



# ECONOMIC IMPACTS OF MARITIME SHIPPING in the GREAT LAKES - ST. LAWRENCE REGION EXECUTIVE SUMMARY

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# EXECUTIVE SUMMARY

## AT A GLANCE – STUDY HIGHLIGHTS

- Cargo moved on the Great Lakes-St. Lawrence Seaway System totaled 143.5 million metric tons (158.3 million short tons) valued at \$15.2 billion (Cdn\$19.8 billion). This commerce supported 237,868 jobs and \$35 billion (Cdn\$45.4 billion) in economic activity
- Cargo moved on the Great Lakes-St. Lawrence River Waterway totaled 230.9 million metric tons (254.6 million short tons) valued at US\$77.4 billion (Cdn\$100.5 billion). This commerce supported 328,543 jobs and \$45.6 billion (Cdn\$59.3 billion) in economic activity
- Commerce transiting the St. Lawrence Seaway supported 92,661 jobs and \$12.9 billion (Cdn\$ 16.8 billion) in economic activity
- The Soo Locks supported 123,172 jobs in the U.S. and Canada and \$22.6 billion (Cdn\$ 29.3 billion) in economic activity

## INTRODUCTION

From the earliest days of European settlement, the Great Lakes and St. Lawrence River have been utilized as a means of transportation. Great Lakes cities were founded as trading posts along a vast marine highway that facilitated commerce in an era pre-dating railroads and highways. This relationship to the water has enabled the region to thrive and today, the Great Lakes-St. Lawrence region is the industrial and agricultural heartland of both the United States and Canada – with a combined GDP of more than \$6 trillion U.S. dollars. This output would represent the third-largest economy in the world – behind the U.S. and China – if it were a country.

Over the last 200 years, navigation improvements in both the United States and Canada have enhanced the waterway. The Welland Canal first connected Lake Ontario and Lake Erie in 1829, enabling vessels to bypass Niagara Falls. The Soo Locks have made the St. Marys River navigable, connecting Lake Superior to the lower four Great Lakes and the St. Lawrence Seaway. The St. Lawrence Seaway has tamed the St. Lawrence River, enabling ships to sail from Lake Ontario to the Atlantic Ocean since 1959.

The resulting deep-draft inland navigation system is the longest in the world, extending 3,700 kilometers (2,300 miles) into the North American heartland. This bi-national trade corridor complements the region's rail and highway network and offers customers a cost-effective, safe, reliable and environmentally smart means of moving raw materials, agricultural commodities and manufactured products to and from domestic and global markets. Cargoes include iron ore, coal, steel, aluminum, machinery, stone, cement, grain, sugar, fertilizers, road salt, petroleum products and containerized goods. These cargoes become the staples of everyday life — food and other household items; buildings, factories, roads and bridges; vehicles and planes; and the energy that powers cities and towns.

Three distinct vessel-operator communities serve the waterway. These include U.S. domestic carriers (“U.S. Lakers”) transporting cargo between ports on the Great Lakes, Canadian domestic carriers (“Canadian Lakers”) operating between ports on the Great Lakes and the St. Lawrence River and Canadian coastal waters, and ocean-going vessel operators (“Salties”), which operate between the region's ports and overseas destinations. These carriers serve more than 110 system ports located in each of the eight Great Lakes states and the provinces of Ontario and Quebec.

In addition to locks, ships and ports, a host of maritime service providers work to ensure the safe, reliable and efficient transport of cargo. These include stevedores, warehouse employees, freight forwarders, dockworkers, crane operators, vessel agents, dredging contractors, marine pilots, truck drivers and port rail operators, tugboat operators and shipyard workers.

## PURPOSE

This report is designed to provide the navigation community, transportation planners, government policy makers and the general public with a realistic assessment of the contributions made by commercial maritime shipping in the Great Lakes and St. Lawrence region to the bi-national, national, state and provincial economies.

To accomplish this goal, a bi-national consortium of public and private sector stakeholders retained Martin Associates of Lancaster, Pennsylvania — a global leader in transportation economic analysis and strategic planning.<sup>1</sup> Martin Associates has completed more than 1000 economic impact, strategic planning, financial feasibility and market studies for major ports and waterway systems throughout the United States and Canada, as well as for ports in Europe, Asia and the Caribbean.

## ORGANIZATION OF STUDY RESULTS

The study provides an assessment of the economic impacts of maritime shipping from four perspectives, as described below:

### Chapter II – Great Lakes-St. Lawrence Seaway

**System:** Includes impacts of domestic and international cargo that has travelled at some point through the Great Lakes, its connecting rivers and the St. Lawrence Seaway (ending in Montreal). This chapter only includes the impacts of tonnage at lower St. Lawrence River Quebec ports if destined to or originating from the Great Lakes-St. Lawrence Seaway System. For example, the economic benefits of container movements to and from the Port of Montreal to overseas markets are not included in this chapter, as this trade does not enter or leave the Great Lakes-St. Lawrence Seaway System. However, grain export shipments leaving the

Port of Duluth, Minn., destined for overseas markets that are temporarily off-loaded at the Port of Quebec for re-loading onto a larger ocean-going vessel, are included. This perspective is most relevant to American stakeholders in that it excludes Quebec commerce that moves exclusively between Canadian ports on the lower St. Lawrence River. It also excludes commerce between these Canadian lower St. Lawrence River ports and overseas ports.

### Chapter III – Great Lakes-St. Lawrence River

**Waterway:** Includes impacts of all domestic and international cargo moving on the Great Lakes, its connecting rivers, the St. Lawrence Seaway and the Lower St. Lawrence River. This analysis captures the fullest extent of the economic benefits of the entire waterway. For example, it includes the domestic movements of commodities like petroleum products between lower St. Lawrence river ports and container movements to and from Quebec ports to overseas markets. This perspective is particularly relevant to Canadian stakeholders in that all Quebec impacts along the St. Lawrence are included in this chapter.

**Chapter IV – St. Lawrence Seaway:** Includes impacts of domestic and international cargo that has travelled through the St. Lawrence Seaway, a system of canals and locks, which connects the Great Lakes to the lower St. Lawrence River. The St. Lawrence Seaway extends from St. Lambert Lock in Montreal to Lake Erie and is composed of a series of 15 consecutive locks (seven locks in the Montreal-Lake Ontario section and eight locks in the Welland Canal section). This data is particularly relevant to those stakeholders who move cargo through the waterway and to policy makers who manage and fund waterway infrastructure.

**Chapter V – Soo Locks:** Includes impacts of domestic and international cargo moving through the Soo Locks, which connect ports on Lake Superior with the lower Great Lakes, the St. Lawrence Seaway, and international markets. The Soo Locks are located on the St. Marys River in Sault Ste. Marie, Michigan. This data is particularly relevant to those stakeholders who move cargo through the locks and to policy makers who manage and fund lock infrastructure.

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<sup>1</sup> Study sponsors include: the Saint Lawrence Seaway Development Corporation, The St. Lawrence Seaway Management Corporation, the American Great Lakes Ports Association, the Chamber of Marine Commerce, the Lake Carriers' Association, and the Shipping Federation of Canada.

## METHODOLOGY

This analysis estimates the combined U.S. and Canadian economic impacts of all marine cargo moving in the bi-national Great Lakes-St. Lawrence region, including domestic cargo moving between U.S. ports; domestic cargo moving between Canadian ports; cross-lake cargo moving between the U.S. and Canada; and international cargo moving between system ports and overseas ports.

Specifically, the study measures the impacts of 2017 cargo movements at 40 U.S. and Canadian ports. The analysis was developed from a comprehensive telephone interview program of more than 770 individual firms with 1,105 operations throughout the region. Models were then developed to expand the 40-port impacts to the state-wide and province-wide levels.

The report estimates tonnage volume (and its dollar value) moved for each of the geographic segments detailed in the Organization of Study Results. This is the recorded tonnage transported by vessels.

For the purpose of determining economic impacts, however, the report uses the tonnage “handled” at the Great Lakes-St. Lawrence region’s ports. “Handled” refers to both the shipping (exporting) of the cargo from a system port, and to the receipt (importing) of that cargo in a system port. Because economic activity is created every time cargo is handled, for the purposes of this study, cargo moved between ports within the region has been handled twice. By contrast, cargo moved between system ports and overseas ports has been handled once (in the region). For example, one ton of cargo moved to or from Europe is counted as one ton handled by a port, while one ton of cargo moved from Duluth, Minn., to Cleveland, Ohio, is counted as two tons (one ton exported in Duluth and one ton imported in Cleveland).

