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EXECUTIVE SUMMARY

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.

Over the last 200 years, navigation improvements in both the United States and Canada have enhanced the waterway. The Welland Canal has connected Lake Ontario and Lake Erie, enabling vessels to bypass Niagara Falls. The Soo Locks have made the St. Mary's River navigable, connecting Lake Superior with Lake Huron. The St. Lawrence Seaway has tamed the St. Lawrence River, enabling ships to sail from Lake Ontario to the Atlantic Ocean.

The resulting deep draft navigation system is the longest in the world, extending 3,700 kilometers (2,300 miles) into the North American heartland. This waterway complements the region's rail and highway network and offers customers a costeffective, safe and environmentally smart means of moving raw materials, agricultural commodities and manufactured products. Every year more than 160 million metric tons of cargo is moved on the Great Lakes-St. Lawrence Seaway System. Dominant cargoes include iron ore for steel production, coal for power generation, limestone and cement for construction, and grain for both domestic consumption and export.

Three distinct vessel-operator communities serve the waterway. These include U.S. domestic carriers ("U.S. Lakers") transporting cargo between ports on the system, Canadian domestic carriers ("Canadian Lakers") operating between ports on the system, and ocean-going vessel operators ("Salties"), which operate between system 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 and efficient transport of cargo. These include stevedores, warehousemen, freight forwarders, dockworkers, crane operators, vessel agents, dredging contractors, marine pilots, truck drivers, 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 the Great Lakes-Seaway system to the state, provincial, regional and national economies. This is the first-ever study that measures the economic impacts of the Great Lakes-Seaway system to both nations, at the same time, using the same methodology.

To accomplish this goal, a bi-national consortium of public and private sector Great Lakes-Seaway system stakeholders retained Martin Associates of Lancaster, Pennsylvania — a global leader in transportation economic analysis and strategic planning. Martin Associates completed Great Lakes-Seaway system economic impact studies on U.S.-specific data in 1992, 1995 and 2000, and has completed more than 250 economic impact studies for ports and port systems throughout the U.S., Canada, South America, Europe, and Asia.

METHODOLOGY

This analysis estimates the combined U.S. and Canadian economic impacts of all marine cargo moving on the bi-national Great Lakes-Seaway system, 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 2010 cargo movements at 32 U.S. and Canadian Great Lakes-Seaway system ports. The analysis was developed from a comprehensive telephone interview program of more than 900 individual firms providing maritime services at these ports. Models were then developed to expand the 32-port impacts to the statewide and province-wide levels. It is important to note that the direct impacts generated at the 32 individual ports accounted for 71 percent of the total system-wide impacts. The 16 Canadian ports accounted for 75 percent of the total estimated Canadian impacts, while the 16 U.S. ports accounted for 66 percent of the total estimated U.S. impacts.

This analysis measures the impacts of cargo "handled" at Great Lakes-Seaway system 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 system 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 Great Lakes-Seaway system 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). For 2010, the 322 million metric tons of cargo identified as "handled" is based on approximately 164 million metric tons of cargo "moved."

It is also important to note that the study does not address the economic impacts derived from international traffic originating from or destined for those ports and terminals on the St. Lawrence River east of and including Montreal. For example, the economic benefits of container movements to and from the Port of Montreal to overseas markets are not included in this analysis, as this trade does not enter or leave the Great Lakes-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 Sept-Iles, Quebec for re-loading onto a larger ocean-going vessel, are included.

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 2010 average exchange rate of 1.03).

In order to ensure defensibility and accuracy, the study methodology and results of the analysis have been peer reviewed by leading U.S. and Canadian economists in academia and private industry. The peer review process was jointly managed by the U.S. Department of Transportation and Transport Canada.

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CATEGORIES OF IMPACTS

Employment: These impacts consist of four 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 would experience dislocation 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.
- Related User Employment jobs with firms using
 the port to ship and receive cargo. While the facilities
 and services provided at the ports and marine
 terminals are a crucial part of the infrastructure
 allowing these jobs to exist, these jobs would not
 necessarily be immediately displaced if marine
 activity were to cease. For this reason, related
 user impacts are a separate non-additive
 employment category.

Personal Income: These impacts are a measure of the employee wages and salaries (excluding benefits) received by individuals directly employed due to port activity.

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

In 2010, 322.1 million metric tons of cargo were handled by all U.S. and Canadian ports and marine terminals on the Great Lakes-Seaway system. The movement of this cargo generated the following economic impacts:

System-wide Impacts (Chapter II)

Employment – Maritime commerce on the Great Lakes-Seaway system in 2010 generated 226,833 U.S. and Canadian jobs, including 92,923 direct jobs. As a result of local and regional purchases made by those 92,923 individuals, an additional 66,005 induced jobs were supported in the regional economy. Finally, 67,905 indirect jobs were supported by US\$6.4 billion (Cdn\$6.6 billion) in regional purchases by businesses supplying services at the marine terminals and ports.

Personal Income – Maritime activity in 2010 supported US\$14.1 billion (Cdn\$14.5 billion) in total personal wage and salary income and local consumption expenditures in the regional economies of the U.S. and Canada. The 92,923 direct job holders received US\$4.4 billion (Cdn\$4.5 billion) in wage income; this equates to an average annual salary of US\$47,000 (Cdn\$48,400).

Business Revenue – As a result of maritime activity on the Great Lakes-Seaway system, U\$\$33.6 billion (Cdn\$34.6 billion) in business revenue was received by firms supplying cargo handling and vessel services, and inland transportation services. This amount of revenue is split almost evenly between the United States and Canada.

Local Purchases – Businesses involved in maritime activity in the Great Lakes-Seaway system spent US\$6.4 billion (Cdn\$6.6 billion) on purchases in their respective local economies.

Taxes – A total of US\$4.6 billion (Cdn\$4.7 billion) in federal, state/provincial and local tax revenue was generated by maritime activity on the Great Lakes-Seaway system in 2010.

		Canada	United	States		Total
Jobs						
Direct Jobs		48,288		44,634	!	92,923
Induced		21,947		44,057		66,005
Indirect	28,320			39,585		67,905
Total		98,556	128,227		2	26,833
Personal Income (1,000)	US \$	Cdn \$	US \$	Cdn \$	US \$	Cdn \$
Direct	\$2,310,209	\$2,379,515	\$2,052,776	\$2,114,360	\$4,362,985	\$4,493,875
Re-Spending/						
Local Consumption	\$878,987	\$905,357	\$5,974,194	\$6,153,420	\$6,853,182	\$7,058,777
Indirect	\$1,274,072	\$1,312,294	\$1,623,988	\$1,672,707	\$2,898,060	\$2,985,002
Total	\$4,463,268	\$4,597,166	\$9,650,959	\$9,940,487	\$14,114,227	\$14,537,654
Business Revenue (1,000)	\$15,425,317	\$15,888,076	\$18,135,715	\$18,679,787	\$33,561,032	\$34,567,863
Local Purchases (1,000)	\$3,373,601	\$3,474,809	\$3,040,143	\$3,131,347	\$6,413,744	\$6,606,156
State/Provincial and Local Taxes (1,000)	\$584,966	\$602,515	\$945,668	\$974,038	\$1,530,634	\$1,576,553
Federal Taxes (1,000)	\$1,315,681	\$1,355,151	\$1,737,173	\$1,789,288	\$3,052,853	\$3,144,439

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Exhibit II-9 Economic Impacts by State — Cargo Moving via U.S. Ports and Marine Terminals on the Great Lakes-St. Lawrence Seaway System

Tonnage (1,000)		Indiana 28,360	4	Ohio 10,222	Michigan 61,302		
Jobs							
Direct Jobs	15,516			8,504	1	0,603	
Induced		17,852		9,222		8,061	
Indirect		14,964		10,355		8,155	
Total		48,332	;	28,081	26,819		
Personal Income (1,000)	US \$	Cdn \$	US \$	Cdn \$	US\$	Cdn \$	
Direct	\$726,283	\$748,072	\$378,968	\$390,337	\$484,116	\$498,640	
Re-Spending/							
Local Consumption	\$2,468,927	\$2,542,995	\$1,278,750	\$1,317,113	\$1,058,956	\$1,090,725	
Indirect	\$587,445	\$605,069	\$436,985	\$450,094	\$334,688	\$344,728	
Total	\$3,782,656	\$3,896,135	\$2,094,703	\$2,157,544	\$1,877,761	\$1,934,093	
Business Revenue (1,000)	\$7,894,646	\$8,131,486	\$3,032,330	\$3,123,300	\$3,799,899	\$3,913,896	
Local Purchases (1,000)	\$1,133,209	\$1,167,206	\$772,802	\$795,986	\$637,553	\$656,680	
State and Local Taxes (1,000)	\$359,352	\$370,133	\$203,186	\$209,282	\$182,143	\$187,607	
Federal Taxes (1,000)	\$680,878	\$701,304	\$377,047	\$388,358	\$337,997	\$348,137	

Exhibit II-9 continued

Tonnage (1,000)	Mir	nnesota 30,160		Illinois 7,219		Wisconsin 33,241		
Jobs								
Direct Jobs		2,516		2,813		3,466		
Induced		2,258		2,521		3,071		
Indirect		1,496		1,842		2,240		
Total		6,271		7,177		8,777		
Personal Income (1,000)	US \$	Cdn \$	US \$	Cdn \$	US \$	Cdn \$		
Direct	\$115,464	\$118,928	\$121,942	\$125,600	\$163,789	\$168,703		
Re-Spending/								
Local Consumption	\$263,731	\$271,643	\$384,763	\$396,306	\$367,057	\$378,069		
Indirect	\$60,381	\$62,193	\$87,490	\$90,115	\$91,566	\$94,313		
Total	\$439,576	\$452,763	\$594,196	\$612,022	\$622,412	\$641,085		
Business Revenue (1,000)	\$1,343,705	\$1,384,016	\$438,795	\$451,959	\$1,405,293	\$1,447,451		
Local Purchases (1,000)	\$114,433	\$117,866	\$152,694	\$157,275	\$175,955	\$181,234		
State and Local Taxes (1,000)	\$46,815	\$48,219	\$59,420	\$61,202	\$67,073	\$69,085		
Federal Taxes (1,000)	\$79,124	\$81,497	\$106,955	\$110,164	\$112,034	\$115,395		

Tonnage (1,000)	Ne	w York 2,216	Pennsylv	ania 605		ital US 03,325
Jobs						
Direct Jobs		924		291		44,634
Induced		763		310		44,057
Indirect		280		252	39,585	
Total	1,967		854		1:	28,277
Personal Income (1,000)	US \$	Cdn \$	US\$	Cdn \$	US \$	Cdn \$
Direct	\$49,646	\$51,136	\$12,568	\$12,945	\$2,052,776	\$2,114,360
Re-Spending/						
Local Consumption	\$109,291	\$112,570	\$42,718	\$43,999	\$5,974,194	\$6,153,420
Indirect	\$14,770	\$15,213	\$10,662	\$10,982	\$1,623,988	\$1,672,707
Total	\$173,708	\$178,919	\$65,948	\$67,926	\$9,650,959	\$9,940,487
Business Revenue (1,000)	\$167,397	\$172,419	\$53,650	\$55,260	\$18,135,715	\$18,679,787
Local Purchases (1,000)	\$34,070	\$35,092	\$19,426	\$20,009	\$3,040,143	\$3,131,347
State and Local Taxes (1,000)	\$21,019	\$21,649	\$6,661	\$6,861	\$945,668	\$974,038
Federal Taxes (1,000)	\$31,267	\$32,205	\$11,871	\$12,227	\$1,737,173	\$1,789,288

Exhibit II-10	Economic Impacts by Province — Cargo Moving via Canadian Ports and Marine Terminals
	on the Great Lakes-St. Lawrence Seaway System

Tonnage (1,000)		Ontario 62,293	Quebec 56,511		Total 118,804		
Jobs							
Direct Jobs		28,894		19,394		48,288	
Induced		12,743		9,205		21,947	
Indirect		21,906		6,414		28,320	
Total		63,542	35,013		!	98,556	
Personal Income (1,000)	US \$	Cdn \$	US \$	Cdn \$	US \$	Cdn \$	
Direct	\$1,288,019	\$1,326,659	\$1,022,190	\$1,052,856	\$2,310,209	\$2,379,515	
Re-Spending/							
Local Consumption	\$515,208	\$530,664	\$363,780	\$374,693	\$878,987	\$905,357	
Indirect	\$940,245	\$968,452	\$333,827	\$343,842	\$1,274,072	\$1,312,294	
Total	\$2,743,471	\$2,825,775	\$1,719,797	\$1,771,391	\$4,463,268	\$4,597,166	
Business Revenue (1,000)	\$9,360,290	\$9,641,098	\$6,065,027	\$6,246,978	\$15,425,317	\$15,888,076	
Local Purchases (1,000)	\$2,419,844	\$2,492,439	\$953,757	\$982,370	\$3,373,601	\$3,474,809	
Provincial Taxes (1,000)	\$236,076	\$243,158	\$348,890	\$359,357	\$584,966	\$602,515	
Federal Taxes (1,000)	\$908,089	\$935,332	\$407,592	\$419,820	\$1,315,681	\$1,355,151	

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Impacts by Flag of Carriage (Chapter III)

Three distinct vessel operator communities serve the Great Lakes-Seaway system. U.S. flag operators are those companies whose vessels are documented under the laws of the United States; generally, these carriers operate between U.S. ports within the Great Lakes. Canadian flag operators are those companies whose vessels are documented under Canadian law. These carriers generally operate between lower St. Lawrence River ports and Great Lakes ports, carrying both domestic and bi-national commerce. Finally, foreign flag operators are those carriers whose vessels are documented under the laws of a country other than the United States or Canada. These carriers typically operate between system ports and overseas destinations.

Employment – Of the 226,833 jobs supported by activity on the Great Lakes-Seaway system, cargo moving on the Canadian flag fleet supported 101,568 jobs (45 percent), while cargo moving on U.S. flag vessels supported 107,612 jobs (47 percent). The remaining 17,653 jobs (8 percent) were supported by cargo moving on foreign flag vessels.

Personal Income — For the system-wide personal income total of US\$14.1 billion (Cdn\$14.5 billion), cargo moving on Canadian flag vessels supported 35 percent of that income; cargo moving on U.S. flag vessels supported 55 percent; and cargo moving on foreign flag vessels supported 10 percent.

	Cana	dian Flag	U.S	. Flag	For	eign Flag		Total
Jobs								
Direct Jobs	48,660		37,220		7,043		92,923	
Induced	24,189		35,772		6,044		66,005	
Indirect	28,719		34,621		4,566		67,905	
Total	101,568		107,612		17,653		226,833	
Personal Income (1,000)	US \$	Cdn \$	US \$	Cdn \$	US\$	Cdn \$	US \$	Cdn
Direct	\$2,288,326	\$2,356,976	\$1,696,677	\$1,747,577	\$377,983	\$389,322	\$4,362,985	\$4,493,87
Re-Spending/ Local								
Consumption	\$1,309,804	\$1,349,098	\$4,750,354	\$4,892,864	\$793,025	\$816,815	\$6,853,182	\$7,058,77
Indirect	\$1,286,225	\$1,324,811	\$1,419,128	\$1,461,702	\$192,707	\$198,488	\$2,898,060	\$2,985,00
Total	\$4,884,354	\$5,030,885	\$7,866,158	\$8,102,143	\$1,363,714	\$1,404,626	\$14,114,227	\$14,537,65
Business Revenue (1,000)	\$15,678,458	\$16,148,812	\$15,537,600	\$16,003,728	\$2,344,974	\$2,415,323	\$33,561,032	\$34,567,86
Local Purchases (1,000)	\$3,323,626	\$3,423,335	\$2,685,125	\$2,765,679	\$404,992	\$417,142	\$6,413,744	\$6,606,15
State/Provincial and Local Taxes (1,000)	\$617,015	\$635,525	\$763,841	\$786,757	\$149,777	\$154,271	\$1,530,634	\$1,576,55
-	ψ017,010	Ψ000,020	ψ100,041	ψ100,101	Ψ1-13,111	ψιστ,ΣΙΙ	ψ1,000,004	Ψ1,070,00
Federal Taxes (1,000)	\$1,343,664	\$1,383,974	\$1,445,719	\$1,489,090	\$263,470	\$271,374	\$3,052,853	\$3,144,43

Business Revenue — Cargo moving via Canadian flag vessels supported US\$15.7 billion (Cdn\$16.1 billion) in direct business revenue, 47 percent of the total, while cargo moving on U.S.-flag vessels supported US\$15.5 billion (Cdn\$16.0 billion), accounting for 46 percent of the business revenue. The cargo moving on foreign flag vessels accounted for the balance.

