



FINAL REPORT

The Economic Impact of the Air Transportation Industry in Canada

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Canadian Airports Council (CAC)
a Division of Airports Council International – North America (ACI-NA)
Suite 600, 116 Lisgar Street
Ottawa, ON
K2P 0C2



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EXECUTIVE SUMMARY

INTRODUCTION AND BACKGROUND

Why the Air Transportation Industry Is Important

An economic impact assessment is a useful tool in assisting industry stakeholders, and decision makers to better understand what projects, facilities or even whole industries contribute to the economy. It helps communities and governments determine investment priorities in an era of fiscal restraint. The air transportation industry enhances Canada’s prosperity by:

Air transportation is to this century what the train was to the 19th century. It is the thread that binds us together.

- Generating employment and income in the industry itself, and indirectly through the many companies supporting the industry’s activities such as logistics firms and a range of domestic and technical suppliers from coffee to hi-tech equipment;
- Improving connectivity of regions to other parts of the country and to other parts of the world, acting as a catalyst to enhance business and tourism growth; and
- Enhancing the welfare of Canadians. Simply put, air transportation better allows Canadians to go where they want, when they want.

Key stakeholders in the Canadian air transportation industry see much potential for growth in the coming years. In order to assess the impacts of changes in policy that may be required to capture that potential, it is important to understand and quantify the economic impacts as they are today. This study outlines the scope and nature of the industry, describes the baseline economic impact to the Canadian economy today, and outlines the airports’ share of the industry.

The Air Transportation Industry Defined

The air transportation industry includes firms directly involved in the transportation of people or cargo by air, and those providing aviation related services to them. Airports are a vital component of the air transportation industry providing infrastructure not only for air carriers and their support services - such as aircraft maintenance and repair, fuelling, flight catering and de-

icing – but also directly for passengers and shippers, such as parking and retail outlets. The range is shown in the graphic.

For the purposes of this study, the air transportation industry is defined as including:

- Canadian air carriers providing scheduled and charter services domestically and abroad;
- Canadian General Aviation (GA) operators (private, government and other commercial);
- Canadian airports (including services provided by airports to international air operators while in Canada);
- Aircraft services providers;
- Airport infrastructure and services providers including: engineering, planning and construction (EPC) companies; contracted janitorial, other outsourcing, and groundside operations & maintenance services;

Canada’s Air Transportation Industry and How Airports Fit In



- Canada’s civil aviation regulator, Transport Canada, and other government agencies involved in either related legislated activities or those providing services such as security screening, customs and immigration services, safety and security inspections, accident investigation, etc.;
- Canada’s air navigation service provider; and
- Travel agents/arrangers in Canada providing services to Canadian air carriers and directly to air passengers and shippers.

Airports are made up of the organizations that are based on airport property providing aviation related support services or services to passengers, and their associated airside, terminal and groundside infrastructure.

CANADA AND ITS SHARE OF GLOBAL AIR TRAFFIC

Passenger Traffic

In 2012, Canada’s airports handled over 120 million enplaned/deplaned (E/D) passengers, which is an increase of 3.6% over the previous year. Passenger traffic has grown at an average annual growth rate (CAGR) of 2.6% since 2000. The majority (81%) of passenger traffic was handled at the largest eight airports, each with over 3.5 million passengers, but over 60% of passengers on domestic flights are travelling to, from or between the other smaller regional airports. In the past twelve years, growth in international traffic has been the strongest, averaging 4.9% per year, while domestic traffic grew at an average rate of 2.6%, and transborder at 1.0%.

Dramatic external events in the last decade such as the attacks of 9/11, SARS, ongoing conflicts and the more recent global economic recession have negatively impacted air traffic, particularly between Canada and the U.S. With a total of nearly 28 million origin/destination (O/D) passengers travelling by air between Canada and the U.S in 2012, traffic is rebounding, although more slowly than in other sectors. Included in those 28 million O/D passengers are approximately 5 million Canadians who started or ended their air trip at a U.S. border airport.

There were 27.4 million overseas (i.e., international excluding U.S. transborder) O/D passengers in 2012, with Canadian residents accounting for the majority (70%) of the total. Most of this international traffic (77%) was processed directly through Canadian airports. While far more Canadians travel internationally than residents of other countries to Canada, particularly Mexico, the Caribbean and Central America (and to a lesser extent the U.S.), visitor trips from Asia, the Middle East and Oceania exceed Canadian resident trips to those locations.

Overseas visitors spend per person about the same (excl. airfare) in Canada as Canadians do overseas; but U.S. visitors spend per person about two thirds of what Canadians spend in the U.S.

Passenger Air Services at Canadian Airports

Ninety-five airlines provided commercial scheduled or major charter service at airports in Canada in 2012. Thirty-nine served domestic routes, 14 served transborder routes, and 54 served overseas routes. These airlines provide service linking 251 cities and communities across Canada, 68 cities in the U.S. and another 125 cities across the globe. The number of overseas cities increased by over 30% between 2004 and 2012, or 3.5% per year, and the number of city pairs served and overseas flights have both increased by 7.2% per year. While the number of cities served in Canada and the U.S. has only increased marginally, air service has improved with the numbers of city-pairs and numbers of flights increasing by 1.2 – 2.1% per year over the eight years. Chicago and two airports serving the New York area are the top U.S. airports served by Canadian airports, and London-Heathrow has by far the greatest capacity of all the international airports served from Canada, with service to Paris and Frankfurt having increased greatly as well as that to Beijing. The strongest international growth market has been to vacation destinations in Mexico and the Caribbean.

STATS & FACTS ABOUT CANADA’S AIRPORTS

- 725 certified airports
- 26 in the National Airports System (NAS)
- 225 regional airports with scheduled service
- 120 million plus passengers in 2012
- 95 airlines provide commercial scheduled service linking 251 communities in Canada, 68 cities in the U.S. and another 125 worldwide

With approximately 120 million passengers, Canada’s airports processed almost 3.5 times the national population in 2012.

Canadian registered airlines operate just over half the seat capacity of transborder flights, but Canadians make up 73% of the total passenger count. On the positive side, Canadian carriers' share of capacity has increased steadily from 38% in 2005 to 52% in 2012 largely due to the entry of WestJet and Porter Airlines into the transborder market. On overseas flights, Canadian registered airlines operated 63% of the seat capacity in 2012, up from 50% in 2009, with Canadians making up 70% of the passenger count in 2012.

Air Cargo

Globally, more than \$5 trillion worth of goods are transported annually by air or more than one third of world trade by value. Almost 1.5 million tonnes of cargo was handled at Canadian airports in 2011, half of which was international (incl. U.S.). Toronto Pearson handled the most international air cargo, while Winnipeg handled the most domestic.

Air transportation accounts for 25% of total Canadian trade with countries other than the U.S.

The importance of air cargo to international trade is evident - air transportation was used for almost \$28 billion of trade with the U.S. in 2011, and over \$82 billion of trade with other countries. Air transportation accounted for 5% of total trade (by value) with the U.S. and 24% of total trade with other countries. Air mode is becoming increasingly important for Canada in its trade with other countries: the air mode's share of total Canadian trade with other countries has increased from 21.2% in 2003 to a high of 24.6% in 2010¹.

Airline competition in the air cargo market is limited in Canada, especially for international service. Canada is reliant on foreign airlines for main deck lift for international service.

Canada's Share of the Global Market

Canada's share of the world's passenger traffic is relatively small at 2%. However, per person, Canadians travel by air more than residents in most other countries. Canada also has a relatively small share of the world's cargo market (also at 2%).

Not surprisingly, growth in passenger traffic has been slowest in the developed countries, and strongest in the developing regions such as the Middle East, Latin America, Asia-Pacific and Africa. Worldwide passenger traffic has grown fairly steadily since the decline caused by the global financial crisis in 2008, unlike air cargo that declined sharply in 2008, rebounded strongly in 2010 but has since shown a decline.

Canadian hub airports are relatively small compared to major world hub airports (based on passenger traffic), but in terms of connectivity, they fare better based on the numbers of cities served.

The good news is, the pie is big and getting larger, and Canada has an opportunity to grow its share of the market given the right commercial and regulatory approach.

THE ECONOMIC FOOTPRINT OF THE AIR TRANSPORTATION INDUSTRY

Calculating the Economic Footprint

The air transportation industry's economic footprint is an estimate of the impact that the industry has on the economy. The analysis includes quantification of the direct, indirect and induced demand generated by the industry, to provide a gauge of how much economic activity and employment is supported by that industry.

In this study, the economic footprint of the industry was calculated in two steps:

- Base Direct Economic Footprint that relied on data from Statistics Canada based on the North American Industrial Classification System (NAICS); and
- Additional Direct Impacts using other available data sources to ensure the inclusion of other air transportation and airport activities that were not already covered in the base economic footprint.

¹ Transportation in Canada 2011, Transportation Canada report TP14816

The direct impact of Canadian airports includes services provided by airports to air carriers and the GA community, as well as activities conducted by the airport operator and on-site agencies, NAV Canada, all based aircraft services, airport engineering, planning and construction companies, and the portion of Transport Canada concerned with airport regulation. Also included are airport commercial tenants providing services to passenger while at the airport.

The air transportation industry impacts the economy through the sales, jobs and taxes generated by firms in the sector. Moreover, air transportation companies create supply chain (indirect) effects on other businesses in the country through demand for services and products such as aviation fuel, finance and insurance and real estate services, resulting in further economic impacts. But impacts stretch beyond these supply-chain effects. The industry also influences the economy through what's referred to as "induced effects". When employees of the industry (along with those of suppliers) spend their wages, the economy receives an additional economic impact in the form of new jobs and activity generated through consumer spending. Similarly higher profits generated by the lift to the economic activity will lead to a modest boost to private capital investment.

The sum of the direct, indirect and induced effects represents the overall (total) contribution, or the economic footprint, that the industry has on our economy.

Base Economic Footprint

In 2012, real GDP in the **air transportation industry** was estimated to be \$8.8 billion (direct) in 2002\$.² The economic multiplier – which measures the sum of the direct, indirect and induced impacts relative to the direct impact – is estimated by the Conference Board of Canada to be 3.0. As a result, the total economic footprint of the industry in 2012 was \$26.2 billion (2002\$), representing 2% of Canadian GDP. A multiplier of 3.0 is relatively high owing to the fact that the air transportation industry is a very capital intensive industry and therefore creates a lot of demand through its supply-chain, resulting in a large indirect impact. Furthermore, air transportation is a high wage industry and generates demand for goods and services in other high wage industries.

Inflating the \$26.2 billion to 2012\$ results in a base economic footprint of **\$30.9 billion for the air transportation industry**. The air transportation industry supported a total of **343,800 jobs in 2012**. Moreover, overall job creation in the air transportation industry and those that benefit indirectly or through induced impacts resulted in \$17.4 billion in personal income. The increased economic activity also benefits businesses with pre-tax corporate profits of \$3.5 billion supported by the industry. This increased income results in a total of \$7.4 billion in taxes to government revenues.

Key Economic Indicators - Air Transportation Industry - Base Economic Footprint

	2008	2009	2010	2011	2012
Real GDP at market prices (2012 \$ millions)	27,818	27,860	29,121	30,313	30,916
Average weekly wages industrial composite (percentage difference)	0.2	0.2	0.2	0.2	0.2
Employment (000s)	317.6	312	320	337.8	343.8
Personal income (2012 \$ millions)	15,445	15,482	16,119	16,959	17,357
Pre-tax corporate profits (2012 \$ millions)	2,819	2,961	3,395	3,396	3,542
Personal income tax (2012 \$ millions)	2,876	2,862	2,965	3,082	3,152
Corporate income tax (2012 \$ millions)	518	495	552	545	575
Indirect taxes (2012 \$ millions)	3,158	3,313	3,473	3,623	3,698
Federal govt. balance (2012 \$ millions)	6,729	6,607	6,811	7,126	7,293
Regional govt. balance (2012 \$ millions)	4,634	4,110	4,494	4,745	4,934

Source: The Conference Board of Canada.

² A base year of 2002\$ is used because that is the base year in the CBoC's national model. It is not possible to rebase the industry estimates into a more current base year as the multiplier estimates reflect the price and volume relationships that exist in the base year; changing individual industry prices nullifies the multiplier relationships.

Real GDP of **Canadian airports** was \$3.7 billion (direct) in 2012 measured in 2002\$. When including the indirect and induced impacts, the footprint increased to \$7.4 billion (2002\$) (0.6% of national real GDP), a multiplier of 2.0. The majority of the indirect and induced impacts are in the service sector.

Inflating the \$7.4 billion to 2012\$ results in a base economic footprint of Canadian airports of **\$8.6 billion** in 2012. This increase in output supported **91,000 jobs**, lifting personal income up by \$4.7 billion. Pre-tax corporate profits increased by \$1.1 billion, resulting in \$2 billion in tax collection.

Key Economic Indicators - Canadian Airports - Base Economic Footprint

	2008	2009	2010	2011	2012
Real GDP at market prices (2012 \$ millions)	8,221	8,240	8,415	8,652	8,563
Average weekly wages industrial composite (percentage difference)	0.05	0.05	0.05	0.05	0.05
Employment (000s)	87.2	88.6	90.0	93.1	91.0
Personal income (2012 \$ millions)	4,339	4,465	4,614	4,764	4,697
Pre-tax corporate profits (2012 \$ millions)	969	979	977	1,028	1,066
Personal income tax (2012 \$ millions)	800	817	845	865	857
Corporate income tax (2012 \$ millions)	178	164	155	161	167
Indirect taxes (2012 \$ millions)	906	955	988	1,014	1,007
Federal govt. balance (2012 \$ millions)	1,889	1,888	1,910	1,970	1,951
Regional govt. balance (2012 \$ millions)	877	921	963	996	998

Source: The Conference Board of Canada.

Additional Impacts

The direct impacts of services not included in the base economic footprint were estimated to result in an additional 41,800 full-time equivalent jobs producing \$2.3 billion in GDP. This in turn results in a total impact of 61,100 full-time equivalent jobs and \$4.0 billion in GDP. All of this additional impact is attributable to activities at Canadian airports.

Total Industry Economic Footprint

The total economic footprint of the industry is estimated by adding the employment and GDP of the additional services to the base economic impact.

The total economic footprint of the **air transportation industry** in 2012 is estimated by adding the employment and GDP of the additional services to the base economic impact. The industry directly supports 141,000 jobs, producing \$10.6 billion in direct GDP (2002\$). Including multiplier effects and inflation, the air transportation industry in 2012 supported **almost 405,000 jobs**, generating **\$34.9 billion in GDP**.

Total Economic Footprint – Air Transportation Industry

	GDP (2012\$)		EMPLOYMENT (000)	
	Total		Direct	Total
Base Economic Footprint	\$30.9 B		99.2	343.8
Additional Impacts	\$4.0 B		41.8	61.1
TOTAL	\$34.9 B		141.0	404.9

THE INDUSTRY GENERATES WEALTH, EMPLOYMENT & TAXES

- The industry directly supports 141,000 jobs.
- Each direct job in the industry creates over \$248,000 in total GDP.
- The industry supports over 330 jobs for every 100,000 passengers.
- Over \$7 billion in taxes accrue to governments.

The total economic footprint of **Canadian Airports** in 2012 is estimated by adding the employment and GDP of the additional services to the base economic impact³. Canadian airports directly support almost 63,000 jobs, producing \$5.2 billion in direct GDP (2002\$). Including multiplier effects and inflation, almost **142,000 jobs are supported by Canadian airports, generating \$11.9 billion in GDP.**

Total Economic Footprint – Canadian Airports

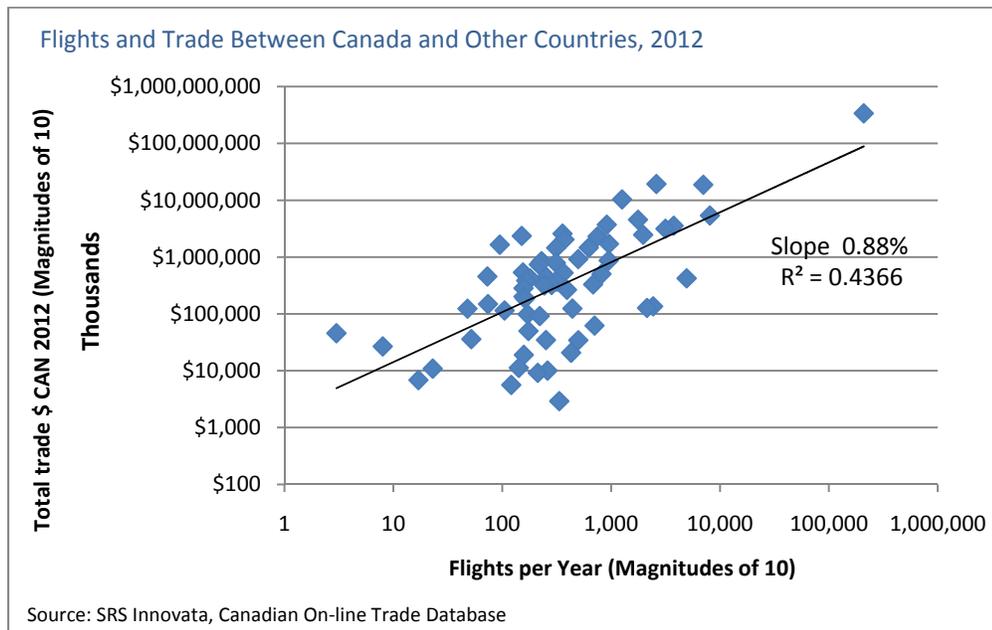
	GDP (2012\$)	EMPLOYMENT (000)	
	Total	Direct	Total
Base Economic Footprint	\$8.6 B	27.9	91.0
Additional Impacts	\$3.3 B	34.7	50.7
TOTAL	\$11.9 B	62.6	141.7

DOWNSTREAM / CATALYTIC IMPACTS

The air transportation industry provides downstream or catalytic impacts, particularly in tourism and trade dependent industries.

- **Tourism.** In 2012, there were approximately 20 million domestic person-trips by air and total spending by these travellers, excluding airfares, was just under \$10 billion. A total of 7.5 million visitors to Canada spent almost \$7.6 billion in Canada in 2012; the large majority (73%) by overseas (non-U.S.) visitors. These data should be contrasted with spending by Canadians abroad after travelling by air. While a stronger air transportation industry will foster more visitors to Canada, it will also enable more travel by Canadians abroad. It is particularly for this reason that the tourism impact has not been added to the total economic footprint of the industry.
- **Trade.** Distance is a natural barrier to trade. Air transportation helps bridge that gap. There is a two-way relationship between air transportation and trade. Air connectivity facilitates trade, but a greater trade relationship between two countries also stimulates demand for air travel between those two countries. The level of trade between Canada and other countries correlates to the numbers of flights to those countries – the larger the number of flights, the greater the trade value. Considering all trading partners, a 1% increase in flights is associated with a 0.88% increase in trade (see figure below). However, considering only non-OECD countries, a 1% increase in flights would result in a 0.57% increase in trade. While availability of direct flights is not a sufficient condition to increase trade with Canada and other countries, direct connections can act as a catalyst of business opportunities and this is borne out by the data.