Impacts are presented at the regional level, country level, state/provincial level, by commodity, by carrier flag, by employment sector and by waterway segment. Throughout the study, all values are expressed in both U.S. and Canadian dollars (using a 2017 average exchange rate of US\$1.00 = Cdn\$1.2984). Cargo volumes are expressed in both metric tons and short tons (1 metric ton = 1.102 short tons).

## EXHIBIT I-2 Individual Ports Modelled

US Ports (19)	Canadian Ports (21)
Ashtabula	Baie Comeau
Burns Harbor	Becancour
Calcite	Goderich
Chicago	Hamilton
Cleveland	Havre-Saint-Pierre
Conneaut	Johnstown
Detroit	Meldrum Bay
Duluth	Montreal
Erie	Nanticoke
Green Bay	Oshawa
Lorain	Port Alfred
Milwaukee	Port-Cartier
Monroe	Quebec
Muskegon	Sarnia
Oswego	Sept Iles
Saginaw River	Sorel
Superior	Thunder Bay
Toledo	Toronto
Two Harbors	Trois-Rivieres
	Valleyfield
	Windsor

## CATEGORIES OF IMPACTS

**Economic Activity:** Total economic activity consists of the direct business revenue received by the businesses supplying the cargo and vessel handling services, plus the re-spending of direct employees' earnings on goods and services in the province/state.

**Employment:** Employment is measured in terms of full-time equivalent jobs, as defined by 2,080 hours per year per full-time worker. These impacts consist of three levels:

- **Direct Employment** — jobs directly generated by maritime and port activity. Direct jobs include those of dockworkers, crane operators, ships' crew, steamship agents, freight forwarders and stevedores, as well as workers with railroad and trucking companies moving the cargo handled at system ports. These jobs also include shippers/consignees that have facilities situated close to ports or marine terminals associated with the production site. These jobs would experience dislocation (likely wouldn't exist) if the activity at ports and marine terminals were to be discontinued.
- **Induced Employment** — jobs created when individuals spend their wages locally on goods and services such as food, housing and clothing.
- **Indirect Employment** — jobs created due to purchases of goods and services by businesses. These include jobs with office supply firms, maintenance and repair companies, parts and equipment suppliers, etc.

**Personal Income:** These impacts are a measure of the employee wages and salaries (excluding benefits) received by individuals directly employed due to port activity and the respending of those earnings on goods and services in the province/state.

**Business Revenue:** These impacts represent the revenue generated by firms providing services at each port.

**Local Purchases:** These impacts include the value of goods and services purchased by the firms providing services at each port. Examples are office supplies, communications, utilities, fuel, maintenance and repair, goods/parts, contracted services, insurance, etc.

**Taxes:** These impacts include payments to federal, state/provincial, and local governments by companies and individuals whose jobs are directly dependent on port activity.

## RESULTS

### Chapter II – Great Lakes-St. Lawrence Seaway System Impacts



This chapter presents the study results from the perspective of the Great Lakes-St. Lawrence Seaway System, which includes the five Great Lakes, their connecting rivers, and the St. Lawrence Seaway (ending in Montreal). This analysis only includes the impacts of cargo tonnage at lower St. Lawrence River Quebec ports if that cargo was destined to or originating from the Great Lakes-Seaway system.

In 2017, a total of **143.5 million metric tons (158.3 million short tons) of cargo valued at US\$15.2 billion (Cdn\$19.8 billion)** moved through the Great Lakes-Seaway system. As noted, a majority of the domestic cargo moving on Canadian and U.S. flag vessels remains in the Great Lakes-Seaway system, creating economic impacts at the loading port as well as the port of discharge. With this accounted for, the actual tons handled at the ports on the Great Lakes-Seaway system is **284.8 million metric tons (314.0 million short tons)**. This cargo generated the following economic impacts:

**Economic Activity** — The marine cargo and vessel activity in the Great Lakes-Seaway system generated a total of **US\$35.0 billion (Cdn\$45.4 billion)** in economic activity in the United States and Canada.

**Employment** — Maritime commerce on the Great Lakes-Seaway system supported **237,868 U.S. and Canadian jobs**, including 78,400 direct jobs. As a result of local and regional purchases made by those 78,400 individuals, an additional 80,343 induced jobs were supported in the regional economy. Finally, 79,126 indirect jobs were supported by US\$8.0 billion (Cdn\$10.4 billion) in regional purchases by businesses supplying services at the marine terminals and ports.

**Personal Income** — Maritime activity supported **US\$14.2 billion (Cdn\$18.5 billion) in total personal wage and salary income and local consumption expenditures** in the regional economies of the U.S. and Canada. The 78,400 direct job holders received US\$3.8 billion (Cdn\$4.9 billion) in wage income.

**Local Purchases** — Businesses involved in maritime activity in the Great Lakes-Seaway system spent **US\$8 billion (Cdn\$10.3 billion) on purchases** in their respective local economies.

**Taxes** — A total of **US\$6.6 billion (Cdn\$8.6 billion)** in federal, state/provincial and local tax revenue was generated by maritime activity in the Great Lakes-Seaway system.

**EXHIBIT II-3**  
**Great Lakes-St. Lawrence Seaway System Impacts – Country Level**

	Canada		United States		Total	
<b>Jobs</b>						
Direct Jobs	29,004		49,395		78,400	
Induced	36,475		43,868		80,343	
Indirect	24,925		54,201		79,126	
Total	90,404		147,464		237,868	
<b>Economic Activity (1,000)</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>
	\$9,386,930	\$12,187,990	\$25,610,903	\$33,253,196	\$34,997,833	\$45,441,187
<b>Personal Income (1,000)</b>						
Direct	\$1,154,563	\$1,499,084	\$2,641,743	\$3,430,039	\$3,796,306	\$4,929,124
Re-Spending/Local Consumption	\$1,550,700	\$2,013,429	\$5,327,418	\$6,917,119	\$6,878,118	\$8,930,548
Indirect	\$1,069,500	\$1,388,639	\$2,485,486	\$3,227,156	\$3,554,986	\$4,615,794
Total	\$3,774,762	\$4,901,151	\$10,454,648	\$13,574,315	\$14,229,410	\$18,475,466
<b>Business Revenue (1,000)</b>	\$7,836,230	\$10,174,561	\$20,283,485	\$26,336,077	\$28,119,715	\$36,510,639
<b>Local Purchases (1,000)</b>	\$2,693,951	\$3,497,827	\$5,276,709	\$6,851,280	\$7,970,661	\$10,349,106
<b>Taxes (1,000)</b>						
Federal	\$1,156,702	\$1,501,862	\$3,371,918	\$4,378,099	\$4,528,620	\$5,879,961
State/Provincial and Local	\$803,823	\$1,043,684	\$1,272,166	\$1,651,781	\$2,075,989	\$2,695,464
Total	\$1,960,525	\$2,545,546	\$4,644,084	\$6,029,880	\$6,604,609	\$8,575,425

**EXHIBIT II-10**  
**Great Lakes-St. Lawrence Seaway System Impacts – by State**

	Indiana		Ohio		Michigan	
<b>Tonnage Handled (1,000): Metric Tons (Short Tons)</b>	<b>26,986 (29,747)</b>		<b>39,599 (43,650)</b>		<b>59,014 (65,051)</b>	
<b>Jobs</b>						
Direct Jobs	19,518		9,398		11,180	
Induced	19,432		8,549		8,294	
Indirect	27,208		15,221		6,436	
Total	66,158		33,168		25,910	
<b>Economic Activity (1,000)</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>
	\$13,726,685	\$17,822,728	\$3,745,199	\$4,862,766	\$4,160,713	\$5,402,270
<b>Personal Income (1,000)</b>						
Direct	\$1,201,907	\$1,560,556	\$475,029	\$616,777	\$536,631	\$696,762
Re-Spending/Local Consumption	\$2,441,194	\$3,169,646	\$1,025,207	\$1,331,128	\$966,365	\$1,254,728
Indirect	\$1,252,811	\$1,626,649	\$710,600	\$922,643	\$272,287	\$353,538
Total	\$4,895,912	\$6,356,852	\$2,210,835	\$2,870,549	\$1,775,283	\$2,305,028
<b>Business Revenue (1,000)</b>	\$11,285,492	\$14,653,083	\$2,719,992	\$3,531,638	\$3,194,348	\$4,147,541
<b>Local Purchases (1,000)</b>	\$2,604,640	\$3,381,865	\$1,411,723	\$1,832,981	\$692,167	\$898,709
<b>Taxes (1,000)</b>						
Federal	\$1,682,700	\$2,184,818	\$622,035	\$807,650	\$558,082	\$724,613
State and Local	\$623,108	\$809,044	\$216,662	\$281,314	\$205,209	\$266,443
Total	\$2,305,808	\$2,993,862	\$838,697	\$1,088,964	\$763,290	\$991,056