Local Purchases — Cargo moving on Canadian flag vessels supported 52 percent of the total local purchases made system-wide in 2010. Cargo moving on the U.S. flag fleet supported 42 percent, while foreign flag vessel activity supported the balance.

Taxes — Cargo moving on Canadian flag vessels supported 44 percent of the total tax impact and cargo moving on the U.S. flag vessels accounted for 47 percent of the impact, while the cargo moving on foreign flag vessels supported the balance of the tax impact.

St. Lawrence Seaway Impacts (Chapter IV)

The St. Lawrence Seaway extends from Montreal to Lake Erie and is composed of a series of 15 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. 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. During 2010, more than 35 million metric tons of cargo passed through the Seaway's infrastructure. This chapter describes the economic impacts of system traffic utilizing any segment of the Seaway. This data is intended to better inform public policy decisions regarding infrastructure investment, system management, vessel regulation, etc.

Employment — Maritime commerce on the St. Lawrence Seaway portion of the Great Lakes-Seaway system in 2010 impacted 86,006 U.S. and Canadian jobs, including 37,344 direct jobs. As a result of local and regional purchases made by those 37,344 individuals, an additional 21,830 induced jobs were supported in the regional economy. Finally, 26,832 indirect jobs were supported by US\$2.8 billion (Cdn\$2.9 billion) in regional purchases by businesses supplying services at the marine terminals and ports.

Personal Income — Maritime commerce utilizing the St. Lawrence Seaway in 2010 supported US\$4.6 billion (Cdn\$4.7 billion) in total personal wages and local consumption expenditures. The 37,344 direct job holders received US\$1.78 billion (Cdn\$1.83 billion) in wage income.

Business Revenue — In 2010, the marine cargo and vessel activity using the St. Lawrence Seaway generated US\$12.3 billion (Cdn\$12.7 billion) in direct business revenue.

Local Purchases — Businesses involved in maritime activity on the St. Lawrence Seaway spent US\$2.8 billion (Cdn\$2.9 billion) on purchases in their respective local economies.

Taxes — St. Lawrence Seaway commercial maritime activity generated US\$1.7 billion (Cdn\$1.7 billion) in local, state/provincial and federal tax revenues.

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Exhibit IV-2 Economic Impacts of the St. Lawrence Seaway — Country Level Canada **United States Impacts** Total Jobs 37,344 Direct Jobs 29,512 7,832 Induced 13,310 8,520 21,830 Indirect 20,220 6,613 26,832 Total 63,041 86,006 22,965 Personal Income (1,000) US \$ Cdn \$ US\$ Cdn \$ US\$ Cdn \$ Direct \$1,387,919 \$1,429,557 \$385,809 \$397,383 \$1,773,728 \$1,826,940 Re-Spending/ Local Consumption \$522.014 \$537.675 \$1.125.765 \$1,159,538 \$1,647,780 \$1.697.213 Indirect \$888,709 \$915,370 \$274.725 \$282,967 \$1,163,434 \$1,198,337 Total \$2,798,643 \$2,882,602 \$1,786,299 \$4,584,942 \$4,722,490 \$1,839,888 \$9,522,050 \$12,689,407 **Business Revenue (1,000)** \$9,807,711 \$2,797,763 \$2,881,696 \$12,319,813 Local Purchases (1,000) \$2.390.769 \$2.930.998 \$2.321.135 \$524.495 \$540.230 \$2.845.629 State/Provincial and Local Taxes (1,000) \$323,447 \$333,150 \$177,427 \$182,749 \$500,873 \$515,899 Federal Taxes (1,000) \$862,260 \$888,128 \$321,534 \$331,180 \$1,183,794 \$1,219,308 Note: Totals may not add due to rounding

Impacts of New York Ballast Water Regulations (Chapter V)

This chapter describes the economic impact of all commercial cargo moving through New York waters of the Great Lakes-Seaway system. This traffic includes the cargo moving on New York sections of the St. Lawrence River though the Montreal-Lake Ontario (MLO) section of the St. Lawrence Seaway, as well as cargo moving to and from Buffalo, N.Y. (intra-lake commerce) and not transiting any Seaway locks.

This analysis is meant to inform the public policy debate surrounding New York State ballast water regulations on vessels transiting New York waters. In December 2008, New York established state regulations governing the discharge of ballast water from commercial vessels operating in New York's jurisdiction. The regulations seek to address the problem of aquatic nuisance species being introduced into New York waters via ships' ballast water.

Under New York's rules, by 2013, all vessels operating in New York waters will be required to install environmental technology that can clean or treat ballast water to meet a specific water quality standard. The State of New York's water quality standard is 100 times more stringent than international standards. The regulations apply to vessels that call on New York ports and vessels that transit New York waters destined for ports in other states.

A July 2011 evaluation by the U.S. Environmental Protection Agency (EPA) determined that technology does not exist to meet the water quality level stipulated by New York. For this reason, the maritime industry believes these regulations to be unworkable and, if left unchanged, will cause economic harm when they come into effect, resulting in complete cessation of commercial maritime commerce in New York waters. The economic impacts presented in this chapter demonstrate the economic-opportunity cost of the proposed regulations on the U.S. and Canadian economies.

Employment — In 2010, Great Lakes-Seaway system maritime commerce that transited New York waters impacted **72,061 U.S. and Canadian jobs**, including *31,314 direct jobs*. As a result of local and regional purchases made by those 31,314 individuals, an additional *18,306 induced jobs* were supported in the regional economy. Finally, *22,442 indirect jobs* were supported by US\$2.4 billion (Cdn\$2.5 billion) in regional purchases by businesses supplying services at the marine terminals and ports.

Personal Income — Cargo moving via New York waters of the Great Lakes-Seaway system supported US\$3.8 billion (Cdn\$3.9 billion) in total personal wages and local consumption expenditures in the regional economies of the U.S. and Canada. The 31,314 direct jobholders received US\$1.5 billion (Cdn\$1.6 billion) in direct wage and salary income.

Business Revenue — In 2010, the marine cargo and vessel activity on the New York waters of the Great Lakes-Seaway system generated a total of US\$10.5 billion (Cdn\$10.8 billion) in direct business revenue in Canada and the United States.

Local Purchases — Businesses involved in Great Lakes-Seaway system maritime activity transiting New York waters spent US\$2.4 billion (Cdn\$2.5 billion) on purchases in their respective local economies.

Taxes — Great Lakes-Seaway system commercial maritime activity moving on New York waters generated US\$1.4 billion (Cdn\$1.5 billion) in local, state/provincial and federal tax revenues.

Exhibit V-2	Economic Impacts of the Commerce Transiting New York Waters of the Great Lakes-
	Seaway System — Country Level

Impacts	Canada		United	States	Total		
Jobs							
Direct Jobs		25,360		5,954		31,314	
Induced	11,477		6,829		18,306		
Indirect	18,117		4,324		22,442		
Total	54,954		-	17,108	72,061		
Personal Income (1,000)	US \$	Cdn \$	US \$	Cdn \$	US \$	Cdn \$	
Direct	\$1,202,427	\$1,238,500	\$301,286	\$310,325	\$1,503,713	\$1,548,824	
Re-Spending/							
Local Consumption	\$448,315	\$461,765	\$898,078	\$925,021	\$1,346,393	\$1,386,785	
Indirect	\$797,643	\$821,573	\$179,162	\$184,537	\$976,806	\$1,006,110	
Total	\$2,448,385	\$2,521,837	\$1,378,526	\$1,419,882	\$3,826,912	\$3,941,719	
Business Revenue (1,000)	\$8,404,342	\$8,656,472	\$2,081,001	\$2,143,431	\$10,485,343	\$10,799,904	
Local Purchases (1,000)	\$2,090,243	\$2,152,950	\$349,540	\$360,026	\$2,439,782	\$2,512,976	
State/Provincial and Local Taxes (1,000)	\$289,027	\$297,697	\$137,400	\$141,522	\$426,427	\$439,219	
Federal Taxes (1,000)	\$749,856	\$772,351	\$248,135	\$255,579	\$997,991	\$1,027,930	

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Related User Impacts (Chapter VI)

This chapter presents information on related user impacts, which measure jobs, income, output and tax impacts with shippers/consignees and supporting industries that move cargo through the ports and marine terminals on the Great Lakes-Seaway system. These impacts are classified as "related" because the firms using system ports and marine terminals to move cargo can — and, in some cases, do — use other ports and marine terminals outside the Great Lakes-Seaway System. As a result, these impacts cannot be counted as exclusively dependent upon the marine terminals in the system.

Employment — In addition to the 226,833 U.S. and Canadian jobs impacted by Great Lakes-Seaway system maritime commerce, there are **an additional 477,593 related user jobs**, including *393,262 in the*

United States and *84,331 in Canada*. The majority of the related user impacts occur in the U.S. as a result of the iron ore and coal movements on the Great Lakes.

Personal Income — In 2010, individuals employed by related users accounted for US\$22.7 billion (Cdn\$23.4 billion) in total personal wages and local consumption expenditures.

Business Revenue — Related user business revenue totaled **US\$115.5 billion (Cdn\$119.0 billion)** in Canada and the United States in 2010.

Taxes — The activity created in the related user sector in 2010 generated **US\$7.1 billion (Cdn\$7.4 billion)** in tax revenue for federal, state/provincial, and local governments.

User Impacts		Canada	United	States		Total
Jobs	84,331		393,262		477,593	
	US \$	Cdn \$	US \$	Cdn \$	US \$	Cdn \$
Personal Income (1,000)	\$4,552,340	\$4,688,910	\$18,179,620	\$18,725,008	\$22,731,960	\$23,413,919
Business Revenue (1,000)	\$31,608,507	\$32,556,763	\$83,906,441	\$86,423,634	\$115,514,949	\$118,980,397
State/Provincial and Local Taxes (1,000)	\$543,053	\$559,345	\$1,853,928	\$1,909,546	\$2,396,981	\$2,468,891
Federal Taxes (1,000)	\$1,382,022	\$1,423,482	\$3,272,332	\$3,370,501	\$4,654,353	\$4,793,984

These summary findings, and the balance of the following report, highlight the significant contribution of maritime commerce on the Great Lakes-St. Lawrence Seaway System to the bi-national regional economy of the Great Lakes and through it, to the economy of North America as a whole.

ABOUT THE STUDY SPONSORS

Martin Associates was retained to perform this analysis by a coalition of U.S. and Canadian Great Lakes-Seaway marine industry stakeholders. Study sponsors include: the St. Lawrence Seaway Management Corporation, the Saint Lawrence Seaway Development Corporation, the Chamber of Marine Commerce, the American Great Lakes Ports Association, the Lake Carriers' Association, the Great Lakes Maritime Task Force, Algoma Central Corporation, Canada Steamship Lines, and Fednav Limited. Technical and project management assistance was provided by Transport Canada. The American Great Lakes Ports Association served as the contracting agent.



About the Study Sponsors 13

ABOUT MARTIN ASSOCIATES

Martin Associates of Lancaster, Pennsylvania, is a leading provider of economic analysis and consulting services to the maritime industry. The company has developed more than 250 economic impact and strategic planning studies for major ports and waterways systems throughout the United States and Canada, including the Port of Seattle, Port of Vancouver, Port of Los Angeles, Port of Houston, Port of New Orleans, Port of Miami, and Port of Halifax. Martin Associates has also provided analysis for maritime trade associations such as the World Shipping Council and American Association of Port Authorities, and government agencies such as the U.S. Army Corps of Engineers and Canadian Coast Guard.





STUDY PEER REVIEW

INTRODUCTION

A draft final version of all six chapters of this analysis was sent to several recognized U.S. and Canadian economists for peer review in August 2011. The review was intended to ensure that the methodology used by Martin Associates to calculate the benefits was sound and met the generally accepted precepts of economic theory. Martin Associates responded in writing to all peer review comments to the satisfaction of all three reviewers. Based on these comments, several minor adjustments were made to the analysis prior to final printing. Letters from the three peer reviewers follow.

PEER REVIEWERS

Dr. John Lawson — Dr. Lawson is a recognized transport economist with nearly 40 years' experience, initially with the UK Department of Transport in the early 1970s, then from the mid-1970s to 2005 at Transport Canada. As Transport Canada's Director for Economic Analysis and Research, Dr. Lawson was responsible for analysis of policy issues, development of analytical methods and data. Retired from Transport Canada in 2005, Dr. Lawson is now an independent transport economics researcher and consultant, and Research Associate of the University of British Columbia Centre for Transport Studies. He consults for public and private sectors, in Canada and internationally, particularly on transport energy and emissions.

Dr. Bruce L. Jaffee — Dr. Jaffee currently serves as the Executive Director and Professor at the Institute for International Business at the Kelley School of Business at the University of Indiana. From 1989 to 1997, he was chairperson of the Department of Business Economics and Public Policy. From 1980 to 1984, he was chairperson of the doctoral programs in business. His research interests include public utility regulation, taxation, exclusive distribution territories, the economic development aspects of sports, energy policy and industry regulation. Dr. Jaffee has had international teaching experience in China, Poland, Hungary and the Czech Republic. After receiving his bachelor's degree from Brown University, Dr. Jaffee earned his master's and doctoral degrees from Johns Hopkins University.

Dr. Robert D. Beam — Dr. Beam currently serves as Professor Emeritus at the School of Business and Economics, University of Wisconsin-Superior. He retired from the school in May 2011 after 30 years. In addition to his teaching duties, Dr. Beam has authored and contributed to numerous economic studies and papers, including several related to Great Lakes trade and transportation. Currently, Dr. Beam also provides consultation services on economic issues. He received his bachelor's, master's, and doctoral economics degrees from the University of Cincinnati, and is a member of the International Atlantic Economic Society.

Study Peer Review 15

LAWSON ECONOMICS RESEARCH INC.

Independent Transport and Economics Research, Ottawa, Canada

Kevin P. O'Malley Director, Office of Budget and Programs Saint Lawrence Seaway Development Corporation 1200 New Jersey Avenue, S.E., Suite W32-300 Washington, D.C. 20590

Dear Mr O'Malley:

Re: Review of "The Economic Impacts of the Great Lakes St. Lawrence Seaway System 2010", by Martin Associates, review draft August 5, 2011

As requested by Transport Canada, I undertook and reported on my "Peer Review" of the above report, interpreting my task as primarily to comment on the validity of the methods and results based on my experience as a transport economist and my knowledge of North American transportation, and also to make editorial suggestions about the clarity and accuracy of the text.