³ Canadian airports regularly conduct their own economic impact studies. These studies are useful to demonstrate the value of individual airports to their local communities and beyond, to garner support for infrastructure projects, and for peer group comparison. However, due to differences in methodology and timing they should not be used to compare with top-down industry-wide estimates such as the current study. Neither is right or wrong, simply based on different assumptions.



- Increase Foreign Direct Investment.** Air transport connectivity (which considers flight frequency and the number of destinations weighted by the importance of each destination) was found to be correlated with higher amounts of foreign direct investment (FDI) relative to a country's GDP.
- Increase Labour Productivity.** An increase in air transportation connectivity of 10% would be estimated to increase labour productivity by 0.07%. In the context of Canadian GDP, this would amount to approximately \$1 billion in increased output. Good air service encourages people to move to where they are most productive, while allowing them to keep in close contact with family and friends.

IMPACTS BEYOND DOLLARS AND CENTS

Air transportation has value beyond just the cumulative amount of output produced by the industry. Air transportation and airports:

- Are Vital to the Livelihood of Canadians in Remote Regions.** During times when winter roads are not available, air transportation is the only way in and out of many remote communities. Northerners depend on air transportation for the delivery of necessities such as food products and access to emergency care.
- Promote the Economic Growth of Canada's North.** Mining is one of the most important economic drivers in Canada's north and its importance is expected to increase with climate change. Air transportation is essential for delivering oversized cargo to remote mining and exploration sites, and for the movement of large crew and supplies. As the economy in the north grows, so will demand for air services.
- Help Protect the Country's Natural Resources.** Provincial and territorial governments attempt to minimize the number of forestry resources destroyed by forest fires, and rely heavily on air transportation to move fire crews, equipment, fuel and supplies. They also use specialized aircraft to suppress forest fires.
- Are Necessary for Emergency Response and Humanitarian Relief.** Air transportation plays a critical role in supporting the movement of specialized emergency personnel, equipment and supplies be they involved in police, military, health care, search and rescue, or hydro maintenance activities.
- Broaden People's Leisure and Cultural Experiences, and Keep Families Connected.** Historically, air transportation has provided a wider choice of holiday destinations and has made them more accessible

and affordable to ordinary Canadians. Moreover, with an ever more mobile work force, particularly in Canada’s developing regions, air transportation provides that essential link to “down home”.

- **Enhance Business Operations and Efficiency.** Air transportation allows firms to shorten delivery times, minimize inventory costs and limit interruptions to production. It allows workers to move to areas where their skills are best utilized, benefiting themselves and Canada as a whole. It also allows firms to develop natural resources in isolated areas using air transport to fly-in workers on rotational shifts.

While it is not possible to quantify the values of each of these benefits, an analysis of the consumer surplus generated by air travel provides a method of estimating, at least approximately, their total benefit as well as the benefits associated with trade and connectivity. Consumer surplus is the aggregate value of the willingness to pay for individual air fares less the actual fare paid and is a measure of the benefit consumers derive from air travel above the fare paid. It was estimated that the consumer surplus that Canadians derived from air travel was approximately \$32 billion in 2009. This indicates that the total value that consumers place on the industry is roughly double the cumulative of GDP produced by the industry.

IMPACTS OF TRAFFIC DIVERSION

Diversion of passenger and cargo traffic from Canadian airports can occur in a number of ways, including: diversion to U.S. border airports; overseas visitors entering Canada by surface mode; diversion from local airports to larger airports in the region; and diversion to surface modes. The economic impact of diversion depends heavily on where the traffic has been diverted to, and quantification of such impacts should be done in conjunction with policy options as these issues are strongly related with the former being in part the result of the latter. These impacts are considered in the companion report on changes to aviation policy in Canada.⁴

Competition among different modes and airports is beneficial for Canadians. However, if the playing field is not level, the welfare of Canadians is hurt and economic value is destroyed.

IN SUMMARY

Canada’s air transportation industry already provides great economic and socio-economic value. There are, however, opportunities to make air transport in Canada more attractive and accessible, promoting economic growth in Canada and growing Canada’s share of the world’s passenger and air cargo market, particularly with emerging markets.

THE CANADIAN AIR TRANSPORTATION INDUSTRY GENERATES WEALTH, EMPLOYMENT & TAXES

- **141,000** people are directly employed by the Canadian air transportation industry
- The industry’s total economic footprint, which includes supplier industries, is **\$34.9 billion** in GDP, and supports a total of almost **405,000** jobs in many different sectors
 - Each direct job in the industry results in **\$248,000** in total GDP
 - Air Transportation supports over **330** jobs for every **100,000** passengers carried
- It contributes over **\$12 billion** to federal & provincial coffers, including over **\$7 billion** in taxes

⁴ The economic impact study, which was compiled by the Conference Board of Canada and the Airports and Aviation Group of SNC Lavalin Inc., is the first of a two-part air transportation policy exercise.

1 BACKGROUND

1.1 INTRODUCTION

An economic impact assessment is a tool to assist industry stakeholders, and decision makers to better understand what projects, facilities or even whole industries mean to the economy. It helps communities and governments determine investment priorities in an era of competition for resources.

The air transportation industry enhances Canada's prosperity by:

- Generating direct, indirect and induced employment, and through the value added created by the industry itself;
- Improving connectivity of regions to other parts of the Country and to other parts of the world; and
- Enhancing the welfare of Canadians and the social fabric of Canada.

*"A mile of road takes you a mile.
A mile of runway can take you anywhere."*

The first speaks directly to the supply chain effects of the industry. It measures the impact that the industry has on employment and GDP through its own activity and in demanding goods and services from its supplier industries. Economically, the air transportation industry's effects are significant.

The second refers to the benefits that flow from the air transportation services themselves with connectivity acting as a catalyst to enhance business and tourism growth. Without that connectivity Canada cannot access the growth markets of the twenty-first century.

And the last bullet highlights the industry's benefits to communities and individuals that would not exist without the availability of air transportation for the movement of people and goods across the second largest country in the world. It is to this Century what the train was to the 19th Century and provides the thread that binds us together.

"Canada has a secure, reliable, first-class transportation system that is capable and ready to facilitate increased international trade with China and the region, which in turn help support job creation and economic growth for Canada."

*The Honourable D. Lebel, Minister of
Transportation Infrastructure and Communities,
November 13, 2012 (while in China)*

Better air transportation connectivity fosters economic development through increased trade, by attracting new businesses, by encouraging investment in trade-related industries and tourism, and through other activities such as cultural and educational exchanges. Air transportation connections to key markets are vital for long-term economic development and growth for the Canadian economy, through the introduction of new or expanded routes to major cities within the global transportation network. Canada's major airports are ideally situated and well connected to become global hubs between the Americas and north-east and central Asia; and Canada's regional airports provide vital domestic travel connectivity and connections to hubs for long-haul travel. Canada's airports also support economic growth in remote areas by providing essential access for natural resource exploration and development, which could not reasonably happen without an efficient air transportation system.

Various studies have been completed in the last decade that show that air transportation is a major contributor to a country's economy, and the story is no different in Canada. Economic impact studies have been done for a number of airports in Canada, for Canadian airlines but not for the airports and air transportation industry as a whole. This study quantifies the impacts of this economically significant industry and how it works to facilitate more general economic growth for Canada.

1.2 OBJECTIVES AND SCOPE

Key stakeholders in the Canadian air transportation industry see much potential for growth in the coming years. In order to assess the impacts of the changes in policy that may be required to capture that potential, it is important to understand and quantify the economic impacts as they are today.

The specific objectives of this Economic Impact Study are to:

- Outline the scope and nature of Canada’s air transportation market today (baseline) in terms of its domestic, U.S. transborder and overseas passenger and cargo segments, and the relative maturity / opportunities of each;
- Describe the baseline economic impact to the Canadian economy today in terms of direct, indirect and induced impacts;
- Outline the “airport’s share” of Canada’s air transportation industry; and
- Discuss the broad economic impact of traffic diversion, both to U.S. border airports, as well as to other modes of transportation.

1.3 DESCRIPTION OF THE INDUSTRY

The air transportation industry includes those industry groups involved in the transportation of people or cargo by air, such as air carriers and other aircraft operators, and those providing aviation related services to the air operators. The latter group includes airports, aircraft service companies, NavCanada, CATSA and other government agencies as well as travel agents.

Airports are a vital component of the air transportation industry providing services directly to both air passenger and air cargo operators and to the passengers themselves. They also provide access for air operators and their aircraft to aircraft services such as aircraft maintenance and repair, fuelling, flight catering and deicing services. Airports are also vital to the communities they serve, literally providing a lifeline to the rest of the world.

The aerospace industry is a broader industry group which includes aeronautic and astronautic research, design, manufacture, operation, or maintenance of vehicles for moving through air and space. Air transportation is one segment of the aerospace industry.

Figure 1-1 graphically depicts the air transportation industry in Canada, showing the inter-dependencies among the various components. For the purposes of this study, the overall air transportation industry is defined as including:

- Canadian air carriers providing scheduled and charter services domestically and abroad;
- Canadian General Aviation (GA) air operators (private, government and other commercial);
- Canadian airports (including services provided by airports to international air operators while in Canada);
- Aircraft services providers;
- Airport infrastructure and services providers including planners, engineers, construction companies, contracted janitorial and groundside maintenance services, etc.;
- Canada’s civil aviation regulator and other government agencies involved in either providing related legislation and regulation, or those providing services such as security screening, customs and immigration services, safety and security inspections etc.;
- Canada’s air navigation service provider; and
- Travel agents/arrangers in Canada providing services to Canadian air carriers and directly to air passengers and shippers.

Airports are made up of the organizations that are based on airport property providing aviation related support services or services to passengers, and their associated airside, terminal and groundside infrastructure.

Figure 1-1. Canada's Air Transportation Industry and How Airports Fit In



1.4 APPROACH AND METHODOLOGY

This study addresses the impacts and benefits of the industry as measured in several ways, including not only the economic footprint of the industry, but also its socio-economic importance.

1.4.1 GENERAL ECONOMIC FOOTPRINT

The analysis for this study took place over a two and a half month period between January and March 2013 using the most recently available information. This study relied on standard econometric techniques in which the total footprint was measured by deriving the indirect and induced impacts associated with the direct GDP in the air transportation industry. Other socio-economic benefits of the air transportation industry were considered separately.

An industry's economic footprint is an estimate of the impact that a particular industry has on the economy. A footprint analysis goes beyond measuring the direct economic contribution by also quantifying the indirect and induced demand generated by that industry to provide a gauge of how much economic activity and employment is supported.

The first step in the engagement was to define the scope of the air transportation industry in Canada. Then the direct impacts of the industry were calculated using a two-step process:

- Base Direct Economic Footprint** relied on data from Statistics Canada based on the North American Industrial Classification System (NAICS) to define the direct impact of the air transportation industry. Supply chain impacts were estimated using Statistic Canada's input-output model and the Conference Board of Canada's econometric model. The total base economic footprint of the air transportation industry in Canada (including its induced impacts) was estimated using the Conference Board's model of the Canadian economy. In addition to quantifying the direct impact of the industry, the indirect and induced effects were also calculated on a large number of economic indicators including employment, output by industry, government revenues and balances. The model used in this study is mature, is consistent with the System of National Accounts, and allows for a later assessment of the economy-wide impacts generated by an increase (or decline) in the air transportation industry due to government policy initiatives; and

- **Additional Direct Impacts** relied on other available data sources, including but not limited to aircraft registries, data obtained directly from the relevant organizations, and publicly available annual reports. These additional impacts are intended to primarily cover activities that relate to air transportation support services that were not already covered in the base economic footprint (direct or indirect).

Cross-checks against other reports and data sources were made where possible, noting any differences in methodology as reasons for variations in results. The differences in methodologies are noted in Appendix B.

Unless otherwise stated, the numbers reported in this report relate to the calendar year 2012.

1.4.2 ECONOMIC FOOTPRINT TYPES OF IMPACTS

Conducting a footprint analysis involves identifying the key supply chain linkages in the transportation sector as well as quantifying the impact of the sector on key economic indicators, such as GDP, employment, income, and government revenues.

The analysis in this study evaluates the combined direct, indirect and induced economic impacts, where:

- **Direct impact** measures the value added⁵ to the economy by the air transportation industry that is attributed directly to the sector's employees, the wages earned, and the firms' revenues generated;
- **Indirect impact** measures the value added that the "direct impact firms" generate within the economy through their demand for intermediate inputs or other support services. For example, activity in the air transportation sector creates demand for air transportation support activities and refined petroleum products; and
- **Induced impacts** are derived when employees of the aforementioned industries spend their earnings and owners spend their profits. These purchases lead to more employment, higher wages, and increased income and tax revenues, and can be felt across a wide range of industries.

Previous studies have also identified **catalytic impacts** that result from the provision of air transportation services. These impacts typically consider the role that air transportation services play in terms of enabling tourism activity and inducing spending by foreign visitors in the domestic economy. This particular impact is considered separately from the economic footprint in this report. It is also compared with spending by Canadians who travel abroad, which is necessary in order to identify the net impact on spending.

1.4.3 ECONOMIC FOOTPRINT DIRECT IMPACTS – WHAT'S INCLUDED AND HOW WERE THEY CALCULATED?

The first step in determining the direct impact was to identify the components of the air transport industry and ensure that all components are included and that none are double counted.

The very nature of the inter-dependencies between the various components of the industry results in a "chicken and egg" type discussion regarding direct and indirect impacts. For example, air carriers would normally count airports as an indirect impact of their activities; while airports generally count the portion of the carrier's activities at their airport, as a direct impact. Similarly, support activities to air carriers such as aircraft maintenance would be considered an indirect impact by carriers; however airports often count this type of activity as a direct impact if based at the airport. Neither is incorrect, it just depends on the lens being looked through.

Figure 1-2 graphically summarizes what direct impacts are included in the Base Economic Footprint, and those that were calculated separately.

⁵ Value added or net output is the difference between total revenue and the sum of expenses on parts, materials, and services used in the production process. Summing the value added across all industries in a region will yield the GDP in that region.

Airports' Share

The airports' share of the air transportation industry's direct impact includes services provided by airports to air carriers and the general aviation community, as well as activities conducted by the airport operator and on-site agencies, NavCanada, all based aircraft services, airport planning, engineering and construction, and the portion of Transportation Canada regulatory department concerned with airport regulation. Also included are airport commercial tenants providing services to passengers while at the airport.

Figure 1-2. Calculating the Direct Impacts



Notes:

* Airport impacts determined from these segments

** Include portion of impact in Airport impact which is related to employees located at airports

1.4.4 *DEFINING REAL GDP OF THE AIR TRANSPORTATION INDUSTRY*

Base Economic Footprint

The North American Industrial Classification System (NAICS) used by Statistics Canada to group economic activity by industry captures activity in the air transportation industry under a number of different categories. For the purposes of calculating the base economic footprint, the air transportation industry was defined as: air transportation (NAICS 481), support activities for air transportation (NAICS 4881) and a share of air transportation activity in postal services and couriers and messengers (NAICS 49A).⁶

To derive the GDP estimate of the share of air transportation in postal services and couriers and messengers (NAICS 49A), revenues associated with air transportation activity in this sector in 2011 were compared with those of the industry as a whole. More specifically, a point estimate of 2011 revenues was calculated using data for cargo tonnage and average revenue per tonne of cargo. Then the industry level gross-output-to-value-added ratio was used to convert the revenue estimate to an estimate of real GDP. The series was extended back to 2008 and forward to 2012 using real GDP growth in postal services and couriers and messengers.

Real GDP data for air transportation is available from Statistics Canada. To avoid double counting, the small amount of demand for air transportation generated by postal services and couriers and messengers was calculated from the input-output tables and subtracted from overall GDP in air transportation.

Gross domestic product data is not available for support activities for air transportation and had to be estimated using real GDP data for total transportation support activities (NAICS 488). This was done by calculating a ratio of wages multiplied by employment in support activities for air transportation divided by total transportation support activities. This ratio multiplied by real GDP data in total transportation support activities is the real GDP estimate for support activities for air transportation. However, since the goal of this study is to estimate the total economic footprint of the air transportation industry, this estimate had to be adjusted to avoid double counting. The second largest indirect impact of the air transportation industry is support activities for air transportation; as a result, adding the indirect impacts from air transportation together with direct GDP from support activities for air transportation would lead to an overestimate of the industry's economic footprint. To avoid this double counting, data from Statistics Canada's detailed input-output model was used to calculate the share of support activities for air transportation that is captured indirectly in air transportation and these amounts were subtracted from support activities for air transportation's GDP estimate.

Real GDP in the air transportation industry was then defined as the sum of the GDP estimates in air transportation, support activities for air transportation and air transportation's share of postal services and couriers and messengers. Real GDP for airports is defined as support activities for air transportation (NAICS 4881).

Additional Direct Impacts

Additional direct impacts include activities related to air transportation support services that are not already captured in the direct or indirect impacts of the base economic footprint. These include (but are not exclusive to): security services provided by CATSA, customs services and airport concessions. In some cases where it was determined that a portion of the activity was already picked up as a direct or an indirect impact of the air transportation or air transportation support industries, only the incremental value-added of these services was included. For example, a portion of general aviation activity is already captured as a direct impact of the air transportation industry. Another example are travel arrangement activities that are carried out directly by air carriers, or the indirect impact on travel arrangement services as a result of the demand for air transportation (as identified through the base economic footprint).

⁶ NAICS 49A is a special aggregation of NAICS 491 and NAICS 492. A description of the NAICS industries included in this study can be found at: [http://stds.statcan.gc.ca/naics-scian/2007/cs-rc-eng.asp?criteria=48-49&keyword=transportation and warehousing&table=3&code_level=](http://stds.statcan.gc.ca/naics-scian/2007/cs-rc-eng.asp?criteria=48-49&keyword=transportation+and+warehousing&table=3&code_level=)

These impacts were primarily estimated by obtaining an estimate of total employment in full-time equivalents (FTE) associated with each activity and multiplying the number of FTEs by an average wage rate based on Labour Force Survey (LFS) data. In other cases, an estimate of total labour costs were first estimated, which were then divided by wages in order to estimate the number of FTEs. Both of these methods provide an estimate of direct employment and the returns to labour. Lastly, if information on capital formation was available, an estimate of the return on capital was added to the returns to labour in order to determine the total value-added of the activity.

1.4.5 CALCULATING THE ECONOMIC FOOTPRINT

Base Economic Footprint

Conducting a footprint analysis involves identifying the key supply chain linkages in the transportation sector as well as quantifying the impact of the sector on key economic indicators, such as GDP, employment, income, and government revenues. The following analysis evaluates the **combined** direct, indirect, and induced economic impacts, which is shown as the “total impact”.

