain Table (CSCT) held its inaugural meeting in June 2014. Chaired by Transport Canada, the Table brings key players together to identify issues and explore a variety of potential solutions to the challenges facing Canada's rail-based supply chain.¹¹

COMMODITY SUPPLY CHAIN TABLE – TERMS OF REFERENCE¹²

- 1.0 Mandate and Objectives of the Commodity Supply Chain Table (CSCT):
 - 1.1 The mandate of the CSCT is to provide a consensus-based, multi-modal, national forum for producers, shippers, service providers, and other supply chain partners involved in the movement of commodities by rail to identify and address transportation system issues to improve the reliability, efficiency, and effectiveness of the supply chain.
 - 1.2 More specifically, the objectives of the CSCT are:
 - to promote strategic exchanges on logistical and/or capacity issues (including winter contingency planning) affecting end-to-end supply chain efficiency for commodities being shipped through Canada's gateways;
 - to provide a forum to share information on, and assess, evolving domestic and international trade and market trends for commodities, including anticipated future demand and system needs;
 - to explore, assess, and identify potential solutions to system inefficiencies through enhanced collaboration across the supply chain; and
 - to discuss the development and implementation of evidence-based supply chain performance metrics to increase the visibility of the supply chain and improve overall system performance.
 - 1.3 Guiding Principles for the CSCT include the following:
 - Increased dialogue, collaboration, and transparency will support a transportation system that functions more efficiently, is more competitive, and is more responsive to the needs of users and service providers.
 - Stakeholders from across commodity supply chains—producers, shippers, railways, ports, terminals, ship owners—must be willing to partner and collaborate in finding solutions to supply chain issues.
 - CSCT participants will share industry best practices and lessons learned; identify system-based performance issues; recommend more in-depth analysis and research as applicable; discuss/assess potential solutions; and contribute to the development and implementation of relevant performance metrics and reporting.

**FIGURE 6 –
COMMODITY
SUPPLY CHAIN TABLE:
MEMBERSHIP LIST¹³**

Industry Participants	Federal Participants
Association of Canadian Port Authorities	Transport Canada (Chair)
Canadian Association of Petroleum Producers	
Canadian Canola Growers Association	Agriculture and Agri-Food Canada (Observer)
Canadian National Railway	
Canadian Pacific Railway	
Chemical Industry Association of Canada	
Forest Products Association of Canada	
Mining Association of Canada	
Pulse Canada	
Railway Association of Canada	
Shipping Federation of Canada	
Western Grain Elevator Association	

Advisory Committee on Transportation and Logistics

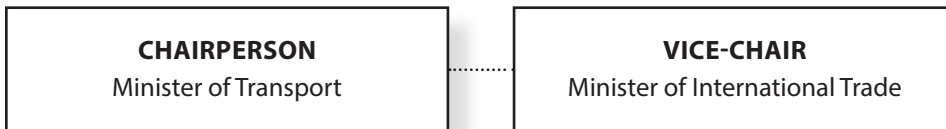
An Advisory Committee on Transportation and Logistics is proposed to replace the Commodity Supply Chain Table. It would be the mechanism to determine, on an ongoing basis and in collaboration with key stakeholders, the state of Canada’s transportation infrastructure; to develop and implement methods to track public and private spending on maintenance and investments in new infrastructure; and to assess gaps in Canada’s long-term requirements.

This newly configured and more broad-based Advisory Committee on Transportation and Logistics would include consideration of all modes of transport, with a view to addressing the systemic issues affecting Canada’s transportation network.

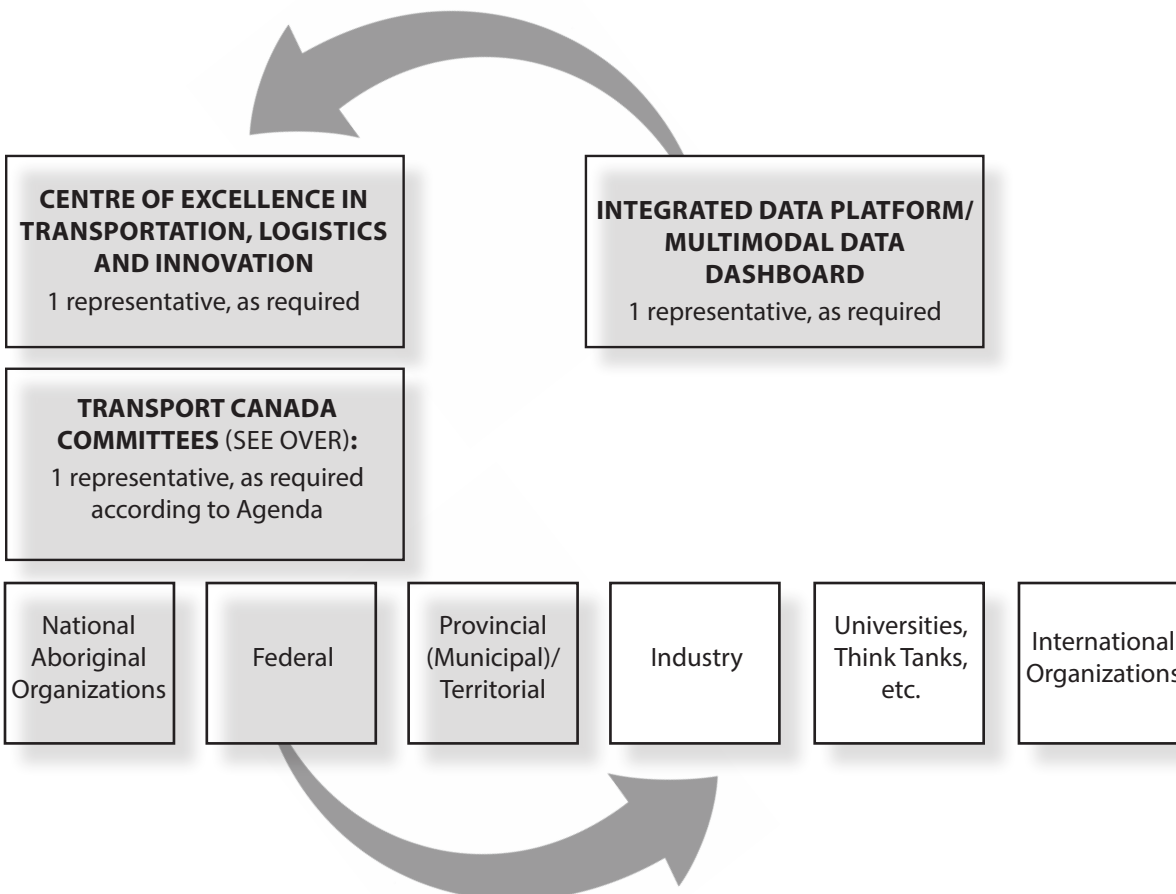
The committee membership representation and selection would be based on its ability to readily:

- develop a long-term vision for transportation in Canada;
- advance Canada’s corridors and critical trade-enabling infrastructure through partnership with the industry and other levels of government; and
- further integrate Canada’s corridors in a North American and international approach.

Figure 7 illustrates the proposed structure for the Advisory Committee on Transportation and Logistics.



**FIGURE 7 –
ADVISORY COMMITTEE
ON TRANSPORTATION
& LOGISTICS: PROPOSED
COMMITTEE STRUCTURE¹⁴**



EXISTING TRANSPORT CANADA COMMITTEES¹⁵

Transport Canada has established a number of committees that advise the department on various matters. The following is a brief compilation of current Transport Canada advisory committees.

MINISTER'S ADVISORY COMMITTEE ON ACCESSIBLE TRANSPORTATION (ACAT)

Advises the federal minister of Transport on obstacles and emerging issues in the federal transportation system that affect accessibility for seniors and persons with disabilities. Its membership includes seniors, persons with disabilities, and the federal passenger transportation industry.

ADVISORY COUNCIL ON RAILWAY SAFETY (ACRS)

A forum for discussion of railway safety issues and development and assessment of changes to the *Railway Safety Act* regulatory framework. It includes representatives from railway company management and labour, Transport Canada, the Railway Association of Canada, provinces, shippers, suppliers, and municipalities.

CANADIAN AVIATION REGULATION ADVISORY COUNCIL (CARAC)

A joint undertaking of government and the aviation community; it includes a large number of organizations selected to represent the viewpoints of the aviation community, operators and manufacturers, with both management and labour represented, as well as professional associations and consumer groups.

CANADIAN MARINE ADVISORY COUNCIL (CMAC)

Transport Canada's national consultative body for marine matters.

THE TRANSPORTATION OF DANGEROUS GOODS GENERAL POLICY ADVISORY COUNCIL

Provides Transport Canada with advice on all matters related to the transportation of dangerous goods. Members of the Council represent the Canadian Association of Fire Chiefs, the Canadian Association of Chiefs of Police, the Federation of Canadian Municipalities, labour unions, and a variety of industry associations, including manufacturers, consignors, carriers and consignees. One seat is reserved for an environmentally-oriented non-governmental organization.

THE FEDERAL-PROVINCIAL/TERRITORIAL TDG TASK FORCE

Provides for the provinces' important role in developing the text of the TDG regulations, as the regulations are referenced in the statutes of each province and territory. Provinces are also responsible for delivering public protection services such as municipal firefighting and highway patrols. The Task Force includes representatives from all provinces and territories, and it is chaired by a provincial representative.

THE INTERNATIONAL AVIATION TECHNICAL COMMITTEE (IATC)

Develops the Canadian position on issues related to civil aviation safety in preparation for assemblies of the International Civil Aviation Organization.

THE MARINE TRANSPORTATION ADVISORY COMMITTEE (MTAC)

Facilitates a strategic and coordinated approach to marine policy in Canada. Its objectives are to reinforce dialogue between the federal government and the marine industry; enhance co-ordination; exchange views on high-level issues of trade and economic development; and discuss the sector's role in the Canadian economy. It is co-chaired by the Deputy Minister of Transport and an industry member.

NATIONAL RECREATIONAL BOATING ADVISORY COUNCIL (NRBAC)

Advises on all matters related to the safety of recreational boaters, the safe operation of recreational boats, the safe and environmentally friendly use of recreational waterways, and any other issue of interest.

REGIONAL ADVISORY COUNCIL (RAC) ON OIL SPILL RESPONSE

Consists of regional committees in which the parties involved in and/or affected by marine oil spills and the oil spill response regime can meet to identify, discuss, and realize opportunities.

Transportation Data Collection

Transportation statistics by mode, presently or recently collected in Canada by Statistics Canada, Transport Canada, the Canadian Transportation Agency, Canada Border Services Agency, Nav Canada, and the Canadian Coast Guard are shown in Figure 8; Figure 9 provides comparable information for the United States.¹⁶

FIGURE 8 – SUMMARY OF FEDERAL TRANSPORTATION DATA IN CANADA, BY MODE¹⁷

Mode	Data Type	Agency/Department	Present Status
Aviation	Airport data	Statistics Canada	active
Aviation	Airport activity	Transport Canada, Statistics Canada	active
Aviation	Financial and operating data	Statistics Canada	active
Aviation	Fare Data (pricing)	Statistics Canada	active
Aviation	Passenger origin-destination	Statistics Canada	active
Couriers and Messengers	Financial and operating data	Statistics Canada	Cancelled after 2008
Marine	Financial	Statistics Canada	Cancelled after 2008
Marine	Port activity	Statistics Canada	Cancelled after 2011
Marine	Commodity origin-destination	Statistics Canada	Cancelled after 2011
Marine	Vessel movements	Canadian Coast Guard	active
Passenger Bus and Urban Transit	Financial and operating data	Statistics Canada	active
Rail	Financial	Canadian Transportation Agency, Transport Canada, Statistics Canada	active
Rail	Cargo origin-destination	Canadian Transportation Agency, Transport Canada, Statistics Canada	active
Taxi and Limousine Services	Financial and operating data	Statistics Canada	Cancelled after 2007
Trucking	Financial and operating data	Statistics Canada	Cancelled after 2011
Trucking	Commodity origin-destination	Statistics Canada	active
Trucking & Couriers	Pricing	Statistics Canada	active
Vehicle Survey (Canadian Vehicle Survey)	Activity of registered on-road vehicles	Statistics Canada	Cancelled after 2009
Vehicle Survey (Canadian Vehicle Use Study)	Activity of on-road vehicles	Transport Canada	Active for limited number of provinces

FIGURE 9 — SUMMARY OF UNITED STATES FEDERAL TRANSPORTATION DATA, BY MODE¹⁸

Mode	Data Type	Agency/Department	Present Status
Aviation	Airport data	Federal Aviation Administration, United States Department of Transport (USDOT), Office of Airline Information	active
Aviation	Airport activity and On-Time Performance	United States Department of Transport, Office of Airline Information	active
Aviation	Financial and operating data	United States Department of Transport, Office of Airline Information	active
Aviation	Fare Data (Consumer Air Fare Report)	United States Department of Transport, Office of Airline Information	active
Aviation	Passenger origin-destination	United States Department of Transport, Office of Airline Information	active
Couriers and Messengers	Financial and operating data	United States Census Bureau	active
Marine	Financial	United States Census Bureau	active
Marine	Port activity	Maritime Administration (MARAD)	active
Marine	Commodity origin-destination	Maritime Administration (MARAD), United States Army Corps of Engineers	active
Passenger Bus and Urban Transit	Financial and operating data	United States Department of Transport, Federal Transit Administration	active
Rail	Financial	Surface Transportation Board	active
Rail	Cargo origin-destination	Surface Transportation Board	active
Taxi and Limousine Services	Financial and operating data	United States Census Bureau	active
Trucking	Financial and operating data	United States Census Bureau	active
Freight Analysis Framework	Commodity origin-destination	Federal Highway Administration	active

Notes

- ¹ The infrastructure program summaries in this section are sourced from a more detailed analysis provided in: Vincent Lauerma, The Conference Board of Canada, *A Strategic Approach to Transportation Infrastructure Funding in Canada*, (prepared for the CTA Review), May 15, 2015.
- ² The numbers for the Infrastructure Canada Funded Programs were obtained from Infrastructure Canada's internal database, and those for Transport Canada funded programs/contribution agreements are from the Department's internal databases (project management database and financial system).
- ³ CTA Review with data from World Economic Forum, *Global Competitiveness Report 2015-16*, (Geneva: September 2015), accessed on October 15, 2015, online: <http://reports.weforum.org/global-competitiveness-report-2015-2016/competitiveness-rankings/>.
- ⁴ ITF, *Understanding the Value of Transport Infrastructure: Guidelines for macro-level measurement of spending and assets*, Task Force Report, (Paris: OECD/ITF, April 2013) accessed on November 23, 2015, online: <http://www.internationaltransportforum.org/pub/pdf/13Value.pdf>.
- ⁵ Summary completed with research provided by: Vincent Lauerma, The Conference Board of Canada, op. cit., and IBI Group (Lee Sims), *Canada's Transportation System: Identification of 'Critical Trade-related' Infrastructure and Approaches to Funding*, prepared for the CTA Review, (June 24, 2015).
- ⁶ Towers Watson, *Global Pension Assets Study* (February 2015), at 4 and 6, accessed on November 23, 2015, online: <https://www.towerswatson.com/en-CA/Insights/IC-Types/Survey-Research-Results/2015/02/Global-Pensions-Asset-Study-2015>.
- ⁷ Benefits Canada, *2014 Canadian Institutional Investment Network Pension Fund Survey* (June 2015), accessed on November 23, 2015, online: <http://www.benefitscanada.com/wp-content/uploads/2015/06/Top-100-Pension-Plans.pdf>.
- ⁸ Sovereign Wealth Fund Institute, *Canada's Public Pension Fund Rankings* (Nevada: July 2014), accessed on November 23, 2015, online: <http://www.swfinstitute.org/canadian-public-pension-fund-rankings/>.
- ⁹ OECD, *Pension Fund Investment in Infrastructure: A Comparison between Australia and Canada*, *OECD working papers on Finance, Insurance and Private Pensions*, No. 32 (George Inderst and Raffaele Della Croce), (Paris: OECD, July 2013), at 34, accessed on November 23, 2015, online: <http://www.oecd.org/pensions/pensionfundinfrastructureaustraliacanada2013.pdf>.

- ¹⁰ World Economic Forum, *Infrastructure Investment Policy Blueprint* (prepared in collaboration with Oliver Wyman) (Geneva: February 2014), accessed on November 23, 2015, online: http://www3.weforum.org/docs/WEF_II_InfrastructureInvestmentPolicyBlueprint_Report_2014.pdf.
- ¹¹ Transport Canada, "Minister Raitt discusses Canada's rail-based supply chain," News Release (Ottawa: June 26, 2014), accessed on October 28, 2015, online: <http://news.gc.ca/web/article-en.do?nid=862989>.
- ¹² Source: Transport Canada departmental information.
- ¹³ Source: Transport Canada departmental information.
- ¹⁴ Source: CTA Review.
- ¹⁵ Transport Canada, *Advisory Committees* (last modified: August 6, 2013), accessed on October 28, 2015, online: <https://www.tc.gc.ca/eng/consultations-advisorycommittees.htm>.
- ¹⁶ Consolidated collections of the data are found on the website of the Bureau of Transportation Statistics www.rita.dot.gov/bts/data_and_statistics/index.html and the International North American Transportation Statistics (NATS) website <http://nats.sct.gob.mx/en/>.
- ¹⁷ Gordon Baldwin, *Report on Multimodal Data Dashboard / Performance and Management for Strategic Decisions – An Examination of Federal Transportation Data*, prepared for the CTA Review (August 28, 2015).
- ¹⁸ *Ibid.*

Appendix C

Linking Trade and Transportation

New and Emerging Markets

New and expanded trade agreements can be expected to lead to increased volumes of trade. As a result, they can have a significant impact on the utilization of Canadian transportation and logistics systems. Factors to consider in the context of future gateway and corridor development and investment include: the countries with which Canada is currently negotiating, and the potential impact on the composition, volume and direction of exports and imports.

Canada has recently implemented a new Free Trade Agreement (FTA) with the Republic of Korea, and has concluded negotiations on three more, namely the Trans-Pacific Partnership,¹ the Canada-European Union Comprehensive Economic and Trade Agreement, and the Canada-Ukraine FTA. If these new agreements are ratified, Canadians would benefit from free trade with some 52 countries that collectively account for over half of the global economy.² These agreements would likely boost trade volumes at both Atlantic and Pacific ports and along their supporting trade corridors.

FTA	Agreement Partners	Agreement Status
Trans-Pacific Partnership	Australia, Brunei Darussalam, Chile, Japan, Malaysia, Mexico, New Zealand, Peru, Singapore, United States, and Vietnam	Concluded on Oct. 5, 2015
Canada-Ukraine FTA	Ukraine	Concluded on July 14, 2015
Canada-Korea FTA	Republic of Korea	In force since Jan. 1, 2015
Canada-European Union: Comprehensive Economic and Trade Agreement	Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, United Kingdom, and Germany	Concluded on Aug. 5, 2014
Canada-Honduras FTA	Honduras	In force since Oct. 1, 2014
Canada-Panama FTA	Panama	In force since Apr. 1, 2013
Canada-Jordan FTA	Jordan	In force since Oct. 1, 2012
Canada-Colombia FTA	Colombia	In force since Aug. 15, 2011
Canada-Peru FTA	Peru	In force since Aug. 1, 2009
Canada-European Free Trade Association FTA	Iceland, Liechtenstein, Norway, and Switzerland	In force since July 1, 2009
Canada-Costa Rica FTA	Costa Rica	In force since Nov. 1, 2002
Canada-Chile FTA	Chile	In force since July 5, 1997
Canada-Israel FTA	Israel	In force since Jan. 1, 1997
North American Free Trade Agreement	Mexico and the United States	In force since Jan. 1, 1994

FIGURE 1 – SUMMARY OF CANADA'S FREE TRADE AGREEMENTS (CONCLUDED AND IN FORCE)³

In a 2015 study prepared for the CTA Review, the Asia Pacific Foundation of Canada predicted that the Asia-Pacific region will account for 45 to 50 percent of the world's GDP by 2030.⁴ The International Transport Forum (ITF) predicts that growth in emerging economies will continue to outpace growth in advanced economies.⁵ Signs of this major geographic shift in trade patterns are already visible in terms of changes in income distribution, consumption structure and relative productivity.

Similarly, Douglas Porter, Chief Economist of BMO Financial Group, predicts a similar paradigm shift on world economies (see Figure 2).⁶ Porter suggested that 30 percent of the world's GDP, previously dominated by the United States and Japan, would be replaced by China and the United States by 2019. He also predicts the following:

- China holds its position in 2019 after overtaking the United States as the world's top GDP country in 2014;
- India continues to grow by doubling its share of global GDP in 2019;
- Russia and Indonesia enter the top 10 ranks; and
- Canada remains in a similar position as in the last five years, with the 16th largest share of global GDP relative to other countries.

**FIGURE 2 –
SHIFTING GLOBAL
ECONOMY: SHARE
OF GLOBAL REAL
GDP, 1989 AND
PREDICTED 2019⁷**

1989 Total GDP	Country Ranking	% of Global	2019 Total GDP	Country Ranking	% of Global
1	United States	22.9	1	China	18.7
2	Japan	8.7	2	United States	15.4
3	Germany	5.8	3	India	7.7
4	France	4.2	4	Japan	3.9
5	Italy	4.2	5	Germany	3.0
6	China	4.1	6	Russia	3.0
7	Brazil	4.0	7	Brazil	2.7
8	India	3.8	8	Indonesia	2.6
9	United Kingdom	3.4	9	France	2.2
10	Mexico	2.6	10	United Kingdom	2.1
12	Canada	2.2	16	Canada	1.4

In their *Global Enabling Trade Report*, the World Economic Forum⁸ uses data from multiple sources to measure the factors, policies and services that facilitate the trade in goods across jurisdictions. In doing so, the report provides benchmarks against which the performance of Canada's gateways and corridors can be assessed. The report ranks countries based on a calculated index (the Enabling Trade Index, or ETI), and also based on a series of sub-indices, which are outlined in Figure 3. In the 2014 report, Canada ranked 14th overall.

Country/ Economy	Overall ETI	1. Domestic market access	2. Foreign market access	3. Efficiency and transparency of border administration	4. Availability and quality of transport infrastructure	5. Availability and quality of transport services	6. Availability and use of ICTs	7. Operating environment	Number of times in top 5
Singapore	1	3	13	1	2	1	8	2	5
Hong Kong SAR	2	1	135	11	3	5	11	1	4
Netherlands	3	46	97	4	9	2	4	8	3
New Zealand	4	5	65	6	39	25	16	7	1
Finland	5	46	97		20	17	3	3	3
United Kingdom	6	46	97	7	10	9	2	11	1
Switzerland	7	85	71	12	12	8	14	5	1
Chile	8	9	2	26	64	43	36	25	1
Sweden	9	46	97	3	35	7	1	9	2
Germany	10	46	97	13	5	3	21	12	2
Japan	13	—	—	5	—	4	—	—	2
United Arab Emirates	16	—	—	—	1	—	—	—	1
Denmark	17	—	—	—	—	—	5	—	1
Qatar	19	—	—	—	—	—	—	4	1
France	21	—	—	—	4	—	—	—	1
Mauritius	29	4	5	—	—	—	—	—	2
Cambodia	93	—	1	—	—	—	—	—	1
Lao PDR	98	—	4	—	—	—	—	—	1
Libya	106	1	—	—	—	—	—	—	1
Nepal	116	—	3	—	—	—	—	—	1
Canada	14	16	76	20	19	13	28	15	0

**FIGURE 3 –
2014 ENABLING TRADE
INDEX PERFORMANCE:
TOP-10 COUNTRIES IN
OVERALL ETI AND TOP-5
BY PILLAR⁹**

One score that stands out relates to Foreign Market Access, where Canada ranks 76th among the 138 countries examined.¹⁰ This indicator measures the tariff barriers faced by a country's exporters in destination markets, including average tariff rates as well as the margin of preferential tariff rates applied by trade agreements (it does not control for relative volumes of trade).

Given that nearly 80 percent of Canadian exports are destined for the U.S. or Mexico, where trade barriers are negligible or have been removed, this ranking perhaps over-represents the challenges most Canadian exporters face on a day to day basis. Ratification of the Canada-European Union and Trans-Pacific Partnership agreements could be expected to improve Canada's ranking markedly. However, the ranking does provide insight into the challenges Canadian exporters face when seeking to diversify and access new markets. Many of the countries that rank highest under this indicator are designated as "least developed economies"¹¹ by the UN and benefit from special and differential treatment from World Trade Organization agreements. These include a requirement that better-off members make extra efforts to lower barriers on least-developed countries' exports.¹² However, relatively-wealthier countries like Chile (ranked 2nd) and the other members of the Pacific Alliance (Colombia, Mexico, and Peru) also perform well on this indicator.¹³

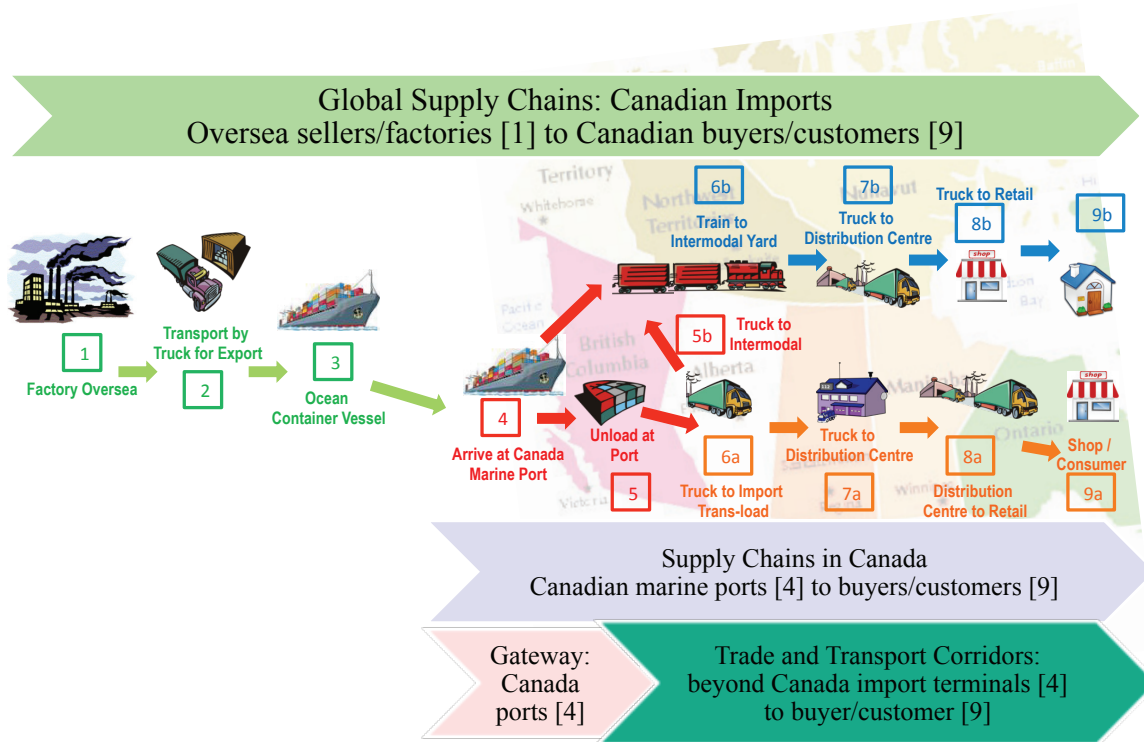
The *Global Enabling Trade Report* also ranks Canada relatively poorly with regard to the Efficiency and Transparency of Border Administration (20th), and the Availability and Use of Information and Communications Technologies (ICTs) (28th).¹⁴ While it is difficult to draw detailed conclusions based on these or Foreign Market Access rankings, the rankings nonetheless highlight areas—in addition to those raised in the CTA Review Report—where potential gains in Canada's trade competitiveness relative to other countries may be found.

Impacts on Trade and Transport Corridors

Multiple transportation or logistics elements that make up trade and transport corridors may be impacted by greater free trade. This includes gateway facilities, such as marine ports, as well as inland multi-modal transfer points (e.g. intermodal yards and distribution centres), where goods change hands or transfer from one mode of transport (representing one link in a supply chain) to another (representing the next supply chain link).

Figure 4 provides a practical example of how these links combine to form supply chains, in the specific context of goods being imported into Canada via a West Coast port. In this example, an overseas factory is the seller (box 1), a Canadian marine port is the gateway (box 4), and the consumers are the buyers in a shop (boxes 9a/9b).

FIGURE 4 – GLOBAL SUPPLY CHAINS TERMINOLOGIES FOR CANADIAN IMPORT TRADE FLOW¹⁵



Canada’s international trade in goods consists of North American cross-border trade, transoceanic trade and air trade. Cross-border trade between Canada and the United States and Mexico accounted for almost 70 percent of Canada’s total trade by value in 2014. North American trade flows through the United States land border crossings, international bridges, the Great Lakes-St. Lawrence Seaway System, as well as the Pacific and Atlantic coasts. Transoceanic trade relies on increasingly larger ocean vessels to transport products across open seas to or from Canadian ports. The vast majority of trade by air enters and exits Canada in the belly holds of passenger aircraft serving Canadian airports.

Critical Trade-Related Infrastructure

IBI Group, in a 2015 study commissioned by the CTA Review, assessed trade-related transportation infrastructure in Canada. As a stepping off point, the study uses the European Commission’s definition of critical infrastructure: “an asset, system or part thereof located in Member States that is essential for the maintenance of vital societal functions, health, safety, security, economic or social well-being of people and the disruption or destruction of which would have a significant impact on a Member State as a result of the failure to maintain those functions.”¹⁶ The IBI study identified four factors that could be applied to determine which facilities, or elements, are “critical” to supporting trade:¹⁷

- **volume:** whether the infrastructure element is large in volume or value carried, compared to other links in the transportation network;
- **capacity:** whether it might be approaching capacity and causing congestion;
- **redundancy:** whether there are alternatives that could be used if a particular link on the network is impaired; and
- **overall importance to the economy.**

The IBI Group study used the most recent databases from Statistics Canada and the U.S. Bureau of Transportation Statistics to extract international trade volumes for Canada. It is noted that inconsistency in recording years and Canadian data gaps prevented the firm from generating a complete picture for a single year of assessment. Based on these databases, however, the study found that:

- for Canada-United States trade, the most important modes were road, rail, and pipeline;
- for other international trade, the most important mode was marine, followed by air and road;
- approximately two-thirds of international trade by value was Canada-United States transborder trade; and
- trade by road accounted for more than 43 percent, and marine more than 21 percent of the total

“Canada remains a country of small concentrations of population separated by long distances. In many cases we have better links north and south to the United States than we do east-west between our own cities. The jurisdictional structure of our Canada has made it more difficult to move east-west than north-south.”

— *TransCanada Yellowhead Highway Association, Submission to the CTA Review, December 2014*

The CTA Review commissioned PBX Engineering Ltd. to analyse supply chain processes for containerized cargo in Canada.¹⁸ The study identified key performance indicators (Figure 5), and investigated current and emerging technologies that could improve the efficiency, interoperability, and security of supply chains. The study identified three technology-driven approaches that provide the greatest potential to improve supply chain performance: (i) improving the tracking and traceability of assets; (ii) enhancing the capability of transportation modes; and (iii) leveraging existing corridors and improving efficiency with technologies.






OCEAN CARRIERS 	Main Goals Key Performance Indicators	<ul style="list-style-type: none"> • Improve access to terminals • Better tracking of each inbound vessel (48 to 96 hrs out) • Average dwell time of vessel <ul style="list-style-type: none"> - at anchor - at berth - in port waters • Vessel on-time arrival performance
TERMINALS 	Main Goals	<ul style="list-style-type: none"> • Enhance management of operations through improved visibility of arrival times and peaks • Better information about empty containers • Improve cost recovery on missed appointments • Establish commitment to transparency
RAIL 	Main Goals Key Performance Indicators	<ul style="list-style-type: none"> • Enhanced management of rail assets by reducing terminal dwell time and transit time • Import rail dwell time (days/on dock) • Avg. rail transit time • Order fulfilment processing time (mine to port) • Total Transit Time = terminal dwell time + rail transit time
TRUCK 	Main Goals Key Performance Indicators	<ul style="list-style-type: none"> • Improve access to reservations to improve operational planning • Enhance fleet management, with reduced terminal turn times and increased double-ended moves • More trips per day • Enhance ability to manage workforce to match business needs • Turn times: Staging area + on terminal • Truck utilization (trips/day) • Avg. Containers per trip
IMPORTERS/ EXPORTERS 	Main Goals	<ul style="list-style-type: none"> • Improve access to terminals • Transparent and responsible use of reservations • Better information about empty containers
RETAILERS/ CONSUMERS	Main Goals	<ul style="list-style-type: none"> • Reliability of supply • Reduce congestion on residential streets

FIGURE 5 – SUPPLY CHAIN PROCESS, TRANSPORT MODES AND INTERFACES¹⁹

CANADA/US BORDER CROSSINGS

- Main Goals**
- Ensure security from threats
 - Ensure accurate in-bond information
 - Reduce cross-border processing times of shipping containers
- Key Performance Indicators**
- Inspection duration:
 - documentation
 - container and seal inspection

Corridors: Protecting Room to Grow

A CPCS Transcom study²⁰ commissioned by the CTA Review assessed six key Canadian bulk commodities: coal, iron ore, grain and oilseeds, potash, crude oil and forestry products, and predicted significant growth in commodity flows by 2030 and 2045. These bulk commodities represent over 60 percent of today's traffic carried by Canadian railways. A significant share of this traffic is destined to marine ports for export. The study projected an overall growth of approximately four times the 2013 tonnage by 2045.²¹ The CPCS report also predicted that the largest growth would be in the crude oil sector. This is consistent with estimates published by the Canadian Association of Petroleum Producers, which predict that Canadian oil production will increase 43 percent from 2014, to 5.3 million barrels per day by 2030.²²

“Railways need to increase rail capacity, especially in the West Coast — new West Coast corridors should be explored (e.g. Prince Rupert, Kitimat).”

— *Canpotex Limited, Submission to the CTA Review, December 2014*

Key corridors and rights-of-way must be protected to ensure that there is room to grow in the future. In addition to trade corridor preservation, consideration should also be given to ways to protect scarce waterfront and industrial land parcels for gateway facility expansions. According to Port Metro Vancouver, the industrial land inventory in Metro Vancouver is expected to be exhausted by 2020. The Port of Montréal is facing a similar issue with respect to diminishing land parcels in an urbanized setting. As identified in the CTA Review submissions, port authorities need the tools to respond to the realities of the local real estate markets in order to protect gateway growth potential in the future. Land protection at locations outside the designated footprints of the Canada Port Authorities might also be considered.

The past successes of the Asia-Pacific Gateway and Corridor Initiative offer good practices and lessons learned regarding investments in trade and transport corridors that boost the ability to compete globally and to prepare for the future. For example, Port Metro Vancouver has estimated that the capacity of the rail network in the Lower Mainland of B.C. may need to double to accommodate anticipated growth.²³

“The *Canada Marine Act* should be amended to provide CPAs with more leverage to acquire land, as it is now up to individual CPAs to come up with proactive and creative strategies to protect its industrial land base.”

— *Montréal Port Authority, Submission to the CTA Review, January 2015*

Today's supply chains are built around trade and transport corridors and oriented towards major urban centres. Congestion, capacity constraints, operational stoppages and other bottlenecks are the primary reasons for delays. As trade and populations continue to grow, issues on urban encroachments, noise and vibration will intensify in Canadian communities. To advance development while addressing local concerns requires collaboration between all levels of government, industry and affected parties.

A new transportation corridor takes time to plan, design and build, especially in an urbanized area. For instance, the South Fraser Perimeter Road, a trade corridor partnership project under Canada's Asia-Pacific Gateway and Corridor Initiative, took over two decades from initial planning to completion. Ongoing dialogue on transportation is required, with particular focus on multimodal corridors, technological innovation, the need to protect the rights of way of existing corridors, and the alignment of potential new trade corridors.



**FIGURE 6 –
URBAN INTERFACES OF A
TRADE AND TRANSPORT
CORRIDOR** ²⁴

The government should amend the letters patent, *Canada Marine Act* and other acts, regulations or guidelines to allow for greater flexibility in managing a looming critical shortage of available industrial land, and stimulate the creation of an industrial land reserve to protect the land base critical to growth in trade infrastructure, and the economic and jobs growth generated by industrial activity.

— *Port Metro Vancouver, Submission to the CTA Review, March 2015*

Trade via Marine Gateways

The top-11 Canadian ports together handled 81 percent of total Canadian trade by volume—more than 341 million tonnes in 2011 (the last year for which accurate data was available, see Figure 7). Pacific Gateway ports—Port Metro Vancouver (officially known as the Vancouver Fraser Port Authority) and the Port of Prince Rupert—jointly handled more than 33 percent of the total trade volume, while the Ports of Montréal and Québec jointly handled more than 13 percent of Canada’s two-way traffic, respectively.

FIGURE 7 – INTERNATIONAL TRADE AT CANADA PORTS, 2011²⁵

Port (more than 5 million tonnes of international traffic in 2011)	Outbound	Inbound	Total	Main Commodities
Vancouver	82,093	14,423	96,516	Coal, grain, sulphur, wood pulp, containers
Saint-John	12,754	14,862	27,616	Oil and oil products
Québec/Levis	8,040	16,040	24,080	Oil and oil products, iron ore, grain
Sept-Isles/Pointe-Noire	22,212	1,769	23,981	Iron ore
Port Hawkesbury	11,798	11,722	23,520	Oil and oil products, aggregate
Montréal/Contrecoeur	8,801	12,500	21,301	Grain, containers, oil products
Prince Rupert	16,716	2,064	18,780	Coal, grain, containers, wood and wood products
Come-By-Chance	10,911	4,000	14,911	Oil and oil products
Port-Cartier	12,691	369	13,060	Iron ore
Halifax	3,658	3,248	6,906	Containers
Hamilton	1,277	3,800	5,077	Coal, iron ore, limestone
Total (Top 11)	190,951	84,797	275,748	
Total Ports	227,276	114,266	341,542	
Top 11 as percentage	84.0%	74.2%	80.7%	

The CTA Review commissioned research on port performance measures that address congestion, responsiveness and fluidity in Australia, Canada, the European Union and the United States. It found that Canada should be recognized as a leader in the measurement of port fluidity in the context of key global supply chains.

COMPARISON OF FLUIDITY AND CONGESTION MEASUREMENTS OF CANADIAN PORTS AGAINST GLOBAL BEST PRACTICES

- Transport Canada has established a world-leading fluidity monitoring program with good metrics for the task. However, port participation does not include all Canada Port Authorities or the largest non-CPA ports.
- Transport Canada is a global leader in port performance metric development and execution. With respect to reporting to the public, the United States is much more transparent with data collected.
- There is a need to increase the participation rate in the fluidity measurement program and to broaden its scope to more bulk and container ports, and to address the shortcomings identified in export container performance measurement.
- Canada is not a nation of large businesses; therefore, this demands that some fluidity metrics be shared more broadly and transparently so that small businesses are also included in the program.
- Transport Canada's Fluidity Web Portal has established access to trade interests to understand metrics for the efficiency of trade flows against current average flow times. Small changes in reporting are required.
- Maritime fluidity efficiency metrics are not currently collected. This is only relevant for those ports where there is a concern about the ability to handle a cargo surge.
- The real gap in port performance data collection is that there is no comprehensive third-party or Transport Canada evaluation of effectiveness of service delivery to all customers, users and supply chain partners of ports. There is no assessment of whether ports supply the services expected or whether service improves or deteriorates over time. This should be rectified, for the largest ports, for a complete fluidity program.
- In the short-term, all existing efficiency metrics need to be confirmed against objectives, and new objectives for maritime fluidity and labour availability/deployment developed. A program for collecting effectiveness metrics needs to be initiated, along with deciding who should collect that data.

Source: Dr. Mary R Brooks, *Port Performance Measures – Identification, Summary and Assessment of Port Fluidity and Congestion Measures* at 21-26, prepared for the CTA Review (July 2015).

Cross-Border Trade by Rail

There are 27 rail crossings along the Canada-United States border. Figure 8 provides details about the 9 most heavily used crossings, with a particular focus on the cross-border movement of intermodal containers.

“Without a healthy and reliable railway network for all shipping sectors, Canada’s reputation and success as a trading nation are seriously hampered.”

— Saskatchewan Mining Association, Submission to the CTA Review, December 2014

FIGURE 8 – TRAINS AND RAIL CONTAINERS (RAIL CARS AND OTHER CONTAINERS) ENTERING THE UNITED STATES FROM CANADA, 2014²⁶

United States Port of Entry (with more than 1,000 trains per year at border crossing)	Canadian Location	Railway: United States	Railway: Canada	Trains	Loaded Rail Containers	Empty Rail Containers	Value of Freight (\$M)
Port Huron, MI	Sarnia, ON	CN(CSX)	CN (CSX)	4,074	267,178	211,360	\$16,454
Detroit, MI	Windsor, ON	CPR (CSX,NS)	CPR (CN,NS)	2,181	98,021	64,792	\$15,331
International Falls, MN	Fort Frances, ON	CN	CN	3,333	472,546	141,598	\$9,092
Buffalo-Niagara Falls, NY	Fort Erie-Niagara Falls, ON	CSX, CN	CN (CPR, NS)	2,395	100,021	35,242	\$7,184
Portal, ND	North Portal, SK	CPR	CPR	1,910	170,338	104,190	\$4,858
Pembina, ND	Emerson, MB	CPR, BNSF	CN, CPR	1,282	103,019	28,530	\$4,013
Champlain-Rouses Pt., NY	Lacolle, QC	CPR, CMQ	CN, CPR	1,505	77,131	9,194	\$2,817
Blaine, WA	White Rock, BC	BNSF	BNSF	2,076	69,445	68,648	\$2,717
Eastport, ID	Kingsgate, BC	UP	CPR	1,389	119,017	8,443	\$2,448
Total				20,145	1,476,716	671,997	\$64,914
All Rail Border Crossings				28,366	1,574,848	780,005	\$69,318
Top nine as percent of all				71.0%	93.8%	86.2%	93.6%
Percent of Total Containers				91.2%			

Cross-Border Trade by Truck

Canada and the United States share the world’s longest border. Due to the lack of available Canadian data, the IBI Group study, as mentioned above, utilized the 2014 United States Bureau of Transportation Statistics database and compiled the Canadian exports value and volumes by truck at 85 highway ports of entry, including four in Alaska. The top 19 ports of entry (see Figure 9) together handled more than 92 percent of the total number of trucks from Canada to United States (representing 98 percent of the value of imports into the United States).²⁷

Canada-United States truck trade is highly concentrated at a few border crossings. The three busiest crossings in Ontario (Windsor-Detroit, Fort Erie-Buffalo, and Sarnia-Port Huron) account for nearly two thirds of total cross border truck trade by value.²⁸ The fourth, fifth and sixth busiest crossings (in Manitoba, British Columbia and Québec) account for only about 5 percent of trade by value, each. During the CTA Review consultations, trucking was raised as an essential element of supply chains. Greater regulatory harmonization was regarded as a critical step towards realizing a seamless North American transportation network.

FIGURE 9 – INTERNATIONAL TRADE BY CROSS-BORDER TRUCKS IN 2014²⁹

United States Port of Entry	Canadian Location	Trucks Entering US	Value of Imports into US (\$US M)	Value of Exports into US (\$US M)	Total Value (\$US M)	Loaded Truck Containers	Empty Truck Containers
Detroit, MI	Windsor, ON	1,554,152	\$65,398	\$44,076	\$109,474	1,164,458	311,060
Buffalo-Niagara Falls NY	Fort Erie-Niagara Falls, ON	962,076	\$38,085	\$27,785	\$65,870	714,130	240,015
Port Huron, MI	Sarnia, ON	778,268	\$29,293	\$21,196	\$50,489	610,848	157,273
Champlain-Rouses Pt., NY	Lacolle-Philipsburg, QC	285,195	\$8,632	\$10,065	\$18,697	259,719	26,803
Pembina, ND	Emerson, MB	229,079	\$11,970	\$5,922	\$17,892	182,589	49,972
Blaine, WA	White Rock, BC	367,994	\$11,509	\$5,604	\$17,113	124,807	53,971
Alexandria Bay/ Cape Vincent, NY	Ivy Lea, ON	192,551	\$6,533	\$7,512	\$14,045	176,956	22,537
Sweetgrass, MT	Coutts, AB	145,805	\$8,547	\$5,125	\$13,672	156,586	26,835
Portal, ND	North Portal, SK	98,872	\$8,620	\$2,737	\$11,357	72,195	26,581
Highgate Springs, VT	Saint-Armand, QC	93,914	\$1,862	\$3,177	\$5,039	42,110	6,661
Sumas, WA	Abbotsford, BC	149,361	\$1,734	\$1,565	\$3,299	123,647	25,248
Houlton, ME	Woodstock, NB	84,043	\$1,065	\$2,165	\$3,230	74,956	9,890
Calais, ME	St. Stephen, NB	62,352	\$1,259	\$1,718	\$2,977	21,921	11,189
Eastport, ID	Kingsgate, BC	63,944	\$1,774	\$989	\$2,763	48,220	20,189
Derby Line, VT	Stanstead, QC	97,836	\$446	\$1,666	\$2,112	82,727	15,282
Sault Ste. Marie, MI	Sault Ste. Marie, ON	38,932	\$776	\$877	\$1,653	34,156	9,333
Ogdensburg, NY	Brockville, ON	37,726	\$325	\$1,069	\$1,394	37,774	8,330
Jackman, ME	Saint-Theophile, QC	84,755	\$238	\$302	\$540	37,695	43,627
Lynden, WA	Langley, BC	41,580	\$159	\$18	\$177	13,894	27,849
Total		5,368,435	\$198,225	\$143,568	\$341,793	3,979,388	1,092,645
All Truck Border Crossings		5,802,211	\$201,268	\$147,336	\$348,604	4,227,227	1,245,860
Percent of Total Border Crossings		92.5%	98.5%	97.4%	98.0%	94.1%	87.7%

“Consideration also needs to be given as to how to maximize the utilization and capacity of existing infrastructure in order to relieve bottlenecks and congestion. Current logistics practices adhere to a 24-hour a day clock. Incenting shippers to ship or receive goods during off-peak times is one way to maximize capacity utilization. Most truckers would prefer to operate during off-peak periods as much as possible; carriers, their customers, the consignees and third party logistics providers all need to work together to maximize efficiency”

— *Canadian Trucking Alliance, Submission to the CTA Review, December 2014*

Notes

- ¹ Foreign Affairs, Trade and Development Canada, *Trans-Pacific Partnership (TPP)* (Ottawa: Foreign Affairs, Trade and Development Canada, October 2015) accessed on October 23, 2015, online : http://www.international.gc.ca/trade-agreements-accords-commerciaux/agr-acc/tpp-ptp/statement-atlanta_declaration-atlanta-2015.aspx?lang=eng.
- ² World Economic Forum, *Global Competitiveness Report 2015-16*, (Geneva: September 2015), accessed on October 15, 2015, online: <http://reports.weforum.org/global-competitiveness-report-2015-2016/competitiveness-rankings/>. Note: calculation based on the summation of GDP for 51 countries as recorded in the Competitiveness Report Economy Profile.
- ³ Foreign Affairs, Trade and Development Canada, *Canada's Free Trade Agreements* (Ottawa: Foreign Affairs, Trade and Development Canada, October 2015) accessed on November 1, 2015, online: <http://www.international.gc.ca/trade-agreements-accords-commerciaux/agr-acc/fta-ale.aspx?lang=eng>.
- ⁴ Asia Pacific Foundation of Canada, *Understanding Asia in 2030 and the Implications for Canadian Transportation Policy*, at 5, prepared for the CTA Review (September 2015).
- ⁵ ITF, *Transport Outlook: Scenarios to 2050*, ITF Lunchtime Session (Leipzig: ITF 2015 Annual Summit held on May 27-29, 2015) accessed on October 23, 2015, online: <http://2015.internationaltransportforum.org/transport-outlook-2050>.
- ⁶ Douglas Porter, BMO Financial Group, *Long-term Canadian outlook*, presentation to the CTA Review (February 18, 2015).
- ⁷ Source: *Ibid.*
- ⁸ World Economic Forum, *The Global Enabling Trade Report 2014*, Hanouz, Geiger, Doherty, eds (Geneva: World Economic Forum, 2014) accessed on November 2, 2015, online: http://www3.weforum.org/docs/WEF_GlobalEnablingTrade_Report_2014.pdf.

- ⁹ *Ibid* at 19 Table 6.
- ¹⁰ *Ibid.* at 95 Canada's Profile: Enabling Trade Index Pillar 2.
- ¹¹ World Trade Organization (WTO), *Understanding the WTO: The Organization; Least-Developed Countries*, (Geneva: WTO, 2015), accessed on November 2, 2015, online: https://www.wto.org/english/thewto_e/whatis_e/tif_e/org7_e.htm. "The WTO recognizes as least-developed countries (LDCs) those countries which have been designated as such by the United Nations. There are currently 48 least-developed countries on the UN list, 34 of which to date have become WTO members."
- ¹² World Trade Organization (WTO), *Understanding the WTO, Fifth Edition, Chapter 6 Developing Countries* (Geneva: WTO, 2015), at 93-94, accessed on October 21, 2015, online: https://www.wto.org/english/thewto_e/whatis_e/tif_e/utw_chap6_e.pdf. Least-developed countries currently in the process of accession to the WTO are: Bhutan, Cambodia, Cape Verde, Lao People's Democratic Republic, Nepal, Samoa, Sudan, Vanuatu and Yemen. In addition, Ethiopia and Sao Tome & Principe are WTO observers, https://www.wto.org/english/thewto_e/minist_e/min01_e/brief_e/brief03_e.htm.
- ¹³ World Economic Forum, *The Global Enabling Trade Report 2014*.
- ¹⁴ World Economic Forum, *The Global Enabling Trade Report 2014*.
- ¹⁵ Source: CTA Review. Chapter 3 illustrates a sample supply chain for Canadian exports.
- ¹⁶ European Union R-Lex Access to European Union law, *European Critical Infrastructures* (European Council Directive 2008), accessed on November 2, 2015, online: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=URISERV:jl0013>.
- ¹⁷ IBI Group, *Canada's Transportation System: Identification of 'Critical Trade-Related' Infrastructure and Approaches to Funding*, prepared for the CTA Review, (June 2015)
- ¹⁸ PBX Engineering Ltd., *Supply Chain Technological Innovation* at 5 para 1, prepared for the CTA Review, (September 2015).
- ¹⁹ *Ibid* at 3 Figure 1.
- ²⁰ CPCS Transcom, *Impact of Future Bulk Commodity Flows on the Canadian Transportation System*, prepared for the CTA Review (August 25, 2015).
- ²¹ *Ibid* at ii Figure ES-1-1.
- ²² Canadian Association of Petroleum Producers (CAPP), *Crude Oil, Forecast, Markets & Transportation* (Calgary: CAPP, June 2015), at i para 3 and ii table, accessed on November 2, 2015, online: <http://capp.ca/publications-and-statistics/publications/264673>. Note: forecast growth from 2014 to 2030, from 3.74 to 5.33 million barrels per day represents 43 percent growth.

- ²³ Port Metro Vancouver, Submission to the Canada Transportation Act Review, (July 2015). Note: Calculations were based on Port Metro Vancouver study prediction of bulk and breakbulk commodities to increase from 77 to 150 million tonnes, Roberts Bank traffic will grow from 1.6 million twenty-foot equivalents (TEUs) to 4.8 M TEUs and South Shore terminals will increase from 1.1 M TEUs to 2.4 M TEUs in 20-25 years.
- ²⁴ Source: CTA Review.
- ²⁵ IBI Group, *op. cit.*, note 25 at 4 Exhibit 2-2 Note: based on Statistics Canada, Shipping in Canada, 2011.
- ²⁶ CTA Review with data from *IBI Group, ibid.* Note: based on United States Bureau of Transportation Statistics
- ²⁷ CTA Review with data from *IBI Group, ibid.*
- ²⁸ CTA Review with data from *IBI Group, ibid.*
- ²⁹ CTA Review with data from *IBI Group, ibid.*

Appendix D

The North

Northern Infrastructure Milestones

The development of transportation infrastructure has occurred in a largely incremental and *ad hoc* manner with some key programs and projects representing the most significant advances.

Historical development of northern infrastructure, including transportation infrastructure, has been undertaken and financed largely by the federal government for economic objectives (i.e. resource projects) and for defence purposes.

- **1942** – CANOL Project was the pipeline and road that brought oil from Norman Wells, Northwest Territories, to be refined in Whitehorse, Yukon, and brought by pipeline to Skagway, Alaska. This project was financed by the United States.
- **1943** – The Alaska Highway was built and financed by the United States government to connect the contiguous United States with Alaska through Canada. It starts in Dawson Creek, British Columbia, and continues through Watson Lake and Whitehorse, Yukon, to Fairbanks, Alaska.
- **1958 to 1960s**– Roads to Resources was intended to enable access to remote resources and thereby financed the construction of hundreds of kilometres of major roads and new bridges in the Yukon and Northwest Territories. These projects included the Dempster Highway, for which construction began in 1959.¹
- **1961 to about 1990** – Northern Road Program provided funding and other help to support road development in the territories, including the completion of the Dempster Highway, the Robert Campbell Highway and the Mackenzie Valley Highway.

Other key developments in the history of transportation in Canada's North include:

TRAILS

- The Inuit of Canada's North have long been connected to each other and to the land, sea and ice by a complex system of trails.²

MARINE

- Waterways have been an essential mode of transportation since Aboriginal northerners used rivers, lakes and the sea to travel between camps.³
- Between 1903 to 1906, Roald Amundsen, captain of the Gjoa, succeeded in being the first European ship to transit the Northwest Passage.
- Between 1940 and 1942, Henry Larsen, aboard the St. Roch, became the first to transit the Northwest Passage from west to east.
- At a practical level, Canada's Arctic marine transportation system has developed into two main components for community resupply and resource development; the western Arctic and the eastern Arctic sealifts.