*EXHIBIT II-10 Continued*

	Minnesota		Illinois		Wisconsin	
<b>Tonnage Handled (1,000): Metric Tons (Short Tons)</b>	<b>31,231 (34,425)</b>		<b>10,289 (11,341)</b>		<b>27,086 (29,856)</b>	
<b>Jobs</b>						
Direct Jobs	2,176		2,943		3,198	
Induced	1,852		2,654		2,316	
Indirect	2,134		880		1,970	
Total	6,161		6,476		7,484	
<b>Economic Activity (1,000)</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>
	\$1,483,766	\$1,926,522	\$830,908	\$1,078,851	\$1,430,900	\$1,857,881
<b>Personal Income (1,000)</b>						
Direct	\$99,333	\$128,974	\$130,780	\$169,805	\$147,229	\$191,162
Re-Spending/Local Consumption	\$213,546	\$277,269	\$345,169	\$448,167	\$245,180	\$318,341
Indirect	\$100,528	\$130,526	\$46,015	\$59,745	\$87,653	\$113,809
Total	\$413,408	\$536,769	\$521,964	\$677,718	\$480,061	\$623,312
<b>Business Revenue (1,000)</b>	\$1,270,220	\$1,649,254	\$485,739	\$630,684	\$1,185,721	\$1,539,540
<b>Local Purchases (1,000)</b>	\$222,048	\$288,308	\$89,032	\$115,599	\$210,833	\$273,745
<b>Taxes (1,000)</b>						
Federal	\$160,488	\$208,378	\$137,785	\$178,900	\$169,585	\$220,189
State and Local	\$69,544	\$90,296	\$64,945	\$84,325	\$71,541	\$92,889
Total	\$230,033	\$298,674	\$202,730	\$263,225	\$241,126	\$313,078

*EXHIBIT II-10 Continued*

	New York		Pennsylvania		Total US	
<b>Tonnage Handled (1,000): Metric Tons (Short Tons)</b>	<b>960 (1,058)</b>		<b>603 (665)</b>		<b>195,768 (215,795)</b>	
<b>Jobs</b>						
Direct Jobs	691		291		49,395	
Induced	542		229		43,868	
Indirect	116		237		54,201	
Total	1,349		757		147,464	
<b>Economic Activity (1,000)</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>
	\$141,866	\$184,199	\$90,864	\$117,978	\$25,610,903	\$33,253,197
<b>Personal Income (1,000)</b>						
Direct	\$38,128	\$49,505	\$12,707	\$16,498	\$2,641,743	\$3,430,039
Re-Spending/Local Consumption	\$63,536	\$82,495	\$27,222	\$35,345	\$5,327,418	\$6,917,119
Indirect	\$5,954	\$7,731	\$9,638	\$12,514	\$2,485,486	\$3,227,156
Total	\$107,618	\$139,731	\$49,566	\$64,357	\$10,454,648	\$13,574,315
<b>Business Revenue (1,000)</b>	<b>\$78,331</b>	<b>\$101,704</b>	<b>\$63,643</b>	<b>\$82,633</b>	<b>\$20,283,485</b>	<b>\$26,336,077</b>
<b>Local Purchases (1,000)</b>	<b>\$17,207</b>	<b>\$22,342</b>	<b>\$29,060</b>	<b>\$37,731</b>	<b>\$5,276,709</b>	<b>\$6,851,280</b>
<b>Taxes (1,000)</b>						
Federal	\$27,143	\$35,242	\$14,100	\$18,308	\$3,371,918	\$4,378,099
State and Local	\$14,780	\$19,190	\$6,377	\$8,280	\$1,272,166	\$1,651,781
Total	\$41,923	\$54,432	\$20,477	\$26,588	\$4,644,084	\$6,029,879

EXHIBIT II-11						
Great Lakes-St. Lawrence Seaway System Impacts – by Province						
	Ontario		Quebec		Total	
<b>Tonnage Handled (1,000): Metric Tons (Short Tons)</b>	<b>61,378 (67,657)</b>		<b>27,686 (30,519)</b>		<b>89,064 (98,176)</b>	
<b>Jobs</b>						
Direct Jobs	21,561		7,443		29,004	
Induced	28,904		7,571		36,475	
Indirect	20,182		4,743		24,925	
Total	70,647		19,757		90,404	
<b>Economic Activity (1,000)</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>
	\$7,700,224	\$9,997,970	\$1,686,706	\$2,190,019	\$9,386,930	\$12,187,990
<b>Personal Income (1,000)</b>						
Direct	\$842,378	\$1,093,744	\$312,184	\$405,340	\$1,154,563	\$1,499,084
Re-Spending/Local Consumption	\$1,276,372	\$1,657,241	\$274,328	\$356,187	\$1,550,700	\$2,013,429
Indirect	\$877,836	\$1,139,782	\$191,664	\$248,856	\$1,069,500	\$1,388,639
Total	\$2,996,586	\$3,890,768	\$778,176	\$1,010,384	\$3,774,762	\$4,901,151
<b>Business Revenue (1,000)</b>	\$6,423,852	\$8,340,729	\$1,412,378	\$1,833,832	\$7,836,230	\$10,174,561
<b>Local Purchases (1,000)</b>	\$2,181,105	\$2,831,947	\$512,846	\$665,880	\$2,693,951	\$3,497,827
<b>Taxes (1,000)</b>						
Federal	\$924,744	\$1,200,688	\$231,958	\$301,175	\$1,156,702	\$1,501,862
Provincial and Local	\$564,274	\$732,653	\$239,549	\$311,030	\$803,823	\$1,043,684
Total	\$1,489,018	\$1,933,341	\$471,507	\$612,205	\$1,960,525	\$2,545,546

EXHIBIT II-12								
Great Lakes-St. Lawrence Seaway System Impacts by Flag of Carriage – Regional Level								
	Canadian Flag		U.S. Flag		Foreign Flag		Total	
<b>Jobs</b>								
Direct Jobs	28,498		39,522		10,380		78,400	
Induced	33,530		35,746		11,066		80,343	
Indirect	27,264		42,838		9,024		79,126	
Total	89,292		118,106		30,471		237,868	
<b>Economic Activity (1,000)</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>
	\$11,052,311	\$14,350,321	\$20,892,882	\$27,127,318	\$3,052,640	\$3,963,548	\$34,997,833	\$45,441,186
<b>Personal Income (1,000)</b>								
Direct	\$1,192,780	\$1,548,706	\$2,137,528	\$2,775,366	\$465,998	\$605,052	\$3,796,306	\$4,929,124
Re-Spending/ Local Consumption	\$1,843,133	\$2,393,124	\$4,294,015	\$5,575,349	\$740,970	\$962,076	\$6,878,118	\$8,930,548
Indirect	\$1,196,511	\$1,553,549	\$1,960,454	\$2,545,453	\$398,022	\$516,792	\$3,554,986	\$4,615,794
Total	\$4,232,424	\$5,495,379	\$8,391,996	\$10,896,168	\$1,604,990	\$2,083,919	\$14,229,410	\$18,475,466
<b>Business Revenue (1,000)</b>	\$9,209,179	\$11,957,197	\$16,598,867	\$21,551,969	\$2,311,670	\$3,001,472	\$28,119,715	\$36,510,639
<b>Local Purchases (1,000)</b>	\$2,863,736	\$3,718,275	\$4,184,789	\$5,433,530	\$922,136	\$1,197,302	\$7,970,661	\$10,349,106
<b>Taxes (1,000)</b>								
Federal	\$1,338,302	\$1,737,652	\$2,722,903	\$3,535,417	\$467,415	\$606,892	\$4,528,620	\$5,879,961
State/Provincial and Local	\$776,507	\$1,008,217	\$1,028,410	\$1,335,288	\$271,071	\$351,959	\$2,075,989	\$2,695,464
Total	\$2,114,810	\$2,745,869	\$3,751,313	\$4,870,705	\$738,487	\$958,851	\$6,604,610	\$8,575,425

## Chapter III – Great Lakes-St. Lawrence River Waterway Impacts



This chapter measures the impacts of maritime shipping on the Great Lakes-St. Lawrence River Waterway. All domestic and international cargo moving on the waterway is included in the analysis, including Great Lakes, St. Lawrence Seaway and lower St. Lawrence River cargo.