To derive the indirect impact (supply chain linkages) of the transportation sector on the economy, the Conference Board of Canada (CBoC) performed two input-output shocks on its national forecasting model to obtain the supply chain linkages in support activities for air transportation and air transportation’s share of postal services and couriers and messengers. Additionally, results from Statistics Canada’s national input-output model were used to provide the estimates for the supply-chain impacts for air transportation. An input-output shock involves increasing or decreasing output in a particular industry to get the total direct and indirect impacts of that change on various other industries. In this scenario, it allowed CBoC to determine which industries are most impacted by activity in the air transportation industry. The simulations performed on the three transportation industries were then aggregated based on their GDP shares to derive a weighted average estimate of the impacts of the air transportation industry.

While the input-output estimates provide a very detailed account of the supply-chain linkages, the CBoC’s national model has the benefit of assessing the impact of additional income, generated through changes in wages and profits, on the economy. The CBoC’s national forecasting model was used to obtain the additional induced impacts on the economy—to estimate the total economic footprint of the air transportation industry on the Canadian economy over the 2008–12 timeframe. In order to use the CBoC’s national forecasting model for the footprint analysis, the estimate of real GDP in the air transportation industry needed to be converted to 2002 dollars as that is the model’s base year.

Additional Economic Impacts

The calculation of the additional direct economic impacts allowed for a more robust estimate of the total economic footprint of the industry in terms of GDP and employment. The additional indirect and induced impacts on real GDP and employment were derived by calculating a weighted-average multiplier based on Statistics Canada’s National Input-Output Multipliers.

1.4.6 DOWNSTREAM AND SOCIO-ECONOMIC IMPACTS

The downstream and socio-economic impacts of the air transport industry are numerous ranging from increased business competitiveness, to economic development in remote and isolated areas, to improving the quality of life for Canadians across the country. It is not possible to quantify each of these benefits. Instead, various benefits are discussed and the results of a consumer surplus study are provided which provides an indication of the value placed on air travel beyond that reflected by the price of the air ticket. The consumer surplus is the aggregate value of the willingness-to-pay for individual air fares less the actual air fare paid. For example, if a traveller purchases an air fare for \$500 but would have paid up to \$600 for the same air fare, the consumer surplus is \$100. For the marginal traveller, the consumer surplus is, or approaches, zero – if the fare increases even a little they will choose not to fly. The lower the elasticity of air fares, the higher the aggregate consumer surplus.

2 CANADA AND ITS SHARE OF GLOBAL AIR TRAFFIC

2.1 INTRODUCTION

The size and make-up of Canada's share of the global air transportation market has changed in recent years and as a foundation of a discussion of the economic impact of the industry, it is important to understand Canada's current standing in the competitive air passenger and air cargo markets.

2.2 PASSENGER MARKET

2.2.1 PASSENGER TRAFFIC IN CANADA

Canadian airports handled over 120 million enplaned/deplaned (E/D) passengers in 2012⁷, an increase of 3.6% from 2011. The largest eight airports, each with over 3.5 million passengers, handled 98 million passengers and accounted for **81%** of total traffic, as shown in Table 2-1. The other 18 National Airport System (NAS) airports handled between them 12.4 million passengers (**10.2%**) and local and regional airports handled the remaining 10.8 million passengers (**8.9%**). This does not truly indicate the importance of the smaller airports to air travel in Canada. While numbers of passengers between city pairs is not available, the seat capacity indicates that only 40-45% of E/D passengers are travelling between the largest eight airports, a similar number are travelling between the largest eight and other regional airports in Canada, and approximately 15% are travelling between the smaller regional airports (i.e., excluding the top eight). When considering origin/destination (O/D) passengers, even more would be from the smaller airports, particularly from travel between smaller communities.

Table 2-1. Total E/D Passengers in Canada by Airport Category by Sector in 2012

Airport Category	Domestic (millions)	Transborder (millions)	International (millions)	Total (millions)	%
Top 8 Airports	52.10	22.49	23.87	98.46	81.0%
Toronto Pearson	13.65	9.46	11.80	34.91	28.7%
Vancouver	9.17	4.28	4.14	17.60	14.5%
Montréal Trudeau	5.33	3.23	5.24	13.80	11.3%
Calgary	9.58	2.73	1.34	13.64	11.2%
Edmonton	5.11	1.17	0.39	6.68	5.5%
Ottawa	3.45	0.78	0.46	4.69	3.9%
Halifax	2.88	0.39	0.34	3.61	3.0%
Winnipeg	2.94	0.45	0.17	3.55	2.9%
Other NAS Airports	10.59	1.10	0.71	12.40	10.2%
Local/Regional Airports	10.02	0.62	0.13	10.77	8.9%
Canada Total	72.71	24.21	24.71	121.63	100.0%
% of Total	60%	20%	20%	100%	

Note:

1. Statistics Canada values include only Revenue passengers, Airport reported values are total passengers, values of total passengers for airport where total passengers were not available were estimated based on the reported Revenue passengers and average ratio of Revenue to total passengers by sector

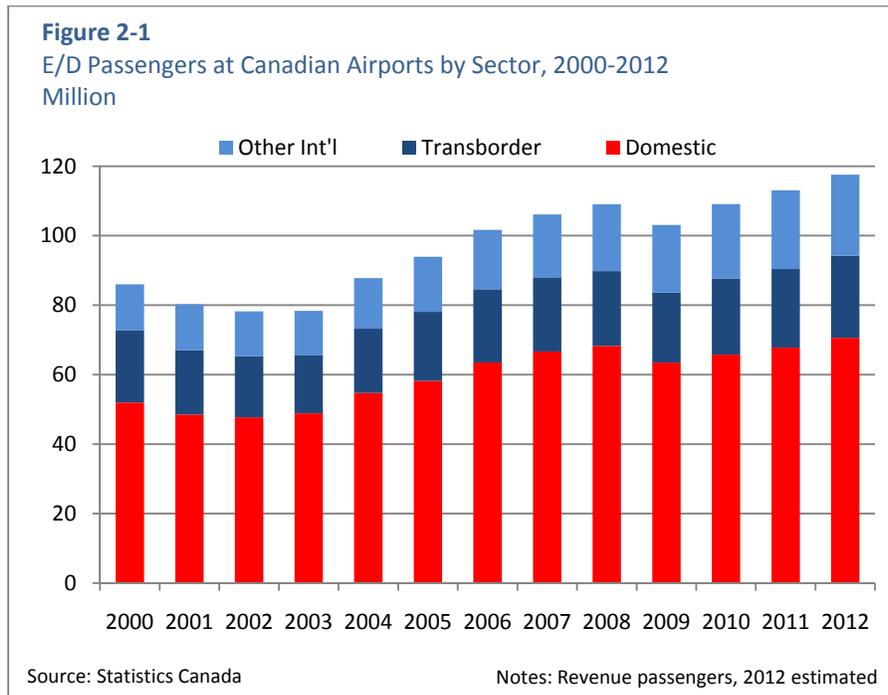
Sources: Airport web sites, Statistics Canada, SNC-Lavalin/Conference Board of Canada

⁷ Including revenue and non-revenue passengers

Sixty percent of the E/D passengers in Canada in 2012 were on domestic flights, while the remaining passengers were split evenly between transborder flights to/from the US and other international (overseas) flights. The largest eight NAS airports accounted for 93% of the transborder traffic and 97% of the other international traffic.

Passenger traffic at Canadian airports has grown from 87 million in 2000 to 121.6 million in 2012 at an average annual growth rate of 2.6%. The growth in traffic has not been steady, as shown in Chart 2-1. Traffic declined by 6.7% in 2001 and a further 2.5% in 2002 as a result of the September 11, 2001, terrorist attacks and the 2001-2002 recession, and after strong growth in 2004-2007, traffic declined again in 2009 due to the “great recession”.

Growth in non-U.S. international traffic has been strong over the 12 years, averaging 4.9% per year, while domestic traffic growth averaged 2.6% per year and transborder traffic only 1.0% per year.



2.2.2 CHARACTERISTICS OF INTERNATIONAL PASSENGERS

A total of 27.7 million origin/destination (O/D) passengers used the air mode on their trip between Canada and the U.S. in 2012. This includes approximately 5 million passengers who are Canadian residents travelling to the U.S. who started their air trip from a U.S. airport close to the border, rather than a Canadian airport⁸. As shown in Figure 2-2, the large majority (73%) of these passengers are Canadians travelling to the US.

Canadians starting their air trip from a U.S. border airport account for 25% of the air trips by Canadian travellers, and 18% of the total air trips. Passengers on transborder flights also include passengers flying between Canada and other international countries, referred to as *overseas*, who are flying via U.S. airports.

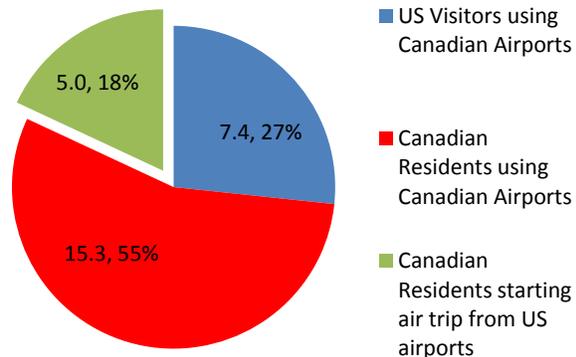
⁸ Canadian Airports Council. “Passenger Leakage Data and Air Fare Analysis”, March 2012

The proportion of overnight trips made by Canadian residents to the U.S. by air mode declined following the September 11th, 2001 terrorist attacks from 36.6% in 2000 to 32.1% in 2002 but by 2010 had risen to 34.6%.

Similarly, the proportion of U.S. residents travelling to Canada by air mode declined between 2000 and 2002 from 25% to 23%, before increasing to 29% in 2010, but is still well below the corresponding proportion for Canadian travellers.

The breakdown of passengers travelling overseas (i.e., international excluding the U.S.) by resident/visitor and airport routing used is presented in Figure 2-3. Of the total of 27.4 million overseas O/D passengers in 2012, Canadian residents (red colour in chart) account for 19.1 million, or 70% of the total. Of these, 3.8 million fly via U.S. airports – 20% of the Canadian resident trips and 14% of all overseas passengers.

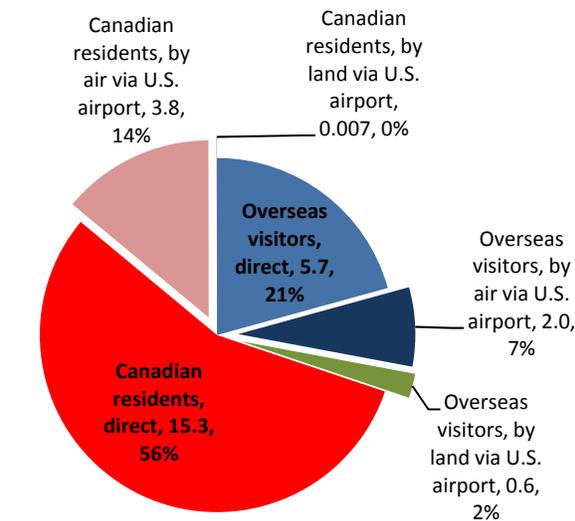
Figure 2-2
O/D Passengers to the U.S.
(000 and % of Total)



Source: Statistics Canada, Conference Board of Canada

For overseas visitors, a third fly via US airports accounting for 7% of total passengers. There is also another 0.6 million visitor O/D passengers that flew to the U.S. and entered Canada at a land border by car, bus or rail mode. Many of these are likely combining travel to the U.S. and Canada. Very few Canadian residents cross into the U.S. by surface mode to catch a flight overseas from a U.S. airport. Overall, 21 million overseas O/D passengers flew directly to/from Canada, 77% of the total, while 6.4 million (23%) used U.S. airports.

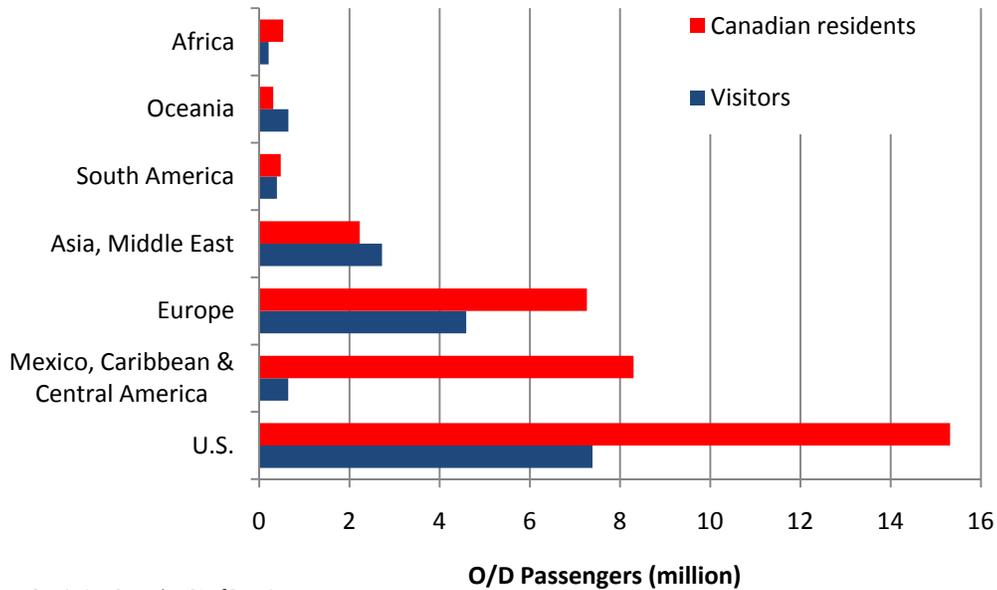
Figure 2-3
O/D Passengers Travelling Overseas, 2012
(000 and % of Total)



Source: Statistics Canada

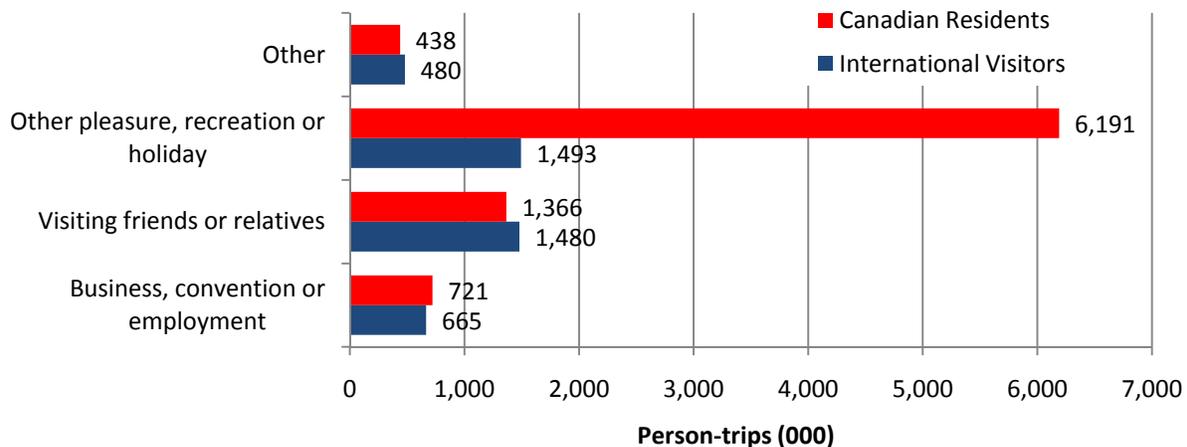
The region of origin of visitor air trips and the destination region of Canadian international air trips are presented in Figure 2-4. Canadians often visit more than one country on their overseas trips and the values presented in the chart are the estimated numbers based on numbers of visits to countries in each region in 2010 (latest year data was published) and actual Canadian resident overseas trips in 2012. Far more Canadian residents travel internationally than residents of other countries visit Canada. This is particularly true for air travel to Mexico & the Caribbean and to a lesser extent the U.S. and Europe. Only for Asia-Middle East and Oceania do visitor trips exceed Canadian resident trips.

Figure 2-4
O/D Passengers Travelling Internationally by World Region for Canadian Residents and Visitors



The number of person-trips by purpose of travel for travel overseas is presented in Figure 2-5. The two segments, *Visiting Friends and Relatives*, and *Business, Convention or Employment*, have similar numbers of trips by visitors and Canadian residents. However, for the category, *Other Pleasure, Recreation or Holiday*, four times as many Canadian residents travel overseas as visitors travel to Canada. Visitors from the U.S. (by all modes, not shown in chart) are more likely to be visiting Canada for pleasure, recreation or a holiday than visitors from overseas (53% vs. 36%), while similar proportions visit Canada for business, convention or employment purposes (15-16%).

Figure 2-5
Purpose of Travel for Overseas Travel, 2010



Average spending per person (excluding airfares) by air passengers on their trips is summarized in Figure 2-6 for the various traveller groups. Spending on overseas travel averages approximately \$1,400 per person, whether it is by people visiting Canada or Canadian residents travelling overseas. Average spending is much less for U.S. visitors to Canada, \$540 per person, while Canadians spend almost \$780 on their air trips to the U.S. on average. Spending by Canadian residents on air trips within Canada is the lowest, averaging approximately \$500 per person.

2.2.3 PASSENGER AIR SERVICES AT CANADIAN AIRPORTS

Ninety-five airlines provided commercial scheduled or major charter service at airports in Canada in 2012. Thirty-nine airlines served domestic routes, 14 served transborder routes and 54 served overseas routes (i.e., international excluding the U.S.). These airlines provided service linking 251 cities and communities across Canada, 68 cities in the U.S. and another 125 cities across the globe.