AIR

- Air transportation became a part of northern life as early as the interwar period, even with the lack of infrastructure, for bringing much needed supplies to communities and resource projects.
- Many of the airstrips in Canada's territories were built during the Cold War for the Distant Early Warning (DEW) Line of air defence stations for DC-3 propeller aircraft that delivered supplies and could land on gravel.⁴

ROAD

- The development of roads in the North has taken the form of roads built on trails, and ice road networks once lakes and rivers freeze.

RAIL

- The northernmost rail line connected to the continental network reaches Hay River, Northwest Territories, from High Level, Alberta. It was built by the federal government between 1961 and 1964 to connect mines with the southern rail network. It is reported that about 3,000 rail cars per year bring cargo, mostly bulk fuel. There is very little cargo that travels from Hay River by rail.⁵

SATELLITE

- Canada's Anik A2 was launched in 1973 and brought about improved communications (radio, television and improved telephone services) in Canada's North.⁶
- RADARSAT-1 was launched in 1995 as Canada's first Earth-observation satellite, which provided much needed information on cartography, hydrology, oceanography, ice conditions and coastal monitoring.⁷
- RADARSAT-2 was launched in 2007. It "offers powerful technical advancements that enhance marine surveillance, ice monitoring, disaster management, environmental monitoring, resource management and mapping in Canada and around the world."⁸

Where we are Today

The National Snow and Ice Center has published data showing that the average extent of Arctic sea ice was lower between 2011 and 2015, relative to the 1981-2010 average.⁹ The anticipated continued decline of Arctic sea ice will affect the utilization of Arctic marine routes since such changes could result in longer shipping seasons yet lead to challenges and hazards associated with increasing mobile sea ice.

The figure below displays data on importance of mining, in terms of employment, for Canada's North:

Contributions	Nunavut	NWT	Yukon
Total employment in mining	2,215	3,689	2,589
Total employment in all sectors	12,500	22,500	19,300
Employment in mining as a proportion of total employment	18%	16%	13%
Mining (and oil and gas) percentage contributions to GDP	18%	27%	12%

**FIGURE 1 –
MINING'S ECONOMIC
CONTRIBUTIONS TO
THE TERRITORIES–2013**¹⁰

TECHNOLOGICAL INNOVATION

As satellites have played and continue to play an important role in facilitating transportation and economic development in Canada's North, it is useful to provide an overview of Canada's satellites.¹¹

BACKGROUNDER: Canada's Satellites

Communications Satellites

- Space-based systems are among the best methods for providing communications across the vast, but sparsely populated, Arctic. Current demand below the 75 degrees North parallel is being met mostly by existing Geosynchronous Earth Orbits (GEO) systems. Above 75th parallel north, there is a gap in coverage, due to the GEO orbit location with existing systems providing unreliable, limited capacity and at low data rates. Most of the demand above 75°N will be from vessels and aircraft, although exploration expedition teams also require support.

Weather Satellites

- Systems currently in use are mostly GEO in near-equatorial orbits and are unable to provide weather information on high-latitude atmospheric conditions. Some weather satellite systems look to the Polar Regions employing Low Earth Orbit that provide high-quality spatial resolution information over high latitudes but on a narrow flight path—it may six hours before the same area is imaged again.

Navigation Satellites

- Global Navigation Satellite Systems (GNSS) provide autonomous geo-spatial positioning with global coverage. They are used in the Arctic as the preferred method of navigation for transportation and a variety of other positioning and timing applications. The lack of navigation infrastructure (radio beacons) and the high magnetic deviation make satellite-based solutions particularly attractive to users in the North. GNSS have some limitations in higher latitudes. New systems are being implemented that could improve higher latitude coverage.

Earth Observation Satellites

- Given the Arctic region's vast geography, remoteness and isolation, Earth Observation is frequently the only cost effective and technically feasible means of obtaining reliable information in a timely fashion for applications such as:
 - the systematic monitoring of shipping routes to detect vessels and icebergs;
 - search and rescue, and disaster response; and
 - the assessment of land stability within permafrost regimes.
- Limitations of current Earth Observation systems are largely due to restricted spatial coverage and revisit frequency. Future Earth Observation sensors of most importance for Arctic applications are the European Union's Sentinel 1 and Canadian Radarsat Constellation radar satellites. These satellites will offer increased frequency of coverage.
- In addition, the North is in darkness for a significant part of the year. The Synthetic Aperture Radar technology used in RADARSAT provides high-resolution images of the Earth's surface independent from daylight, cloud cover and weather conditions, and allows for imaging to be acquired night or day.

Surveillance Satellites

- Space-based surveillance systems are useful sources of information for sovereignty and safety applications in the Arctic. The expansion of movement through the Arctic, enabled by climate change, is increasing the need for effective search and rescue capabilities and the protection of borders from movement of illegal goods.

Marine Transport in the North

In terms of cruise ship tourism, in 2008, 2,400 passengers travelled in northern Canada on 26 transits.¹² It is anticipated that with melting sea ice in the North and increasing interest on the part of tourists, cruise ship tourism will grow.

“The amalgamation of Lower Mainland ports creating Port Metro Vancouver led to effective regional long-term planning. A similar approach could be taken in Canada’s north with the creation of a regional Canada Port Authority under the aegis of the *Canada Marine Act*.”

— *Association of Canadian Port Authorities, Submission to the CTA Review, May 2015*

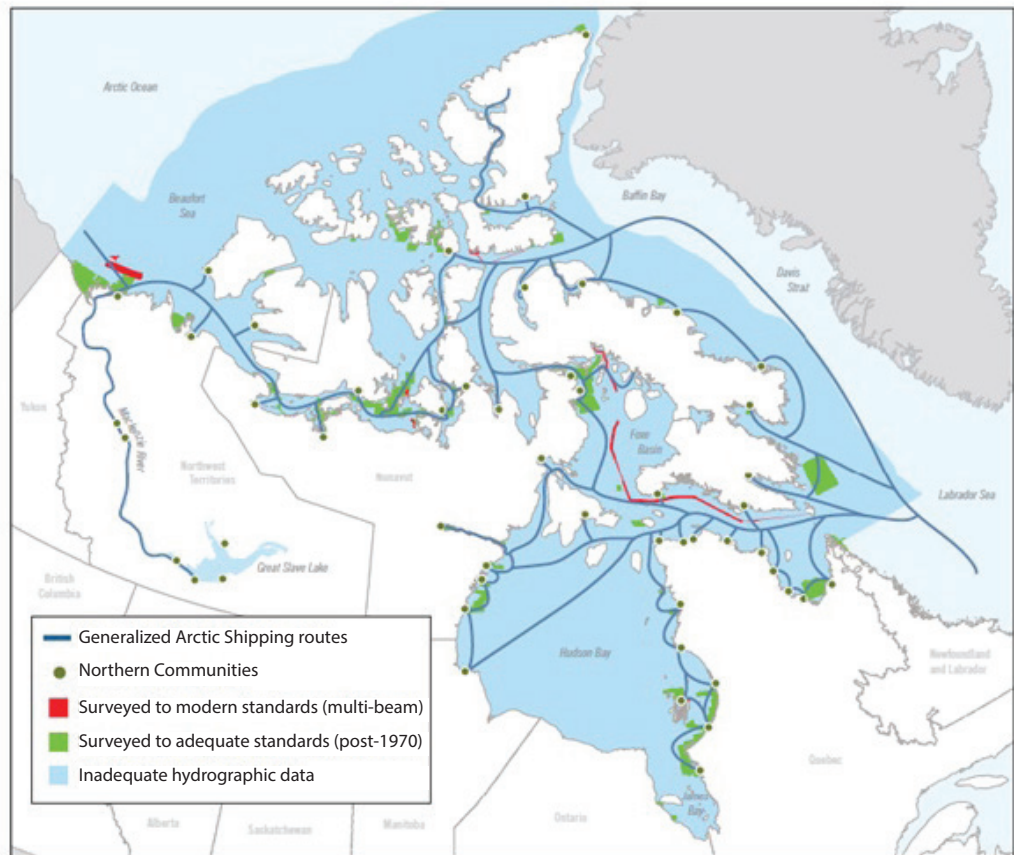
There are no Canada Port Authorities or pilotage authorities in place to oversee marine infrastructure and service delivery in the North.

“Government should establish a working group to put an arctic pilotage service in place, with draft regulations setting out the compulsory areas and other requirements for pilotage. The working group should also identify the elements of a strategy for recruiting and training a cadre of pilots to deliver the service and an appropriate administrative structure for the proper and most cost-effective management of the service.”

— *Canadian Marine Pilots’ Association, Submission to the CTA Review, December 2014*

Figure 2 shows the status of surveying of Canadian Arctic shipping as included in the 2014 Fall Report of the Commissioner of the Environment and Sustainable Development.

**FIGURE 2 –
CANADIAN ARCTIC
SHIPPING ROUTES¹³**



Note: Not all northern communities are represented on the map.
Source: Adapted from Fisheries and Oceans Canada.

Aviation in the North

Canada's northern territories have 48 certified airports and 73 aerodromes, 20 of which receive jet aircraft operations. In most cases, outside of the Territorial capitals, jet service is by older, less fuel-efficient, aircraft which can be equipped with "gravel kits" to enable safe operations on unpaved runways.¹⁴ There are only 10 paved runways in Canada's North.¹⁵ The last model of passenger jet with gravel capability was built in the 1980s.

RESEARCH: REMOTE AIR SERVICES

Comparable jurisdictions with public subsidy programs for scheduled air services to remote communities include the United States, Australia, and the European Union and its member states. Observations from these jurisdictions that are relevant to the consideration of whether and how to support northern air services in Canada include:

- Criteria for the provision of public subsidies, and what constitutes a remote region vary considerably;
- Significant administrative burden to define needs, monitor markets and prices, and manage scope and cost; and
- Ongoing risk that programs may disrupt markets and competition.

In consultations, Northern Canadian operators did not seek government subsidies to support the provision of services. Instead, they have called for a level playing field for competing for public service travel, more cooperation with large southern carriers and infrastructure improvements.

Source: RP Erickson & Associates Aviation Consultants, *Comparison of Approaches for Supporting, Protecting & Encouraging Remote Air Services*, prepared for the CTA Review, July 2015.

Figure 3 illustrates the large number of roundtrip seats for the territorial capital cities when compared with other Canadian cities with comparable population sizes.

Airport	City Population	Territorial Population	Number of Carriers	Daily North-South Flights	Annual R/T Seats
Whitehorse	28,000	37,000	3	4 to 6	270,500
Yellowknife	21,000	44,000	5	7 to 9	226,800
Iqaluit	7,000	36,000	2	2 to 3	73,000
Red Deer	91,000	—	1	3	19,700
Brandon	56,000	—	1	1	25,500
St John	68,000	—	1	4*	102,200

*St John to Toronto

**FIGURE 3 –
COMPARISON OF AIR
CARRIER TRAFFIC IN THE
TERRITORIAL CAPITALS
AND SIMILARLY-SIZED
CITIES¹⁶**

The following figure shows the market environment between carriers operating between the North and southern hubs.

**FIGURE 4 –
COMPARISON OF
AIR CARRIER MARKETS¹⁷**

Routing	Distance in km	Airfare Same Day	Yield per km	Airfare 14 Day	Yield per km
Vancouver-Calgary	686	\$275	0.40	\$154	0.23
Vancouver-Winnipeg	1862	\$327	0.18	\$402	0.22
Calgary-Winnipeg	1193	\$327	0.27	\$186	0.16
Calgary-Yellowknife	1261	\$337	0.27	\$337	0.27
Whitehorse-Vancouver	1485	\$474	0.32	\$183	0.12
Yellowknife-Edmonton	1018	\$288	0.28	\$148	0.15

“Government should establish a new fund dedicated to addressing the specific needs of northern and remote airports, namely extreme climate and the limited number of asphalt runways. Changing weather patterns are affecting service levels at the most northern and remote airports, up to 25 percent of flights at many northern airports are cancelled or diverted due to weather/visibility conditions. Automated Weather Observation Systems (AWOS) can help address these issues, but the cost of setting up electronic infrastructure can be prohibitive.”

— Federation of Canadian Municipalities, Submission to the CTA Review, December 2014

International Comparisons

Other Arctic countries have more mature transportation infrastructure to support development and security needs. Canada’s Northern transportation system is underdeveloped due to a number of factors. Notable aspects of developments from other Arctic countries are shown below.

GREENLAND

- For its size and remoteness, Greenland has relatively well-developed marine and aviation transportation infrastructure. It has no road network but of its 18 airstrips, 14 have paved runways,¹⁸ and there are port facilities in 16 centres.¹⁹
- Greenland has significant public subsidies for air services; 2009 numbers from Statistics Greenland indicate that the real cost of providing district flights in Southern Greenland is five times higher than the average ticket price.

RUSSIAN FEDERATION

- Russia’s infrastructure improvements in the Arctic are focused on making the Northern Sea Route a viable trade route over the long term. The Northern Sea Route goes from about the Barents Sea in the West to the Bering Strait in the East and, depending on the sailing lane, is between 2,200 to 2,900 nautical miles of “ice infested” sea.²⁰

UNITED STATES

- With 61 paved airports, Alaska has more than six times as many paved runways as the three Canadian territories combined.²¹
- With respect to the subsidization of remote air services, the United States Essential Air Services program has a budget of US\$249 million supporting commuter airlines in 120 communities in the contiguous United States and 43 communities in Alaska.²²

FINLAND, NORWAY AND SWEDEN

- These three Arctic countries have sophisticated transportation systems, but the conditions are different than those in Canada.
- Each has ports that operate year-round as they are not impacted by winter ice. Permafrost and discontinuous permafrost in these countries do not exist, which means that construction of transportation infrastructure is generally easier and less costly.
- Norway has 61 subsidized remote air routes (i.e. Public Service Obligation routes), more than Sweden and Finland, but only 10 percent of domestic seats are offered through the program.²³
- As of December 2014, Sweden had 10 designated Public Service Obligation routes.
- Finland is reported to have only one domestic Public Service Obligation route.²⁴

The next 20 to 30 years

NORTHERN INFRASTRUCTURE-RELATED INITIATIVES OF CANADIAN PROVINCES

Quebec's *Plan Nord* (initiated in 2011 and renewed in 2014) has a stated objective to "promote the potential for mining, energy, tourism, and social and cultural development in Quebec, north of the 49th degree of latitude." The current iteration of *Plan Nord* constitutes an "adaptable framework for future years" that will allow for other projects to be added to it, based on input from communities, and government entities, so long as they are consistent with the directions of the Plan. The development of transportation infrastructure is identified as a cornerstone of *Plan Nord* and calls for a coherent network.²⁵

In Ontario, the Ministry of Transportation is developing the Northern Ontario Multimodal Transportation Strategy, to assist in the implementation of the Growth Plan for Northern Ontario. The Government of Ontario states that the strategy "will identify transportation policy, program and investment opportunities for a modern and sustainable multimodal transportation system."²⁶

DEVELOPMENT OF NORTHERN RESOURCE CORRIDORS

The CTA Review commissioned a report to evaluate potential transport corridors in the North.²⁷ The focus was on those transport corridors that, if developed sufficiently for natural resource extraction, could also provide complementary economic benefits for the North.

The report concluded that corridor planning should "move beyond the economics of an individual project," vet prospective infrastructure on a number of criteria, and establish a corridor coalition to "build multi-user legacy infrastructure that the North could not otherwise afford."²⁸

“The future of mining lies in Canada’s vast and remote northern regions. There is a synergy between resource development and social and economic policy objectives. The government should make strategic, material, and long-term infrastructure investments in remote and northern regions that increase the viability of mining projects, and support the local, regional, and national social and economic benefits they bring to northerners, Aboriginals and all Canadians.”

— *NWT & Nunavut Chamber of Mines, Submission to the CTA Review, June 2015*

The Review heard from stakeholders that investors looking to develop mining projects in remote and northern regions are required to build the infrastructure for their operations, including ports, road and railways, and airstrips. They may also need to provide their own ice breaking and other services to support safe and reliable transport to their operations. The Northwest Territories and Nunavut Chamber of Mines call the cost of these facilities and services “a northern premium.”

“Transport Canada must play a greater role in coordinating federal safety responsibilities, and lead development of a “Northern Transportation Vision” in consultation with stakeholders.”

— *Nunavut Eastern Arctic Shipping Incorporated, Submission to the CTA Review, June 2015*

Notes

- ¹ Tom Novosel, “Resources,” Northern Research Portal (University of Saskatchewan: Exhibit, 2005-2006), accessed on November 10, online: <http://scaa.usask.ca/gallery/northern/content?pg=ex07-3>.
- ² Claudio Aporta, “The Trail as Home: Inuit and Their Pan-Arctic Network of Routes,” *Human Ecology* (April 2009: Volume 37), at 131–146, accessed on November 10, online: <http://metafactory.ca/travelingculture/wp-content/uploads/2011/07/aporta2009.pdf>.
- ³ Northwest Territories Tourism, River Transportation, (no date) accessed on November 10, 2015, online: <http://spectacularnwt.com/who-we-are/history/river-transportation>.
- ⁴ Bob Weber, “Canada’s aging Arctic airports reducing service to northerners, pilots say” *Toronto Star* (June 2, 2013), accessed on November 10, 2015, online: http://www.thestar.com/news/canada/2013/06/02/canadas_aging_arctic_airports_reducing_service_to_northerners_pilots_say.html.

- ⁵ Northwest Territories Department of Transportation, *Connecting Us: Northwest Territories Transportation Strategy* (Yellowknife: Government of Northwest Territories, 2015), at 29, accessed on November 2, 2015, online: http://www.dot.gov.nt.ca/_live/documents/content/477-Transportation%20Strategy-proof%2006-04-15%20FINAL.pdf.
- ⁶ Canadian Space Agency, *Canadian Space Milestones* (last modified: July 31, 2015), accessed on November 2, 2015, online: <http://www.asc-csa.gc.ca/eng/about/milestones.asp>.
- ⁷ Canadian Space Agency, *RADARSAT-1* (last modified: March 21, 2014), accessed on November 2, 2015, online: <http://www.asc-csa.gc.ca/eng/satellites/radarsat1/default.asp>.
- ⁸ Canadian Space Agency, *ibid.*
- ⁹ National Snow and Ice Data Center, *Arctic Sea Ice Extent* (no date), accessed on November 2, 2015, online: <http://nsidc.org/arcticseaicenews/files/2015/09/Figure2a.png>.
- ¹⁰ Mining Association of Canada, *Leveling the Playing Field: Quantifying the Cost Differential of Exploration and Mineral Development in Northern Canada* (April, 2015), at 9, accessed on November 2, 2015, online: http://mining.ca/sites/default/files/documents/Levelling_the_Playing_Field.pdf.
- ¹¹ Canadian Space Agency, *Submission to the Canada Transportation Act Review* (July 21, 2015).
- ¹² M. Lück, P. T. Maher and E. J. Stewart, *Cruise Tourism in Polar Regions-Promoting Environmental and Social*, (Earthscan: London, England), at 4, cited in Hodgson and Associates, *Exploring Plausible Futures for Marine Transportation in Canadian Arctic*, prepared for Transport Canada (November 30, 2013), accessed on November 10, 2015, online: <http://www.dal.ca/content/dam/dalhousie/images/faculty/science/marine-affairs-program/Marine%20Transportation%20in%20Canadian%20Arctic%20Report%202014.pdf>.
- ¹³ Office of the Auditor General of Canada, *2014 Fall Report of the Commissioner of the Environment and Sustainable Development*, (Ottawa: Public Works and Government Services Canada, 2014), accessed on November 10, 2015, online: http://www.oag-bvg.gc.ca/internet/English/parl_cesd_201410_03_e_39850.html.
- ¹⁴ Kate Fletcher, "Guest Editorial," *Transport Canada Website*, accessed on November 19, 2015, online: <https://www.tc.gc.ca/eng/civilaviation/publications/tp185-3-09-editorial-3947.htm>.
- ¹⁵ Federation of Canadian Municipalities, *Northern and Remote Airports* (September 2, 2015), accessed on November 10, 2015, online: <http://www.fcm.ca/home/issues/rural-and-northern/northern-communities/northern-and-remote-airports.htm>.

- ¹⁶ RP Erickson & Associates, *Comparison of Approaches for Supporting, Protecting & Encouraging Remote Air Services*, prepared for the CTA Review, (June, 2015), at 24.
- ¹⁷ *Ibid.* At 26.
- ¹⁸ *Ibid.*
- ¹⁹ Association for European Transport and Contributors, 2011, *The Transport Commission of Greenland*, accessed on November 10, 2015, online: <http://abstracts.aetransport.org/paper/download/id/3692>, at 5.
- ²⁰ W. Ostreng et al., *Shipping in Arctic Waters: A comparison of the Northeast, Northwest and Trans-Polar Passages*, (Springer Praxis Books, 2013).
- ²¹ Federation of Canadian Municipalities, Northern and remote airports, *op. cit.*
- ²² RP Erickson & Associates, *op. cit.*, at i.
- ²³ *Ibid.* at 9.
- ²⁴ *Ibid.*
- ²⁵ Government of Quebec, "2015-2020 Action Plan," *The Plan Nord: Toward 2035* (April 2015), accessed on November 10, 2015, online: http://plannord.gouv.qc.ca/wp-content/uploads/2015/04/Synthese_PN_EN.pdf.
- ²⁶ Government of Ontario submission to the CTA Review, February 12, 2015.
- ²⁷ Kells Boland, PROLOG Canada Incorporated, *A Preview of Northern Resource Corridor Development: Prospects for Arctic and Northern Surface and Marine Corridors*, prepared for the CTA Review, (July 2015).
- ²⁸ *Ibid.* At 59.

Appendix E

Innovation

Some Background on Transportation Innovation

MARINE

The introduction of mechanical propulsion, combustion engines and metal bodies in the late 19th century have enabled larger and larger ships to be built in order to leverage economies of scale. That said, a 2015 International Transport Forum (ITF) study found that approximately 60 percent of cost savings on vessel costs per container being transported by today's large new container ships are the result of using more efficient engines, and not directly due to scale.¹ A report by A.T. Kearney Korea estimates that a 20 to 40 percent reduction in fuel use could result from the deployment of more modern vessels, which are double the size of those generally in service today.²

Innovations that reduce fuel use also yield important environmental benefits. For example, Transport Canada's Shore Power Program enables cruise ships to plug-in to the local electrical grid while docking at a Canadian port, allowing cruise ships to turn off their engines, thereby reducing emissions. Port Metro Vancouver was the first shore power enabled port, in partnership with the Province of British Columbia, Holland America Line, Princess Cruises and BC Hydro. Vancouver's Shore Power project was found to have reduced 1,521 tonnes of greenhouse gas emissions from April to October 2010, when 44 connections were installed at the Canada Place Terminal, whose connections provided 2,024 MWh of electricity in lieu of 476 tonnes of diesel fuel over a 268-hour period.³

RAIL

Transportation costs make up a larger component of the delivery price of bulk commodities, relative to higher value-added goods. Thus, Canadian producers may benefit from innovations that increase railway productivity and capacity. For example, in recent years, the railways have introduced grain hopper cars that are shorter, can carry more grain, and allow for more cars to be carried by a unit train.

AUTOMOBILE

The automobile industry has strong market-driven incentives to innovate; for example, with a focus on nurturing and responding to consumers' needs and desires. Examples from recent decades include technologies that: reduce fuel use and improve environmental performance (e.g. hybrid/electric engines and continuously variable transmissions), increase convenience (e.g. satellite navigation systems), and enhance safety (air bags, traction control). The latest innovations involve increasing use of automation, from lane-control and parking assistance, to fully autonomous vehicles.

Autonomous vehicles (also known as driverless or self-driving cars), are capable of operating without human input by sensing their environment, navigating from maps and databases, and communicating with other vehicles and road-side infrastructure in real-time. For autonomous vehicles to operate in mixed traffic, a new regulatory framework would be required to ensure that anticipated safety and economic benefits are all realized. Various jurisdictions in North America have been proceeding independently in preparation for the arrival of autonomous vehicles on the mass market. Several American states have already begun legislating for their use on public roads. Without coordination at the federal level, there is a risk that these initiatives will result in a patchwork of incompatible rules. A Canada-United States regulatory framework that sets the appropriate parameters could

guide states, provinces and territories in the drafting of new laws in preparation for the deployment of autonomous vehicles in their respective jurisdictions. This would ensure harmonization with the United States, and consistent requirements from coast to coast across Canada.

“No new infrastructure project (like a new bridge or highway or transit system of any kind) should be planned or built without an “automated vehicles impact audit” to determine whether it will be appropriate in the coming Age of Autonomous Vehicles.”

— *Brian Flemming, CM, QC, DCL Presentation to the Centre for Transportation Infrastructure, November 2014*

SATELLITE AND WIRELESS COMMUNICATIONS

Many recent innovative technologies have been made feasible through communications advancements. The first man-made satellite was launched into orbit in 1957, and today, constellations of satellites allow complete global coverage for surveillance, communications, Internet access, etc. that support improved tracking, navigation, search and rescue, and so on (see Backgrounder on Canada’s Satellites in Appendix D). Brad Tipler’s 2015 study prepared for the CTA Review⁴ assessed the increasing integration of wireless technology in transportation. The deployment and integration of the next-generation of satellite and wireless communication technologies will create an information-based ecosystem of connected vehicles and transportation infrastructures, whose applications will increasingly rely on space-based technology.

Satellite-based navigation technology is becoming ubiquitous in all modes of transport. One example is in air traffic management. Nav Canada is the founding partner of Aireon,⁵ which is deploying leading-edge technology on the new Iridium NEXT⁶ satellites, which will provide continuous global coverage including of polar regions. This will replace ground-based radar systems that leave gaps in areas over vast expanses of ocean and uninhabited terrain (Aircraft have been lost within these gaps in coverage in the past). The system will also allow aircraft to be routed more closely together, on the most efficient courses, to reduce fuel use, emissions and cost. Air navigation service providers in Italy, Ireland and Denmark have already bought in to the system.

The vast amounts of data generated by satellites can also be harvested to provide accurate historic information to support better transportation planning, forecast and operations. Big Data refers to the collection and exploitation of such large data sets. This in and of itself is not new. What distinguishes Big Data from previous generations of analytics for the ITF, for example, is “the confluence of new data collection mechanisms based on ubiquitous digital devices, greatly enhanced storage capacity and computing power as well as enhanced sensing and communication technologies. These technologies enable near real-time use and transmission of massive amounts of data.”⁷

Where Canada is Positioned in the World

Brendon Hemily, in a 2015 study commissioned by the CTA Review, concluded that Canada is poorly positioned for a future that will be characterized by disruptive technologies.⁸ Countries with well-developed innovation cultures, such as the Netherlands and United Kingdom, have already invested heavily in transportation related technologies. For example, the Netherlands recently invested €245 million in traffic information and management for its road network;⁹ and the United Kingdom has invested in a Driverless Car Project.¹⁰ Such initiatives should better position these countries to compete internationally in the future. This finding is supported in World Economic Forum rankings on innovation, where Canada also generally underperforms relative to the country's overall ranking of 13th in the Global Competitiveness Index (Figure 1).

**FIGURE 1 –
WORLD ECONOMIC
FORUM GLOBAL
COMPETITIVENESS
INDEX TOP 15 RANKED
COUNTRIES AND
RESPECTIVE RANKINGS
ON INNOVATION AND
TECHNOLOGY¹¹**

Country	Global Competitiveness Index – Overall Ranking	12.01: Capacity for innovation	12.02: Quality of scientific research institutions	12.03: Company spending on R&D	12.04: University-industry collaboration in R&D	12.05: Gov't procurement of advanced tech products	12.06: Availability of scientists and engineers	9.0 : Availability of latest technologies
Switzerland	1	1	1	1	3	17	23	7
Singapore	2	19	12	11	5	4	11	13
United States	3	2	4	3	2	11	4	2
Germany	4	5	9	6	10	10	15	12
Netherlands	5	16	6	18	9	21	22	10
Japan	6	14	7	2	16	14	3	16
Hong Kong SAR	7	29	29	29	28	38	41	22
Finland	8	6	10	4	1	33	1	1
Sweden	9	4	11	7	11	23	14	4
United Kingdom	10	10	2	17	4	34	18	5
Norway	11	18	17	20	15	16	12	3
Denmark	12	11	16	15	20	65	35	23
Canada	13	23	18	26	19	55	10	11
Qatar	14	12	14	9	8	1	2	20
Taiwan, China	15	21	26	13	14	29	28	36

Note: Top 10 rankings for each indicator are in **bold**.

As new applications for wireless and space-based technologies continue to develop, Canada has opportunities to become a stronger global player in the development and exploitation of innovations that will improve the performance of Canada's transportation system and global networks. For instance, Canada can lead in the establishment of industry standards domestically, as well as internationally, by working with countries with similar geographic/climatic conditions and policy priorities.

Notes

- ¹ ITF, *The Impact of Mega-Ships – Case-Specific Policy Analysis* (Paris: OECD/ITF, May 2015), at 18 Table 1.2, accessed on October 25, 2015, online: http://internationaltransportforum.org/Pub/pdf/15CSPA_Mega-Ships.pdf.
- ² A.T. Kearney Korea LLC, *Balancing the Imbalances in Container Shipping* (2012) at 4, accessed on October 23, 2015, online: https://www.atkearney.com/documents/10192/254830/Balancing_the_Imbalances_in_Container_Shipping_.pdf/d4a46d4a-d42f-4738-9b37-6343698d1007.
- ³ Transport Canada, *Case Study – Port Metro Vancouver Shore Power Project* (Ottawa: Transport Canada, 2012), accessed on October 23, 2015, online: <https://www.tc.gc.ca/eng/programs/environment-sptp-case-study-2690.htm>.
- ⁴ Brad Tipler, *Utilizing Wireless Communication Applications to Improve Transportation Safety and Efficiency*, prepared for the CTA Review (June 2015).
- ⁵ Aireon LLC is a joint venture between Iridium Communications, NAV Canada, ENAV, the Irish Aviation Authority and Naviair, with support from the U.S. Federal Aviation Administration (FAA) and supplier Harris Corporation and Exelis.
- ⁶ Iridium NEXT is a constellation of satellites network with 66 Low-Earth Orbiting advanced communications satellites, 6 In-Orbit space satellites and 9 ground spaces. Iridium NEXT will provide continuous coverage over the entire earth's surface. Aireon is installing Automatic Dependent Surveillance-Broadcast (ADS-B) technology on these satellites to provide aircraft communications, navigation and surveillance. ADS-B is always turned-on, and provides accurate position data for surveillance and continuous broadcasting of aircraft positions.
- ⁷ ITF, *Big Data and Transport: Understanding and assessing options* (Paris: OECD/ITF, Corporate Partnership Board Report, 2015), accessed on November 10, 2015, online: http://www.internationaltransportforum.org/pub/pdf/15CPB_BigData.pdf.

- ⁸ Brendon Hemily, on behalf of ITS Canada, *Surface Transportation-Related Technological Innovation in Canada and Abroad*, prepared for the CTA Review (March 2015).
- ⁹ Ministerie van Infrastructuur en Milieu, *ITS in the Netherlands – Progress Report 2010–2014*, at 13.
- ¹⁰ Department for Transport, UK, *Pathway to Driverless Cars- Summary report and action plan* (London: February 2015), accessed on November 10, 2015, online: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/401562/pathway-driverless-cars-summary.pdf.
- ¹¹ Source: CTA Review with information from World Economic Forum, 2015a, *op. cit.*, at 132-361.

Appendix F

Climate Change

The most significant environmental consequences from transportation are air pollutants and greenhouse gas emissions. The development of emissions regulations, the use of economic measures and today's innovations can help the transportation sector become a better steward of the environment.

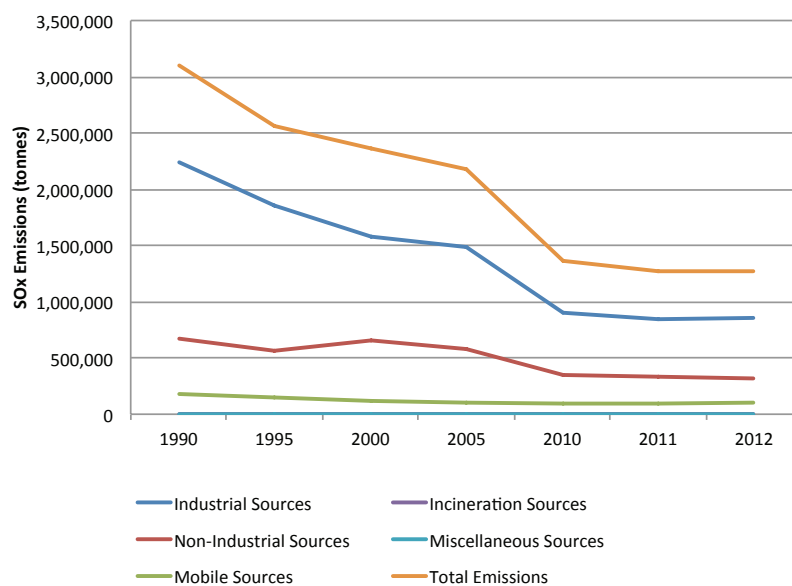
AIR POLLUTANTS

Air pollutants such as sulphur oxides, nitrogen oxides, particulate matter and ozone result from the incomplete combustion of fuel particles, resulting in air quality issues such as smog and acid rain. Smog and acid rain have proven links to causing cardiac and respiratory illnesses, as well as acidification of lakes, rivers and streams which harms wildlife.

*The Canadian Medical Association Journal*¹ advocates for following the lead of the World Health Organization in updating acceptable levels of small particulate matter, nitrogen dioxide and ground-level ozone. These pollutants have significant respiratory impacts on children, and can increase the risk of cardiac diseases (such as heart attacks, chronic lung disease and emphysema) among adults. Air pollution is more concentrated in areas close to airports, rail yards, highway corridors and high congestion areas such as downtown cores.

Environment Canada has been publishing *Canada's Air Pollutant Emission Inventory* since 1973. The numbers have reflected the positive outcomes of regulations designed to decrease air pollutants from all modes of transportation. Since then, Canadian and American governments have worked together to create a Canada-U.S. Air Quality Agreement and a North American Emissions Control Area; the former has resulted in a 58 percent² decrease of sulphur oxides over 22 years, and the latter has the potential to reduce the same pollutants by 96 percent,³ thereby improving air quality and enhancing public health. The North American Emission Control Area is supported by the 2013 *Vessel Pollution and Dangerous Chemicals Regulations*, under the *Canada Shipping Act, 2001*, which implemented the designated area and limits the sulphur content of marine fuel used within the designated area to 1 percent, followed by a 0.1 percent limit in 2015. Domestically, Canada has implemented regulations for cleaner fuels⁴ which affect all modes of transportation.

**FIGURE 1 —
CANADA'S SULPHUR OXIDE
EMISSIONS OVER TIME⁵**



Over the last two and a half decades, Canada’s economy has nearly tripled⁶ and its population has grown by about 25 percent⁷ (see Appendix A, Figures 9 and 5). Today, according to the 2014 National Pollutant Release Inventory, the transportation sector accounts for 0.2 percent of Canada’s particulate matter emissions, 6 percent of sulphur oxide emissions and 55 percent of nitrogen oxide emissions. Since 1990, this represents a reduction of 92 percent in particulate matter emissions, only a 4 percent increase in sulphur oxide emissions (Figure 1), and more than a 9 percent decrease in nitrogen oxide emissions (Figure 2). This means that despite the significant growth in population and economy, the transportation sector has nearly eliminated its emissions of particulate matter, and has stabilized its per-tonne emissions of sulphur and nitrogen oxides.

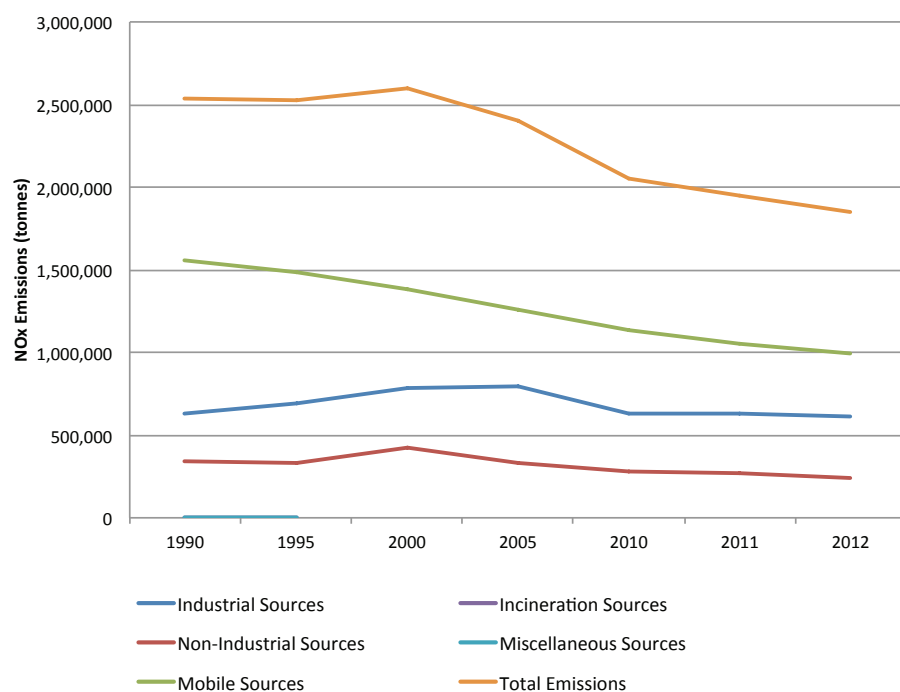


FIGURE 2 — CANADA’S NITROGEN OXIDE EMISSIONS OVER TIME⁸

GREENHOUSE GAS EMISSIONS

Climate change, as defined by the United Nations, is the “change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere.”⁹ Carbon dioxide is the primary greenhouse gas emitted from the combustion of fossil fuels; it also alters the composition of the atmosphere by affecting its ability to absorb and emit radiation. Effectively, the best way to reduce greenhouse gas emissions, and consequently mitigate climate change, is to reduce the amount of fossil fuels burned. Over the years, Canada’s transport sector has become more fuel efficient, reducing its greenhouse gas emissions per tonne of goods transported or per passenger moved per kilometre. However, the sector still relies heavily on the combustion of fossil fuels.

The Canadian Medical Association has reported that health impacts stemming from greenhouse gas emissions are associated with an increase in natural disasters; a rise in infectious diseases; increase in food- and water-borne illnesses; salination of fresh water supply from warming and rising of sea levels; higher levels of cardio-respiratory morbidity and mortality, asthma and allergens; and loss of livelihoods from diseases and/or natural disasters.¹⁰ Greenhouse gas emissions are a global issue and have to be addressed as such.

According to Environment Canada, Canada is responsible for approximately 1.6 percent of global greenhouse gas emissions.¹¹ In 2013, the transportation sector accounted for 23 percent of all of Canada's greenhouse gas emissions according to *Canada's National Inventory Report* to the United Nations for the years 1990 to 2013. In 2013, Canada recorded transportation greenhouse gas emissions as follows: 57 percent for passenger transportation and 36 percent for freight transportation.¹²

In North America, Canada and the United States developed harmonized regulations to decrease greenhouse gas emissions by increasing the fuel efficiency of light-, medium- and heavy-duty fleets, and implemented voluntary measures to reduce greenhouse gas emissions in other modes. According to the Canada's National Energy Board, "both passenger cars and light trucks have experienced improvements in fuel economy due to advancements in vehicle technology."¹³ Both governments implemented similar fuel efficiency programs¹⁴ to encourage sales-weighted fuel economy for vehicles sold in the North American market. There was a noticeable improvement in the fuel economy of the Canadian vehicle fleet as a whole.¹⁵

The *Canada-U.S. Voluntary Action Plan to Reduce Greenhouse Gas Emissions from Locomotives*, (an initiative under the auspices of the Canada-United States Regulatory Cooperation Council) builds on existing collaboration between both governments on locomotive air pollutant regulations. Final targets and measures to be included in the Voluntary Action Plan should be completed in 2016.

In 2015, there were several key events that took place in the lead up to the United Nations Climate Change Conference, Conference of the Parties 21 (COP 21), held in Paris in December 2015: the International Transport Forum (ITF) 2015 Annual Summit in May, The G-7 Summit (June), the Third International Conference on Financing for Development (July), and the General Assembly of the United Nations (September).

At the ITF 2015 Annual Summit, the Council of Ministers of Transport issued a *Declaration from Ministers on Transport, Trade and Tourism* on the value of pursuing low-carbon transport. The Declaration stated that ministers "recognize that the new international climate agreement, which is to be forged and agreed by COP 21, should encourage mainstreaming of low-carbon transport in global policies on climate change and sustainable development."¹⁶

The G-7 Leaders' Declaration in June 2015 expressed a "strong determination to adopt a protocol, another legal instrument" at COP 21 that would be "applicable to all parties that is ambitious, robust, inclusive, and reflects evolving national circumstances." The agreement "should enhance transparency and accountability including through binding rules at its core to track progress towards achieving targets" with the "global goal to hold the increase in global average temperature below 2°C." The common vision for greenhouse gas emissions reductions is to reduce emissions by "40-70 percent by 2050 compared to 2010, recognizing that this challenge can only be met by a global response."¹⁷ The G-7 Declaration stated that members commit to the long-term objective of applying effective policies and actions throughout the global economy to incentivize investments towards low-carbon growth opportunities.

The Third International Conference on Financing for Development took place in Addis Ababa, in July 2015. The Addis Ababa Action Agenda provided “the new framework [which] would help align finance flows with economic, social and environmental priorities. Its policy actions drew upon all sources of finance, technology, innovation, trade and data, mobilizing the means for a global transformation towards sustainable development.”¹⁸ The Agenda provides the foundation for implementing a global sustainable agenda. The importance of nationally owned sustainable development strategies supported by integrated national financing frameworks was also stressed. Ministers stated in the agreement that “each country has primary responsibility for its own economic and social development and that the role of national policies and development strategies cannot be overemphasized.”¹⁹

The General Assembly of the United Nations Summit took place in New York in September 2015, and leaders adopted the Addis Ababa Action Agenda which provides a foundation for implementing the global sustainable post-2015 Development Agenda and the Millennium Development Goals with respect to ensuring environmental sustainability. The Addis Ababa Action Agenda laid an economic foundation for COP 21.

Also in preparation for COP21, six major oil companies (Royal Dutch Shell, BG Group, BP Global, Eni S.p.A., Statoil, and Total S.A.) sent an open letter to the United Nations in June 2015 “expressing their readiness to further limit greenhouse gas emissions if States introduce carbon pricing systems where they do not yet exist at the national or regional levels and eventually link them into a global system that puts a price on the environmental and economic costs of greenhouse gas emissions. The companies indicate their interest in engaging in dialogue to contribute to the creation and implementation of a workable approach to carbon pricing.”²⁰ The World Bank President Jim Yong Kim welcomed the call “for a price on carbon...an important step in global efforts to drive the world’s economy toward a low-carbon, resilient future and lower climate risks.”²¹

“For us to do more, we need governments across the world to provide us with clear, stable, long-term, ambitious policy frameworks. This would reduce uncertainty and help stimulate investments in the right low carbon technologies and the right resources at the right pace.”

— *Royal Dutch Shell, BG Group, BP Global, Eni S.p.A., Statoil, and Total S.A., Letter to the Executive Secretary of the United Nations Framework Convention on Climate Change, June 2015*

Leaders of major food and beverage companies also released a joint letter to global leaders explaining that “climate change is bad for farmers and for agriculture.” They have asked leaders “to embrace the opportunity presented to you in Paris, and to come back with a sound agreement, properly financed, that can affect real change.” The World Resources Institute reports that large American companies have signed the *American Business Act on Climate* pledge “to demonstrate their support for action on climate change and the conclusion of a climate change agreement in Paris that takes a strong step forward toward a low-carbon, sustainable future.”²²

The G-7 leaders called upon the international community to propose post-2020 emission targets in their submissions of Intended Nationally Determined Contributions prior to COP21.²³ Canada's Intended Nationally Developed Contributions that were submitted in advance of COP21 stated that "Canada intends to achieve an economy-wide target to reduce its greenhouse gas emissions by 30 percent below 2005 levels by 2030."²⁴ According to the World Resources Institute, if countries achieve their proposed COP21 targets, global emissions will be approximately 4 percent lower in 2025 and 7 percent lower in 2030 than they would have been with existing 2020 pledges.²⁵

CLIMATE CHANGE ADAPTATION

Climate change adaptation is based on the recognition that climate change has arrived. The University of Waterloo's Climate Change Adaptation Project shows some major climate trends in Canada. Models revealed that the temperature is rising across the country leading to higher than average summer temperatures and an increase in the number of heat and humidex advisories. Consequently, delays in cooling and the emergence of ice cover in the Great Lakes are expected. Northern regions will probably experience a 4 to 8 degree Celsius increase in temperature for autumn and winter, likely resulting in the opening of northern water passages, expansion of resource extraction due to melting permafrost, and vulnerable ice and all-weather roads due to melting permafrost.²⁶

Climate variability and change threaten critical national infrastructure and the Canadian economy. Climate events in recent years have offered insight into what continued changes might mean for infrastructure: floods affecting management of road systems, degradation of permafrost threatening the integrity of building structures (for example bridges), more extreme weather events inundating coastlines and disrupting crucial services (such as ports which link domestic and international supply chains).²⁷ Climate change adaptation action aims to reduce vulnerabilities and increase the resilience of systems to climatic impacts. In the context of transportation, resilience refers to the physical strength and durability of the infrastructure to withstand adverse impacts without losing its basic function as well as its ability to recover quickly and at minimal cost.²⁸

The 2011 Report of the National Round Table on the Environment and the Economy, *Climate Prosperity – Paying the Price: The Economic Impacts of Climate Change for Canada*, concluded that climate change adaptation is a cost-effective way to alleviate its impacts. For example, intensive heat places a great deal of strain on city infrastructure. As extreme weather becomes more frequent, infrastructure decision-making must begin to incorporate more resilient design and construction practices.²⁹

In an attempt to address these uncertainties, Natural Resources Canada's Adaptation Platform (2011-2016) was designed to bring together institutional, financial and knowledge resources to enable development and widespread use of adaptation information and tools. The platform fosters collaboration across Canada's provincial and territorial governments, federal government departments, natural resource industries and professional organizations, to collaborate on shared adaptation priorities. As discussed in Chapter 4, Transport Canada's Northern Transportation Adaptation Initiative has supported work on the adaptation of transportation infrastructure to climate change.³⁰ This initiative was evaluated in June 2015 and it was recommended that Transport Canada work with other organizations active in northern transportation adaptation to ensure coordination, avoid duplication, and identify opportunities for streamlining and/or partnering³¹

Decoupling, innovation and performance-based regulations are mechanisms which can be developed collaboratively through a Centre of Excellence and an Advisory Committee on Transportation and Logistics (as described in Appendix B) in the best interest of the long-term vision for Canada's transportation system.

MOVING FORWARD

In light of international environmental commitments, the prediction of scarcity of oil in the future³² and Canada's need to reduce current emission levels, the cost of transportation is likely to increase.³³ Economic growth from transportation and environmental sustainability should occur in tandem.

Notwithstanding technological progress and the potential for cost-effective energy efficiency improvements and policy efforts, the transportation system has not fundamentally changed. An increase in energy efficiency and the combustion of cleaner fossil fuels reduces impacts at the margins of the transportation sector; however, greenhouse gas emissions still continue to rise. Similarly, the latest international research from the ITF shows that the transportation intensity of GDP also declines in the most advanced economies: that the relationship between GDP and freight tonne-kilometres successively decreases as per capita incomes grow. This only leads to marginal reductions in emissions.

Consistent with both trends toward the reduced emissions intensity of transport, and the reduced transport intensity of economic growth, Canada is demonstrating progress in decoupling emissions from economic growth. Economy-wide emissions and transport sector emissions have remained relatively consistent throughout 2010 to 2012 as the economy grew 4.4 percent over that same time.³⁴ The transportation sector accounted for 25 percent of greenhouse gas emissions in 1990 and 23 percent in 2013; the relative share of emissions from transport have remained fairly constant, irrespective of growth and changes in the economy and population.³⁵ However, to achieve the scale of reductions of emissions from transport that would be required to meet international commitments on emissions, greater decoupling would need to be achieved. To do so, stronger mechanisms would be necessary, such as a measure or system for putting a price on carbon emissions.³⁶

The OECD report *Effective Carbon Prices*, found that carbon taxes and emissions trading systems are the most cost-effective way to put a price on emissions and internalize them into the market.³⁷ They may be the most effective means to reduce emissions, and both the IMF and the World Bank encourage carbon taxes and emissions trading systems. Other policies are less economically preferable than carbon pricing (such as fuel taxes). For example, the study showed that the average cost of reducing a tonne of emissions in road transport is up to eight times more expensive when using alternatives other than fuel taxes.³⁸ The reason that carbon pricing is effective is because it makes polluting activities more expensive and green technologies more affordable, driving market-based decisions.

“The ‘polluter pays principle’ states that whoever is responsible for damage to the environment should bear the costs associated with it.”

— *The United Nations Environmental Programme, Taking Action: An Environmental Guide For You and Your Community, 1995*

There are a number of mechanisms available to the transport sector to ameliorate transportation emissions and economic growth. For example:

- Logistic solutions, such as intermodality, multimodality, and optimization of the supply chain are instruments which aim to reduce distance travelled and maintain or increase tonnage transported.
- Modal shifting can be used as a tool to shift transport demand to less energy-intensive modes of transport. Road transportation produces 68 percent of Canada's transportation greenhouse gas emissions and shifting to rail or marine modes would result in a lower overall energy and emissions output.
- Ongoing structural change in the economy, which increases the share of the service sector in the GDP can enhance transport sector energy efficiency. Volume of physical production and its movements from production market to consumption market have a determining influence on travel distances. When economic growth is driven especially by the tertiary (service) sector, and trucks with high transportation capacities are used for freight transport, travels can be reduced and energy necessary to satisfying the demand of economic growth in term of transportation can be also reduced.

Governments also have available tools to reduce emissions, such as:

- Market-based and economic instruments could encourage energy efficiency and a switch to cleaner fuels, such as carbon trading systems or, higher taxes for freight transport using diesel with higher sulphur content. Additionally, economic instruments could encourage technology and innovation to assist in the advancement of higher energy efficiency, new sources of energy and mitigation of harmful emissions from transportation.
- Regulatory instruments are effective for setting emissions standards and implementing measures to aid that achievement.³⁹
- Transport planning can reduce travel distances, especially in urban areas. Developing public transport networks with private investment could improve transport planning.

The latest international research from the ITF estimated that "emissions from freight transportation will increase by 290 percent by 2050 and quadruple CO₂ emissions."⁴⁰ As a result, it is critical for Canada to address market failure in the short term and to develop the mechanisms to internalize external environmental costs to prepare Canada for the long-term growth in freight transportation and its environmental performance.

An Advisory Committee on Transportation and Logistics could promote greater government-industry collaboration to advance environmental outcomes in the transportation system by setting objectives and reporting on results. Together, the sector could set the future trajectory of greenhouse gas emissions with targets that push the limits of operational efficiencies and technological advancements.

Notes

- ¹ Michael Brauer, Conor Reynolds, Perry Hystad, "Traffic-related air pollution and health in Canada," *CMAJ* (December 10, 2013, vol. 185, no. 18, First published October 21, 2013), accessed on November 23, 2015, online: <http://www.cmaj.ca/content/185/18/1557>.
- ² Environment Canada, *Canada – United States Air Quality Agreement Progress Report 2014*, (Ottawa: 2014) accessed on November 23, 2015, online: <https://www.ec.gc.ca/Air/D560EA62-2A5F-4789-883E-9F4DA63C58CD/AQA%20Report%202014%20ENG.pdf>.
- ³ Environment Canada, *Sulphur in Diesel Fuel Regulations – Factsheet* (last modified: June 21, 2012), accessed on November 23, 2015, online: <https://www.ec.gc.ca/energie-energy/default.asp?lang=En&n=1764584F-1>.
- ⁴ Environment Canada, *On-Road Vehicle and Engine Emissions Regulations, Sulphur in Gasoline Regulations, Sulphur in Diesel Fuel Regulations* (last modified: July 29, 2015), accessed on November 23, 2015, online: <http://news.gc.ca/web/article-en.do?nid=1009859>. Since 1971, the federal government has adopted increasingly stringent standards for smog-forming emissions from motor vehicles. The most recent emission regulations for new on-road vehicles and engines were published in the *Canada Gazette*, Part II, on January 1, 2003. The On-Road Vehicle and Engine Emission Regulations came into force on January 1, 2004. The Regulations align emission standards with the United States federal standards and apply to light-duty vehicles (e.g., passenger cars), light-duty trucks (e.g., vans, pickup trucks, sport utility vehicles), heavy-duty vehicles (e.g., trucks and buses), heavy-duty engines and motorcycles <http://www.ec.gc.ca/Air/default.asp?lang=En&n=AE4ECEC1-1>.
- ⁵ Source: Environment Canada, *National Pollutant Release Inventory, 2014*. Caption – The graph shows a reduction in sulphur oxide emissions in all sectors, including transportation (mobile sources). Mobile sources emissions can be seen approaching near zero levels. Sectors shown are: Industrial sources (Blue), Non-Industrial sources (Red), Mobile sources (Green), Incineration sources (Purple), Miscellaneous sources (Light Blue), Total Emissions (Orange).
- ⁶ OECD, "May 2014, Long-term Baseline Projections," *Economic Outlook*, No 95, accessed on July 15, 2015, online: <http://stats.oecd.org/>. See Appendix A.
- ⁷ United Nations, Department of Economic and Social Affairs, 2015, *World Population Prospects (2015 Revision)*, (New York: 2015), accessed on July 15, 2015, online: <http://esa.un.org/unpd/wpp/>. See Appendix A.
- ⁸ Source: Environment Canada, *National Pollutant Release Inventory, 2014*. Caption – The graph shows a reduction in nitrogen oxide emissions in all sectors, including transportation (mobile sources). Nitrogen oxide emissions from Mobile sources have reduced by more than 500,000 tonnes. Sectors shown are: Industrial

sources (Blue), Non-Industrial sources (Red), Mobile sources (Green), Incineration sources (Purple), Miscellaneous sources (Light Blue), Total Emissions (Orange).