In 2017, a total of **230.9 million metric tons (254.6 million short tons) of cargo valued at \$77.4 billion U.S. (Cdn\$100.5 billion)** moved through the Great Lakes-St. Lawrence River waterway. As noted, a majority of the domestic cargo moving on Canadian and U.S. flag vessels remains in the waterway, creating economic impacts at the loading port as well as the port of discharge. With this accounted for, the actual tons handled at the ports on the Great Lakes-St. Lawrence River waterway is **381 million metric tons (420 million short tons)**. This cargo generated the following economic impacts:

**Economic Activity** — The marine cargo and vessel activity generated a total of **US\$45.6 billion (Cdn\$59.2 billion)** in economic activity in the United States and Canada.

**Employment** — Maritime commerce supported **328,543 U.S. and Canadian jobs**, including 105,885 direct jobs. As a result of local and regional purchases made by those 105,885 individuals, an additional 108,712 induced jobs were supported in the regional economy. Finally, 113,946 indirect jobs were supported by US\$12.3 billion (Cdn\$16.0 billion) in regional purchases by businesses supplying services at the marine terminals and ports.

**Personal Income** — Maritime activity supported **U.S.\$17.9 billion (Cdn\$23.3 billion) in total personal wage and salary income and local consumption expenditures** in the regional economies of the U.S. and Canada. The 105,885 direct job holders received US\$5.0 billion (Cdn\$6.5 billion) in wage income.

**Local Purchases** — Businesses involved in maritime activity spent **US\$12.3 billion (Cdn\$16 billion) on purchases** in their respective local economies.

**Taxes** — A total of **US\$9.0 billion (Cdn\$11.7 billion) in federal, state/provincial and local tax revenue** was generated by maritime activity.

**EXHIBIT III-3**  
**Great Lakes-St. Lawrence River Waterway Impacts – Country Level**

	Canada		United States		Total	
<b>Jobs</b>						
Direct Jobs	56,490		49,395		105,885	
Induced	64,844		43,868		108,712	
Indirect	59,745		54,201		113,946	
Total	181,079		147,464		328,543	
<b>Economic Activity (1,000)</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>
	\$20,003,296	\$25,972,279	\$25,610,903	\$33,253,197	\$45,614,199	\$59,225,476
<b>Personal Income (1,000)</b>						
Direct	\$2,330,505	\$3,025,927	\$2,641,743	\$3,430,039	\$4,972,248	\$6,455,967
Re-Spending/Local Purchases	\$2,570,100	\$3,337,018	\$5,327,418	\$6,917,119	\$7,897,518	\$10,254,137
Indirect	\$2,578,709	\$3,348,196	\$2,485,486	\$3,227,156	\$5,064,196	\$6,575,352
Total	\$7,479,314	\$9,711,141	\$10,454,648	\$13,574,315	\$17,933,961	\$23,285,455
<b>Business Revenue (1,000)</b>	\$17,433,196	\$22,635,261	\$20,283,485	\$26,336,077	\$37,716,681	\$48,971,339
<b>Local Purchases (1,000)</b>	\$7,044,726	\$9,146,872	\$5,276,709	\$6,851,280	\$12,321,436	\$15,998,152
<b>Taxes (1,000)</b>						
Federal	\$2,352,898	\$3,055,002	\$3,371,918	\$4,378,099	\$5,724,816	\$7,433,101
State/Provincial and Local	\$2,012,017	\$2,612,403	\$1,272,166	\$1,651,781	\$3,284,184	\$4,264,184
Total	\$4,364,915	\$5,667,405	\$4,644,084	\$6,029,879	\$9,008,999	\$11,697,285

**EXHIBIT III-10**  
**Great Lakes-St. Lawrence River Waterway Impacts – by State**

	Indiana		Ohio		Michigan	
<b>Tonnage Handled (1,000): Metric Tons (Short Tons)</b>	<b>26,986 (29,747)</b>		<b>39,599 (43,650)</b>		<b>59,014 (65,051)</b>	
<b>Jobs</b>						
Direct Jobs	19,518		9,398		11,180	
Induced	19,432		8,549		8,294	
Indirect	27,208		15,221		6,436	
Total	66,158		33,168		25,910	
<b>Economic Activity (1,000)</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>
	\$13,726,685	\$17,822,728	\$3,745,199	\$4,862,766	\$4,160,713	\$5,402,270
<b>Personal Income (1,000)</b>						
Direct	\$1,201,907	\$1,560,556	\$475,029	\$616,777	\$536,631	\$696,762
Re-Spending/Local Consumption	\$2,441,194	\$3,169,646	\$1,025,207	\$1,331,128	\$966,365	\$1,254,728
Indirect	\$1,252,811	\$1,626,649	\$710,600	\$922,643	\$272,287	\$353,538
Total	\$4,895,912	\$6,356,852	\$2,210,835	\$2,870,549	\$1,775,283	\$2,305,028
<b>Business Revenue (1,000)</b>	\$11,285,492	\$14,653,083	\$2,719,992	\$3,531,638	\$3,194,348	\$4,147,541
<b>Local Purchases (1,000)</b>	\$2,604,640	\$3,381,865	\$1,411,723	\$1,832,981	\$692,167	\$898,709
<b>Taxes (1,000)</b>						
Federal	\$1,682,700	\$2,184,818	\$622,035	\$807,650	\$558,082	\$724,613
State and Local	\$623,108	\$809,044	\$216,662	\$281,314	\$205,209	\$266,443
Total	\$2,305,808	\$2,993,862	\$838,697	\$1,088,964	\$763,290	\$991,056

*EXHIBIT III-10 Continued*

	<b>Minnesota</b>		<b>Illinois</b>		<b>Wisconsin</b>	
<b>Tonnage Handled (1,000): Metric Tons (Short Tons)</b>	<b>31,231 (34,425)</b>		<b>10,289 (11,341)</b>		<b>27,086 (29,856)</b>	
<b>Jobs</b>						
Direct Jobs		2,176		2,943		3,198
Induced		1,852		2,654		2,316
Indirect		2,134		880		1,970
Total		6,161		6,476		7,484
<b>Economic Activity (1,000)</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>
	\$1,483,766	\$1,926,522	\$830,908	\$1,078,851	\$1,430,900	\$1,857,881
<b>Personal Income (1,000)</b>						
Direct	\$99,333	\$128,974	\$130,780	\$169,805	\$147,229	\$191,162
Re-Spending/Local Consumption	\$213,546	\$277,269	\$345,169	\$448,167	\$245,180	\$318,341
Indirect	\$100,528	\$130,526	\$46,015	\$59,745	\$87,653	\$113,809
Total	\$413,408	\$536,769	\$521,964	\$677,718	\$480,061	\$623,312
<b>Business Revenue (1,000)</b>	\$1,270,220	\$1,649,254	\$485,739	\$630,684	\$1,185,721	\$1,539,540
<b>Local Purchases (1,000)</b>	\$222,048	\$288,308	\$89,032	\$115,599	\$210,833	\$273,745
<b>Taxes (1,000)</b>						
Federal	\$160,488	\$208,378	\$137,785	\$178,900	\$169,585	\$220,189
State and Local	\$69,544	\$90,296	\$64,945	\$84,325	\$71,541	\$92,889
Total	\$230,033	\$298,674	\$202,730	\$263,225	\$241,126	\$313,078