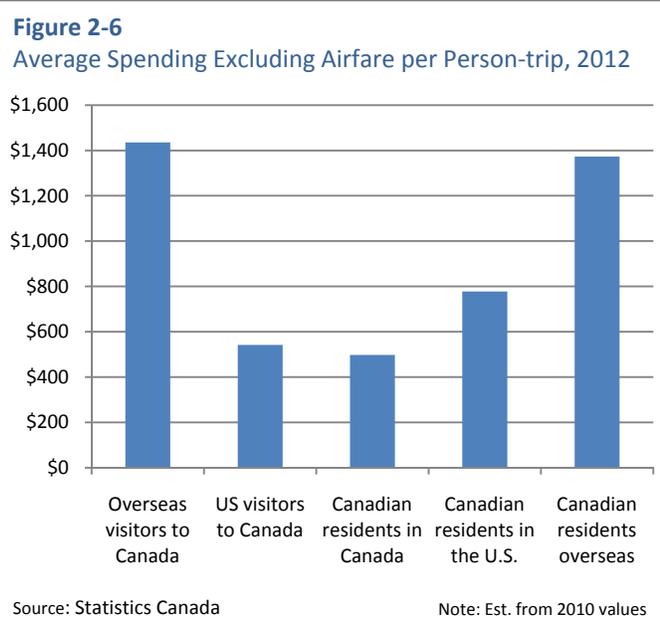
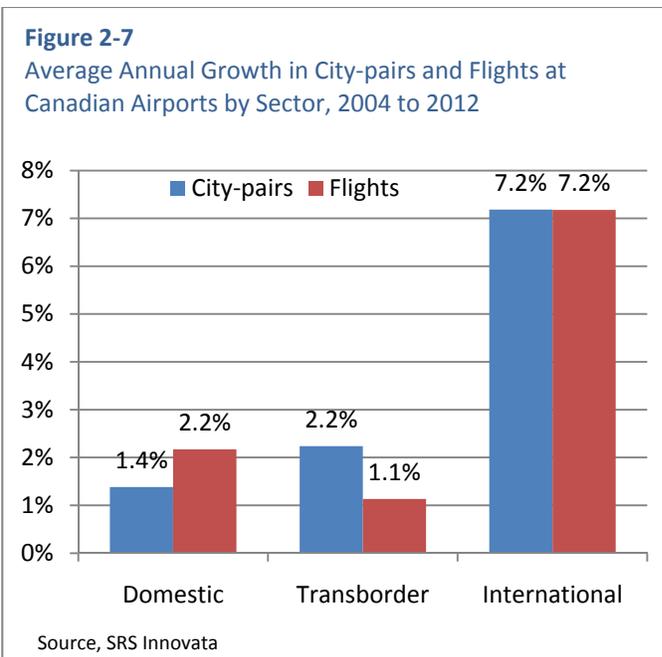


Figure 2-7
Average Annual Growth in City-pairs and Flights at Canadian Airports by Sector, 2004 to 2012

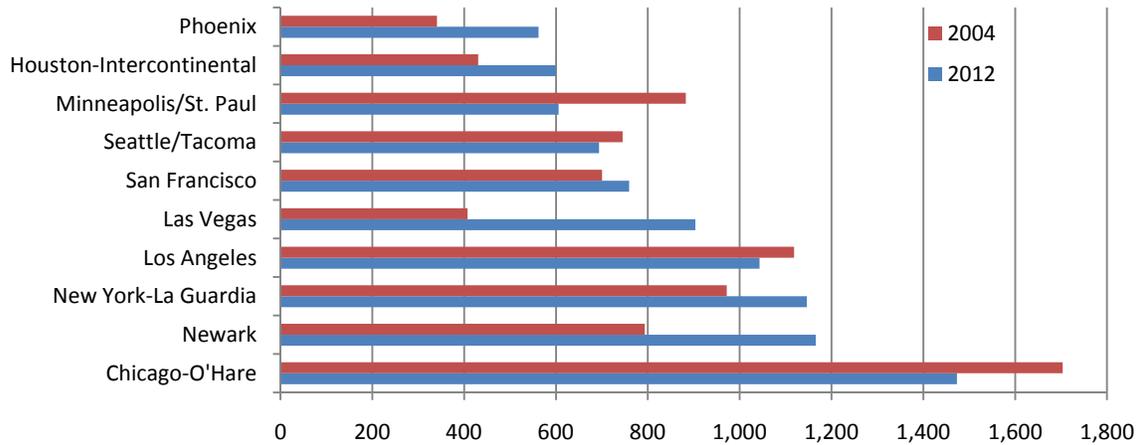


The number of overseas cities served has increased by over 30% over the eight years 2004 to 2012, or 3.5% per year, and the number of overseas city-pairs served and overseas flights have both increased by 7.2% per year over that period – see Figure 2-7. While the numbers of cities served in Canada and the U.S. have only increased marginally, air service has improved with the numbers of city-pairs and numbers of flights increasing by 1.1-2.2% per year over the eight years.

Chicago and two airports serving the New York area are the top U.S. airports served from Canadian airports measured by departing seat capacity (see Figure 2-8), while growth since 2004 has been strongest at Las Vegas followed by New York La Guardia and Newark. Service declined to Minneapolis/St. Paul with the merger of Northwest Airlines and Delta.

London-Heathrow has by far the greatest airline seat capacity to Canada of all the international airports served from Canada, but capacity has hardly changed over the past eight years (see Figure 2-9). Service to two other European hubs, Paris and Frankfurt, has increase greatly, as has service to Beijing. However, of the top 10 markets, the strongest growth in service has been to vacation destinations in Mexico and the Caribbean.

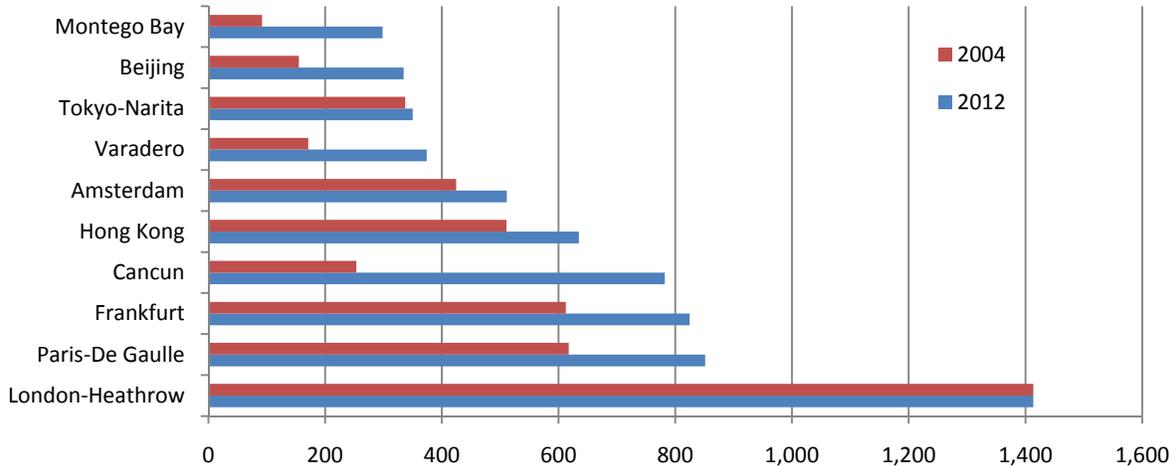
Figure 2-8
Top Ten U.S. Cities Served from Canadian Airports - Annual Departing Seat Capacity (000)



Source, SRS Innovata

Note: Adjusted to include charter flights not in SRS

Figure 2-9
Top Ten International Cities Served from Canadian Airports - Annual Departing Seat Capacity (000)

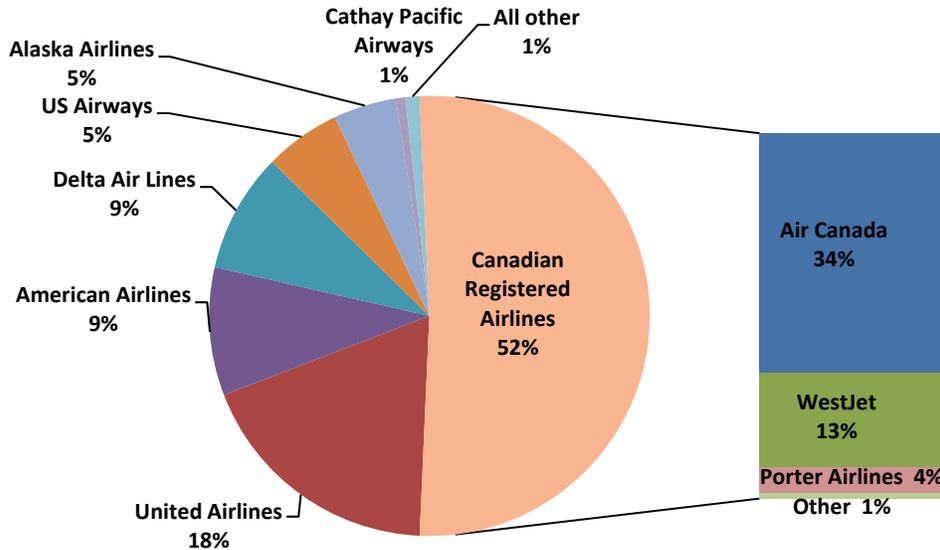


Source, SRS Innovata

Note: Adjusted to include charter flights not in SRS

Canadian registered airlines operate just over half the seat capacity of transborder flights – see Figure 2-10. Air Canada provides 34% of the capacity, followed by its Star Alliance partner United Airlines with 18% and WestJet with 13%. While Canadian airlines may operate 52% of the capacity, they have a disproportionately small share of the transborder traffic considering that 67% of the travellers are residents of Canada, and including those Canadians using U.S. border airports to travel to their destination in the U.S., 73% of the total travellers are Canadian residents. On the positive side, the share of capacity provided by Canadian registered airlines has increased steadily from 38% in 2005 to 52% in 2012 largely due to the entry of WestJet and Porter Airlines into the transborder market.

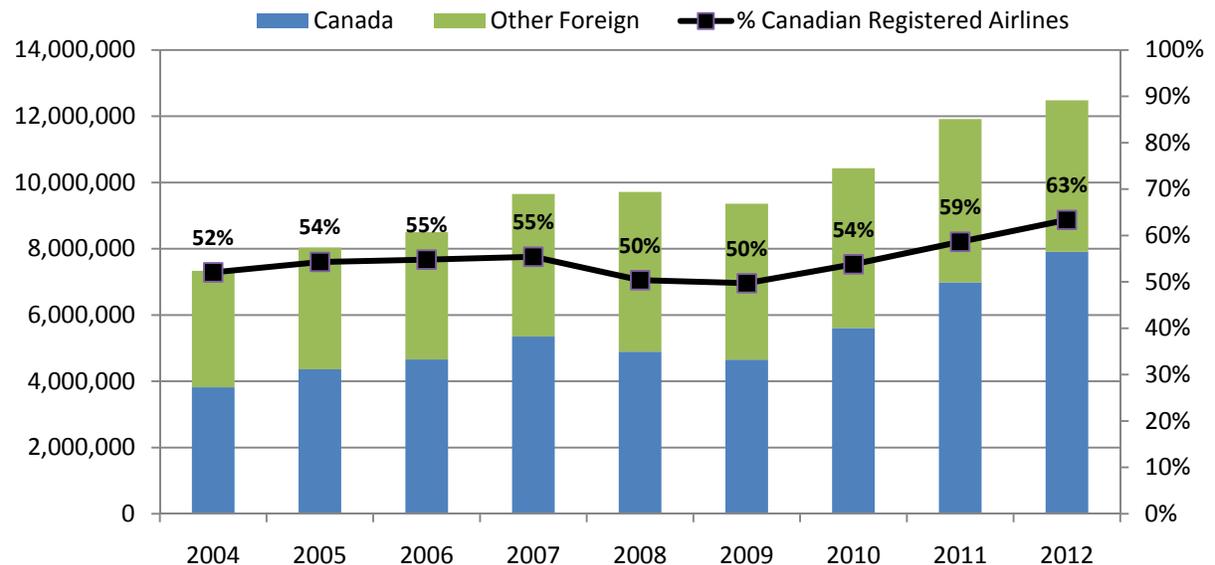
Figure 2-10
Share of Seat Capacity on Transborder Flights by Airline, 2012



Source, SRS Innovata

On overseas flights, Canadian registered airlines operated 63% of the seat capacity in 2012, up from 50% in 2009 – see Figure 2-11. Air Canada provided 36% of the capacity, followed by two charter airlines, Air Transat 12% and Sunwing 8%, and WestJet with 7%. The 63% share of capacity by Canadian airlines compares with the Canadian resident share of overseas traffic of 70%.

Figure 2-11
Departing Seat Capacity on Overseas Flights by Canadian Registered and Foreign Airlines, 2004 - 2012



Source, SRS Innovata

2.2.4 CANADA'S SHARE OF GLOBAL PASSENGER TRAFFIC

Canadian airport's share of world passenger traffic is relatively small at 2%, as shown in Figure 2-12. However, per person, Canadians travel by air more than residents of most other countries. The number of E/D passengers per capita is 3.5 for Canada, less than the 4.3 for the U.S., but significantly greater than the 1.9 for Europe and 0.7 for the Middle East and Latin America⁹. As shown in Figure 2-13, growth in passenger traffic has been slowest in the developed economies and strongest in the developing regions such as the Middle East, Latin America, Asia-Pacific and Africa. This pattern of growth has been similar over the past three years, although growth has been 2-3% stronger over the 2009 to 2012 period for Europe and the U.S. and 1% higher for Canada.

Figure 2-12
E/D Passengers by Country/Region, 2012
Milion and % of Total

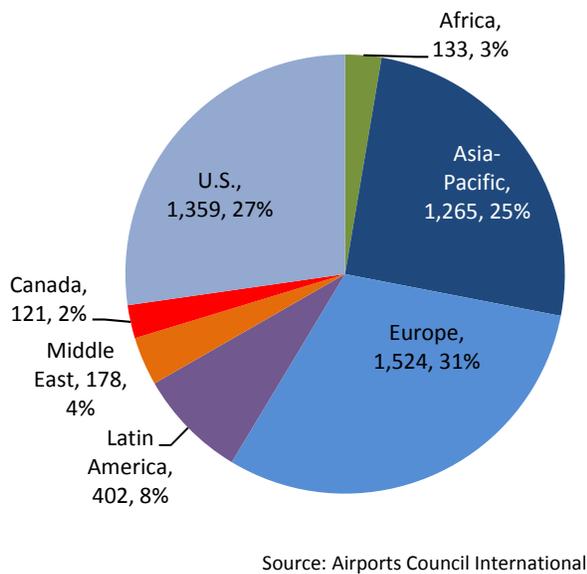
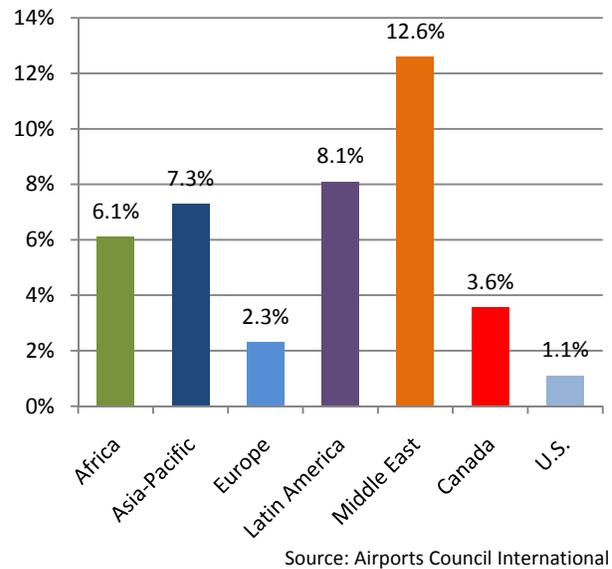


Figure 2-13
Growth in E/D Passengers by Country/Region, 2012
% Change

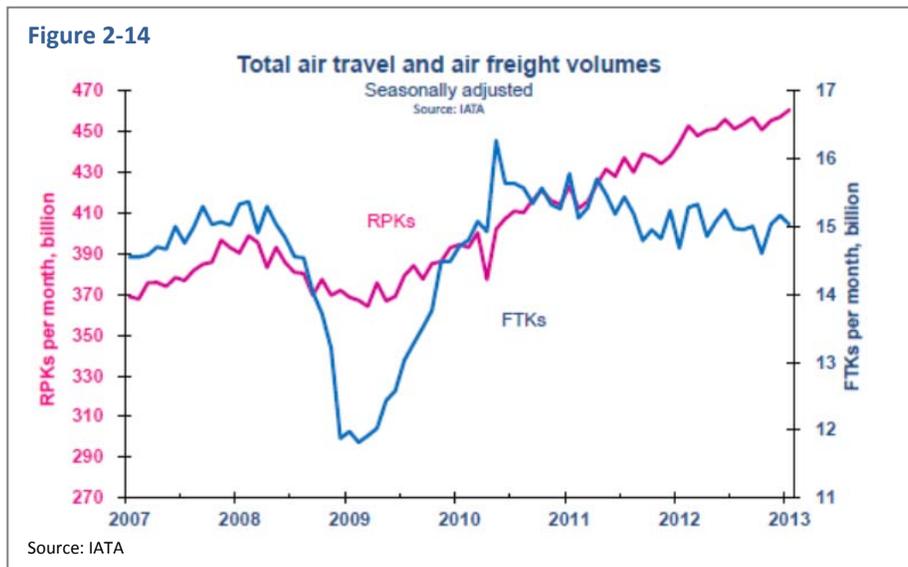


Over the past four years worldwide passenger traffic has grown fairly steadily since the decline caused by the financial crisis and recession in 2008 (see Figure 2-14). This is in contrast with air cargo traffic which declined sharply with the recession in late 2008, rebounded strongly in 2010, but has shown a slow decline since then.

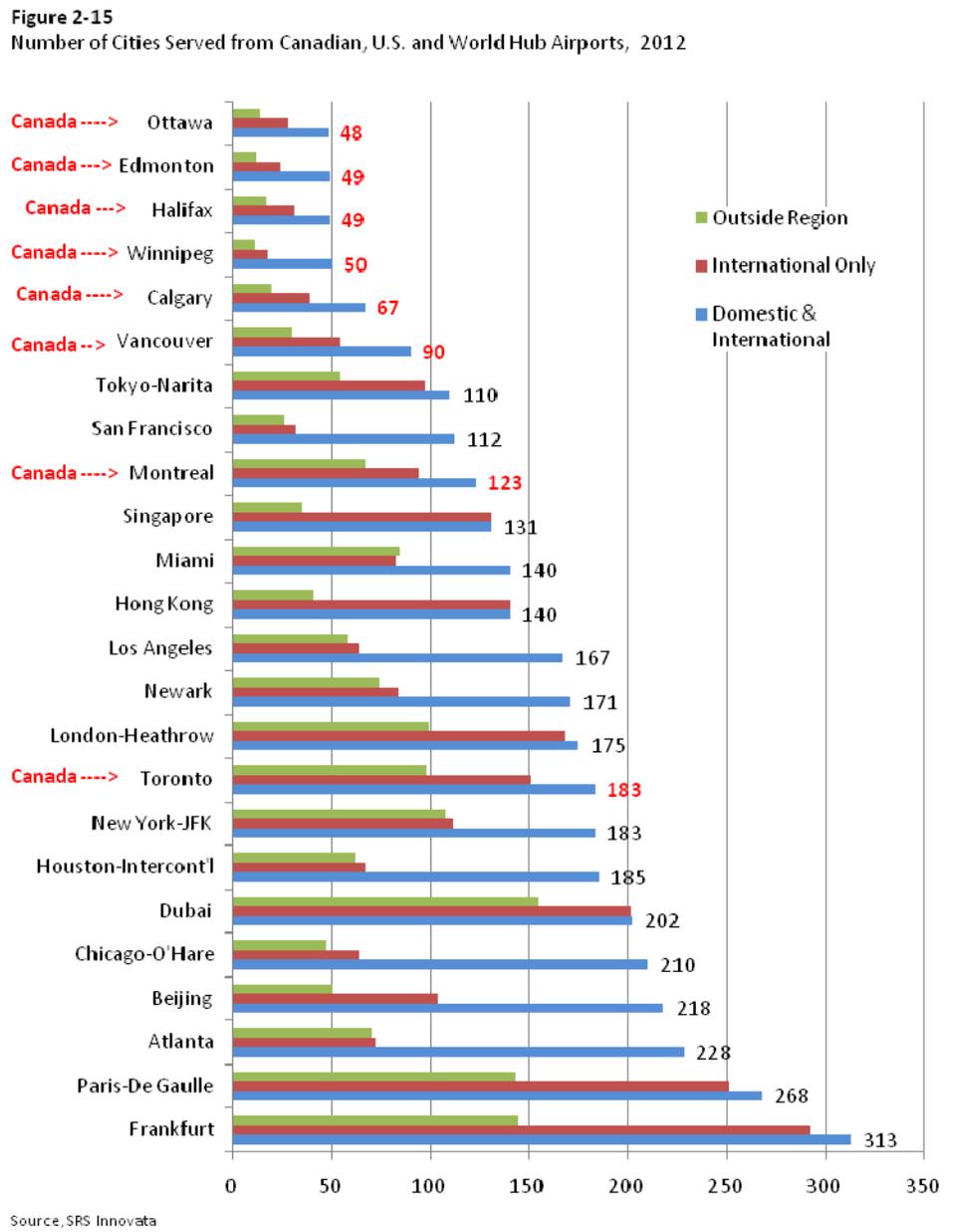
⁹ Number of O/D passengers per capita would be a better measure, but O/D passenger data by region is not available. One would expect the percentage of connecting passengers to be similar across regions in which case comparisons based on E/D passengers will be similar.