- ⁹ Intergovernmental Panel on Climate Change, *Fourth Assessment Report: Climate Change 2007* (Geneva: World Meteorological Organization, 2007), accessed on November 23, 2015, online: https://www.ipcc.ch/publications_and_data/ar4/syr/en/mains1.html.
- ¹⁰ Canadian Medical Association "Climate Change and Human Health" *CMA Policy*, (2010) accessed on November 23, 2015, online: <http://policybase.cma.ca/dbtw-wpd/Policypdf/PD10-07.pdf>.
- ¹¹ Environment Canada, *Global Greenhouse Gas Emissions* (last modified: April 17, 2015), accessed on November 23, 2015, online : <https://www.ec.gc.ca/indicateurs-indicators/default.asp?lang=en&n=54C061B5-1>.
- ¹² Environment Canada, National Inventory Report 1990-2013 Part I (United Nations Framework Convention on Climate Change: 2015), accessed on November 23, 2015, online: http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/8812.php.
- ¹³ Source: National Energy Board, *Canadian Energy Demand: Passenger Transportation Energy Briefing Note* (January 2009) accessed on November 23, 2015, online: <https://www.neb-one.gc.ca/nrg/ntgrtd/mrkt/archive/2009pssngrtrnsprttn/pssngrtrnsprttn-eng.pdf>.
- ¹⁴ The United States established the Corporate Average Fuel Economy standards for motor vehicles which required improved sales-weighted fuel economy for both new passenger and light trucks sold. In Canada, the Company Average Fuel Consumption was a similar program with equivalent targets. The standards were similar in both countries because of the highly integrated nature of the Canadian and American auto industries. (source NEB)
- ¹⁵ Government of Canada, *Background Paper for the Development of Motor Vehicle Fuel Consumption Regulations*, January 2008, at 12.
- ¹⁶ ITF "Declaration from Ministers on Transport, Trade and Tourism," 2015 Annual Summit Media Release (May 28, 2015), accessed on November 23, 2015, online: <http://www.internationaltransportforum.org/Press/PDFs/2015-05-28-Ministerial-Declaration-.pdf>.
- ¹⁷ Foreign Affairs, Trade and Development Canada, Leaders Declaration G7 Summit Germany (last modified: June 8, 2015), accessed on November 23, 2015, online: http://www.international.gc.ca/g8/g7_germany_declaration-g7_allemande_declaration.aspx?lang=eng
- ¹⁸ United Nations "World Conference of Financing for Development Forges 'New Financial Alliance' as Global Leaders Conclude Summit with Adoption of Addis Ababa Action Agenda," Meetings Coverage and Press Releases, (July 16, 2015),

accessed on July 22, 2015, online: <http://www.un.org/press/en/2015/dev3191.doc.htm>.

¹⁹ *Ibid.*

²⁰ United Nations Framework Convention on Climate Change Newsroom “Six Oil Majors Say: We Will Act Faster with Stronger Carbon Pricing,” Statement (June 1, 2015), accessed on November 23, 2015, online: <http://newsroom.unfccc.int/unfccc-newsroom/major-oil-companies-letter-to-un/>

²¹ *Ibid.*

²² Cynthia Cummins et al., ‘Science-based Emissions Targets : The Key to Sending a Strong Corporate Signal Before COP21’, World Resources Institute Online (November 5, 2015), accessed on November 23, 2015, online: <http://www.wri.org/blog/2015/11/science-based-emissions-targets-key-sending-strong-corporate-signal-cop-21>.

²³ According to the World Resources Institute, Intended Nationally Determined Contributions are countries public outline on what post-2020 climate actions they intend to take under a new international agreement prior to COP21, see <http://www.wri.org/indc-definition>.

²⁴ Environment Canada, “Canada’s INDC Submission to the UNFCCC” *op. cit.*

²⁵ Kelly Levin, et al., “What Effect Will National Climate Plans (INDCs) Have on Global Emissions? 5 Things to Know” World Resources Institute Online, <http://www.wri.org/blog/2015/10/what-effect-will-national-climate-plans-indcs-have-global-emissions-5-things-know>.

²⁶ Dr. Blair Feltmate and Dr. Jason Thistlethwaite, “Climate Change Adaptation: Priorities Plan for Canada” University of Waterloo Climate Change Adaptation Project (June 2012), accessed on November 23, 2015, online: <https://uwaterloo.ca/environment/sites/ca.environment/files/uploads/files/CCAP-Report-30May-Final.pdf>.

²⁷ IISD Report, Climate Change Adaptation and Canadian Infrastructure (November 2013) accessed on July 10, 2015, online: http://www.iisd.org/pdf/2013/adaptation_can_infrastructure.pdf.

²⁸ United Nations Economic Commission for Europe, Climate Change Impacts and Adaptation for International Transport Networks (United Nations: 2013), accessed on May 23, 2015, online: <http://unstats.un.org/unsd/geoinfo/UNGEGN/default.html>.

²⁹ Feltmate and Thistlethwaite, “Climate Change Adaptation: Priorities Plan for Canada” *op. cit.*

³⁰ Transport Canada, Northern Transportation Adaptation Initiative (last modified: April 20, 2015), accessed on July 15, 2015, online: <https://www.tc.gc.ca/eng/innovation/ntai-menu-1560.htm>.

- ³¹ Transport Canada, Evaluation of the Northern Transportation Adaptation Initiative (last modified: June 1, 2015), accessed on July 15, 2015, online: www.tc.gc.ca/eng/corporate-services/des-reports-1260.htm.
- ³² The International Energy Agency has pointed out that the less successful the world is in decarbonising, the greater the oil price increase, see <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52011DC0144&from=EN>.
- ³³ “The underlying purpose of full cost estimates is to provide directional guidance for policies to promote efficiency in the utilization and mix of transportation modes. This reflects the basic microeconomic prescription of linking prices to social (marginal) costs to obtain the most efficient allocation of resources. Modes of transport and their use have evolved over time with mixes of public and private involvement, and with some differences in levels of taxation and subsidies. This has caused distortions within modes as well as distortions between modes. The first step is to develop accurate and comparable measures of the full costs of the various modes, i.e. not distorted by differences in taxes or subsidies. This gives rise to many specific issues such as measuring and valuing capital inputs in infrastructure, comparing expenditures at different points in time, etc.” see http://www.sauder.ubc.ca/Faculty/Research_Centres/Centre_for_Transportation_Studies/~//media/Files/Faculty%20Research/OPLOG%20Division/OPLOG%20Publications/GILLEN/Gillen%20-%20Full%20Costs.ashx.
- ³⁴ The rate of emission output remained the same, though overall emissions did increase, see https://ec.gc.ca/ges-ghg/E0533893-A985-4640-B3A2-008D8083D17D/ETR_E%202014.pdf.
- ³⁵ Environment Canada, *National Inventory Report 1990-2013 Part I*, *op. cit.*
- ³⁶ Kenneth Ruffing, “*Keeping track of decoupling*” OECD Observer (No 228, September 2001), accessed on November 23, 2015, online: http://www.oecdobserver.org/news/archivestory.php/aid/615/Keeping_track_of_decoupling.html.
- ³⁷ OECD, *Effective Carbon Prices*, (Paris: OECD, 2013), accessed on November 23, 2015, online: <http://dx.doi.org/10.1787/9789264196694-en>.
- ³⁸ *Ibid.*
- ³⁹ Rafea Mraih, “Transport Intensity and Energy Efficiency: Analysis of Policy Implications of Coupling and Decoupling,” in Dr. Moustafa Eissa (ed.), *Energy Efficiency - The Innovative Ways for Smart Energy, the Future Towards Modern Utilities* (October 17, 2012) accessed on November 23, 2015, online: <http://www.intechopen.com/books/energy-efficiency-the-innovative-ways-for-smart-energy-the-future-towards-modern-utilities/transport-intensity-and-energy-efficiency-analysis-of-policy-implications-of-coupling-and-decoupling>.
- ⁴⁰ Climate Change Policy & Practice, “OECD Projects 290% Increase in Freight Transport Emissions by 2050,” iisd Reporting Services (January 27, 2015), accessed on November 23, 2015, online: <http://climate-l.iisd.org/news/oecd-projects-290-increase-in-freight-transport-emissions-by-2050>.

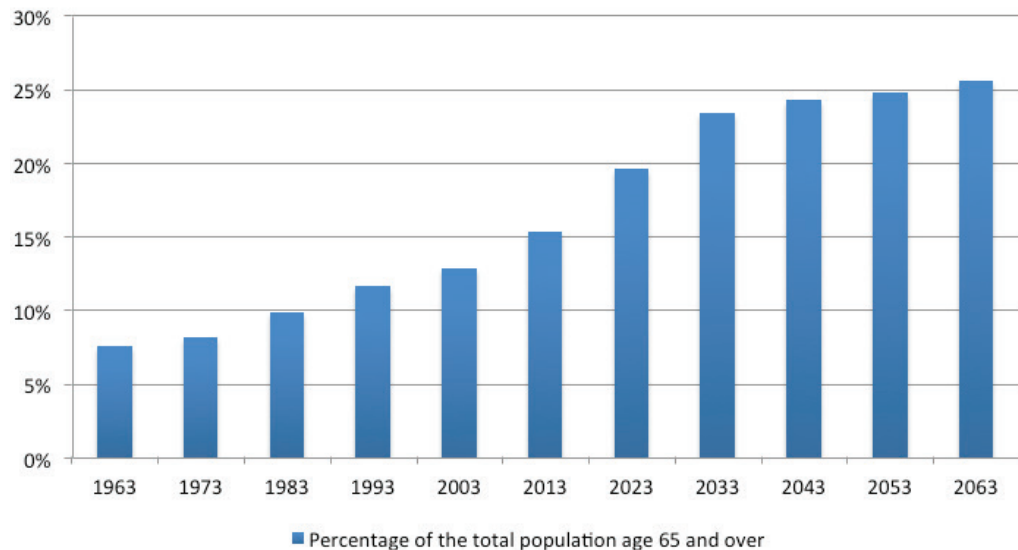
Appendix G

Access and Accessibility

Demographics: Disability and the Aging Population

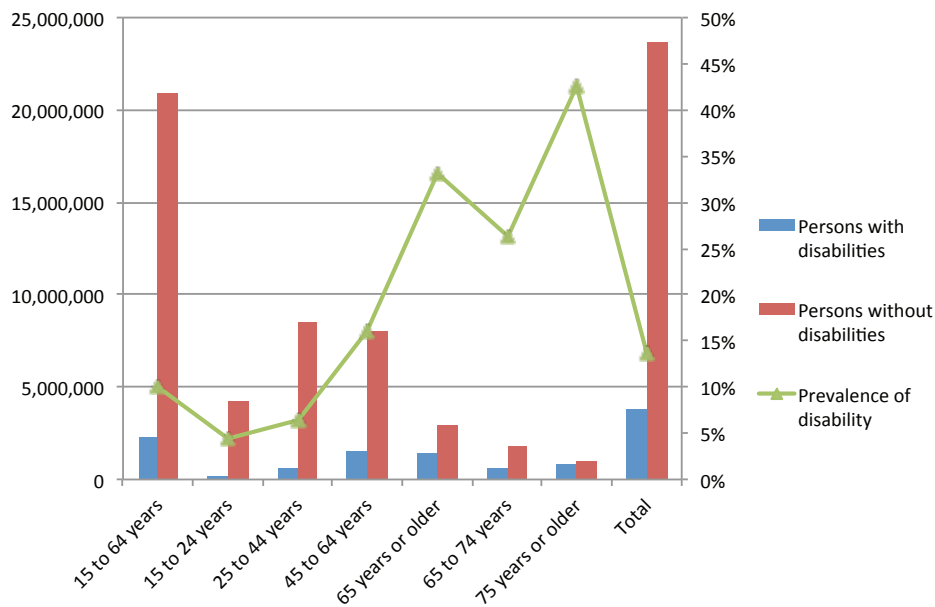
The Canadian population is aging, with seniors (persons aged 65 and over) making up the fastest-growing age group. There is a strong correlation between age and disability, with nearly 40 percent of people with disabilities being over 65 years old.¹ By 2050, nearly one in four Canadians is expected to be 65 or over as compared to less than one in seven today (see Figure 1).²

**FIGURE 1 –
CANADIAN POPULATION
65 YEARS AND OVER,
HISTORICAL (1963-2013)
AND PROJECTED
(2023-2063)³**



The number of seniors of all ages is expected to continue to rise, with the fastest growth among those aged 80 and over, whose share of the population is expected to more than double, growing from 4.1 percent in 2013 to between 9.2 and 9.8 percent of the population by 2043.⁴ Using United Nations population forecasts (see Appendix A), the number of Canadians over 80 years of age may be between 3.7 and 4.7 million people.

The populations of some regions in Canada are aging more rapidly than others. The Atlantic Provinces are expected to see the highest increase in their proportion of seniors by 2026, while Ontario will have the lowest projected increase. Most older seniors (77 percent) live in urban centres, with 61 percent living in the 27 largest metropolitan areas, reflecting the overall trend towards urbanization in Canada, while 23 percent reside in rural areas.⁵ According to Employment and Social Development Canada, about 3.8 million Canadians (13.7 percent) reported having a disability in 2012,⁶ which can have a pronounced impact on their ability to access transportation infrastructure and services. For example, Statistics Canada states that as many as 8 out of 10 persons with disabilities reported using a mobility aid.⁷ In addition to persons with disabilities, many seniors in general experience a range of problems that affect their ability to travel and their confidence in travelling. These may include reduced visual acuity, some loss of hearing, difficulty with balance and grip and loss of stamina.



**FIGURE 2 –
PREVALENCE OF PERSONS
WITH DISABILITIES IN
CANADA BY AGE GROUP,
2012⁸**

Accessibility Issues over the Years

The range of issues affecting access and accessibility in relation to transportation has evolved over the years. Many new issues, areas and different types of disabilities have emerged as a result of specific complaints and rulings by regulatory bodies in Canada and elsewhere. Since 2000, the Canadian Transportation Agency has addressed key accessibility issues in such cases as:

- Accessibility of Renaissance Cars (CCD-VIA); 175-AT-R-2003 | Decision | 2003-03-27.
- Obesity – whether it is a disability; 646-AT-A-2001 | Decision | 2001-12-12.
- Attendant Travel (Eddy Morten vs Air Canada) 435-AT-A-2005 | Decision | 2005-07-08.
- Carriage of mobility aids onboard aircraft and Replacement of larger aircraft with smaller aircraft on routes within Canada (including the accessibility of the Canadair Regional Jet—CRJ) Derksen vs. Air Canada; 418-AT-A-2005 | Decision | 2005-06-30.
- Availability of Teletypewriters (TTY) for persons who are deaf or have speech impairments (Elliott Richman) E.g. 449-AT-W-2005 | Decision | 2005-07-12.
- Accessibility of online reservation system (Legault vs Air Canada); 648-AT-A-2006 | Decision | 2006-11-27.
- Use of medical oxygen onboard aircraft (“undueness decision”); 336-AT-A-2008 | Decision | 2008-06-26.
- Space for service animal onboard aircraft (East vs Air Canada); 327-AT-A-2008 | Decision | 2008-06-20.
- Additional fares for additional seats to accommodate a person’s disability (“one-person-one-fare”); 6-AT-A-2008 | Decision | 2008-01-10.
- Allergies to nuts and peanuts (Huyer & Nugent vs Air Canada); 431-AT-A-2010 | Decision | 2010-10-19.
- Allergies to cats; 66-AT-A-2010 | Decision | 2010-01-25.

Approaches to Accessibility

The CTA Review commissioned international analyses on transportation accessibility that compared approaches in terms of legislation, regulation, enforcement, monitoring and dispute resolution. One study covered the European Union,⁹ and another, covered the United States.¹⁰ The reports also evaluated the strengths and weaknesses and the overall effectiveness, for benchmarking, and identified emerging trends in Europe and the United States. The Review met with representatives from government agencies and disability organizations in London, Brussels and Washington to obtain perspectives on best practices and implementation issues. The CTA Review benchmarked Canadian approaches against international partners to seek out best practices. An overview of the best practices identified by European and American experts/officials follows below. A few areas of particular interest included access to the transportation network (not just accessibility), the legal basis that underpins accessibility standards, the definition of disability, and the mechanisms for addressing systemic issues.

BEST PRACTICES — EUROPE AND THE UNITED STATES

- Definition of disability.
- Legislative/regulatory authority (versus voluntary codes of practice).
- Consistent approach (i.e. only one agency/body responsible).
- Addressing systemic issues:
 - Agency/body authorized to initiate own investigations; and
 - Agency/body authorized broaden matters/complaints.
- Dispute resolution and reporting mechanisms.
- Retention of records of non-compliance/complaints for 5 years and report.
- Ability to review equipment/facilities early on.
- Enforcement powers

Addressing Aging Populations

- Policies for “Travelling with confidence.”
- Consideration given to dependence on technology.
- Consideration given to cognitive disability.

Sources: Ann Frye Limited and CBS Capitol Business Solutions reports prepared for the CTA Review, 2015.

The two international research projects reviewed the standards in place in Canada, the European Union and the United States, by mode of transport. They also identified areas where the Canadian standards are comparable, more or less prescriptive and highlight the differences. The results of the two projects are provided in Figure 3.

FIGURE 3 – BENCHMARKING OF ACCESSIBILITY STANDARDS: HIGHLIGHTS OF MAJOR DIFFERENCES¹¹

ACCESSIBILITY ELEMENT:	PERSONAL WHEELCHAIR FOOTPRINT
<p>Canada Set in <u>Voluntary Codes of Practice:</u> (Note: references to “bus” apply to intercity, only)</p>	<p>“Personal wheelchair” means a passenger-owned wheelchair that requires a minimum clear floor area of 750 mm by 1,200 mm to accommodate the wheelchair and its occupant and a minimum clear turning space of 1,500 mm in diameter.</p>
<p>United States Found in ADA and ACAA Regulations and Incorporated Access Board Guidelines:</p>	<p>Wheelchair spaces must be 30 by 48 inches.</p>
<p>European Union Technical Regulations and Passenger Rights Regulations:</p>	<p>RAIL: Basic Dimensions—Over the full length of the wheelchair space the width shall be 700 mm from floor level to a minimum height of 1,450 mm with an additional 50 mm width to give clearance for hands on each side that is adjacent to any obstacle that will inhibit clearance for the wheelchair users hands (e.g. wall or structure) from a height of 400 mm to 800 mm above floor level (if one side of the wheelchair is adjacent to the aisle there is no additional 50 mm requirement for that side of the wheelchair as it is already free space). Turning circle—1,500 mm; specified weight.¹² BUS:¹³ Wheelchair space on vehicle—For each wheelchair user provided for in the passenger compartment there shall be a special area at least 750 mm wide and 1,300 mm long. The longitudinal plane of the special area shall be parallel to the longitudinal plane of the vehicle and the floor surface of the special area shall be slip resistant and the maximum slope in any direction shall not exceed 5 per cent. AIR AND MARITIME: no specification.</p>
ACCESSIBILITY ELEMENT:	ON-BOARD WHEELCHAIRS
<p>Canada Set in <u>Voluntary Codes Of Practice:</u> (Note: references to “bus” apply to intercity, only)</p>	<p>AIR: one required for aircraft with accessible washroom; one can be requested without accessible washroom (aircraft with 60+ seats). BUS: no requirement. FERRY: at least one on each passenger deck. RAIL: one per passenger train.</p>
<p>United States Found in ADA and ACAA Regulations and Incorporated Access Board Guidelines:</p>	<p>AIR: one required with accessible washroom; one can be requested without accessible washroom. RAIL, BUS, FERRY: no parallel provision.</p>
<p>European Union Technical Regulations and Passenger Rights Regulations:</p>	<p>AIR: one required with accessible washroom; one can be requested without accessible washroom. RAIL, BUS, MARITIME: no parallel provision.</p>

**FIGURE 3 – BENCHMARKING OF ACCESSIBILITY STANDARDS:
HIGHLIGHTS OF MAJOR DIFFERENCES¹¹ (CONTINUED)**

ACCESSIBILITY ELEMENT:	NUMBER OF WHEELCHAIR SPACES/CABINS
<p>Canada Set in <u>Voluntary Codes of Practice:</u> (Note: references to “bus” apply to intercity, only)</p>	<p>AIR: N/A. BUS: minimum of one per bus. FERRY: at least 5 percent of cabins or minimum of 1 cabin has to be accessible. RAIL: minimum of one per train.</p>
<p>United States Found in ADA and ACAA Regulations and Incorporated Access Board Guidelines:</p>	<p>BUS: minimum of two per bus. INTERCITY RAIL: must be a number of spaces equal to the number of single level coaches on the train, with at least one but not more than two on a given car.</p>
<p>European Union Technical Regulations and Passenger Rights Regulations:</p>	<p>RAIL: the longer the units the more spaces to be provided (e.g. unit length more than 300 m must have 4 wheelchair spaces). BUS: minimum of one.</p>
ACCESSIBILITY ELEMENT:	CARRIAGE OF MOBILITY AIDS
<p>Canada Set in <u>Voluntary Codes Of Practice:</u> (Note: references to “bus” apply to intercity, only)</p>	<p>AIR, BUS, FERRY, RAIL: required without charge. (Note: air is covered by regulations). AIR: where aircraft less than 60 seats and design does not permit- no requirement to carry mobility aid.</p>
<p>United States Found in ADA and ACAA Regulations and Incorporated Access Board Guidelines:</p>	<p>Required without charge in all modes. (Note: aircraft with 100 or more seats must have on-board storage capacity for a folding wheelchair).</p>
<p>European Union Technical Regulations and Passenger Rights Regulations:</p>	<p>ALL MODES: must be carried without charge (AIR: up to 2 pieces are free).</p>
ACCESSIBILITY ELEMENT:	LOST OR DAMAGED MOBILITY AIDS
<p>Canada Set in <u>Voluntary Codes Of Practice:</u> (Note: references to “bus” apply to intercity, only)</p>	<p>AIR, BUS, RAIL: repair and replacement required. FERRY: N/A (Note: AIR is covered by regulations).</p>
<p>United States Found in ADA and ACAA Regulations and Incorporated Access Board Guidelines:</p>	<p>No parallel provision in rail. Compensation based on original price for ferry and air. No repair/replacement obligation.</p>
<p>European Union Technical Regulations and Passenger Rights Regulations:</p>	<p>Passenger must be compensated for lost or damaged mobility equipment “in accordance with rules of international Community and national law.”</p>

ACCESSIBILITY ELEMENT:**ACCESSIBILITY FEATURES (EQUIPMENT)**

• DOORS • SIGNAGE • LIGHTING

Canada Set in Voluntary Codes of Practice:
(Note: references to “bus” apply to intercity, only)

Different accessibility standards depending on the mode; e.g. doors – wide enough to accommodate a personal wheelchair (rail/ferry/bus). Signage – positioning, locations, size. Lighting – no glare or shadows.

United States Found in ADA and ACAA Regulations and Incorporated Access Board Guidelines:

No technical accessibility standards for ferries (proposal not yet finalized). Lighting provisions do not mention glare and shadows.

European Union Technical Regulations and Passenger Rights Regulations:

Detailed technical standards for all these features on rail and bus. Some requirements for maritime. No technical accessibility standards for AIR (but guidance from European Civil Aviation Conference—ECAC).

ACCESSIBILITY ELEMENT:**ACCESSIBLE WASHROOMS**

Canada Set in Voluntary Codes Of Practice:
(Note: references to “bus” apply to intercity, only)

AIR: at least one required for multiple-aisle aircraft; partial accessibility for single aisle aircraft. **BUS:** If none, non-express service bus must stop every 2.5 hours. **FERRY:** if public washroom, at least one per ferry. **RAIL:** minimum of one in each coach with wheelchair tie-down and in accessible sleeping compartment.

United States Found in ADA and ACAA Regulations and Incorporated Access Board Guidelines:

AIR: at least one for multiple-aisle aircraft. No requirement in single-aisle aircraft. Intercity **BUS:** not required. **FERRY:** awaiting pending technical standards proposal. **RAIL:** Same as Canada but also required in lounge and food service cars.

European Union Technical Regulations and Passenger Rights Regulations:

AIR: no legal requirement. ECAC guidance: “Aircraft with more than one aisle should be equipped with at least one spacious lavatory for persons with reduced mobility catering for all kinds of disabilities. Any other aircraft equipped with at least two lavatories should have at least one catering for the special needs of persons with reduced mobility (door wide enough to assist the person with reduced mobility).” **RAIL:** “Universal toilet” must be available and accessible from each wheelchair space. **MARITIME:** general requirement for accessible washroom. **BUS:** no requirement.

**FIGURE 3 – BENCHMARKING OF ACCESSIBILITY STANDARDS:
HIGHLIGHTS OF MAJOR DIFFERENCES¹¹ (CONTINUED)**

ACCESSIBILITY ELEMENT:	SERVICE ANIMALS
<p>Canada Set in <u>Voluntary Codes of Practice:</u> (Note: references to “bus” apply to intercity, only)</p>	<p>AIR, BUS, FERRY, RAIL: Acceptance without charge. • Service Animal relieving area required. (AIR: terminals only). • Floor spaces: enough space for service animal to lie down. • Service animals must be accepted for carriage if certified and harnessed; carriers can accept if do not meet requirements (BUS: proof of certification and training). • Service animal must be accommodated.</p>
<p>United States Found in ADA and ACAA Regulations and Incorporated Access Board Guidelines:</p>	<p>Relieving area – required only in airport terminals. No certification required. No specifications regarding floor space. Service animals must be accommodated (in terminals covered by Department of Justice rules, only dogs are service animals). In air, emotional support animals and some animals other than dogs allowed.</p>
<p>European Union Technical Regulations and Passenger Rights Regulations:</p>	<p>Similar requirements to Canada. (Note: does not accept other animals, only “recognized assistance dogs”). Relieving area – no such requirement.</p>
ACCESSIBILITY ELEMENT:	SEATING
<p>Canada Set in <u>Voluntary Codes of Practice:</u> (Note: references to “bus” apply to intercity, only)</p>	<p>ACCESSIBLE SEATING • MOVEABLE ARMRESTS, COMPATIBLE WITH NEEDS (FERRY)</p> <p>Accessible seating. BUS: 1st Row on each side (moveable armrests). AIR: at least 50 percent evenly distributed throughout the cabin. INTERCITY BUS: required on all rows. FERRY: at least 5 percent compatible with needs of persons with disabilities. RAIL: at least 10 percent, even distributed throughout coach car with wheelchair tie-down.</p>
<p>United States Found in ADA and ACAA Regulations and Incorporated Access Board Guidelines:</p>	<p>TRANSIT AND INTERCITY BUS: two wheelchair locations required. INTERCITY RAIL: number of accessible spaces equivalent to the number of single level coaches on the train, no more than two in a given car. AIR: Moveable aisle armrests required on 50 percent of aircraft rows, in all classes of service. Not required in other modes.</p>
<p>European Union Technical Regulations and Passenger Rights Regulations:</p>	<p>BUS requirement for priority seats and technical specification. RAIL: requirement for priority seats “Not less than 10 percent of the seats by fixed trainset or individual vehicle, and by class.” AIR: moveable armrests not required but recommended (ECAC) “In aircraft with 30 or more seats at least 50 percent of all aisle seats should have moveable armrests.”</p>

ACCESSIBILITY ELEMENT:**TERMINAL/FACILITIES ACCESSIBILITY**

• TECHNICAL SPECIFICATION FOR ACCESSIBILITY • FACILITY – GENERAL PLANNING • INFORMATION • DESIGNATED SEATING • TRANSPORTATION WITHIN/BETWEEN TERMINALS • GROUND TRANSPORTATION

Canada Set in Voluntary Codes of Practice:

(Note: references to “bus” apply to intercity, only)

Technical specifications:

- Specify in proposals, contracts for facilities and equipment to comply with Canadian Standards Association (CSA) Standard CAN/CSA-B651 Accessible Design for the Built Environment [CSA standard incorporated by reference].
- Planning: Consult with persons with disabilities; apply principles of universal design; Maintain/repair accessibility features.
- Information: Announcements/ Information to be in format understood by persons with disabilities (e.g. audio, visual etc).
- Seating: Provide seating at regular intervals, at gates/departure.
- Transportation within/between terminals: all modes should be accessible; public announcement made in both audio and visual formats.
- Ground Transportation: to be accessible (included in contracts) Information regarding advance notice and procedures to follow.

United States Found in ADA and ACAA Regulations and Incorporated Access Board Guidelines:

In terminals, general ADA accessibility requirements apply, including Access Board guidelines adopted by DOT and DOJ rules. No specific planning requirements; facilities must be designed to meet Access Board guidelines. Maintenance of accessible features required. No designated seating requirements in terminals. Effective communication, including use of accessible formats, required. See below with respect to TTYs and announcements. At airports, inter- and intra-terminal transportation systems must be accessible. Ground transportation must independently meet ADA requirements, but no requirement for terminals to put accessibility requirements in contracts.

European Union Technical Regulations and Passenger Rights Regulations:

Access to/within terminal facilities is generally covered by legislation at individual Member State level. Exception: Rail, there is a legal requirement contained in the Persons with Reduced Mobility—Technical Specifications for Interoperability covering all stations on the network.

- A technical specification for accessibility.
- Planning: A requirement for Member States to produce implementation plans detailing progress towards full accessibility of stations (and rolling stock) and to consult with people with disabilities.
- Information: requirements for both written and spoken information to be accessible.
- Seating: On each platform where passengers are allowed to wait for trains, and at every waiting area, there shall be a minimum of one area fitted with seating facilities and a space for a wheelchair.
- Transportation within/between terminal and ground transportation not covered (except for requirement for accessible interchange points with other mode).

AIR: general accessibility guidelines for airports contained in ECAC Doc 30.

**FIGURE 3 – BENCHMARKING OF ACCESSIBILITY STANDARDS:
HIGHLIGHTS OF MAJOR DIFFERENCES¹¹ (CONTINUED)**

ACCESSIBILITY ELEMENT:

COMMUNICATION

- PROVISION OF INFORMATION IN MULTIPLE FORMATS
- TELE-COMMUNICATION (TTYS)
- ANNOUNCEMENTS
- WEBSITE ACCESSIBILITY
- KIOSKS

Canada Set in Voluntary Codes of Practice:

(Note: references to “bus” apply to intercity, only)

AIR, FERRY, AND RAIL: Multiple Formats required.

- Alternate communication systems to be available.
- Have means to visually and verbally provide announcements to persons with disabilities (in format that can be understood).
- Must meet World Wide Web Consortium standards.
- Where kiosk used for ticketing or info – at least one machine accessible. New requirement effective 2016: Each new kiosk installed must be accessible until threshold of at least 25 percent accessible is reached by 2022.

United States Found in ADA and ACAA Regulations and Incorporated Access Board Guidelines:

All modes – effective communication required, including use of accessible formats.

- TTY service for ferry and air reservations; otherwise general effective communication requirements apply. Terminals must meet ADA teletypewriter (TTY) requirements for facilities.
- All modes: effective communication requirement. ADA requires that, where announcements are made verbally in facilities (e.g. terminals), visual equivalent must be provided.
- Intercity rail: There must be a public address system, but no requirement for visual equivalent.
- Transit bus: Stop announcements required; visual equivalent recommended but not required.
- No such standard, except in aviation.
- No such requirement, except in new air requirement that begins to go into effect in 2016. By 2022, 25 percent of kiosks must be accessible.

European Union Technical Regulations and Passenger Rights Regulations:

ALL MODES: general requirement for “accessible formats.”

- **AIR:** recommended in ECAC guidance. No requirements.
- **RAIL:** requirement for dynamic audible and visual announcement of next stop and other key information.
- No European requirement – some Member States have own requirements.
- No such requirement (except alternative means for persons who are blind – unstaffed rail stations).

ACCESSIBILITY ELEMENT:**TRAINING REQUIREMENTS**

Canada Set in Voluntary Codes of Practice:
(Note: references to “bus” apply to intercity, only)

Specific requirements for training personnel who interact with persons with disabilities. Note – Covered by Regulations (for all modes and facilities except small carriers, small terminals and commuter rail).

United States Found in ADA and ACAA Regulations and Incorporated Access Board Guidelines:

General Training to proficiency (except in air which have more detailed requirements). **FERRIES:** left to operator’s discretion.

European Union Technical Regulations and Passenger Rights Regulations:

ALL MODES: general requirement for disability awareness training and specific requirements for staff providing assistance to the travelling public.

ACCESSIBILITY ELEMENT:**ASSISTANCE FOR PASSENGERS WITH DISABILITIES**

- REGISTRATION/CHECK-IN
 - PROCEEDING TO BOARDING AREA
 - BOARDING (SEE SEPARATE ELEMENT)
 - STOWING/RETRIEVING MOBILITY AID
 - TRANSFER ASSISTANCE
 - INQUIRING PERIODICALLY
 - BOARDING/DISEMBARKING ASSISTANCE
 - SECURITY SCREENING
 - SAFETY BRIEFING/CARD
 - ACCESSIBILITY PLANS AND REPORTS
(PROVINCIAL REQUIREMENT ONLY)
-

Canada Set in Voluntary Codes of Practice:
(Note: references to “bus” apply to intercity, only)

When 48 hours notice provided – service to be provided. Reasonable efforts with less notice. Written confirmation required. **BUS:** To be provided by bus operator except if there is a personal care attendant. **AIR:** Covered by Regulations.

May require boarding in advance. **BUS:** 30 minutes in advance (if disassembly required). **AIR:** Alternate means. **RAIL, FERRY, AND BUS:** N/A Braille and Large Print Cards. Ensure persons with disabilities receive individualized pre-travel safety briefing and demonstration, if needed.

Federal – No such requirement. Provincial – Ontario – requires accessibility plans and reports.

United States Found in ADA and ACAA Regulations and Incorporated Access Board Guidelines:

AIR: Carriers must ensure transportation between gates and terminals, plus assistance in baggage claim and ticketing. On aircraft, assistance in preparing to eat, moving to washrooms, stowing and retrieval of mobility aids. 48 hour notice required only for more time-consuming service requests (e.g. medical oxygen, transportation of an electric wheelchair in smaller aircraft). Intercity bus – Lift boarding, assistance with securement, stop announcements required. No advance notice provisions.

**FIGURE 3 – BENCHMARKING OF ACCESSIBILITY STANDARDS:
HIGHLIGHTS OF MAJOR DIFFERENCES¹¹ (CONTINUED)**

FERRIES: boarding/disembarking assistance required. Intercity rail: no specific provisions.

AIR: level entry boarding requirements. **FERRIES:** Operator to provide boarding/ disembarking assistance. **INTERCITY RAIL:** Level entry boarding requirements. **INTERCITY BUS:** Lift boarding required.

Transportation Security Administration screening requirements apply. Carriers cannot impose additional screening requirements on persons with disabilities.

No specific requirement regarding safety cards, but general effective communication requirements apply.

No such requirement.

**European Union Technical Regulations
and Passenger Rights Regulations:**

ALL MODES: legal requirement to provide assistance. Similar to Canada except Europe extends assistance to point of arrival/designated points (e.g. long-term parking, train and bus stations).

Even if notice not given, operator must make “all reasonable efforts” to get passenger on board.

ALL MODES: assistance must be given. Advance notice recommended but can only be required (air) for those travelling with powered wheel-chairs.

AIR: no requirement but best practice guidance (ECAC) on procedures for security staff.

Communication of essential information in accessible formats.

RAIL: national implementation plans on accessibility required – updated every 5 years.

SCORECARD ON ACCESSIBILITY

Canada has accessibility provisions in regulations and Codes of Practice, but does not have a general scorecard or “state of accessibility.” Elsewhere, scorecards are commonly used to provide progress over time toward a specified goal and to monitor the performance in achieving these goals. An accessibility scorecard was one of the best practices identified by the international benchmarking work. The Canadian Transportation Agency could be empowered to monitor the performance or state of accessibility on a regular basis (e.g. every three years) using a scorecard that includes the accessibility elements and sub-elements highlighted in the figure, right:

FIGURE 4 – SAMPLE ACCESSIBILITY SCORECARD

Accessibility Element	Overall Assessment [Exceeds, meets, needs improvement, attention required, or non-existent]	Best Practice	Status of Compliance [No of complaints]	Comments/ Highlights
Establishment of Accessibility Policies, Practices and Procedures				
Involvement of Persons with Disabilities (e.g. Organization has an Advisory Committee)				
Training for Staff / Contractors				
Procurement / Acquisition of Goods				
Information and Communication <ul style="list-style-type: none"> • Website • Accessible format • Kiosks • Announcements • Telecommunication 				
Service Animals <ul style="list-style-type: none"> • Acceptance without charge • Relieving area • Space for service animals • Certification 				
Seating <ul style="list-style-type: none"> • Accessible seating • Moveable armrests/ compatible with needs (Ferry) 				
Wheelchairs <ul style="list-style-type: none"> • On board spaces • Carriage of mobility aids • Lost/Damaged 				
Accessible Washrooms				
Accessibility Features (Equipment) <ul style="list-style-type: none"> • Doors • Signage • Lighting 				
Assistance for Passengers with Disabilities <ul style="list-style-type: none"> • Registration/check-in • Proceeding to boarding area • Boarding/disembarking assistance • Stowing/retrieving mobility aid • Transfer assistance • Inquiring periodically 				
Security Screening				
Safety Briefing				

Notes

- ¹ Statistics Canada, *Canadian Survey on Disability 2012*, Catalogue no. 89-654-X, Ottawa, 2013.
- ² Statistics Canada, Canada (Code 01) and Canada (Code 01) (table), Census Profile, 2011 Census, Statistics Canada Catalogue no. 98-316-XWE (Ottawa: 2012), accessed on October 24, 201, online: www12.statcan.gc.ca/census-recensement/2011/dp-pd/prof/index.cfm?Lang=E.
- ³ Source: CTA Review with data from the medium-growth scenario (M1), Statistics Canada, *Population Projections for Canada (2013-2063)*, (May 26, 2015) accessed on November 23, 2015, online: <http://www.statcan.gc.ca/pub/91-520-x/2014001/tbl/tbl2.4-eng.htm>.
- ⁴ *Ibid.*
- ⁵ Turcotte, M., and G. Schellenberg, *A Portrait of Seniors in Canada* (Ottawa: Statistics Canada, 2007) at 13-15.
- ⁶ Employment and Social Development Canada, *Canadians in Context – People with Disabilities*, (last modified: November 23, 2015) accessed on November 23, 2015, online: <http://www4.hrsdc.gc.ca/.3ndic.1t.4r@-eng.jsp?iid=40>.
- ⁷ Source: Statistics Canada. *Canadian Survey on Disability 2012*, Catalogue no. 89-654-X, Ottawa, 2013.
- ⁸ Source: CTA Review with data from Statistics Canada, *Canadian Survey on Disability 2012*, Catalogue no. 89-654-X, Ottawa, 2013.
- ⁹ Ann Frye Limited, *Comparing Canadian and European Approaches to Transportation Accessibility – Final Report*, prepared for the CTA Review (May 26, 2015).
- ¹⁰ CBS Capitol Business Solutions, *Comparison of Canadian and U.S. Approaches to Transportation Accessibility*, prepared for the CTA Review (March 16, 2015).
- ¹¹ Sources: Canada – Information that is publicly available on the Canadian Transportation Agency website including Regulations and Codes of Practice; Europe: Ann Frye Limited, *Comparative Analysis of Canadian and European Approaches to Accessible Transportation Standards*, *op. cit.*; and United States: Robert Ashby, *Comparative analysis of Canadian and United States Approaches to Accessibility Standards*, *op. cit.*
- ¹² Fully laden weight of 300 kg for wheelchair and occupant (including any baggage) in the case of an electrical wheelchair for which no assistance is required for crossing a boarding aid. —Fully laden weight of 200 kg for wheelchair and occupant (including any baggage) in the case of a manual wheelchair.
- ¹³ Bus: “Reference wheelchair” (used for testing of vehicle accessibility), overall length: 1,200 mm; overall width: 700 mm; overall height: 1,090 mm. Note: A wheelchair user seated in the wheelchair adds 50 mm to the overall length and makes a height of 1,350 mm above the ground.

Appendix H

Freight Rail

The following sections provide background and supplementary information on freight railway operations in Canada.

Canada's Railway Network

There were a total of 45,743 route-kilometres of track in Canada in 2014, making the country's rail network the fifth largest in the world.¹ This network forms part of the key "hardware" for the freight transportation system in Canada. Nearly half of the route kilometres of the network (22,483 km) is owned or leased by the Canadian National Railway (CN), just over a quarter by the Canadian Pacific Railway (CP) (11,927 km), with the remaining quarter (11,333 km) owned by regional, short-line, terminal or switching railways or subsidiaries of United States-based railways. The rail system also included 19 intermodal terminals (with all but one being operated by either CN or CP), and 27 rail border crossings with the United States. Between 2004 and 2013, 8,679 km of track was transferred to new owners (often shortline railways), and 2,493 km of track was abandoned. Figure 1 on the following page situates the location and breadth of these networks within the broader North American context.

The reach of the Canadian network extends from coast to coast and connects to principal maritime ports, although in some cases (in Prince Rupert and Halifax, for example) only with one Class 1 railway (CN). The networks of CN and CP extend deep into the United States² and connect with that country's five main Class 1 carriers – Union Pacific (the largest rail operator in North America), Burlington-Northern Santa Fe, CSX, Norfolk Southern and Kansas City Southern. All but the last in this list converge in Chicago, which was described to the CTA Review as the hub and the heart of the North American railway system; roughly 25 percent of all rail traffic cuts through the city.³ While recognizing the value of such a hub, it is nonetheless a major bottleneck. A train can travel roughly 3,500 km from Los Angeles to Chicago in as little as 48 hours, for example, but then spend an average of 30 hours crossing the Chicago region.⁴ Delays like this stretch out delivery time for shippers, while at the same time reduce asset utilization (e.g. car cycle times) for railways.

Though the challenges with orchestrating traffic and investment within the city are unlikely to go away in the near future — traffic through Chicago is expected to double over the next 30 years, for example — a United States railroad commentator suggests no carrier is likely to walk away from the city. "The history is that the capital has been spent and the railroad networks have been configured to send volumes through Chicago because that was a connecting point."⁵ This situation illustrates well the immobility of investments made in physical railway assets, and in a Canadian context, highlights the importance of long-term planning (Chicago has been the United States' premier rail hub for nearly 150 years, for example) and coordination within and among the public and private sectors.

FIGURE 1 – MAP OF CANADIAN RAILWAY NETWORKS WITHIN NORTH AMERICA⁶



Canadian Industry Profile

Railways in Canada operate in an integrated North American market that, according to most measures, is comprised largely of freight railway companies operating vertically-integrated, limited-access and privately-financed systems.⁷ Barriers (financial, land) to new market entrants are high, meaning that new rail freight rail companies have emerged through mergers or the purchase of abandoned networks or branch lines. Historically the story has been one of corporate consolidation rather than proliferation, a trend that is unlikely to be reversed over the coming decades.

CN and CP represent more than 80 percent of Canada's rail industry in nearly all metrics, except for tonnes originated, as shown in Figure 2. The exception is due to two regional railways⁸ that handle iron ore from mines in Québec and Labrador to the St. Lawrence River at Port Cartier and Sept-Îles. These two railways do not connect with the rest of the Canadian network and both are owned by the shipper. Hudson's Bay Railway, formerly a CN branch line, is also considered below as a regional railway, given its track length (1,300 km), and that it generally terminates traffic at the Port of Churchill, rather than feeding traffic into Class 1 networks as is often the case with short line railways.

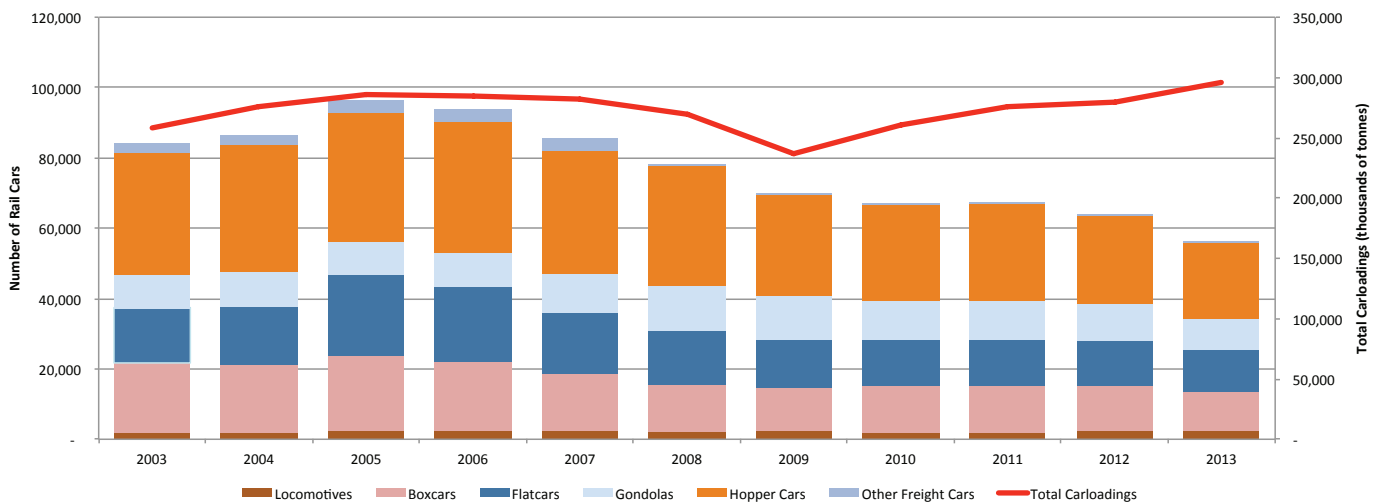
**FIGURE 2 –
SUMMARY METRICS FOR
CANADIAN RAILWAYS,
2012⁹**

Metric	CP and CN (Canada)	Regional Railways	Shortlines	Total Freight	CR and CN (% of total)
Railroad operated (km)	35,167	2,940	5,221	43,328	81.2
Number of locomotives	2,494	131	226	2,851	87.5
Number of freight cars	61,024	2,386	1,075	64,485	94.6
Fuel (thousands of gallons)	423,750	13,737	11,662	449,149	94.3
Avg number of employees	28,185	1,623	1,495	31,303	90.0
Tonnes originated (thousands)	227,150	110,154	38,476	375,780	60.4
Revenue Ton Miles (billions)	244.5	24.6	4.4	273.5	89.4
Avg length of haul (km)	1,397	425	77	-	
Capital expenditures (CAD\$ million)	1,474	84	52	1,611	81.2

Canadian Railway Fleet

Changes in the size of the Canadian Class 1 railway fleet over time illustrate how rail cars are being used more intensively to deliver services to railway customers. While the total volume of rail car loadings grew by 14.2 percent between 2003 and 2013 (from 259 million tonnes to 295 million tonnes), the size of the Class 1 rail fleet has decreased substantially over the same period. From a high in 2005, for example, the fleet has decreased by roughly 41 percent.¹⁰ The only segment that has grown over the period from 2005 to 2013 is the locomotive fleet (from 2,143 in 2005 to 2,428 in 2013). The share of the non-Class 1 fleet relative to the total has remained fairly stable, representing roughly 11 percent of the total number of locomotives and around 5 percent of the total number of freight cars.¹¹

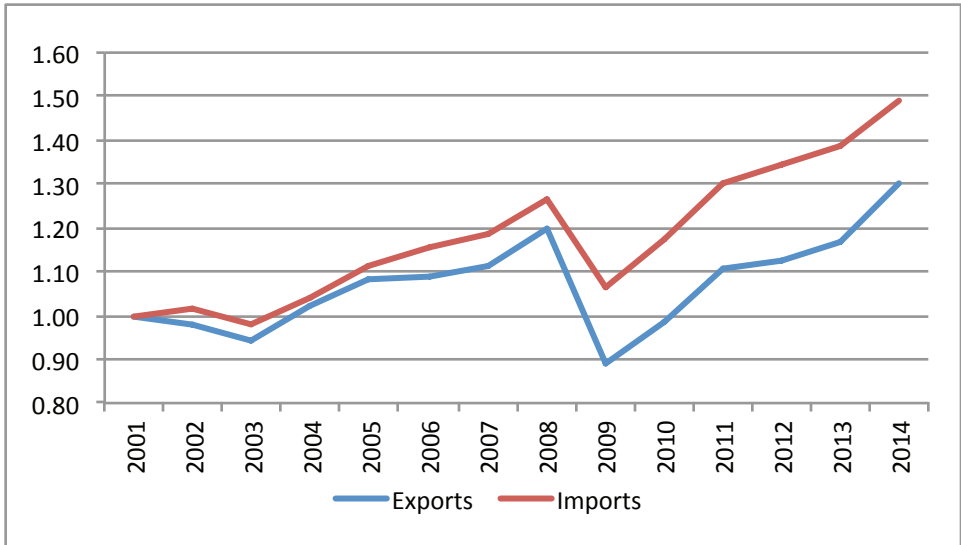
FIGURE 3 – RAILWAY FLEET (CN AND CP) AND TOTAL CARLOADINGS, 2003-2013¹²



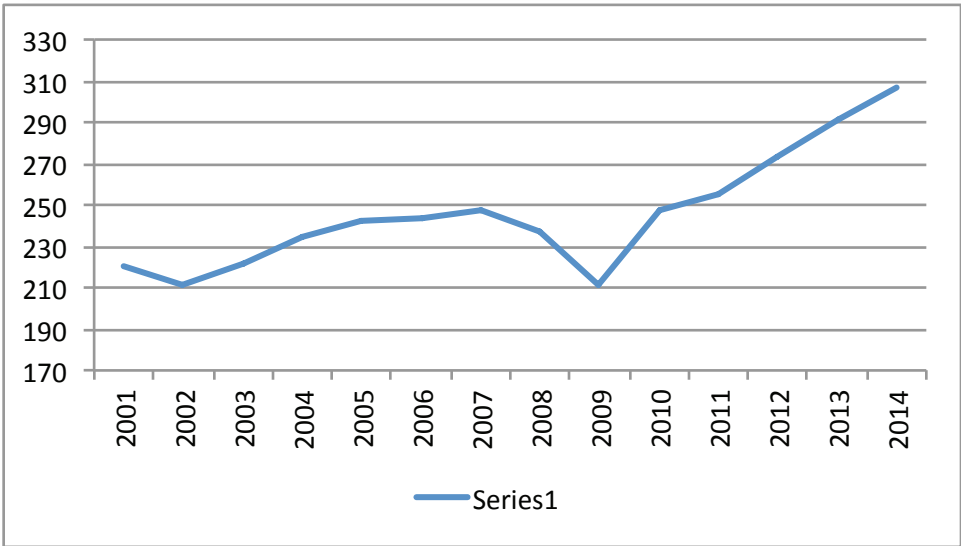
Beyond more intensive use of capital assets, there are a number of factors that also underlie the trends noted above, including railways' greater reliance on third-party ownership of rail cars,¹³ faster rail car cycle times, greater use of higher capacity railcars (those with a Gross Rail Load of 286,000 pounds have dominated new additions to the North American fleet since the early 1990s),¹⁴ and the advent of longer and heavier trains. Over the 2003 to 2013 period, total Class 1 railway employment decreased by 5.8 percent, from 31,595 to 29,755 full-time equivalent employees.

Relationship between Freight Rail Transport and Canadian Trade

Though the link between transportation and trade has been widely discussed, Figure 4 provides a simple illustration in the context of railway activity. It shows a clear and positive correlation between the total amount of freight transported by Canadian railways in Revenue Ton Miles (which is the typical measure used, rather than a metric Revenue Tonne Kilometres) and Canadian trade activity, as measured by the value of exports and imports. That is, changes in the value of Canadian trade are roughly mirrored by changes – in the same direction – in railway activity.



**FIGURE 4 –
RELATIONSHIP BETWEEN
CANADIAN TRADE¹⁵
AND RAILWAY TRAFFIC,
2001-2014¹⁶**

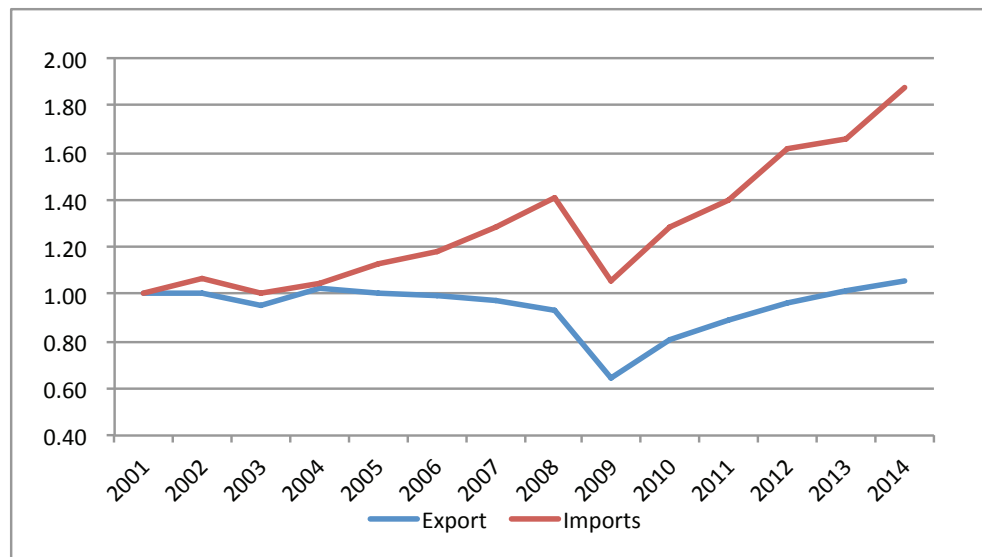


Also evident is the significant impact of the 2008-09 economic downturn on both trade and railway output. The magnitude of this impact, however, is not borne out in railway investment (which grew from 2008 to 2009) or railway full-time employment (which decreased by 8 percent from 2008 to 2009, compared to a nearly 30 percent drop in exports, for example).