The study's input data included the system traffic, the results of a survey of system participants and various multipliers and rates obtained from the US BLS and Statistics Canada, all of which are confidential or proprietary to the consultant. I was therefore unable to duplicate and validate the calculations, so my review was based on the descriptions of the study methodology and findings.

My overall assessment is that the analysis was very thorough and extensive. It is unusual among "economic impact analyses" in its "bottom-up" approach of producing estimates for 32 separate ports, expanding to all traffic, aggregating to States and Provinces, and producing estimates for the Seaway and separately for traffic using New York waters, as well as by type of service and commodity. It is also particularly unusual among impact analyses in obtaining much of its base data through an extensive survey of the firms providing services in the system, to obtain estimates of their employment and finances relating to the system, rather than simply applying inaccurate average rates from Input-Output tables.

In my review I provided a number of comments and questions for clarification, and raised some of the uncertainties in the assumptions and methods of such economic impact analyses, arising e.g. in the distinctions between "direct" and "indirect" activities, in the inferences of the extent to which such activities are at risk of elimination in the absence of the facilities, and in the instability of multipliers used to estimate "induced" output and employment.

Sincerely,

John Lawson

John Cawson

President and Principal of Lawson Economics Research.

Previously Director, Economic Analysis & Research, Transport Canada

NDIANA UNIVERSITY



September 13, 2011





Mr. Kevin P. O'Malley Director, Office of Budget and Programs Saint Lawrence Seaway Development Corporation U.S. Department of Transportation 1200 New Jersey Ave., SE, Suite W32-300 Washington, DC 20590

RE: Binational Economic Impact Study

Dear Mr. O'Malley:

As you requested, I have reviewed the Martin Associates' August 5, 2011 report, The Economic Impact Study of the Great Lakes St. Lawrence Seaway System 2010. Overall, I find the study to be conceptually sound, comprehensive, based on appropriate data, and generally well written. Although no detailed information is provided about their survey data or the models that they use, the overall results seem reasonable.

I am very impressed that Martin Associates was able to get such a high response rate from the firms that they interviewed. The location specific data provided by phone interviews coupled with Martin Associates' knowledge of the maritime industry enhance the accuracy of these results.

During my review the study, I provided comments and suggestions on a few specific areas including the explanations of economic models used in the analysis, types of data collected for the study, RIMS II modeling considerations, evaluation of related user jobs, and sensitivity analysis. I received adequate responses and explanations from Martin Associates.

I personally have conducted economic impact studies of various individual events (e.g., the Indianapolis 500 and the Final Four basketball tournament) and industries. As a result, I feel qualified to recognize methodologically appropriate studies such as this one.

DEPARTMENT OF **BUSINESS ECONOMICS** AND PUBLIC POLICY

1309 East Tenth Street Bloomington, Indiana 47405-1701

812-855-9219 Fax: 812-855-3354 Bruce L. Jaffee

Sincerely

Professor and Executive Director Institute for International Business

BLJ:rg

RDB Consulting



Economics

September 15, 2011

Mr. Kevin P. O'Malley
Director, Office of Budget and Programs
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Suite W32-300
Washington, D.C. 20590
Kevin.o'Malley@sls.dot.gov
Re: The Economic Impacts of the Great Lakes St. Lawrence Seaway System 2010

Peer Review Letter of Endorsement

Dear Mr. O'Malley:

I would like to thank you and The Saint Lawrence Seaway Development Corporation for the opportunity to review this study prepared by Martin Associates of Lancaster, PA titled, *The Economic Impacts of the Great Lakes St. Lawrence Seaway System 2010.* Overall, I found the contents of this study to be well organized and clearly presented. Throughout each chapter, I found the impact calculations to be accurate and internally consistent. The impacts are derived using standard economic impact methods, summarized and explained in an easy to understand tabular format. I support the study's findings and methodology. I also feel that detailed telephone and personal interviews with terminal operators and port tenants are the best way to gather primary source data for this type of seaway cargo impact study. They are more expensive than electronic mail surveys, but they have a better chance of capturing higher response rates (83% in this case).

In my peer review, I asked for further clarification of how the Bureau of Economic Analysis and Statistics Canada define and develop the state/province personal earnings multipliers and job/sales multipliers for the relevant ports. I also asked Martin Associates to explain in greater detail how these multipliers were used to calculate state/province induced jobs and income impacts. I am satisfied with the clarifications Martin Associates provided in response to the points I raised.

Therefore, based on the evidence presented to me in this study and my prior experience serving as Principal Investigator for a university economic impact study I completed for UW-Superior in 2008, as well as my examination of scores of other impact studies during the course of my tenure as Professor of Economics at the University of Wisconsin - Superior, I would conclude that this study was completed in a professional and detailed manner, and I support its methods and findings as carried out by Martin Associates.

Sincerely,

Robert D. Beam, Ph.D.

Professor Emeritus of Economics

Robert D. Beam

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South Range, WI

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METHODOLOGY

- 1. Flow of Impacts
- 2. Impact Structure
- 3. Summary of Methodology
- 4. Commodities Included in the Analysis
 - **5.** Estimate of Tonnage
- **6.** Expansion of the 32 Port Impact Models to Measure System-Wide Impacts

Chapter

METHODOLOGY

Martin Associates of Lancaster, Pennsylvania, was retained by a consortium of U.S. and Canadian Great Lakes-St. Lawrence Seaway System stakeholders¹ to analyze the economic impacts generated by marine cargo activity on the Great Lakes-Seaway system. The analysis includes the economic impacts of all marine cargo moving on the waterway, including U.S. domestic commerce, Canadian domestic commerce, bi-national commerce between the two countries, and international traffic moving between the Great Lakes-Seaway region and overseas destinations. The impacts are measured for the year 2010 and are presented in terms of total economic impacts at the bi-national regional level, the state/provincial level and the country level.

The Great Lakes-Seaway system extends from its western-most point in Duluth, Minnesota, to eastern Quebec. The waterway includes the five Great Lakes, their connecting channels and the St. Lawrence River. This analysis examines the economic impacts created by cargo and vessel activity at all marine terminals located along the system — in the states of Minnesota, Wisconsin, Illinois, Indiana, Michigan, Ohio, Pennsylvania and New York, and the provinces of Ontario and Quebec. Included are terminals owned by public port authorities such as municipalities, counties and independent port agencies, as well as those owned and operated by private companies.

It is important to note that the purpose of the study is to quantify the economic benefits of the Great Lakes-Seaway system; therefore, the scope does not include measurement of the net impacts of the system.

To ensure the most accurate measurement of Great Lakes-Seaway system impacts, the study excludes impacts created by international maritime commerce

through St. Lawrence River ports in Quebec, where cargo does not transit the St. Lawrence Seaway lock system to and from the upper lakes. For example, trade between European ports and the Port of Montreal is not included in the impact analysis.

The study methodology is based on analysis of a core group of 32 Canadian and U.S. Great Lakes-Seaway system ports. The 32 individual ports are listed in Exhibit I-1.

The study team conducted detailed interviews with marine terminal operators, service providers, railroads, port tenants and other stakeholders at each port. The firms included in the interview process were identified from the following sources:

- Greenwood's Guide to Great Lakes Shipping
- Port directories
- Interviews with port authorities associated with the 32 individual ports
- Supplemental lists provided by stakeholders

¹ The consortium includes the American Great Lakes Ports Association (AGLPA), the Chamber of Marine Commerce (CMC), the St. Lawrence Seaway Management Corporation (SLSMC), the Saint Lawrence Seaway Development Corporation (SLSDC), the Lake Carriers' Association, the Great Lakes Maritime Task Force, Fednav Limited, Algoma Central Corporation, and Canada Steamship Lines. Technical and project management assistance was provided by Transport Canada.

Exhibit I-1	Individual Ports Included in the Study				
US Ports (16)	Canadian Ports (16)				
Ashtabula	Becancour				
Buffalo	Goderich				
Burns Harbor	Hamilton				
Chicago	Meldrum Bay				
Cleveland	Montreal/Contrecoeur				
Conneaut	Nanticoke				
Detroit	Oshawa				
Duluth	Port-Cartier				
Erie	Quebec/Levis				
Green Bay	Sarnia				
Milwaukee	Sept Iles/Pointe-Noire				
Monroe	Sorel				
Oswego	Thunder Bay				
Saginaw	Toronto				
Superior	Trois-Rivieres				
Toledo	Windsor				

In total, 1,095 firms were identified. All firms were contacted by telephone and interviewed to collect the data required to assess direct impacts and develop the individual port models. Of the 1,095 firms contacted, 907 (83 percent) provided data in the following categories:

- Jobs
- Income
- Revenue
- Local purchases
- Terminal operational specifics:
 - Modal splits
 - Hinterland distribution patterns
 - · Rail and truck rates
 - Rail yard specifics

To measure the impacts of marine cargo moving via individual ports and private terminals not included in the core group of 32 ports, Martin Associates developed prototype economic impact models. These models were used to expand the impacts to a state/provincial level, thus incorporating the Great Lakes-Seaway tonnage moving to and from all marine terminals located within a specific state or province.

1. FLOW OF IMPACTS

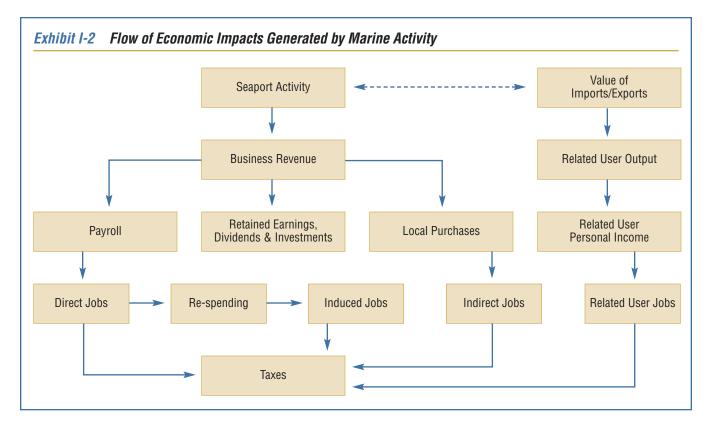
Waterborne cargo activity at a marine terminal on the Great Lakes-Seaway system contributes to the local, regional, state/provincial and national economies by generating business revenue for firms that provide vessel and cargo-handling services at the terminal. These companies, in turn, provide employment and income to individuals, and pay taxes to federal, state/provincial and local governments. Exhibit I-2 shows how activity at marine terminals generates impacts throughout the local, regional, state/provincial and national economies. As this exhibit illustrates. the economic impact of a port cannot be reduced to a single number, as the port activity creates several impacts — the revenue impact, employment impact, personal income impact, and tax impact. These impacts are non-additive. For example, the income impact is part of the revenue impact, and adding together these impacts would result in double-counting.

1.1 Business Revenue Impact

At the outset, activity at the port generates **business** revenue for firms that provide services. This business revenue impact is dispersed throughout the economy in several ways; it is used to hire people, purchase goods and services, and pay federal, state and local taxes. The remainder may be used to pay stockholders, retire debt or make investments, or may be held as retained earnings. Note that the only components of the revenue impact that can definitely be identified as remaining in the local economy are those portions dispersed in the following ways: salaries to local employees; local purchases by individuals and businesses directly dependent on the seaport: contributions to federal, state/provincial and local taxes; tenant lease payments to the port authorities; and wharfage and dockage fees paid by the steamship lines to the individual port authorities.

The related users output (described in Chapter VI) is the value of the marine cargo moving via the marine terminals. This output covers two categories of items moving through the terminals: the value added at each stage of production for exported (shipped) items, as well as the value added at each stage of use of imported (received) products. This total value of

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output represents the economic value of the marine terminals on the Great Lakes-Seaway system. In the steel sector, for example, related users include mines producing the coal and ore tonnage moving on the Great Lakes-Seaway system; the mills producing steel from that ore tonnage; and all suppliers and support operations required to produce the steel associated with that iron ore tonnage transported on the system. Similarly, grain farmers producing the grain exported (shipped) from system ports are included in the related user category, as are the supporting industries and their output required to deliver a ton of grain for export.

1.2 Employment Impact

The employment impact of the Great Lakes-Seaway port activity consists of four levels of job impacts:

 Direct employment impact — jobs directly generated by seaport activity. Direct jobs generated by marine cargo include jobs with railroads and trucking companies moving cargo between inland origins and destinations, and the marine terminals, as well as the jobs of longshoremen and dockworkers, steamship agents, freight forwarders, stevedores, and others. It should be noted that jobs classified as "directly generated" are those that would experience near-term dislocation if the activity at the marine terminals were discontinued.

- Induced employment impact jobs created throughout the local, regional and national economies because individuals directly employed due to port activity spend their wages locally on goods and services such as food, housing and clothing. These jobs are held by residents located throughout the region, since they are estimated based on local and regional purchases.
- Indirect employment impact jobs created within the region due to purchases of goods and services by firms, not individuals. These jobs are estimated directly from local purchases data supplied by the 907 companies interviewed as part of this study. They include jobs with office supply firms, maintenance and repair firms, parts and equipment suppliers, and others.
- Related user employment impact jobs with firms using the seaport to ship and receive cargo.
 While the facilities and services provided at the ports and marine terminals are a crucial part of the infrastructure that allows these jobs to exist, they would not necessarily be displaced immediately if

marine activity were to cease. The related users include the shippers/consignees who do not have operations on port property, and therefore could — and often do — use other modes to ship and receive cargo and raw materials. For the purposes of this analysis, shippers/consignees that have on-dock facilities or marine terminals associated with the production site are counted as directly dependent. Related user impacts are presented in Chapter VI of this report.

1.3 Personal Earnings Impact

The **personal earnings impact** is the measure of employee wages and salaries (excluding benefits) received by individuals directly employed due to port activity. Re-spending of these earnings on goods and services throughout the regional economy is also estimated using a state or provincial personal-earnings multiplier, which reflects the percentage of purchases by individuals that are made within the state/province in which the port is located. This re-spending generates additional jobs or the "induced" employment impact. The re-spending effect varies by region a larger effect occurs in regions that produce a relatively large proportion of the goods and services consumed by residents, while lower re-spending effects are associated with regions that import a relatively large share of consumer goods and services (since personal earnings "leak out" of the region for these out-of-region purchases). The direct earnings are a measure of the local impact since they are received by those directly employed by port activity.

1.4 Tax Impact

Tax impacts are tax payments to federal, state/provincial and local governments by firms and by individuals whose jobs are directly dependent upon and supported (induced and indirect jobs) by activity at the marine terminals.

2. IMPACT STRUCTURE

The four types of economic impacts are created throughout various business sectors of the local, regional, state/provincial and national economies. Four distinct sectors are impacted as a result of activity at the marine terminals. These are:

- Surface transportation sector
- · Maritime services sector
- Shippers/consignees using the port
- · Port authorities/Seaway authorities

Within each business sector, various participants are involved. This study estimates separate impacts for each of the participants. Below is a discussion of the four sectors analyzed for economic impacts — including a description of the major participants in each.

2.1 Surface Transportation Sector

The surface transportation sector consists of both the railroad and trucking industries. The trucking firms and railroads are responsible for moving the various cargoes between the marine terminals, and the inland origins and destinations.