*EXHIBIT III-10 Continued*

	<b>New York</b>		<b>Pennsylvania</b>		<b>Total US</b>	
<b>Tonnage Handled (1,000): Metric Tons (Short Tons)</b>	<b>960 (1,058)</b>		<b>603 (665)</b>		<b>195,768 (215,795)</b>	
<b>Jobs</b>						
Direct Jobs		691		291		49,395
Induced		542		229		43,868
Indirect		116		237		54,201
Total		1,349		757		147,464
<b>Economic Activity (1,000)</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>
	\$141,866	\$184,199	\$90,864	\$117,978	\$25,610,903	\$33,253,197
<b>Personal Income (1,000)</b>						
Direct	\$38,128	\$49,505	\$12,707	\$16,498	\$2,641,743	\$3,430,039
Re-Spending/Local Consumption	\$63,536	\$82,495	\$27,222	\$35,345	\$5,327,418	\$6,917,119
Indirect	\$5,954	\$7,731	\$9,638	\$12,514	\$2,485,486	\$3,227,156
Total	\$107,618	\$139,731	\$49,566	\$64,357	\$10,454,648	\$13,574,315
<b>Business Revenue (1,000)</b>	\$78,331	\$101,704	\$63,643	\$82,633	\$20,283,485	\$26,336,077
<b>Local Purchases (1,000)</b>	\$17,207	\$22,342	\$29,060	\$37,731	\$5,276,709	\$6,851,280
<b>Taxes (1,000)</b>						
Federal	\$27,143	\$35,242	\$14,100	\$18,308	\$3,371,918	\$4,378,099
State and Local	\$14,780	\$19,190	\$6,377	\$8,280	\$1,272,166	\$1,651,781
Total	\$41,923	\$54,432	\$20,477	\$26,588	\$4,644,084	\$6,029,879

EXHIBIT III-11						
Great Lakes-St. Lawrence River Waterway Impacts – by Province						
	Ontario		Quebec		Total	
<b>Tonnage Handled (1,000): Metric Tons (Short Tons)</b>	<b>61,378 (67,657)</b>		<b>123,856 (136,527)</b>		<b>185,234 (204,184)</b>	
<b>Jobs</b>						
Direct Jobs		21,561		34,929		56,490
Induced		28,904		35,940		64,844
Indirect		20,182		39,563		59,745
Total		70,647		110,433		181,079
<b>Economic Activity (1,000)</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>
	\$7,700,224	\$9,997,970	\$12,303,072	\$15,974,309	\$20,003,296	\$25,972,279
<b>Personal Income (1,000)</b>						
Direct	\$842,378	\$1,093,744	\$1,488,126	\$1,932,183	\$2,330,505	\$3,025,927
Re-Spending/Local Consumption	\$1,276,372	\$1,657,241	\$1,293,728	\$1,679,777	\$2,570,100	\$3,337,018
Indirect	\$877,836	\$1,139,782	\$1,700,873	\$2,208,414	\$2,578,709	\$3,348,196
Total	\$2,996,586	\$3,890,768	\$4,482,727	\$5,820,373	\$7,479,314	\$9,711,141
<b>Business Revenue (1,000)</b>	\$6,423,852	\$8,340,729	\$11,009,344	\$14,294,532	\$17,433,196	\$22,635,261
<b>Local Purchases (1,000)</b>	\$2,181,105	\$2,831,947	\$4,863,621	\$6,314,925	\$7,044,726	\$9,146,872
<b>Taxes (1,000)</b>						
Federal	\$924,744	\$1,200,688	\$1,428,154	\$1,854,315	\$2,352,898	\$3,055,002
Provincial and Local	\$564,274	\$732,653	\$1,447,743	\$1,879,750	\$2,012,017	\$2,612,403
Total	\$1,489,018	\$1,933,341	\$2,875,897	\$3,734,064	\$4,364,915	\$5,667,405

EXHIBIT III-12								
Great Lakes-St. Lawrence River Waterway Impacts by Flag of Carriage – Regional Level								
	Canadian Flag		U.S. Flag		Foreign Flag		Total	
<b>Jobs</b>								
Direct Jobs		35,171		39,522		31,192		105,885
Induced		39,870		35,746		33,095		108,712
Indirect		30,951		42,838		40,157		113,946
Total		105,993		118,106		104,445		328,543
<b>Economic Activity (1,000)</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>
	\$12,842,890	\$16,675,208	\$20,892,882	\$27,127,318	\$11,878,427	\$15,422,950	\$45,614,199	\$59,225,476
<b>Personal Income (1,000)</b>								
Direct	\$1,447,512	\$1,879,450	\$2,137,528	\$2,775,366	\$1,387,208	\$1,801,151	\$4,972,248	\$6,455,967
Re-Spending/ Local Consumption	\$2,075,353	\$2,694,638	\$4,294,015	\$5,575,349	\$1,528,151	\$1,984,151	\$7,897,518	\$10,254,137
Indirect	\$1,344,635	\$1,745,874	\$1,960,454	\$2,545,453	\$1,759,107	\$2,284,024	\$5,064,196	\$6,575,352
Total	\$4,867,500	\$6,319,962	\$8,391,996	\$10,896,168	\$4,674,465	\$6,069,325	\$17,933,961	\$23,285,455
<b>Business Revenue (1,000)</b>	\$10,767,537	\$13,980,570	\$16,598,867	\$21,551,969	\$10,350,277	\$13,438,800	\$37,716,681	\$48,971,339
<b>Local Purchases (1,000)</b>	\$3,246,603	\$4,215,389	\$4,184,789	\$5,433,530	\$4,890,043	\$6,349,232	\$12,321,436	\$15,998,152
<b>Taxes (1,000)</b>								
Federal	\$1,540,588	\$2,000,300	\$2,722,903	\$3,535,417	\$1,461,325	\$1,897,384	\$5,724,816	\$7,433,101
State/Provincial and Local	\$981,580	\$1,274,483	\$1,028,410	\$1,335,288	\$1,274,193	\$1,654,413	\$3,284,184	\$4,264,184
Total	\$2,522,168	\$3,274,783	\$3,751,313	\$4,870,705	\$2,735,518	\$3,551,797	\$9,008,999	\$11,697,285

## Chapter IV – St. Lawrence Seaway Impacts



This chapter presents the economic impacts of cargo that specifically transits the St. Lawrence Seaway. The Seaway extends from Montreal to Lake Erie and is composed of a series of 15 consecutive locks that connect the Great Lakes to the lower St. Lawrence River and the Atlantic Ocean. The Welland Canal section consists of eight Canadian locks that enable ships to pass between Lakes Erie and Ontario, bypassing the Niagara Falls. The Montreal-Lake Ontario (MLO) section of the Seaway consists of seven locks — five located in Canada and two in the United States. These locks enable ships to pass between Lake Ontario and the lower St. Lawrence River. This chapter describes the economic impacts of all domestic and international traffic moving through the lock system.

During 2017, more than **38.1 million metric tons (41.9 million short tons)** of cargo valued at US\$7.7 billion (Cdn\$10.0 billion) passed through the St. Lawrence Seaway's infrastructure. A total of **64 million metric tons (70.5 million short tons)** of cargo transiting the St. Lawrence Seaway was handled at the region's ports generating the following economic impacts:

**Economic Activity** — Marine cargo and vessel activity generated a total of **US\$12.9 billion (Cdn\$16.8 billion)** economic activity in the United States and Canada.

**Employment** — Maritime commerce supported **92,661 U.S. and Canadian jobs**, including 29,624 direct jobs. As a result of local and regional purchases made by those 29,624 individuals, an additional 34,539 induced jobs were supported in the regional economy. Finally, 28,498 indirect jobs were supported by US\$2.9 billion (Cdn\$3.7 billion) in regional purchases by businesses supplying services at the marine terminals and ports.

**Personal Income** — Maritime commerce supported **US\$4.9 billion (Cdn\$6.3 billion) in total personal wages and local consumption expenditures**. The 29,624 direct job holders received U.S.\$1.4 billion (Cdn\$1.8 billion) in wage income.

**Local Purchases** — Businesses involved in maritime activity on the St. Lawrence Seaway spent **US\$2.9 billion (Cdn\$3.8 billion) on purchases** in their respective local economies.

**Taxes** — St. Lawrence Seaway commercial maritime activity generated **US\$ 2.4 billion (Cdn\$3.1 billion) in local, state/provincial and federal tax revenues**.