The rise in containerized import traffic (typically higher value cargo by weight than the bulk products which dominate railway exports) transported by freight railways is evident in Figure 5. This trend is reflected in the volume of rail imports and exports, where the volume of imports more than doubled over the 2001 to 2014 period (from 17.7 million tonnes to 40.7 million tonnes) while the volume of exports increased by only 1 million tonnes (from 74.2 million tonnes to 75.2 million tonnes).

Distribution of Freight Rail Traffic

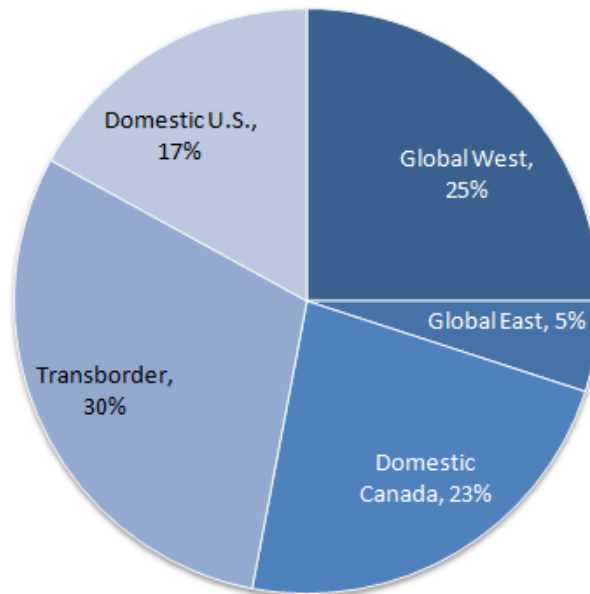
**FIGURE 5 –
CHANGES IN THE VALUE
OF RAIL EXPORTS AND
IMPORTS, 2001-2014
(INDEX, 2001 = 1)**¹⁷



The transport of rail freight within Canada accounted for nearly a quarter of Class 1 revenues in 2013, as seen in Figure 6. The remaining roughly three quarters is attributable to international trade (i.e. transborder, Global West, Global East), or movements within the United States via their respective subsidiaries based in the United States.

Though traffic and revenue growth are anticipated in all segments over the coming decades, the relative shares of each region may change. More liberalized trade and investment arrangements with Pacific or Atlantic trading partners, for example, have potential to expand rail traffic via either coast (i.e. Global West, Global East). Research by the Asia Pacific Foundation of Canada suggests that, to the degree Canada is able to capitalize on the related trade opportunities, the growth anticipated in Asia will in particular affect the share of revenue from “Global West” traffic. Among the growth factors that the report¹⁸ identifies is a transformation in Asia’s demographic and societal profile, resulting from changing population trends, continuous urbanization, and a growing middle class. They note that this transformation will not only result in a shift of consumption patterns to more discretionary goods and services from abroad, but also increased demand for raw materials, food and energy.

**FIGURE 6 –
DISTRIBUTION OF
CLASS 1 REVENUE BY
REGION, 2013¹⁹**



This finding is reflected in a report²⁰ by CPCS, a firm specializing in transportation infrastructure. The report highlights that “with the exception of the growth in iron ore traffic from the Labrador Trough to ports on the North Shore of Québec for onward export to world markets, the growth in exports of other bulk commodities, including notably coal, potash, grain and oilseeds, and forestry products, will likely be drawn to the export positions on the West Coast [of Canada].”²¹ With the addition of crude oil, this group represents Canada’s top-six bulk commodity exports by rail.

Forecasted export growth for these and other commodities are included in Chapter 8,²² which reinforce the position that overall demand for rail services will grow over the coming decades. Recognizing that such forecasts often fall short of accurately predicting the future, the CPCS report presents four alternative scenarios for traffic growth based on combinations of plausible social, technical, environmental, economic and political drivers. In doing so, it notes that global demand for commodities, like those noted above, is considerably variable, which will lead to variability in demand for rail service. Consequently, capacity to meet future service demand will likely be added incrementally; the “extent to which demand is certain and immediate will dictate the pace with which the private sector (including railways and port terminals) undertakes those investments.”²³ Predictable and steady traffic growth will likely be supported by incremental capacity improvements, but volatile or unanticipated growth will likely lead to short-term capacity issues.²⁴

Rather than attempt to predict future traffic and service demand, the CPCS report argues that the scenario planning approach provides more meaningful insight in aid of assessing needs and being responsive to future demand. In analysing the results of four different future scenarios, the report finds a number of pressure points that, regardless of scenario, will impact future bulk commodity flows. Their findings are summarized in Figure 7, on the following page.

FIGURE 7 – KEY CAPACITY PRESSURE POINTS FOR BULK COMMODITY FLOWS

Pressure Point	Considerations
CN and CP Mainlines to Vancouver	<ul style="list-style-type: none"> • Growth in top 6 commodity groups (see above) will eventually exceed rail line capacity to Vancouver. • Significant investments in track capacity will be required well in advance of 2045, and likely 2030. • While CN and CP continue to make investments along this section of track, the cost of major expansion between Kamloops and Vancouver will be high due to the difficult terrain (e.g. Rogers Pass). • Alternatives to moving traffic through Vancouver will eventually need to emerge, and while track to Prince Rupert is under capacity, greater use of the line would further concentrate a larger portion of traffic on a line serviced by a single railway. • Moving traffic Eastward via the Great Lakes-St. Lawrence Seaway is another alternative, which will become more attractive as costs to ship to Vancouver increase. • An expansion of the National Freight Rail System through the construction of a new northern rail corridor, connecting to Pacific and Atlantic Oceans, Hudson’s Bay and Beaufort Sea, is among the boldest alternative options.²⁵
United States-bound traffic	<ul style="list-style-type: none"> • Though there are a number of border crossings into the United States from Canada, the efficiency of North-South movements of rail traffic will be affected by network congestion in the United States, particularly (as noted above) in and around the Chicago area.
Western Port Terminal Capacity	<ul style="list-style-type: none"> • Beyond the planned expansions of grain, potash and coal terminals, additional terminal capacity will be required to accommodate forecast demand over the coming decades, capacity that will likely be added incrementally (as with rail) in line with confidence about future traffic growth. • New terminals will require space to grow, but land access and urban encroachment will limit the degree to which the private sector can expand.
Congestion in and around Major Canadian Cities	<ul style="list-style-type: none"> • Growth of cities around major transportation infrastructure (like around Port Metro Vancouver or the Port of Montréal) has acted as a constraint to the expansion of port activities and given rise to land-use conflicts and public concerns related to freight and transportation externalities, including traffic congestion to and from terminals. • Alternatives include the use of ports outside of urban centres for bulk commodity movements and growing bulk commodity logistics facilities outside of urban centres.
Grain Hopper Car Fleet	<ul style="list-style-type: none"> • Most of this rail car fleet is owned by the federal and provincial governments, and will outlive its useful life well before 2030; CP indicated, for example, that of the nearly 5,600 Government of Canada hopper cars that it operates, 424 were built in 1972-73, 2,962 were built in 1976-77, 2,165 were built between 1981 and 1986, and 16 were built in 1994. • Replacement of this fleet with higher capacity rail cars will help manage traffic growth, but currently the Maximum Revenue Entitlement for grain transportation constrains reinvestment by railways.

The considerations highlighted in this table indicate that the action of one firm or one level of government alone will not likely provide sufficient impetus to address each challenge. Canada does, however, benefit from having implemented and tested an effective model for coordinating public-private efforts to address multimodal trade-related transportation issues such as these. The gateway and corridor approach, formalized under a National Policy Framework,²⁶ has been highlighted many times over the course of the CTA Review as a successful, partnership-based approach that should be continued to address future challenges and share risks and costs among all parties who benefit from physical or competitiveness investments

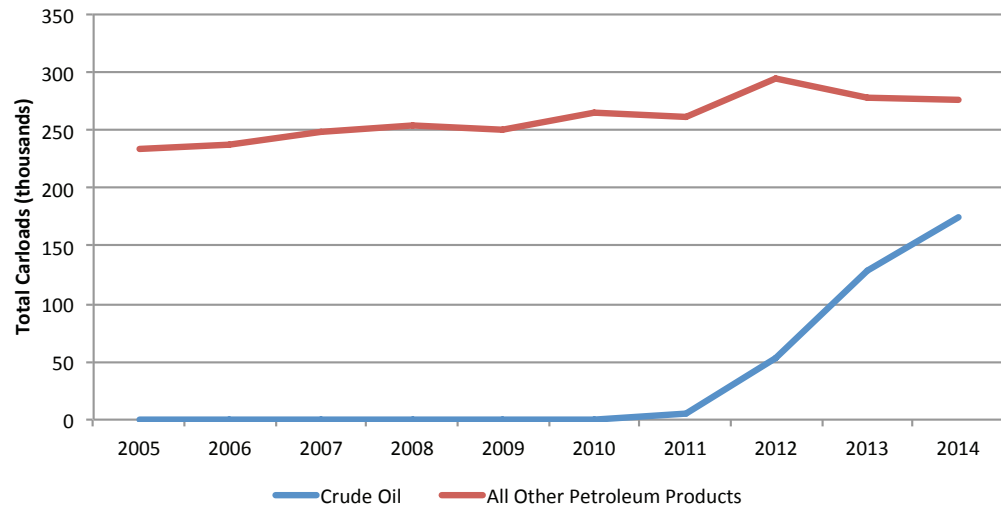
Movement of Crude Oil by Rail

The tragic accident and loss of life in Lac-Mégantic, Québec on July 6, 2013 highlighted the potential risks associated with the movement of dangerous goods by rail. In responding to the accident, the Minister of Transport announced a number of changes to the rail safety regime for the movement of crude oil in particular, including (but not limited to) new means of containment,²⁷ new rail operating rules, and changes to rail liability insurance requirements to ensure compensation is available for those affected by an accident. The CTA Review report includes recommendations intended to help implement these and related measures and support the on-going efforts of all parties – including governments, railways and shippers – to reduce the risks associated with dangerous goods transport.

Growth in the movement of crude oil by rail is a relatively new phenomenon, as shown in Figure 8, below. Though the growth rate has been significant, crude oil shipments by rail still represent only a small fraction of total freight rail traffic.²⁸ Rail has emerged as a complement to pipeline transport (still the preferred and lowest-cost means of conveyance) due to a number of factors, including the growth in unconventional extraction (hydraulic fracturing, or “fracking”) taking place away from areas served by North America’s pipeline network, pipeline capacity lagging production growth, high global oil prices, and particular advantages that rail transport offers relative to pipelines.²⁹

Significant investments have been made in Canada’s oil sands, and there is the potential for crude oil exports to double in the next 15 years.³⁰ The impact on crude by rail volumes will be linked to the pace at which new pipeline capacity can be added. Over the near term (between now and the end of 2018), for example, there are five projects planned that would provide incremental pipeline capacity of nearly 3.4 million barrels per day (by contrast, crude by rail volumes averaged 185,000 barrels per day in 2014³¹). As oil production continues to grow (albeit more slowly than anticipated), delays to these pipeline projects will add pressure to use rail as an alternative means of transport. Such delays (if production expands as projected) could have a material impact on the rail corridors used for crude oil transport. The CPCS report referenced above notes that, for example, an additional 62 unit trains per day would be required to transport the same volume of crude oil by the five planned projects noted above. While an unlikely and perhaps impossible outcome due to rail capacity limitations, crude by rail is nevertheless important for producers, and its use will be determined by the timing of proposed pipeline projects,³² along with prevailing economic conditions.

**FIGURE 8 –
CRUDE OIL AND OTHER
PETROLEUM PRODUCT
TRAFFIC ON RAIL
(2005-2014)³³**



Notes

- ¹ Canada is fifth after the United States (with a rail network of nearly 225,000 km), Russia (128,000 km), India (116,000 km) and China (112,000 km).
- ² In certain cases, short line railways also connect with United States based networks.
- ³ Chicago Region Environmental and Transportation Efficiency Program (CREATE), a partnership between the city, the state of Illinois and industry representatives with the American Association of Railroads.
- ⁴ *Ibid.*
- ⁵ Comments by Tom Finkbiner, CEO of Tiger Cool Express, as reported in "Is \$4B enough to solve Chicago's rail congestion? Maybe." *Journal of Commerce*, (October 16, 2015).
- ⁶ Source: Reprinted with permission of the Railway Association of Canada.
- ⁷ Some railways in Canada and the United States have accessed on federal, state or provincial programs to support capacity improvements and technology adoption.
- ⁸ ArcelorMittal, Mines Canada and Quebec North Shore and Labrador Railway.
- ⁹ Notes: (1) Regional railways include ArcelorMittal Mines Canada, Quebec North Shore and Labrador and Hudson's Bay Railway (now owned by Omnitrax), (2) imperial units are used due to industry norms. Source: Transport Canada and the Railway Association of Canada (RAC), and reproduced in a submission from Malcolm Cairns Research and Consulting.
- ¹⁰ From 93,947 in 2005 to 55,730 in 2013.

- ¹¹ Transport Canada, *Transportation in Canada 2013*, (Ottawa: Her Majesty the Queen in Right of Canada, represented by the Minister of Transport, 2014) accessed on November 23, 2015, online: https://www.tc.gc.ca/media/documents/policy/Transportation_in_Canada_2013_eng_ACCESS.pdf at Tables RA3 and RA 10.
- ¹² Source: CTA Review with data from Transport Canada, *Transportation in Canada 2013*, at Tables RA3 and RA10.
- ¹³ Notably, this graphic does not include freight cars belonging to shippers, including tanker cars like those used to transport bulk petroleum products.
- ¹⁴ Railinc, *The North American Freight Railcar Review*, 2015, accessed on November 23, 2015, online: <https://www.railincorporated.com/rportal/ref-conference-2015>.
- ¹⁵ Source: CTA Review with data from Statistics Canada and the US Census Bureau, published by Industry Canada, *Trade Data Online*, (Report date: November 25, 2015), accessed on November 25, 2015, online: <https://www.ic.gc.ca/eic/site/tdo-dcd.nsf/eng/Home>.
- ¹⁶ Source: CTA Review with data from Railway Association of Canada, *2014 Rail Trends*, (December 31, 2013), accessed on November 25, 2015, online: <http://www.railcan.ca/publications/trends> and Railway Association of Canada, *2009 Rail Trends*, (December 2008), accessed on November 25, 2015, online: <http://www.railcan.ca/publications/trends>.
- ¹⁷ Source: CTA Review with data from Transport Canada, *Transportation in Canada 2014*, (Ottawa: Her Majesty the Queen in Right of Canada, represented by the Minister of Transport, 2015) accessed on November 23, 2015, online https://www.tc.gc.ca/media/documents/policy/2014_TC_Annual_Report_Overview-EN.pdf.
- ¹⁸ Asia Pacific Foundation of Canada, *Understanding Asia in 2030 and the Implications for Canadian Transportation Policy*, prepared for the CTA Review, (September 16, 2015).
- ¹⁹ Source: CTA Review with data from the Asia Pacific Foundation of Canada, *ibid*.
- ²⁰ CPCS Transcom, *Impact of Future Bulk Commodity Flows on the Canadian Transportation System*, prepared for the CTA Review (August 25, 2015).
- ²¹ *Ibid.* at ii.
- ²² Produced by IHS Global Insight.
- ²³ CPCS Transcom, *Impact of Future Bulk Commodity Flows on the Canadian Transportation System*, *op. cit.*, at iv.
- ²⁴ As highlighted in the CPCS report, and recognized within this Report, a key question facing policy makers is whether short-term capacity issues are a necessary feature of market-based forces or if they are a market failure that requires government intervention.

- ²⁵ See, for example, CIRANO, *The Northern Corridor: Investing in Infrastructure to Realize Canada's Potential*, University of Calgary, School of Public Policy Discussion Paper (June 18, 2015), accessed on November 23, 2015, online: <http://policyschool.ucalgary.ca/sites/default/files/Northern-Corridor-web.pdf>.
- ²⁶ Transport Canada, *National Policy Framework for Strategic Gateways and Trade Corridors*, (Ottawa: Government of Canada, 2009) accessed on November 23, 2015, online: <http://www.canadagateways.gc.ca/media/documents/en/NationalPolicyFramework.pdf>.
- ²⁷ See Transport Canada "Minister Raitt and Secretary Foxx announce next generation of stronger, safer rail tank cars" News Release (May 1, 2015), accessed on November 23, 2015, online: <http://news.gc.ca/web/article-en.do?nid=969589>.
- ²⁸ There were 10.6 million tonnes of crude oil transported by rail in 2013, for example, roughly 3.6 percent of the 295.4 million tonnes in total carried by railways in 2013 (Source: Transport Canada).
- ²⁹ They include, for example, the broader reach and access that North America's rail network provides relative to the pipeline network and that rail-based options are easily scalable and protect product integrity.
- ³⁰ CPCS Transcom, *Impact of Future Bulk Commodity Flows on the Canadian Transportation System*, *op. cit.*
- ³¹ Canadian Association of Petroleum Producers, *Crude Oil Forecast, Markets and Transportation*, (CAPP: June 2015), accessed on November 23, 2015, online: <http://www.capp.ca/publications-and-statistics/publications/264673>.
- ³² *Ibid.* at v.
- ³³ Source: CTA Review with data from Transport Canada, *Transportation in Canada 2014*, *op. cit.*, at Table RA10.

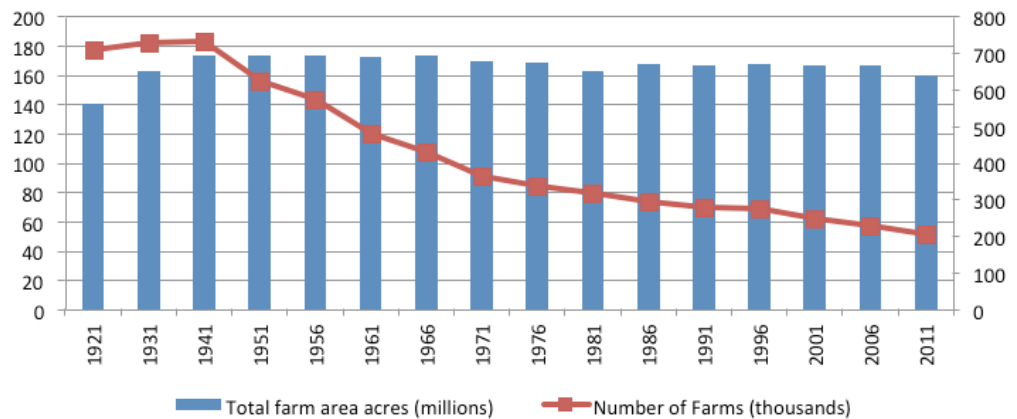
Appendix I

Transport of Grain

The Canadian Agriculture and Grain Sector – State of Play

The agriculture sector in Canada has been evolving over the last several decades. For example, in 2011 there were just over 200,000 farms in Canada, a number representing a decrease of 10.3 percent (or 23,643 farms) since the last Census of Agriculture in 2006. Historically, the total number of census farms¹ in Canada began to decline after 1941 followed by the accelerating urbanization of the 1950s. The largest 5-year decline on record was from 1956 to 1961 when the number of farms fell by 16.4 percent or about 94,000 farms (Figure 1). Farm operators are also getting older; the average age was 47.5 years in 1991 and rose to 54 years in 2011.

**FIGURE 1 –
NUMBER OF FARMS AND
FARM AREA, CANADA,
1921-2011²**

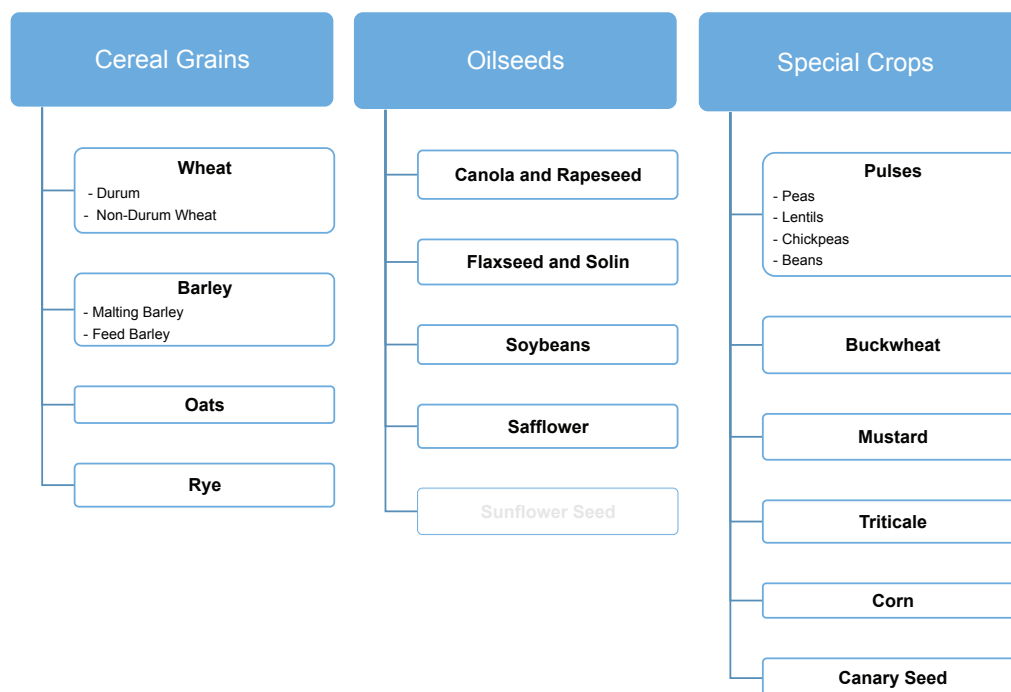


Another interesting trend is growth in average farm size – the average size of a Canadian farm increased from 728 acres to 778 acres, a growth of 6.9 percent. There are also differences across provinces and regions. In Newfoundland and Labrador, for instance, the average farm size was 152 acres, in contrast to expansive operations in the Prairie Provinces, such as Saskatchewan, which had the largest average farm size in the country, at 1,668 acres in 2011. Saskatchewan also had the greatest increase in average farm size, at 15.1 percent relative to 2006.

Of the total number of farms in Canada, approximately 46 percent (or more than 95,000 farms) were primarily engaged in field crop production.³ These farms and the producers who operate them constitute the foundation of the Canadian grains, oilseeds and special crops industries. With an annual value in the range of about \$26 to \$29 billion, crop production accounts for just over 50 percent of total Canadian farm cash receipts.⁴ The production of cereals, oilseeds, special crops, and corn represent about \$19.5 billion or 75 percent of annual farm cash receipts derived from crop production.

Grain is grown across a vast geographic area in Canada. Roughly 58 percent of farms producing field crops are located in the Prairie Provinces where cereal, oilseed, and special crop production dominate and represent on the order of 92 percent of total crop cash receipts in these provinces. In Québec and Ontario corn and soybean production is most significant accounting for 42 percent of total crop cash receipts in those provinces.

Grains produced in Canada fall into three broad groupings: cereal grains, oilseeds and other grains and special crops. Figure 2 provides a current representation of the grains grown in Canada.



**FIGURE 2 –
GRAINS GROWN
IN CANADA⁵**

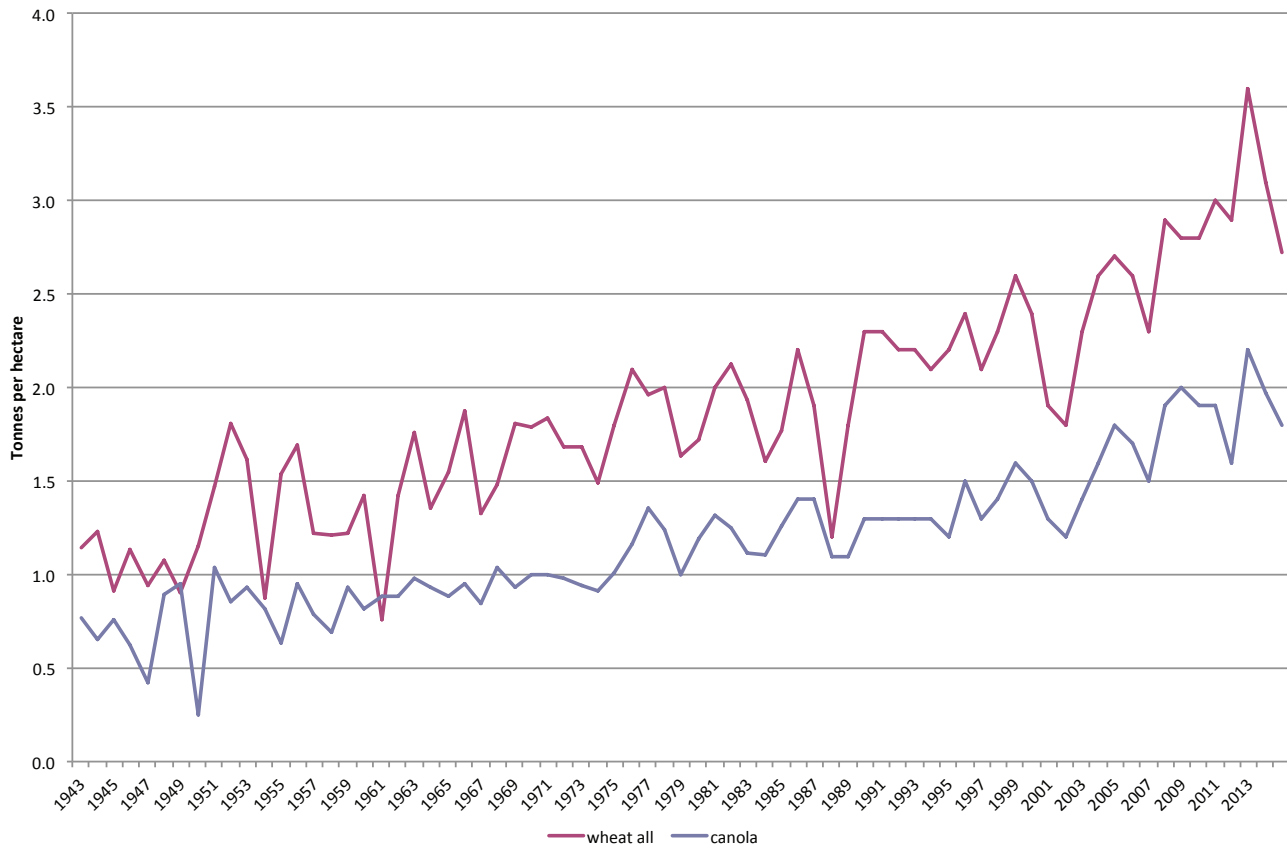
There has been a shift away from planting wheat toward oilseeds and specialty crops. The factors supporting the long run shift to planting oilseeds and pulses and special crops include rising world incomes and population growth. The consumption of proteins and fats and oils, which are high in oilseeds and pulses and special crops, is correlated with gross domestic product while consumption of carbohydrates, found in wheat and coarse grains, is linked to population growth. Over the past 40 to 50 years world incomes have increased faster than populations which have translated into higher prices for oilseeds, pulses, and special crops relative to wheat and coarse grains.

Other factors supporting the expansion of oilseeds and pulses and special crops have included the adoption of improved varieties, improved farming practices, and the application of science and technology. The introduction of improved disease resistant and hybrid canola varieties in combination with improved agronomic practices sharply raised financial returns from canola, while reduced fertilizer requirements of soybeans, peas, lentils and other pulses gave these crops a cost of production advantage. The introduction of genetically engineered varieties simplified the production of canola, soybeans and corn although the high heat unit requirements of corn confined that crop mostly to eastern Canada.

A host of domestic and international policies has also affected the composition of the cropping mix across western Canada. Prior to 1995, exports of grain were heavily subsidized under the *Western Grain Transportation Act*. The revocation of the *Western Grain Transportation Act* made it uneconomic to export low value feed grains from western Canada. Under successive United States Farm Bills, American production of grains converged to a few major crops covered by production subsidies, with production of a number of comparatively minor crops, such as mustard, peas and flaxseed shifting north of the border to Canada. During roughly the same time span, significant American and European Union subsidies on grains reduced Canadian Wheat Board pooled returns and the attractiveness of wheat and barley to producers.

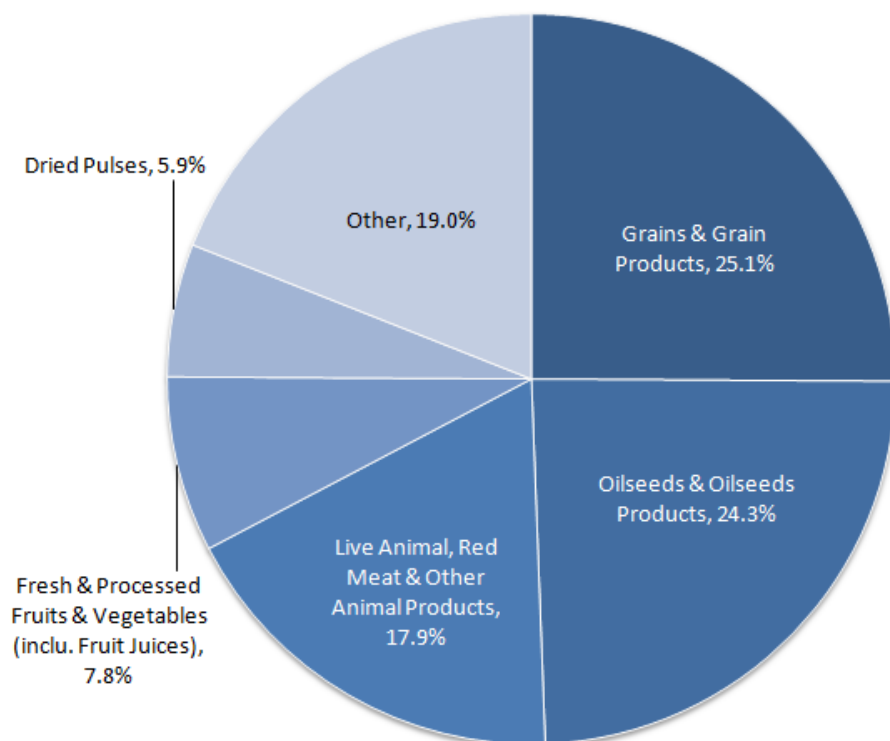
In recent years, producers in the former Soviet Union, namely Russia, Ukraine and Kazakhstan, have sharply increased exports of wheat, while China has introduced a policy of self-sufficiency in cereals and is relying on international markets for the oilseeds that supply the rising consumer demand for edible oils. The result has been downward pressure on wheat prices and upward pressure on the world price for oilseeds and oilseed products.

FIGURE 3 – CANADA CROP YIELDS: WHEAT VS CANOLA³



Reflecting these factors, farmers' seeding decisions have shifted cropping area across western Canada in favour of oilseeds, pulses, and special crops compared to cereal grains.

Canada is a trading nation, and as a major agricultural producer in a small open economy, producing over and above what is consumed domestically for most agricultural commodities, Canada's agriculture and agri-food sector continues to depend on exports. In 2013, exports of agricultural commodities reached \$46.0 billion. The composition of these agricultural exports, in terms of the importance of grains and oilseeds are illustrated in Figure 4.



**FIGURE 4 –
COMMODITY
COMPOSITION OF
CANADIAN AGRICULTURE
AND AGRI-FOOD EXPORT
SALES, 2013⁷**

Canada was the world's fifth largest exporter of agriculture and agri-food products (3.5 percent of the total \$1.3 trillion value of world agriculture and agri-food exports) after the European Union, the United States, Brazil, and China in 2013. Three main commodity groups accounted for over two-thirds of these Canadian exports: grains and grain products accounted for 25.1 percent, followed by oilseeds and oilseed products at 24.3 percent, and live animals, red meat and other animal products at 17.9 percent.⁸

History of the Grain-Handling-and-Transportation System⁹

Since the late 1880s, the federal government has regulated grain freight rates in Western Canada through various mechanisms. In 1897, the federal government and the Canadian Pacific Railway (CP) signed the Crow's Nest Pass Agreement. This Agreement set subsidized rates for the movement of agricultural products by rail from the Prairie Provinces to tide-water. In return for reducing freight rates, the federal government gave CP a cash subsidy of \$3.3 million and title to extend a line through the Crow's Nest Pass into the Kootenay region of southern British Columbia. The freight rates were subsidized to ease the hardship faced by Western farmers which they felt was imposed upon them by the railways. These rates became statutory in 1925. In 1927, the Crow rates were extended to Canadian National Railway (CN), and over time to cover exports of grain, flour, and several other crops to ports on the West Coast and Churchill, Manitoba.

The Canadian Wheat Board (CWB) was established by the Parliament of Canada on July 5, 1935 to serve as a marketing board for Western Canadian wheat and barley. Its operation was governed by the Canadian Wheat Board Act as a mandatory producer marketing system for wheat and barley in Alberta, Saskatchewan, Manitoba, and a small part of British Columbia. As the only buyer of wheat and barley, it was illegal for any farmer in areas under the CWB's jurisdiction to sell their wheat and barley through any other channel than the CWB. Its market power over wheat and barley marketing was referred to as the "Single Desk." The CWB's mandate was to pay farmers a base price for their grain, identify markets

to sell the grain, negotiate the best price, deliver the product, issue advance cheques, and make final payments after the crop was sold. If the wheat market went up, farmers captured the profits, and if the market declined, the government absorbed the loss.

By the late 1950s, statutory freight rates for the movement of grain had become non-compensatory, and in response, the railways slowed shipments to grain terminals and reduced investment in the grain handling system.

In 1984, the *Western Grain Transportation Act* replaced the Crow's Nest Pass freight rates. The *Western Grain Transportation Act* set a formula for determining freight rates on the basis of a multiple of the Crow rate. Thus it maintained the old principle of fixing rail transport charges on the sole basis of distance, with no allowance for timing or volume. It institutionalized the payment of the subsidy and also increased rates to compensatory levels. By 1989-90, the benefit was \$720 million which covered 70 percent of the freight cost, with the remaining 30 percent paid by shippers.

Faced with the challenge of eliminating a large deficit in the mid-1990s, the government scaled back the payment of the benefit in 1993 to 1995, and by 1995 farmers were paying half the cost of transporting grain. The government also faced international pressure on eliminating trade distorting transportation subsidies (i.e. the Uruguay Round Agreement on Agriculture).

The *Western Grain Transportation Act* was repealed in 1995 and consequently, the Western grain transportation subsidy came to an end after 98 years. However, to protect farmers, the maximum rates that could be charged by the railways for the transportation of 58 grain commodities were set under the 1996 *Canada Transportation Act*. The demise of the Crow rate enabled Canada to honour some of its obligations under the revised General Agreement on Tariffs and Trade (GATT) to reduce "anti-competitive" agricultural subsidies. Further, it was recognized that the Crow rates discouraged efficiency, frustrated efficient pricing, distorted market signals, and created perverse situations such as the movement of Prairie grain to Thunder Bay and then back to Winnipeg for export to the United States in order to collect the subsidy. It also helped to alleviate some of the federal government's fiscal problems. The elimination of rail freight subsidies also initiated a process of gradual deregulation, one of the major deregulatory events that began in the 1990s.

In December 1997, the Minister of Transport tasked Justice Willard Estey to chair the *Grain Handling and Transportation Review*. The objective of this Review was:

"To conduct a comprehensive, forward-looking review of the handling and transportation system for prairie grain and grain products and to develop recommendations and related implementation plans..."

Justice Estey was to examine:

"what alterations, additions, reductions or other organic changes are required (if any) in the present administrative and commercial regulation of the grain industry, in order to strengthen and enhance the position of Canada in the global grain market?"

Specifically around grain transportation rates, the Estey Grain Handling and Transportation Review examined the maximum “rate cap” which existed at that time. The final report was submitted to the federal government in December 1998. It contained 15 recommendations, several of which pertained to the transportation of Canadian Wheat Board grain, including that the maximum statutory rate scale for the rail movement be repealed. This would mean that the preordained freight rates under sections 149 to 153 of the *Canada Transportation Act* be replaced by negotiated contract rates. It also recommended something akin to open access to the existing CN and CP lines so as to “better serve the national interest in obtaining competitive and efficient transportation by rail.” There were recommendations around the Act’s Final Offer Arbitration (FOA) provisions as well, the disposal of the federal government’s hopper car fleet and its allocation policy, promoting the utilization of the Seaway as an alternative transportation route to the movement of grain, and that the Canadian Wheat Board have no operational or commercial role in the handling and transportation of grain.

On May 12, 1999, the Minister of Transport announced in a policy statement that the federal government agreed with Estey’s vision that the western-grain-handling-and-transportation system should be made more efficient, accountable and beneficial to farmers by moving to a more commercially-oriented environment with appropriate safeguards to protect the public interest. To give effect to his vision, the federal government appointed Mr. Arthur Kroeger to develop operational details so as to implement the federal government’s plan for the 2000-01 crop year.¹¹

By the end of September 1999, Mr. Kroeger prepared three reports with recommendations categorized around the following headings:

1. The Revenue Cap should replace the present rate cap;
2. Railway Competition should be increased;
3. Final Offer Arbitration should be revised; and,
4. The Transportation Role of the Canadian Wheat Board should be superseded by commercial, contract-based arrangements.

On May 10, 2000, the federal government announced a package of reforms on Canada’s grain-handling-and-transportation system. The Reform Package (based on Estey and Kroeger) contained six components: replacement of the rate cap with the revenue cap; creation of a more commercial and competitive system for moving grain from country elevators to ports (by tendering of Canadian Wheat Board shipments); improvements to the Final Offer Arbitration provisions of the Act; funding for prairie grain roads; improvements to branch line rationalization; and, private monitoring of the impact of changes.¹²

On August 1, 2000, the government passed Bill C-34, amending the *Canada Transportation Act*, to replace the regulation of maximum rates for the movement of grain with a regulation of maximum revenues, or a revenue cap – the present Maximum Revenue Entitlement program – that CN and CP could earn for the movement of grain. The Canadian Transportation Agency was given responsibility for establishing the revenue cap each year. The Maximum Revenue Entitlement was originally envisioned to be a short-term transition measure from the maximum rate scale of the *Western Grain Transportation Act* to a deregulated or more fully commercialized pricing environment.

A number of federal government initiatives have taken place post-2000 to further help improve the grain-handling-and-transportation system. For example, in 2013, the *Fair Rail Freight Service Act* was enacted in response to a review of rail freight service. Shippers now have the right to conclude a service agreement with rail companies, and an arbitration process was established for cases where negotiations fail. On January 21, 2014, the federal government announced an investment of \$1.5 million over five years in a multi-sector (pulse, oilseeds and grain industries) collaboration project to improve supply chain efficiency and reliability. In February 2014, the government announced its intention to change its grain-monitoring program to compel the railways to provide more detailed information on a more frequent basis, including the number of cars ordered and cancelled by clients, and the number of cars delivered by the railways. On May 29, 2014, Bill C-30, the *Fair Rail for Grain Farmers Act*, received royal assent. Bill C-30 was introduced in response to the rail transportation challenges associated with moving the record 2013-14 Western Canadian grain crop. The new law establishes requirements regarding the minimum amount of grain to be moved by certain rail companies, creates regulatory authority to extend inter-switching distances in Alberta, Saskatchewan, and Manitoba to 160 km, creates regulatory authority to specify “operational terms” in Service Level Agreements, and mandates the Agency to advise the Minister on minimum amounts of grain to be moved by CN and CP in a crop year.

In regard to the marketing of wheat, the Canadian Wheat Board’s Single Desk marketing power officially ended on August 1, 2012 as a result of Bill C-18, the *Marketing Freedom for Grain Farmers Act*, which was tabled by the federal government and passed into law in December 2011. The Canadian Wheat Board changed its name to simply CWB, reflecting its changed status. It continued to operate as a grain company as it moved toward its eventual privatization. On April 15, 2015, it was announced that a 50.1 percent majority stake in CWB would be acquired by Global Grain Group, a joint venture of Bunge Limited and the Saudi Agricultural and Livestock Investment Company, for \$250 million.

The Maximum Grain Revenue Entitlement Program¹³

The Maximum Grain Revenue Entitlement (MRE) is an economic regulatory policy instrument that replaced the setting of maximum freight rates for specified western Canadian grain products for specified movements by the prescribed railways (currently CN and CP). The MRE, introduced on August 1, 2000, requires the Canadian Transportation Agency to annually determine a maximum revenue entitlement or “revenue cap” for the movement of western grain¹⁴ by CN and CP,¹⁵ and to subsequently determine whether these railway companies have exceeded their revenue caps.

Sections 150 and 151 of the *Canada Transportation Act* set out the MRE provisions as follows:

1. A prescribed railway company’s revenues, as determined by the Agency, for the movement of grain in a crop year may not exceed the company’s maximum revenue entitlement for that year as determined under subsection 151(1).
2. If a prescribed railway company’s revenues, as determined by the Agency, for the movement of grain in a crop year exceed the company’s maximum revenue entitlement for that year as determined under subsection 151(1), the company shall pay out the excess amount, and any penalty that may be specified in the regulations, in accordance with the regulations.

The MRE program replaced maximum freight rates regulation for the movement of western grain. Parliament agreed to let the railway companies set individual rates for shipping western grain, but required them to stay within a total revenue limit calculated by the Agency based on their western grain movements in an effort to provide some shipping price protection.¹⁶

Under section 150 there are two distinct tasks which the Agency is required to perform – first, to establish CN’s and CP’s maximum revenue entitlements for the relevant crop year and, second, to determine if CN or CP have exceeded their maximum revenue entitlements for that crop year. A crop year is “the period beginning on August 1 in any year and ending on July 31 in the next year.”

THE MAXIMUM REVENUE ENTITLEMENT FORMULA

In practice, the MRE or revenue cap is calculated on the basis of a statutory formula, base year statistics, and a volume-related composite price index (VRCPI). The VRCPI is an inflation factor calculated by the Agency that reflects forecast price changes for CN and CP, in terms of labour, fuel and material and capital purchases.

Section 151(1) of the Act provides the precise formula that the Agency is to use in determining the revenue cap. A prescribed railway company’s maximum revenue entitlement for the movement of grain in a crop year is the amount determined by the Agency in accordance with the formula: **$[A/B + ((C - D) \times \$0.022)] \times E \times F$**

Where:

- A. is the company’s revenues for the movement of grain in the base year;
- B. is the number of tonnes of grain involved in the company’s movement of grain in the base year;
- C. is the number of miles of the company’s average length of haul for the movement of grain in that crop year as determined by the Agency;
- D. is the number of miles of the company’s average length of haul for the movement of grain in the base year;
- E. is the number of tonnes of grain involved in the company’s movement of grain in the crop year as determined by the Agency; and
- F. is the volume-related composite price index as determined by the Agency (VRCPI).

The actual figures for items A, B and D are set out in section 151 of the Act and are different for CN and CP:

- For the purposes of subsection (1), in the case of the Canadian National Railway Company, A is \$348,000,000; B is 12,437,000; and (c) D is 1,045.
- For the purposes of subsection (1), in the case of the Canadian Pacific Railway Company, A is \$362,900,000; B is 13,894,000; and D is 897.

The formula determines an average rate—a fixed revenue per tonne—for the base year adjusted by the incremental cost associated with the difference in the average length of haul in the given crop year versus the base year. (The base year is 2000-01). This length of haul adjusted average rate is then multiplied by the number of tonnes moved in the crop year to arrive at a total revenue amount, which is in turn multiplied by the Agency determined

VRCPI. In other words, each railway company's MRE is the base year revenue per tonne, adjusted for length of haul, multiplied by the volume of grain moved in the given crop year and adjusted for railway input cost inflation.

Especially important to note is that the fixed level of revenue per tonne in the base year is actually cost based and has also been adjusted for productivity gains. The costs used to set this level were those from the last *Western Grain Transportation Act* (WGTA) costing review in 1992, inflated each year by the VRCPI to bring the level up to 2000, and then reduced by 18 percent to reflect railway productivity gains over the period of 1992 to 2000. The result is a base-year revenue per tonne of \$27.98 for CN and \$26.12 for CP. Also to be noted is that the factor \$0.022 is the base year coefficient of change in railway costs when plotted against miles, i.e. the marginal cost per mile in the base year. The determination of C and E in the formula is a fairly straightforward computation exercise.

If the Agency determines that a prescribed railway company's revenues for the movement of grain in a crop year exceed the company's maximum revenue entitlement for that year, the railway company must pay out the amount by which its revenue exceeds its cap, and additionally pay the prescribed penalty set out in the *Railway Company Pay Out of Excess Revenue for the Movement of Grain Regulations*. These Regulations also specify that the excess plus the penalty must be paid to the Western Grains Research Foundation.

Maximum Revenue Entitlement Policy

As discussed above, regulation of grain freight rates was intended to be a compromise between grain shippers' desire for protection against railway market power, the railways' objective of having a more commercially oriented grain transportation system, and the need for all to have a degree of predictability. However, the grain sector has changed considerably since the MRE's introduction, and a number of issues, both technical and policy-related, have arisen since. Examples include:

- The MRE is a disincentive to the movement of grain by container. Railways' costs are higher for container movements and so they charge higher rates – this extra revenue consumes the railways' MRE more quickly. (container shipping has the potential to provide additional capacity during surges in grain export demand.)
- The MRE creates "free-rider" problems, which discourage the railways from making investments in grain rail capacity improvements (e.g. hopper cars, locomotives, crews) as the formula cannot distinguish individual railway investments. Investments, regardless of who makes them, are applied equally to both railways in the formula. Benefits from one railway's investments accrue to both railways equally, creating the disincentive.
- Treatment of interswitching movements in the MRE calculations creates unfairness: the railway must claim the revenue it receives for performing interswitching, but does not get an adjustment to its MRE that fully reflects the interswitching movements performed (the actual tonnage moved), thereby financially harming the carrier that performs the interswitch for the other.

In consideration of interswitching, the railways argue that the current treatment of such activities under the MRE are causing them financial harm because, while the railway in question must claim the revenue it receives for performing interswitching, it does not receive an adjustment to its MRE that fully reflects the interswitching movements

performed. In other words, it is the line haul carrier that contracts with and receives payment for transporting the goods from the shipper; the railway performing the interswitching services is then compensated by the line haul carrier at the regulated interswitching rates. Importantly, however, the actual tonnes moved in the performance of the interswitching services are not fully taken into account in calculating the MRE itself. That is, the carrier performing the interswitching does not receive any adjustment to its MRE to reflect these tonnes. In effect, the manner in which interswitching is treated under the MRE leaves the carrier providing the interswitching services with no opportunity of being fully compensated for the interswitching tonnes moved.

In Decision No. 305-R-2015, (released September 18, 2015), the Agency made a change to the methodology it uses for the treatment of interswitching under the MRE. In full force for the 2015-16 crop year, the Agency will be using an Equivalent Tonne Approach in an attempt to better recognize the additional tonne miles performed by, and to better compensate, the interswitching carrier. Although an improvement to the current approach, the Agency admits in its September 18 Decision that “the implied level of entitlement provided for these workloads [tonnes] is less than the interswitching rates that are earned under the *[Railway Interswitching Regulations]*.” Also, the structure of the MRE formula leaves the Agency “a very limited number of variables with which to reflect a highly complex transportation operation.” Effectively the railway performing the interswitching movement is still at a disadvantage relative to the line haul carrier, but the hope is that under the new approach, it will be slightly less so.

Stakeholder views on the MRE are essentially mixed. Those that support its continued retention, including certain producers and grain shippers, believe the MRE offers rate protection that supports the competitiveness of the sector, and that its elimination would permit railways to charge higher prices for the same service. The argument has been made that other commodities moved by the Class 1 railways, and in fact grain movements not subject to the MRE such as those destined to the United States, face the same “poor service” as the transport of grain under the MRE. In other words, eliminating the MRE would only result in higher freight rates and same perceived inadequate service. However, there are some in the sector that favor reforms to the MRE such as the ability to pay “premium freight rates” in return for guaranteed and reliable service.

Those opposed to the MRE include the railways who maintain that the MRE constrains their ability to improve grain sector service and supply chain efficiency by reducing the incentive to invest in grain versus other capacity. In fact, the treatment of government supplied hopper cars replacement is a big issue. The MRE allows no credit for the extra costs of government hopper car replacement with more modern equipment. There are also many non-grain shippers that support its elimination; they are concerned the MRE restricts the amount of revenue available for capital investment in the rail network that benefits all shippers, grain and non-grain alike given that the railway network is shared, thereby hurting everyone’s service. Others say market forces would be permitted to work properly in allocating grain cars given limited rail capacity. For example, in a post-Canadian Wheat Board monopoly environment, railways can use price to allocate limited grain rail cars, but this ability is constrained under the MRE, so the railways instead choose to ration grain rail cars—shippers potentially get only a fraction of the cars they order (which they argue is occurring today). Greater harmonization with grain-handling-and-transportation policies of the United States is another argument in support of the elimination of the MRE.

Producer Cars

Under the *Canada Grain Act*, grain producers are entitled to order producer cars through the Canadian Grain Commission to ship any grain designated as such under the *Canada Transportation Act*. Producers have the option to deal directly with the Canadian Grain Commission and self-administer their cars, or use an administrator who submits a completed producer car application on their behalf to the Commission. The Commission is responsible for allocating producer cars. Note that about four percent of grain producers use the producer car system.

If a producer ships to a Canadian Grain Commission licensed elevator, the producer is paid based on the grade and net weight of the grain at unload. If the producer uses an administrator, usually the administrator contracts with the railway, pays the freight, cleaning charges and any weighing and inspection fees that may apply on the producer's behalf. The administrator deducts these fees from the final payment to the producer.

The change in the mandate of the Canadian Wheat Board (now called the CWB), effective August 1, 2012, altered the transportation environment for producer car shippers. Because the producer requires a means through which to market the grain moved in a producer car, producer cars historically relied almost exclusively on the CWB which marketed over 95 percent of producer cars loaded in Western Canada (the remaining 5 percent was devoted primarily to the movement of oats into the American market). The post-single desk process requires producers to find their own marketing channels prior to ordering a producer car. Equally important to producers was the ability of the CWB to minimize a producer's risk exposure through its ability to absorb a producer car mis-grade through blending with other product at the port terminal – a strategy made possible by virtue of the CWB's control of all wheat and barley flowing through a terminal. Going forward, the new CWB will no longer be able to continue this practice, meaning that producers will now assume a greater proportion of the risk associated with producer car shipments including being responsible for shipping costs, all costs related to the risk of loss, ensuring the accurate reporting of the contents of a car, and all risk associated with the grade and quality of the product. The CWB accorded some level of service protection to the producer car shipper; this no longer is the case.

Several grain stakeholders including those within the Crop Logistics Working Group, Keystone Agricultural Producers, the Coalition of Saskatchewan Agricultural Producers, etc. have recommended that producer car shippers be better recognized under the *Canada Transportation Act* in respect of not only receiving better rail service, but also in respect of the protection of access to infrastructure required for producer car loading (e.g. loading sites, sidings). They want the Act to support producer car shippers by creating an environment where farmers who wish to load and ship producer cars are reasonably able to do so and receive adequate service from Class 1 railway companies. They view producer car shipping as a meaningful shipping alternative and one that provides a competitive option to conventional grain handling companies, where they feel market power between grain companies and farmers can sometimes also be unbalanced.

Interswitching Rates

Regulated in Canada since 1904, interswitching is a competitive access provision for the benefit of shippers intended to allow "captive" shippers fair and reasonable access to another competing railway at a regulated rate. It is undertaken through a commercial agreement between railways whereby one railway (local carrier) will carry traffic between

a shipper's facility and an interchange and transfer it to a second railway who performs the "line haul" (i.e. the majority of the linear distance of the overall railway movement). It can take place at the origin or destination end of a traffic movement.

Sections 127 and 128 of the *Canada Transportation Act* provide the authority for the Agency to regulate interswitching within a radius of 30 km of an interchange, or a prescribed different distance (the *Fair Rail for Grain Farmers Act* extended the distance to 160 km in certain provinces). The Agency regularly sets rates to be applied on hauls to interswitching points, and the rail carrier must apply the rate when transferring freight traffic to a connecting rail carrier at the request of a shipper, a municipality, or any other interested person.

The *Railway Interswitching Regulations* set the rates to be charged for interswitching services provided by the terminal carrier. These rates are set on a per car basis for distinct interswitching distance zones, and for blocks of fewer than sixty cars and 60 cars or more. The interswitching rate is based on the system-wide average of the railways' costs for such switching movements (including a contribution to fixed costs which the Agency adjusts annually). While the Agency has established different rates based on zones within the 30 km radius (and beyond) and on the numbers of cars switched, the rate is the same regardless of the location where the move occurs, and does not vary by market conditions.