2.2 Maritime Services Sector

Waterborne cargoes handled by each Great Lakes-Seaway port/marine terminal generate economic activity in various business sectors of the local economy. Specifically, these impacts occur in the following categories:

Terminal Operations — includes those companies that hire labor to load/off-load ships, transfer cargo to truck or rail, sort cargo, stage cargo, and provide short- and long-term storage of cargo

Dockworkers — include members of the International Longshoremen's Association, International Union of Operating Engineers, International Brotherhood of Teamsters and the United Steelworkers, as well as those dockworkers with no union affiliation that are involved in the loading/unloading of cargo

Tug Assist — includes those companies that provide tug boats to assist vessels with docking and undocking

Pilots — include those companies and organizations that provide navigation-assistance services to vessels as required under U.S. and Canadian law

Agents — include those companies that provide vessel and crew-related services, including documentation required to enter and clear the ship, arrangement of pay for crews, and provision of food and supplies

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Marine Services — include a variety of service providers such as chandlers that supply ships with food, supplies and equipment; marine surveyors that inspect vessels and cargo, and provide valuations for insurance purposes; launch operators that provide ferry services for crew to move from ship to shore; and fuel-supply companies that provide vessels with bunker fuel

Freight Forwarders — include those companies that provide transportation logistics and management services, and that coordinate both marine and land transportation for cargo

Government — includes those federal and local government agencies that perform services related to cargo handling and vessel operations, such as the U.S. Army Corps of Engineers, Department of Homeland Security, U.S. Customs and Border Protection, the Canadian and U.S. Coast Guards, and the Canada Border Services Agency.

Ship Repair — includes those companies that provide ship construction and repair services on both a scheduled and emergency basis

Laker Operators — include the crew and headquartersbased management employees of U.S. and Canadian domestic Great Lakes vessel operators that transport cargo

Barge Operators — include the crew and headquartersbased management employees of U.S. and Canadian domestic Great Lakes barge operators that transport cargo

2.3 Shippers/Consignees Sector

This sector includes those firms that ship or receive cargo via a specific port. For the purpose of this analysis, shippers/consignees are divided into two categories. The first category consists of those dependent upon the port and usually located within the port's immediate vicinity.

The second category of shippers/consignees consists of those that could easily use competing ports. For example, if the port were not available, members of the first category would likely be driven out of business in the near term, while members of the second category would shift to another port. These non-dependent users are classified as "related port users" and are

addressed in Chapter VI of this report. These related users include farmers producing grain for export, mines producing iron ore, limestone, gypsum and salt, and the construction industry, which uses sand, gravel and cement.

2.4 Port Authorities/Seaway Authorities

This sector includes the various port authorities operating in the Great Lakes-Seaway system. Also included in this category are the employees of the U.S. Saint Lawrence Seaway Development Corporation (SLSDC) and the Canadian St. Lawrence Seaway Management Corporation (SLSMC), as well as the lock operators at each of the lock systems on the Great Lakes-Seaway system — including the Soo Locks, which connect Lake Superior and Lake Huron.

3. SUMMARY OF METHODOLOGY

This section provides a summary of the methodological approach used to analyze the economic impacts of the vessel and cargo activity on the Great Lakes-Seaway system.

3.1 Data Collection

The cornerstone of Martin Associates' approach is the collection of detailed baseline impact data from firms providing services at the ports and terminals. To ensure accuracy and defensibility, the baseline impact data were collected from interviews with 907 firms that provide services on the Great Lakes-Seaway system. These firms represent more than 80 percent of the 1,095 firms identified in the Great Lakes-Seaway port community. In most cases, multiple interviews were conducted with several persons in each firm.

The baseline survey data collected from the 907 firms were used to develop operational impact models for each of the 32 ports. These data were also used to develop a model to expand the impact calculations beyond the 32 ports and therefore, to estimate statewide/province-wide impacts.

3.2 Direct Jobs, Income, Revenue and Tax Impacts

The results of these interviews were then used to develop the baseline direct job, revenue and income impacts for the business sectors and job categories

associated with the cargo activity at the marine terminals in the 32 individual port districts for which specific impact models were developed.

The direct tax impacts are estimated at a federal, state/provincial and local level based on actual per capita income levels as published by the Tax Foundation (for the U.S.) and Revenue Canada.

3.3 Induced Impacts

Induced impacts are those generated by the purchases of **individuals** directly employed as a result of port and terminal activity. For example, a portion of the personal earnings received by those directly employed due to activity at the marine terminals is used for purchases of goods and services, both regionally, as well as out-of-region. These purchases, in turn, create additional jobs in the region; these jobs are classified as "induced".

To estimate these induced jobs for the 16 U.S. Great Lakes ports, the study team developed a state personal-earnings multiplier (for each state in which a port was located) from data provided by the U.S. Bureau of Economic Analysis, Regional Income Division. This personal-earnings multiplier was used to estimate the total personal earnings generated in the state as a result of the activity at the specific Great Lakes port within that state. A portion of this total personal-earnings impact was next allocated to specific local purchases (as determined from consumption data for the relevant state residents), as developed from the U.S. Bureau of Labor Statistics, Consumer Expenditure Survey, 2009. These purchases were next converted into retail and wholesale induced jobs in the state economy — by combining the purchases with the jobs-to-sales ratios in the supplying industries. A portion of the retail purchases was allocated to wholesale purchases, based on industryspecific data developed from the U.S. Bureau of Census, 2007 Economic Census. These wholesale purchases were combined with the relevant jobs-tosales ratios for the wholesale industries associated with the local purchases. These ratios were developed at the state level in which the specific port was located.

To estimate the induced impacts associated with the cargo moving via the Canadian ports, personal-income multipliers for the waterborne transportation sector in Ontario and Quebec were developed by Statistics Canada, Industry Accounts Division, and provided to

Martin Associates. Martin Associates developed the distribution of purchases by type of purchase (food at home, food in restaurants, housing, apparel, home furnishings, transportation, medical care, etc.) for each province — using data provided by Statistics Canada (2009 base data). The associated supplying industry jobs-to-sales ratios on a provincial level were also supplied to Martin Associates by Statistics Canada (Provincial Input-Output Models). These ratios included the retail and wholesale re-spending impacts. The personal consumption expenditures from the port activity were then combined with these job multipliers to estimate the "consumption" induced impacts by the province in which each of the 16 Canadian ports are located.

To estimate the "non-consumption" induced impacts with such sectors as state/provincial governments, education, and other social services, a ratio of state/provincial employment in these key service industries to total state/provincial employment was developed. This ratio was then multiplied by the direct and consumption induced jobs to estimate the total direct and induced job impact.

The re-spending impact includes not only the wage and salary income received by people employed to provide goods and services to the direct job holders, but also the value of the purchases. Therefore, the re-spending/local consumption impact cannot be divided by the induced jobs to estimate the induced income — as this would overestimate the induced personal wage/salary impact per induced job.

A separate induced impacts model was developed for each of the 32 ports.

3.4 Indirect Jobs

Indirect jobs are generated in the local economy as the result of purchases by **companies** that are directly dependent upon cargo and vessel activity at ports and marine terminals, including shippers/consignees. These purchases are for goods such as office supplies and equipment, as well as for services including maintenance and repair, communications and utilities, transportation and professional services. To estimate the indirect economic impact, data on local purchases — by type of purchase — were collected from each of the 907 firms interviewed. These local purchases were then combined with employment-to-

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sales ratios in local supplying industries, developed from the U.S. Bureau of Economic Analysis, Regional Input-Output Modeling System for the U.S. ports and from Statistics Canada, Industry Accounts Division, for Canadian ports. The indirect job ratios also account for the in-state/in-province spin-off effects from multiple rounds of supply chains that are required to provide the purchased goods and services. Indirect income, local purchases and taxes are also estimated.

A separate indirect impacts model was developed for each of the 32 ports.

3.5 Related User Impacts

Related user impacts measure the jobs, income, output and tax impacts with shippers and consignees and supporting industries that move cargo through the marine terminals located at each of the 32 ports. These impacts are classified as "related" because these firms can and do use other ports and marine terminals not necessarily on the Great Lakes-Seaway system. As a result, jobs with these exporters and importers cannot be counted as dependent upon the ports and marine terminals on the system.

The related user jobs are estimated based on the value-per-ton of the commodities exported and imported via each of the 32 ports, and the associated iobs to value-of-output ratios for the respective producing and consuming industries located in the state or province. The value-per-ton of each key commodity moving through each port was developed from the U.S. Census Bureau, USA Trade Online, and also converted into Canadian dollars for the Canadian ports. The average value-per-ton for each commodity moving through each port was then multiplied by the respective tonnage moved in 2010. Ratios of jobs to value-of-output for the corresponding consuming and producing industries were developed by Martin Associates from the U.S. Bureau of Economic Analysis. Regional Input-Output Modeling System, for the United States — for each of the Great Lakes states in which the 16 ports are located. For the 16 Canadian ports, the ratios were developed using data from Statistics Canada, Industry Accounts Division. These jobs-to-value coefficients include the spin-off impacts that would occur at the national level in order to produce the export commodity or use the import

commodity in production. The ratios of jobs to value-of-export or import cargo were then combined with the national value of the respective commodities moving via each of the 32 ports; this allowed for the estimation of related jobs and spin-off jobs in the national economies that support the export and import industries using the Great Lakes-Seaway system. Similarly, the respective income and output multipliers were used to estimate the related personal income impacts, as well as the total value of economic output and taxes generated by each port. It is important to note that care was taken to control for double counting of the direct, induced and indirect impacts.

Examples of related user impacts include the following: iron ore mining associated with iron ore shipped via Great Lakes-Seaway ports; the steel industries consuming the iron ore for use in the production of steel; coal mining associated with coal moved through each port; the utilities consuming coal received by water at each of the ports; and farming associated with the volume of grain moving via the ports.

Note that the related user impacts include only the impacts created by the volume of the cargo moving via each specific port. The related impacts include the impacts with the shipper/consignee of the cargo, and also include the impacts with the support industries necessary to deliver that volume of cargo to a port for shipment.

For raw materials and intermediate products received at a port — iron ore, for example —the value of the volume of ore received at the specific port is converted into a "value of steel produced." This value of the steel produced (based on the volume and value of the ore received) is then used to develop the related user jobs, income, inter-industry purchases, value of output, and the taxes paid resulting from the volume and value of the iron ore received at the specific port and resulting steel production.

For example, for a steel mill located in proximity to a port — but receiving a portion of raw materials by rail — the related impact is based only on the volume of the raw materials received via the port by water. Therefore, the total employment at the mill is not included in the related jobs, only that share specifically related to the volume of the raw material moving through the marine terminals.

The respective income and output multipliers associated with the industries for which the employment coefficients were developed, were used to estimate the related user personal income impacts, as well as the total value of economic output and taxes generated by cargo activity at each of the 32 ports, and for the total system. Once again, care was taken to control for double counting of the direct, induced and indirect impacts.

Note that related user impacts are counted only once for the shipment or receipt of cargo by a port/marine terminal, in contrast to the calculations used for the other types of impacts. For example — for grain shipped via Thunder Bay, received at a St. Lawrence River port such as Quebec and then reloaded onto a foreign-flag vessel for export — direct, induced and indirect impacts are created at the port of shipment (Thunder Bay), the port of discharge (Quebec) and the port where the grain was loaded for international export (Quebec). Therefore, the same ton of grain created direct, induced and indirect impacts at each of the three points of handling. This is not the case for related user impacts, as the user impacts with the grain (the farm jobs, income, revenue, taxes and supporting industries required to deliver a ton of grain to the port for shipment) are counted only for the initial shipment of the grain from Thunder Bay. The related user impacts of the same ton of grain are not counted for the St. Lawrence River ports.

A related user model was developed for each of the 32 ports and then used in each prototype model for "non-port specific" cargo and vessel activity, to estimate the total related user impacts for each state/province and the system as a whole.

The related user impacts are presented in Chapter VI of this report.

4. COMMODITIES INCLUDED IN THE ANALYSIS

Economic impacts were estimated for the following commodities handled at the marine terminals on the Great Lakes-Seaway system:

- · Steel products
- General cargo (excluding steel)
- Iron ore

- Grain
- Stone/aggregates
- Cement
- Salt
- Other dry bulk
- Other liquid bulk
- Coal
- Petroleum products
- Wind energy components/equipment

5. ESTIMATE OF TONNAGE

Currently, there is no single data source for the marine cargo moving on the Great Lakes-Seaway system. The U.S. Army Corps of Engineers' (USACE) "Waterborne Commerce Statistics" provides data on total international and domestic shipments by U.S. port district, but does not have information for the Canadian ports. Furthermore, the year 2009 is the latest year for which USACE data is available, and due to the recession, that year's tonnage levels were abnormally low. The Lake Carriers' Association provides tonnage data for vessel activity on the Great Lakes. This tonnage is for bulk cargo moving on U.S. and Canadian flag carriers — by port of loading and broad bulk commodity groups — and this data is available for the year 2010. The Lake Carriers' Association also provides data on U.S. flag vessels moving cross-lake to Canadian ports. Statistics Canada provides port-to-port data flows by commodity, both international and domestic, for the Canadian ports operating on the Great Lakes-Seaway aystem, but this data is for 2009. Finally, the Canadian St. Lawrence Seaway Management Corporation (SLSMC) publishes data for traffic moving via the St. Lawrence Seaway and for traffic movements by lock system on the Great Lakes-Seaway system. However, this database does not include traffic moving within the upper four Great Lakes (and not transiting one of the Seaway locks). All of these sources were used to formulate estimates regarding tonnage by commodity moving on the Great Lakes-Seaway system.

The tonnage estimates used in each of the 32 individual port models were developed from individual port authority tonnage data and through interviews with the terminal operators located in each of the 32 port

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districts. This data was then cross-checked with the Lake Carriers' Association database for U.S. and Canadian flag carriers — by key commodity group — with specific focus on identifying cargo moving on the U.S. and Canadian flag fleets. The St. Lawrence Seaway Traffic Statistics database was also used to check and modify the tonnage — by commodity — identified for each port as international tonnage, as well as U.S. and Canadian flag tonnage moving via the St. Lawrence Seaway lock system.

The 322.1 million metric tons of cargo handled via the U.S. and Canadian ports and marine terminals located on the Great Lakes-Seaway system include domestic cargo shipped via the ports, as well as that same cargo received through ports in the system. Therefore, this tonnage represents shipment and receipts of domestic cargo and trans-lake cargo, and will be significantly greater than the domestic cargo identified as moving on the vessels by the Lake Carriers' Association and the St. Lawrence Seaway Traffic Statistics.

The tonnage estimates developed for each of the 32 ports were then used as inputs into the port-specific models, which consist of the direct, induced, indirect and related users sub-modules. Impacts were then estimated for each of the 32 ports.

6. EXPANSION OF THE 32-PORT IMPACT MODELS TO MEASURE SYSTEM-WIDE IMPACTS

A prototype model was developed for each state and province, to measure the cargo that moves through private terminals and ports not located in one of the 32 port districts for which the individual models were developed. These prototype models also consist of direct, induced, indirect and related sub-modules, and were developed based on revenue-per-ton ratios and jobs-per-ton ratios by commodity and category, estimated from the port-specific models for the ports located in each relevant state or province.

The "other Great Lakes-Seaway tonnage" (outside the 32 port districts) was calculated based on the following methodology. For the United States, total state tonnage by commodity moving on the Great

Lakes was developed from data provided by the U.S. Army Corps of Engineers. This data is for the year 2009, and was expanded based on the growth in tonnage between 2009 and 2010, as reported by the Lake Carriers' Association. The individual port-district tonnage used in the port-specific models for each state was then subtracted from each state's total Great Lakes tonnage — by commodity — to estimate "other Great Lakes-Seaway tonnage," by commodity, for each state.