**EXHIBIT IV-3**  
**St. Lawrence Seaway Impacts – Country Level**

	Canada		United States		Total	
<b>Jobs</b>						
Direct Jobs		19,451		10,173		29,624
Induced		24,966		9,572		34,539
Indirect		15,390		13,109		28,498
Total		59,806		32,855		92,661
<b>Economic Activity (1,000)</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>
	\$7,076,236	\$9,187,784	\$5,872,312	\$7,624,610	\$12,948,548	\$16,812,394
<b>Personal Income (1,000)</b>						
Direct	\$773,169	\$1,003,883	\$577,694	\$750,078	\$1,350,863	\$1,753,960
Re-Spending/Local Consumption	\$1,068,180	\$1,386,925	\$1,181,409	\$1,533,941	\$2,249,589	\$2,920,866
Indirect	\$662,617	\$860,342	\$605,598	\$786,309	\$1,268,215	\$1,646,650
Total	\$2,503,966	\$3,251,150	\$2,364,701	\$3,070,327	\$4,868,667	\$6,321,477
<b>Business Revenue (1,000)</b>	\$6,008,055	\$7,800,859	\$4,690,903	\$6,090,669	\$10,698,959	\$13,891,528
<b>Local Purchases (1,000)</b>	\$1,660,900	\$2,156,513	\$1,255,824	\$1,630,563	\$2,916,725	\$3,787,076
<b>Taxes (1,000)</b>						
Federal	\$793,210	\$1,029,903	\$768,660	\$998,028	\$1,561,869	\$2,027,931
State/Provincial and Local	\$536,124	\$696,103	\$291,707	\$378,753	\$827,831	\$1,074,856
Total	\$1,329,334	\$1,726,007	\$1,060,367	\$1,376,780	\$2,389,700	\$3,102,787

**EXHIBIT IV-10**  
**St. Lawrence Seaway Impacts – by State**

	Indiana		Ohio		Michigan	
<b>Tonnage Handled (1,000): Metric Tons (Short Tons)</b>	<b>1,451 (1,599)</b>		<b>6,126 (6,753)</b>		<b>1,523 (1,678)</b>	
<b>Jobs</b>						
Direct Jobs		6,175		2,015		482
Induced		6,218		1,702		340
Indirect		8,608		3,350		337
Total		21,002		7,067		1,159
<b>Economic Activity (1,000)</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>
	\$4,610,939	\$5,986,843	\$616,554	\$800,534	\$81,506	\$105,828
<b>Personal Income (1,000)</b>						
Direct	\$385,752	\$500,861	\$92,281	\$119,818	\$21,497	\$27,912
Re-Spending/Local Consumption	\$783,502	\$1,017,299	\$199,161	\$258,590	\$38,713	\$50,264
Indirect	\$396,371	\$514,649	\$156,633	\$203,373	\$14,036	\$18,224
Total	\$1,565,625	\$2,032,808	\$448,075	\$581,781	\$74,246	\$96,400
<b>Business Revenue (1,000)</b>	\$3,827,437	\$4,969,545	\$417,393	\$541,943	\$42,794	\$55,564
<b>Local Purchases (1,000)</b>	\$824,071	\$1,069,974	\$308,434	\$400,471	\$36,592	\$47,511
<b>Taxes (1,000)</b>						
Federal Taxes (1,000)	\$550,773	\$715,123	\$118,305	\$153,607	\$18,074	\$23,467
State and Local	\$202,319	\$262,690	\$43,911	\$57,015	\$7,493	\$9,728
Total	\$753,091	\$977,814	\$162,216	\$210,621	\$25,566	\$33,195

*EXHIBIT IV-10 Continued*

	Minnesota		Illinois		Wisconsin	
<b>Tonnage Handled (1,000): Metric Tons (Short Tons)</b>	<b>3,356 (3,699)</b>		<b>786 (866)</b>		<b>3,415 (3,764)</b>	
<b>Jobs</b>						
Direct Jobs	284		501		460	
Induced	251		476		351	
Indirect	351		148		271	
Total	886		1,125		1,082	
<b>Economic Activity (1,000)</b>	<b>US \$</b> \$165,468	<b>Cdn \$</b> \$214,844	<b>US \$</b> \$139,051	<b>Cdn \$</b> \$180,544	<b>US \$</b> \$195,722	<b>Cdn \$</b> \$254,125
<b>Personal Income (1,000)</b>						
Direct	\$13,641	\$17,711	\$23,859	\$30,978	\$22,786	\$29,586
Re-Spending/Local Consumption	\$29,325	\$38,076	\$62,970	\$81,760	\$37,946	\$49,269
Indirect	\$16,534	\$21,468	\$7,750	\$10,062	\$12,061	\$15,660
Total	\$59,500	\$77,255	\$94,578	\$122,801	\$72,794	\$94,515
<b>Business Revenue (1,000)</b>	\$136,143	\$176,768	\$76,081	\$98,783	\$157,776	\$204,856
<b>Local Purchases (1,000)</b>	\$36,380	\$47,235	\$14,970	\$19,437	\$28,982	\$37,630
<b>Taxes (1,000)</b>						
Federal	\$20,391	\$26,476	\$24,274	\$31,518	\$24,438	\$31,730
State and Local	\$9,094	\$11,808	\$11,583	\$15,039	\$10,500	\$13,633
Total	\$29,486	\$38,284	\$35,857	\$46,557	\$34,938	\$45,363

*EXHIBIT IV-10 Continued*

	New York		Pennsylvania		Total US	
<b>Tonnage Handled (1,000): Metric Tons (Short Tons)</b>	<b>230 (253)</b>		<b>0 (0)*</b>		<b>16,886 (18,614)</b>	
<b>Jobs</b>						
Direct Jobs	255		0		10,173	
Induced	234		0		9,572	
Indirect	43		0		13,109	
Total	533		0		32,855	
<b>Economic Activity (1,000)</b>	<b>US \$</b> \$63,042	<b>Cdn \$</b> \$81,854	<b>US \$</b> \$29	<b>Cdn \$</b> \$38	<b>US \$</b> \$5,872,312	<b>Cdn \$</b> \$7,624,610
<b>Personal Income (1,000)</b>						
Direct	\$17,873	\$23,206	\$4	\$5	\$577,694	\$750,078
Re-Spending/Local Consumption	\$29,783	\$38,671	\$9	\$11	\$1,181,409	\$1,533,941
Indirect	\$2,210	\$2,870	\$3	\$4	\$605,598	\$786,309
Total	\$49,866	\$64,747	\$16	\$20	\$2,364,701	\$3,070,327
<b>Business Revenue (1,000)</b>	\$33,259	\$43,184	\$20	\$26	\$4,690,903	\$6,090,669
<b>Local Purchases (1,000)</b>	\$6,387	\$8,294	\$9	\$12	\$1,255,824	\$1,630,563
<b>Taxes (1,000)</b>						
Federal	\$12,401	\$16,101	\$4	\$6	\$768,660	\$998,028
State and Local	\$6,805	\$8,836	\$2	\$3	\$291,707	\$378,753
Total	\$19,206	\$24,937	\$7	\$8	\$1,060,367	\$1,376,780

\* Pennsylvania tonnage appears as 0 as it is less than 1,000 metric tons

EXHIBIT IV-11						
St. Lawrence Seaway Impacts – by Province						
	Ontario		Quebec		Total	
<b>Tonnage Handled (1,000): Metric Tons (Short Tons)</b>	<b>29,916 (32,977)</b>		<b>17,154 (18,908)</b>		<b>47,070 (51,885)</b>	
<b>Jobs</b>						
Direct Jobs	15,689		3,762		19,451	
Induced	21,219		3,747		24,966	
Indirect	12,747		2,642		15,390	
Total	49,655		10,152		59,806	
<b>Economic Activity (1,000)</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>
	\$6,064,386	\$7,873,999	\$1,011,850	\$1,313,785	\$7,076,236	\$9,187,784
<b>Personal Income (1,000)</b>						
Direct	\$619,825	\$804,781	\$153,344	\$199,102	\$773,169	\$1,003,883
Re-Spending/Local Consumption	\$939,159	\$1,219,404	\$129,022	\$167,522	\$1,068,180	\$1,386,925
Indirect	\$553,255	\$718,347	\$109,362	\$141,995	\$662,617	\$860,342
Total	\$2,112,239	\$2,742,531	\$391,727	\$508,619	\$2,503,966	\$3,251,150
<b>Business Revenue (1,000)</b>	\$5,125,227	\$6,654,595	\$882,828	\$1,146,264	\$6,008,055	\$7,800,859
<b>Local Purchases (1,000)</b>	\$1,379,579	\$1,791,246	\$281,321	\$365,268	\$1,660,900	\$2,156,513
<b>Taxes (1,000)</b>						
Federal	\$670,945	\$871,154	\$122,265	\$158,749	\$793,210	\$1,029,903
Provincial and Local	\$411,481	\$534,267	\$124,643	\$161,836	\$536,124	\$696,103
Total	\$1,082,426	\$1,405,422	\$246,908	\$320,585	\$1,329,334	\$1,726,007