Concerns have been raised that rates set in a formulaic manner, as the interswitching rates, through averaging and at variable cost plus a contribution to constant costs cannot be said to be consistent with commercial considerations, as per section 112 of the *Canada Transportation Act*, and the need for a sufficient return to justify investment. Further, interswitching rates are only modified when the *Railway Interswitching Regulations* are reviewed; this may be whenever the circumstances warrant, but at least once in every five year period after the regulations are made. Most railways costs (e.g. labour, maintenance, etc.) rise over time, and the rate may lag.

The Class I railways have claimed that the current way in which the Agency determines interswitching rates (notwithstanding the extended limits applicable to all traffic in the Prairies) is non-compensatory. They disagree with the Agency claim that interswitching rate calculations allow for a contribution to fixed costs and a return on capital, and hence are compensatory. They believe the rates fail to capture any compensatory return on capital, and only partially compensate for the book value of assets. As rail assets are depreciated over many years (i.e. 40 years), there can be large discrepancies between the book value of the asset and their replacement cost. The Class I railways have recommended that the existing interswitching rates be reviewed to ensure that they reflect market and commercial considerations consistent with section 112 of the Act which stipulates that the rate "*must be commercially fair and reasonable to all parties*" and offer sufficient returns to replace assets or increase capacity.

Many federal Shortline railways also believe the Agency's regulated interswitching rates are non-compensatory (and even to a greater degree than the Class 1 carriers). The Review has heard from Shortlines that the Agency's regulated rates are not reflective of their costs or their cost variability. Shortlines have a unique cost structure and may have lower labor costs than larger railways, but with generally lower traffic volumes they cannot benefit from economies of scale. Shippers have not provided views on Agency-determined interswitching rates.

The 160 km Interswitching Limits

Interswitching is one of the Act's competitive access provisions. Before the *Railway Interswitching Regulations* were amended in respect of the *Fair Rail for Grain Farmers Act*, to extend the limit for rail interswitching from 30 to 160 kilometres in Alberta, Saskatchewan, and Manitoba for all commodities to increase competition among railway companies and give shippers access to alternative rail services, about 94 percent of grain elevators were served by one railway. The 30 km interswitching limits allowed only 14 elevators in that radius to commercially negotiate a rate with a competing rail line (either in Canada or the United States) for the line haul movement, but the number of grain elevators eligible for this provision rose to 150 under the 160 km limits.¹⁷ At the time of writing, the validity of the process by which the *Canada Transportation Act* was amended and implemented by the Agency in respect of the determination of the 160 km rates was being challenged at the Supreme Court of Canada.

In regard to requests for extended interswitching beyond the 30 km limit (notwithstanding the new 160 km limits), an applicant may go to the Agency to seek an extension, but the intent of the Act is to provide one to those located relatively close to the 30 km interswitch bounds and if the shipper's circumstances warrant it. In other words, when the Agency considers an interswitching extension application, it makes its decision on the basis of whether the applicant would be competitively disadvantaged without the extension.

Most grain and some non-grain shippers favor making the 160 km interswitching distances permanent (despite the fact there have been very few applications for extended interswitching to date) and applied to the movement of all commodities in all provinces. They view the new limits as having the potential to increase competition among the Class 1 railways, or at least provide an incentive for CN and CP to offer better service.

Some shippers have mixed views on the overall effectiveness of regulated interswitching as a competitive access tool (regardless of interswitching distances). They claim interswitching is of limited use because its effectiveness is dependent on CN and CP's willingness to compete over the next segment (there is a perception they do not compete for each other's captive shippers – this aside, the Class 1s may not even have the capacity to compete).

CN and CP are strongly critical of the new limits. They contend that extended interswitching is contrary to market-based pricing, and if applied to all commodities in all provinces it would, in effect, mean that regulated freight rates could apply to the vast majority of rail traffic in Canada. Since regulated interswitching rates are cost-based, interswitching along a longer portion of the track means that railways have a smaller amount of their network from which to generate revenues at market prices and engage in differential pricing. Connectivity and competition from United States railway carriers without reciprocity are concerns; e.g. Claude Mongeau, CEO, CN has said:

"This action could hit Canada's railways by opening their business to unfair poaching by United States railways without any reciprocity. Beyond causing financial harm to CN, it could drain traffic away from Canadian ports and cause the loss of jobs, reduce investment, and undermine tax revenues across Canada."

There was no feedback on facilitating the process by which a shipper or other party may apply to the Agency for extended interswitching. This issue had not been raised during consultations.

Grain Hopper Cars

Between 1972 and 1994, the federal Government purchased 13,500 rail hopper cars to carry Canadian grain from the Prairies to Western Canadian ports for export. The expected service life of these hopper cars was about 40 years. Under past and current operating agreements, these hopper cars are provided at no cost to CN and CP for grain transport, although the federal government collects annual revenues in the range of \$10 to 15 million for alternate uses of the cars. Due to losses from accidents and aging, the federal fleet was estimated at about 8,410 hopper cars in 2014. The Governments of Alberta and Saskatchewan respectively acquired 1,000 hopper cars in 1980-81 of which about 900 currently remain in service. The Canadian Wheat Board (now G3 Global Grain Group) bought about 2,000 hopper cars in 1979-80 and purchased 1,663 leased rail cars in 2005-06; about 3,380 hopper cars remain in their fleet. The total number of Canadian grain hopper cars is estimated at about 23,000.¹⁹

The existing grain hopper car fleet in Canada is nearing the end of its useful life and must be expanded and renewed. The federal government can play a role in the development of a long-term strategic plan on how best this can be achieved and under what timelines. It also has a role to ensure a favorable regulatory regime exists that does not generate barriers to investment. Modifications to the MRE methodology (or elimination of the MRE, outright) could reduce “free-riders” and investment disincentives. Other options include, an accelerated capital cost allowance of railway cars (e.g. to levels comparable to those in the United States, 30 percent for railway cars), and the exploration of the appropriateness of an investment tax credit are initiatives that foster a positive investment climate. As tax matters, these fall under the jurisdiction of Finance Canada.

Many submissions from, and consultations with, grain shippers highlighted a perceived lack of adequate rail car capacity in the grain-handling-and-transportation system. This perception of insufficiency was intensified during the grain transportation “failures” during the winter of 2013-14. Most appealed to the railways to increase their rail car supply to meet current and future demand.

The Class 1 railways maintain that they have been making investments in capacity, but contend that the current regulatory regime is a significant deterrent to on-going investments. For example, the CEO of CN Railway wrote a letter to the CTA Review Chair specifically on the issue of the MRE and the Agency’s treatment of one of its more recent acquisitions of new grain hopper cars. The CEO expressed his frustration over how such investments are accounted for by the Agency in the MRE formula: “and that the overall CN adjustment is shared with CP, is particularly troublesome.”²⁰ The railways have further argued that the MRE allows no credit for the extra costs of government hopper car replacement with more modern equipment. For example, under the existing MRE provisions, the Agency will not allow for the extra costs attributable of acquiring more modern equipment as compared to simply replacing the government cars with equivalent cars. In other words, under the current MRE formula, CN and CP will only be provided with “financial credit” of an amount equal to the cost of replacing an existing grain hopper car with one of the same as opposed to a more modern and efficient car. The CN CEO continued: “the regulatory framework for Western Canada grain is ill-suited to promote sound railway investment through adequate pricing mechanism.”²¹

Notes

- ¹ According to Statistics Canada, a census farm (or agricultural operation) is any operation that produces agricultural products with the intention of selling them. This includes a wide variety such as farms that are operated by people who choose farming for lifestyle reasons, to those who farm for economic reasons, with or without off-farm work.
- ² Source: CTA Review with data from Statistics Canada, 2011 *Census of Agriculture* (2012), accessed on November 23, 2015, online: <http://www.statcan.gc.ca/eng/ca2011/index>.
- ³ Source: Statistics Canada, 2011 Census of Agriculture, *op. cit.*
- ⁴ Source: Agriculture and Agri-food Canada internal data.
- ⁵ Quorum Corporation, Grain Monitoring Program Supplemental Study, *The Marketing and Logistics Component of the Canadian Grain Supply Chain – Technical Report* (September 2014), at 19.
- ⁶ Agriculture and Agri-food Canada internal data and analysis, 2015.
- ⁷ Source: CTA Review with data from Agriculture and Agri-food Canada internal Calculations and Statistics Canada.
- ⁸ Agriculture and Agri-Food Canada. *An Overview of the Canadian Agriculture and Agri-Food System 2015*, (Ottawa: Agriculture and Agri-Food Canada, April 2015) (Catalogue number A38-1/1-2015E-PDF).
- ⁹ This section was prepared from a review of many sources including Agriculture and Agri-food Canada (AAFC) internal documents, and a paper written by Joseph Monteiro and Gerald Robertson entitled: *Grain Transportation in Canada – Deregulation*.
- ¹⁰ Willard Z. Estey, *Grain Handling and Transportation Review – Final Report* (December 21, 1998).
- ¹¹ Arthur Kroeger, *Grain Handling and Transportation System: Stakeholders' Report* (October 5, 1999).
- ¹² This refers to the present day Grain Monitor. In conjunction with the enactment of Bill C-34, the government announced that they would appoint an independent third party to monitor the overall efficiency of the grain handling and transportation system, including the impact of changes on producers, the Canadian Wheat Board, railways, grain companies, and ports. On June 19, 2001, the Government of Canada announced that Quorum Corporation had been selected as the monitor for the prairie grain handling and transportation system.
- ¹³ Dr. Joseph Schulman, CPCS Transcom, *Report on the Western Grain Transportation Maximum Revenue Entitlement*, prepared for the CTA Review (April 22, 2015).

- ¹⁴ The terms “movement,” “grain” and “Western Division,” as they apply in Division VI (Transportation of Western Grain) of the Act are all defined at section 147 of the Act.
- ¹⁵ Section 147 of the *Canada Transportation Act* defines “prescribed railway company” to mean “the Canadian National Railway Company, the Canadian Pacific Railway Company and any railway company that may be specified in the regulations.” To date, no other railways have been specified by regulation so that only CN and CP are deemed to be “prescribed railways” and therefore subject to the Maximum Revenue Entitlement provisions.
- ¹⁶ Canadian Transportation Agency, Backgrounder: *Western Grain Revenue Cap Program* (last modified: October 23, 2015), accessed on November 23, 2015, online: <https://www.otc-cta.gc.ca/eng/publication/backgrounder-western-grain-revenue-cap-program>.
- ¹⁷ The number of grain elevators as stated by the Hon. Gerry Ritz, Minister of Agriculture and Agri-food, to the House Standing Committee on Agriculture and Agri-Food, March 31, 2014. However, the Agency’s August 1, 2014 Regulatory Impact Statement indicates that: “*This amendment extends the interswitching zone for shippers of all commodities located within Alberta, Saskatchewan and Manitoba from 30 kilometres to 160 kilometres....Up to 261 grain elevators will have access to more than one carrier, compared to 48 at present.*”
- ¹⁸ CN, *CN disturbed by Canadian government legislation introducing heavy-handed regulatory intrusion into rail grain transportation*, CN News Article (March 26, 2014), accessed on November 23, 2015, online: <https://www.cn.ca/en/news/2014/03/cn-disturbed-by-canadian-government-legislation-introducing-heavy-handed-regulatory-intrusion>.
- ¹⁹ Quorum Corporation, and other sources.
- ²⁰ April 10, 2015 letter to the Honorable David Emerson from CN President and Chief Executive Officer, Mr. Claude Mongeau.
- ²¹ *Ibid.*

Appendix J

Passenger Rail

Uniqueness of VIA Rail

VIA Rail is a non-agent Crown corporation, which constrains it from operating on a commercial basis, as it is unable to rely upon the financial resources of its shareholder, the Government of Canada, to provide reassurances for its liabilities.¹

Research commissioned by the CTA Review shows that VIA Rail and passenger rail services in Canada are unique when compared with the models of other countries, such as those in the European Union. Unlike elsewhere, commuter rail service in Canada is delivered by separate and distinct providers. The research report states that it is a “challenge to compare market performance in a systematic way for two main reasons: first, regional and commuter traffic is much more intensive than longer distance travel and masks the information on the latter unless one examines the data route-by-route; second, Canada’s population and rail volumes are much smaller in comparison with other countries.”²

RESEARCH: Passenger Rail Services

International comparisons of passenger rail services, including those in the European Union, Australia and the United States reveal that Canada is unique in terms of the relevant legislation and governance, funding models, markets served and performance. VIA Rail Canada is a separate state-owned operation of rail passenger services restricted to inter-city markets. Significant intergovernmental cooperation exists in other countries, while Canadian provincial and federal governments plan and run their rail operations and interests in isolation.

Using data related to ridership, interface with freight rail, competition from other modes, and demographic and technological trends, a long-term outlook was prepared for inter-city passenger rail in Canada, focused on the Quebec City-Windsor Corridor. The scenarios forecast inter-city ridership at 2.6 to 4.9 million passengers by 2036.

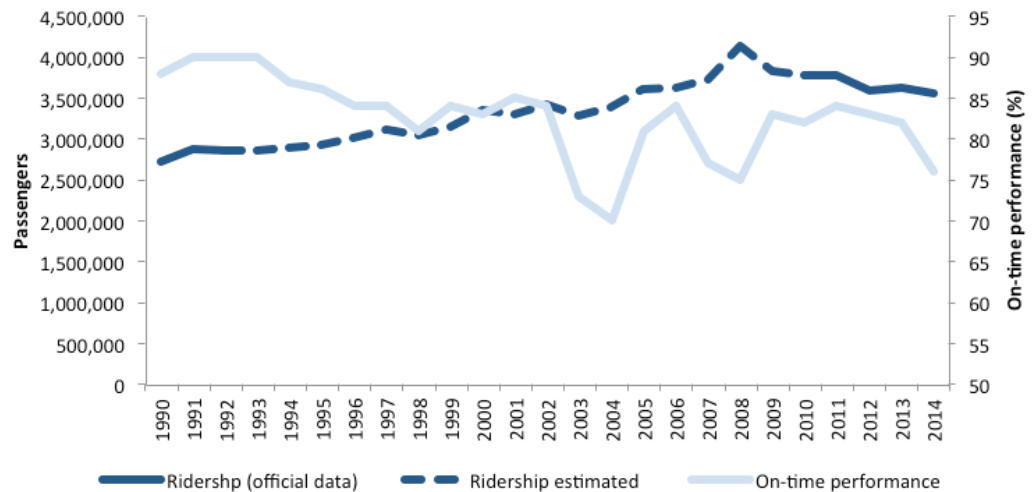
Factors influencing ridership include: track capacity constraints due to freight and commuter trains, relatively low frequencies, lengthy journey times, less attractive pricing policies, and increased competition from other modes.

Lessons learned from the United Kingdom: private-public partnerships may not be sufficient to reverse the long-term decline in VIA Rail ridership along the Quebec City-Windsor Corridor. However, private sector practices for marketing, ticket pricing, etc., may contribute to reversing the forecasted decline.

Sources: Kieran MAS, *International Comparison of Passenger Rail Systems*, prepared for the CTA Review, June 2015; and AECOM, *Overview and Long-Term Outlook for Inter-City Passenger Rail*, prepared for the CTA Review, September 2015.

The AECOM study showed that VIA Rail’s on time performance has generally been declining over the past twenty years. This corresponds with a period during which rail freight volumes have been increasing (see Appendix H).

**FIGURE 1 –
ON-TIME PERFORMANCE
AND RIDERSHIP ON THE
CORRIDOR³**



Growth of Commuter Rail Ridership

Commuter rail ridership has been growing steadily in the three urban agglomerations with Metrolinx/GO Transit providing service in the Greater Toronto and Hamilton Area, West Coast Express providing service in the Lower Mainland of British Columbia, and l'Agence Métropolitaine de Transport (AMT) providing service in the Montréal Area:

- Metrolinx/GO Transit's ridership on its rail system was: 47 million in 2011-12; 48 million in 2012-13; and 51 million in 2013-14.⁴ The original GO Train Service had ridership of 2.5 million passengers in 1967.⁵
- L'Agence Métropolitaine de Transport's commuter rail ridership: 17.45 million in 2012; 17.6 million in 2013; and 17.8 million in 2014.⁶ When AMT became responsible for its first two lines in 1996, ridership was 6.5 million trips per year.⁷
- West Coast Express ridership has grown from about 1.6 million in 1996 to the current ridership in the high to mid two millions: 2,872,461 in 2012; 2,750,261 in 2013; and 2,625,328 in 2014.⁸

RESEARCH: REGIONAL AND REMOTE PASSENGER RAIL SERVICES

- Canada has eight active and two inactive regional and remote passenger rail services.
- Performance projections and underlying assumptions for these services generally show that costs and government subsidies are expected to rise significantly by 2035.
- There is a lack of a definition for criteria for the provision of government subsidies for regional (as opposed to remote) services.

Source: Research and Traffic Group, *Overview of Long-Term Scenarios for Regional and Remote Passenger Rail in Canada*, prepared for the Canada Transportation Act Review, June 2015.

The following tables provide additional information on the regional and remote passenger rail services that provide transportation options for communities and travellers:

Operator	Length (km) ¹	Service End Point Stations
Tshiuetin Rail Transportation (TRT)	576	Sept-Iles – Schefferville
Keewatin Railway Company (KRC)	251	The Pas – Pukatawagan
Algoma Central Railway (ACR)	476	Sault Ste. Marie – Hearst
VIA Rail Active Services	4,733	Jasper – Prince Rupert Winnipeg – Churchill Sudbury – White River Montréal – Senneterre Montréal – Jonquière
VIA Rail Inactive Services		Victoria – Courtney ² Montréal – Gaspé ³

FIGURE 2 – REGIONAL AND REMOTE SERVICES LENGTHS AND END-POINT STATIONS⁹

1. The distances shown for VIA are the incremental route-miles (converted to kilometres) dedicated to R&R services, (the route-miles shared with other services are not included). Aggregate service-miles or train-trip lengths would be a larger number.
2. Service was discontinued in 2011 due to track conditions.
3. The segment from Montréal to Matapédia is operated in combination with the Ocean long haul service. The separate service between Matapédia and Gaspé was discontinued in September 2013 due to track conditions on that track segment.

	Permanent Residents	Commercial Tourism	Private Cottagers
Remote (No other land access)	KRC, TRT		
Blended (part remote, part with access)	VIA (W-C)	VIA (W-C, S-WR, M-S, M-J)	VIA (S-WR, M-S, M-J)
Full road access but no private or public bus service	ACR	ACR	ACR
Competitive Land Modes	VIA (V-C, M-G, J-PR)	VIA (V-C, M-G, J-PR)	

FIGURE 3 – REGIONAL AND REMOTE RAILWAY CHARACTERIZATION GRID (COMMUNITY ACCESS / TYPE OF USER)¹⁰

Legend:

ACR = Algoma Central Railway; KRC = Keewatin Railway Company; TRT = Tshiuetin Rail Transportation; ACR = Algoma Central Railway; and for VIA services: J-PR = Jasper - Prince Rupert, W-C = Winnipeg – Churchill; S-WR = Sudbury - White River; M-S = Montréal – Senneterre; M-J = Montréal – Jonquière; V-C = Victoria – Courtney; M-G = Montréal - Gaspé.

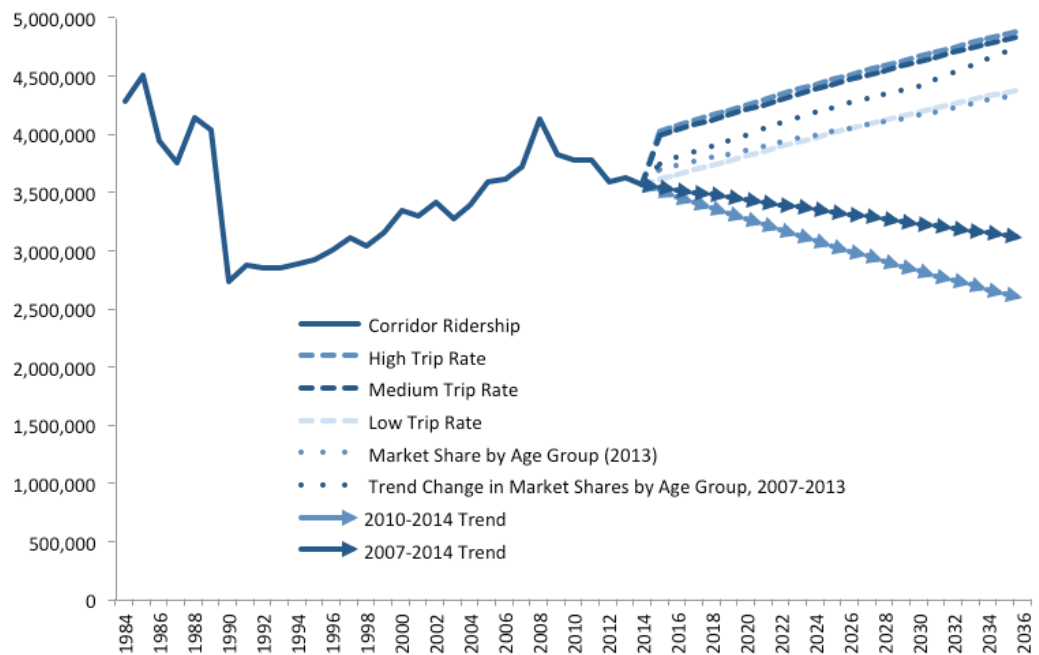
**FIGURE 4 –
TOTAL FEDERAL
GOVERNMENT
SUBSIDIES – 2004-09¹¹**

Operator	Total Subsidies for 2004-2009
Tshuettin Rail Transportation	\$41,349,530
Ontario Northland Transportation	\$12,500,000
Keewatin Railway Company	\$8,938,671
Algoma Central Railway	\$11,920,573
VIA Rail (2006-2010)	\$1,550,000,000

FORECASTS FOR THE NEXT 20-30 YEARS

The following tables provide projections on ridership and demographic considerations in the Windsor-Quebec City corridor. The first figure shows the range of possible ridership trends, taking into account a number of factors that can be referenced in the AECOM report.

**FIGURE 5 –
VIA RAIL RIDERSHIP
FORECASTS¹²**



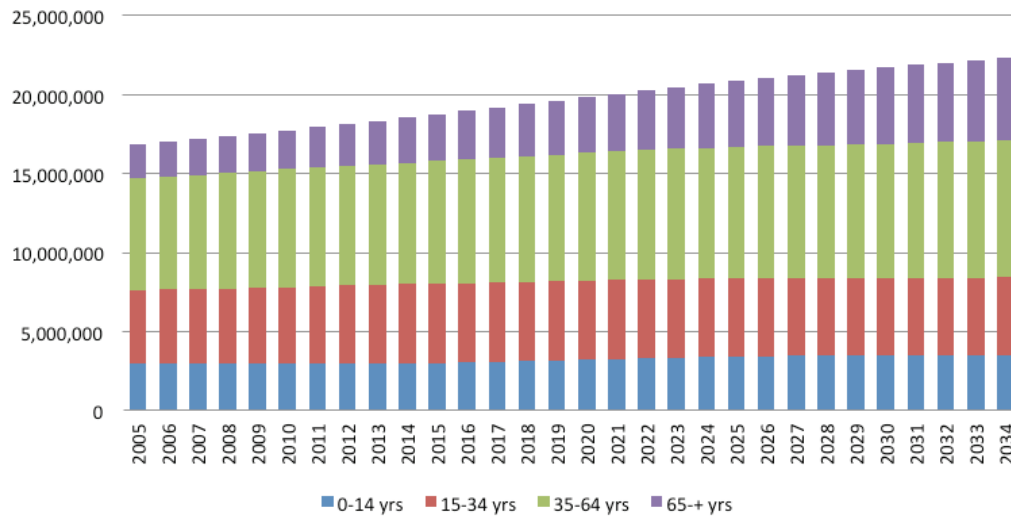


FIGURE 6 – HISTORIC AND PROJECTED CORRIDOR POPULATION BY AGE GROUP, 2005-2035¹³

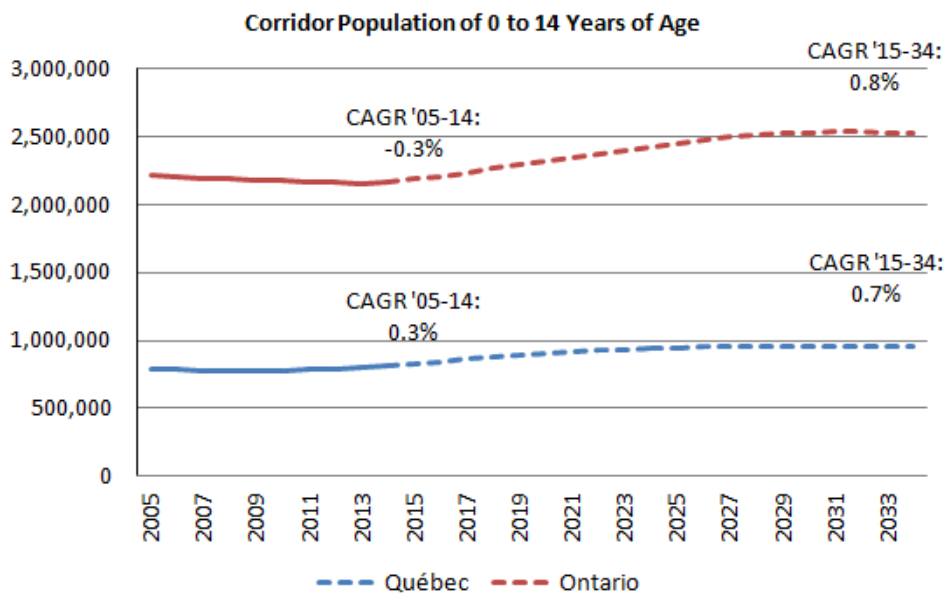
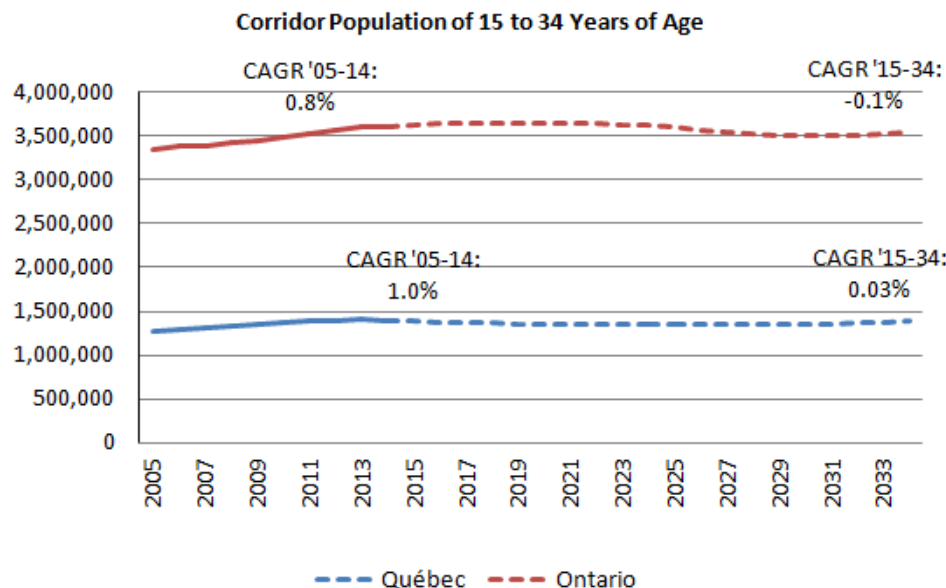
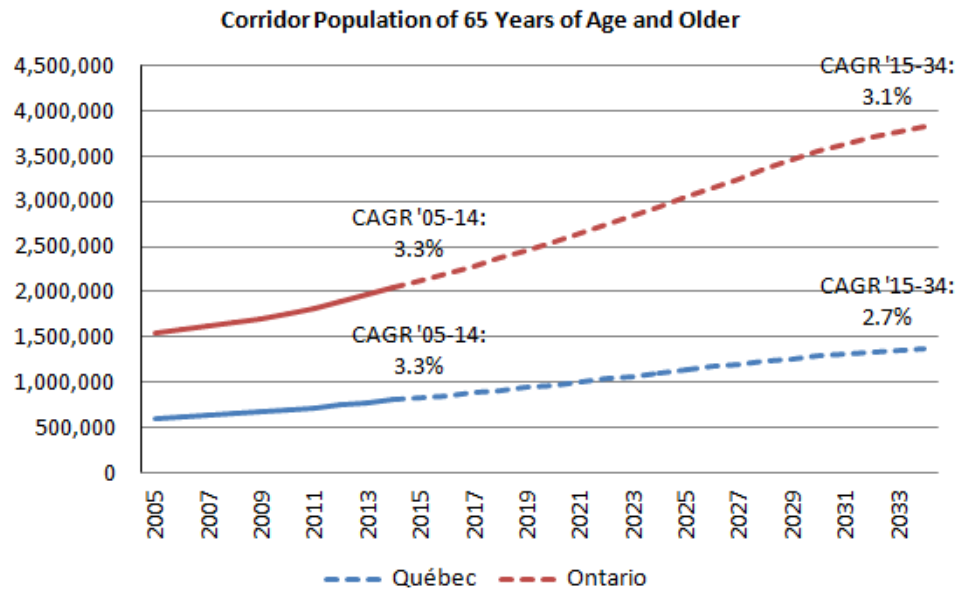
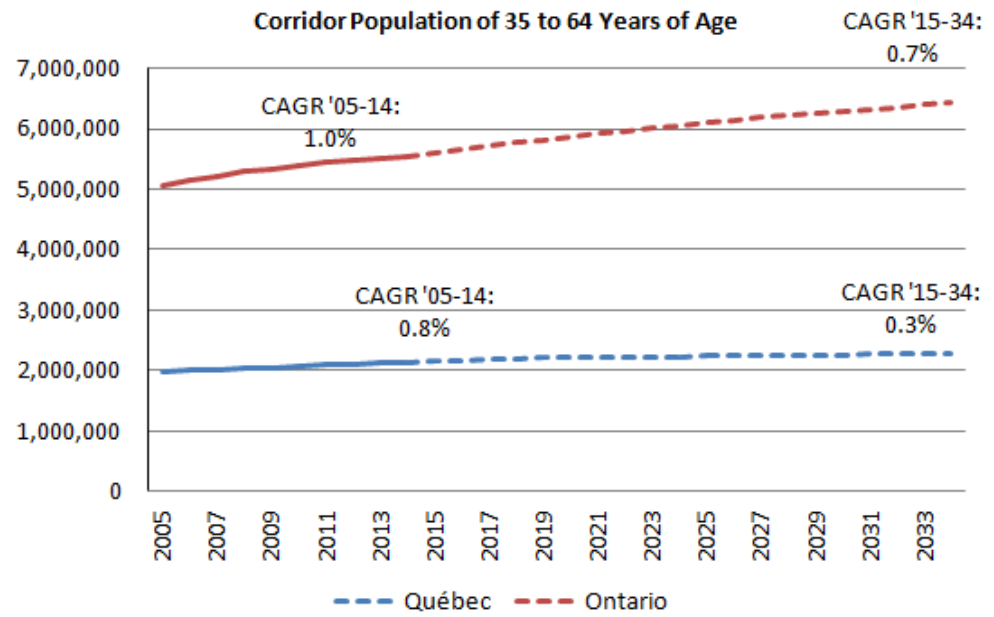


FIGURE 7 – HISTORIC AND PROJECTED CORRIDOR POPULATION BY AGE GROUP, 2005-2034¹⁴





Notes

- ¹ For more on the differences between agent and non-agent Crown corporations, see Treasury Board of Canada Secretariat, *Agent Status and Crown Corporations*, (last modified: May 31, 2007), accessed on November 23, 2015, online: <http://www.tbs-sct.gc.ca/gov-gouv/agent-mandataire/agent-mandataire-eng.asp>.
- ² Kieran MAS, *International Comparison of Passenger Rail Systems*, prepared for the CTA Review (June 2015), at 2.
- ³ Sources: VIA Rail, *Annual Report* (years 2000, 2003-2014), Canarail (1993) and AECOM estimates. AECOM *Overview and Long-Term Outlook for Inter-City Passenger Rail*, prepared for the CTA Review, 2015, at 8.
- ⁴ Metrolinx, *Annual Report 2013-2014* (2014), at 36, accessed on November 23, 2015, online: http://www.metrolinx.com/en/aboutus/publications/Annual_Report_2013-2014_EN.pdf.
- ⁵ GO Transit, *What is GO?* (no date), accessed on November 23, 2015, online: <http://www.gotransit.com/public/en/aboutus/whatisgo.aspx>.
- ⁶ Agence métropolitaine de transport (AMT), *Rapport Annuel 2014*, at 17, accessed on November 23, 2015, online: <https://www.amt.qc.ca/Media/Default/pdf/section8/publications/amt-rapport-annuel-2014.pdf>.
- ⁷ Daniel Bergeron, Agence métropolitaine de transport, *The Commuter Train Network Reaches New Heights with the Addition of 160 New Railcars!* (presentation to the Transport Association of Canada, Annual Conference, 2010) accessed on November 23, 2015, online: <http://conf.tac-atc.ca/english/resourcecentre/readingroom/conference/conf2010/docs/a3/amt-montreal-e.pdf>.
- ⁸ Metro Vancouver, *Transit Ridership 1989 – 2014*, accessed on November 23, 2015, online: <http://www.metrovancouver.org/services/regional-planning/PlanningPublications/TransitRidership.xls>.
- ⁹ Research and Traffic Group, *Remote and Regional Rail Passenger Services*, prepared for the CTA Review, 2015, at 3.
- ¹⁰ *Ibid.*
- ¹¹ Research and Traffic Group, *Remote and Regional Rail Passenger Services*, *op. cit.*
- ¹² Source: VIA Rail, TSRC 2007 and 2013, C4SE, ISQ and calculations in AECOM, *Overview and Long-Term Outlook for Inter-City Passenger Rail*, *op. cit.*, at 19.
- ¹³ Source: Institut de la statistique du Québec, C4SE, AECOM. AECOM, *Overview and Long-Term Outlook for Inter-City Passenger Rail*, *op. cit.*, at A-6.
- ¹⁴ *Ibid.* at A-7.

Appendix K

Air Transport

This Appendix provides supplemental information and analysis on each of the themes outlined for the recommendations on air transport in Chapter 9. It also provides background on key issues, including summaries of the research projects prepared for the CTA Review.

User Pay Policy and the Cost of Air Transport

Globally-competitive air transport is a key piece of Canada's overall competitiveness, as well as for the quality of life of Canadians. However, the conditions that make it so important also make for a high-cost and difficult operating environment: small populations, spread across great distances, marked by rugged geography and weather extremes, all of which pose challenges for efficiency, reliability and economies of scale.

Pilots make their livelihood in the aviation sector, its growth and prosperity are of prime concern.

— *Air Line Pilots Association, Int'l (Canada Board), Submission to the CTA Review, January 2015*

Canada implemented a policy of "user pay" for the operation and development of air infrastructure and services during the 1990s so that airport and air navigation infrastructure is funded by revenues generated from traffic and business. But Canada's approach to user-pay adds to the relatively high cost of air travel, as users support the full cost of infrastructure and operations: the government collects revenues from air transport fees and taxes in excess of its investments in the sector (see Figure 1). This is one part of why air travel prices in Canada are far higher than comparable countries, including competitors located just a short drive across the United States border.

A paradigm shift in how decision-makers view the sector is required to unleash its full potential to grow the economy and jobs, connect communities, support vital trade objectives and compete globally.

— *Transat A.T., Submission to the CTA Review, January 2015*

Airport authorities pay rent as a return to taxpayers for the use of publicly owned assets, which they must also maintain and upgrade (more on airports policy below). The authorities are non-profit entities, so rent costs are entirely passed along to users. The rent collected from the largest airport authorities is calculated at progressive rates of up to 12 percent on the airport's gross revenue. The not-for-profit structure was chosen so that all airport revenues would be reinvested in operations and facilities. In practice, rent requires large airports to raise \$1.12 of new revenue for every \$1 of investment. While rent may only cost approximately \$2 to \$5 per passenger, depending on the airport, it is equivalent to up to one third of the landing/terminal fees paid by carriers at the larger airports.¹ These levels of rents are considered to be uncompetitive with competing jurisdictions, and out of proportion with equivalent charges levied on Canadian marine ports (see Figure 3, below).

High taxes and fees continue to undermine the cost competitiveness of Canada’s aviation industry, government continues to collect airport rent despite that the amount of rent now exceeds the original value of the assets transferred to the authorities. These costs lead to increased landing fees and higher ticket and cargo prices.

— *Canadian Chamber of Commerce, Submission to the CTA Review, December 2015*

**FIGURE 1 –
COMPARISON OF
FEDERAL REVENUES
AND EXPENDITURES
ON AIR TRANSPORT²**

Government revenues from the air sector 2013-14 (M)			
Airport Rent	Air Travellers Security Charge	Fuel Tax	TOTAL
\$294.4	\$661.9	\$97.2	\$1,053.5
Government investments in the air sector 2013-14 (M)³			
Airports Capital Assistance Program	Canadian Air Transport Security Authority Budget	Subsidy for 18 TC-owned and operated airports ⁴	TOTAL
\$29.8	\$559.1	\$38.2	\$627.1
Difference (M)			\$426.4

According to federal policy, government revenues from the Air Travellers Security Charge are intended to balance “over time” with expenditures for the Canadian Air Transport Security Authority, Transport Canada’s aviation security functions, and RCMP on-board policing.⁵ Airlines have received some tangible benefit from the creation of the Canadian Air Transport Security Authority, and the government’s levying of the Air Travellers Security Charge, as it relieved carriers of the estimated \$100 million in screening costs that they had incurred prior to 2002, and the \$1 billion in specialized screening equipment that has been required after 2002.⁶ The security fee transfers these costs directly to passengers.

This policy of fully recovering the cost of policy, regulatory and policing functions is viewed as inconsistent with other modes of transport and with other areas of the economy (e.g. there is no marine security fee, or land border security fee). The extent to which the government bears the full costs is also contested. For example, Air Canada has recently complained that over the past five years, the value of the seats it has provided to security officers has exceeded \$100 million, and further claimed that most other jurisdictions provide compensation for similar programs.⁷ In recent years revenues have grown with traffic at rates of 3-5 percent per year while spending on security has remained relatively flat (see Chapter 9, Figure 3). Like airport rent and aviation fuel taxes, the security charge also flows into the Consolidated Revenue Fund. In addition, airports’ payments in lieu of municipal taxes can also be significant, up to \$30 to \$40 million in the cases of the airports in Toronto and Montréal, respectively.

Security services are public goods, the same as national defense. No person can be excluded from the security they offer, and no person's enjoyment of this protection weakens that of another person's protection. In 2013, United States aviation security expenditures were US\$7.8 B, of which the federal treasury accounted for 67%. The fee paid by passengers produced \$1.88B or 28% of security expenses.

— *Dr. Barry E. Prentice, Professor, I.H. Asper School of Business, University of Manitoba, Presentation at the International Symposium on Aviation Security, Toronto, May, 2014*

Many competing jurisdictions also already allow international arriving passengers to purchase duty free items at airports. This has been considered in Canada at times in the past, but never adopted. As a result, airport authorities are losing out on potential revenues from duty-free sales, as departing travellers can buy on arrival at an overseas destination, but this business is not being recuperated from arriving travellers. Airport authorities use revenues from non-aeronautical sources, including duty-free stores, to offset fees charged to airlines and passengers.

Through consultations, submissions, and previously published reports, Canada's airlines, airports, tourism and hotel associations, pilots unions, provinces, chambers of commerce, boards of trade, international freight forwarders, the C. D. Howe Institute, Conference Board of Canada and many others have unanimously called for the reduction of the government cost burden on aviation, (i.e. airport rent, fuel taxes, the security fee). Many also call for greater control of airport costs in terms of capital spending and fee-setting decisions. Some provinces have opposed allowing arrivals duty free in the past, but the Review heard indirectly that provincial governments may now look to this more favourably. Some provinces have reduced or eliminated aviation fuel taxes from international flights, but Ontario recently increased its fuel tax.

The repeal of the BC fuel tax on international flights in 2012 is another case study that quantifies the impact of what may seem, at first glance, a "small" fee. Since then it is reported that 22 airlines have added flights to Vancouver. The government estimates that the \$12 million in initial lost revenue has been replaced by new payroll and consumption taxes to the tune of about \$20 million.

— *National Roundtable on Travel and Tourism, Submission to the CTA Review, February 2015*

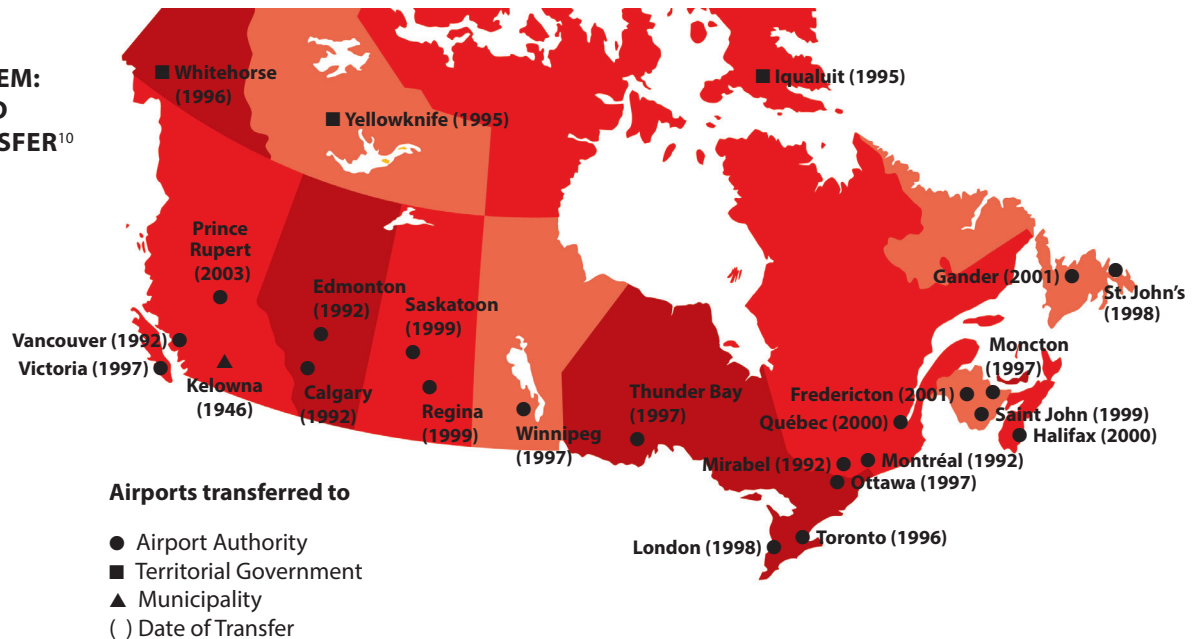
Nearly \$1 billion was collected last year in airport rent and security fees. By increasing ticket prices, these costs reduce demand for air travel by up to 2.5 million passengers annually according to Transport Canada estimates, because demand for air travel is highly elastic. If government fees and taxes are reduced, other adjustment would be required so that savings are passed on to users. These could include policy and regulatory measures to encourage competition, along with governance changes to improve market discipline at airports. Savings drive increased traffic, supporting greater economies of scale; these efficiencies translate into further profitability for the sector and more competitive prices for users. For example, according to Transport Canada economic models, and supported by similar analysis provided to the Review by one large commercial carrier, a \$1 reduction in airfare prices may induce about 125,000 new travelers per year, corresponding to a daily round trip by a Boeing 737.

NATIONAL AIRPORTS POLICY: OWNERSHIP AND GOVERNANCE

Thirty years ago, Transport Canada owned and operated most airports across the country, as well as the air navigation system. Most of the infrastructure was built to the highest architectural and technological standards in the 1950s and 1960s, but by the mid-1980s, the system was aging and approaching the end of its useful life. Competing priorities for public funds and government debt levels were pushing the government-operated model to a breaking point. Federal budgets would not bear the replacement cost of the airport and air navigation systems, which were increasingly ill-suited to growing traffic and new security requirements as a result of violent attacks targeting air transport.⁸

Following a series of studies in the 1980s, and the privatization of airports in the United Kingdom, Canada commercialized air navigation services (Nav Canada) and the larger airports, and adopted the user pay approach to building and operating air infrastructure across the sector. Beginning with Vancouver, Calgary, Montréal and Edmonton, from 1992 to 2003, the operation of the largest 22 federally-owned airports (those with traffic levels above 200,000 passengers per year and/or located in provincial capitals) were transferred to 21 airport authorities.⁹

FIGURE 2 – THE NATIONAL AIRPORTS SYSTEM: LOCATIONS AND DATES OF TRANSFER¹⁰



These not-for-profit, non-share capital corporations were created with a mandate to develop and operate the airport and lands safely, securely, and for the economic development of their regions. Most are incorporated federally under the *Canada Not-for-profit Corporations Act*, but some (including Calgary and Edmonton), are incorporated under provincial legislation. The Crown retained ownership of the lands and assets, under relationships governed by 60-year leases (with one 20-year renewal option). The authorities pay rent, and at the end of the lease, they must turn over a world-class airport, with no debt to the government. As the end of lease approaches, authorities will have increasing difficulty borrowing to maintain/improve assets, and leasing to businesses operating on airport lands. Airport authorities are free to set fees, take on debt, and operate subsidiaries.

The National Airports Policy created the National Airports System, which included the 22 airports operated by airport authorities, along with the airports in the two territorial capitals – Whitehorse and Yellowknife – which were transferred to the territorial governments, and Kelowna, which is operated and partly-owned by the municipality. Iqaluit was added to the National Airports System upon the creation of Nunavut. These four airports, are not subject to the same lease and rent requirements.

Public Accountability Principles incorporated by reference within the leases and the airport authorities' articles of incorporation spell out certain conditions for how the airports should operate and be governed. The leases also provide for the continuation of an airport's operations in the event that an airport authority was no longer able or willing to do so (e.g. because of default). There is no legislation clearly laying out respective roles, responsibilities, and obligations, as is the case for Canadian port authorities (*Canada Marine Act*) and Nav Canada (*Civil Air Navigation Services Commercialization Act*). This gap leaves differences in the Minister of Transport's powers, and the accountability and governance structures among the different entities.

Airport Authority	Gross Revenue	Airport Rent	Rent as % of Gross Revenue
Toronto-Pearson	\$1,117,534,000	\$128,877,000	11.53%
Montréal	\$446,600,000	\$45,600,000	10.21%
Vancouver	\$434,183,000	\$42,272,000	9.73%
Calgary	\$351,326,000	\$34,761,000	9.89%
Edmonton	\$182,844,000	\$15,380,000	8.41%
TOTAL (18 Airports)	\$3,099,753,000	\$291,720,00	9.41%

Port Authority	Gross Revenue	Revenue Charge	Charge as % of Gross Revenue
Vancouver	\$210,900,379	\$6,208,414	2.94%
Montréal	\$87,357,000	\$3,819,000	4.37%
Toronto	\$50,293,020	\$2,411,000	4.79%
Prince Rupert	\$39,302,561	\$1,800,000	4.58%
Québec City	\$30,814,552	\$1,300,000	4.22%
TOTAL (18 Ports)	\$547,300,000	\$19,313,000	3.53%

**FIGURE 3 –
COMPARISON OF AIRPORT
AND PORT REVENUES AND
FEDERAL CHARGES, 2013¹¹**

Airport authorities access financing at preferential rates due in part to an unfettered power to raise fees. The not-for-profit nature means no money is taken out of the airport for dividends. In principle, this helps to keep costs down for users. But absent competitive pressures, monopoly operations also tend to be overcapitalized, and some airports may fit this description. The largest authorities have built world-class (albeit expensive) airports, but the smallest struggle to maintain their airports with limited traffic.

Some stakeholders, including carriers, have called for user-appointed directors to help Boards lean away from fee increases and over-building. They point to Nav Canada’s legislation (the *Civil Air Navigation Services Commercialization Act*), Board and governance structures, and legislated fee charging principles overseen by the Canadian Transportation Agency as providing stronger checks on monopoly power (see below). Nav Canada’s structure also separates the members of the corporation (the not-for-profit equivalent of shareholders) from the directors, clarifying lines of accountability (see Backgrounder, right).

Airport Improvement fees were instituted by airport authorities shortly after commercialization as a method of improving airport infrastructure and increasing accountability. Despite the noble intentions, fees have spiraled out of control, increasing exponentially from a nominal \$5 charge to up to \$35.

— *WestJet Pilots Association, Submission to the CTA Review, May 2015*

The National Airports Policy also guided the divestiture of the vast majority of smaller federally-owned airports (including those in the three territorial capitals) to provincial or local authorities. All but 18 smaller airports were transferred outright, in negotiated settlements, to provincial or local authorities, with funding for deferred capital investments. Transport Canada continues to operate those small airports across the country that the government was unable or unwilling to divest.

**FIGURE 4 –
18 TRANSPORT CANADA
OWNED AND OPERATED
("LEGACY") AIRPORTS¹²**



BACKGROUND: NAV Canada

The National Airports Policy also established Nav Canada as a not-for-profit non-share capital corporation. Unlike the airport authorities, Nav Canada was required to purchase all of its assets from the federal government for \$1.5B in 1996, which was financed with debt. Under the *Civil Air Navigation Services Commercialization Act*, the corporation was given discretion to set fees according to the “charging principles” defined in legislation and appealable to the Canadian Transportation Agency. It can also take on debt, and sell its services abroad.

Nav Canada provides air navigation in Canadian and North Atlantic airspace, and sells its services and technology around the world. Nav Canada is also investing in innovation, for example, Aireon, a joint venture with Iridium, is set to launch a continuous satellite-based global air navigation network that will allow greatly increased capacity on the most efficient routes, offering tremendous fuels savings to airlines, as well as important future revenue potential for Nav Canada. It has been recognized 3 times by global airlines as the world’s best air navigation service for its delivery of value to its users, and steadily reducing fees over the past decade.

Capital plans are only approved for safety, obsolescence or payback to Nav Canada and its customers (e.g. in fuel savings). Investments that reduce fuel use deliver significant value for airlines, because: debt is cheaper than equity, and Nav Canada’s cost of capital is 67 to 75 percent less than that of its airline customers. Nav is designated as a “Public Issuer,” so public disclosure rules apply like for companies traded on the stock market. It publishes quarterly financials and full annual reports, etc. It has provided private sector efficiency without the need price regulation. Savings are reinvested in the system or passed on as fee reductions. Some stakeholders cite Nav Canada as a model for natural monopolies and public utilities, including port and airport authorities and the Canadian Air Transport Security Authority.

The corporation has 5 member groups (the equivalent of shareholders), who appoint the directors:

- Commercial Carriers (4 directors);
- General Aviation (1 director);
- Air Navigation Service Labour Unions (2 directors);
- Federal Government (3 directors); and
- Director Member (4 unrelated directors appointed by the Board, as well as the President/CEO).

Source: CTA Review and Nav Canada Annual Reports.

The Airport Capital Assistance Program (ACAP) is a vital source of funding for safety related investments at small airports across Canada. After over 20 years in existence it is clear that the program needs improvements in order to keep pace with the forces of inflation, regulatory burden, and time in order to be a viable resource for small airports across Canada.

— *Airport Management Council of Ontario, Supplemental Submission to the CTA Review, June 2015*

Most smaller airports are also free to set fees, but may not have the same access to debt as the larger airports. With lower traffic volumes, smaller airports often have difficulty sustaining operations and capital with user fees alone. While none have closed, self-sufficiency is an ongoing issue.

Airport authorities make long-term commitments that the looming end of leases may soon jeopardize. The federal government should sell its remaining interest in the leases either to the not-for-profit airport authorities that operate them or to for-profit corporations. Such sales could make investors, airlines, travelers, and taxpayers all better off.

— Benjamin Dachis, C.D. Howe Institute, *Full Throttle: Reforming Canada's Aviation Policy*, January 2014.

The 1994 National Airports Policy stated that airport rents would fund an Airports Capital Assistance Program to support needed safety investments. In practice, the federal government takes in more than \$291 million in rent from the largest airports, while only spending \$20 to \$40 million on the Airports Capital Assistance Program, depending on the year, in support of very basic safety improvements.¹³

Submissions from municipalities and their associations, as well from the mining industry and various chambers of commerce, all highlighted the importance of strengthening federal support for local airport infrastructure in smaller and more remote communities.

Inclusion of the smallest airports in the National Airports System is considered to put them at a competitive disadvantage to locally-owned airports, which benefit from federal, provincial, and municipally-supported infrastructure and operations. All of the airports that were fully divested by the federal government under the National Airports Policy have survived, and some have even outgrown the small federally-owned airports (see Figure 5, right).

To remain viable, regional/local airports require adequate and predictable funding for essential, safety-related capital projects. Smaller airports have less stable traffic, less than favourable balance sheets and aging assets, and have greater difficulty in obtaining capital through commercial markets for maintenance and upgrades. These airports have been operating in an underfunded manner for an extended period and the infrastructure and equipment is becoming worn and aged and requires improvements to support on-going operation.

— Atlantic Canada Airports Association, *Submission to the CTA Review*, January 2015

It may be debatable whether smaller National Airports System airports provide nationally-significant connectivity. The Review has found no compelling policy rationale for maintaining federal ownership and operation of the 18 airports that remain with Transport Canada as a legacy of the National Airports Policy. These smaller airports could potentially be operated by locally-based authorities in the interests of their communities. This would provide the airport operators with access to infrastructure funding that is equitable with similar size facilities in other communities, while also reducing the federal government's financial liability for them, over time.