For Canada, total provincial tonnage for all Great Lakes-Seaway ports was developed from Statistics Canada data. The most recent year for which this data is available is 2009; therefore, the data were adjusted by the rate of growth in Canadian Laker tonnage between 2009 and 2010. The individual port-district tonnage used in the port-specific models for each province was then subtracted from each province's total Great Lakes-Seaway tonnage to estimate "other Great Lakes-Seaway tonnage" for Ontario and Quebec.

Using the 32 port-specific models, and the state and provincial models for "other tonnage", the economic impacts at the level of the 32 port districts and the "other impacts" were then combined to estimate total impacts in the following categories:

- System-wide
- By state and province
- By commodity
- By carrier flag
- By employment sector

It is worth emphasizing that the direct impacts generated at the 32 individual ports accounted for 71 percent of the total impacts. The 16 U.S. ports accounted for 66 percent of the estimated total U.S. impacts, while the 16 Canadian ports accounted for 75 percent of the estimated total Canadian impacts.



SYSTEM-WIDE IMPACTS

- 1. Total Economic Impacts
 - 2. Job Impacts
 - 3. Revenue Impacts
- 4. Personal Income and Local Consumption Impacts
 - **5.** Federal, State/Provincal and Local Tax Impacts
- 6. Impacts by State and Province



SYSTEM-WIDE IMPACTS

This chapter presents the results of the economic impact analysis of the Great Lakes-St. Lawrence Seaway System, including the economic impacts generated by traffic from all sources: U.S. domestic commerce; Canadian domestic commerce; bi-national commerce between the two countries; and international traffic moving between the Great Lakes-Seaway region and overseas destinations. The impacts are measured for the year 2010 and are presented in terms of total economic impacts at the bi-national regional level, the country level and the state/provincial level. The results of the 32 individual port studies are not presented due to confidentiality issues.

1. TOTAL ECONOMIC IMPACTS

In 2010, 322.1 million metric tons of cargo were handled by the ports and marine terminals located on the Great Lakes-Seaway system. This activity created a range of economic impacts (described below) in the region — defined as the Canadian provinces of Ontario and Quebec, and the states of New York, Pennsylvania, Ohio, Indiana, Illinois, Wisconsin, Michigan and Minnesota.

Exhibit II-1 summarizes the economic impacts of all traffic moving via the ports on the Great Lakes-Seaway system. The monetary impacts are expressed in both U.S. and Canadian dollars (shown as US\$ or Cdn\$). The exchange rate used throughout the report is \$1.00 U.S. dollar = \$1.03 Canadian dollars. The exchange rate reflects the annual average for 2010, as of December 31, 2010, and is sourced from "The Board of Governors of the Federal Reserve System Data Download Program."

Additional impacts known as "related user impacts" are presented in a separate chapter (Chapter VI). These impacts are segregated because the shippers and consignees in the "related users" category are economically less dependent on Great Lakes-Seaway ports than the users that create the direct, induced and indirect economic impacts.

Exhibit II-1	Economic Impacts of the Great Lakes-St. Lawrence Seaway System
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		Total
Jobs		
Direct Jobs	9	2,923
Induced	6	6,005
Indirect	6	7,905
Total	22	6,833
Personal Income (1,000)	US \$	Cdn \$
Direct	\$4,362,985	\$4,493,875
Re-Spending/Local Consumption	\$6,853,182	\$7,058,777
Indirect	\$2,898,060	\$2,985,002
Total	\$14,114,227	\$14,537,654
Business Revenue (1,000)	\$33,561,032	\$34,567,863
Local Purchases (1,000)	\$6,413,744	\$6,606,156
State/Provincial and Local Taxes (1,000)	\$1,530,634	\$1,576,553
Federal Taxes (1,000)	\$3,052,853	\$3,144,439

The 322.1 million metric tons of cargo handled at U.S. and Canadian ports and marine terminals located on the Great Lakes-Seaway system include domestic cargo shipped via the ports within the system, as well as that **same cargo** received by the ports in the system. Therefore, this tonnage represents shipment and receipt of both domestic and trans-lake cargo, and will be significantly greater than the domestic cargo identified as moving on the vessels by the Lake Carriers' Association and the St. Lawrence Seaway Traffic Statistics. The handling of this cargo generated the following economic impacts in the United States and Canada:

226,833 jobs in Canada and the United States are in some way related to the cargo handled at the marine terminals located on Great Lakes-Seaway system.

- Of the 226,833 jobs, 92,923 direct jobs were generated by the marine cargo and vessel activity at the marine terminals on the Great Lakes-Seaway system.
- As the result of the local and regional purchases by those 92,923 individuals holding the direct jobs, an additional 66,005 induced jobs were supported in the regional economy.
- 67,905 indirect jobs were supported by US\$6.4 billion (Cdn\$6.6 billion) in regional purchases by businesses supplying services at the marine terminals and ports.

In 2010, the marine cargo and vessel activity at the marine terminals on the Great Lakes-Seaway system generated a total of US\$33.6 billion (Cdn\$34.6 billion) in total economic activity in the United States and Canada.

 Marine activity supported US\$33.6 billion (Cdn\$34.6 billion) in total personal wage and salary income, and local consumption expenditures for regional residents of the U.S. and Canada. This includes US\$14.1 billion (Cdn\$14.5 billion) indirect, indirect, induced and local consumption expenditures. The 92,923 direct job holders received US\$4.4 billion (Cdn\$4.5 billion) in direct wage and salary income. This equates to an average salary of nearly US\$47,000 (Cdn\$48,400). A total of US\$4.6 billion (Cdn\$4.7 billion) in direct, induced and indirect federal, state/provincial and local tax revenue was generated by maritime activity at the marine terminals located on the Great Lakes-Seaway system.

Of the US\$4.6 billion (Cdn\$4.7 billion),
 US\$1.5 billion (Cdn\$1.6 billion) was paid to local and state/provincial governments, while
 US\$3.1 billion (Cdn\$3.14 billion) was paid in federal taxes.

Exhibit II-2 shows the breakdown of the total impacts by country.

As shown in Exhibit II-2, direct jobs generated by the cargo and vessel activity on the Great Lakes-Seaway system were nearly equally distributed between the U.S. and Canada. Of the 92,923 direct jobs generated, 48,288 were created in Canada, while 44,634 direct iobs were created in the U.S. However, the majority of induced and indirect jobs were created in the U.S. The difference in induced jobs reflects the fact that the savings rate in Canada was more than three times the level in the United States in 2007 — the year in which the income multipliers were developed by the U.S. Bureau of Economic Analysis and by Statistics Canada, Industry Accounts Division. 1 As a result of the lower savings rate in the U.S., the income multipliers are more than triple the multipliers for Canada. Therefore, the re-spending impact is significantly lower in Canada than in the U.S., which results in fewer induced jobs. In addition, two different input/output models were used in the analysis — the Statistics Canada, Industry Accounts Division model for Canada and the U.S. Bureau of Economic Analysis. RIMSII model for the United States. The differences in these two models may also explain some portion of the differences between the re-spending/induced job impact for Canada and the United States. However, it appears that the differences in the savings rate are the major underlying explanatory factor.

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The Organisation of Economic Co-operation and Development (OECD) reports that the share of household disposable income saved in 2007 was 1.5 percent in Canada and 0.4 percent in the United States. In 2006, the savings as a percentage of household disposable income were 2.5 percent in Canada compared to 0.4 percent in the U.S., a more than five times differential, which would result in a significantly higher re-spending impact in the U.S. than in Canada, and thus personal-income multipliers are significantly greater in the U.S. than in Canada.

		Canada	United	States		Total
Jobs						
Direct Jobs		48,288		44,634	!	92,923
Induced		21,947		44,057	(66,005
Indirect		28,320		39,585	(67,905
Total		98,556	1	28,227	2:	26,833
Personal Income (1,000)	US \$	Cdn \$	US \$	Cdn \$	US \$	Cdn \$
Direct	\$2,310,209	\$2,379,515	\$2,052,776	\$2,114,360	\$4,362,985	\$4,493,875
Re-Spending/						
Local Consumption	\$878,987	\$905,357	\$5,974,194	\$6,153,420	\$6,853,182	\$7,058,777
Indirect	\$1,274,072	\$1,312,294	\$1,623,988	\$1,672,707	\$2,898,060	\$2,985,002
Total	\$4,463,268	\$4,597,166	\$9,650,959	\$9,940,487	\$14,114,227	\$14,537,654
Business Revenue						
(1,000)	\$15,425,317	\$15,888,076	\$18,135,715	\$18,679,787	\$33,561,032	\$34,567,863
Local Purchases (1,000)	\$3,373,601	\$3,474,809	\$3,040,143	\$3,131,347	\$6,413,744	\$6,606,156
State/Provincial and Local Taxes (1,000)	\$584,966	\$602,515	\$945,668	\$974,038	\$1,530,634	\$1,576,553
Federal Taxes (1,000)	\$1,315,681	\$1,355,151	\$1,737,173	\$1,789,288	\$3,052,853	\$3,144,439

Indirect jobs generated per dollar of local purchases are lower in Canada than in the U.S., reflecting the fact that in Canada, there are greater leakages of purchases out of the region. As a result, the jobs-to-sales multipliers used in estimating the indirect jobs ratios are lower in Canada than in the United States.

2. JOB IMPACTS

This section focuses on the 92,923 direct jobs created by the 322.1 million tons of cargo handled at the ports and marine terminals on the Great Lakes-Seaway system. Exhibit II-3 shows the direct jobs impact by commodity moving on the system. As this exhibit shows, the movement of iron ore, which represents the largest tonnage handled at the ports and marine terminals, created the largest number of direct jobs — 37,210. The majority of these jobs are with directly dependent shippers/consignees (steel mills) located at the ports that are directly dependent on the receipt of iron ore by vessels. About 17,000 of these direct jobs are with mills located in Canada and about 12,000 are with steel mills in the United States. The movement of other dry bulk cargoes generates the second-largest direct jobs impacts. These

Exhibit II-3	Direct Jobs by Commodity —
	Regional Level

	Tota	al
	1,000 tons	Direct Jobs
Steel	3,165	5,080
General Cargo	2,390	681
Iron Ore	120,866	37,210
Grain	21,287	3,150
Stone/Aggregate	40,590	4,234
Cement	12,497	3,085
Salt	17,267	3,065
Other Dry Bulk	26,289	12,831
Liquid Bulk	17,606	6,440
Coal	59,612	5,591
Wind Energy	560	290
Not Allocated		11,265
Total	322,129	92,923

Exhibit II-4 Direct Jobs by Commodity — Country Level

	Canada		United	United States		Total	
	1,000 tons	Direct Jobs	1,000 tons	Direct Jobs	1,000 tons	Direct Jobs	
Steel	1,246	416	1,920	4,664	3,165	5,080	
General Cargo	1,945	471	444	210	2,390	681	
Iron Ore	31,303	19,888	89,562	17,321	120,866	37,210	
Grain	16,536	2,107	4,751	1,043	21,287	3,150	
Stone/Aggregate	6,030	738	34,560	3,496	40,590	4,234	
Cement	4,972	1,452	7,525	1,633	12,497	3,085	
Salt	11,712	1,479	5,555	1,587	17,267	3,065	
Other Dry Bulk	19,362	10,008	6,927	2,824	26,289	12,831	
Liquid Bulk	15,139	4,052	2,467	2,389	17,606	6,440	
Coal	10,306	1,331	49,306	4,260	59,612	5,591	
Wind Energy	252	93	308	196	560	290	
Not Allocated		6,253		5,012		11,265	
Total	118,804	48,288	203,325	44,634	322,129	92,923	

impacts are concentrated with the operations of tenants located at the individual ports, as well as private terminals located on the Great Lakes handling and processing dry bulk cargoes such as alumina and other ores, fertilizers and potash. The majority of these direct jobs were created in Canada.

Exhibit II-4 shows the direct jobs by commodity for each country.

The majority of the tonnage shipped and received at the U.S. ports and terminals consists of iron ore, stone/aggregates and coal. Iron ore, other dry bulk, grain, petroleum products and coal are the major commodities shipped and received at the Canadian ports and terminals located on the Great Lakes-Seaway system.² Iron ore creates the largest number of direct jobs in both countries, followed by the shipment and receipt of other dry bulk cargo at Canadian ports. Steel products moving on the Great Lakes create larger impacts in the United States, due to the location of major steel fabrication tenants at several of the U.S. Great Lakes ports.

The direct jobs generated by category are presented in Exhibit II-5. This exhibit shows that nearly 50 percent of the direct jobs impact is with shippers/ consignees that are directly dependent upon the shipment and receipt of cargo by vessel. As noted, the location of steel mills, alumina smelters and dependent iron ore, salt and alumina mines in proximity to the ports and marine terminals on the Great Lakes-Seaway system underscores the importance of the transportation system in providing raw materials to the region's steel mills and industrial economy. The second-largest number of direct jobs is created with the trucking firms serving the ports and marine terminals, followed by the terminal workers, which include jobs with marine terminals located within the port districts and throughout the system, as well as with warehousing operations associated with the terminal operations. In some cases these terminal workers are associated with the dependent shippers/consignees. About 7,600 direct jobs are with the Canadian and U.S. flag vessel operators, and tug and barge operators moving cargo

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² It is important to emphasize that of the 89.6 million tons of iron ore moving via the U.S. ports and terminals on the Great Lakes, most of the ore is shipped from U.S. ports, both to Canadian and U.S. steel mills. Therefore, the 89.6 million tons of iron ore include both shipments and receipts of iron ore at U.S. ports, while the iron ore moving via the Canadian ports is more representative of iron ore receipts. However, iron ore does move from the St. Lawrence River to Great Lakes ports. The actual amount or iron ore shipped by vessel from U.S. Great Lakes ports (not including receipts) on the Great Lakes-Seaway system was about 43.8 million metric tons in 2010, as estimated by the Lake Carriers' Association.

on the system³; 3,373 jobs are with freight forwarders and customs brokers arranging for the handling of the cargo; and another nearly 2,000 jobs are with firms providing maritime services such as ship chandlering, vessel cargo and hull surveys, ship repair and marine equipment sales, and servicing.

Exhibit II-6 shows the direct job impacts by category, by country, for the cargo activity at all ports and terminals on the Great Lakes-Seaway system.

As presented in Exhibit II-6, the number of direct jobs with dependent shippers/consignees is greater in Canada than in the United States, reflecting the location of alumina smelters at port facilities, as well as fertilizer operations in addition to steel mills and steel fabrication complexes both in Canada and the United States. Direct jobs with rail are also significantly higher in the U.S. due to the greater use of rail to move coal and iron ore to the ports for shipment.

Exhibit II-5 Direct Jobs Impacts by Category — Regional Level

	Direct Jobs
Surface Transportation	
Rail	2,355
Truck	13,686
Maritime Service	
Terminal Employees	10,369
Dockworkers	1,604
Tug Assists	903
Pilots	240
Agents	162
Maritime Services	1,959
Forwarders	3,373
Government	2,066
Marine Equipment/Ship Repair	4,900
Laker	6,512
Barge	1,117
Dependent Shippers/Consignees	42,488
Port Authority	1,188
Total	92,923
Note: Totals may not add due to rounding	

Exhibit II-6 Direct Jobs Impacts by Category — Country Level

Di	Canada rect Jobs	United States Direct Jobs	Total
Surface Transportation			
Rail	565	1,790	2,355
Truck	6,741	6,945	13,686
Maritime Service			
Terminal Employees	4,191	6,178	10,369
Dockworkers	979	625	1,604
Tug Assists	391	513	903
Pilots	73	166	240
Agents	92	71	162
Maritime Services	656	1,302	1,959
Forwarders	1,244	2,129	3,373
Government	659	1,407	2,066
Marine Equipment/Ship Repair	3,506	1,394	4,900
Laker	2,331	4,181	6,512
Barge	536	581	1,117
Dependent Shippers/Consignees	25,434	17,054	42,488
Port Authority	890	298	1,188
Total	48,288	44,634	92,923

³ Note that the barge-operator impacts consist primarily of U.S. flag operations on tug-barge combinations, but also include shoreside jobs with bunker (fueling) operations.