Hub Airports

Canadian hub airports are relatively small compared to major world hub airports considering total passenger traffic, but in terms of connectivity they fare better. The numbers of cities served from eight of Canada’s largest hub airports and sixteen other major hubs across the globe are presented in Figure 2-15. In terms of total cities served and total international destinations, Frankfurt with 313 cities served is the largest followed by Paris with 268. Toronto ranks highly, eighth of the hubs examined between New York-JFK and London-Heathrow, with 181 cities served. Montreal has service to 123 cities, ranked sixteenth between Singapore and San Francisco. The other Canadian airports have fewer cities served than the other hub airports examined.



When examining how Canadian airports rate as international hubs on connectivity, one must consider the geographical location of the hub airports. U.S. airports rate relatively poorly as international hubs as the U.S. is a large country with relatively few nearby countries, while European hubs have a majority of their service within Europe that is included as international. An alternative measure is to consider the numbers of cities served outside the hub airport’s local region. Dubai is the largest international hub airport on this measure, followed by Frankfurt and Paris. Toronto fares well on this measure, ranked sixth just behind New York-JFK and London-Heathrow, and well ahead of Chicago, Los Angeles, Houston and Atlanta. Montreal also fares well, ranked tenth ahead to Tokyo, Beijing and Hong Kong, and just behind Newark and Atlanta. The Asian hub airports don’t rate highly on this measure as much of their service is to airports within the region.



2.3 AIR CARGO MARKET

“Air cargo plays a critical role in driving economic growth and development. This is not always fully appreciated by governments.”¹⁰ More than \$5 trillion worth of goods are transported by air annually, or more than a third of world trade by value. For airlines, it accounts for about 12% of industry revenues¹¹ and can mean the difference between a viable and a non-viable route where air cargo is carried in the belly holds of passenger airplanes. Air cargo services are also vital to the livelihood of remote Canadian communities that are not connected by road or rail.

¹⁰ Tony Tyler, IATA’s Director General and CEO, International Air Transportation Association, 12 March 2013

¹¹ International Air Transportation Association, 12 March 2013

2.3.1 AIR CARGO IN CANADA TODAY

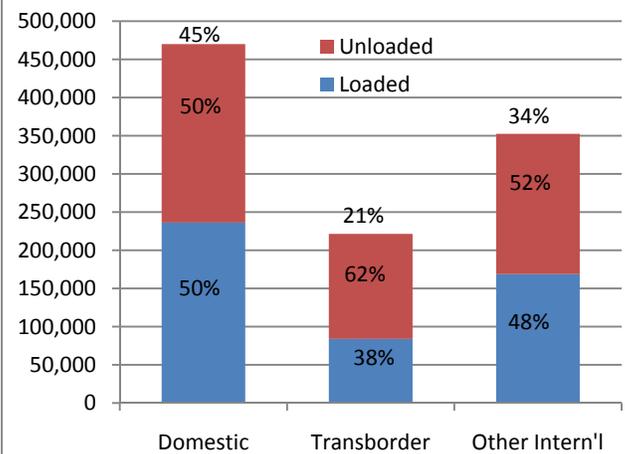
Almost 1.5 million tonnes of cargo was handled at Canadian airports in 2011¹², half of which was international. Table 2-2 summarizes the air cargo tonnages at the major cargo airports in 2011. Toronto Pearson Airport handled a third of the Canada's total tonnage and half the international tonnage.

Table 2-2
Cargo Tonnages at Canadian Airports, 2011

Airport	Domestic	Intern'l	Total	
Toronto Pearson	89,553	403,107	492,660	1
Vancouver	92,942	130,936	223,878	2
Calgary	65,645	56,067	121,712	1
Montreal - Trudeau	16,142	88,971	105,113	2
Montreal - Mirabel	95,518	0	95,518	1
Winnipeg	145,004	29,432	174,436	2
Hamilton	66,362	18,783	85,145	3
Edmonton	28,769	8,975	37,744	1
Halifax	27,281	1,982	29,263	2
Ottawa	16,406	8,557	24,963	2
Moncton	23,030	6	23,036	2
St. John's	8,814	36	8,850	3
Total of 12 airports	675,466	746,851	1,422,317	
Other airports^	11,107	38,968	50,075	4
Total Canada	686,573	785,819	1,472,392	

Sources: ACI-North America Air Traffic Database, and Statistics Canada: Air Carrier Traffic at Canadian Airports,

Figure 2-16
Air Cargo Tonnages by Sector and Direction, 2011
Tonnage, % by Sector, and % loaded/unloaded



Source: Statistics Canada

Notes:

- 1 Tonnages for domestic, international and total cargo reported by airports to ACI-NA
- 2 Total cargo tonnages reported by airports to ACI-NA, domestic and international tonnages estimated using percentage international from tonnages reported by Statistics Canada
- 3 Tonnages reported by Statistics Canada
- 4 Tonnages for "Other airports" based on tonnages reported by Statistics Canada

Approximately 45% of air cargo is domestic, 21% transborder and 34% other international – see Figure 2-16. More cargo on transborder flights is unloaded than loaded (62% vs. 38%), while on other international flights the split is fairly even.

¹² Tonnages reported by airports are typically greater than those reported by Statistics Canada as not all airlines report to Statistics Canada. Values reported by airports have been used where publically available, otherwise values reported by Statistics Canada have been used.

Airlines carrying air cargo can be classified into the four types: Belly, Mixed, Integrator and All-cargo (Table 2-3). Approximately 40-45% of cargo is carried in the belly of passenger flights by passenger airlines or by mixed passenger-cargo carriers. The proportion is even higher for international cargo, particularly on routes served using wide-body aircraft. Additional passenger service on these routes provides economical space for air cargo and helps stimulate growth in air cargo traffic and exports.

Table 2-3. Air Cargo Carrier Type

Carrier Type	Illustrative carriers	% of Cargo
Belly	Air Canada, WestJet, United, American	
Mixed	Cathay Pacific, Lufthansa, Air France, Calm Air, First Air	40-45%
Integrated	FedEx, Purolator, UPS, DHL	25%
All-cargo	Cargojet, Cargolux, Evergreen	30-35%

Airline competition in the cargo market is limited in Canada, especially for international service. Canada is reliant on foreign airlines for main deck lift for international service.

Following a similar trend as world air cargo traffic, shown in Figure 2-14, air cargo traffic in Canada grew strongly until 2007 but with the sharp increase in fuel prices and the recession, traffic fell by 25% over the next two years. Traffic increased strongly in 2010, but was still 2% below its 2007 peak, and traffic declined again, slightly, in 2011.

Considering the value rather than the tonnage of air cargo, the importance of air cargo to international trade becomes evident. Air transportation was used for almost \$28 billion of trade with the U.S. in 2011, and over \$82 billion of trade with other countries. Air transportation accounted for 5% of total trade (by value) with the U.S. and 24% of total trade with other countries. Air mode is becoming increasingly important for Canada in its trade with other countries; air mode's share of total Canadian trade with other countries has increased from 21.2% in 2003 to a high of 24.6% in 2010¹³.

2.3.2 CANADA'S SHARE OF THE GLOBAL AIR CARGO MARKET

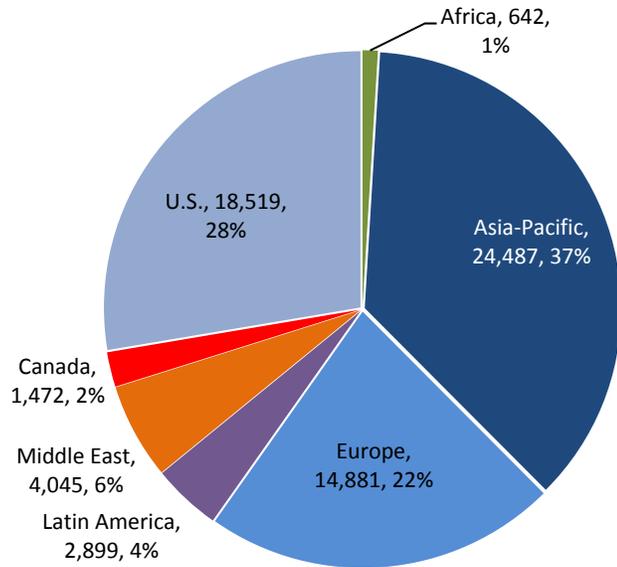
As with passenger traffic, Canadian airports account for 2% of the air cargo handled at airports worldwide (see Figure 2-17). To put Canada 2% share into a global context, airports in the Asia-Pacific region handle 37% of global air cargo, with the U.S. and Europe accounting for 28% and 22%, respectively. Airports in the Middle East and Africa had the strongest growth in air cargo in the two-year period, 2011-2012, but cargo traffic at European airports declined by 3% in 2012 due to the recession affecting economic activity in the region (Figure 2-18). Air cargo also declined over those two years in Canada and the U.S.

Canada's major trading partners using air transportation are the United Kingdom, China, Germany, Japan and France¹⁴. The most common commodities transported by air (in terms of value) to and from Canada are machinery and electrical equipment and other manufactured goods.

¹³ Transportation in Canada 2011, Transportation Canada report TP14816

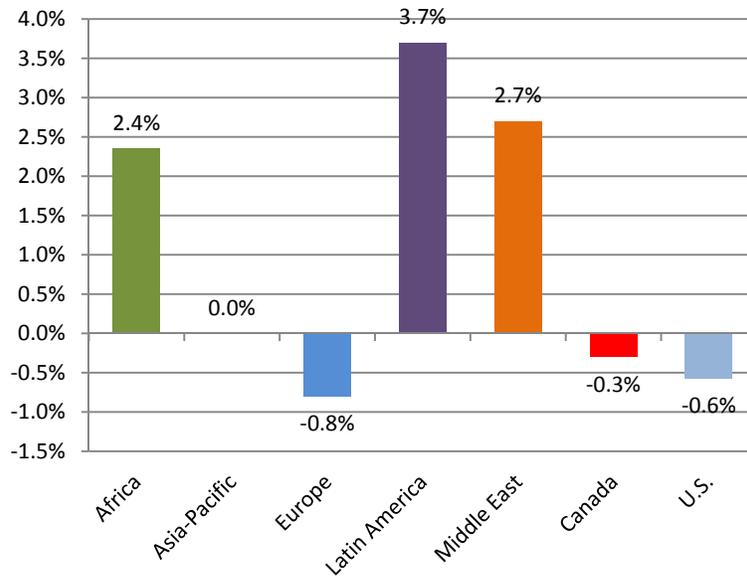
¹⁴ Policy Analysis of Issues Relating to Air Cargo, prepared for Transport Canada by Jacobs Consultancy Canada Inc, 2008.

Figure 2-17
E/D Air Cargo by Country/Region, 2012
Tonnes (000) and % of Total



Source: ACI

Figure 2-18
Growth in Air Cargo by Country/Region, 2011 and 2012
Average Annual Growth (%)



Source: ACI

Note: Growth in Canada in 2012 assumed to be same as for N.America

3 THE ECONOMIC FOOTPRINT OF THE AIR TRANSPORTATION INDUSTRY

3.1 INTRODUCTION

The results from the economic footprint analysis are broken into three subsections that detail the impacts on key economic indicators, real GDP and employment. Each subsection is then used to discuss the results from the base economic footprint analysis for the air transportation industry as a whole and then the base footprint results for the Canadian airport industry.

3.2 ECONOMIC FOOTPRINT

3.2.1 BASE ECONOMIC FOOTPRINT

The air transportation industry provides many benefits to the economy through the sales, jobs and taxes generated by firms operating in the sector. Moreover, air transportation companies create supply-chain (indirect) effects on other businesses in the country through demand for services and products, such as jet fuel and finance, insurance, and real estate services, resulting in further economic benefits. But impacts stretch beyond these supply-chain impacts. The air transportation industry also influences the economy through what economists refer to as “induced effects.” When employees of the air transportation industry (along with those of suppliers) spend their wages, the economy receives an additional economic boost in the form of new jobs and activity generated through consumer spending. Similarly, higher profits generated by the lift to economic activity will lead to a modest boost to private capital investment. The sum of the direct, indirect, and induced effects represents the overall (total) contribution, or the economic footprint, that the industry has on Canada’s economy.

When accounting for direct, indirect and induced impacts, **the air transportation industry had an economic footprint of \$30.9 billion in 2012** (measured in 2012\$). (See Table 3-1 for a summary of the air transportation industry’s impact on key economic indicators).

The air transportation industry supported a total of 343,800 jobs in 2012. Moreover, overall job creation in the air transportation industry and those that benefit indirectly or through induced impacts resulted in \$17.4 billion in personal income. The increased economic activity also benefits businesses supported by the air transportation industry with pre-tax corporate profits of \$3.5 billion. This increased income provides a total of \$7.4 billion in taxes to government revenues including \$3.2 billion in personal income taxes, \$3.7 billion in indirect taxes (which consist mostly of sales and excise taxes) and \$575 million in corporate income taxes. **The taxes collected are 26 times higher than the total rents paid by airports to the federal government.** The federal government balance benefited from the increased economic activity by \$7.3 billion in 2012 while the aggregate provincial/territorial governments’ balance is improved by \$4.9 billion (due to other factors in addition to tax revenues, such as reduced EI payments and higher royalty payments).

Table 3-1. Key Economic Indicators - Air Transportation Industry - Base Economic Footprint

	2008	2009	2010	2011	2012
Real GDP at market prices (2012 \$ millions)	27,818	27,860	29,121	30,313	30,916
Average weekly wages industrial composite (percentage difference)	0.2	0.2	0.2	0.2	0.2
Employment (000s)	317.6	312	320	337.8	343.8
Personal income (2012 \$ millions)	15,445	15,482	16,119	16,959	17,357
Pre-tax corporate profits (2012 \$ millions)	2,819	2,961	3,395	3,396	3,542
Personal income tax (2012 \$ millions)	2,876	2,862	2,965	3,082	3,152
Corporate income tax (2012 \$ millions)	518	495	552	545	575
Indirect taxes (2012 \$ millions)	3,158	3,313	3,473	3,623	3,698
Federal govt. balance (2012 \$ millions)	6,729	6,607	6,811	7,126	7,293
Regional govt. balance (2012 \$ millions)	4,634	4,110	4,494	4,745	4,934

Source: The Conference Board of Canada.

The total base economic footprint of Canadian airports, including direct, indirect and induced impacts was \$8.6 billion in 2012. (See Table 3-2 for a summary of the airport industry's impact on key economic indicators). This increase in output supported 91,000 jobs in 2012 lifting personal income up by \$4.7 billion. Pre-tax corporate profits increased by \$1.1 billion. The increase in profits and income resulted in \$2 billion in tax collection with an \$857 million increase in personal taxes, a \$1 billion increase in indirect taxes and a \$167 million increase in corporate taxes. The federal government balance improved by \$2 billion while the aggregate provincial government balance improved by \$1 billion.

Table 3-2 Key Economic Indicators – Canadian Airports - Base Economic Footprint

	2008	2009	2010	2011	2012
Real GDP at market prices (2012 \$ millions)	8,221	8,240	8,415	8,652	8,563
Average weekly wages industrial composite (percentage difference)	0.05	0.05	0.05	0.05	0.05
Employment (000s)	87.2	88.6	90.0	93.1	91.0
Personal income (2012 \$ millions)	4,339	4,465	4,614	4,764	4,697
Pre-tax corporate profits (2012 \$ millions)	969	979	977	1,028	1,066
Personal income tax (2012 \$ millions)	800	817	845	865	857
Corporate income tax (2012 \$ millions)	178	164	155	161	167
Indirect taxes (2012 \$ millions)	906	955	988	1,014	1,007
Federal govt. balance (2012 \$ millions)	1,889	1,888	1,910	1,970	1,951
Regional govt. balance (2012 \$ millions)	877	921	963	996	998

Source: The Conference Board of Canada.

3.2.2 REAL GROSS DOMESTIC PRODUCT (GDP)

While the data in the previous section has been converted to a 2012 base year, the data in this section is in 2002\$, the base year in the CBoC's national model. It is not possible to rebase the industry estimates into a more current base year as the multiplier estimates reflect the price and volume relationships that exist in the base year and changing individual industry prices nullifies the multiplier relationships.

In 2012, real direct GDP in the air transportation industry was estimated to be \$8.8 billion in 2002\$. The economic multiplier—which measures the sum of the direct, indirect and induced impacts relative to the direct impact—is estimated by the Conference Board to be 3.0 in the air transportation industry. As a result, the total economic footprint of the industry in 2012 was \$26.2 billion (2002\$), representing 2 per cent of Canadian real GDP.