FIGURE 5 – CANADA'S LARGEST PASSENGER AIRPORTS (SMALLEST FEDERALLY-OWNED NAS AIRPORTS HIGHLIGHTED)¹⁴

Airport			Total Passengers (enplaned and deplaned)		
			2013	2014	Change
1	Toronto/Lester B Pearson International	NAS Airport Authority	35,261,531	37,523,366	6.4%
2	Vancouver International	NAS Airport Authority	17,644,195	18,944,527	7.4%
3	Calgary International	NAS Airport Authority	13,788,879	14,666,729	6.4%
4	Montréal/Pierre Elliott Trudeau Int'l	NAS Airport Authority	13,514,047	14,174,375	4.9%
5	Edmonton International	NAS Airport Authority	7,380,826	7,710,267	4.5%
6	Ottawa/Macdonald-Cartier International	NAS Airport Authority	4,480,895	4,472,365	-0.2%
7	Winnipeg/J.A. Richardson International	NAS Airport Authority	3,448,823	3,626,250	5.1%
8	Halifax/Robert L Stanfield International	NAS Airport Authority	3,540,594	3,620,107	2.2%
9	Toronto/Billy Bishop Toronto City	Non-NAS	<i>Approximately 2,400,000*</i>		
10	Victoria International	NAS Airport Authority	1,563,656	1,634,887.4	6%
11	Kelowna	NAS - City of Kelowna	1,589,476	1,607,991	1.2%
12	St John's International (NL)	NAS Airport Authority	1,481,037	1,555,795	5.0%
13	Saskatoon/John G Diefenbaker Int'l	NAS Airport Authority	1,406,576	1,497,579	6.5%
14	Québec/Jean Lesage International	NAS Airport Authority	1,420,271	1,449,413	2.1%
15	Regina International	NAS Airport Authority	1,238,358	1,254,933	1.3%
16	Fort McMurray	Non-NAS	1,097,457	1,166,540	6.3%
17	Thunder Bay	NAS Airport Authority	742,192	739,837	-0.3%
18	Greater Moncton International	NAS Airport Authority	644,273	649,427	0.8%
19	London	NAS Airport Authority	456,545	479,928	5.1%
20	Prince George	NAS Airport Authority	442,314	435,128	-1.6%
21	Yellowknife	NAS Territorial Gov't	356,227	359,384	0.9%
22	Comox	Non-NAS	333,615	336,656	0.9%
23	Deer Lake	Non-NAS	295,430	320,272	8.4%
24	Charlottetown	NAS Airport Authority	300,754	317,150	5.5%
25	Fredericton	NAS Airport Authority	<i>Approximately 315,000*</i>		
26	Whitehorse International	NAS Territorial Gov't	269,326	305,179	13.3%
27	Terrace	Non-NAS	183,439	290,383	58.3%
28	Windsor	Non-NAS	241,684	263,401	9.0%
29	Vancouver Harbour	Non-NAS	256,025	247,380	-3.4%
30	Fort St John	Non-NAS	174,773	245,509	40.5%
31	Saint John (NB)	NAS Airport Authority	<i>Approximately 240,000*</i>		
32	Sudbury	Non-NAS	249,256	232,879	-6.6%
33	Timmins	Non-NAS	207,132	210,448	1.6%
34	Victoria Harbour	TC Owned-Operated	208,726	203,194	-2.7%
35	Goose Bay	Non-NAS	142,169	176,037	23.8%
36	Wabush	TC Owned-Operated	183,836	153,671	-16.4%
37	Kitchener/Waterloo	Non-NAS	148,189	147,317	-0.6%
38	Gander International	NAS Airport Authority	132,613	140,997	6.3%
CANADA TOTAL			123,909,945	130,589,685	5.4%

* Passenger volumes at airports with one dominant carrier are not published by Statistics Canada due to commercial sensitivity.

There is widespread consensus that airport rent should be reduced or eliminated, and that end of lease issues should be resolved. Transferring ownership would solve both issues, but some airport authorities are comfortable with the current model and would prefer rent cuts and rolling lease extensions. Some are concerned that a land transfer would subject them to provincial/municipal building/planning codes and fees, increasing the cost and time for development, and may implicate First Nations land claims. Airport authorities have questioned the need for governance reforms, but in consultations they were generally accepting of most, if not all specific measures. This is because many airport authorities already fulfill the objectives of many of the potential reforms, either voluntarily, or to meet obligations to lenders under securities rules. What is missing is consistency for comparability.

Until recently, several large airports were in favour of full privatization. However, during the Review's consultations, only one provided a submission that was favourable to this option. Smaller airport authorities also indicated that over the years, they have come to realize that membership in the National Airports System provides them with no advantages, but excludes them from federal infrastructure funding. Most indicated an interest in a divestiture process like that for the regional airports in the 1990s.

The National Airports Policy was implemented when there were few international models to emulate. It has generally succeeded in its primary objectives: divested airports have not failed, as their communities have assumed responsibility for them. Most of the problems the Review has identified can be traced back to a choice in the 1990s not to completely divest larger airports and to rely even more on competition and market forces to guide decision-making. These could be addressed by completing the movement from government ownership and operation through commercialization to full privatization, including a transfer of the lands and assets, while enacting a legislative framework that will ensure transparency, accountability, and oversight by users and the Crown now and into the future.

Airports could be a possibility for privatization, not just commercialization. But if airports are privatized, this must be accompanied by strong regulations and oversight on rates and service.

— *Air Transport Association of Canada, Submission to the CTA Review, December 2015*

BACKGROUND: Airport Privatization Options

A number of options are available for the privatization of the large airports depending on whether the government chooses to maintain full or partial ownership of the land, or fully privatizes both the operations and the assets of the airport together.

Retaining ownership of the airport lands and assets:

1. “Monetizing” the rent revenue stream under the ground lease by selling it to a private investor who would name directors to the Board instead of the federal government. Note that this option would not resolve the identified cost competitiveness or end of lease issues; or
2. Privatizing the operation of the airport through a new concession or management contract and implementing legislation to dissolve the existing leases and airport authorities. Note that this would be more complicated for those authorities incorporated provincially.

Partial sale of the airport lands and assets:

3. Forming an equity partnership with a private sector manager who would own at least 49% of the airport and be responsible for its operation under a contract. Requires legislation to dissolve the existing leases and airport authorities. Birmingham International Airport (United Kingdom) operates under a similar model, with a minority equity stake held by the Ontario Teachers Pension Plan.

Selling the airport lands and operations:

4. Converting the existing airport authorities into a share capital, for-profit business corporation under the *Canada Business Corporations Act* and selling the airport lands to the authorities. Would require legislation to continue or transfer assets and liabilities. In some cases would require working with the provinces, First Nations and others, depending on the ownership of the land in question, whether there is applicable provincial legislation, and any existing agreements, outstanding land claims, etc.
5. Dissolving the leases and the existing authorities, and selling the assets to a private company or consortium of investors. Up to 100% ownership of the airports could be offered in one sale, as was done with the large airports in the United Kingdom in the 1980s. Or the sale could be completed in tranches over a period of time, as has been done in the past with the sale of Canadian Crown corporations like Petro Canada and Air Canada.

Source: CTA Review, with background information from individual airport authorities.

Analysis on airport privatization that has been shared with the Review identified a number of hurdles that would need to be cleared in order to fully privatize the airports. Among these was a requirement to obtain the consent of the holders of the airport authorities' outstanding bonds under an extraordinary resolution. The transfer of airport lands to privatized airport authorities would also likely require the consent of bondholders, in addition to First Nations, provinces, and others in certain specific cases; for example, in locations where there are outstanding land claims, or where the airport authorities are incorporated provincially.

A regulatory regime would also likely be needed to balance the interests of shareholders and users (including passengers and carriers). Fully privatized airport authorities would also likely need to be regulated to restrain the use of market power for excessive profit taking. Regulatory regimes in place elsewhere in the world provide examples. During consultations a number of stakeholders said Australia's regulatory regime offered the lowest administrative and cost burden on government, and does not incent ongoing annual increases in fees and profits, which has been observed at the large airports in the United Kingdom.

In addition to introducing more private sector discipline on the management of the asset (i.e. investment and fee-setting decisions), fully-privatized airports would gain access to a new source of funding: share capital. While ensuring that they maintain an appropriate debt to equity ratio, airports could issue new share capital to reduce debt or obtain the funds required for new investments. The airports would be better equipped to meet their future needs in terms of capital, while benefiting from greater flexibility in financial management. Governance would be simplified with a more traditional organizational model. An economic mechanism for regulating prices and tariffs based on the Australian model of self-regulation and a system of arbitration of complaints is recommended.

Whatever model of privatization is chosen, any revenue for the government from the sale/concession price of privatizing the airports increases airport costs, and would ultimately be passed on to Canadian travellers in the form of higher fares and fees. It is noted that taxpayers have already received a significant return on their investment in the airports in the form of airport rent, likely in excess of the value of the airport assets that were transferred by the Government. Use of privatization to extract the maximum revenue for government undermines the objective of a more competitive air transport sector. Privatization should encourage clearer and more direct accountability and more market-disciplined oversight by the Board of Directors (who would be answerable to shareholders) than may be the case for the existing community-based boards, which are not distinct from the members of the corporation.

DOMESTIC AIR CARRIER COMPETITION AND FOREIGN OWNERSHIP LIMITS

Until the mid-1990s, Canada rigidly regulated the domestic and international airline marketplace. Domestic fares were set according to the distance travelled, regardless of market conditions and cost. An airline ticket to fly from Toronto to Montréal (the busiest route in the country) was therefore priced the same as a lower-volume route of the same distance. Airlines were also mandated to serve specific routes, and revenues generated from artificially-inflated prices on higher-volume routes were intended to cross-subsidize losses on the mandated lower-volume routes that connected smaller centres.

The policy objective may have been noble: equitable access to air transport for Canadians across the country, but the rigidity and inefficiencies made the system on the whole more expensive. Likewise, domestic regulation and conditions in international air services agreements effectively divided the world between the two “flag” airlines. Air Canada (then a Crown corporation) largely flew out of eastern Canada, and CP Air (later Canadian Airlines) generally operated out of the west. The rationale for this regime had faded as newer aircraft came online with increasingly longer ranges. This approach was recognized to have limited competition, innovation, and service improvements, and therefore, the competitiveness of the airlines, and of Canada as whole. While the Review heard issues regarding current air carrier policies, there is wide agreement that they are preferable to past policies.

Aviation is a low-margin, high-cost business, susceptible to external shocks (such as recessions, fuel price volatility, natural disasters, weather, security risks, pandemics), particularly for air carriers. The International Air Transport Association has shown that since the 1970s, global air traffic has increased tenfold, always recovering after drops due to external shocks, even as the price in real terms has been cut in half.¹⁵ There have been important improvements in fuel efficiency, and increased aircraft load factors, but the largest change is improved labour productivity. The emergence of low and ultra-low cost carriers, often with non-unionized workforces, is part of this change. The ability of United States-based carriers to use Chapter 11 bankruptcy to unilaterally alter collective agreements and pension obligations is another. Efficiencies from smaller cabin crews, technology and automation also play a part.¹⁶ Canadian airlines have been a part of this trend. However, they may not have been as aggressive in cutting workforce costs as competitors in the United States, due to such factors as different bankruptcy rules and stronger labour unions.

Between 2006 and 2012, in the face of increasing third-party taxes and fees and an average rate of inflation of 1.72 percent, Canada’s aviation sector has done its part to keep airfares cost-competitive for travellers. Over the same time period, average base fares in Canada have decreased 3.1 percent.

— *National Airlines Council of Canada, Submission to the CTA Review, January 2015*

Airlines have historically offered relatively poor returns on invested capital. In general, the air carriers that consistently deliver positive returns on investment are low and ultra-cost carriers. Ultra-low cost carriers have been highly successful in other major aviation markets, inducing significant growth in traffic volumes and offering the best average returns on investment.¹⁷ However, these business models have not succeeded (or in the case of ultra-low cost carriers even been attempted) in Canada. Ultra-low cost services involve very low ticket prices for services between secondary, or tertiary airports (e.g. from Plattsburgh, New York, near Montréal, to Sanford, Florida, near Orlando). For a family, the differences in ticket prices can become significant, and worth the time and cost of the extra driving at either end. Further incentives can come from free airport parking, and exemption from United States government fees that apply to international flights but not domestic ones. In 2012, when the Canadian and United States dollars were exchanging near parity, the Conference Board of Canada estimated that as many as 5 million Canadians were crossing the United States border for lower cost flights, a phenomenon referred to as “leakage.”¹⁸ The total numbers may fluctuate with exchange rates, and are likely lower today. Leakage is a symptom of the fundamentally different cost structures of air transport on both sides of the Border.

The *Canada Transportation Act* limits foreign ownership in Canadian airlines to 25 percent of voting shares. The 2008 Wilson Report¹⁹ and subsequent government commitments called for this limit to increase to a maximum of 49 percent on a negotiated basis, but there has been no change in practice. Air transport is different from the rail sector, which does not have such ownership limits. The existing international regime for air transport is largely based on a complex web of bilateral agreements set within the framework of the 1945 Chicago Convention. These agreements generally requires airlines to be “substantially owned and effectively controlled” within one of countries party to an agreement; to effect this in practice, most countries limit foreign ownership in airlines somewhere from 0-49.9 percent of voting shares. The European Union currently allows up to 49 percent foreign investment in a European carrier (while retaining effective control in Europe); Australia and New Zealand will allow up to 100 percent foreign ownership for airlines operating within their domestic markets.

RESEARCH: Airline Foreign Ownership Limits

Restrictions on ownership and control of airlines operating domestic services fall under domestic legislation, while restrictions on ownership and control of airlines operating international services are contained within nationality clauses of air service agreements, where only designated carriers are permitted to undertake services. The rationale for these controls may include: national security, prevention of flags of convenience and free-riding problems, assurance of service, and the assumption that nationally-owned carriers have a stronger interest in ensuring local jobs and economic growth.

The *Canada Transport Act* requires Canadian airlines to be at least 75% owned and “controlled in fact” by Canadians (as defined by the Act). Countries such as the United States have similar restrictions, others (e.g. Australia, New Zealand) have fully deregulated domestic markets but retained some restrictions on carriers operating international services.

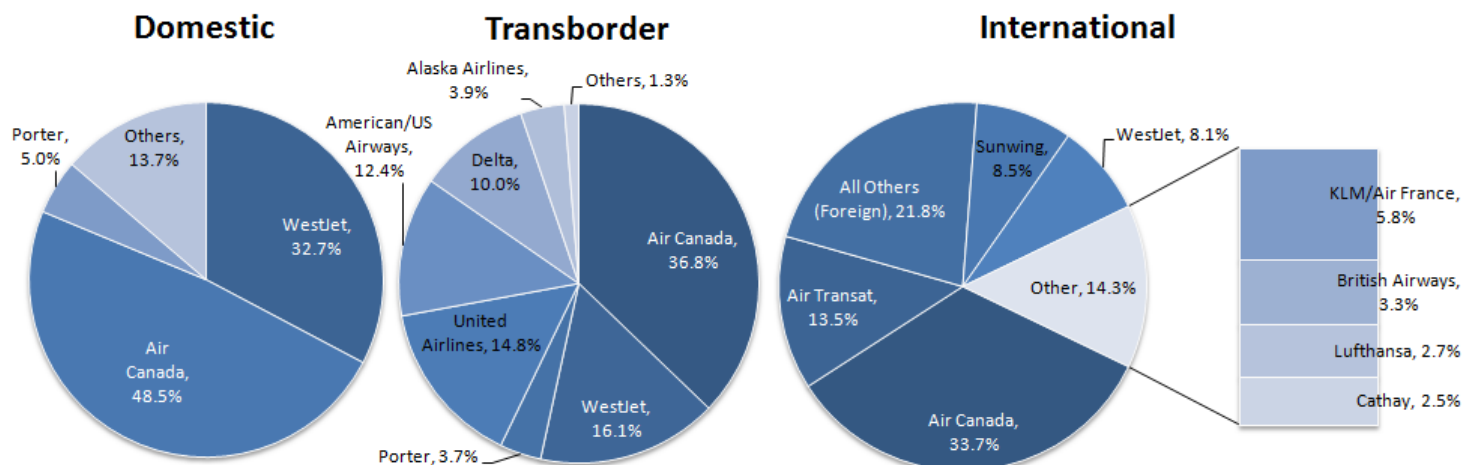
For international carriers, the most common ownership requirement as found in most agreements is substantial ownership and effective control. This can be quantified (e.g. 51% is substantial), or debated (whether effective control can rest with a dominant, but non-majority, shareholder). This is the approach used by Canada, the United States and Mexico. A more liberal approach to ownership is found in the concept of principal place of business, which is favoured generally by the International Civil Aviation Organization, and is applied to some extent in Australia and New Zealand.

The analysis of international examples as well as estimating a set of empirical models to test whether a change in Canada’s restriction on foreign ownership of airlines would affect competition among airlines had mixed results. The differences in the sizes of the countries and their markets and proximity to competitors make it difficult to directly compare Canada to European Union member states, Australia and New Zealand. Meanwhile the evidence of a relationship where the lack of restrictions generally supports more intense competition was not particularly robust and varied depending on the control variables included in the models.

Source: Duval and Schiff, *An Assessment of Foreign Investment Limits on Air Service Provision in Canada*, (prepared for the CTA Review) (August 29, 2015).

The Review has heard that Canada’s small investment market makes it difficult, if not impossible, for small operators to grow, and for new competitors to enter the market. The Canadian market is dominated by the two largest carriers that together control more than 80 percent of the domestic market (see Figure 6, below). During consultations, more than one stakeholder referred to Canada as “the land that ultra-low cost carriers have forgot,” and a lack of competition is consistently cited among the reasons Canadians generally face higher airfares.

FIGURE 6 – AIR CARRIER MARKET SHARE IN CANADA, 2015²⁰ (PERCENTAGE OF CAPACITY, SEATS OFFERED)



Despite the Act’s 25 percent foreign ownership limit, there are exceptions and alternative arrangements that create imbalances in the system, and these may benefit the largest established players and restrict new entry. Publicly traded operators can and do access capital in excess of the limit through the use of variable voting shares. A variable voting regime involves two or more classes of stock which are given different weights in votes at shareholders’ meetings, such as for the election of Directors. A carrier can meet the Act’s definition of being Canadian (section 55 (1)) so long as the separate class of shares offered to non-Canadians does not carry more than 25 percent of the aggregate votes, even if the value of these shares represents more than 25 percent of the equity in the company.²¹

In practice, it is very difficult to determine what percentage of a publicly-traded airline is under foreign control. At the same time, it is far easier to determine who owns the equity and debt of a privately-held company. This puts smaller operators, who are more likely to be privately-held, at a disadvantage for accessing debt and equity sources outside of Canada. The Review heard from multiple sources in the aviation and investment communities that Canada has a relatively small pool of capital with the expertise and interest in investing in aviation, and that existing sources of investment within Canada have largely been tapped by established players. As a result, small operators reported significant difficulties accessing capital to grow. We heard that it may be impossible for a new competitor to enter the market, since there are simply not enough investors within Canada to provide 75 percent of the capital required to launch a commercial air carrier.

A consequence of this is that many smaller markets are underserved by existing carriers, and Canadian travelers and air cargo shippers face relatively-high prices compared to similar jurisdictions overseas, even controlling for government taxes and user fees for airports

and security. The Canadian market has very little cargo freighter service and no ultra-low cost passenger service, while incumbent carriers are making record profits, filling airplanes despite high fares and new fees. This suggests that there would be room for a no-frills service at the bottom of the market, without critically disrupting the incumbents.

The Act's foreign ownership limits do not apply to specialty air services (e.g. aerial fire-fighting), but *Canadian Aviation Regulations* require that an air operator's certificate be held by a Canadian. We heard that operators have needed ministerial exemptions to access capital that would otherwise be allowed in the law due to inconsistencies between the regulatory requirements for certification and the Act.

The Review has heard that large Canadian carriers (Air Canada, WestJet and CargoJet) oppose increasing the limit, except perhaps on a bilateral and reciprocal basis. They argue that the market is well-served by existing competition levels, and that new entrants would disrupt the sector's viability. Reciprocity is difficult in practice. The United States (Canadian operators' most likely source of capital) is unlikely to increase its ownership limits for domestic and political reasons for the foreseeable future. It is also noted that Air Canada and WestJet have called for increased ownership limits in the past when they were in need of investment. Airport authorities and travel and tourism stakeholders have called for increased competition, along with more choices of routes, services, and prices. Incumbent smaller and specialty air operators have indicated to the Review that they would also welcome a more level playing field for accessing capital to grow their businesses.

Without the removal of the foreign control restriction, it is unlikely that new business models will be made available to the Canadian consumer. Numerous Canadian industries have thrived with the removal of foreign control restrictions, while the transportation and communication industries continue to be thwarted by this antiquated protectionist policy.

— *Clark and Company Barristers, Submission to the CTA Review, December 2014*

Increasing the ownership limit would likely require safeguards for to ensure competition, a level playing field, national security, and so on. Canada already has a process in place to assess issues related to competition and the national interest for large investments in Canadian businesses under the *Investment Canada Act*. In other sectors outside of transport, non-Canadians who acquire control of an existing Canadian business or who wish to establish a new Canadian business are subject to the *Investment Canada Act* and its regulations, and they must submit a notification or an application for review (see Background, right).

BACKGROUND: *The Investment Canada Act*

This legislation covers cases where non-Canadians acquire control of an existing Canadian business or wish to establish a new unrelated Canadian business, requiring submission of a notification or application for review.

Monetary thresholds prescribed under the *Investment Canada Act* are used to determine whether an investment proposal by a non-Canadian will be reviewed by government. The review assesses whether the investment is likely to be of net benefit to Canada. The threshold is \$600 million (scheduled to increase for inflation) for investments by: World Trade Organization (WTO) investors that are not state-owned enterprises; and by non-WTO investors that are not state-owned enterprises where the Canadian business was controlled by a WTO investor. All other acquisitions of control of a Canadian business and the establishment of new businesses in Canada by a foreign investor require advance notification to the government. In some instances, the *Investment Canada Act* may also deem the acquisition of a minority interest in a Canadian business by a non-Canadian investor to be an acquisition of control.

The *Investment Canada Regulations* address the foreign investment review framework. The manner of calculating the enterprise value of the Canadian business that is the subject of the investment is prescribed in the regulations, depending on whether it is publicly traded or not.

Foreign investments by state-owned enterprises are all subject to the standards for the net benefit review threshold. The net benefit review process in the *Investment Canada Act* also contains national security provisions, which permit the Canadian government to review investments that could be injurious to national security. The federal cabinet may impose any measures it deems to protect national security.

The *Investment Canada Act* does not define “national security,” which provides Cabinet with the discretion to determine the national security interest in a given case. Foreign investments constituting the acquisition of a minority holding in a Canadian business or resulting in the establishment of a new Canadian business, or even a foreign entity carrying on all or part of its operations in Canada are all subject to the national security provisions. There are no monetary thresholds for national security reviews

Sources: Industry Canada, *An Overview of the Investment Canada Act*, (June 2014) accessed on October 20, 2015, online: <https://www.ic.gc.ca/eic/site/ica-lic.nsf/eng/home>; and Peter Glossop, Jordan Giurlanda, *Frequently Asked Questions Concerning the Investment Canada Act*, (Osler, April 24, 2015), accessed on October 20, 2015, online: <https://www.osler.com/en/resources/regulations/2015/frequently-asked-questions-concerning-the-investme>.

INTERNATIONAL AIR CARRIER COMPETITION AND INTERNATIONAL AIR POLICY

The rights of a foreign carrier to serve destinations in Canada are determined by air services agreements between Canada and the carrier's home country. Agreements may specify a maximum of weekly flights each country's carriers may operate, frequencies for specific airlines and airports, aircraft sizes, code sharing arrangements, and so on. Within those constraints, carriers determine the frequency and capacity of service to a given destination based on commercial considerations. The framework for international air services was put in place by the Chicago Convention (*Convention on International Civil Aviation*) in 1944, and is overseen by the International Civil Aviation Organization, a body of the United Nations, based in Montréal.

For decades, Canada negotiated highly-prescriptive air services agreements, designating specific routes for Air Canada and CP/Canadian Airlines, for example, and requiring airlines to operate services to Montréal-Mirabel Airport. The 1995 Canada-United States air transport agreement was the first step towards the liberalization of international air services to and from Canada. It was soon followed by agreements with the United Kingdom and other key partners. These liberalized agreements allow increased flights by foreign airlines to more Canadian cities, providing Canadians with more service choices when flying to the United States and Europe, as well for connecting to points beyond. This second factor has become increasingly important as globalization increases international trade, investment and travel, as well as demand for world travel for leisure, and visiting friends and relatives.

In 2006, the government released the Blue Sky policy, Canada's framework for negotiating air transport agreements. The policy aims for the liberalization of air transport agreements and reciprocal "Open Skies-type" agreements, when (and only when) they are determined to be in Canada's overall interest. Under the approach codified in the Blue Sky policy, Canada no longer assigns frequencies to specific airports. Instead, carriers determine where to allocate the flights they are allowed under the agreement. In less than a decade, new or expanded agreements covering over 80 countries have been concluded under the policy, including all of Canada's busiest trade and travel markets.²² Open air services agreements cover 45 countries, representing 72 percent of Canadian international traffic, and the vast majority of Canada's international trade (e.g. the United States, European Union, Japan, South Korea, and Brazil). Today, the international market is generally liberalized, and direct services are offered to about 190 destinations by a mix of international and domestic-based airlines.²³

**FIGURE 7 –
NUMBER OF
INTERNATIONAL
DESTINATIONS WITH
DIRECT SERVICE FROM
CANADA BY CONTINENT²⁴**

Destination Continent	2004	2008	2012
North America (United States and Mexico, only)	71	76	79
Europe	40	51	44
Caribbean	27	29	34
Asia	11	11	13
South America	6	7	6
Middle East	1	4	5
Central America	1	2	5
Africa	2	3	3
Australasia	0	3	2
TOTAL	159	186	191

A significant part of this growth is in seasonal services to a proliferating number of vacation destinations; there has also been important growth in year-round connectivity to destinations in Asia, Africa, and the Middle East. Per capita travel has grown slightly faster than GDP, led by rising international travel.

According to Transport Canada, only 3 percent of existing international traffic falls under agreements that pose practical constraints on carriers' business plans. Much of that business is with the increasingly important global hubs of Turkey, Singapore, the United Arab Emirates, and Qatar. Canada also does not have fully open agreements with important trade partners, such as China, India, and Mexico (though the limits on the agreements may not pose practical constraints on carriers' current business plans). Agreements are likely to limit traffic either because the Government Canada has determined that there are risks due to safety, security or unfair competition,²⁵ or Canada has proposed a more liberal air services agreement, but the offer has been declined by the other country.

Emirates has unequivocally advocated for the political, economic and consumer benefits that flow from liberalisation. Emirates operates in an open skies environment from its hub in Dubai, exposed to competition with more than 130 carriers. This fiercely competitive environment has delivered substantial dividends for the Dubai economy and consumers.

— *Emirates Airlines, Submission to the CTA Review, December 2014*

Canada has resisted increasing access to fast growing competitors in Turkey and the Gulf on the basis of a lack of demand for direct travel. However, Canada has pursued open agreements in other equivalently-sized markets when Canadian carriers have expressed commercial interests. In the former cases, Canada responded to market growth by granting increased access in increments of 1 or 2 weekly flights at a time. Some industry observers believe such moves may have been calculated to make expansion into the market more awkward and costly.

There is currently an intense debate in the United States and Europe regarding the fairness of competition with Persian Gulf carriers. However, this debate is occurring within the context of open air services agreements that allow unlimited market access. Canada only allows three flights per week per Gulf carrier and caps the total aircraft size.

RESEARCH: International Policy

The principles in the Blue Sky policy are consistent with CAPA's idea of a modern liberal aviation policy, but the broadly-worded public interest tests and level playing field requirements allow for varied implementation in practice. Since 2006, Canada's balanced approach to determining the national interest seems to have emphasized Air Canada's well-being as the starting point; from there, any relaxation of policy to allow foreign airlines added access has apparently been measured against its potentially negative impact on Air Canada's existing, and potential, routes.

This contrasts with the international air policies of most of Canada's peers, where, consumer interests have been given a more prominent role in determining the shape of aviation policy, and of the national interest. Canadian consumers and the local economy are the ones bearing the cost of the current approach. There is significant scope for improving Canada's accessibility both as a business and tourism destination.

Canada has made positive moves toward reaching relatively liberal agreements with major trade partners, but more can be done. The overall number of open agreements is small. Canada's liberalization priorities appear to have been driven more by Air Canada's and WestJet's aspirations to drive outbound tourism.

Traffic with fast-growing Asian markets is being diverted over the more open United States routes. United States open skies agreements open a trap door for carriers and routes that Canada has sought to close. As a result millions of long haul Canadian travellers are taking short haul flights via the United States and connecting onto/from widebody United States or foreign airlines to reach their destination.

Until Air Canada launched its own service to Dubai and Delhi, the carrier had almost no exposure to the markets where the Persian Gulf Carriers could pose a threat. Canadian carriers benefit from this tourism and business traffic, as more than a third of traffic arriving on the Gulf carriers connect via Air Canada or WestJet.

Canada's reticent approach to open skies is not a recipe for the future, especially when Canadian airports are on the doorstep of United States hubs itching for growth, having already realised the economic gains resulting from a sophisticated and liberal aviation policy.

Source: CAPA Centre for Aviation, *Cost-benefit analysis of restricting and liberalising international air access to Canada*, (prepared for the CTA Review) (August 2015).

Any carrier who creates an uneven, unhealthy ground by operating beyond sector dynamics should be noted by the regulator. On the other hand, the reality of aviation being a sensitive and highly dynamic industry should also be taken into consideration, as travelers and the sector itself are extremely quick in managing to meet the need of an existing demand.

— *Turkish Airlines, Submission to the CTA Review, March 2015*

A strong anchor carrier is a key success factor for a global hub airport. Around the world, the most successful global hubs are “open ports.” That is, they are located in countries that grant open air access, even to their fiercest competitors, in order to concentrate the high volumes of connecting traffic required to support a vast and expanding route network.

Progressive air policy liberalization will benefit the traveling public by offering more services to more destinations at a lower cost. We support new aviation policy that expands aviation and tourism market opportunities and increases choice for air travellers. This may also have the benefit of introducing a more competitive market and lead to more competitive fares for consumers.

— *Ottawa International Airport Authority, Submission to the CTA Review, March 2015*

Until recently, most airports, the tourism-hotel sector, provinces, and business groups called on Canada to accelerate the pace of liberalization and push for more open air agreements, while Canadian airlines continued to prefer an approach where Canada would seek open agreements only where the carriers had interests, and resisted liberalizing access where they feared competition. Currently, the travel and tourism sector has worked to speak with one voice to government, with airports and tourism groups softening their public positions on liberalization. Nonetheless, in consultations with the Review they continued to indicate preferences for more rapid liberalization.

Some stakeholders have raised concerns about unfair competition in the air sector. Primarily, this is because air transport is not covered by multilateral agreements on trade in services, nor subject to World Trade Organization dispute-settlement rules. While Air Canada and Canadian Airlines were under financial uncertainty, there were compelling policy arguments for constraining access by competitors in support of Canadian hub airports and airlines. As a result, if Canada moves to increase the pace of liberalization with fast growing competitors such as those in Turkey and the Persian Gulf, it stands to reason that Canada also carefully consider available options providing for remedies and enforcement mechanisms should a party not meet its obligations for fair trade and competition. Examples include the dispute resolution mechanisms employed by the United States and United Kingdom in air services agreements such as those with the United Arab Emirates, and the dispute settlement mechanism in the Canada-United States Softwood Lumber Agreement.

To achieve their full potential as cargo hubs, airports require a cohesive, national air transportation policy that fosters the success of Canada's communities. Part of that policy must include a focus on international trade and services agreements that liberalize cargo movement. Canada has a number of agreements in place intended to liberalize passenger movement, but more are needed to address cargo traffic, particularly with countries where trade and the potential for trade is large, e.g. the BRICs.

— *Winnipeg Airports Authority, Submission to the CTA Review, May 2015*

GLOBAL HUB STRATEGY

Increased volumes of travellers and freight can be leveraged to lower incremental transportation costs in the country as a whole, and can also create new opportunities for other sectors of the economy to add value. According to the Canadian Airports Council's Submission to the Review, transit traffic can account for 25 to 50 percent of airline seats on major international routes. The addition of this traffic at the margins can support air services to new destinations that could not be sustained on the basis of origin-destination traffic alone, and it can also support increases in frequency and capacity of services to established markets. High levels of traffic and connectivity benefit the wider regional economy. Industries ranging from directly-related sectors like warehousing and logistics, to manufacturing, and higher level services such as IT, communications, insurance, finance, all tend to develop in clusters around transportation hubs.

Canada's relatively small population and economy, spread across a vast country, located far from overseas markets, augments the importance of aviation to prosperity and quality of life here. And growing the market for international connecting traffic through Canada would support increased connectivity that would benefit both passenger travel and cargo shipments. Canadian cities like Vancouver, Calgary, Toronto, and Montréal are well-placed geographically to serve in-transit traffic; thereby connecting emerging markets and providing a gateway for North America. For example, flight times to travel from Brazil to China with connections in any of the major hubs in Canada, the United States, the Middle East and Europe are all around 22 to 24 hours, approximately. Thus, transit times, costs and processes are a critical for the competitiveness of hub airports and airlines.

The market opportunity for connecting South America with Asia is also there: the International Air Transport Association forecasts that traffic between these two regions will be the fastest growing market over the next 20 years. Middle Eastern hubs are already seizing market share. According to the Canadian Airports Council's submission to the CTA Review, "in 2005, 16 percent of South America—Asia traffic was routed through North America, 80 percent over Europe, and virtually nothing over the Middle East. By 2013, Canada and the United States had lost more than half their market share, Europe's share dropped to 64 percent and Middle Eastern hubs went from 0 to 24 percent."

Canadian hubs are not alone. Other countries in the Persian Gulf, Turkey, China, recognize the business opportunity from transit travel, and are making concerted efforts to capture the growth. Their vast public investments are paying off in terms of major increases in market share. Doha-based Qatar Airways, and the United Arab Emirates' main carriers

(Dubai-based Emirates and Abu-Dhabi-based Etihad) are seeking to develop world-wide hub-and-spoke networks that concentrate and disperse international traffic through brand new, high-capacity, high quality airports. The model for success is another global hub, Singapore, where the state-owned airline and airport were early leaders in the hub development trend.

Although wealthy, the small populations of these small states could not support the high volumes and frequencies of direct international air services to global destinations without attracting significant numbers of connecting travellers who do not have the Middle East (or Singapore) as a destination. In fact, with a product that features a vast network, high frequencies, and attractive services and prices, these airlines, and their airports, have succeeded in drawing traffic on routes for which a connection through the Gulf would represent a significant detour. Qatar Airways, Emirates Airlines, and Etihad Airways have developed into major competitors to older North American and European airlines, and established partnerships such as the revenue sharing between Air Canada, United Airlines and Lufthansa on North American traffic through Frankfurt. Whether in spite of, or because of this, the more established aviation markets in the United States and Europe have seen more growth than Canada.

Transportation policy must look beyond domestic needs and must also address how Canada’s aviation sector can better compete in what is a global market, against global competitors. As is the case for other governments around the world, the Canadian government can be a leader by establishing the right policy and removing ineffective regulations to facilitate the development in Canada of strong global hubs and national carriers through which international passengers, cargo, and revenue flow.

— *Greater Toronto Airports Authority, Supplemental Submission to the CTA Review, June 2015*

Air Canada and the airports authorities in Toronto and Vancouver have noticed these trends, and are designing strategies to target increasing foreign transiting traffic. International travellers using Canadian airlines and/or airports to travel from one foreign destination to another could increase traffic volumes, service and competition on Canada’s international routes by providing higher passenger and freight volumes than the population would normally sustain. Canada is well-placed on global flight paths, but Canadian airports and carriers are engaged in a fiercely competitive global market. As noted above, Brazilian flying to China can travel via Canada, the United States, Europe, the Middle East, or South Africa with comparable flight times. Cost, facilitation (i.e. visa, border and security processes), and a strong domestic anchor carrier are known success factors for hubs. The size of local populations and tourism markets also support hub development. Canada’s ability to develop its hubs is hindered by many of these factors.

As discussed above, Canada’s user-pay approach contributes to the relatively high cost of air travel. In contrast, various levels of government in the United States provide direct support to airports, and both air navigation and aviation security are partially-subsidized, as are flights to designated remote locations. Competitors support their air sectors in different

ways: by subsidizing infrastructure, such as in Turkey and Singapore; by not collecting rents from airports, which is common throughout the world; or by full or partial state ownership of carriers, as in the Middle East, Asia and parts of Europe.

Canada's approach to the facilitation of secure traffic flows may also impact on the competitiveness of air transport. Visa requirements protect Canadians and uphold the integrity of the immigration system, but they can also discourage tourists, businesspeople, students and in-transit travellers. Visa rules impact on hub competitiveness as well. A Brazilian flying to China, for example, would be allowed to transit through airports in the European Union and Gulf without a visa, but not Canada. Wait times, document requirements and costs involved in obtaining visas can be prohibitive, and yet visas are required for many of Canada's target trade and tourism markets, constraining connectivity increases in support of these other policy objectives. Other countries recognize this, and allow transit through secure facilities without visas for travelers from all but a handful of the high-risk countries. Canada does the opposite, and only allows travelers from a small number of low-risk countries to transit without a visa. Canada has also stood still on the scope of its existing trusted traveler programs, while the United States and others use technology and risk-based screening to facilitate trusted travel.

Global connectivity can be enhanced by expanding the Can+, Transfer without Visa, China Transit, and Transfer Departure Facility programs. Oftentimes these programs are mired in lengthy pilot projects at larger Canadian airports which results in other airports lagging behind. More proactive countries have enhanced their overall air access thus capturing the lucrative tourist and business air traveller, and providing more opportunities for trade and economic development to benefit their regions and citizens.

— *Halifax International Airport Authority, Submission to the CTA Review, February 2015*

Visas have been shown to be an impediment to travel. In the case of Mexico, for example, traffic went from a 14 percent growth rate (relative to other countries of origin, not including the United States) the year prior to Canada's imposition of visa requirements, to a 14 percent decline the year of the visa change, and a 27 percent decline the following year. Confirming this relationship, lifting visa requirements has the reverse effect, in the Czech Republic, traffic went from a -0.5 percent decline the year before the change to 22 percent growth in the year visa requirements were removed and another 12 percent of growth in the following year.²⁶ Canada's existing transit without visa programs are highly appreciated by stakeholders, but they are limited to select countries, airlines, etc. thereby serving relatively small groups. Without adding new countries or cities, other carriers who want to start or expand hub services through Canada are ineligible. Most competitors for hub traffic allow transit without a visa.

In 2016, Citizenship and Immigration Canada launches the Electronic Travel Authorization (eTA), which parallels initiatives elsewhere (such as the United States Electronic System for Travel Authorization—ESTA). It provides advance passenger information, making it an important tool for pre-screening travellers, but involves another layer of process and a \$7 fee, making it a new barrier to travel from trusted countries. An eTA will also be required for transit without visa, and visa exempt passengers transiting Canada to the U.S, meaning a traveler would have to complete both a \$7 eTA and a US\$14 ESTA, adding another hurdle to hub traffic. Citizenship and Immigration Canada has begun to expand transit without visa and leverage eTA to facilitate travel, but more can be done: the United States has built on the NEXUS program to create Global Entry, which is eligible to trusted travelers from a number of other countries, and the British-Irish Visa Scheme allows visitors from China and India to travel freely to both the United Kingdom and Ireland using either country's visa.

Border protection processes impact on hub competitiveness by affecting transit times and convenience, key factors in attracting connecting traffic. The Canada Border Services Agency has deployed automated border kiosks²⁷ at Vancouver, Montréal and Toronto that have greatly increased flow-through, and has recently developed a future vision for border management. But the competition is moving ahead—the United States is quickly rolling out new technology²⁸ and opening eligibility to non-United States travellers, which Canada has not done—limiting the benefits of the technology. Like many frontline agencies, the Canada Border Services Agency is facing increasing traffic without commensurate increases in resources to meet the demand. In addition, an increasing number of smaller airports are seeking to add border services to allow for direct flights to the United States and vacation destinations. Future traffic growth, will further stress the system, and require that the Canada Border Services Agency invest in automation and facilitative technology and adjust rules and processes to make better use of those technologies so that it can focus its limited resources on the highest-risk travellers and shipments.

Airlines, airports, tourism and hotel associations, pilots unions, provinces, chambers of commerce, boards of trade, international freight forwarders, think tanks, and others are unanimous in calls for Canada to recognize United States visas and harmonize with United States trusted traveller programs.

AIRPORT SECURITY SCREENING: GOVERNANCE AND PERFORMANCE

Canada enjoys one of the world's safest and most secure air transportation systems. Until 9/11, airport security screening was generally delivered by airlines. In the aftermath, governments significantly tightened security regulations. Most adopted similar technologies and rules, but varying delivery models. Canada divided responsibility between Transport Canada to set regulations and the Canadian Air Transport Security Authority (a Crown corporation) to administer screening delivered by private security companies under contract. In the United Kingdom, screening services are delivered by airports under national regulations. The United States Transportation Security Administration (a branch of the Department of Homeland Security) is responsible for both the regulation and the delivery of screening by federal employees.

In 2012-13, 97% of passengers typically waited less than 15 minutes. The number fell in 2013-14 to 92% and CATSA is estimating for 2014-15, this will drop to 82% of passengers waiting less than 15 minutes. By 2015-16, the drop is significant with 32% expected to wait less than 15 minutes. Longer screening wait times negatively impact airport authorities, air carriers and lost production for the business traveller. In the end, no one wins.

— *Canadian Corporate Travel Association, Submission to the CTA Review, May 2015*

The Canadian approach is rooted in a choice between security on the one hand and convenience on the other. Canadians may have accepted this approach immediately after 9/11. In fact, many stakeholders said that Canada's post-9/11 security model worked well at first, at least relative to the United States. This is no longer the case. Aviation security agencies around the world are changing their approaches to deliver on their core security mandate while also improving customer convenience. Service in the United States and United Kingdom has steadily improved without incident, with the adoption of intelligence-driven, risk-based initiatives, such as the United States TSA Pre✓ program, demonstrating that security and convenience need not be mutually exclusive, or come at higher cost. Many global airports with which Canada is competing for international traffic achieve screening rates of 95 percent of travelers in 10 minutes or less, while CATSA's performance is not regulated, and it has no official service standards.

Given the importance of the United States market and transborder air travel, we strongly encourage Canada to continue to strive for equivalent screening capabilities, regulations and manage emergency orders with those of United States, as well as to accelerate the changes required to implement the One Stop Security agreement with the European Union, which has the potential to eliminate duplicate screening activities and free up resources to focus on high risk areas.

— *International Air Transport Association, Submission to the CTA Review, February 2015*

Canadians pay some of the highest air security charges in the world²⁹ and should be able to expect the highest standards of both air security and customer convenience. By spreading limited resources equally to every passenger, and on every prohibited item, Canada's approach does not use risk to prioritize and maximise security, value for money, and service. Air transport security should aim to be sophisticated and risk-based, with differentiated processes and standards based on a reliable identification of high- and low-risk travellers, driven by intelligence, using smart technology, funded appropriately, responsive to change (threats, technology, traffic patterns) and accountable for results and balancing service and security.

Other Canadian agencies with security functions (Citizenship and Immigration Canada and the Canada Border Services Agency) and aviation security agencies overseas have been increasingly successful in developing and leveraging technologies and processes to simultaneously improve the delivery of their core security mandates while also facilitating

streamlined processing and shorter wait times for trusted travellers, all at reduced costs to the public. The Canada Border Services Agency has also partnered with Canadian airports on innovative new solutions to resolve irritants such as wait times in arrivals halls.³⁰

Air, travel, tourism and business sector stakeholders have been nearly unanimous in expressing their frustration and concern with the current delivery model in Canada. While they all agree that Transport Canada and the Canadian Air Transport Security Authority (CATSA) are fulfilling the core mandate of securing the system against attack, they have also expressed their concern that unlike experiences elsewhere in the world, Transport Canada regulations and CATSA operations remain significant impediments to customer convenience and an impediment to the air industry's growth. Stakeholders report that the feedback loop between frontline security operations, CATSA who oversees them, and the regulator is not working well, and that Transport Canada does not properly account for the operational impacts of its decisions.

A wholesale improvement has been called for in performance on all fronts. Although traffic, and security fee revenues have continued to increase steadily at 3 to 5 percent, CATSA's budget has been cut deeply and will remain roughly the same for the next 4 years.³¹ CATSA also lacks the mandate, incentives, autonomy, and organizational culture to innovate in the ways others have; for example, it has no performance or service standards driving improvements. CATSA has continued to deliver competently on its core security mandate, but it has done so by letting throughput to decline and wait times to climb. The Canadian model appears to be broken, and the air sector is suffering the consequences with ripple effects throughout the economy.

CONSUMER PROTECTION OF AIRLINE PASSENGERS

In Canada, changes in passenger rights are the result of one-off rulings by the Canadian Transportation Agency in response to complaints filed by any person, according to "just and reasonable" terms of carriage and treatment. Airline passenger protection is based on formal complaints to, and rulings by, the Canadian Transportation Agency on a case-by-case basis. Complainants do not have to be customers, and Agency rulings only apply to the specific carriers that are subject to the complaint. This results in higher transaction costs and uncertainty for carriers; a lack of consistency, transparency and predictability for passengers; and high volumes of complaints by individuals who have never been aggrieved customers to the Agency, which is required to rule on all complaints.

The United States and European Union have prescriptive regimes of pre-established rights associated with specific issues and defined penalties for over-bookings, lengthy tarmac delays, mishandled baggage, and so forth. These are sometimes referred to as "passenger bills of rights." Canadian carriers are already subject to the United States and European Union consumer protection rules for flights to and from these destinations, and are able to do so profitably, so passenger bill of rights requirements are not so onerous as to impede service. Nor have these rules prevented several ultra-low cost carriers from developing popular, and profitable, no-frills services in the United States and European Union, available at airfares far below those available in the Canadian market. The costs of compliance with codified consumer protections can be mitigated since the most significant disruptions involve extreme weather, which are not compensated under protection systems.

RESEARCH: Airline Consumer Protection

Consumer protections and recourse options for airline passengers are provided under sections 65, 67, and 85 of the *Canada Transportation Act*, and administered by the Canadian Transportation Agency. The actual rights of airline passengers vary between airlines.

The Australian model has no cost to taxpayers and is flexible and adaptable: the Airline Consumer Advocate is funded and structured by agreement between the major Australian airlines. Giving airlines control of the consumer protections may minimize compensation guarantees, while a lack of government intervention reduces the ability of the regime to remedy chronic industry problems.

The United States model is balanced more in favour of consumers, with legally-backed financial penalties imposed by a government authority, providing a strong incentive for airlines to develop policies and eliminate poor practices for the benefit of consumers. Changes are enacted through a lengthy, but transparent public regulatory process. The United States has nearly eliminated excessive tarmac delays in 5 years through vigorous enforcement, but the highly trained staff needed to effectively monitor airlines for compliance comes at a higher cost to taxpayers.

The European Union model, provides strong guarantees for consumers, with specific compensation guarantees owed to consumers in a broad range of circumstances, such as general delays beyond a defined hour threshold. Changes require a full European Union legislative process, making the model extremely inflexible. Enforcement is handled by institutions within member states which may be more convenient/accessible for complainants, but may also result in inconsistency in the application of the European Union-wide regulations, as well as in the enforcement costs for taxpayers, in member states.

Canada's Ombudsman for Banking Services and Investments is mandated to help consumers resolve disputes in a timely, impartial, transparent manner, but has limited enforcement power. But adjudicators hired by a bank may be perceived in a conflicted position.

Canada's Commissioner for Complaints for Telecommunications Services is an industry dispute resolution model that customers appear to be very satisfied with, and that has made extensive efforts to be transparent regarding the structure of organization, senior staff, its complaint process, complaints statistics, as well as the identification of systemic industry issues. The funding structure as well as Board of Directors composition allows for multiple stakeholders to contribute to this process.

Source: Public Interest Advocacy Centre, *Consumer Protections for Airline Passengers*, (prepared for the CTA Review) (March 31, 2015).

The North American air market is highly integrated; greater harmonization of rules would simplify the operating environment for industry and provide more predictable service for travellers. For example, musicians report significant issues when transporting their instruments during air travel. Rules in Canada vary widely by carrier and differ from those across the border. Carriers argue that this allows differentiated products,³² but travelers may be confused by the inconsistent practices.

Harmonization with the United States would allow more than 20,000 musicians across Canada better travel, enhanced outcomes, streamlined programs, better efficiencies and improve safety and capacity.

— *Canadian Federation of Musicians, Submission to the CTA Review, December 2014*

Since 2012, carriers are required to list prices inclusive of fees and taxes; but, these rules do not apply to charter services that are included in vacation/tour packages, which operate under provincial jurisdiction.

We have heard from carriers, travel agents, Agency officials and consumers' advocates alike that these vague wordings in the Act give the Agency too much leeway to make decisions that are effectively writing and re-writing government policy on an ad hoc basis, producing a lack of predictability, consistency and level playing field for carriers and customers. While Canadian carriers claim that a more prescriptive model will increase airfares, with few tangible benefits for travelers, Canadian carriers already operate profitably under United States and European Union rules when they serve those markets. Canadians also expect minimal levels of service in both languages, but obligations on airlines/airports are inconsistent.

AIR SECTOR REGULATION AND CERTIFICATION

The aerospace and air transport sectors feed each other: professionals move back and forth, aerospace activity supports airport development; airlines and operators need access to quality maintenance repair and overhaul (MRO) services and original equipment manufacturers (OEM) quickly, which requires timely certification, and so on. As a result, Transport Canada plays a critical role in the aviation industry and in keeping the sector competitive: Transport Canada has a world-recognized reputation as a regulator and certifier. We have heard that the department recognized for punching above its weight. This reputation helps the Canadian aviation sector to punch above its weight, because Canadian (or Canadian-certified) engineers, designers, pilots and products can be easily re-certified for operation anywhere in the world. However, the Review has heard that wait-times for users and industry seeking certification and licensing are lengthening. Stakeholders said the resources for certification and licensing functions at Transport Canada may be waning, especially in the regional offices. There is concern that expertise is being lost in areas where there has not been steady replacement of senior staff who have been reaching retirement.

Meanwhile, competitors appear to be racing ahead. The Review heard how China is building up its aerospace and aviation capacity from scratch with massive investments into schools, firms and institutions, including its certification and oversight functions as a pillar of China's economic development strategy. The Review heard that rotations by staff

through state-owned aerospace firms for industry experience and back to the regulator is regularly done to develop skills and capacity. The results of these efforts will likely accumulate rapidly. If Canada continues to lag and offer slower service to certification requests, it risks becoming a case of government not providing the fundamental public infrastructure for the transport sector, which is itself fundamental to other sectors. Looking out 20 to 30 years, why would emerging economies go to the Canada, or the United States or European Union for products, certification and other services if they can reliably be found faster and at lower cost in China? We are already hearing that the reputation of Canadian certification is slipping because of long turnaround times, and people are shopping around to find faster certification elsewhere and then having that recognized in Canada.

The Review has heard that Canada needs to take into account the economic development capacity of transportation and the potential that strong collaboration between government and industry has to leverage transportation for national economic development. Transportation can better be linked to the economic goals of the country by investing in the necessary resources that would ensure Canadian certification continues to be a globally recognized and sought-after seal of approval.

We have also heard that there is a poor understanding on the part of the regulators, both domestically and internationally, of the true nature of business aviation and small northern and remote operators: their operations, constraints, existing level and type of safety measures. The Canadian Business Aviation Association and the Northern Air Transport Association have both said that these deficits have led to the creation of Regulatory Impact Analyses and international regulations that do not properly consider the impacts on their sectors, and instead appear to be part of a growing trend to move all aviation regulation to the standard required of commercial, scheduled service. These standards are not necessarily higher than those that could be in place for business aviation and small operators.

In commercial, scheduled aviation the risks, mitigations, scheduling – virtually every aspect of operations – bear little if any relationship to business aviation. To impose these systems on non-scheduled carriage is not only misguided, but counterproductive to the high level of safety and security that government is hoping to achieve, and could even be crippling to business aviation operations.

— *Canadian Business Aviation Association, Submission to the CTA Review, December 2014*

The aviation and aerospace sectors have indicated in the 2012 Aerospace Review and to the CTA Review that they are ready to pay fees for service, if the service standards are clear and met. Smaller operators have the most difficulty accessing service in a timely fashion and are most likely to be supportive of these recommendations, but the entire sector may be expected to benefit.

Transport Canada must consider industry segment-specific solutions and work with stakeholders in the commercial aviation sector to develop less damaging proposals that will enhance safety, that are tailored to the characteristics and requirements of Canada’s diverse commercial aviation sectors.