3. REVENUE IMPACTS

In 2010, the direct business revenue received by the firms directly dependent upon the cargo handled at the marine terminals in the Great Lakes Seaway system was US\$33.6 billion (Cdn\$34.6 billion). These firms provide maritime services and inland transportation services for the cargo handled at the marine terminals and the vessels calling at the terminals.

Exhibit II-7 shows the distribution of this direct revenue impact by category and economic sector in both U.S. and Canadian dollars.

Similar to the direct jobs impacts by category, the majority of the direct business revenue is received by the dependent shippers/consignees located at the ports and marine terminals operating on the Great Lakes-Seaway system.

The revenue impacts by category, by country, are presented in Exhibit II-8.

Exhibit II-7 Revenue Impact by Category — Regional Level

	Revenue Million US	Revenue Million Cdn
Surface Transportation		
Rail	\$5,081	\$5,233
Truck	\$1,361	\$1,402
Maritime Service		
Terminal Employees	\$1,661	\$1,711
Tug Assists	\$92	\$95
Pilots	\$92	\$94
Agents	\$38	\$40
Maritime Services	\$483	\$497
Forwarders	\$602	\$620
Marine Equipment/Ship Re	pair \$895	\$922
Laker	\$2,929	\$3,017
Barge	\$196	\$202
Dependent Shippers/Consignee	s \$19,836	\$20,431
Port Authority	\$294	\$303
Total	\$33,561	\$34,568

Note: Totals may not add due to rounding

Exhibit II-8	Revenue Impact by Category — Country Level
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	Cai	nada	United States		
	Million US	Million Cdn	Million US	Million Cdn	
Surface Transportation					
Rail	\$1,180	\$1,215	\$3,901	\$4,018	
Truck	\$695	\$716	\$666	\$686	
Maritime Service					
Terminal Employees	\$802	\$826	\$859	\$885	
Tug Assists	\$40	\$41	\$52	\$54	
Pilots	\$28	\$29	\$64	\$66	
Agents	\$12	\$12	\$27	\$28	
Maritime Services	\$155	\$160	\$328	\$338	
Forwarders	\$222	\$229	\$380	\$392	
Marine Equipment/Ship Repair	\$569	\$586	\$326	\$336	
Laker	\$1,041	\$1,073	\$1,888	\$1,944	
Barge	\$96	\$99	\$100	\$103	
Dependent Shippers/Consignees	\$10,390	\$10,701	\$9,447	\$9,730	
Port Authority	\$196	\$202	\$98	\$101	
Total	\$15,425	\$15,888	\$18,136	\$18,680	

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Consistent with the distribution of direct jobs by category, the largest revenue impacts are with the dependent shippers/consignees. The revenue from rail operations is greater in the U.S. than in Canada. reflecting the longer haul of the rail moved to and from U.S. ports, particularly the movement of coal from Ohio, West Virginia and the Powder River Basin area. Similarly, pilotage revenue is higher in the United States, due to the longer length of vessel transits to the majority of the U.S. ports on which pilots are required — primarily to the Duluth, MN/Superior. WI marine terminals. The laker revenue for cargo moved to and from the U.S. is nearly double the Canadian laker revenue, primarily due to the higher volume of cargo moving on lakers to U.S. ports compared to Canadian Great Lakes and St. Lawrence River ports, as well as the distance traveled by U.S. lakers — particularly in the iron ore trade.

4. PERSONAL INCOME AND LOCAL CONSUMPTION IMPACTS

The 92,923 individuals directly employed as a result of the cargo handled at the ports and marine terminals received US\$4.4 billion (Cdn\$4.5 billion) in wages and salaries, for an average annual salary of US\$47,000 (Cdn\$48,400). These individuals, in turn, used these earnings to purchase goods and services, to pay taxes, and for savings. The purchase of goods and services from regional sources creates a re-spending effect known as the personal-earnings multiplier effect. For the U.S. Great Lakes ports, this re-spending, or multiplier effect, was estimated using a personalearnings multiplier for the maritime sector, by state, from the U.S. Bureau of Economic Analysis, RIMSII. The income multipliers by province were developed from Statistics Canada, Industry Accounts Division, for the maritime sectors of Ontario and Quebec. Using the local personal-earnings multipliers by state and province for the relevant ports, an additional US\$6.9 billion (Cdn\$7.1 billion) in income and consumption were created in the Great Lakes regional economy. In addition, the 67,905 indirectly employed workers received indirect wages and salaries totaling US\$2.9 billion (Cdn\$3.0 billion). Combining the direct, induced and indirect income impacts, the 322.1 million tons of cargo handled at the ports and

terminals located on the Great Lakes-Seaway system created US\$14.1 billion (Cdn\$14.5 billion) in wages and salaries, and local consumption expenditures in the regional economy.

The 48.288 direct job holders at the Canadian ports and terminals received US\$2.3 billion (Cdn\$2.4 billion), for an average salary of US\$47,900 (Cdn\$49,300). The 44,634 direct job holders at the U.S. ports received US\$2.0 billion (Cdn\$2.1 billion) in direct personal income, for an average salary of US\$46,000 (Cdn\$47,400). As noted, the re-spending impact is much lower for the Canadian ports than for the U.S. ports, reflecting the much higher savings rate for Canadian households compared to those in the U.S. — thus reducing the income-multiplier impact. The Organisation of Economic Co-operation and Development (OECD) reported that in 2007 (the time period for which the income multipliers were derived for the U.S. and Canada), the percentage of household income saved by Canadians was more than three times greater than for U.S. households. This difference in the propensity to save has a significant impact on the level of personal-income multipliers, as reflected by the actual multiplier levels. In addition, to the extent that Statistics Canada and the U.S. Bureau of Economic Analysis develop and define personal-income multipliers differently, the income multipliers will differ. However, in developing the personal-income multiplier impacts, Martin Associates used the national government agencies in each country to provide the income multipliers, based on our definitions. Note that the re-spending impact also includes the local consumption impact.

In addition to the direct income impact and the re-spending and consumption impacts, the division of the re-spending impact/local consumption impact by the induced jobs will overstate the actual salary of the induced job holders.

The 67,905 indirect job holders received US\$2.9 billion (Cdn\$3.0 billion)in personal income, of which the 28,320 Canadian indirect job holders received US\$1.3 billion (Cdn\$1.3 billion), while the 39,585 indirect job holders in the U.S. received US\$1.6 billion (Cdn\$1.7 billion).

5. FEDERAL, STATE/PROVINCIAL AND LOCAL TAX IMPACTS

Total state and local tax impacts generated by the cargo activity on the Great Lakes-Seaway system were estimated from several sources. The U.S. tax impacts were estimated from income indices developed by the Tax Foundation, while the Canadian tax impacts were estimated based on data provided to Martin Associates by Revenue Canada. In addition. adjustments were made to reflect the different tax relationships in Quebec at the federal level. The cargo activity at the U.S. ports and marine terminals created US\$945.7 million (Cdn\$974.0 million) in state and local taxes, and US\$1.7 billion (Cdn\$1.8 billion) in federal taxes. The cargo activity at the Canadian ports created US\$585.0 million (Cdn\$602.5 million) in provincial taxes, and US\$1.3 billion (Cdn\$1.4 billion) in federal taxes. The ratio of state, local and federal taxes to total direct, induced (including local consumption expenditures) and indirect income is about 43 percent in Canada and about 28 percent in the U.S.

6. IMPACTS BY STATE AND PROVINCE

The economic impacts were estimated at the port level for the 32 U.S. and Canadian Great Lakes and St. Lawrence River ports. The models developed for these 32 individual ports were then used to develop prototype models for each Great Lakes state and province — in order to capture the impacts of cargo activity moving through ports and marine terminals for which specific models were not developed. This process provided a model for each state and province to estimate the total impacts at the state and provincial level. It is important to note that the direct impacts generated at the 32 individual ports accounted for 71 percent of the total impacts. The 16 U.S. ports accounted for 66 percent of the total estimated U.S. impacts, while the 16 Canadian ports accounted for 75 percent of the total estimated Canadian impacts.

Exhibit II-9 presents the U.S. impacts of total cargo moving via U.S. ports and marine terminals located on the Great Lakes-Seaway system. As this exhibit shows, in terms of direct, induced and indirect jobs, the impacts of the total traffic handled at U.S. ports and terminals are greatest for the state of Indiana, followed by Michigan and Ohio.

Exhibit II-10 shows the impacts of the cargo moving on the Great Lakes-Seaway system for the provinces of Ontario and Quebec. As noted earlier, these impacts do not include the impacts of the international cargo handled at St. Lawrence River ports in Quebec. As this exhibit indicates, the ports in Ontario account for about 60 percent of the direct job impacts for Canada.

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Exhibit II-9 Economic Impacts by State — Cargo Moving via U.S. Ports and Marine Terminals on the Great Lakes-St. Lawrence Seaway System

Tonnage (1,000)	Indiana 28,360		4	Ohio 40,222		Michigan 61,302	
Jobs							
Direct Jobs		15,516		8,504	1	0,603	
Induced		17,852		9,222		8,061	
Indirect		14,964		10,355		8,155	
Total	48,332			28,081	2	.6,819	
Personal Income (1,000)	US \$	Cdn \$	US \$	Cdn \$	US \$	Cdn \$	
Direct	\$726,283	\$748,072	\$378,968	\$390,337	\$484,116	\$498,640	
Re-Spending/							
Local Consumption	\$2,468,927	\$2,542,995	\$1,278,750	\$1,317,113	\$1,058,956	\$1,090,725	
Indirect	\$587,445	\$605,069	\$436,985	\$450,094	\$334,688	\$344,728	
Total	\$3,782,656	\$3,896,135	\$2,094,703	\$2,157,544	\$1,877,761	\$1,934,093	
Business Revenue (1,000)	\$7,894,646	\$8,131,486	\$3,032,330	\$3,123,300	\$3,799,899	\$3,913,896	
Local Purchases (1,000)	\$1,133,209	\$1,167,206	\$772,802	\$795,986	\$637,553	\$656,680	
State and Local Taxes (1,000)	\$359,352	\$370,133	\$203,186	\$209,282	\$182,143	\$187,607	
Federal Taxes (1,000)	\$680,878	\$701,304	\$377,047	\$388,358	\$337,997	\$348,137	

Exhibit II-9 continued

Tonnage (1,000)	Minnesota 30,160			linois 7,219	Wisconsin 33,241			
Jobs								
Direct Jobs	2,516			2,813		3,466		
Induced	2,258			2,521		3,071		
Indirect	1,496			1,842		2,240		
Total		6,271	7,177			8,777		
Personal Income (1,000)	US\$	Cdn \$	US\$	Cdn \$	US \$	Cdn \$		
Direct	\$115,464	\$118,928	\$121,942	\$125,600	\$163,789	\$168,703		
Re-Spending/								
Local Consumption	\$263,731	\$271,643	\$384,763	\$396,306	\$367,057	\$378,069		
Indirect	\$60,381	\$62,193	\$87,490	\$90,115	\$91,566	\$94,313		
Total	\$439,576	\$452,763	\$594,196	\$612,022	\$622,412	\$641,085		
Business Revenue (1,000)	\$1,343,705	\$1,384,016	\$438,795	\$451,959	\$1,405,293	\$1,447,451		
Local Purchases (1,000)	\$114,433	\$117,866	\$152,694	\$157,275	\$175,955	\$181,234		
State and Local Taxes (1,000)	\$46,815	\$48,219	\$59,420	\$61,202	\$67,073	\$69,085		
Federal Taxes (1,000)	\$79,124	\$81,497	\$106,955	\$110,164	\$112,034	\$115,395		

	No	w York	Pennsylv	onio	To	tal IIC	
Tonnage (1,000)	2,216		reillisylv	605	Total US 203,325		
- , , ,		2,210		000		30,020	
Jobs		004		004		44.004	
Direct Jobs	924			291		44,634	
Induced	763			310		44,057	
Indirect	280		252	;	39,585		
Total	1,967		854		128,277		
Personal Income (1,000)	US \$	Cdn \$	US \$	Cdn \$	US \$	Cdn \$	
Direct	\$49,646	\$51,136	\$12,568	\$12,945	\$2,052,776	\$2,114,360	
Re-Spending/							
Local Consumption	\$109,291	\$112,570	\$42,718	\$43,999	\$5,974,194	\$6,153,420	
Indirect	\$14,770	\$15,213	\$10,662	\$10,982	\$1,623,988	\$1,672,707	
Total	\$173,708	\$178,919	\$65,948	\$67,926	\$9,650,959	\$9,940,487	
Business Revenue (1,000)	\$167,397	\$172,419	\$53,650	\$55,260	\$18,135,715	\$18,679,787	
Local Purchases (1,000)	\$34,070	\$35,092	\$19,426	\$20,009	\$3,040,143	\$3,131,347	
State and Local Taxes (1,000)	\$21,019	\$21,649	\$6,661	\$6,861	\$945,668	\$974,038	
Federal Taxes (1,000)	\$31,267	\$32,205	\$11,871	\$12,227	\$1,737,173	\$1,789,288	

Exhibit II-10	Economic Impacts by Province — Cargo Moving via Canadian Ports and Marine Terminals
	on the Great Lakes-St. Lawrence Seaway System

Tonnage (1,000)	Ontario e (1,000) 62,293			luebec 56,511	Total 118,804		
Jobs							
Direct Jobs		28,894		19,394		48,288	
Induced		12,743		9,205		21,947	
Indirect	21,906			6,414		28,320	
Total		63,542		35,013		98,556	
Personal Income (1,000)	US \$	Cdn \$	US\$	Cdn \$	US \$	Cdn \$	
Direct	\$1,288,019	\$1,326,659	\$1,022,190	\$1,052,856	\$2,310,209	\$2,379,515	
Re-Spending/							
Local Consumption	\$515,208	\$530,664	\$363,780	\$374,693	\$878,987	\$905,357	
Indirect	\$940,245	\$968,452	\$333,827	\$343,842	\$1,274,072	\$1,312,294	
Total	\$2,743,471	\$2,825,775	\$1,719,797	\$1,771,391	\$4,463,268	\$4,597,166	
Business Revenue (1,000)	\$9,360,290	\$9,641,098	\$6,065,027	\$6,246,978	\$15,425,317	\$15,888,076	
Local Purchases (1,000)	\$2,419,844	\$2,492,439	\$953,757	\$982,370	\$3,373,601	\$3,474,809	
Provincial Taxes (1,000)	\$236,076	\$243,158	\$348,890	\$359,357	\$584,966	\$602,515	
Federal Taxes (1,000)	\$908,089	\$935,332	\$407,592	\$419,820	\$1,315,681	\$1,355,151	

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SYSTEM-WIDE IMPACTS BY FLAG OF CARRIAGE

- 1. Total Economic Impacts
 - 2. Job Impacts
 - 3. Revenue Impacts
- 4. Personal Income and Local Consumption Impacts
 - **5.** Federal, State/Provincial and Local Tax Impacts
- 6. Impacts by State and Province



SYSTEM-WIDE IMPACTS BY FLAG OF CARRIAGE

This chapter presents impacts by vessel operator category. Cargo moves to and from the U.S. and Canadian Great Lakes ports/marine terminals on Canadian flag vessels, U.S. flag vessels and foreign flag vessels. For the most part, the Canadian flag vessels move cargo to and from Canadian ports, while U.S. flag vessels move cargo to and from U.S ports, according to the carriage laws in place in each country. In a more limited scope, the Canadian flag and U.S. flag vessels move cargo between the U.S. and Canadian ports in cross-lake operations. Canadian flag vessels often move cargo from points within the Great Lakes to ports on the St. Lawrence River, whereas U.S. flag carriers typically operate exclusively within the Great Lakes and seldom transit the Montreal-Lake Ontario Section of the St. Lawrence Seaway.