Table 3-3. Components of GDP by Industry - Air Transportation Industry Base Economic Footprint

	2008	2009	2010	2011	2012
Millions of 2002 Dollars (Basic Prices)					
Real gross domestic product	24,347	22,920	24,407	25,632	26,154
Total goods	4,357	4,107	4,369	4,583	4,662
Crop, forestry, fishing and trapping and support	126	118	126	133	137
Mining	2,254	2,122	2,260	2,373	2,417
Utilities	376	353	377	398	408
Construction	232	221	233	243	244
Manufacturing	1,369	1,293	1,372	1,436	1,457
Business services	19,397	18,257	19,443	20,421	20,845
Wholesale & retail trade	1,583	1,483	1,587	1,675	1,722
Wholesale trade	879	824	881	928	951
Retail trade	705	658	706	747	771
Transportation & warehousing	10,773	10,175	10,798	11,301	11,481
Truck transportation	335	321	336	347	344
Transit and ground passenger transportation	85	81	86	89	89
Pipeline transportation	169	160	170	177	179
Other transportation	9,653	9,096	9,681	10,160	10,334
Postal service and couriers and messengers	486	475	482	482	488
Warehousing and storage	44	42	44	46	46
Information & cultural services	790	742	792	833	853
Finance, insurance & real estate	3,373	3,157	3,381	3,570	3,672
Professional, scientific and technical	1,093	1,024	1,096	1,156	1,187
Other business services	1,785	1,676	1,789	1,884	1,929
Public sector	594	556	595	629	647
Multiplier	2.9	2.9	2.9	3.0	3.0
Air transportation industry real GDP	8,261	7,819	8,281	8,648	8,760

Source: The Conference Board of Canada.

A multiplier of 3.0 is relatively high owing to the fact that the air transportation industry is a very capital intensive industry and therefore creates a lot of demand through its supply-chain resulting in a large indirect impact. Furthermore, air transportation is a high wage industry and generates demand for goods and services in other high wage industries such as mining (oil & gas) and finance, insurance and real estate. As a result, in addition to having a large indirect impact, air transportation also has a significant induced impact on economic activity. (See Table 3-3 for the total economic footprint of the air transportation industry on the components of GDP by industry).

Table 3-4. Components of GDP by Industry – Canadian Airports Base Economic Footprint

	2008	2009	2010	2011	2012
Millions of 2002 Dollars (Basic Prices)					
Real gross domestic product	7,325	7,043	7,354	7,565	7,439
Total goods	995	957	999	1,028	1,011
Crop, forestry, fishing and trapping and support	23	22	23	24	23
Mining	152	146	153	157	155
Utilities	90	86	90	93	91
Construction	138	133	139	143	141
Manufacturing	592	569	594	611	601
Business services	6,228	5,988	6,252	6,432	6,325
Wholesale & retail trade	290	279	291	300	295
Wholesale trade	211	203	212	218	214
Retail trade	79	76	79	81	80
Transportation & warehousing	4,202	4,040	4,218	4,339	4,267
Truck transportation	270	260	271	279	274
Transit and ground passenger transportation	52	50	53	54	53
Pipeline transportation	83	80	83	86	84
Other transportation	3,732	3,589	3,747	3,854	3,790
Postal service and couriers and messengers	36	35	36	37	37
Warehousing and storage	28	27	28	29	28
Information & cultural services	235	226	236	243	239
Finance, insurance & real estate	637	613	640	658	647
Professional, scientific and technical	244	234	245	252	248
Other business services	620	596	622	640	630
Public sector	102	98	103	106	104
Multiplier	2.0	2.0	2.0	2.0	2.0
Airport industry real GDP	3,667	3,526	3,681	3,787	3,724

Source: The Conference Board of Canada.

At \$11.5 billion, the largest impact is on the transportation and warehousing industry. Most of that is the \$8.8 billion direct impact, but there is also a significant indirect impact on support activities for air transportation (shown in other transportation in Table 3-3). Real GDP in the finance, insurance and real estate industry is up \$3.7 billion with large increases in the banking and credit depository intermediation and the lessors of real estate subcomponents. Real GDP in the mining industry is up by \$2.4 billion as there is a large indirect impact on oil and gas extraction, given that jet fuel is one of the largest inputs in the air transportation industry. Manufacturing is up by \$1.5 billion thanks to increased demand for aerospace product and parts and refined petroleum products.

Real GDP of **Canadian airports** was \$3.7 billion in 2012 (measured in 2002\$). When including the indirect and induced impacts, the footprint increased to \$7.4 billion (0.6 per cent of national real GDP), a multiplier of 2.0. The largest impact is on the transportation and warehousing industry, which mostly reflects the direct impact from airports. (See Table 3-4 for the total economic footprint of the airport industry on the components of GDP by industry). The majority of the indirect and induced impacts are on the service sector with finance, insurance and real estate increasing by \$647 million and other business services (which includes industries such as accommodation and food services and administration and support) increasing by \$630 million.

3.2.3 EMPLOYMENT IMPACTS

According to Statistics Canada, the air transportation industry directly employed 71,177 people in 2012 while support activities for air transportation directly employed 27,979 people. But given the industry's large multiplier effects, the total impact on employment is also quite large. When including all direct, indirect and induced impacts, the air transportation industry supported 343,800 jobs in Canada in 2012. (See Table 3-5). The largest impact is in transportation and storage with total employment up 158,400. Notable increases also occurred in other commercial services (up 91,800) and wholesale and retail trade (up 30,900).

Table 3-5. Labour Market Impacts by Sector – Air Transportation Industry Base Economic Footprint

	2008	2009	2010	2011	2012
(000s)					
Total employment	317.6	312	320	337.8	343.8
Primary	13.3	13.2	14	14.4	14.4
Construction	3.6	3.7	3.9	4.1	4.2
Utilities	1.8	1.8	1.9	2.0	2.1
Manufacturing	15.3	15.2	15.0	15.2	15.0
Other commercial services	79.7	77.3	83.7	89.4	91.8
Wholesale and retail trade	28.9	27.9	28.8	30.4	30.9
Transportation and storage	151.6	149	147.8	156.2	158.4
Finance, insurance and real estate	13.8	13.9	14.4	15.1	15.6
Public sector	9.6	10.1	10.7	11.1	11.4

Source: The Conference Board of Canada.

Data from Statistics Canada show that support activities for air transportation directly employed 27,979 people in 2012. When including the direct, indirect and induced impacts, total employment supported by Canadian airports was 91,000. The employment multiplier is higher in the airport industry than in the air transportation industry as a whole as the majority of the impacts in the airport industry are in the service sector where it takes more employment to support each million dollar increase in real GDP. The largest employment increase was in transportation and storage due to the direct employment but there was also a sizeable gain in other commercial services where employment increased by 28,000. (See Table 3-6 for a complete breakdown of employment by industry).

Table 3-6. Labour Market Impacts by Sector – Canadian Airports Base Economic Footprint

	2008	2009	2010	2011	2012
(000s)					
Total employment	87.2	88.6	90.0	93.1	91.0
Primary	1.0	1.1	1.1	1.1	1.1
Construction	2.1	2.2	2.3	2.4	2.4
Utilities	0.4	0.4	0.5	0.5	0.5
Manufacturing	6.6	6.7	6.5	6.5	6.2
Other commercial services	25.9	25.8	27.1	28.3	28.0
Wholesale and retail trade	5.3	5.2	5.3	5.4	5.3
Transportation and storage	41.7	42.8	42.8	44.4	43.1
Finance, insurance and real estate	2.6	2.7	2.7	2.8	2.8
Public sector	1.5	1.6	1.7	1.7	1.7

Source: The Conference Board of Canada.

3.3 ADDITIONAL IMPACTS

As discussed in the methodology section, the direct economic impact in terms of employment and GDP of additional services not included in the base economic footprint were estimated by using a variety of data sources. The additional direct impacts were estimated for each component using data on either the employment levels and typical or average salaries, or personnel costs and other expenditures. Where salaries were used, an allowance of 30% was included to cover employee benefits such as annual leave, sick leave and pension/retirement contributions. In addition, the return on capital was estimated either by applying a rate of return to the net book value of assets (if available), or adding an additional 15% on top of the returns to labour. The additional direct impacts in terms of employment and GDP are summarized in Table 3-7. It should be noted that the additional impact for GA excludes payments to airports and aircraft support services, and the travel arrangement component includes on that part of their services related to arranging air travel. The total direct impact of these components is significant, providing almost 42,000 full-time equivalent jobs and almost \$2.3 billion to GDP.

Table 3-7. Additional Direct Impacts – Air Transportation Industry

	Employment	GDP (million)
On-Site Government Agencies	10,800	\$5,50
General Aviation	9,400	\$780
Other Commercial Airport Tenants	14,100	\$520
Civil Aviation Regulator, Safety Board	1,100	\$130
Pass. Travel & Freight Arrangers	6,400	\$3,10
TOTAL	41,800	\$2, 290

Total additional impacts (including direct, indirect and induced) are estimated to be 61,100 full-time jobs and \$4.0 billion in real GDP¹⁵.

3.4 TOTAL ECONOMIC FOOTPRINT

The total economic footprint of the air transportation industry is estimated by adding the employment and GDP of the additional services to the base economic impact. These results are summarized in Table 3-8. The industry directly supports 141,000 jobs, producing \$10.6 billion in direct GDP (2002\$). Including multiplier effects and inflation, the air transportation industry supports almost 405,000 jobs, generating \$34.9 billion in GDP.

Table 3-8. Total Economic Footprint – Air Transportation Industry

	GDP (2002\$)		GDP (2012\$)	EMPLOYMENT (000)	
	Direct	Total	Total	Direct	Total
Base Economic Footprint	\$8.8 B	\$26.2 B	\$30.9 B	99.2	343.8
Additional Impacts	\$1.8 B	\$3.1 B	\$4.0 B	41.8	61.1
TOTAL	\$10.6 B	\$29.3 B	\$34.9 B	141.0	404.9

The total economic footprint of Canadian airports is estimated by adding the employment and GDP of the additional services based at the airport to the base economic impact of Canadian airports. These results are summarized in Table 3-9. Canadian airports directly support almost 63,000 jobs, producing \$5.2 billion in direct GDP (2002\$). Including multiplier effects and inflation, almost 142,000 jobs are supported by Canadian airports, generating \$11.9 billion in GDP.

Table 3-9. Total Economic Footprint – Canadian Airports

	GDP (2002\$)		GDP (2012\$)	EMPLOYMENT (000)	
	Direct	Total	Total	Direct	Total
Base Economic Footprint	\$3.7 B	\$7.4 B	\$8.6 B	27.9	91.0
Additional Impacts	\$1.5 B	\$2.6 B	\$3.3 B	34.7	50.7
TOTAL	\$5.2 B	\$10.0 B	\$11.9 B	62.6	141.7

¹⁵ The multiplier was estimated by mapping the categories to the appropriate industrial code and then calculating a weighted average multiplier based on GDP and employment shares.

4 DOWNSTREAM BENEFITS

The economic footprint of the air transportation industry estimates the impact that the industry has on GDP, employment and taxes through its production inputs. On the other hand, the *services* that the air transportation industry provides have a value that is beyond just the cumulative amount of air fare revenues that are generated as a result. One method of quantifying this value is by estimating the consumer surplus that passengers and shippers capture when purchasing air transportation services.¹⁶ This is discussed below, and essentially covers all of the benefits not included in the industry's GDP calculation.

This study also identifies specific, large downstream benefits associated with the air transportation industry such as increased tourism and trade, foreign direct investment and labour productivity, as well as the criticality of air transportation to developing Canada's north, and providing essential social services.

While it is not possible to quantify the values of each of these benefits, an analysis of the consumer surplus generated by air travel provides a method of estimating, at least approximately, their total benefit as well as the benefits associated with trade and connectivity.

4.1 TOURISM

Air transportation is a critical enabler of the tourism industry, particularly for international tourism. Spending by air passengers on their trips can be considered as downstream or catalytic impacts of the air transportation industry. As shown in Table 4-1, a total of 7.5 million visitors to Canada spend almost \$7.6 billion in Canada in 2012, the large majority (72%) by overseas visitors. There were also nearly 20 million domestic person-trips by air in 2012 and total spending by these travellers is estimated at just under \$10 billion.

Table 4-1. Number of Air Trips and Expenditures Excluding Airfares by International Visitors Using Canadian Airports

Segment		2010	2011	2012
U.S. visitors	(000s)	3,548	3,597	3,695
Average spend (1)		\$508	\$532	\$547
Overseas visitor direct	(000s)	2,742	2,843	2,835
Average spend		\$1,514	\$1,532	\$1,575
Overseas visitor via U.S.	(000s)	956	959	988
Average spend (2)		\$1,032	\$1,060	\$1,089
Total Visitors	(000s)	7,246	7,398	7,517
Average spend		\$957	\$984	\$1006
Total spend	(million)	\$6,937	\$7,283	\$7,560

Sources: Statistics Canada, Table 427-0001- Number of international travellers entering or returning to Canada, by type of transport, monthly (persons), CANSIM (database).
Statistics Canada, Tourism Snapshot 2011 Year-end Review, and 2010 Year-end Review

Notes:

- (1) Assumes visitors by plane spend same as average of all modes for stay of one or more nights
- (2) Assumes that those flying via the U.S. spend 25% less in Canada than those travelling direct to Canada as they spend part of their trip in the U.S.

¹⁶ Braun, Klophaus and Lueg-Arndt (2010), "Wider Economic Benefit of Air Transport: Estimating Consumer Surplus for German."

These data should be contrasted with spending by Canadians abroad after travelling by air. While a stronger air transportation industry will foster more visitors to Canada, it will also enable more travel by Canadians abroad. It is particularly for this reason that the tourism impact has not been added to the total economic footprint of the industry.

4.2 CONNECTIVITY

Air transportation connectivity impacts many things in a significantly positive manner, most notably international trade, foreign direct investment and labour productivity. It is also key to developing Canada's north through natural resource exploration and exploitation.

4.2.1 TRADE

There are both natural and artificial barriers to international trade. Of the most important natural barriers to trade is distance. Just as a tax on imports or exports will reduce trade, a greater physical distance between prospective trade partners will also reduce trade. Better and more efficient and affordable air transportation links help to reduce the implicit tariff that results from the natural barrier of distance.

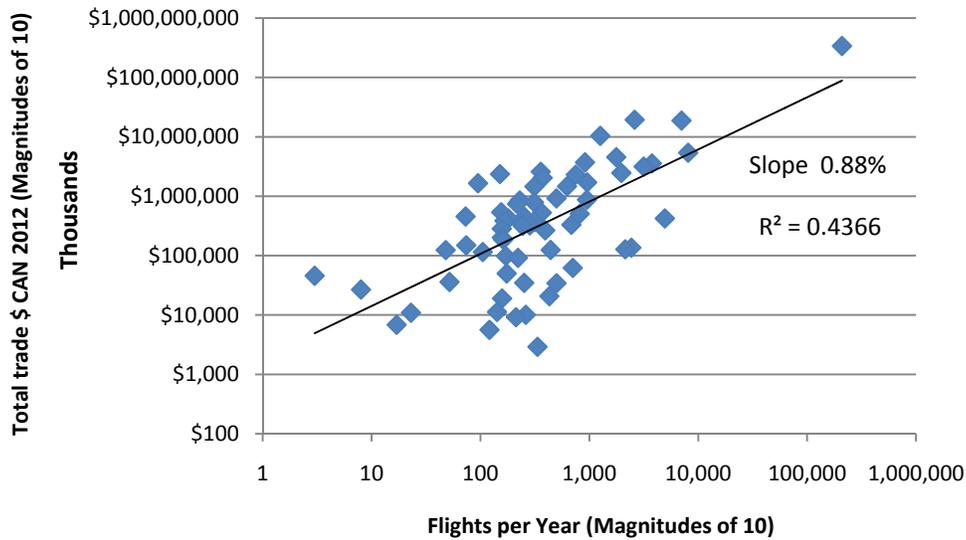
Increased trade itself is not itself a benefit. The benefit arises as a result of the efficiency gains from trade. For example, a larger trade market allows for greater specialization in production. In other words, it allows more businesses and/or countries to focus on what they are comparatively efficient at producing.

One way to observe the impact of air transportation on international trade is by identifying the correlation between air transportation connectivity and the level of trade between specific countries. This does not explain the cause and effect. It is expected that better air transportation connectivity facilitates trade, but a greater trade relationship between two countries also stimulates demand for air travel between the two countries. However, observing the relationship at least provides for an indication of what the upper end of air transportation's explanatory power of international trade is.

As shown in Figure 4-1, the level of trade between Canada and other countries is correlated with the numbers of flights to those countries (shown on a log-log scale) – the larger the number of flights, the greater the trade value. The degree to which the level of air connectivity causes an increase in trade is beyond the scope of this study. However, the ability for business people to easily travel between two countries would be expected to result in more business, but the level of air service is driven by demand for the flights which is related to, among other things, the level of business activity between the two countries. Figure 3-2 shows the relationship still exists when considering only developing countries, but is weaker.

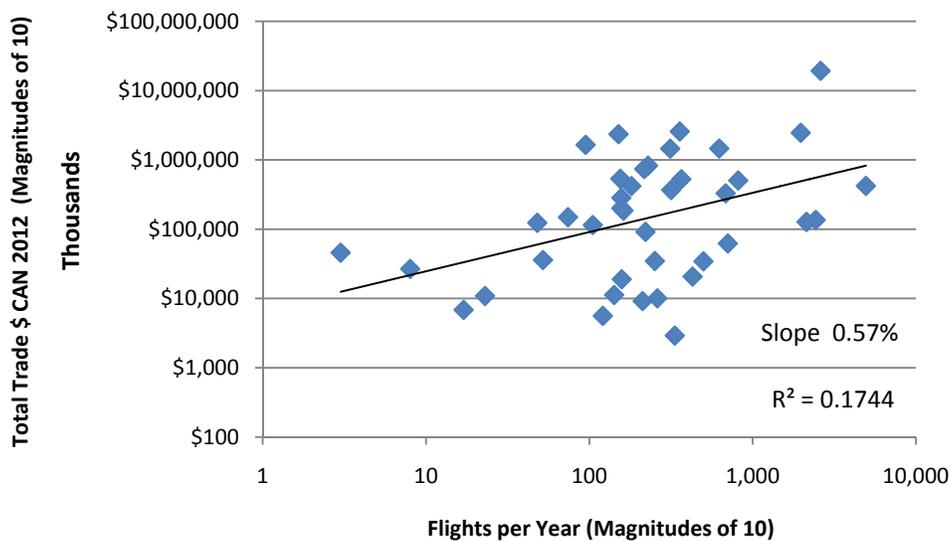
The slope of the line, estimated at 0.88 in Figure 3-1, can be interpreted as an indication that a 1% increase in flights is associated with a 0.88% increase in trade. In other words, in Canada we tend to trade more with the countries that we fly to more often, however correlation does not prove this will be the case for all countries. For Non-OECD countries (Figure 3-2) the slope of 0.57 can be interpreted that a 1% increase in flights is associated with a 0.57% increase in trade. In both cases there is a broad indication that more flights connote more trade.