EXHIBIT IV-12								
St. Lawrence Seaway Impacts by Flag of Carriage – Regional Level								
	Canadian Flag		U.S. Flag		Foreign Flag		Total	
<b>Jobs</b>								
Direct Jobs	21,936		317		7,371		29,624	
Induced	26,083		354		8,101		34,539	
Indirect	20,851		252		7,396		28,498	
Total	68,870		923		22,868		92,661	
<b>Economic Activity (1,000)</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>
	\$10,471,829	\$13,596,623	\$130,405	\$169,317	\$2,346,314	\$3,046,454	\$12,948,548	\$16,812,394
<b>Personal Income (1,000)</b>								
Direct	\$992,206	\$1,288,281	\$12,977	\$16,849	\$345,679	\$448,830	\$1,350,863	\$1,753,960
Re-Spending/ Local Consumption	\$1,597,005	\$2,073,552	\$19,528	\$25,355	\$633,056	\$821,960	\$2,249,589	\$2,920,866
Indirect	\$922,719	\$1,198,059	\$11,016	\$14,304	\$334,479	\$434,288	\$1,268,215	\$1,646,650
Total	\$3,511,931	\$4,559,892	\$43,521	\$56,508	\$1,313,214	\$1,705,078	\$4,868,667	\$6,321,477
<b>Business Revenue (1,000)</b>	\$8,874,824	\$11,523,071	\$110,877	\$143,963	\$1,713,258	\$2,224,494	\$10,698,959	\$13,891,528
<b>Local Purchases (1,000)</b>	\$2,149,435	\$2,790,826	\$26,736	\$34,714	\$740,555	\$961,536	\$2,916,725	\$3,787,076
<b>Taxes (1,000)</b>								
Federal	\$1,173,826	\$1,524,096	\$14,236	\$18,484	\$373,807	\$485,351	\$1,561,869	\$2,027,931
State/Provincial and Local	\$639,766	\$830,672	\$8,647	\$11,227	\$179,419	\$232,958	\$827,831	\$1,074,856
Total	\$1,813,592	\$2,354,768	\$22,883	\$29,711	\$553,226	\$718,309	\$2,389,700	\$3,102,787

## Chapter V – Soo Locks Impacts



This chapter describes the economic impacts of all domestic and international cargo moving through the Soo Locks, which connect ports on Lake Superior to the lower Lakes, the St. Lawrence Seaway and international markets. The Soo Locks are located on the St. Marys River in Sault Ste. Marie, Michigan.

In 2017, a total of **69.1 million metric tons of cargo (76.2 million short tons) valued at US\$5.8 billion (Cdn\$7.5 billion)** passed through the Soo Locks. The actual tons handled at system ports that also moved through the Soo Locks is **134.8 million metric tons (148.6 million short tons)**, creating the following economic impacts:

**Economic Activity** — The marine cargo and vessel activity moving through the Soo Locks generated a total of **US\$22.6 billion (Cdn\$29.3 billion)** in total economic activity in the United States and Canada.

**Employment** — Maritime commerce that transited the Soo Locks supported **123,172 U.S. and Canadian jobs**, including 39,765 direct jobs. As a result of local and regional purchases made by those 39,765 individuals,

an additional 41,828 induced jobs were supported in the regional economy. Finally, 41,579 indirect jobs were supported by US\$4.2 billion (Cdn\$5.4 billion) in regional purchases by businesses supplying services at the marine terminals and ports.

**Personal Income** — Cargo moving via the Soo Locks supported **US\$7.9 billion (Cdn\$10.3 billion) in total personal wages and local consumption expenditures** in the regional economies of the U.S. and Canada. The 39,765 direct jobholders received US\$2.1 billion (Cdn\$2.7 billion) in direct wage and salary income.

**Local Purchases** — Businesses involved in maritime activity transiting the Soo Locks spent **US\$4.2 billion (Cdn\$5.4 billion) on purchases** in their respective local economies.

**Taxes** — Commercial maritime activity moving via the Soo Locks generated **US\$3.8 billion (Cdn\$4.9 billion) in local, state/provincial and federal tax revenues.**

EXHIBIT V-3 Soo Locks Impacts – Country Level						
	Canada		United States		Total	
<b>Jobs</b>						
Direct Jobs		11,668		28,097		39,765
Induced		15,100		26,728		41,828
Indirect		9,246		32,332		41,579
Total		36,014		87,158		123,172
<b>Economic Activity (1,000)</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>
	\$5,187,870	\$6,735,930	\$17,407,618	\$22,602,051	\$22,595,488	\$29,337,981
<b>Personal Income (1,000)</b>						
Direct	\$452,477	\$587,496	\$1,655,669	\$2,149,720	\$2,108,146	\$2,737,216
Re-Spending/Local Consumption	\$651,124	\$845,419	\$3,301,561	\$4,286,747	\$3,952,685	\$5,132,166
Indirect	\$401,147	\$520,849	\$1,480,902	\$1,922,803	\$1,882,048	\$2,443,652
Total	\$1,504,747	\$1,953,763	\$6,438,132	\$8,359,271	\$7,942,879	\$10,313,034
<b>Business Revenue (1,000)</b>	\$4,536,746	\$5,890,512	\$14,106,056	\$18,315,303	\$18,642,803	\$24,205,815
<b>Local Purchases (1,000)</b>	\$1,006,529	\$1,306,877	\$3,152,483	\$4,093,184	\$4,159,011	\$5,400,060
<b>Taxes (1,000)</b>						
Federal	\$506,315	\$657,400	\$2,170,159	\$2,817,734	\$2,676,474	\$3,475,134
State/Provincial and Local	\$328,161	\$426,084	\$804,489	\$1,044,549	\$1,132,650	\$1,470,633
Total	\$834,476	\$1,083,484	\$2,974,648	\$3,862,283	\$3,809,124	\$4,945,767

EXHIBIT V-10 Soo Locks Impacts – by State						
	Indiana		Ohio		Michigan	
<b>Tonnage Handled (1,000): Metric Tons (Short Tons)</b>	<b>19,272 (21,244)</b>		<b>11,813 (13,021)</b>		<b>23,676 (26,098)</b>	
<b>Jobs</b>						
Direct Jobs		15,046		3,024		5,677
Induced		15,706		3,163		4,405
Indirect		20,973		4,436		3,495
Total		51,725		10,623		13,577
<b>Economic Activity (1,000)</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>
	\$10,379,603	\$13,476,876	\$1,931,952	\$2,508,446	\$2,522,921	\$3,275,761
<b>Personal Income (1,000)</b>						
Direct	\$983,114	\$1,276,476	\$182,988	\$237,592	\$289,994	\$376,529
Re-Spending/Local Consumption	\$1,996,804	\$2,592,650	\$394,925	\$512,770	\$522,222	\$678,053
Indirect	\$965,748	\$1,253,927	\$209,006	\$271,374	\$147,610	\$191,657
Total	\$3,945,666	\$5,123,053	\$786,919	\$1,021,736	\$959,826	\$1,246,238
<b>Business Revenue (1,000)</b>	\$8,382,799	\$10,884,226	\$1,537,027	\$1,995,676	\$2,000,700	\$2,597,708
<b>Local Purchases (1,000)</b>	\$2,007,826	\$2,606,961	\$405,561	\$526,580	\$379,549	\$492,807
<b>Taxes (1,000)</b>						
Federal	\$1,314,792	\$1,707,126	\$254,401	\$330,314	\$317,604	\$412,377
State and Local	\$492,197	\$639,069	\$77,118	\$100,130	\$114,232	\$148,319
Total	\$1,806,990	\$2,346,195	\$331,519	\$430,444	\$431,836	\$560,696