Using a combination of data sources from the Lake Carriers' Association; Statistics Canada; the U.S. Army Corps of Engineers Waterborne Commerce Statistics for the Great Lakes; data provided by the individual port authorities; and estimates of the U.S. flag share and Canadian share of laker traffic by port and commodity provided by the Lake Carriers' Association, Martin Associates developed 2010 tonnage estimates of cargo moving by commodity, port and U.S. flag, Canadian flag and international flag. This tonnage was entered into the 32 individual port economic-impact models and "other state/province prototype models," to estimate the impacts of cargo activity on the Great Lakes-St. Lawrence Seaway System by flag of carriage.

Based on this methodology, it is estimated that in 2010, Canadian flag vessels handled 142.5 million metric tons of cargo to and from ports on the Great Lakes-Seaway system, and U.S. flag carriers handled 164.2 million tons. Since this estimate includes shipments and receipts, it represents about two times the actual level of tonnage moving on vessels. Therefore, an estimate of the actual tonnage moving on U.S. and Canadian flag vessels is developed based on dividing the U.S. and Canadian flag tonnage

handled by two — about 153.4 million metric tons (142.5 + 164.2 = 306.7 / 2 = 153.4). This compares to a five-year average of 140.2 million metric tons of dry bulk-only tonnage reported by the Lake Carriers' Association. It is important to note that the 153.4 million metric tons of cargo include liquid bulk cargo, as well as general cargo moving on the system (a combined total estimated at 8.2 million metric tons). Combining the 8.2 million metric tons of liquid bulk and general cargo moving on the domestic fleets increases the five-year average reported by the Lake Carriers' Association to 148.4 million metric tons — a value within 4% of the domestic tonnage estimated by Martin Associates.

The international tonnage (non-U.S. flag / non-Canadian flag) is estimated by taking the total cargo tonnage moving on the Great Lakes-Seaway system and subtracting the tonnage moving via the Canadian and U.S. flag vessels. Using this methodology, it is estimated that about 7.6 million metric tons moved on foreign flag vessels in 2010. This compares to the 7.2 million metric tons of cargo moved on foreign flag vessels reported by the St. Lawrence Seaway Traffic Report, 2010. This difference can be attributed to time of

reporting, as some sources report on an annual basis, while others report on a shipping-season or fiscal-year basis.

It is important to note that there is no single database reflecting port to port moves, by commodity and by flag. In lieu of such a database, the above methodology provides a useful tool to estimate tonnage for each vessel operator category. Nevertheless, because of anomalies in shipping patterns, simple addition of estimated tonnage will not sum to the 322.1 million total tons handled on the Great Lakes-Seaway system. Such anomalies include cargo handled more than two times (such as iron ore moved into the Port of Cleveland and transshipped to a river vessel for delivery to the end user), or cargo handled in the region only one time (such as steel moving between a Great Lakes port in southern Lake Michigan to an inland river port).

This chapter presents the results of the economic impact analysis of the cargo moving by flag of carriage. The impacts are presented in terms of total economic impacts at the regional level, the country level and the state/provincial level. The results of the 32 individual port studies are not presented due to confidentiality issues.¹

1. TOTAL ECONOMIC IMPACTS

Exhibit III-1 summarizes the economic impacts of cargo moving by flag on the Great Lakes-Seaway system. The monetary impacts are expressed in both U.S. and Canadian dollars.

	Cana	dian Flag	U.S	. Flag	Foreign Flag		Total	
Jobs								
Direct Jobs	4	8,660	37	7,220		7,043	Ć	92,923
Induced	2	4,189	35,772			6,044	(66,005
Indirect	2	8,719	34,621			4,566	(67,905
Total	10	1,568	107,612		1	7,653	22	26,833
Personal Income (1,000)	US \$	Cdn \$	US\$	Cdn \$	US\$	Cdn \$	US\$	Cdn
Direct	\$2,288,326	\$2,356,976	\$1,696,677	\$1,747,577	\$377,983	\$389,322	\$4,362,985	\$4,493,87
Re-Spending/ Local								
Consumption	\$1,309,804	\$1,349,098	\$4,750,354	\$4,892,864	\$793,025	\$816,815	\$6,853,182	\$7,058,77
Indirect	\$1,286,225	\$1,324,811	\$1,419,128	\$1,461,702	\$192,707	\$198,488	\$2,898,060	\$2,985,00
Total	\$4,884,354	\$5,030,885	\$7,866,158	\$8,102,143	\$1,363,714	\$1,404,626	\$14,114,227	\$14,537,65
Business Revenue (1,000)	\$15,678,458	\$16,148,812	\$15,537,600	\$16,003,728	\$2,344,974	\$2,415,323	\$33,561,032	\$34,567,86
Local Purchases (1,000)	\$3,323,626	\$3,423,335	\$2,685,125	\$2,765,679	\$404,992	\$417,142	\$6,413,744	\$6,606,15
State/Provincial and Local Taxes (1,000)	\$617,015	\$635,525	\$763,841	\$786,757	\$149,777	\$154,271	\$1,530,634	\$1,576,55
Federal Taxes (1,000)	\$1,343,664	\$1,383,974	\$1,445,719	\$1,489,090	\$263,470	\$271,374	\$3,052,853	\$3,144,43

It is important to emphasize that only St. Lawrence Seaway traffic originating or destined at the St. Lawrence River ports are included in the analysis. The total impacts of the St. Lawrence River ports were also estimated but not included in the analysis. Also included is the cargo moving along the St. Lawrence River on Canadian flag vessels.

The movement of this cargo generated the following economic impacts:

Of the 226,833 direct, induced and indirect jobs created by activity on the Great Lakes-Seaway system, cargo moving on the Canadian flag fleet supported 101,568 jobs, while cargo moving on the U.S. flag fleet supported 107,612 jobs. The balance — 17,653 jobs — was supported by cargo moving on foreign flag vessels.

- Of the 92,923 direct jobs, 48,660 were generated by the marine cargo moving on Canadian flag vessels and 37,220 direct jobs were created by cargo moving to and from ports on U.S. flag vessels. Cargo moving on foreign flag vessels created 7,043 direct jobs.
- As a result of the regional purchases by those individuals holding the direct jobs, an additional 24,189 induced jobs were supported by cargo moving on Canadian flag vessels; 35,772 induced jobs were supported by the cargo moving on U.S. flag vessels; and 6,044 induced jobs were supported by cargo moving on foreign flag vessels.
- Of the 67,905 indirect jobs, 28,719 were supported by direct purchases made by the firms handling cargo moving on the Canadian flag vessels; 34,621 indirect jobs were supported by purchases by the firms handling cargo moving on the U.S. flag vessels; and the balance was supported by purchases by the firms handling cargo moving on foreign flag vessels.

In 2010, the marine cargo moving on the Great Lakes-Seaway system (on all vessels) supported US\$14.1 billion (Cdn\$14.5 billion) in total personal income and consumption impacts, of which the cargo moving on Canadian flag vessels supported US\$4.9 billion (Cdn\$5.1 billion); the cargo moving on U.S. flag vessels created US\$7.9 billion (Cdn\$8.1 billion); and the cargo moving on foreign flag vessels supported US\$1.36 billion (Cdn\$1.4 billion).

Businesses providing services to the cargo moving on the system and dependent shippers/consignees received US\$33.6 billion (Cdn\$34.6 billion) in direct business revenue. Of that total, the revenue generated by cargo moving via Canadian flag vessels accounted for 47 percent, while cargo moving on the U.S. flag vessels accounted for 46 percent of the business revenue. Cargo moving on the foreign flag vessels accounted for the balance.

A total of US\$4.6 billion (Cdn\$4.7 billion) in direct, induced and indirect federal, state/provincial and local tax revenue was generated by maritime activity at the marine terminals located on the Great Lakes-Seaway system. Cargo moving on Canadian flag vessels supported 43 percent of the tax impact; cargo moving on U.S flag vessels accounted for 48 percent of the tax impact; and cargo moving on foreign flag vessels supported the balance of the tax impact.

Exhibits III-2, III-3 and III-4 show the breakdown of the total impacts by country and by flag of carriage.

		Canada	United	United States		Total	
Jobs							
Direct Jobs		44,226		4,434		48,660	
Induced		20,020		4,168		24,189	
Indirect		25,828		2,891		28,719	
Total	90,074		-	11,494	1	01,568	
Personal Income (1,000)	US \$	Cdn \$	US \$	Cdn \$	US \$	Cdn \$	
Direct	\$2,095,842	\$2,158,718	\$192,484	\$198,258	\$2,288,326	\$2,356,976	
Re-Spending/							
Local Consumption	\$799,550	\$823,536	\$510,254	\$525,561	\$1,309,804	\$1,349,098	
Indirect	\$1,164,273	\$1,199,201	\$121,952	\$125,611	\$1,286,225	\$1,324,811	
Total	\$4,059,664	\$4,181,454	\$824,690	\$849,430	\$4,884,354	\$5,030,885	
Business Revenue							
(1,000)	\$14,100,278	\$14,523,287	\$1,578,180	\$1,625,525	\$15,678,458	\$16,148,812	
Local Purchases (1,000)	\$3,084,533	\$3,177,069	\$239,093	\$246,266	\$3,323,626	\$3,423,335	
State/Provincial and Local Taxes (1,000)	\$533,418	\$549,420	\$83,597	\$86,105	\$617,015	\$635,525	
Federal Taxes (1,000)	\$1,195,220	\$1,231,077	\$148,444	\$152,897	\$1,343,664	\$1,383,974	

	C	anada	United	States	Total		
Jobs							
Direct Jobs		1,948		35,272	;	37,220	
Induced		858		34,913	;	35,772	
Indirect		1,764		32,857	;	34,621	
Total		4,570 103,043		1	07,612		
Personal Income (1,000)	US \$	Cdn \$	US\$	Cdn \$	US \$	Cdn \$	
Direct	\$86,615	\$89,214	\$1,610,061	\$1,658,363	\$1,696,677	\$1,747,577	
Re-Spending/							
Local Consumption	\$34,646	\$35,685	\$4,715,708	\$4,857,179	\$4,750,354	\$4,892,864	
Indirect	\$76,158	\$78,442	\$1,342,970	\$1,383,259	\$1,419,128	\$1,461,702	
Total	\$197,419	\$203,342	\$7,668,739	\$7,898,801	\$7,866,158	\$8,102,143	
Business Revenue (1,000)	\$747,349	\$769,769	\$14,790,251	\$15,233,959	\$15,537,600	\$16,003,728	
Local Purchases (1,000)	\$194,394	\$200,226	\$2,490,731	\$2,565,452	\$2,685,125	\$2,765,679	
State/Provincial and Local Taxes (1,000)	\$16,988	\$17,498	\$746,853	\$769,259	\$763,841	\$786,757	
Federal Taxes (1,000)	\$65,346	\$67,306	\$1,380,373	\$1,421,784	\$1,445,719	\$1,489,090	

	C	anada	United	States		Total
Jobs						
Direct Jobs		2,114		4,928		7,043
Induced		1,069		4,976		6,044
Indirect	729			3,837		4,566
Total	3,912		-	13,741	1	7,653
Personal Income (1,000)	US \$	Cdn \$	US \$	Cdn \$	US \$	Cdn \$
Direct	\$127,751	\$131,584	\$250,232	\$257,738	\$377,983	\$389,322
Re-Spending/						
Local Consumption	\$44,791	\$46,135	\$748,233	\$770,680	\$793,025	\$816,815
Indirect	\$33,642	\$34,651	\$159,065	\$163,837	\$192,707	\$198,488
Total	\$206,185	\$212,370	\$1,157,530	\$1,192,256	\$1,363,714	\$1,404,626
Business Revenue (1,000)	\$577,690	\$595,021	\$1,767,284	\$1,820,302	\$2,344,974	\$2,415,323
	ψ011,000	ψ000,021	ψ1,707,204	Ψ1,020,002	Ψ2,044,374	Ψ2, τ 10,020
Local Purchases (1,000)	\$94,673	\$97,513	\$310,319	\$319,629	\$404,992	\$417,142
State/Provincial and Local Taxes (1,000)	\$34,560	\$35,597	\$115,217	\$118,674	\$149,777	\$154,271
Federal Taxes (1,000)	\$55,115	\$56,768	\$208,355	\$214,606	\$263,470	\$271,374

It is estimated that 142.5 million metric tons of cargo were handled at Great Lakes-Seaway ports and marine terminals associated with transportation by Canadian flag vessels. As noted earlier, this number represents handling of cargo upon loading and unloading.

Of the 101,568 direct, induced and indirect jobs supported by cargo movement by Canadian flag vessels, 90,074 are created by cargo moving on Canadian flag vessels at **Canadian ports**, while cargo carried by Canadian flag vessels to and from **U.S. ports** created 11,494 direct, induced and indirect jobs. Similarly, the majority of the personal-income impacts, local purchases and state/provincial, local and federal tax impacts is created by cargo moving on Canadian flag vessels via Canadian ports.

It is estimated that 164.2 million metric tons of cargo were handled at Great Lakes ports and marine terminals associated with transportation by U.S. flag vessels. As noted earlier, this number represents handling of cargo upon loading and unloading.

The vast majority of the impacts associated with U.S. flag vessels are in the United States. This reflects the fact that the majority of cargo moving on U.S. flag vessels is moving between U.S. ports.

It is estimated that 7.6 million metric tons of cargo were handled at Great Lakes ports and marine terminals associated with transportation by foreign flag vessels. Of the 17,653 direct, induced and indirect jobs supported by cargo moving on foreign flag vessels, the majority — 13,741 jobs — was supported by cargo moving via U.S. Great Lakes ports.

2. JOB IMPACTS

This section focuses on the distribution of the 92,923 direct jobs by flag. Exhibit III-5 shows the direct job impacts by commodity moving on the Great Lakes-Seaway system by Canadian, U.S. and foreign flag vessels. Iron ore moving on Canadian and U.S. flag vessels creates the majority of the direct impacts. As this exhibit shows, the movement of iron ore, which represents the largest tonnage handled at the ports and marine terminals, created the largest number of direct jobs — 37,210 jobs. The majority of these jobs was with directly dependent shippers/ consignees (steel mills) located at the ports that are directly dependent on the receipt of iron ore by U.S. and Canadian flag vessels. "Other dry bulk cargo" moving on Canadian flag vessels created the secondlargest direct job impact, followed by the movement of petroleum and liquid bulk cargoes.

The carriage of steel imports on foreign flag vessels created the largest impact for cargo moving internationally, followed by the export of grain from both Canadian and U.S. Great Lakes ports.

Exhibit III-6 shows the direct jobs by commodity, flag of registry and country.