Figure 4-1
Flights and Trade Between Canada and Other Countries, 2012



Source: SRS Innovata, Canadian On-line Trade Database

Figure 4-2
Flights and Trade Between Canada and Non-OECD Countries, 2012

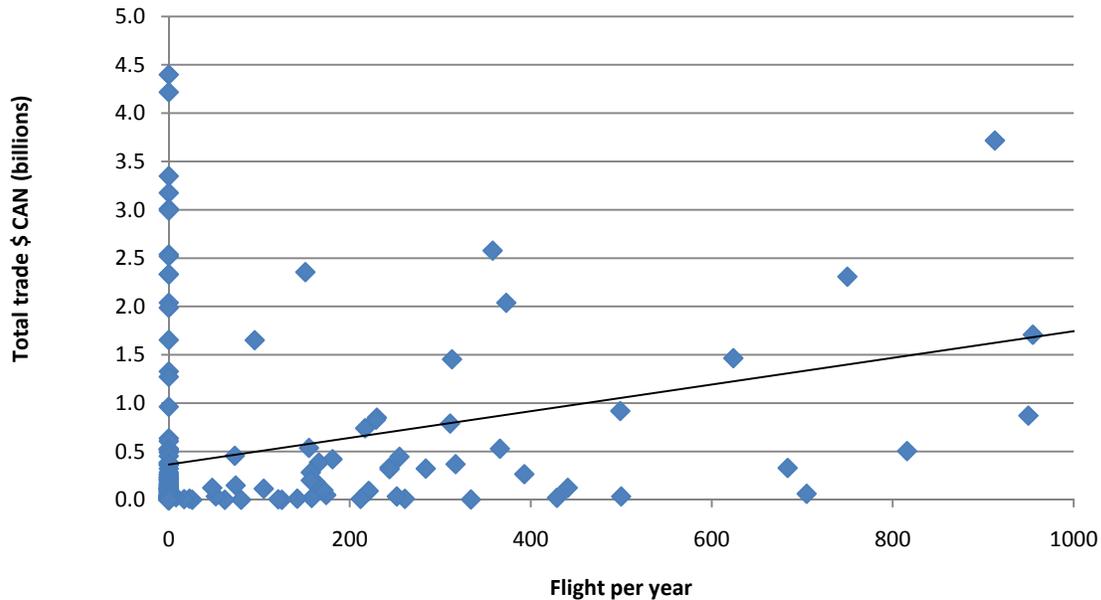


Source: SRS Innovata, Canadian On-line Trade Database

To get a fuller appreciation of the relationship between air service and trade, we need to also consider countries where there is no air service with Canada – these are not included in Figures 4-1 and 4-2. Figure 4-3 shows the numbers of flights versus the value of trade for countries with zero or limited flight and trade with Canada. While most countries with zero flights have very little trade with Canada, there are a small number with significant trade such as Norway, Iraq, Saudi Arabia, and Thailand all with over \$3 billion in trade value for 2012. Similarly there are some countries with direct air service and very little trade with Canada, although these are mostly vacation

destinations in the Caribbean. While availability of direct flights is not a sufficient condition to increase trade between Canada and other countries, direct connections can act as a catalyst of business opportunities and this is borne out by the data.

Figure 4-3
Flights and Trade Between Canada and Other Countries with Zero to 1,000 Flights and Excluding Larger Trade Partners, 2012



Source: SRS Innovata, Canadian On-line Trade Database

4.2.2 FOREIGN DIRECT INVESTMENT AND LABOUR PRODUCTIVITY

A study examined the linkage between the increase in air transportation connectivity and the change in foreign direct investment (FDI) and economic growth¹⁷. Air transportation connectivity (which considers flight frequency and the number of destinations, weighted by the importance of each destination) was found to be correlated with higher amounts of FDI relative to a country's GDP.

Another study found that connectivity has a statistically significant link with labour productivity (and therefore GDP).¹⁸ It found that the elasticity of labour productivity with respect to connectivity was approximately 0.007. In other words, an increase in air transportation connectivity of 10 per cent is associated with an increase in labour productivity of 0.07 per cent. In the context of Canadian GDP, this would amount to approximately \$1 billion in increased output. Air transport allows friends and relatives spread across the country to visit each other thus encouraging workers to move to areas where they are most needed, benefiting themselves and Canada as a whole.

It should be noted that while there is significant evidence of the correlations between connectivity and, FDI, labour productivity and trade, it is difficult to disentangle correlation and causality. While it makes intuitive sense that better connected areas are more productivity due to better access to buyer and supplier markets and more competitive markets and general, it is also expected that wealthier regions also *demand* more air transportation

¹⁷ Oxford Economics (2009), *Economic Benefits from Air Transportation in Canada*, 8.

¹⁸ Smyth and Pearce (2007), *Aviation Economic Benefits*, 8.

services. As a result of this feedback loop we can generally expect that some but not all of the correlation can be explained with connectivity being the causal factor.

4.2.3 NORTHERN ECONOMIC DEVELOPMENT

Air transport is critical to economic development in the North. First Air's Hercules aircraft for example are particularly useful for delivering oversized cargo to remote mining and exploration sites,¹⁹ which are in turn a large source of employment in those regions. In a recent report²⁰, the Conference Board of Canada forecasts that overall, the Northwest Territories, Yukon and Nunavut are poised to generate GDP growth of 5.4% in 2014, stating that "mining will be one of the most important economic drivers in Northern Canada in the years ahead". As the economy in the north grows, so will demand for air services and making air travel more attractive and affordable will spur this development.

4.2.4 ECONOMIC DEVELOPMENT OUTSIDE OF MAJOR URBAN CENTRES

Efficient air transportation makes it possible for those providing professional services in industries such as financial services, engineering, consulting, goods and manufacturing, telecommunications, etc. to live in smaller communities while at the same time serving their customers throughout Canada and around the world.

4.3 SOCIAL BENEFITS

4.3.1 ACCESS FOR REMOTE COMMUNITIES

Most Canadian provinces and territories have significant and growing populations in the north, and with climate change, have an increased reliance on air transportation for access to/from their communities, and to essential goods and social services. For example, there is no permanent road network in Nunavut. And only 19 per cent of residents have year-round access to roads in NWT (many roads are winter roads). Winter roads are typically available for use beginning in November or December and ending in March or April. However, the period of time during which winter roads are available for use has been declining due to milder winters. Reliance on winter roads is not exclusive to Canadians who live in the territories. For example, over 25,000 people in 28 communities in Northern Manitoba are served by 2,300 km of winter roads that are constructed every year.²¹ Similar demographics exist in many other provinces including Ontario, Quebec, British Columbia, Alberta, and Newfoundland and Labrador. An ATAG study²² concludes that air transportation to/from remote communities promotes social inclusion by connecting those living in such communities with the rest of the country.

As a result, air transportation services – both passenger and cargo – are vital to the livelihood of Canadians in remote regions, particularly during the remainder of the year where winter roads are not available. Carriers such as First Air, Air North, Ken Borek Air, Calm Air, Aklak, Air Tindi, and Perimeter Airlines provide these services by operating to and from remote and regional airports. Many of the aircraft operated by these carriers are in fact equipped to land on gravel and ice-strip runways. And many are "combi" aircraft that can be configured to accommodate passenger and cargo in various combinations.

Northerners depend on air transportation services for the delivery of necessities such as food products and access to emergency care.

¹⁹ First Air, "Our Fleet." <http://www.firstair.ca/about/fleet/> (accessed March 18, 2013).

²⁰ Territorial Outlook: Winter 2013 (March 2013), as summarized in a Wall Street Journal article "Economic Growth Heating Up in Canada's North", March 18, 2013

²¹ Bristow and Gill (2011), *Northern Assets: Transportation and Infrastructure in Remote Communities*. The Conference Board of Canada, 28.

²² The economic and social benefits of air transportation 2008, ATAG

4.3.2 EMERGENCY RESPONSE AND HUMANITARIAN RELIEF

Airports play a critical role in supporting the movement of specialized emergency personnel, equipment and supplies, be they involved in police, military, health care, or hydro maintenance activities. While difficult to quantify, there are many examples of how the availability of airports as support infrastructure results in increased survival rates (air ambulance services); early restoration of hydro after severe storms; lives being saved through aerial search and rescue activities; and crime rates drop through provision of social, police and judicial services via air.

Provincial and Territorial governments attempt to minimize the number of forestry resources destroyed by forest fires. To do so, they rely heavily on air transportation to move fire crews, equipment, fuel and supplies, and to suppress fires through use of specialized aircraft. Airports provide key infrastructure to support fire management programs.

4.3.3 OTHER IMPACTS

The growth rate of air traffic exceeds that of the industry's contribution to climate change, and the industry as a whole is working towards carbon-neutral growth through more fuel-efficient and quieter aircraft, as well as more efficient flight paths and approach patterns.

ATAG also states other impacts including that:

- by providing a wide choice of holiday destinations around the world through affordable means, air transportation broadens people's leisure and cultural experiences; and
- air services allow firms to shorten delivery times, minimize inventory costs, and limit interruptions to production.

4.3.4 CONSUMER SURPLUS

The consumer surplus is the aggregate value of the willingness-to-pay for individual air fares less the actual air fare paid. For example, if a traveller purchases an air fare for \$500 but would have paid up to \$600 for the same air fare, the consumer surplus is \$100. For the *marginal* traveller, the consumer surplus is or approaches zero. If the fare increases even incrementally – they will choose not to fly.

The lower the elasticity of air fares, the higher the aggregate consumer surplus. A study that used conservative estimates for air fare price elasticities (in the range of -0.8 to -1.1) estimated that the consumer surplus that Canadians derived from air travel was approximately \$32 billion in 2009.²³ This indicates that the total value that consumers place on the industry is roughly double the cumulative of GDP produced by industry.

²³ Oxford Economics (2009), *Economic Benefits from Air Transportation in Canada*, 8.

5 IMPACTS OF TRAFFIC DIVERSION

5.1.1 INTRODUCTION

Diversion of traffic from use of Canadian airports can occur in a number of ways, including:

- Flying from a U.S. border or hub airport rather than a Canadian airport;
- Overseas visitors flying to the U.S. and crossing into Canada by surface mode;
- U.S. visitors flying to a U.S. border airport and crossing into Canada by surface mode;
- Travelling by surface mode to a more distant hub airport in Canada rather than using the local airport; and
- Travelling by surface mode on long trips where air is generally the preferred option.

The various types of diversion affect both passenger and cargo traffic, but to different extents. The numbers of passengers likely not using Canadian airports for each of the above types of diversion are discussed below.

5.1.2 LEVELS OF DIVERSION

Diversion to U.S. Border Airports

A study for the Canadian Airports Council examined the use of U.S. border airports by Canadian residents and estimated the diversion to be approximately 5 million O/D passengers in 2011. The primary reason for the use of U.S. border airports was the availability of much lower airfares, inclusive of taxes and charges. Not all these passengers would have flown from a Canadian airport if they did not have the opportunity to choose a U.S. airport with a lower fare. Some of them would not have flown at all if the higher priced Canadian option was the only option. In addition, many people drive rather than fly from either Canadian or U.S. border airports due to the high fares which include taxes and charges not levied on road passengers. It indicates that there is an opportunity for Canadian airports to capture significantly more traffic if the fares available from their airport were lower.

Overseas Visitors Entering Canada by Surface Modes

Over 610,000 overseas visitors entered Canada by land in 2012, equivalent to 1.22 million O/D passengers. This represents almost 40% of the current overseas visitors coming to Canada via U.S. airports. Many of these travellers would have combined a trip with a visit to the U.S., but could have flown from the U.S. to Canada rather than travelling by car, bus or train. With lower airfares, some would switch to air to cross into Canada, or preferably pick Canada as their North American destination.

U.S. Visitors Flying to a U.S. Border Airport and Crossing into Canada by Surface Mode

No information is available on the numbers of U.S. residents flying to a U.S. border airport and crossing into Canada by surface mode. The number would be expected to be significantly less than the numbers of Canadian residents using U.S. border airports for several reasons:

- There are far few U.S. residents visiting Canada (3.47 million vs. 8.05 million), particularly leisure travellers (1.13 million vs. 4.77 million) who are more price sensitive and more likely to use U.S. border airports to save money²⁴; and
- Canadian residents can use their own car to access U.S. border airports, but U.S. residents using U.S. border airports would need to rent a car to travel across the border, increasing the cost and offsetting the cost advantage of using the U.S. border airport.

²⁴ 2010 numbers from Statistics Canada

The number of U.S. visitors to Canada flying via a U.S. border airports could be of the order of 0.5 to 1.0 million annually.

Diversion from Local Airports to Larger Airports in the Region

Diversion of traffic from local airports to larger airports in a region is a major issue for small airports in Canada. Passengers driving 3 to 6 hours to a hub airport, or an airport served by multiple carriers with a greater number of destinations served and/or frequency of flights, can often result in more than half the air travel demand of the area not using the local airport. This diversion of traffic results in fewer flights, smaller aircraft and/or reduced competition at the smaller airport which increases travel costs, adversely affecting economic activity in the area. Diversion of traffic to the larger airports has a positive impact for the hub airports as passengers still use those airports but as O/D rather than E/D passengers, which generally results in them paying the Airport Improvement Fee (AIF) and car parking fees to the larger airport rather than the local airport.

Examining 16 of the smaller airports in Canada with scheduled passenger service provided by one of the major airlines (or their regional partner), all with over 30,000 annual passengers and within a 5 hour drive of a larger airport, it was estimated that approximately 3 million O/D passengers are diverted from these smaller local airports each year reducing their revenues from passenger fees alone by over \$20 million. Anecdotally it is reported that diversion to larger airports has resulted in smaller airports losing scheduled service altogether.

While it is unlikely that all this diverted traffic could be retained by the local airports, policies which encourage airline competition and increase ACAP funding will help to reduce costs, resulting in lower airfares which would attract some of these travellers back to using their local airport. The more travellers that use the local air services the better those services will be, thus stimulating more travel demand and business in the area.

On the other hand, much of the traffic from small airports is destined for regional or national hub airports. As a result, small airports both compete and collaborate with larger airports and to some extent rely on the health of regional and national hubs to provide connecting traffic onwards to international destinations. As a result, policies that facilitate the speedier flow of connecting passengers, for example, help the hub airport *and* the feeder airport compete for traffic.

Diversion to Surface Modes

The choice of mode of travel is dependent on many factors including the travel time, cost of travel, number of people in the travelling group, the purpose of travel, stress of travel, availability of a vehicle, and the need for a vehicle and personal items at the destination. Government policy can affect two of the most important factors, travel time and cost, and cause people to switch from one mode to another. Policies that increase airport costs which are passed on by the airport to the airlines and ultimately the passengers cause a shift from air to car mode, and causes some people not to travel at all, especially on longer trips. Similarly, policies that increase time for passengers to clear security, or create greater variability in this time, will result in passengers having to arrive earlier for their flights which will increase their travel times and cause a shift to car mode. This is particularly true for short trips, less than about 500 km, where the total door-to-door travel time advantage of air becomes marginal. Flat fees such as the Air Transport Security Charge also lead to more diversion for short trips as the charge represents a greater percentage increase in the total cost of travel than for longer trips.

The elasticity of air travel to changes in airfares provides an indication of the expected change in passengers for a given change in fare. Elasticities for short haul trips are generally higher in magnitude than elasticities for long haul trips reflecting the ability of people to switch to car, bus or rail mode for the short haul trips. The difference in the elasticities between short and long haul trips is therefore an indication of the proportion of people that would switch modes. For example, the elasticities at a national level for short and long haul leisure trips is estimated to be -1.22 and -0.88²⁵, with a difference of -0.33. Thus a 10% increase in airfare would result in a 12.2% reduction in short-haul air trips, but only an 8.8% reduction in long-haul air trips. Of the 12.2% reduction in short-haul trips,

²⁵ Estimating Travel Demand Elasticities. InterVistas, 2007. Factor for National Level of 0.8 applied to elasticities reported in Figure 3-1 for leisure travel.

roughly 3.3% would switch modes and 8.8% would not make the trip. A 10% increase would result in business short-haul travel being reduced by 6%, half the reduction found for leisure travellers, but the majority of these business travellers not travelling by air would switch to car, bus or rail mode.

A study in the U.K. that examined the effects of price on long distance travel in Britain found a reduction in air fares of 25% over a 20 year period would result in air travel increasing by 12.5%, implying an elasticity of -0.5. The study found that about half of this would be due to a switch from car and rail modes, while half would be new travel generated²⁶.

The two approaches indicate that 30-50% of air travellers on short-haul trips that do not travel by air due to increases in the cost of air travel would switch to car, bus or rail modes and the remainder would not travel.

Similar values for travel time and travel cost elasticities for inter-urban travel by air mode were reported in a U.S.²⁷ study (-0.43 and -0.38, respectively), although the values were lower than found for air travel elsewhere.

An example of a policy which discriminates between modes is the imposition of airport federal lease rents, causing increased costs to air passengers, while equivalent fees for road users and rail passenger services are not charged and indeed are heavily subsidized. It has been estimated that the imposition of airport rents has resulted in a reduction in air passengers at Canadian airports of 0.89%²⁸. Based on the above findings, 30-50% of these passengers would have switched to car, bus or rail modes.

Not all of these discriminatory policies are Canadian. For example, Canadian passengers who cross the border by air are charged a U.S. Agricultural Fee, a U.S. Immigration Fee and a U.S. Customs Fee. Surface passengers avoid all of these fees.

Diversion of Air Cargo

Diversion of air cargo from local airports to more distant larger airports or cargo hubs is common. In 2006, the Greater Toronto Airport Authority (GTAA) saw an estimated 60-65% of potential air cargo from the Toronto area being diverted to airports other than Toronto Pearson. In Atlantic Canada, where live/fresh seafood accounts for a large portion of the potential air cargo, it is estimated that 33% of Nova Scotia's and 15% of New Brunswick and PEI's potential air cargo is diverted to U.S. airports²⁹.

Based on the findings of these studies it is estimated that the amount of Canadian air cargo traffic diverted from Canadian to U.S. airports is of the order of 15-25%, or between 220,000 and 370,000 tonnes annually. This includes both inbound and outbound cargo and almost all of this diverted cargo is being transported to or from international markets, primarily Europe and Asia. This is in addition to the estimated 120,000 to 200,000 tonnes of air cargo on transborder flights which are transshipped through the US to/from international markets.

²⁶ The Prospects for Longer Distance Domestic Coach, Rail, Air and Car Travel In Britain. Report to the Independent Transportation Commission by Joyce M Dargay, January 2010

²⁷ Kenneth Small and Clifford Winston (1999), "The Demand for Transportation: Models and Applications," in Essays in Transportation Economics and Policy, Brookings Institute (www.brooking.edu).

²⁸ The Elimination of Airport Rent: Return on Investment. InterVistas report Prepared for the Canadian Airports Council, July 2009

²⁹ Ontario-Quebec Gateway Multimodal Freight and Passenger, Traffic Flows and Infrastructure Study. Jacobs Consultancy, 2009.

5.1.3 IMPACT OF DIVERSION

The economic impact of diversion depends heavily on where the traffic has been diverted to. For example, traffic that has been diverted to U.S. airports means less employment, output and government tax revenues in Canada. This is the result of less airport and ground-based activity in Canada and in many cases, less business for Canadian air carriers (not all as some of that traffic may be diverted away from international carrier service at Canadian airports).