— *Helijet, Submission to the CTA Review, May 2015*

Notes

- ¹ Based on simple calculations comparing total rent paid with passenger traffic volumes and operating costs as reported in select airport authorities’ published annual reports. Note that non-National Airports System airports pay no rent, and smaller National Airports System airports pay little or no rent. See for example, Greater Toronto Airports Authority, *Upward, Onward: GTAA 2014 Annual Report*, (2015) accessed on July 15, 2015, online: <http://www.torontopearson.com/en/AnnualReports>; Aéroports de Montréal, *An Expanding Air Service: 2014 Annual Report*, (May 2015) accessed on July 15, 2015, online: <http://www.admtl.com/sites/default/files/RA2014-A.pdf>; Vancouver Airport Authority, 2014 Annual Report, accessed on July 15, 2015, online: http://www.yvr.ca/Libraries/2014_Annual_Report/2014_Annual_Report.sflb.ashx; and Halifax International Airport Authority, *Beyond: 2014 Annual Report*, (2015), accessed on July 15, 2015, online: <http://hiala.ca/wp-content/uploads/2015/05/HIAA-2014-Annual-Report-English.pdf>.
- ² Source: CTA Review with data from Transport Canada, *Transportation in Canada 2014*, (Ottawa: Her Majesty the Queen in Right of Canada, represented by the Minister of Transport, 2015) accessed on October 20, 2015, online: https://www.tc.gc.ca/media/documents/policy/2014_TC_Annual_Report_Overview-EN.pdf.
- ³ Over the past decade, the government has also contributed one-off funding to projects at select airports under infrastructure programs: Building Canada, Infrastructure Stimulus, regional economic development agencies, etc.
- ⁴ Transport Canada continues to own and operate 18 “legacy” airports; revenues were about \$14M, and Transport Canada spent \$25M to operate these airports, and invested another \$27.2M on capital improvements. Source: *Transport Canada, Departmental Performance Report 2013-14*, (Ottawa: Her Majesty the Queen in Right of Canada, represented by the Minister of Transport, 2014) accessed on October 21, 2015, online: <https://www.tc.gc.ca/eng/corporate-services/planning-dpr-2013-14-1195.html#2d>.
- ⁵ See for example: *Transport Canada, Air Travellers Security Charge (ATSC)*, (last modified: January 17, 2011), accessed on July 15, 2015, online: <https://www.tc.gc.ca/eng/aviation/security/page-181.htm>.
- ⁶ Source: Transport Canada internal figures.

- ⁷ Jim Bronskill, "Ottawa refuses to help pay for Air Canada's \$100M sky marshal tab" *The Toronto Star* (November 22, 2015) accessed on November 23, 2015, online: <http://www.thestar.com/news/canada/2015/11/22/ottawa-refuses-to-help-pay-for-air-canadas-100m-sky-marshal-tab.html>.
- ⁸ The bombing of Air India Flight 182 on June 23, 1985 remains the worst terrorist attack in Canadian history. After, Canada implemented baggage reconciliation: passengers do not board an aircraft without their baggage.
- ⁹ Montréal's two airports, Mirabel and Dorval (now, Trudeau), were both transferred to Aéroports de Montréal.
- ¹⁰ Source: Transport Canada.
- ¹¹ Source: CTA Review with data from Transport Canada, internal records.
- ¹² Source: Transport Canada.
- ¹³ Program rules exclude investments in modern technologies that may improve reliability and efficiency; e.g. automated weather observation and instrument landing systems that are required for safe landings in poor conditions, because only "visual" approach aids such as lighting are eligible, but not energy-efficient LED lighting.
- ¹⁴ Source: CTA Review with data from Statistics Canada, *Passengers enplaned and deplaned on selected services — Top 50 airports*, (Statistics Canada catalogue no. 51-203-X-No.2014000) accessed on October 21, 2015, online: <http://www.statcan.gc.ca/pub/51-203-x/2014000/t002-eng.htm>.
- ¹⁵ International Air Transport Association, *Profitability and the air transport value chain* (IATA Economics Briefing No 10) (June 2013), accessed on October 20, 2015, online: <https://www.iata.org/whatwedo/Documents/economics/profitability-and-the-air-transport-value%20chain.pdf>.
- ¹⁶ *Ibid.*
- ¹⁷ *Ibid.*
- ¹⁸ Vijay Gill, Conference Board of Canada, 2012, *Driven Away: Why More Canadians are Choosing Cross Border Airports* (October 2012) accessed on October 20, 2015, online: [www.cacairports.ca/sites/default/files/Driven Away - Why More Canadians are Choosing Border Airports - FINAL.pdf](http://www.cacairports.ca/sites/default/files/Driven%20Away%20-%20Why%20More%20Canadians%20are%20Choosing%20Border%20Airports%20-%20FINAL.pdf).
- ¹⁹ The *Competition Policy Review Panel*, *Compete to Win*, 2008, accessed on November 23, 2015, online: <http://www.ic.gc.ca/eic/site/cprp-gepmc.nsf/eng/home>.
- ²⁰ Source: CTA Review with data from Transport Canada and International Air Transport Association, Scheduled Reference Service.

- ²¹ See Canadian Transportation Agency, Interpretive Note: *Canadian Ownership Requirement*, (last modified: October 5, 2015), accessed on November 16, 2015, online: <https://www.otc-cta.gc.ca/eng/canadian-ownership>.
- ²² Source: Transport Canada internal information.
- ²³ Available Transport Canada statistics begin at 2004, see Figure 7. Air Canada alone directly serves nearly twice the number of international destinations than it and CP combined in 1985, and new international air services agreements have greatly increased the number and frequency of services allowed by foreign carriers to Canada.
- ²⁴ Source: CTA Review with data from Transport Canada and International Air Transport Association AirportIS.
- ²⁵ Carriers in the United States, European Union and Canada State allege that their Persian Gulf competitors are competing unfairly because they benefit from excessive state subsidies. See for example Keith Laing, "Airlines: Foreign subsidies are destroying flight competition," *The Hill*, (March 12, 2015), accessed on July 15, 2015, online: <<http://thehill.com/policy/transportation/235543-airlines-foreign-subsidies-destroying-flight-competition>>. The United States and European Union have open air services agreements with the UAE and Qatar, whereas Canada has limited market access for carriers from these countries due to level playing field concerns.
- ²⁶ Vijay Gill & R. Neil Raynor, The Conference Board of Canada, 2013, *Growing Canada's Economy: A New National Air Transportation Policy*, (Report, 2013) accessed on October 21, 2015, online: <http://www.conferenceboard.ca/topics/energy-enviro/airpolicy.aspx>.
- ²⁷ The ABC Kiosk, designed and built by the Vancouver Airport Authority for the Canada Border Services Agency, is an example of the innovative investments possible by a commercialized structure and a business-oriented culture.
- ²⁸ Also designed by Vancouver Airport Authority, the United States Department of Homeland Security uses this Canadian technology more widely and with greater success.
- ²⁹ Air Travellers Security Charge per one-way departure: Domestic \$7.48; United States Transborder \$12.71; Other International \$25.9 (source: *Transport Canada, Air Travellers Security Charge (ATSC)*, accessed on November 23, 2015, online: <https://www.tc.gc.ca/eng/aviationsecurity/page-181.htm>).
- ³⁰ For example, the Vancouver Airport Authority's proprietary Automated Border Clearance and Automated Passport Control self-service kiosk systems developed with Canada Border Services Agency and United States Customs and Border Protection. With it, air passengers complete routine portion of border processing, decreasing the time to clear customs, while also increasing the amount of time customs officers have to engage with travelers directly and screen for higher risks. Vancouver Airport has sold the technology to airports across North America.

- ³¹ From 2010 to 2014, the number of passengers screened increased by 13 percent, ATSC revenue increased by 10.3 percent; but CATSA funding decreased by 9.9 percent, such that CATSA's funding as a share of the ATSC has fallen from 95 percent to 84 percent. Sources: Public Works and Government Services Canada, *Public Accounts of Canada* (years 2003-20014, accessed on November 23, 2015, online: http://epe.lac-bac.gc.ca/100/201/301/public_accounts_can/index.html), and CATSA's *Annual Reports and CATSA 2014/15-2018/19 Corporate Plan* (years 2004-2014, accessed on November 23, 2015, online: <http://www.catsa.gc.ca/corporate-publications>).
- ³² For example, Air Canada recently promoted that it was “happy to introduce a few enhancements to our carry-on baggage policy” for musical instruments, see: Air Canada, “Enhancements to Policy on Musical Instruments” News Release (September 25, 2015), accessed on November 23, 2015, online: <https://www.aircanada.com/en/news/150925.html>.

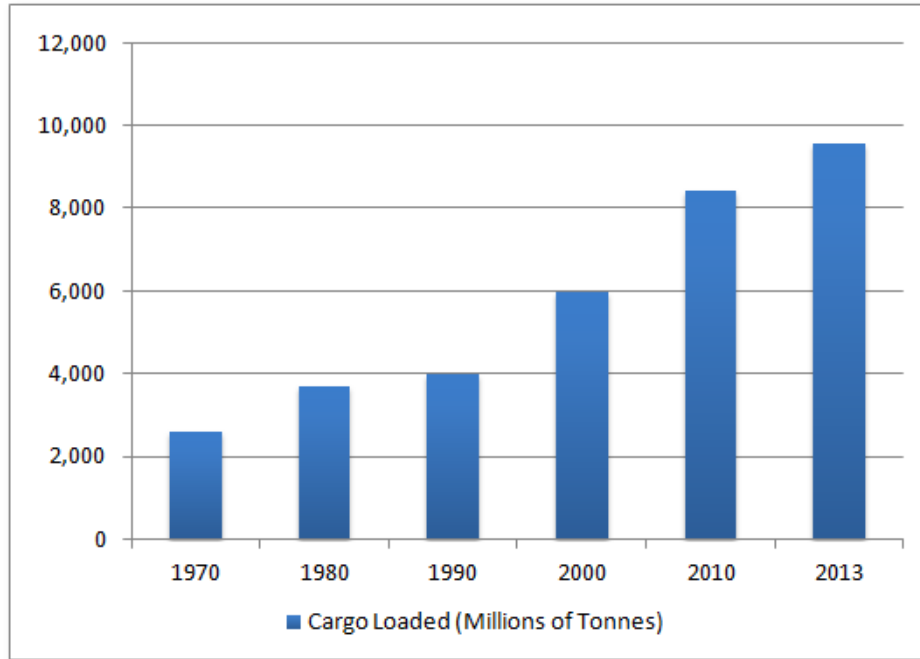
Appendix L

Marine Transport

Background on the Marine Sector

The maritime sector is global and growing. Ships transport 80 percent of global trade,¹ and seaborne trade volumes are predicted to double from today by 2030.²

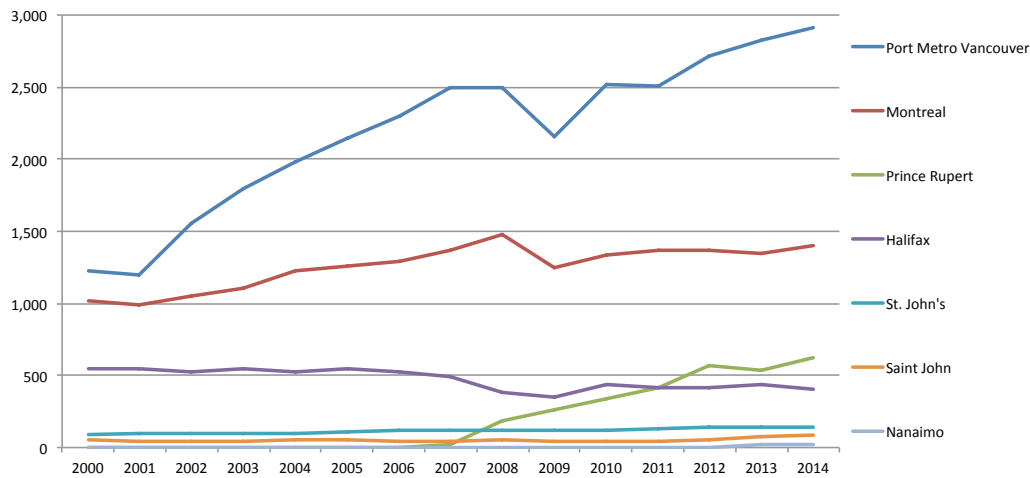
**FIGURE 1 —
WORLD FREIGHT MOVED
BY SEA (MILLIONS OF
TONNES LOADED,
SELECTED YEARS)³**



Ports are integral to the transportation system, providing intermodal infrastructure that facilitates the movement of goods through Canada's trade corridors. Over the last decade, there has been a 20 percent increase in tonnage received at key ports; non-containerized commodities make up most of the volume versus containerized cargo (Figures 2 and 3).

**FIGURE 2 —
TONNAGE LOADED
AND UNLOADED AT
ALL CANADA PORT
AUTHORITIES (TONNES)⁴**

	2007	2008	2009	2010	2011	2012	2013	2014
Total Non-Containerized Commodity	223.18	220.82	204.16	235.70	248.77	267.73	270.18	266.08
Total Containerized Commodity	33.79	35.88	33.46	36.68	38.45	41.46	43.08	44.35
Total	256.97	256.70	237.62	272.38	287.22	309.19	313.26	310.43



**FIGURE 3 –
CONTAINER TRAFFIC
AT KEY CANADIAN PORTS,
2000-2014 (MILLIONS
OF TEUS)⁵**

The following map illustrates the location of Canada's major marine gateways along with the principle rail connections extending from these ports inland.



**FIGURE 4 –
TRANSPORT CANADA
MAP OF MARINE
INFRASTRUCTURE
AND INLAND RAIL
CONNECTIONS⁶**

The following figures show volumes at various points in the marine transport system, through the Great-Lakes St. Lawrence Seaway System, and the largest marine ports (by container volumes) Vancouver, Montréal, Prince Rupert and Halifax.

**FIGURE 5 –
TRAFFIC VOLUME
ST. LAWRENCE SEAWAY⁷**

	2011	2012	2013	2014	Change 2013-2014
Cargo Traffic [tonnes]					
Combined Traffic	37,558,000	39,055,000	37,055,000	39,887,000	7.6%
Montréal/Lake Ontario section	28,740,000	31,388,000	28,561,000	30,072,000	5.3%
Welland Canal section	29,646,000	29,980,000	29,237,000	31,757,000	8.6%
Vessel Transits [vessels]					
Combined Transits	4,227	4,083	3,900	3,937	0.9%
Montréal/Lake Ontario section	3,000	2,975	2,768	2,657	-4.0%
Welland Canal section	3,296	3,243	3,133	3,272	4.4%

**FIGURE 6 –
CUMULATIVE TRAFFIC
VOLUME (TONNES)
AT THE PORTS OF
VANCOUVER, MONTRÉAL,
PRINCE RUPERT, AND
HALIFAX⁸**

	2011	2012	2013	2014	Change 2013-2014
Vancouver	122,499,631	123,897,786	135,008,952	139,628,826	3.0%
Inbound	24,230,828	25,345,449	27,386,123	28,506,870	4.0%
Outbound	98,268,803	98,552,337	107,622,829	111,121,956	3.0%
Montréal	28,534,264	28,422,003	28,156,971	30,445,984	8.1%
Inbound	18,175,376	18,412,052	17,712,148	19,411,112	9.6%
Outbound	10,358,888	10,009,951	10,444,823	11,034,872	5.6%
Prince Rupert	19,339,236	22,289,98	23,060,096	20,691,537	-10.3%
Inbound	—	—	—	—	—
Outbound	19,339,236	22,289,980	23,063,299	20,691,537	-10.3%
Halifax	9,486,612	9,490,961	8,608,044	7,831,883	-9.0%
Inbound	4,423,175	4,682,184	4,047,216	4,123,093	1.9%
Outbound	5,063,437	4,808,777	4,560,828	3,708,790	-18.7%

	2011	2012	2013	2014	Change 2013-2014
Vancouver	2,507,032	2,713,161	2,825,475	2,912,929	3.0%
Inbound	1,320,610	1,451,309	1,507,992	1,556,706	3.0%
Outbound	1,186,422	1,261,852	1,317,483	1,356,223	3.0%
Montréal	1,362,975	1,375,327	1,346,065	1,402,393	4.2%
Inbound	671,931	680,510	648,736	696,840	7.4%
Outbound	691,044	694,817	697,329	705,553	1.2%
Prince Rupert	410,469	564,857	536,43	618,167	15.2%
Inbound	234,742	318,068	303,840	359,959	18.5%
Outbound	175,727	246,789	232,599	258,207	11.0%
Halifax [1]	410,649	416,572	442,173	400,063	-9.5%
Inbound	191,649	199,633	216,200	201,807	-6.7%
Outbound	219,000	216,939	225,973	198,256	-12.3%

**FIGURE 7 –
CONTAINER TRAFFIC
(TEUs) AT THE PORTS OF
VANCOUVER, MONTRÉAL,
PRINCE RUPERT, AND
HALIFAX⁹**

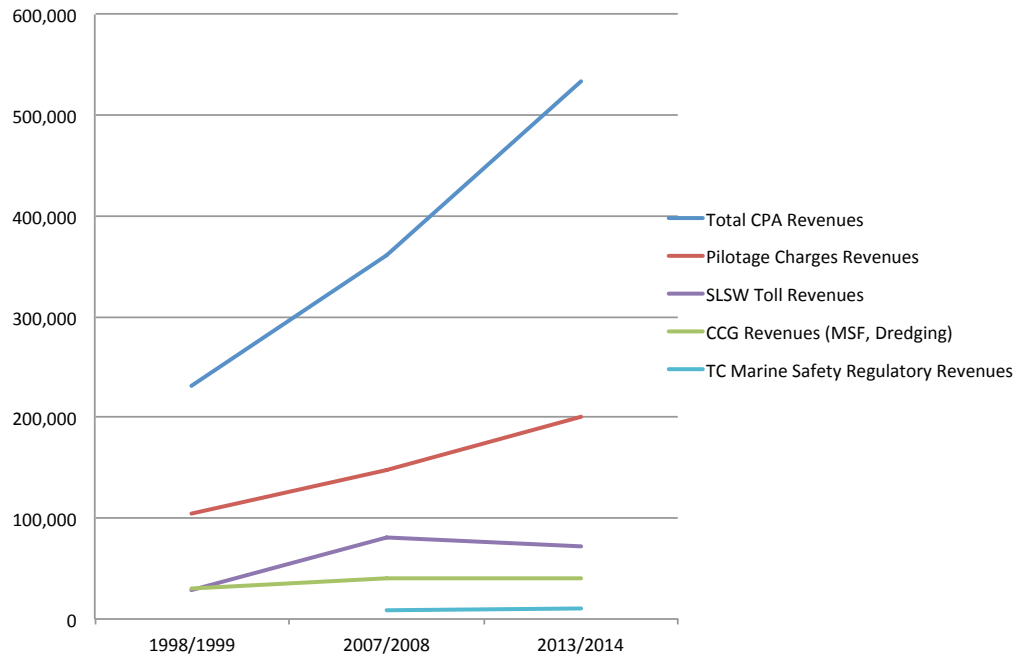
Services and Costs of Marine Transport

MARINE SERVICES AND FEES

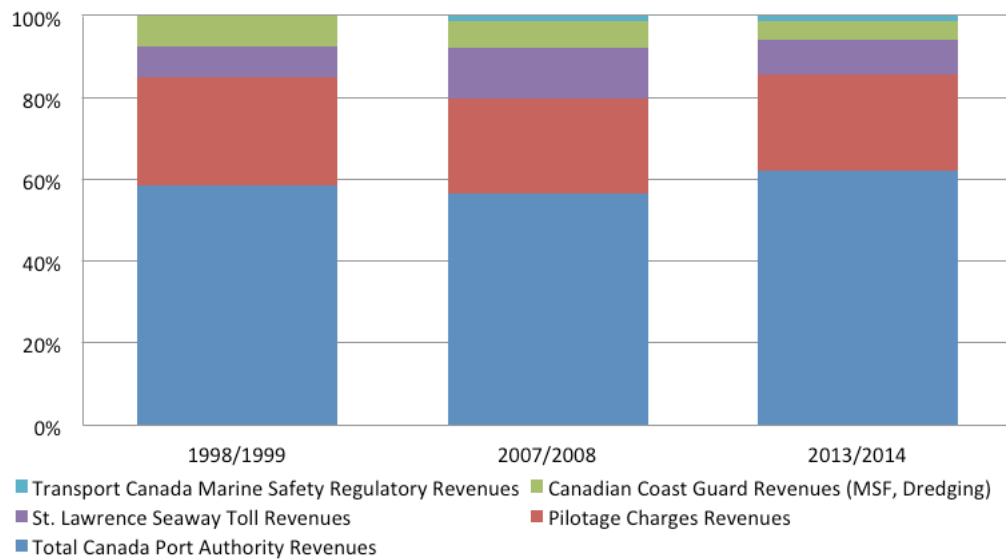
In Canada, numerous maritime services are offered for a fee, including (but not limited to) harbour dues, wharfage dues and charges, towage and terminal fees, anchorage and berthage fees payable to the port, pilotage fees, a Transport Canada vessel inspection fee, and St. Lawrence Seaway cargo and vessel tolls (see Figure 8). Marine navigation services, which include setting buoys and signals and traffic control in busy channels as well as ice-breaking services, are provided by the Canadian Coast Guard under the authority of the Minister of Fisheries, Oceans and the Canadian Coast Guard. The government introduced user fees to recover part of the costs for navigation services, which have not changed since 1998. Approximately 15 to 30 percent of the Canadian Coast Guard's operating costs (\$27 million out of \$190 million) are recovered from industry (see Figures 9 and 10); icebreaking fees are separate.

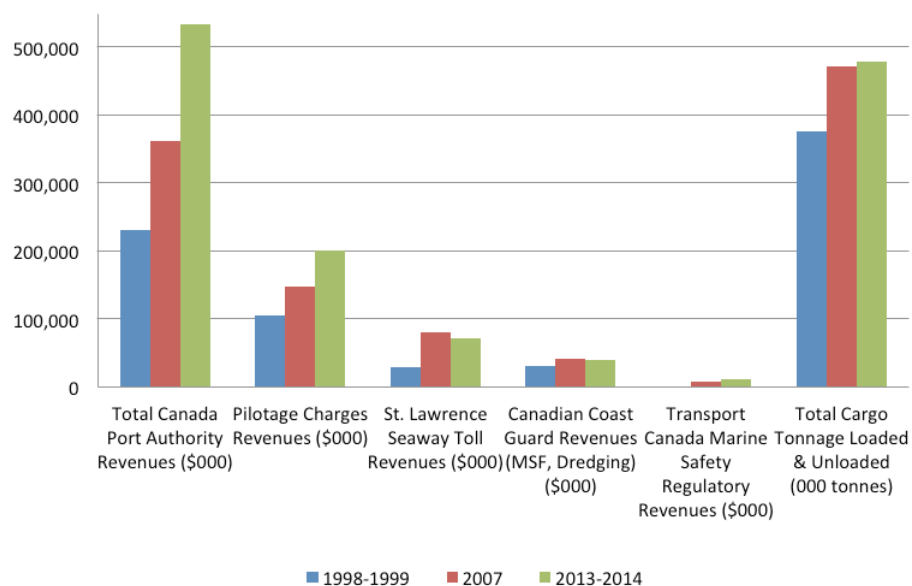
Carriers have cited pilotage as a material cost burden that impairs the competitiveness of the St. Lawrence region and Great Lakes-St. Lawrence Seaway System. A study commissioned by the CTA Review similarly found that pilotage costs represent a significant deterrent against developing transportation alternatives in that corridor. For example, a carrier transporting goods through the St. Lawrence River system from Thunder Bay to Baie Comeau will be assessed a fee of approximately \$12,000 by the Pilotage Authority. According to the Canadian Marine Pilots' Association, pilotage fees represent approximately 2 percent of shipping lines' operating costs.¹⁰

**FIGURE 8 –
TRENDS IN REVENUES
FROM CANADIAN MARINE
FEES (THOUSANDS OF
DOLLARS)¹¹**



**FIGURE 9 –
RELATIVE WEIGHTS
OF MARINE FEES PAID
BY VESSELS IN CANADA¹²**





**FIGURE 10 –
COMPARISON OF SHIPPING
AND MARINE FEES AND
TOTAL CARGO TONNAGE
IN CANADA, 1998-2014¹³**

The services of the Canadian Coast Guard and Transport Canada are financed through a combination of own-source revenues and appropriations. The preceding figures illustrate how Canadian Coast Guard and Transport Canada fee rates have not increased over time in line with the increase in service delivery costs, as they have for other components of the marine system in Canada. Canadian Coast Guard revenues were lower in 1998-1999.

The services of the Canada Port Authorities, Pilotage Authorities and St. Lawrence Seaway Management Corporation are: 100 percent self-financed through own-source revenues. These entities operate on a not-for-profit basis (i.e. expenditures and revenues should balance). As illustrated, harbour, wharfage, berthage, pilotage and Seaway dues have increased over time to ensure revenues and expenditures continue to balance.

As was noted in Appendix K, on air transport, the federal government collects rent from the largest airport authorities. Airport Rent is calculated at progressive rates of up to 12 percent of the airport authorities' gross revenue. The federal government levies a similar gross revenue charge on marine port authorities, but it is calculated at much lower rates (See Appendix K, Figure 3).

Port Performance, Governance and Capitalization

PORT PERFORMANCE

Ensuring the fluid movement of freight through Canadian ports remains critical if they are to continue to serve as competitive gateways. The Review commissioned a research report on Port Performance Measures,¹⁴ specifically those that address congestion, responsiveness and fluidity across the port system. It explored how port performance is measured in Canada, what is done elsewhere and, in particular, how the measurement of fluidity is undertaken. Among the research's conclusions was the observation that Canada is not alone in facing challenges of handling cargo surges and measuring fluidity and congestion/delay. While Canada has many options for addressing surges and congestion/delay, they all depend on quality data for decision-making and on decision-makers having timely access to the data without having to make special requests. Better data and the right data will be key to overcoming these challenges and making sound investment decisions.¹⁵

PORT GOVERNANCE AND CAPITALIZATION

Since the 1980s, there has been a general shift from direct state ownership and control of transportation assets towards the devolution of authorities and operations to arm's-length and private entities. In Canada, the commercialization of operations has been accompanied by retained government interest in the land and other physical assets of the ports.

The current Canadian port governance regime was established in 1998 as part of the government's strategy to modernize and commercialize the marine sector, enacted in the *Canada Marine Act*. Those major ports that were deemed to be of strategic significance to Canadian trade, linked to major intermodal infrastructure, handled a diverse mix of traffic, and were considered likely to remain financially self-sufficient were designated as Canada Port Authorities.¹⁶ As such, port assets and operations were transferred to Canada Port Authorities, which would be managed by under a shared governance arrangement and with a commercial mandate. The federal government remains the sole shareholder and selects the majority of the Boards of Directors. Other directors are chosen by the provincial and municipal governments, subject to certain consultation requirements.

The *Canada Marine Act* recognizes the significance of marine transportation to Canada and its contribution to the Canadian economy. The purpose of the Act as described in section 4, includes:¹⁶

- (i) Implementing marine policies that provide Canada with the marine infrastructure that it needs;
- (ii) Promoting the success of ports that contribute to the competitiveness, growth and prosperity of the Canadian economy;
- (iii) Basing the marine infrastructure and services on international practices and approaches that are consistent with those of Canada's major trading partners in order to foster harmonization of standards among jurisdictions; and
- (iv) Providing for a high level of safety and environmental protection.

Part I of the *Canada Marine Act* applies to the Canada Port Authorities that are incorporated under individual Letters Patent pursuant to section 8 of the *Canada Marine Act*; they are mandated to operate on commercial principles such that they remain financially self-sustaining while charging fees that are "fair and reasonable." They must maintain infrastructure at levels matching those of Canada's trading partners, and ensure the security and environmental sustainability of their operations.

The CTA Review also commissioned a study by the Institute on Governance¹⁷ on the governance of Ports, which highlighted international best practices. It also examined case studies that have potential applications in the Canadian context (specifically from the United Kingdom, New Zealand and the Australian states of Victoria and New South Wales).

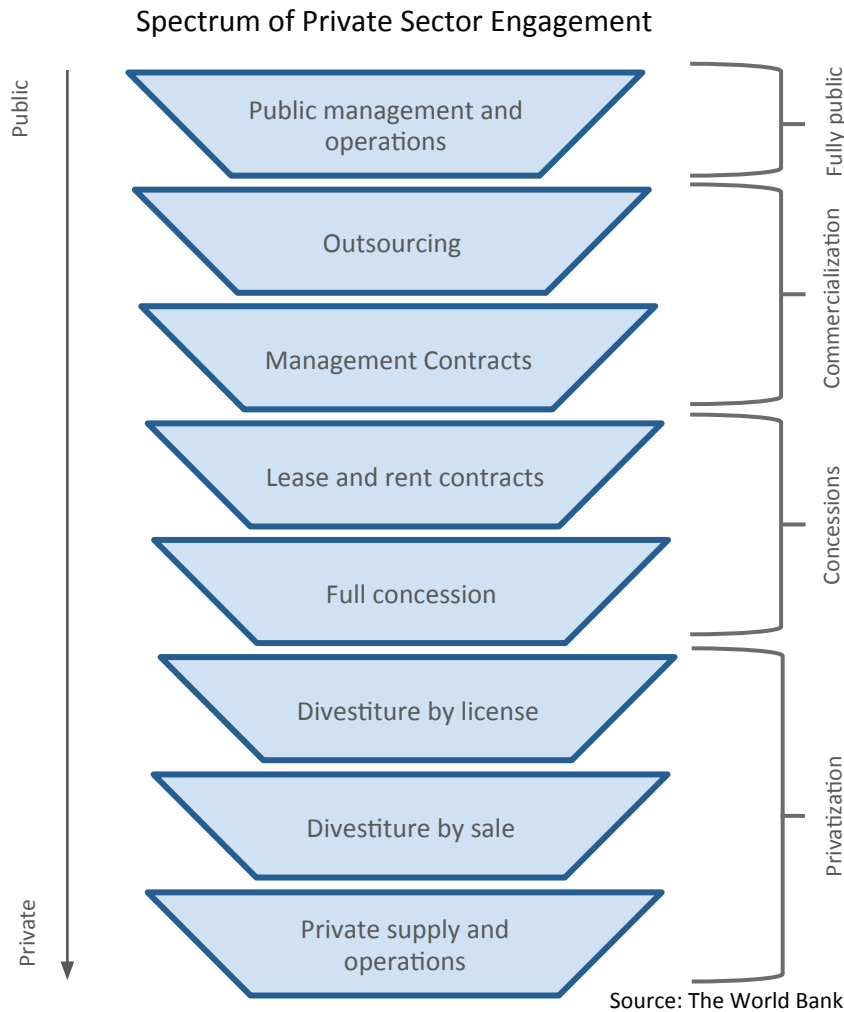


FIGURE 11 – SPECTRUM OF PRIVATE SECTOR ENGAGEMENT¹⁸

The Institute on Governance report, entitled *Port Governance Review*, noted that the spectrum of private sector engagement in owning and operating ports and port governance arrangements was vast (Figure 11) but could be classified along the following spectrum of models: Government Owned and Operated “Service Ports,” Commercialized/Corporatized Public Sector Ports, Landlord-Concession Ports, and Fully Privatized Ports (Figure 12). The benchmarking study noted that the majority of United Kingdom ports have been fully privatized for decades, demonstrating the viability of privatization, while a small but significant portion of United Kingdom ports have seen value in remaining as locally controlled, multi-stakeholder trust ports. The New South Wales Government (in Australia) has demonstrated an innovative privatization approach that relies on the use of a holding company to facilitate a long-term lease transaction based on the condition that private port corporations use the lands for port purposes and maintain the condition of the port assets. The Victoria Government (Australia) has retained a much higher level of public control through its use of the Statutory State Owned Corporation model for the Port of Melbourne. New Zealand port governance has been devolved from the national to the local level, with a three-tier structure being established in Auckland consisting of city council, that controls an investment holding company, that in turn controls the local port corporation.

**FIGURE 13 — COMPARISON OF PORT GOVERNANCE MODELS:
CANADA, AUSTRALIA, NEW ZEALAND, THE UNITED KINGDOM²¹**

ELEMENTS:	LEGISLATION AND POLICIES
Canada (CPAs):	National Marine Policy, 1995; <i>Canada Marine Act</i> , 1998
United Kingdom:	National Policy Statement on Ports (2012); Modern Ports: a United Kingdom policy (2000); <i>Planning Act</i> , 2008; <i>Ports Act</i> , 1991
New Zealand (Auckland):	<i>Port Companies Act</i> , 1988; <i>Companies Act</i> , 1993; <i>Local Government Act</i> , 2002
Australia: (Victoria and New South Wales—NSW)	Central: <i>Corporations Act</i> 2001, National Ports Strategy Victoria Port of Melbourne: <i>Transport Integration Act</i> , 2010 and <i>Port Management Act</i> , 1995 NSW: <i>Ports and Maritime Administration Act</i> , 1995, <i>State Owned Corporations Act</i> , 1989, and <i>Port Assets (Authorised Transactions) Act</i> , 2012
ELEMENTS:	GOVERNANCE MODEL
Canada (CPAs):	Port Authority
United Kingdom:	Private Trust
New Zealand (Auckland):	Two-tier local public corporation; Mixed public-private ownership
Australia: (Victoria and New South Wales—NSW)	Statutory State-Owned Corporation; Private (long-term lease)

**FIGURE 13 — COMPARISON OF PORT GOVERNANCE MODELS:
CANADA, AUSTRALIA, NEW ZEALAND, THE UNITED KINGDOM²¹ (CONTINUED)**

ELEMENTS:	MANDATE / LEGISLATIVE INTENT AND OBJECTIVES
Canada (CPAs):	<p><i>Canada Marine Act, 1998</i></p> <ul style="list-style-type: none"> • Provision of infrastructure to meet national, regional, local objectives based on international practices. • Promote successful ports. • Satisfy user needs at a reasonable cost to users. • Autonomy for local management. • Ability to privatize • Coordinate and integrate marine with surface and air. • Identify Canada Port Authorities as strategic national assets. • Financial self-sufficiency required under Act. • No federal support for capital / infrastructure; it is up to the individual Port Authority to raise capital funds from debt.
United Kingdom:	<p><i>Modern Ports: A United Kingdom Policy</i> Government does not run the ports industry. Government does not decide the port industry's commercial strategy or direct or fund investment.</p> <p><i>National Ports Policy Statement</i> Market-led approach with requirement of national statements by ports to assist the national planning process.</p> <p><i>Ports Act, 1991.</i> Enables privatization of trust ports.</p>
New Zealand (Auckland):	<p><i>Port Companies Act, 1988</i> Principal objective of every port company shall be to operate as a successful business.</p>
Australia: (Victoria and New South Wales—NSW)	<p>Victoria:</p> <p><i>Transport Integration Act, 2010</i> Objectives: Integrate into transportation system. Collaborate for sustainable growth, port services are available and cost effective, establish and manage channels.</p> <p>Functions: plan for development and operation, provide land/water/ infrastructure, control development, manage, services, promote, facilitate infrastructure integration, provide navigation aids, safety, follow direction of Minister.</p> <p><i>Port Management Act, 1995</i> Determines fees, subject to price regulation. Port managers responsible for: planning, permits, allocating moorings, maintaining wharves, dredging, constructing new facilities.</p>

New South Wales:

Ports and Maritime Administration Act, 1995

Established the three ports as state-owned corporations (subsequently repealed), and provided the authorities of the Minister in port governance.

State Owned Corporations Act, 1989.

Set out in detail the governance structure of the previous Statutory State-Owned Corporations model and has provisions that continue for Port Authority of New South Wales

Ports Assets (Authorised Transactions) Act, 2012

Enabled the restructuring of assets, rights and liabilities of the port corporations for the purpose of consolidation and privatization.

ELEMENTS:

LEVEL(S) OF GOVERNMENT AND KEY GOVERNANCE BODIES

Canada (CPAs):

Transport Canada oversees CPAs and remote ports.

Local/regional ports have been transferred to provincial, municipal, community organization or private interests.

United Kingdom:

Central: Department for Transport is the lead department; and Infrastructure Planning Commission also has a role.

New Zealand (Auckland):

Central: Ministry of Transport

Local: Regional Council, Auckland Council Investments Limited, Ports of Auckland Limited.

Australia:
(Victoria and New South Wales—NSW)

Commonwealth Government: Infrastructure Australia, National Transport Commission.

Victoria:

Primarily State Government: Department of Transport, Planning and Local Infrastructure is responsible.

State government is coordinated planner and regulator, owns largest port in Melbourne.

New South Wales:

Ministry of Roads, Maritime and Freight.

Port Authority of NSW.

Private companies: Port of Newcastle Investments and NSW Ports.

**FIGURE 13 — COMPARISON OF PORT GOVERNANCE MODELS:
CANADA, AUSTRALIA, NEW ZEALAND, THE UNITED KINGDOM²¹ (CONTINUED)**

ELEMENTS:	PUBLIC VS. PRIVATE MODEL ELEMENTS
Canada (CPAs):	<p>Public: regulation (through licenses/ permits, safety, customs and immigration), waterside maintenance, pilotage and towage.</p> <p>Mixed public/private: monitoring, emergency, protecting public interest, maintenance, marketing, facilities, line handling.</p> <p>Private: applying port and environmental policy, security, land acquisition/disposal, landside and berth capital investment.</p>
United Kingdom:	<p>Private Ports: United Kingdom has privatized both the port authority and cargo handling operations.</p> <p>Trust Ports: public bodies (that can be privatized) where there is a private sector operator.</p>
New Zealand (Auckland):	<p>Ports of Auckland: 100 percent publicly owned.</p> <p>Port of Tauranga: nearly half privately owned (publicly listed).</p>
Australia: (Victoria and New South Wales—NSW)	<p>Victoria: Mix of public and private models. Port of Melbourne is a fully public major port, but is on the verge of new structure based on private long-term lease.</p> <p>New South Wales: Hybrid of private management and development (through 99-year lease) with public ownership through Port authority. Long-term lease includes requirements that restrict use of port lands for port related activities and maintaining condition of port over the course of the lease.</p>

ELEMENTS:

DECISION MAKING (BOARD ROLE, STRUCTURE, APPOINTMENTS)

Canada (CPAs):

Single appointment for each level of government with appointments made by the Minister of Transport based on public consultation/ advice. CPAs (and remote ports) are creatures of the federal government, while local ports have been devolved to lower levels of government. Federal statutorily-mandated and board governed organizations that have specific roles and responsibilities through Letters Patent.

United Kingdom:

Private: Board is responsible to shareholders.

Trust: independent statutory bodies governed by their own unique statutes and controlled by a local independent Board with no shareholders or owners. Surpluses reinvested in the port for the benefit of stakeholders. The Secretary of State for Transport retains responsibility for appointing chairs and non-executive board members for strategically significant ports.

New Zealand (Auckland):

Central government is limited to high level planning considerations and setting up port organizations.

Auckland: Board appointments are made by Council to a municipally-owned holding company.

Australia:

(Victoria and New South Wales—NSW)

Victoria: Board is appointed by GiC for three year, renewal terms, serving at pleasure.

CEO must be approved by Minister.

Board is responsible for governance of corporation including strategic direction, establishing corporate objectives, risk, CEO appointment, and performance monitoring

New South Wales: Shareholders appoint Board of investment operators – which is responsible for directing the management and development of the port.

Minister appoints board of the Port Authority of NSW – which is responsible for regulation of larger leased ports and operation of three smaller publicly-owned ports.

Ports Assets Ministerial Holding Corporation is headed by Secretary of the Treasury – it shares oversight of the leased ports.

**FIGURE 13 — COMPARISON OF PORT GOVERNANCE MODELS:
CANADA, AUSTRALIA, NEW ZEALAND, THE UNITED KINGDOM²¹ (CONTINUED)**

ELEMENTS:	OVERSIGHT AND ACCOUNTABILITY
Canada (CPAs):	<p>Included in federal <i>Access to Information and Privacy Act</i> regime.</p> <p>Reporting and planning documents submitted to the responsible federal department (Transport Canada).</p>
United Kingdom:	<p>Private: The United Kingdom government generally follows a “hands-off” approach, but is authorized to step in if issues arose.</p> <p>Trust: accountable to stakeholders and reporting to Secretary of State.</p>
New Zealand (Auckland):	<p>Central: the constitution of the Ports of Auckland can only be modified with the approval of the Minister of Transport (<i>Port Companies Act</i>).</p> <p>Local: three levers of control include appointments, shareholder resolutions and statements of intent.</p>
Australia: (Victoria and New South Wales—NSW)	<p>Victoria: Board is responsible to State Parliament through Minister through respective supporting documents.</p> <p>New South Wales: Port authority is responsible to the Minister.</p> <p>The state government sets out conditions in the long-term leases for the private companies owning the ports of Newcastle, Kembla and Botany.</p> <p>Government retains ability to intervene if leasing companies do not live up to their obligations in the areas of appropriate port use and maintaining condition of the port.</p>

Short Sea Shipping

The Review commissioned a study by MariNova Consulting on short sea shipping that examined global trends, performance and emerging best practices.²²

MariNova considered short sea shipping practices in Europe, United States, Australia and Canada. It highlighted two limitations for greater use of the Great Lakes-St. Lawrence Seaway System, namely the implications of the United States' *Jones Act* (which restricts cabotage, similar to *Canada's Coasting Trade Act*) and the Harbor Maintenance Tax, which increases costs for Canadian mariners as well.²³ Short sea shipping must compete with trucks, but the trucking industry operates year round, and does not have to contend with the American maritime restrictions. The Detroit–Windsor Truck Ferry is an illustrative case: the ferry takes 20 minutes to cross the Detroit River, and carries up to eight trucks and trailers. It operates at full capacity from Detroit to Windsor. The Windsor to Detroit run is usually empty (with the exception of hazardous cargo) because the United States Harbor Maintenance Tax renders it uncompetitive to alternative surface routes.²⁴

The United States *Jones Act* has been frequently studied, and a number of Bills seeking to amend it have been introduced in Congress over the years, but political positions on the legislation (and on cabotage), are entrenched and unlikely to change in the near future. Absent significant changes, the *Jones Act* will likely to continue to deter further development of short sea shipping across the Great Lakes and from Canadian ports such as Montréal and Halifax through to Great Lakes ports in the United States.

Another limitation of short sea shipping is and the lack of year round service (10.5-month shipping season).

The study references a 2008 report by engineering firm Genivar Inc. that examined the environmental impacts²⁵ and social costs²⁶ of three modes of transportation: rail, road and marine.²⁷ Genivar compared shipments of solid bulk, cargo containers, containers on trailers, and petroleum, on the Great Lakes, St. Lawrence River, East Coast, and West Coast, and concluded that short sea shipping has the lowest environmental and social costs.²⁸

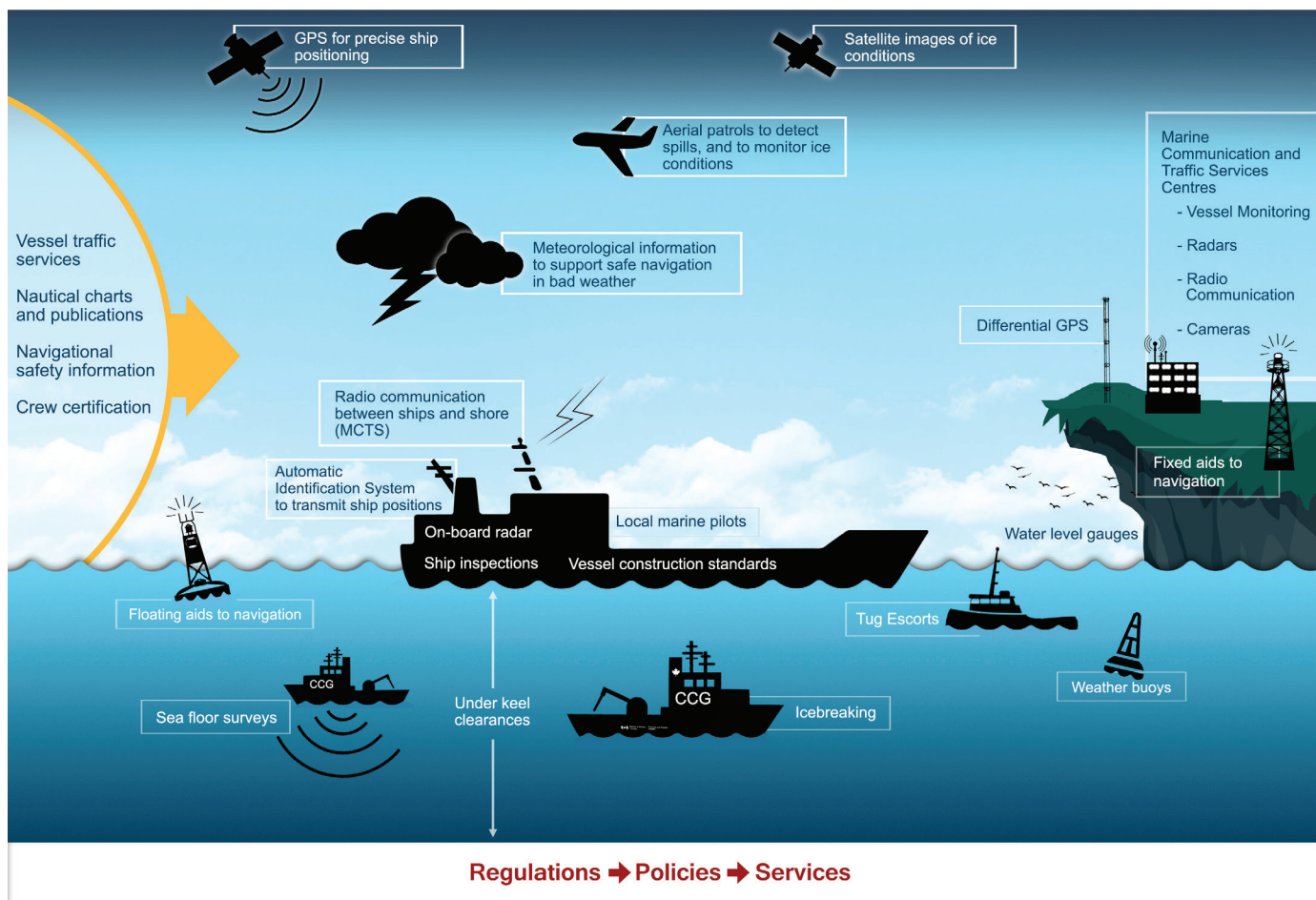
MariNova recommended a number of actions to advance short sea shipping in Canada such as further/deeper collaboration under the Highway H2O initiative, easing coasting trade and duty provision for imported vessels, and beginning to accept vessels that have been approved by the International Association of Classification Societies, rather than requiring that imported vessels be refitted to adhere to Transport Canada standards.

Canadian Coast Guard

The Canadian Coast Guard is mandated to provide services to support safe, economical and efficient movement of ships in Canadian waters, to deliver the marine component of the federal search and rescue program, and to ensure appropriate marine pollution response. The Canadian Coast Guard also provides support needed by sectors within Fisheries and Oceans Canada such as scientific surveys, and other federal government departments with the provision of ships, aircrafts and other marine services for the protection of marine and aquatic environments, public safety and security on the water, marine science and fisheries resource management.²⁹

The figure below illustrates some of the systems and services that support transport in Canadian waters, including the Canadian Coast Guard (identified as “CCG”).

FIGURE 14 – GRAPHICAL REPRESENTATION OF CANADA’S MARINE SAFETY SYSTEM³⁰



The Canadian Coast Guard divides its operations into three regions – Atlantic, Central & Arctic, and Western (Figure 15). Each region is led by an Assistant Commissioner, who is responsible for directing the day-to-day programs and services in their respective region.



FIGURE 15 – CANADIAN COAST GUARD REGIONAL BOUNDARIES³¹

WESTERN REGION

- 11 Large Vessels
- 5 Small Vessels
- 13 Search and Rescue Lifeboats
- 3 Air Cushion Vessels
- 7 Helicopters

CENTRAL AND ARCTIC REGION

- 14 Large Vessels
- 8 Small Vessels
- 18 Search and Rescue Lifeboats
- 2 Air Cushion Vessels
- 7 Helicopters

ATLANTIC REGION

- 18 Large Vessels
- 9 Small Vessels
- 14 Search and Rescue Lifeboats
- 8 Helicopters
- College
- 2 Training Vessels

The services provided by the Canadian Coast Guard can be grouped under six major programs, namely Aids to Navigation, Waterways Management, Environmental Response, Icebreaking, Marine Communications and Traffic Services and Search and Rescue. While each region delivers core Canadian Coast Guard programs, the focus of each region may differ depending on climate, geography and client needs.³² Figure 16 breaks down Canadian Coast Guard funding by activity.

FIGURE 16 — CANADIAN COAST GUARD COSTS BY ACTIVITY AND PROGRAM ALIGNMENT ARCHITECTURE (PAA) PROGRAM, 2014-2015 (THOUSANDS OF \$)³³

PAA PROGRAM	Salary	Operation and Maintenance	Total Operating	Major Capital	Grants and Contributions	Total Planned Spending**
Marine Communications and Traffic Services	31,526	4,810	36,336	—	—	36,336
Marine Navigation	16,705	35,707	52,412	—	—	52,412
Aids to Navigation	12,649	15,075	27,724	—	—	27,724
Icebreaking Services	642	15,179	15,821	—	—	15,821
Waterways Management	3,413	5,453	8,866	—	—	8,866
Search and Rescue Services	9,632	14,971	24,603	—	5,021	29,624
Environmental Response Services	8,184	3,627	11,812	—	—	11,812
Maritime Security	3,622	3,329	6,951	—	—	6,951
Coast Guard College	10,292	3,049	13,341	—	—	13,341
Fleet Operational Readiness*	170,117	59,089	229,205	190,462	—	419,667
Shore-Based Asset Readiness	59,758	14,207	73,965	48,003	—	121,968
Total	309,835	138,789	448,624	238,465	5,021	692,110

* Operation and Maintenance includes ship refit and fuel for Fisheries and Oceans Canada's Ecosystems and Oceans Science Sector and Ecosystems and Fisheries Management

** Workplace Compensation Board budget is included in Operation and Maintenance figures

An evaluation conducted by the Department of Fisheries and Oceans' Evaluation Directorate was completed in March 2014 on the Canadian Coast Guard's operational capabilities, including the state of internal fleet maintenance and replacement. Select findings are presented below.

EVALUATION FINDINGS AND RECOMMENDATIONS: Canadian Coast Guard Fleet Operational Readiness

The evaluation found that vessels are being maintained to meet regulatory requirements. Overall, maintenance work tends to be more corrective, with limited ability for preventative maintenance due to financial constraints. The advanced age of many vessels is reflected in the decline in reliability. The remaining operational life of both large and small vessels is less than 30 percent. Some new assets were procured, with projects underway to replace large vessels in the years ahead. Fleet Procurement's long-term renewal plan outlines replacement plans well beyond projects currently under way, to ensure other vessels are procured as others reach the end of their useful life. The Fleet Procurement program was introduced in 2009-10. Its projects and outcomes will typically require several years to reach fruition.

Additional funding has been a significant component in enabling Fleet Maintenance and Fleet Procurement to proceed with necessary work. For the past decade, Fleet Maintenance has received about \$47 million annually in addition to its capital budget to help cover maintenance costs. However, still has not been sufficient, as Fleet Maintenance had to rely on funding from the 2009 Economic Action Plan to undertake some major repairs. Fleet Procurement relies on funding approval beyond its base budget for the majority of its projects. Between 2005 and 2012, the federal government approved an additional \$6.8 billion mainly for procurement projects, and some major repairs to large vessels.

Shipyards capacity, national shipbuilding priorities and a competitive labour market will have a strong bearing on Fleet Procurement project timelines and outcomes in the immediate years ahead. This has implications for Fleet Maintenance and the need to keep old vessels operational longer than anticipated, some well beyond their initial design life.

Source: Evaluation Directorate, Fisheries and Oceans Canada: Evaluation of Fleet Operational Readiness Program, Fleet Maintenance And Fleet Procurement Sub-Programs, March 2014.

Modernization of Pilotage

Modern day pilotage arose from the ancient practice of sea captains hiring locals with intimate knowledge of local waters to guide them through narrow channels and away from dangerous shoals, rocks and tides. Today, this practice is engrained to some extent in all countries' coastal regulations, to protect the safety and security of citizens, and to prevent disruptions to commerce that would arise should a marine route be blocked through accident or spill.

Pilotage entails the assignment of a pilot to a vessel for a period of hours or a day. Domestic operators report some challenges in retaining experienced captains; it was suggested that they instead seek pilotage positions. Most pilots gain their Canadian experience commanding domestic vessels operating on coastal and inland waterways. The pool of seafarers who are qualified to apply for pilotage positions is limited.

There are four Pilotage Authorities in Canada: Pacific, Great Lakes, Laurentian and Atlantic. Each Pilotage Authority is required to be financially self-sufficient and to set fair and reasonable user charges. For the Pacific, Laurentian and Atlantic, tanker traffic represents a significant component of pilot missions and this is expected to increase over time.