*EXHIBIT V-10 Continued*

	Minnesota		Illinois		Wisconsin	
<b>Tonnage Handled (1,000): Metric Tons (Short Tons)</b>	<b>30,924 (34,088)</b>		<b>910 (1,003)</b>		<b>20,605 (22,713)</b>	
<b>Jobs</b>						
Direct Jobs	2,155		175		1,817	
Induced	1,834		158		1,318	
Indirect	2,111		52		1,235	
Total	6,101		385		4,369	
<b>Economic Activity (1,000)</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>
	\$1,469,832	\$1,908,430	\$55,740	\$72,372	\$1,012,298	\$1,314,368
<b>Personal Income (1,000)</b>						
Direct	\$98,393	\$127,753	\$7,784	\$10,107	\$83,833	\$108,849
Re-Spending/Local Consumption	\$211,524	\$274,643	\$20,545	\$26,676	\$139,607	\$181,265
Indirect	\$99,488	\$129,175	\$2,712	\$3,521	\$54,799	\$71,150
Total	\$409,405	\$531,571	\$31,041	\$40,304	\$278,238	\$361,265
<b>Business Revenue (1,000)</b>	\$1,258,308	\$1,633,787	\$35,194	\$45,696	\$872,691	\$1,133,102
<b>Local Purchases (1,000)</b>	\$219,776	\$285,357	\$5,238	\$6,801	\$130,086	\$168,903
<b>Taxes (1,000)</b>						
Federal	\$158,957	\$206,390	\$8,560	\$11,114	\$109,046	\$141,585
State and Local	\$68,879	\$89,432	\$3,960	\$5,142	\$44,395	\$57,642
Total	\$227,835	\$295,822	\$12,520	\$16,256	\$153,441	\$199,228

*EXHIBIT V-10 Continued*

	New York		Pennsylvania		Total US	
<b>Tonnage Handled (1,000): Metric Tons (Short Tons)</b>	<b>325 (358)</b>		<b>0 (0)</b>		<b>107,525 (118,525)</b>	
<b>Jobs</b>						
Direct Jobs	203		0		28,097	
Induced	144		0		26,728	
Indirect	30		0		32,332	
Total	377		0		87,158	
<b>Economic Activity (1,000)</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>
	\$35,272	\$45,797	\$0	\$0	\$17,407,618	\$22,602,051
<b>Personal Income (1,000)</b>						
Direct	\$9,562	\$12,416	\$0	\$0	\$1,655,669	\$2,149,720
Re-Spending/Local Consumption	\$15,935	\$20,690	\$0	\$0	\$3,301,561	\$4,286,747
Indirect	\$1,539	\$1,998	\$0	\$0	\$1,480,902	\$1,922,803
Total	\$27,036	\$35,103	\$0	\$0	\$6,438,132	\$8,359,271
<b>Business Revenue (1,000)</b>	\$19,337	\$25,108	\$0	\$0	\$14,106,056	\$18,315,303
<b>Local Purchases (1,000)</b>	\$4,447	\$5,774	\$0	\$0	\$3,152,483	\$4,093,184
<b>Taxes (1,000)</b>						
Federal	\$6,799	\$8,828	\$0	\$0	\$2,170,159	\$2,817,734
State and Local	\$3,708	\$4,815	\$0	\$0	\$804,489	\$1,044,549
Total	\$10,507	\$13,643	\$0	\$0	\$2,974,648	\$3,862,283

**EXHIBIT V-11**  
**Soo Locks Impacts – by Province**

	Ontario		Quebec		Total	
<b>Tonnage Handled (1,000): Metric Tons (Short Tons)</b>	<b>19,257 (21,227)</b>		<b>7,990 (8,807)</b>		<b>27,247 (30,034)</b>	
<b>Jobs</b>						
Direct Jobs	10,479		1,189		11,668	
Induced	13,943		1,157		15,100	
Indirect	8,476		770		9,246	
<b>Total</b>	<b>32,898</b>		<b>3,116</b>		<b>36,014</b>	
<b>Economic Activity (1,000)</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>
	\$4,783,280	\$6,210,611	\$404,590	\$525,319	\$5,187,870	\$6,735,930
<b>Personal Income (1,000)</b>						
Direct	\$405,559	\$526,578	\$46,917	\$60,917	\$452,477	\$587,496
Re-Spending/Local Consumption	\$614,504	\$797,871	\$36,620	\$47,548	\$651,124	\$845,419
Indirect	\$370,117	\$480,560	\$31,029	\$40,289	\$401,147	\$520,849
<b>Total</b>	<b>\$1,390,180</b>	<b>\$1,805,010</b>	<b>\$114,567</b>	<b>\$148,754</b>	<b>\$1,504,747</b>	<b>\$1,953,763</b>
<b>Business Revenue (1,000)</b>	\$4,168,777	\$5,412,740	\$367,970	\$477,772	\$4,536,746	\$5,890,512
<b>Local Purchases (1,000)</b>	\$918,514	\$1,192,599	\$88,014	\$114,278	\$1,006,529	\$1,306,877
<b>Taxes (1,000)</b>						
Federal	\$467,044	\$606,410	\$39,271	\$50,990	\$506,315	\$657,400
Provincial and Local	\$289,117	\$375,389	\$39,044	\$50,695	\$328,161	\$426,084
<b>Total</b>	<b>\$756,161</b>	<b>\$981,799</b>	<b>\$78,315</b>	<b>\$101,685</b>	<b>\$834,476</b>	<b>\$1,083,484</b>

**EXHIBIT V-12**  
**Soo Locks Impacts by Flag of Carriage – Regional Level**

	Canadian Flag		U.S. Flag		Foreign Flag		Total	
<b>Jobs</b>								
Direct Jobs	14,451		24,805		508		39,765	
Induced	17,229		23,969		631		41,828	
Indirect	12,559		28,446		573		41,579	
<b>Total</b>	<b>44,240</b>		<b>77,220</b>		<b>1,712</b>		<b>123,172</b>	
<b>Economic Activity (1,000)</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>	<b>US \$</b>	<b>Cdn \$</b>
	\$7,073,549	\$9,184,296	\$15,363,551	\$19,948,035	\$158,387	\$205,650	\$22,595,488	\$29,337,981
<b>Personal Income (1,000)</b>								
Direct	\$616,639	\$800,645	\$1,467,132	\$1,904,925	\$24,374	\$31,647	\$2,108,146	\$2,737,216
Re-Spending/ Local Consumption	\$993,524	\$1,289,992	\$2,918,801	\$3,789,771	\$40,360	\$52,403	\$3,952,685	\$5,132,1667
Indirect	\$554,671	\$720,185	\$1,301,761	\$1,690,207	\$25,616	\$33,259	\$1,882,048	\$2,443,652
<b>Total</b>	<b>\$2,164,835</b>	<b>\$2,810,822</b>	<b>\$5,687,694</b>	<b>\$7,384,902</b>	<b>\$90,350</b>	<b>\$117,310</b>	<b>\$7,942,879</b>	<b>\$10,313,034</b>
<b>Business Revenue (1,000)</b>	\$6,080,025	\$7,894,304	\$12,444,751	\$16,158,264	\$118,027	\$153,246	\$18,642,803	\$24,205,815
<b>Local Purchases (1,000)</b>	\$1,321,680	\$1,716,070	\$2,775,337	\$3,603,497	\$61,994	\$80,493	\$4,159,011	\$5,400,060
<b>Taxes (1,000)</b>								
Federal	\$737,942	\$958,144	\$1,913,289	\$2,484,214	\$25,243	\$32,776	\$2,676,474	\$3,475,134
State/Provincial and Local	\$407,047	\$528,510	\$711,723	\$924,101	\$13,880	\$18,021	\$1,132,650	\$1,470,633
<b>Total</b>	<b>\$1,144,989</b>	<b>\$1,486,654</b>	<b>\$2,625,012</b>	<b>\$3,408,316</b>	<b>\$39,123</b>	<b>\$50,797</b>	<b>\$3,809,124</b>	<b>\$4,945,767</b>