However, the economic impact of diversion from one domestic mode of transportation to another in Canada is ambiguous. If some of this traffic is diverted to road and lost to Canadian airports and air carriers, it will mean a decrease in air transportation industry output, employment and contribution to government revenues. However, it will also mean an increase in all of the above from the competing mode. Even in the case of non-commercial competitors (such as personal light-duty vehicles), it will mean a loss in government revenues from fuel excise taxes and potentially a loss in output and employment from domestic vehicle manufacturing sector and any vehicle support industries. On the other hand, it can mean an increase in public expenditures on road and bridge maintenance. The key point is that the impact is far less clear-cut than it is in the case of traffic that is diverted out of the country.

An unintended consequence of diversion to road is an increase in accidents. Scheduled commercial air service is by far the safest mode of travel for inter-city travel. In terms of fatalities per kilometer of travel, scheduled air service is at least 20 times safer than automobile travel outside urban areas, approximately 5 times safer than inter-city bus and inter-city rail³⁰ travel.

It is recommended that the potential economic impact of traffic diverted from the country be evaluated in conjunction with policy options, as these issues are strongly related, with the former being in part a result of the latter.

³⁰ Comparison of safety for modes of travel given in: Transit's Safety and Security Record, STRP Synthesis S3, Canadian Urban Transit Association, 2000 and National Safety Council® Injury Facts® 2011 Edition (http://static.mgnetwork.com/rtd/pdfs/20110610_deathrates11.pdf).

6 SUMMARY CONCLUSIONS

THE CANADIAN AIR TRANSPORTATION INDUSTRY GENERATES WEALTH, EMPLOYMENT & TAXES

- *141,000 people are directly employed by the Canadian air transportation industry*
- *The industry's total economic footprint, which includes supplier industries, is \$34.9 billion in GDP, and supports a total of almost 405,000 jobs in many different sectors*
 - *Each direct job in the industry results in \$248,000 in total GDP*
 - *Air Transportation supports over 330 jobs for every 100,000 passengers carried*
- *It contributes over \$12 billion to federal & provincial coffers, including over \$7 billion in taxes*

Passenger Traffic

- With over 120 million E/D passengers, Canada's airports processed almost 3.5 times the national population in 2012.
- With passenger traffic growing at an average annual rate of 2.6% since the year 2000, traffic at Canadian airports is growing faster than the U.S., but slower than the global rate.
- Canada's largest eight airports, each with more than 3.5 million passengers, handle the majority (over 80%) of the passenger traffic, but over 60% of passengers are travelling either to, from or between the other smaller airports.
- With 60% of E/D passengers, the majority of the traffic at Canadian airports is domestic. The remainder of the traffic is split between international and transborder. However, many of the international, transborder and domestic passengers are connecting to/from domestic flights, and only about 30% of O/D passengers are domestic, while transborder and other international account for approximately 35% each.
- In the past twelve years, the largest passenger growth area has been in non-U.S. international traffic (4.9% CAGR), followed by domestic (2.6%) and lastly U.S. transborder (1.0%). There were 27.4 million overseas passengers in 2012, with Canadian residents accounting for 70% of the total. Canada should focus its efforts on reducing barriers to air travel, both for domestic and international travel, particularly to fast growing developing countries where the potential economic benefits to Canada are greatest.
- Approximately 25% of air trips by Canadians to the U.S., equivalent to about 2.5 million trips (5 million O/D passengers), begin at U.S. border airports – there is an opportunity to recapture approximately 25%-40% of this.
- Air service to the U.S. has improved both in terms of city-pairs and flights, increasing on average by 1% to 2% per year since 2004. Chicago-O'Hare and two of the airports serving the New York area – La Guardia and Newark – are the top U.S. airports served from Canadian airports.
- While Canada's share of the transborder seat capacity has been steadily increasing, Canadian registered airlines have a disproportionately small share of the transborder market. On overseas flights, Canadian registered airlines operate over 60% of the seat capacity. Increasing the share of international travel on Canadian airlines would result in higher economic footprint of Canada's air transportation industry. However, this should not be achieved by restrictions on foreign carriers which could reduce service and/or increase fares resulting in a decline in connectivity and its associated benefits

- Canadian airports' share of worldwide passenger traffic is relatively small at 2%; however, being a large country with limited surface transportation networks over large parts, Canadians rely heavily on air transportation and, on a per person, Canadians travel by air more than residents of most other countries.
- The number of overseas cities served increased by over 30% between 2004 and 2012, and the number of overseas flights has increased by 7.2% per year in that period. London-Heathrow has by far the greatest capacity of all the international airports served from Canada, with service to Paris and Frankfurt having increased greatly as well as that to Beijing. The strongest international growth market has been to vacation destinations in Mexico and the Caribbean.

Air Cargo Traffic

- Almost 1.5 million tonnes of cargo was handled at Canadian airports in 2011, half of which was international (incl. U.S.).
- With air transportation accounting for 5% of total trade (by value) with the U.S. and 24% of total trade with other countries in 2012, this mode is becoming increasingly important in trade with other countries.
- Canadian airports account for 2% of the air cargo handled at airports worldwide.
- The largest growth areas for air cargo are the Middle East and Africa.
- While Canada's share of the global air cargo pie is small by volume, it is significant in terms of value, and should not be ignored by policy makers.

Canada's Share of the Global Market

- The good news is the pie is big and getting larger, and Canada has an opportunity to grow its share of the market given the right commercial and regulatory approach.
- On a global scale, Canadian hub airports are relatively small compared to major world hub airports (based on passenger traffic), but provide better connectivity in terms of cities served outside of the hub airport's local region. Toronto fairs well on this measure, ranked sixth just behind New York's JFK and London-Heathrow, and well ahead of Chicago, Los Angeles, Houston and Atlanta. Montreal also fairs well, ranked tenth, ahead of Tokyo, Beijing and Hong Kong, and just behind Newark and Atlanta. Canadian hubs are well situated to becoming global hub airports connecting the Americas with Asia and to a lesser extent, Europe.

Economic Impact

- The air transportation industry generates great economic value for Canada by generating direct, indirect and induced employment and through the value added created by the industry itself. The economic footprint of Canada's air transportation industry is large. In 2012 the industry directly employed 141,000 people producing \$10.7 billion in direct GDP (2002\$). The industry's total economic footprint, which includes the impact on the supplier industries, is estimated to be \$34.9 billion in GDP. This economic activity supports a total of almost 405,000 jobs. Overall job creation in the air transportation industry and those that benefit indirectly or through induced impacts results in over \$17 billion in personal income. Increased economic activity supported by the industry also benefits businesses with pre-tax corporate profits of \$3.5 billion. This increased income results in more than \$7.4 billion in taxes.

Total Economic Footprint – Air Transportation Industry

	GDP (2012\$)		EMPLOYMENT (000)	
	Total		Direct	Total
Base Economic Footprint	\$30.9 B		99.2	343.8
Additional Impacts	\$4.0 B		41.8	61.1
TOTAL	\$34.9 B		141.0	404.9

- In 2012, Canada's airports directly supported 63,000 jobs producing \$5.2 billion in direct GDP (2002\$). Including multiplier effects and inflation, there were almost 142,000 jobs supported by Canadian airports generating \$11.9 billion in GDP.
- In 2012, there were approximately 20 million domestic person-trips by air and total spending by these travellers, excluding airfares was over \$9.95 billion. A total of 7.5 million visitors to Canada spent almost \$7.6 billion in Canada in 2012; the large majority (73%) by overseas (non-U.S.) visitors. In addition, air transportation also facilitates travel by Canadians abroad to an increasing number of destinations.
- Distance is a natural barrier to trade. Air transportation helps bridge that gap. The level of trade between Canada and other countries correlates to the numbers of flights to those countries – the larger the number of flights, the greater the trade value. Considering all trading partners, a 1% increase in flights is associated with a 0.88% increase in trade overall. A 1% increase in flights between Canada and non-OECD countries is associated with a 0.57% increase in trade and a 1% increase in flights between Canada and countries with less than 1,000 flights (currently) could result in 0.3% increase in trade. While availability of direct flights is not a sufficient condition to increase trade between Canada and other countries, direct connects act as a catalyst for business opportunities.
- Connectivity has value. This is demonstrated by an estimated consumer surplus of \$32 billion (2009); a correlation with higher amounts of Foreign Direct Investment (FDI) relative to GDP; and a statistically significant link with labour productivity. Mining and energy development projects are often in isolated or remote areas and rely heavily on air transport – many of these resources would not be developed without air transport for ferrying workers, supplies, equipment, spare parts and test samples. Air transportation also allows firms to shorten delivery times, minimize inventory costs and limit interruptions to production.
- Air transportation also has other socio-economic value such as providing the only year-round access to remote communities, supplying them with essentials such as food products and emergency care. As Canada's economy in the North grows, so will the need for air services. Air transportation plays a critical role in supporting the movement of specialized emergency personnel and equipment and supplies be they involved in protecting Canada's natural resources, police, military, hydro maintenance or health care, and it enhances the leisure and cultural experiences of Canadians by providing them with a wider choice of holiday destinations throughout Canada and the world.

Impacts of Traffic Diversion

Diversion of passenger and cargo traffic from Canadian airports can occur in a number of ways, including: diversion to U.S. border airports; overseas visitors entering Canada by surface mode; diversion from local airports to larger airports in the region; and diversion to surface modes. Competition among different modes and airports is beneficial for Canadians. However, if the playing field is not level, the welfare of Canadians is hurt and economic value is destroyed.

APPENDIX A – DATA SOURCES AND DOCUMENT REVIEW

Report Title / Data Source	Author	Date
Driven Away: Why More Canadian Airports are Choosing Cross Border Airports	Conference Board of Canada	April 2012
One of Our Airports is Missing! Tackling the Challenge of Cross Border Shopping – Air Travel Edition	Canadian Airports Council	2012
The Future of Canadian Air Travel: Toll Booth or Spark Plug. Report on the Future Growth and Global Competitiveness of Canada's Airports	Standing Senate Committee on Transportation and Communications	May 2012
Airport Policy in Canada	Frontier Centre for Public Policy	August 2012
The Real Air Rage	MacLean's Magazine	March 2012
Economic Benefits from Air Transportation in Canada	Oxford Economics	2011
The Economic Impacts of the Member Carriers of the National Airlines Council of Canada	Dr. F. Lazar	September 2011
NACC Internal Briefing for TC Roundtable on Air Transportation and Airport Issues	NACC	N/A
The Strategic Impact of the Canadian Based Air Travel and Tourism Industry on Canada's Economy	Jacobs Consultancy	September 2010
Economic Impact of Civil Aviation	ICAO	2001
The Economic Impact of Commercial Airports in 2010	CDM Smith for ACI-NA	January 2012
The Economic Impact Contribution of the Aviation Industry in the UK	Oxford Economics	October 2006
What is the Contribution of Aviation to the UK Economy?	Oxera	2009
The Economic and Social Benefits of Air Transport	ATAG	2008
The Social and Economic Impact of Airports in Europe	York Aviation for ACI-Europe	January 2004
Airport Devolution: The Canadian Experience	M. Brooks & B. Prentice	N/A
Blue Sky – Canada's New International Air Policy	Government of Canada	N/A
Looking to 2020 – The Future of Travel and Tourism in Canada – Whitepaper	National Travel and Tourism Coalition	October 2010
The Elimination of Airport Rent – ROI	InterVistas for CAC	July 2009
Improving Canadian Aviation Competitiveness	IATA	N/A
Economic Impact of Civil Aviation on the US Economy	FAA	August 2011
The Economic Impact of Canadian Airports 2002	Canadian Airports Council	2002
The Economic Impact of Canadian Airports 1998	Canadian Airports Council	1998
YVR Economic Impact Study	N/A	2009
YOW Economic Impact Study	LeighFisher	2010
YYZ Update of Economic Impact Model	HDR HLB Decision Economics	2006
YUL and YMX Economic Impact Study	N/A	2009
YHZ Economic Impact Study	Chris Lowe Group	2010
YWG Economic Impact Study	N/A	2009
YEG Economic Impact Study	InterVistas	2008
YYC Economic Impact Study	RP Erickson	2004
YYJ Economic Impact Study	N/A	2005
YYQ Economic Impact Study	N/A	2007
YYT Economic Impact Study	N/A	2009
YLW Economic Impact Study	InterVistas	2010
YQT Economic Impact Study	RP Erickson	2011
YKF Economic Generator	N/A	2007
YGK Economic Impact Study	Inside Canadian Airports	2010
Air Travel Demand Elasticities	Gillan, Morrison and Stewart	2003
Estimating Air Travel Demand Elasticities	InterVistas for IATA	2003

Understanding Transport Demands and Elasticities	Victoria Transport Institute	2012
Missing Trade Opportunities – the Impact of Heathrow’s Capacity Constraint on the UK Economy	Frontier Economics	November 2012
Aircraft Movement Statistics	Statistics Canada	2012
Air Carrier Traffic at Canadian Airports	Statistics Canada	2011 & historical
Canadian Residents Travel Survey	Statistics Canada	2011 (late Jan 2013)
International Travel Survey	Statistics Canada	2011 (2012 CANSIM tables)
Traffic by Region (incl. US)	ACI and IATA	N/A
Flight Schedules	IATA Innovate	N/A
NAICS databases	Stats Canada	N/A

APPENDIX B – COMPARISON WITH OTHER STUDIES

Comparison with Other Industry Wide Economic Impact Studies

There are explainable differences in the economic impact results found in this study and those found in the past, such as the Oxford Economics study from 2011 or Dr. Lazar’s study for the NACC from the same year. For the reasons outlined below, the studies are consistent once the differences are taken into account. The differences in terms of total GDP (direct, indirect and induced) and employments are summarized in Table B-1.

Table B-1 – Comparison of Total GDP Impact and Employment

	Base Year	Total GDP	Direct/Indirect/Induced	Direct Employment	Total Employment
SLI/CBoC	2012	\$33,500		139,700	392,400
Oxford Economics	2011	\$33,305		219,000	401,000
NACC	2010	\$27,400		40,000	113,300

The **SLI/CBoC Study** relied on data from Statistics Canada for the direct impacts, paid special attention to overlapping impacts to avoid double counting, and used the CBoC’s large, well established model of the national economy to produce the full impact results.

The **Oxford Economics Study** had a broader definition of direct impacts by including aerospace. This accounts for part of the larger direct GDP and employment figures. However, the total GDP and employment figures are similar. This can be explained in part by the difference in the base year and the fact that our estimates capture a portion of the aerospace industry through indirect impacts and include general aviation activity. The main source of their data was IATA. Since this data does not correspond to the official industry statistics produced by Statistics Canada, it has different data for the direct impacts. Their gross value added and employment data, relative to the Stats Canada data is relatively low for airlines and relatively high for airports. Although the explanation of how the multipliers were derived is limited, it appears that the indirect and induced impacts were calculated based on the input/output tables available in Statistics Canada’s CANSIM database. The multiplier impacts used in the Oxford study are much lower than what the most current data indicates.

The **NACC Study** focussed on the four NACC members (Air Canada, Air Transat, Jazz and WestJet) and as a result, was narrower in scope and lower impacts would be expected. For example, while it would capture some airport activity as an indirect impact of the air carriers, it would not include airport and ground based services that support international and other non-NACC domestic carriers. The four NACC members do account for the bulk of the activity in the air transportation industry (NAICS 481) though, which is why the total GDP impacts approach our estimates. The NACC study seemed to use expenditures for the NACC members as an estimate for gross output in the industry. Then the gross-output to GDP multiplier from Statistics Canada’s multiplier table was used to estimate the total GDP impact. The direct impact in this study seemed to be confined to the airline industry. Again, in the NACC study the multipliers are much lower than what we found in our study.

While the two above mentioned studies applied different methodologies to define the direct industry impacts, the most substantial difference occurs in the multiplier estimates. Statistics Canada produces new input/output and multiplier tables on an annual basis. This is necessary as the industrial composition of the economy changes over time and also because the interdependencies between industries and the impact that they have on one another is constantly changing. The latest estimates from Statistics Canada, which were used in this study, show larger multiplier impacts for the air transportation industry.

Comparison with Individual Airport Economic Impact Studies

Various Canadian airports conduct their own economic impact studies on a regular basis. These studies are typically useful for demonstrating the value of the airport to the local community and beyond, to demonstrate trends at a particular airport, to garner support for infrastructure projects, and to compare the economic impact of one airport relative to its peers, as the methodologies are roughly comparable.

However, the summed results of individual airport studies are less comparable to industry-wide studies as they use different methodologies:

- The individual airport studies generally aggregate gross output of airport tenants and other ground based services. Gross output equates to the total value of the products or services sold (gross revenues) by the tenant or service provider, as well as by the airport operator and government agencies based at the airport. The industry-wide studies similar to this one typically rely on value-added measures to determine the impact on GDP. Value-added equates to the value of the labour and capital consumed in the process of providing those goods or services. Airport studies that include measures of GDP are typically based on an industry wide ratio between gross output and GDP (often the air transport industry). This ratio may not be appropriate for all industry segments operating at the airport (e.g., terminal food & beverage and retail concessions). If only used to examine trends at a particular airport, the differences will likely not be significant if the same methodology and ratio is carried over time.
- The individual airport studies often include a portion (typically half to account for a one-way fare) of the air fares of all of the passengers served by the airport in question (as included in gross output for the carriers). The industry-wide studies that isolate airports only include the value-added of the Canadian services provided directly to the air carriers in Canada, such as landing and terminal services, and maintenance services, etc. They also only include Canadian produced fuel and other intermediate inputs as an indirect impact. The airport studies in comparison are typically based on gross output and account for Canadian and off-shore inputs. For example, if we were to simply aggregate the estimate of the air fares alone that are counted by the individual airports, we would expect to arrive at a figure that is roughly equal to the gross revenues of all of the air carriers. As the industry-wide studies rely on value-added, the corresponding figure would be much smaller as the air carriers purchase a significant amount of intermediate inputs such as jet fuel in order to generate those revenues. The gross output measure would include the value of the fuel and the other intermediate inputs (which may have been purchased outside of Canada), whereas the value-added measure would not.
- Airports also typically include in their studies, some elements of ground transport beyond car rentals (e.g. bus & taxi) that we could not estimate for this industry wide study, although this amount is considered negligible.
- Some airports also have non-aviation related activity taking place on airport property (e.g., non-aviation industrial, hotels, golf courses etc.) which are not captured in the Stats Canada data as air transportation industry related and are therefore not included in this study.

While both approaches have merit, and neither one is better than the other, for the reasons outlined above (among others), one should not aggregate the values from the individual airport studies for the purpose of comparing to the industry-wide studies such as this one or others (including the Oxford Economics study referenced earlier). Comparisons based on this approach are more “apples to oranges” rather than “apples to apples” in their conclusions. Aggregating individual assessments will almost invariably result in a larger figure, particularly for GDP.