As referenced previously, pilotage costs represent a significant deterrent against the development of marine transportation alternatives in the St. Lawrence River corridor. The study found that pilotage can add as much as \$15,000, or more, to the weekly cost of moving cargo between Halifax and Montréal or Hamilton.³⁴ The Great Lakes Pilotage Authority has exempted American and Canadian domestic vessels from incurring pilotage fees in certain circumstances, such as when deck officers undergo vigorous training through the United States Coast Guard and Great Lakes Pilotage Authority certification.³⁵

In considering global best practices, MariNova noted that "shore-based" pilotage (similar to aircraft-based autopilot systems) could be considered for the Great Lakes-St. Lawrence Seaway System, referencing studies from Denmark and Sweden, that reached similar conclusions. The Danish Maritime Authority study found that shore-based pilotage would be feasible in outlying waters with relatively little impact on safety, and would deliver considerable cost savings for the shipping industry.³⁶ The study also concluded that shore-based pilotage is unlikely to be adopted by all vessel owners, particularly oil tankers. The Swedish study by Chalmers University of Technology (Gothenburg) concurred that while shore-based pilotage has the potential to facilitate traffic flow and to improve safety, it will not be suitable to all ships or for all waterways.³⁷

Notes

- ¹ United Nations Conference on Trade and Development (UNCTAD) *Review of Maritime Transport*, (Geneva: UNCTAD/RMT/2014, 2014), accessed on November 23, 2015, online: http://unctad.org/en/PublicationsLibrary/rmt2014_en.pdf.
- ² Lloyd's Register, *Global Marine Trends 2030*, (London: Lloyd's Register and University College London, 2014), accessed on November 23, 2015, online: <http://www.lr.org/en/marine/projects/global-marine-trends-2030.aspx>.
- ³ Source: CTA Review with data from UNCTAD *Review Of Maritime Transport*, *op. cit.*
- ⁴ Source: CTA Review with data from Canada Port Authorities and Transport Canada.
- ⁵ Source: CTA Review with data from St. Lawrence Seaway Management Corporation, *Seaway Traffic Reports*.
- ⁶ Source: from Transport Canada, *Transportation in Canada 2014*, (Ottawa: Her Majesty the Queen in Right of Canada, represented by the Minister of Transport, 2015) accessed on October 20, 2015, online: https://www.tc.gc.ca/media/documents/policy/2014_TC_Annual_Report_Overview-EN.pdf.
- ⁷ Source: Seaway Traffic Reports. St. Lawrence Seaway Management Corporation.
- ⁸ Source: CTA Review with data from Transport Canada, and the websites of the ports of Halifax, Montréal, Prince Rupert and Vancouver. Containerized and non-containerized traffic combined.
- ⁹ Source: CTA Review with data from Transport Canada – Transportation and Economic Analysis, and the websites of the ports of Halifax, Montréal, Prince Rupert and Vancouver. Note: Halifax Port Authority (HPA) and non-HPA facilities combined.
- ¹⁰ Canadian Marine Pilots' Association, *Canadian Pilotage Provides Better Value for Money than Almost Any Other System in the World*, accessed on November 18, 2015, online: <http://www.marinepilots.ca/en/articles/tariffs.html>.
- ¹¹ Source: CTA Review with data from Transport Canada, *Transportation in Canada 2014: Statistical Addendum*, *op. cit.* for revenues of Pilotage and Port Authorities, Departmental performance reports for the Canadian Coast Guard <http://www.dfo-mpo.gc.ca/dpr-rmr/2013-14/SupplementaryTables/uf-fu-eng.html#s1.2>; and Transport Canada (Supplementary Tables, User Fee Revenues) <https://www.tc.gc.ca/eng/corporate-services/planning-dpr-2013-14-1189.html#t3>.
- ¹² Source: *Ibid.*
- ¹³ Source: *Ibid.*

- ¹⁴ Mary R. Brooks, Mary R. Brooks Transportation Consulting, *Port Performance Measures: Identification, Summary and Assessment of Port Fluidity and Congestion Measures, Final Report*, prepared for the CTA Review, (July 16, 2015).
- ¹⁵ *Ibid.* at 65.
- ¹⁶ *Canada Marine Act* (S.C. 1998, c. 10)
- ¹⁷ Institute on Governance - *Port Governance Review Final Report*, prepared for the CTA Review, (July 28, 2015).
- ¹⁸ Source: World Bank, "MODULE 3 - Alternative Port Management Structures and Ownership Models" in *Port Reform Toolkit PPIAF, World Bank, 2nd Edition*, (Washington: World Bank, 2007), at 111, accessed on November 6, 2015, online: <http://ppp.worldbank.org/public-private-partnership/library/port-reform-toolkit-ppiaf-world-bank-2nd-edition>.
- ¹⁹ Source: World Bank, *Port Reform Toolkit*, *op. cit.*
- ²⁰ Institute on Governance, *Port Governance Review Final Report*, *op. cit.*
- ²¹ Source: Institute on Governance, *Port Governance Review Final Report*, *ibid.*
- ²² MariNova Consulting Limited *Final Report – Analysis of Short Sea Shipping and Extending the Seaway Season*, prepared for the CTA Review, (September 21, 2015).
- ²³ According to the Maritime Law Centre, the *Jones Act* determines which ships may lawfully engage in trade and the rules under which they must abide: it prohibits any foreign built or foreign flagged vessel from engaging in coastwise trade within the United States.
- ²⁴ R.G. Edmonson, "Short-sea vs. HMT" *Journal of Commerce*, April 24, 2005.
- ²⁵ Fuel consumption efficiency, air contaminants, greenhouse gases and other non-quantifiable impacts.
- ²⁶ Accidents, congestion and noise.
- ²⁷ Genivar, *Evaluation of Environmental and Social Impacts and Benefits of Shortsea Shipping in Canada*, prepared for Transport Canada (TP 15000E, 2008).
- ²⁸ MariNova Consulting, *Analysis of Short Sea Shipping and Extending the Seaway Season*, *op. cit.*
- ²⁹ Canadian Coast Guard, *Levels of Services* May 2010 (Update).
- ³⁰ Canadian Coast Guard.
- ³¹ Source: *Ibid.*

³² Fisheries and Oceans Canada, *Canadian Coast Guard Integrated Business and Human Resources Plan 2014-2017* (2014), accessed on November 6, 2015, online: <<http://www.ccg-gcc.gc.ca/folios/00018/docs/IBHRP-2014-2017-eng.pdf>.

³³ Source: *ibid.*

³⁴ MariNova Consulting, *Analysis of Short Sea Shipping and Extending the Seaway Season*, *op. cit.*

³⁵ *Ibid.* at 48.

³⁶ Danish Maritime Authority, *Technological Assessment on the Possibility of Shore Based Pilotage in Danish Waters: Final Report*, November 2014. (Cited by MariNova Consulting at 55-56).

³⁷ M. Lutzhoft, K. Bruno, *Talk and Trust before Technology: First Steps Toward Shore-Based Pilotage*, (Chalmers University of Technology of Sweden, no date) [cited by MariNova at 55-56].

Appendix M

Canadian Transportation Agency

A Brief History of Transportation Regulation in Canada up to 1987

Transportation regulation in Canada¹ began with the establishment of a *Railway Committee of the Privy Council* in 1868. In 1903 the regulatory powers of the Committee were transferred to the Board of Railway Commissioners, an independent, quasi-judiciary regulatory agency. Subsequently, the board was given jurisdiction over express, telegraph and telephone companies (1908); government-owned railways (1923); international bridges and tunnels (1929); abandonment of railway lines (1933); Hudson Bay Railway (1948); and Newfoundland Railways.²

The *Transport Act* of 1938 changed the name of the board to the Board of Transport Commissioners for Canada and gave it regulatory powers over transportation by air and water. In 1944 the regulation of civil aviation was transferred to the Air Transport Board. The 1967 *National Transportation Act* created the Canadian Transport Commission, entering a new phase of transportation regulation.³

The Canadian Transport Commission replaced the Board of Transport Commissioners, the Air Transport Board and the Canadian Maritime Commission. The Commission was also granted regulatory powers over commodity pipelines, and the sectors of highway transport placed under federal control. Initially the Canadian Transport Commission also had regulatory powers over telecommunications, but these were transferred to the Canadian Radio-Television and Telecommunications Commission in 1976.

Under the *National Transportation Act* of 1967, the structure of railway regulations followed the principles proposed by the MacPherson Commission: overall reliance on market forces except for regulatory interventions related to the protection of “captive shipper” and prohibition of non-compensatory rates.⁴ The Canadian Transport Commission also dealt with specific cases where the rates imposed a burden on shippers or regions not justified by the existence of specific cost conditions. In air transport, the regulatory activities of the Commission largely reflected government policies of the time. In the 1970s, the degree of competition had been gradually increased by granting competing airlines operating authorities over major scheduled routes and by permitting a substantial increase of competition by non-scheduled (i.e. charter) airlines in the discretionary travel market.

The National Transportation Agency was created in 1987 as part of the move to deregulate parts of Canada’s transportation sector. Until the 1970s, “public utility”-type economic regulation for transportation had gone unquestioned in North America. Although Canadian thinking on regulating transportation had been influenced by the United States model, Canadian policies and practices were quite distinct. Canadian railways had a wide degree of pricing freedom, unlike United States railways, and inter-state highway transport was also controlled, a situation with no parallel in Canada. Air transport regulations were also different. However, the concept of regulation was seriously questioned in the 1970’s, resulting in the economic deregulation of transport in the United States. In Canada in 1985, a policy paper was put forward by the Minister of Transport at the time, Don Mazankowski, entitled “Freedom to Move,” which outlined extensive reforms to regulatory practices and formed the basis of the *National Transportation Act*, the enabling legislation of the National Transportation Agency.

Description of *Ex Parte*

Ex parte refers to proceedings where one of the parties has not received notice and, therefore, is neither present nor represented. Relief is awarded without the presence or even the knowledge of the other party, who may be affected or bound by the proceeding which goes against the principle that all parties should have the opportunity to appear and be heard before judgement is rendered. Accordingly, in law, it is considered extraordinary relief.

Ex parte is usually used in situations where emergency relief is requested and time is of the essence. A full hearing of the application occurs after the interim relief is granted.

Under the *National Transportation Act*, 1987, subsection 40(3) provided the National Transportation Agency with the power to make an interim *ex parte* order, if special circumstances so required. The subsection provided:

“The Agency may, if the special circumstances of any case so require, make an interim ex parte order authorizing, requiring or forbidding anything to be done that the Agency would be empowered, on application, notice and hearing, to authorize, require or forbid, but no such interim order shall be made for any longer time than the Agency may deem necessary to enable the matter to be heard and determined.”

This subsection was not continued in the *Canada Transportation Act*, 1996. The Act did, however, retain a general section on interim relief, subsection 28(2), which gives to the Agency the authority to issue interim relief prior to making a final order:

“The Agency may, instead of making an order final in the first instance, make an interim order and reserve further directions either for an adjourned hearing of the matter or for further application.”

This subsection gives to the Agency flexibility in granting a tailor-made order to meet the needs of a particular case. Moreover, in Letter Decision No. 2014-08-18 the Agency reviewed its jurisdiction to entertain interim relief and the test to be applied by the Agency. In Decision No. LET-AT-R-356-2001, the Agency confirmed that the three-part test applicable to applications for interlocutory injunctions, as well as for stays, applies to an application for an interim order under subsection 28(2) of the *Canada Transportation Act*. This test is summarized as follows:

“The onus to show that an interim order should be granted rests on the applicant. Briefly stated, at the first stage, the applicant must demonstrate that there is a serious question to be tried. At the second stage, the applicant is required to demonstrate that irreparable harm will result if the relief is not granted. The third part of the test requires an assessment of the balance of inconvenience to the parties; in other words, which of the two parties will suffer the greater harm from the granting or refusal of an interlocutory injunction.”

Notes

- ¹ Of note, transportation regulation in Canada is administered by all levels of government (federal, provincial, and municipal) and covers prices, conditions and levels of service, and the operating authority of transport units. The purpose of regulation is to ensure that transportation services are provided adequately and that users of these services are protected from excessive prices or unfair practices. Regulation can also be used to assist certain regions, industries or user groups (e.g. persons with disabilities).
- ² As found at: K. Studnicki-Gizbert, "Transportation Regulation" *The Canadian Encyclopedia* (published February 7, 2006, last modified August 19, 2014), accessed on November 23, 2015, online: <http://www.thecanadianencyclopedia.ca/en/article/transportation-regulation/>.
- ³ Canadian Transportation Agency, *100 Years at the Heart of Transportation – An Historical Perspective*, (Ottawa: Minister of Public Works and Government Services Canada, July 2015), Catalogue number TT4-2/2015E-PDF.
- ⁴ The Royal Commission on Transportation, chaired by Murdoch MacPherson, was appointed by the federal government in 1959 to investigate transportation policy, particularly freight-rate inequities.

Appendix N

Mandate and Terms of Reference

The mandate and terms of reference of the 2014-15 Canada Transportation Act Review are included below for information.

On June 25, 2014, the Honourable Lisa Raitt, Minister of Transport launched a statutory Review of the Canada Transportation Act. The Act is the umbrella economic legislation for Canada's national transportation system.

The mandate of this Review stems from section 53 of the *Canada Transportation Act* that requires a comprehensive review of the operation of the Act and certain other acts pertaining to the economic regulation of transportation. The Review will be guided by formal Terms of Reference, which establish the scope for the Review.

Given the urgency created by a backlog in grain deliveries in the 2013-14 crop year, grain transportation will be given priority consideration. The Review will consider the provisions of the Act that are relevant to the transportation of grain by rail, some of which could apply more broadly to the rail-based supply chain for all commodities, taking into account the broader goal of a commercially based, market-driven, multi-modal transportation system that delivers the best possible service in support of economic growth and prosperity.

The Review will also examine the extent to which the national transportation system has the capacity and adaptability that will allow it, and its users, to respond effectively to evolving international and domestic conditions and markets. This will include examining major global and national trends relevant to transportation; projecting freight capacity needs across the system; examining whether existing or planned capacity and performance improvements will be responsive to these needs and periodic demands for surge capacity; and advising on possible steps to help ensure that the national transportation system has the capacity and nimbleness to support economic activity across all sectors over the medium- and long-term.

Finally, the Review will be asked to give consideration to a number of specific issues, including:

- whether adjustments to the current transportation legislative and policy framework are required to support Canada's international competitiveness, trade interests, and economic growth and prosperity;
- how strategic transportation gateways and corridors can be developed and leveraged to support Canadian prosperity through linkages to global markets;
- how the quality and utilization of transportation infrastructure capacity can be optimized through, for example, improved alignment of transportation policies and regulations and/or the use of innovative financing mechanisms;

- how technological innovation can contribute to improvements in transportation infrastructure and services;
- whether adjustments to transportation safety and environmental regimes are needed to continue achieving high standards for safe and sustainable transportation, given increasing system volumes/demands;
- how safety and well-being concerns related to rail transportation (including the movement of dangerous goods) through communities can be addressed;
- how to address rapid changes in the North and associated challenges for the continued safety, security, and sustainability of the northern transportation system, and specifically, the federal role in supporting the northern transportation system;
- how federally-regulated passenger rail services can be delivered to meet travellers' needs while minimizing costs to the public purse;
- how the vitality of the Canadian aviation sector, air connectivity, and Canada's ability to attract visitors and transiting travellers can be maintained and augmented in light of the range of cost factors and competitive global markets; and
- whether current governance and service delivery models for key federal operations, assets and agencies—including the Canadian Transportation Agency, Canadian Pilotage Authorities, the St. Lawrence Seaway, and airport and port authorities—can be improved.

Appendix O

Submissions and Consultations

Abbotsford Airport Authority
 Aboriginal Affairs and Northern
 Development Canada
 ACDEG Group
 Action-Gardien de Pointe-Saint-Charles-
 Bernier
 Administration portuaire de Trois-Rivières
 AéroMontréal
 Aéroports de Montréal
 Agence métropolitaine de transport (AMT)
 Agglomération des Îles-de-la-Madeleine
 Agricultural Producers Association of
 Saskatchewan
 Agriculture and Agri-Food Canada
 Agriculture Transport Coalition /
 CTA Review Coalition
 Agrium Incorporated
 Agrocorp International
 Air Canada
 Air Canada Pilots Association
 Air China
 Air Georgian Limited
 Air Line Pilots Association, International –
 Canada Board
 Air North Charter and Training Limited
 Air Tindi Limited
 Air Transport Association of Canada
 Airport Management Council of Ontario
 Aker Arctic Technology Incorporated
 Alaska Industrial Development and Export
 Authority
 Alberta Agriculture and Rural Development/
 Alberta Agriculture and Forestry
 Alberta Association of Municipal Districts
 and Counties
 Alberta Barley Commission
 Alberta Beef Producers
 Alberta Cattle Feeders Association
 Alberta Federation of Agriculture
 Alberta Forest Products Association
 Alberta Ministry of Transportation/Alberta
 Infrastructure and Transportation
 Alberta Pacific Forest Industries Incorporated
 Alberta Pork Producers
 Alberta Pulse Growers Commission
 Alberta Roadbuilders & Heavy Construction
 Association
 Alberta Seed Growers Association
 Alberta Urban Municipalities Association
 Alberta Wheat Commission
 Algoma Central Corporation
 Alitalia Airlines
 Alkan Air Limited
 Antwerp Port Authority
 APM Terminals
 Arctia Shipping
 Arctic Co-operatives Limited
 AREVA Resources Canada
 Assembly of First Nations
 Associated Engineering
 Association of American Port Authorities
 Association of American Railways
 Association of Canadian Port Authorities
 Association of Canadian Travel Agencies
 Association of Manitoba Municipalities
 ATCO Electric Yukon
 Athabasca County
 Athabasca Oil Sands Area Transportation
 Coordination Committee
 Atlantic Canada Airports Association
 Atlantic Chamber of Commerce
 Atlantic Pilotage Authority
 Atlantic Provinces Trucking Alliance
 Baltic and International Maritime Council
 (BIMCO)
 Barley Council of Canada
 Bearskin Airlines
 BHP Billiton Canada
 BMO Financial Group
 Bombardier Incorporated
 British Columbia Chamber of Commerce
 British Columbia Marine Terminal Operators
 Association
 British Columbia Maritime Employers
 Association
 British Columbia Ministry of Transportation
 and Infrastructure
 British Columbia Trucking Association
 British International Freight Association

British Ports Association
 Brookings Institution
 Bunge Canada Limited
 Burlington Northern Santa Fe Railway (BNSF)
 Calgary Airport Authority
 Calm Air International LP
 Cameco Corporation
 Canada Bikes
 Canada Border Services Agency
 Canada Bus Association
 Canada Special Crops Association
 Canada Steamship Lines
 Canada's Ecofiscal Commission
 Canada's New West Partnership
 Canadian Air Transport Security Authority
 Canadian Airports Council
 Canadian Association of Petroleum Producers
 Canadian Automated Vehicles Centre of Excellence (CAVCOE)
 Canadian Automobile Association (CAA)
 Canadian Business Aviation Association
 Canadian Canola Growers Association
 Canadian Cattleman's Association
 Canadian Chamber of Commerce
 Canadian Corporate Travel Agencies
 Canadian Council of Chief Executives
 Canadian Energy Pipeline Association
 Canadian Federation of Agriculture
 Canadian Federation of Musicians
 Canadian Fertilizer Institute
 Canadian Gas Association – Canadian Natural Gas Vehicle Association
 Canadian Grain and Oilseed Exporters Association
 Canadian Grains Commission
 Canadian Hydrographic Services
 Canadian International Freight Forwarders Association (CIFFA)
 Canadian Manufacturers & Exporters
 Canadian Marine Pilots' Association
 Canadian Maritime Law Association
 Canadian National Millers Association
 Canadian National Railway Company (CN)
 Canadian North
 Canadian Northern Economic Development Agency
 Canadian Oilseed Processors Association
 Canadian Pacific Railway Company (CP)
 Canadian Shipowners Association
 Canadian Space Agency
 Canadian Steel Producers Association
 Canadian Tire Corporation Limited
 Canadian Tourism Commission (Destination Canada)
 Canadian Transportation Agency
 Canadian Transportation Agency Accessibility Advisory Committee
 Canadian Transportation Research Forum (CTRF)
 Canadian Trucking Alliance
 Canadian Urban Transit Association
 Canadian Wheat Board
 Canaryseed Development Commission of Saskatchewan
 Cando Rail Services Limited
 Canfor Corporation
 Canpotex Limited
 Cargill Limited
 CargoJet Incorporated
 CargoM
 Carleton University
 Cascade Aerospace Incorporated
 Casino Mining Corporation
 C. D. Howe Institute
 Cekask Development Corporation
 Central Maine and Quebec Railway
 Centre interuniversitaire de recherche sur les réseaux d'entreprise, la logistique et le transport (CIRRELT)
 CentrePort Canada Incorporated
 Cereals Canada
 Chamber of Marine Commerce
 Chamber of Shipping of British Columbia
 Charlottetown Airport Authority
 Chemistry Industry Association of Canada
 Chemtrade Logistics Incorporated
 Chief Isaac Incorporated

China Southern Airlines Company Incorporated
 Chinook Helicopters Limited
 Chongqing Guoyuan Port
 Citizenship & Immigration Canada
 City of Owen Sound
 City of Toronto
 City of Vancouver
 Clark and Company Barristers
 Coalition for Algoma Passenger Trains
 Coalition of America's Gateways and Trade Corridors
 Coalition of Rail Shippers
 Commissioner of Official Languages
 Conair Group Incorporated
 Confédération des organismes de personnes handicapées du Québec (COPHAN)
 Conference Board of Canada —
 Centre for Transportation Infrastructure
 Congress of Aboriginal Peoples
 Conifex Timber Incorporated
 Consortium de Recherche et d'Innovation en Aérospatiale au Québec
 The Corporation of Delta
 Council of Canadians with Disabilities
 Council of Deputy Ministers (Transportation)
 Council of Marine Carriers
 Crop Logistics Working Group
 Crowley Maritime Corporation
 CSA Group
 Daishowa-Marubeni International Limited
 Dakwakada Development Corporation
 Danish Maritime Authority – Blue Denmark
 Danish Shipowners' Association
 Dawson City Chamber of Commerce
 Denmark Ministry of Business and Growth
 DJ Specialties
 DNV GL
 Dunkley Lumber Limited
 Edmonton International Airport
 Egyptair
 Emirates Airlines
 EnerJet
 Escalation Consultants, Incorporated
 ESL Shipping Limited
 Ethiopian Airlines
 European Aviation Safety Agency
 European Bank for Reconstruction Development
 European Commission (Accessibility)
 European Disability Forum
 European Railway Agency
 European Road Federation
 European Union Road Federation
 EVA Air
 Exchange Income Corporation
 Export Development Canada
 Farm West Holdings Incorporated
 Fédération des chambres de commerce du Québec
 Federation of Canadian Municipalities
 Federation of Canadian Municipalities – Railway Association of Canada's Proximity Management Program
 FedEx Canada
 Finland Ministry of Transport and Communications
 Finnish Shipowners' Association
 Finnish Transport Safety Agency (TRAFI)
 First Air
 Fisheries and Oceans Canada
 Fisheries and Oceans Canada – Canadian Coast Guard
 Flax Council of Canada
 Foreign Affairs, Trade and Development Canada
 Forest Products Association of Canada
 Fort McMurray Airport Authority
 Fredericton Airport Authority
 Freight Management Association
 Genesee & Wyoming Incorporated
 Gibson Energy Incorporated
 Global Public Affairs
 Gorman Brothers Lumber Limited
 Grain Growers of Canada
 Grande Prairie Agriculture and Forestry Shippers

Great Lakes Pilotage Authority	Kelowna Airport
Greater Moncton International Airport Authority	Keystone Agricultural Producers
Greater Sudbury Airport	Laurentian Pilotage Authority
Greater Toronto Airports Authority	Legumex Walker Incorporated
Greater Vancouver Gateway Council	Les Armateurs du Saint Laurent/ St. Lawrence Shipoperators
Greater Vancouver Gateway Society	Loblaws Companies Limited
Greater Vancouver Regional District Board	Locher Evers International
Green Marine – Alliance Verte	Logico Carbon Solutions Incorporated
Greenbrier Companies	London International Airport Authority
Groupe Desgagnés Incorporated/ Transport Desgagnés Incorporated	Louisiana-Pacific Canada Limited
Gubala Consulting Incorporated	LTA Aérostructures
Hainan Airlines Limited	Lynnterm (Western Stevedoring)
Halifax International Airport Authority	The Maersk Group
Hamilton Port Authority	Malcolm Cairns Consulting
Hamlet of Pangnirtung	Manitoba Ministry of Agriculture, Food and Rural Development
Hapag-Lloyd	Manitoba Ministry of Infrastructure and Transportation
Helijet International Incorporated	Manitoba Pulse Growers Association
Holland America Line Incorporated	Marine Exchange of Alaska
Hotel Association of Canada	Marine Exchange of Southern California
HUB Cycling	Maritime UK
Industry Canada	Maritimt Forum
Industry Canada – Competition Bureau	Masthead Public Affairs Incorporated/ Transportation Coalition
Infrastructure Canada	Mediterranean Shipping Company (MSC)
Inland Terminal Association of Canada	Methanex Corporation
Institute of Directors (United Kingdom)	Metis National Council
Inter-American Development Bank	Metro Vancouver
Interfor Corporation	Metrolinx
International Air Transportation Association (IATA)	Millar Western Forest Products Limited
International Longshore and Warehouse Union	Mining Association of Canada
International Maritime Organization	Minsheng International Shipping Group
International Ship Owners Alliance of Canada	MMG Limited
International Transport Forum	MMK Consulting Incorporated
Inuit Tapiriit Kanatami (ITK)	Moffat & Nichol
Island Express Air Incorporated	Montréal International
Island Tug and Barge Marine Group Limited	Montreal Port Authority
Intelligent Transportation Systems Canada	National Airline Council of Canada
Jazz Aviation	National Farmers Union
Jetlines	National Marine Manufacturers Association of Canada
Jingtang Port Authority	

National Council on Public Private Partnerships (United States)	Orient Overseas Container Line (OOCL China Limited)
National Round Table on Travel and Tourism	Ottawa International Airport Authority
Native Woman's Association	Pacific Coastal Airlines Limited
Natural Resources Canada	Pacific Pilotage Authority
Nav Canada	Parrish & Heimbecker Limited
NEAS Group	Partners for Regional Aviation Infrastructure
Neptune Coal Terminals Limited	Partnership for Resource Trade
Netherlands Ministry of Infrastructure and the Environment	Paterson Grain
Network rail	Port Alberni Port Authority
New Brunswick Southern Railway Company Limited	Port Authority of Tianjin
New Brunswick Transportation and Infrastructure	Port of Halifax
Newfoundland Labrador Department of Transportation and Works	Port of Helsinki
North Bay Jack Garland Airport	Port of Metro Vancouver
Northern Air Transport Association (NATA)	Port of Rotterdam Authority
Northern Transportation Company Limited (NTCL)	Port of Saint John
Northwest Territories Department of Transportation	Port of Seattle (Seattle-Tacoma International Airport)
Norway Ministry of Trade, Industry and Fisheries	Port Québec
Norway Ministry of Transport and Communications	Porter Airlines
Norwegian Ports Association	PortsToronto (Billy Bishop Toronto City Airport)
Norwegian Shipowners Association	PPP Canada Incorporated
Nova Scotia Department of Transportation and Infrastructure Renewal	Prairie Oat Growers Association
Nunavut Impact Review Board	Prince Edward Island Department of Transportation and Infrastructure Renewal
Nunavut Sealink and Supply Incorporated (NSSI)	Prince George Airport Authority
NWT & Nunavut Chamber of Mines	Prince Rupert Port Authority
OmniTRAX Incorporated	Privy Council Office
Ontario Dump Truck Association	PROLOG Canada Incorporated
Ontario Forest Industries Association	Public Interest Advocacy Centre
Ontario Ministry of Transportation	Pulse Canada
Ontario Municipal Employment Retirement System	Qatar Airways
Ontario Teachers' Pension Plan	QGI Consulting Incorporated
Organization for Economic Cooperation and Development (OECD)	Qikiqtaaluk Corporation
Oceanex Incorporated	Québec Ministère des Transports
	Quebec North Shore and Labrador Railway Company
	Quorum Corporation
	Railway Association of Canada
	RBC – Railway Shipper Forum
	Region of Peel
	Richardson International
	Rio Tinto Group

Ritchie Smith Feeds, Incorporated	Spliethoff Group
Rocky Mountaineer	Squamish Terminals Limited
Rowe's Construction	Saint Lawrence Seaway Development Corporation
Royal Automobile Club	The St. Lawrence Seaway Management Corporation
RTL – Westcan Bulk	Sultran
RTL Construction	Suncor Energy Incorporated
Rural Municipality of Hudson Bay No. 394	Sunwing Airlines Incorporated
Safe Rail Communities	Taseko Mines Limited
Sarvaq Aviation	Teamsters Canada
Saskatchewan Association of Rural Municipalities	Teck Resources Limited
Saskatchewan Barley Development Commission	Telesat Canada
Saskatchewan Canola Development Commission	Thunder Bay International Airport Authority
Saskatchewan Chamber of Commerce	Thunder Bay Port Authority
Saskatchewan Mining Association	Thunder Bay Terminals Limited
Saskatchewan Ministry of Agriculture	Tolko Industries Limited
Saskatchewan Ministry of Highways and Infrastructure	Top of the World Travel
Saskatchewan Producer Coalition	Toronto Region Board of Trade
Saskatchewan Pulse Growers	Tourism Industry Association of Canada
Saskatchewan South West Transportation Planning Council	Town of High Level
Saskatchewan Wheat Development Commission	TransCanada Yellowhead Highway Association
Saskatoon International Airport	Transat A.T. Incorporated
Sault Ste. Marie Airport Development Corporation	TransLink
SeaHow	Transport Action Ontario
Seaspan	Transport API
Shanghai International Ports Group	Transport for London (United Kingdom)
Shanghai Shipping Exchange	Transportation Investment Corporation
Shipping Federation of Canada	Transport for London (United Kingdom)
Shortsea Shipping Norway	TSI (Deltaport) Container Terminal
Simpsons Seeds Incorporated	Turkish Airlines
Sinclar Group Forest Products Limited	Unifor
SinoTrans Eastern Company Limited	Union Internationale des Transports Publics
Skagway (Borough & Port Commission)	United Kingdom Confederation of Business Industry
Société de développement économique du Saint Laurent (SODES)	United Kingdom Department for Transport
Société de transport de l'Outaouais	United Kingdom House of Commons (Library)
South Asia Plastics Group Limited	United Kingdom Major Ports Group
Southern Railway of British Columbia Limited	United States Chamber of Commerce
	United States Coast Guard
	United States Congressional Staff (Transportation)

United States Department of Agriculture
United States Department of Homeland Security
United States Department of Transportation
United States Surface Transportation Board
University of British Columbia
University of Manitoba
University of Saskatchewan
University of Toronto
UPS Canada Incorporated
Vancouver Airport Authority
Vancouver Board of Trade
Vancouver Fraser Port Authority
The Van Horne Institute
VIA Rail Canada
Victoria Gold Corporation
Victoria International Airport
Ville de Thetford Mines
Ville de Trois-Rivières
Viterra Incorporated
West Coast Container Freight Handlers Association
West Fraser Timber Company Limited
Western Barley Growers Association
Western Canadian Shippers' Coalition
Western Canadian Wheat Growers Association
Western Grain Elevator Association
Western Stock Growers Association
Western Transportation Advisory Committee – Fall Member Forum
WestJet Airlines Limited
WestJet Pilots Association
Westshore Terminals Limited
Weyerhaeuser Company Limited
White Pass & Yukon Route Railway
Windsor Port Authority
Winnipeg Airports Authority
Winnipeg Chamber of Commerce
World Bank Group
World Shipping Summit
Yellowknife and NWT Chambers of Commerce

Yukon Chamber of Commerce
Yukon Energy Corporation
Yukon Council of First Nations
Yukon Highways and Public Works

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Eddy Aceti
Jocelyne Bernier
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Burrardview Community Association
Scott Clements
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Brian Flemming
Neil & Marilyn Hoyland
Frederic Jean
Byron Jonah
Mr. & Mrs. Kerre Briggs
David Knee
Paula & Ray Letheren
Markland Wood Homeowners Association
Mr. & Mrs. Martin
Allan McCartney
Dale Morrival
Duncan Nixon
Alexandra Ross
Martina Schmalz
John Stevens
Rajesh Thapar
Dwayne Rourke & Teresa Wild
Dennis Wilson
Garry & Maryann Wolosinka

Appendix P

The Team

Chair

The Honourable David L. Emerson, P.C.

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David Cardin

Duncan Dee

Marie-Lucie Morin

Marcella Szel

EXECUTIVE DIRECTOR

Randall Meades

SECRETARIAT

Rosemary Baldwin

Nathan Gordon

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Catalytico

CanadaUK Partners Limited

Capitol Business Solutions Incorporated

Centre for Asia-Pacific Aviation (CAPA)

Centre for International Governance
Innovation

Colorado State University

Conference Board of Canada

CPCS Transcom Limited

Dawson Strategic

Domino Creative

Ecritures Etc.

Gordon Baldwin

IBI Group Incorporated

ICF Consulting Canada Incorporated

Institute on Governance

Intelligent Transportation Systems Society
of Canada

InterVISTAS Consulting Incorporated

John Coleman

John Higginbotham

John Wright

Kieran Management Advisory Services
Limited

MariNova Consulting Limited

Mary R. Brooks Transportation Consulting

Norris Consultants

PBX Engineering Limited

PROLOG Canada Incorporated

Public Interest Advocacy Centre

Rene Drolet Consulting Services

The Research and Traffic Group

Robert C. Ashby

RP Erickson & Associates

University of Manitoba, Transport Institute

University of Toronto, Institute for
Aerospace Studies

Van Horne Institute

Appendix Q

Glossary

AIR SERVICES AGREEMENTS:

The Chicago Convention (see below) is the framework treaty for international civil aviation, but it does not regulate the business aspects of international air transport. In the absence of such a multilateral treaty for commercial aviation, states negotiate and agree on bilateral air services agreements (also known as air transport agreements) that provide a legal framework for scheduled international air services. Today, a web of some 3500-4000 agreements are in force around the world. These are premised on each state's sovereignty over its own airspace, and states exchange commercial rights (based on the "freedoms of the air," see below), on which airlines may operate the agreed services, the levels of frequency and capacity of those services, as well as perhaps the routes they may fly, and even rules about pricing in some cases. These rights represent upper limits on what carriers may operate, not minimums, and the carriers decide how many of the allocated frequencies, etc., to use based on commercial considerations. (Source: Transport Canada, and CAPA report prepared for the CTA Review)

AIR TRAVELLERS SECURITY CHARGE (ATSC):

A government fee directly payable by air travellers in Canada. The ATSC came into effect in April 2002 to fund the air travel security system, including the Canadian Air Transport Security Authority (CATSA) — the federal authority responsible for the security screening of air passengers and their baggage. In addition to CATSA, the air travel security system includes Transport Canada regulations and oversight, and Royal Canadian Mounted Police officers on selected domestic and international flights. All proceeds from the ATSC, including any applicable GST or the federal portion of the HST, are intended to fund the air travel security system, and rates have been adjusted a number of times so that revenues are roughly equivalent to expenses for air travel security over time. For air travel within Canada, the charge is \$7.48 for one-way travel, and \$14.96 for round-trip travel. For transborder flights to the continental U.S., the charge is \$12.71, and for other international air travel is \$25.91, including GST or the federal portion of the HST. For transborder and international travel, the ATSC generally applies only to flights departing from Canada. (Source: Transport Canada)

AIRPORT LEASES:

Ground leases set out the conditions under which Transport Canada transferred responsibility for developing and operating the lands and assets of 22 National Airports System airports to the airport authorities (see below). These are the primary documents structuring the relationship between the federal government and the airport authorities. The term of the leases is 60 years, with an option to renew for an additional 20 years. At the end of the lease, the airports and all improvements since their transfer revert back to the federal government, free from any financial obligation. The airport authorities pay rent to the federal government. (Source: Office of the Auditor General of Canada). Airport Rent: The largest airports in the National Airports System (see below) are required to make annual rent payments to provide the Government of Canada with reasonable compensation for the airport assets it continues to own. Rents are calculated using a formula based on gross revenues incorporating a progressive scale: on the first \$5M – 0 percent; on the next \$5M – 1 percent; on the next \$15M – 5 percent; on the next \$75 M – 8 percent; on the next \$150 M – 10 percent; on any amount over \$250 M – 12 percent. In 2013-14, the federal government collected \$294.4M in airport rent. (Source: Transport Canada).

AIRPORTS CAPITAL ASSISTANCE PROGRAM (ACAP):

Transport Canada program that provides federal funds to help smaller airports finance capital projects that will maintain and improve safety. Certified airports that offer year-round regularly scheduled commercial passenger service, and are not owned or operated by the federal government, are eligible for ACAP funding. The maximum federal contribution to eligible project costs decreases on a sliding scale based on traffic volumes, from 100 percent for airports with under 50,000 passengers per year to 0 percent for airports with more than 525,000. Airports in the North are eligible for at least 85 percent federal funding. In 2013-14, ACAP invested \$29.8M in airport infrastructure. (Source: Transport Canada)

BLUE SKY POLICY:

The 2006 policy guiding Canada's approach to bilateral air transportation negotiations for scheduled passenger and all-cargo services. It calls for a proactive approach to the liberalization of Air Services Agreements (see above), and the negotiation of reciprocal "Open Skies"-type agreements (see below) where these are in Canada's overall interest. Instead of a "one-size-fits-all" approach to air transport negotiations, the policy states that Canada may be justified to exercise caution, for example, in markets where there are concerns about an unlevel playing field. (Source: Transport Canada)

BRANCH LINE RATIONALIZATION:

A branch line is a secondary railway line that branches off a through route, usually a main line. Branch line rationalization is the process by which the Class I railways abandoned or discontinued service to a branch line.

CHICAGO CONVENTION (CONVENTION ON INTERNATIONAL CIVIL AVIATION, 1944):

signed on 7 December 1944 by 52 States, and ratified on 5 March 1947, the Chicago Convention sets out the purpose of International Civil Aviation Organization (ICAO), and sets out principles and arrangements for the safe and orderly development of international civil aviation. It is based on the fundamental recognition that every state has complete and exclusive sovereignty over the airspace above its territory. Its purpose has been to create a framework in which international air transport services may be established on the basis of equality of opportunity and operated soundly and economically. (Source: ICAO)

COMMERCIALIZATION:

Any of a series of approaches by which market discipline and business principles can be introduced to traditional government activity, ranging from government agencies to not-for-profit organizations, to public and private-sector partnerships, to employee-run companies, to Crown corporations to privatization (see below). (Source: Transport Canada).

CONNECTED CAR:

is a car that is equipped with Internet access, and usually also with a wireless local area network to allow the car to share internet access with other devices both inside and outside the vehicle. Connected vehicles include vehicle-to-vehicle, vehicle-to-roadside infrastructure, and vehicle-to-other systems.

DECOUPLING:

The term decoupling refers to breaking the link between “environmental bads” and “economic goods,” i.e. when the growth of the environmentally relevant variable (bad pressures) is less than the growth rate of the economic variable over a given period. (Source: OECD)

DOMAIN AWARENESS:

Maritime Domain Awareness is “the effective understanding of any activity associated with the maritime environment that could impact upon the security, safety, economy or environment.” (Source: International Maritime Organization)

ELECTRONIC TRAVEL AUTHORIZATION (ETA):

A requirement for all visa-exempt foreign nationals (except U.S. citizens) before entering Canada that will be implemented in 2016. The eTA will cost \$7, and will be valid for 5 years. It is intended to enhance the safety and security of Canadians and strengthen the integrity of the immigration program and was a commitment under the *Perimeter Security and Economic Competitiveness Action Plan*. It mirrors the current U.S. Electronic System for Travel Authorization (ESTA) program to ensure a common approach to screening travellers outside the North American perimeter. (Source: Citizenship and Immigration Canada)

FINAL OFFER ARBITRATION (FOA):

Final offer arbitration described in Part IV of the *Canada Transportation Act*, provides a means of resolving rate disputes between a shipper and a carrier. Pursuant to section 161 of the Act, a shipper who is dissatisfied with the rate or rates charged or proposed to be charged by a carrier for the movement of goods, or with any of the conditions associated with the movement of goods, may, if the matter cannot be resolved between the shipper and the carrier, submit the matter in writing to the Canadian Transportation Agency for a Final Offer Arbitration to be conducted by one arbitrator or by a panel of three arbitrators. In consideration of the information provided by the implicated carrier and shipper, and any other information the arbitrator(s) request(s), and sometimes in consideration of whether the shipper could use any other competitive means of transportation, the arbitrator(s) choose(s) either the final rate offer of the shipper or the final rate offer of the carrier. The decision remains in effect for one year, provided the parties did not previously agree on a lesser period. (Source: Canadian Transportation Agency)

FREEDOMS OF THE AIR:

The First Freedom of the Air is the right or privilege for an air carrier to fly across the territory of another country without landing. The Second is for an air carrier to land in the territory of another country for non-traffic purposes, most commonly to refuel aircraft, to make unexpected repairs or to respond to an emergency. The Third is for an air carrier from country A to put down, in the territory of country B, traffic coming from country A. The Fourth is for an air carrier of country A to take on, in the territory of country B, traffic destined for country A. The Fifth is for an air carrier of country A to take on traffic in the territory of country B and carry it to a third country as part of a service to/from country A. The Sixth is for an air carrier of country A to take on traffic in country B and carry it to country C via country A. The Seventh is for an air carrier of country A to carry traffic between country B and country C, without serving country A (stand-alone service). (Source: Transport Canada)

FULFILLMENT CENTRES:

The location where incoming orders are received from affiliated stores or locations and where orders are processed and filled. These centers may also work independently for specific companies. (Source: BusinessDictionary.com)

FUNDING (TRANSPORTATION INFRASTRUCTURE):

Provision of capital by the public sector from general funds (gained by taxation or user-type charges) and this capital is not expected to be recovered. Federal funding instruments may include: contribution programs, grants, other transfer payments, tax transfers, loans and loan guarantees.

FINANCING (TRANSPORTATION INFRASTRUCTURE):

Provision of capital, in most cases by private sources (investors and lenders), where capital recovery is expected. The private sector can be involved in various aspects of transportation infrastructure financing, including designing, building, or project management such as maintenance and operations. The public-private partnership (P3) model is a method of attracting private financing to new infrastructure projects.

GLOBAL VALUE CHAINS:

Firms identify the different stages of design, production, marketing and distribution processes and locate the related activities across different countries by restructuring their operations internationally through outsourcing and off-shoring of activities. Elements of global value chains include activities around the world related to research, development, design and production of products, the marketing and finance needed to support production and distribution.

GLOBAL SUPPLY CHAINS:

Physical flow and associated processes of getting goods moved around the globe between buyers and sellers. Elements of global supply chains include transport service providers and activities related to documentation, insurance and financial services.

GREENHOUSE GASES:

Gases that absorb and emit radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's atmosphere and clouds. Greenhouse gas emissions are carbon dioxide, nitrous oxide, water vapour, methane and ozone. Carbon dioxide is the primary greenhouse gas emitted, and the main human activity that releases this gas is the combustion of fossil fuels. (Source: Environment Canada)

HUB-AND-SPOKE SYSTEM:

A model for organizing transportation services in which lower-volume branches feed into central hubs where passengers or cargo are transferred onto higher-volume, longer-distance trunk routes. For example, in air transportation, local airports offer air transportation to a central airport where long-distance flights are available. (Source: United States Department of Transport, Transportation Research Bureau)

INTELLIGENT TRANSPORTATION SYSTEMS (ITS):

Describe technology applied to transport and infrastructure to transfer information between systems for improved safety, productivity and environmental performance. This includes stand-alone applications such as traffic management systems, information and warning systems installed in individual vehicles, as well as cooperative ITS applications involving vehicle to infrastructure and vehicle-to-vehicle communications.

INTENDED NATIONALLY DETERMINED CONTRIBUTIONS:

A country's public outline on post-2020 climate target and actions the country intends to take under a new international agreement prior to COP21. (World Resources Institute)

INTERNATIONAL CIVIL AVIATION ORGANIZATION (ICAO):

A United Nations agency, created in 1944, with the signing of the Convention on International Civil Aviation (Chicago Convention), and based in Montréal. ICAO is the global forum for the promotion of safe, efficient and secure aviation. ICAO develops policies and standards, undertakes compliance audits, performs studies and analyses, provides assistance and builds capacity through its direct activities and the cooperation of the 191 Member States of the Chicago Convention. ICAO oversees more than 10,000 standards and recommended practices that are contained in the 19 Annexes to the Chicago Convention. (Source: ICAO)

INTEROPERABILITY:

A common set of processes, procedures and equipment adopted by multiple providers, to support seamless usage for the customer and data acquisition and reimbursement for the provider. (Source: IBI Group)

JUST IN TIME DELIVERY:

An inventory strategy companies employ to increase efficiency and decrease waste by receiving goods only as they are needed in the production process, thereby reducing inventory costs. (Source: Investopedia)

LEGACY INVESTMENT:

Also refers to legacy asset, an asset that has been on the company's books for a long period of time, and has likely been fully depreciated.

LEVEL OF SERVICE AGREEMENT:

A contract with a service provider specifying the services that are required and the terms associated with how they will be provided.

LOAD FACTORS:

A measure of the volume of traffic relative to available carrier capacity, load factor is the percentage of seating or freight capacity which is utilized by passengers or shippers. (Source: United States Department of Transportation, Bureau of Passenger Statistics)

LOGISTICS:

Activities within one company or organization involving product distribution and warehousing, (as opposed to along a supply chain which encompasses manufacturing and procurement, and movement of goods through multiple modes of transportation).
Marine Exchange: a single point source of information on vessel and port activity for the port for which it has been established, including providing information on vessels, terminals, and shipping agents. A marine exchange is intended to provide continuously updated information on all vessel movements.

MARKET POWER:

The ability to set prices above competitive levels. (Source: Competition Bureau)

MAXIMUM GRAIN REVENUE ENTITLEMENT (MRE):

Introduced August 1, 2000 to replace a regime of maximum regulated freight rates, the MRE or “revenue cap” is a ceiling on the average rate that CN and CP can charge, and on the total revenues they can earn (i.e., the average rate per tonne) for moving regulated, non-U.S.-bound western export grain in a crop year, as calculated by the Canadian Transportation Agency. The MRE program requires the Agency to annually determine a MRE and to subsequently determine whether CN and CP have exceeded their caps (as per sections 150 to 151 of the *Canada Transportation Act*). It is calculated on the basis of a statutory formula, base year statistics, and a volume-related composite price index: each railway company’s MRE is the base year revenue per tonne, adjusted for length of haul, multiplied by the volume of grain moved in the given crop year and adjusted for railway input cost inflation. The railways may set differential rates for moving grain as long as their total earned revenue from these movements does not exceed their entitlement. (Source: CPCS Transcom report prepared for the CTA Review)

NATIONAL AIRPORTS POLICY:

The 1994 policy that guided the commercialization of larger airports and air navigation services, and the divestiture of smaller airports to local authorities. The policy states that local operation is preferable because it is more cost-effective, more responsive to local needs and better able to match levels of service to local demands. The policy expects most airports to become financially self-sufficient, but recognizes exceptions at smaller airports due to undercapitalization in the past or future capital requirements. The policy directs that airport rent revenues from the National Airports System (see below) help fund capital requirements of airports outside the System. (Source: Transport Canada)

NATIONAL AIRPORTS SYSTEM:

Comprises 26 nationally-significant airports that were determined under the National Airports Policy to be essential to Canada’s air transportation system, supporting both domestic prosperity and international competitiveness. Specifically, these were all airports in national, provincial and territorial capitals, as well as airports with annual traffic of 200,000 passengers or more. Other than Iqaluit, upon creation of Nunavut, no airports have been added or removed to the National Airports System since 1994. The government commercialized the National Airports System through the transfer of responsibility for the operation, management and development of the airports to airport authorities. The federal government retained ownership of 22 of these airports with the objective of guaranteeing the integrity and long-term viability of the nationally-significant airports. The exceptions are those in the territorial capitals, which were transferred outright to the territorial governments, and Kelowna, which was already partially owned and operated by the municipality. (Source: Transport Canada)

NORTHWEST PASSAGE:

The marine transportation route that traverses the Arctic Ocean, in Canadian and United States waters, that connects the Atlantic and Pacific Oceans.

NORTHEAST PASSAGE:

The marine transportation route that traverses the Arctic Ocean, in Russian and Norwegian waters, that connects the Atlantic and Pacific Oceans.

NORTHERN SEA ROUTE:

A large component of the Northeast Passage, defined by Russian legislation, from the Kara Sea to the Bering Strait.

OFF-SHORING:

Relocation of a company's operations to another country for reasons such as lower labor costs or more favorable economic conditions than in the company's home country. (Source: the Business Dictionary)

ON-TIME PERFORMANCE:

Refers to transportation service's success rate for remaining on its published or contracted schedule.

OPEN SKIES:

A specific reference to U.S. international air policy since 1992, the term "Open Skies" is widely used to describe air services agreements (see above) that eliminate government interference in commercial airline decisions about routes, capacity and pricing. Agreements are described as "Open Skies" in direct contrast to the restrictive and prescriptive air services agreements that were the norm for much of the second half of the 20th Century, and had the protection of national ("flag") carriers from competition as a primary goal. (Source: United States Department of State)

PILOTAGE:

Pilotage is an act by a licensed pilot in assisting the master of a ship in navigating and manoeuvring in ports, straits, lakes, rivers and other waterways. (Source: maritimehub.org)

PURCHASING POWER PARITY (PPP):

The basis for PPP is the "law of one price." PPP is a theory which states that exchange rates between currencies are in equilibrium when their purchasing power is the same in each of the two countries. This means that the exchange rate between two countries should equal the ratio of the two countries' price level of a fixed basket of goods and services. When a country's domestic price level is increasing (i.e., a country experiences inflation), that country's exchange rate must depreciated in order to return to PPP. PPP valuations are calculations which take into account the relative costs of local goods, services and inflation rates of the country. (Source: University of British Columbia, Sauder School of Business)

PRIVATIZATION:

Any material transaction by which the state's ultimate ownership of corporate entities is reduced, privatization is a transfer of assets to the private sector rather than a transfer of activities. This includes direct divestment by the state, divestment of corporate assets by government-controlled investment vehicles as well as the dilution of state positions in state-owned enterprises by secondary share offerings to the non-state shareholders. By this definition the transfer of certain commercial activities from state-owned enterprises to private operators (e.g. through concessions, delegated management contracts, leasing or other forms of public-private partnership) is not considered as privatization.

(Source: OECD)

PRODUCER CARS:

Producer cars are railway cars that are loaded and shipped by producers. Under the *Canada Grain Act*, grain producers are entitled to order producer cars through the Canadian Grain Commission to ship any grain covered under the *Canada Grain Act*. Producer cars are used to ship grain directly to a particular destination and provide producers a delivery alternative to the licensed grain handling system. Producers have the option to deal directly with the Canadian Grain Commission and self-administer their cars or use an administrator who submits a completed producer car application on their behalf to the Canadian Grain Commission. (Source: Canadian Grain Commission)

RESILIENT SUPPLY CHAIN:

A supply chain (see below) that has the ability to recover quickly from a disruption in order to achieve output at, or near, the pre-event level. (Source: Transport Canada, Centre of Excellence in Economics, Statistics, Analysis)

SHORT LINE RAILWAY:

For the purposes of this report, a short line railway is considered to be a freight railway company operating in Canada with annual revenues below \$250,000,000 in each of the last two years. In practice, this translates into all freight railways except the Canadian Pacific Railway (CP) and the Canadian National Railway Company (CN).

SHORTSEA SHIPPING:

In the North American context, "shortsea shipping" refers to the marine transportation of passengers and goods that does not cross oceans and takes place within and among Canada, the United States and Mexico. Within Canada itself, there are five major shortsea shipping regions: the West Coast; the Great Lakes-St. Lawrence Seaway; the Laurentian area (the St. Lawrence River east of Montréal); the Atlantic Coast; and the Arctic.

(Source: Transport Canada)

SINGLE DESK: The “single desk” refers to the Canadian Wheat Board’s (CWB) former role as monopoly marketer of wheat and barley grown in the Prairie Provinces and a small part of B.C. Established as an agricultural marketing board by the Government of Canada on July 5, 1935 and governed by the Canadian Wheat Board Act, the CWB was the sole buyer and seller (i.e., the “single desk”) of prairie wheat and barley destined for export from Canada or for human consumption in Canada. Following a change in government policy, the single desk model was discontinued in August 2012.

SUBSTANTIAL OWNERSHIP AND EFFECTIVE CONTROL:

General principle used in domestic legislation (including the *Canada Transportation Act*) and international Air Services Agreements (see above) to determine the nationality of an air carrier. Usually focuses on the amount of ownership of the air carrier held by certain parties, such that more than 50 percent of the equity in an air carrier would constitute substantial ownership. “Effective control” may be exercised by different entities depending on the activity of the air carrier. For example, air carrier management may exercise effective control over certain operations, such as opening a new route, while financial entities, shareholders or a government might exercise effective control for the purpose of increasing the air carrier’s capital, merging it with another air carrier or dissolving the company. (Source: ICAO)

SUPPLY CHAIN:

A connected network of suppliers, manufacturers, shippers, distributors and retailers where transportation plays the role of unifying link among all the actors. (Source: Transport Canada, Centre of Excellence in Economics, Statistics, Analysis)

SUPPLY CHAIN VULNERABILITIES:

Weak spots within the supply chain, including physical locations (e.g. areas susceptible to floods, avalanches), potential labour disruptions, cyber threats, and choke points. (Source: Transport Canada, Centre of Excellence in Economics, Statistics, Analysis)

THROUGHPUT:

(with respect to transport and customs facilities) the rate of time required to process passengers or cargo through a border crossing, security screening or other process.

TRANSIT TRAVEL PROGRAMMING:

The Transit Without Visa program and the China Transit Program allow certain foreign nationals to transit through Canada on their way to and from the U.S. without a Canadian transit visa. The program is operated jointly by Citizenship and Immigration Canada and the Canada Border Services Agency. Travellers from the Philippines, Indonesia, Thailand and Taiwan, who would normally require a visa to come to Canada, are allowed to transit without a visa if they are travelling through Canada en route to or from the U.S. and are in possession of a valid U.S. visa. The China Transit Program allows visa-free transit through Canada to or from the U.S. for travellers from China with valid U.S. visas when travelling from: Beijing, Guangzhou, Shanghai, Hong Kong, Manila, Taipei, Tokyo, Seoul, Xiamen, Fuzhou, Chengdu, Shenyang, Harbinin. (Source: Citizenship and Immigration Canada)

TRUCK-PLATOONING:

Procedure in which a manually driven truck is followed by one or more autonomously guided trucks that may be “tethered” electronically to the lead vehicle.

TRUSTED TRAVELLER PROGRAMMING:

Provide expedited travel for pre-approved, low risk travelers through dedicated lanes and kiosks, for example at border crossings, and airport customs and security screening checkpoints. For example, The NEXUS program allows pre-screened travelers expedited processing when entering the United States and Canada. (Source: United States Customs and Border Protection)