Exhibit III-5	Direct Jobs by	y Commodit	v — Regional Level

	Direct Jobs Canadian Flag	Direct Jobs U.S. Flag	Direct Jobs Foreign Flag	Total
Steel	82	1,987	3,010	5,080
General Cargo	466	117	98	681
Iron Ore	19,148	17,562	499	37,210
Grain	2,291	68	790	3,150
Stone/Aggregate	950	3,258	25	4,234
Cement	2,333	576	176	3,085
Salt	2,163	888	15	3,065
Other Dry Bulk	9,776	2,689	366	12,831
Liquid Bulk	4,052	2,388	0	6,440
Coal	1,602	3,945	44	5,591
Wind Energy	NA	NA	290	290
Not Allocated	5,797	3,740	1,728	11,265
Total	48,660	37,220	7,043	92,923

Note: Totals may not add due to rounding

Exhibit III-6 Direct Jobs by Commodity — Country Level

		Cai	nada			United	States	
	Canadian Flag	U.S. Flag	Foreign Flag	Total	Canadian Flag	U.S. Flag	Foreign Flag	Total
Steel	52	0	364	416	30	1,987	2,646	4,664
General Cargo	465	0	6	471	0	117	92	210
Iron Ore	18,284	1,507	97	19,888	864	16,055	402	17,321
Grain	1,995	0	112	2,107	296	68	679	1,043
Stone/Aggregate	640	98	0	738	310	3,160	25	3,496
Cement	1,452	0	0	1,452	881	576	177	1,633
Salt	1,464	0	15	1,479	699	888	0	1,587
Other Dry Bulk	9,684	0	324	10,008	92	2,689	43	2,824
Liquid Bulk	4,052	0	0	4,052	0	2,388	0	2,389
Coal	1,024	295	12	1,331	578	3,650	32	4,260
Wind Energy	0	0	93	93	0	0	196	196
Not Allocated	5,113	47	1,093	6,253	684	3,693	635	5,012
Total	44,226	1,948	2,114	48,288	4,434	35,272	4,928	44,634

With respect to the country impacts by flag of carriage, the Canadian flag carriers accounted for 91percent of the economic impact at the Canadian ports. The impacts generated by this cargo were greatest for iron ore moving on Canadian flag vessels, followed by the impacts created by the movement of "other dry bulk" by Canadian flag. The majority of the jobs generated by iron ore moving on Canadian flag vessels was with steel facilities located at the Canadian ports, while the impacts created by dry bulk cargo moving on the Canadian flag vessels are with fertilizer, aluminum smelters and chemical manufacturing facilities located at the Canadian marine terminals. Iron ore moving from the United States created the largest economic impact for U.S. flag vessels serving Canadian ports. The majority of the impacts created by the foreign flag vessels is associated with the movement of imported/exported steel from Canadian ports.

With respect to the U.S. port impacts by flag of carriage. 79 percent of these economic impacts were generated by cargo moving on U.S. flag vessels. reflecting domestic cargo movements, particularly for iron ore moving between U.S. ports. The movement of coal on U.S. flag vessels created the next-largest economic impact at the U.S. ports. Cargo moving on foreign flag vessels calling at the U.S. ports created nearly 5,000 direct jobs in the United States, and more than 50 percent of those direct jobs were associated with steel moving on foreign flag vessels. The impacts generated by Canadian flag vessels calling at U.S. ports were greatest for iron ore shipped from U.S. ports to Canadian ports on Canadian flag vessels, followed by the shipment and receipt of cement and aggregates on Canadian flag vessels moving these cargoes between U.S. and Canadian ports.

The direct jobs generated by category are presented in Exhibit III-7.

Exhibit III-7	Direct Jobs Impacts by Category — Regional Level
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Eximate in 7 Direct constitution	is by buildy i	Hogional Love!					
	Canadian Flag	U.S. Flag	Foreign Flag	Total			
Surface Transportation							
Rail	787	1,272	295	2,355			
Truck	7,499	5,098	1,089	13,686			
Maritime Service							
Terminal Employees	4,870	4,800	639	10,309			
Dockworkers	867	307	431	1,604			
Tug Assists	438	370	95	903			
Pilots	0	0	240	240			
Maritime Services	792	1,082	306	2,181			
Forwarders	1,497	1,720	157	3,373			
Government	809	1,157	99	2,066			
Marine Equipment/Ship Repair	3,283	919	699	4,900			
Laker	2,942	3,570	0	6,512			
Barge	561	442	113	1,117			
Dependent Shippers/Consignees	23,969	16,329	2,190	42,488			
Port Authority	345	153	690	1,188			
Total	48,660	37,220	7,043	92,923			

Note: Totals may not add due to rounding. The 113 jobs with barge operations include the landside jobs with bunkering operations, not the line-haul carriage by U.S. or Canadian flag tug/barge operations. "Port authority jobs" reported for the foreign flag vessels reflect the lock operators and administrative operations of the St. Lawrence Seaway Authority and the St. Lawrence Seaway Development Corp., since without these operations, the foreign flag vessels could not transit to and from the Great Lakes ports.

Exhibit III-8 shows the direct job impacts by category, by flag. As described previously, the direct jobs created by the movement of cargo on Canadian flag vessels created 52.4 percent of the total direct job impacts, followed by 40.1 percent created by movement of cargo on U.S. flag vessels, and the balance — 7.6 percent — by the movement of cargo on foreign flag vessels.

For all flags of carriage, the greatest impact is with the dependent shippers/consignees, followed by jobs with the trucking firms moving cargo to and from the ports. It is estimated that general cargo such as steel, wind energy equipment and project cargo (such as oversized boilers, locomotives, factory pieces, etc.) account for about 17 percent of all cargo moving on the Great Lakes-Seaway system on foreign flag ships. In contrast, general cargo accounts for about 1 percent of the cargo moving on the Canadian and U.S. flag vessels.

As presented in Exhibit III-8, the level of direct jobs with dependent shippers/consignees is significant for the Canadian and U.S. flag operations in both countries, reflecting the location of alumina smelters at port facilities, as well as fertilizer operations, in addition to the steel mills and steel-fabrication complexes both in Canada and the United States. Direct jobs with rail are higher in the U.S. than in Canada, due to the greater use of rail to move grain, iron ore and coal to the port terminals for shipment.

3. REVENUE IMPACT

In 2010, US\$33.6 billion (Cdn\$34.6 billion), in direct revenue was generated for businesses involved in providing services to cargo and vessel operations on the Great Lakes-Seaway system, as well as companies directly dependent upon the use of the ports/marine terminals for shipment and receipt of cargo. The revenue impact created by flag of carriage is almost

Exhibit III-8 Direct Jobs Impacts by Category — Country Level

		Car	nada		United States			
	Canadian Flag	U.S. Flag	Foreign Flag	Total	Canadian Flag	U.S. Flag	Foreign Flag	Total
Surface Transportation								
Rail	493	19	52	565	294	1,253	243	1,790
Truck	6,254	315	171	6,741	1,245	4,783	917	6,945
Maritime Service								
Terminal Employees	3,989	55	145	4,189	881	4,745	494	6,120
Dockworkers	817	3	159	979	50	304	272	625
Tug Assists	345	13	33	391	93	357	62	513
Pilots	0	0	73	73	0	0	166	166
Maritime Services	598	10	142	750	194	1,073	164	1,431
Forwarders	1,149	45	50	1,244	348	1,675	107	2,129
Government	603	25	32	659	207	1,133	68	1,407
Marine Equipment/Ship Repair	3,137	6	364	3,506	146	913	335	1,394
Laker	2,251	80	0	2,331	691	3,490	0	4,181
Barge	458	7	70	536	103	435	43	581
Dependent Shippers/Consignees	23,817	1,370	247	25,434	152	14,959	1,943	17,054
Port Authority	315	0	575	890	31	153	115	298
Total	44,226	1,948	2,114	48,288	4,434	35,272	4,928	44,634

equal between the cargo moving on Canadian and U.S. flag vessels. In 2010, the cargo moving on Canadian flag vessels supported US\$15.7 billion (Cdn\$16.1 billion) while the cargo moving on U.S. flag vessels created US\$15.5 billion (Cdn\$16.0 billion). In contrast, the direct revenue impact of the cargo moving on foreign flag vessels was estimated at US\$2.3 billion (Cdn\$2.4 billion).

Exhibit III-9 shows the distribution of this direct revenue impact by category and economic sector by flag of carriage.

The majority of the direct business revenue is received by the dependent shippers/consignees located at the ports and marine terminals operating on the Great Lakes-Seaway system.

The revenue impacts by category and flag are presented for Canada in Exhibit III-10 and for the United States in Exhibit III-11.

Exhibit III-9 Revenue Impact by Category and Flag — Regional Level

	Cana	dian Flag	US	US Flag Fore		Foreign Flag		Total
	Millions US	Millions Cdn	Millions US	Millions Cdn	Millions US	Millions Cdn	Millions US	Millions Cdn
Surface Transportation								
Rail	\$1,759.1	\$1,811.9	\$2,934.2	\$3,022.2	\$387.3	\$398.9	\$5,080.6	\$5,233.0
Truck	\$761.0	\$783.8	\$489.6	\$504.3	\$110.7	\$114.1	\$1,361.4	\$1,402.2
Maritime Service								
Terminal Employees	\$891.9	\$918.6	\$652.2	\$671.8	\$117.4	\$120.9	\$1,661.5	\$1,711.3
Tug Assists	\$45.1	\$46.4	\$39.8	\$41.0	\$7.4	\$7.6	\$92.3	\$95.1
Pilots	\$0.0	\$0.0	\$0.0	\$0.0	\$91.7	\$94.4	\$91.7	\$94.4
Maritime Services	\$186.6	\$192.2	\$264.9	\$272.9	\$69.8	\$71.9	\$521.4	\$537.0
Forwarders	\$266.5	\$274.5	\$307.1	\$316.3	\$28.8	\$29.7	\$602.4	\$620.5
Marine Equipment/ Ship Repair	\$525.8	\$541.5	\$244.3	\$251.6	\$124.8	\$128.5	\$894.8	\$921.7
Laker	\$1,309.7	\$1,349.0	\$1,619.1	\$1,667.7	\$0.0	\$0.0	\$2,928.9	\$3,016.7
Barge	\$100.7	\$103.7	\$71.9	\$74.0	\$23.5	\$24.2	\$196.0	\$201.9
Dependent Shippers/	ΦO 74 F 4	# 10.000.0	#0.000.0	Φ0.070.0	Φ4 O4O O	Φ4 0 <u>50 0</u>	#40.000.4	#00 404 F
Consignees	\$9,715.1	\$10,006.6	\$8,808.0	\$9,072.2	\$1,313.3	\$1,352.6	\$19,836.4	\$20,431.5
Port Authority	\$117.0	\$120.5	\$106.5	\$109.7	\$70.3	\$72.4	\$293.8	\$302.7
Total	\$15,678.5	\$16,148.8	\$15,537.6	\$16,003.7	\$2,345.0	\$2,415.3	\$33,561.0	\$34,567.9

Exhibit III-10 Revenue Impact by Category and Flag — Canada

	Cana	dian Flag	US	US Flag Forei		eign Flag Tota		ıl Canada	
	Millions U.S.	Millions Cdn	Millions U.S.	Millions Cdn	Millions U.S.	Millions Cdn	Millions U.S.	Millions Cdn	
Surface Transportation									
Rail	\$1,020.8	\$1,051.5	\$57.5	\$59.2	\$101.3	\$104.4	\$1,179.6	\$1,215.0	
Truck	\$643.8	\$663.2	\$29.9	\$30.8	\$21.1	\$21.8	\$694.9	\$715.8	
Maritime Service		\$0.0						\$0.0	
Terminal Employees	\$742.2	\$764.4	\$16.7	\$17.2	\$43.4	\$44.7	\$802.3	\$826.3	
Tug Assists	\$35.8	\$36.9	\$1.4	\$1.5	\$2.5	\$2.6	\$39.8	\$41.0	
Pilots	\$0.0	\$0.0	\$0.0	\$0.0	\$28.1	\$28.9	\$28.1	\$28.9	
Maritime Services	\$139.1	\$143.3	\$2.2	\$2.2	\$25.3	\$26.0	\$166.6	\$171.6	
Forwarders	\$204.4	\$210.6	\$8.0	\$8.3	\$9.7	\$10.0	\$222.2	\$228.8	
Marine Equipment/ Ship Repair	\$490.7	\$505.4	\$1.1	\$1.1	\$76.9	\$79.2	\$568.7	\$585.7	
Laker	\$1,002.8	\$1,032.9	\$38.5	\$39.7	\$0.0	\$0.0	\$1,041.3	\$1,072.6	
Barge	\$82.4	\$84.9	\$1.3	\$1.4	\$12.6	\$13.0	\$96.4	\$99.3	
Dependent Shippers/ Consignees	\$9,626.5	\$9,915.3	\$538.0	\$554.2	\$225.2	\$231.9	\$10,389.7	\$10,701.4	
Port Authority	\$111.6	\$115.0	\$52.6	\$54.2	\$31.5	\$32.4	\$195.7	\$201.6	
Total	\$14,100.3	\$14,523.3	\$747.3	\$769.8	\$577.7	\$595.0	\$15,425.3	\$15,888.1	

Exhibit III-11 Revenue Impact by Category and Flag — United States

Canad	lian Flag	US	US Flag Forei		eign Flag T		otal U.S.	
Millions U.S.	Millions Cdn	Millions U.S.	Millions Cdn	Millions U.S.	Millions Cdn	Millions U.S.	Millions Cdn	
\$738.3	\$760.4	\$2,876.7	\$2,963.0	\$286.0	\$294.6	\$3,901.0	\$4,017.99	
\$117.1	\$120.7	\$459.7	\$473.5	\$89.6	\$92.3	\$666.4	\$686.43	
			\$0.0	\$0.0	\$0.0		\$0.00	
\$149.7	\$154.2	\$635.5	\$654.6	\$74.0	\$76.2	\$859.2	\$884.98	
\$9.2	\$9.5	\$38.4	\$39.5	\$4.9	\$5.0	\$52.5	\$54.04	
\$0.0	\$0.0	\$0.0	\$0.0	\$63.6	\$65.5	\$63.6	\$65.52	
\$47.5	\$48.9	\$262.8	\$270.7	\$44.5	\$45.9	\$354.8	\$365.43	
\$62.1	\$64.0	\$299.0	\$308.0	\$19.1	\$19.7	\$380.2	\$391.62	
\$35.1	\$36.2	\$243.2	\$250.5	\$47.9	\$49.3	\$326.1	\$335.92	
\$307.0	\$316.2	\$1,580.6	\$1,628.0	\$0.0	\$0.0	\$1,887.5	\$1,944.16	
\$18.2	\$18.8	\$70.5	\$72.7	\$10.8	\$11.2	\$99.6	\$102.59	
\$88.6	\$91.3	\$8,269.9	\$8,518.0	\$1,088.1	\$1,120.7	\$9,446.6	\$9,730.04	
\$5.4	\$5.5	\$53.9	\$55.5	\$38.8	\$40.0	\$98.1	\$101.06	
\$1,578.2	\$1,625.5	\$14,790.3	\$15,234.0	\$1,767.3	\$1,820.3	\$18,135.7	\$18,679.79	
	\$738.3 \$117.1 \$149.7 \$9.2 \$0.0 \$47.5 \$62.1 \$35.1 \$307.0 \$18.2 \$88.6 \$5.4	\$738.3 \$760.4 \$117.1 \$120.7 \$149.7 \$154.2 \$9.2 \$9.5 \$0.0 \$0.0 \$47.5 \$48.9 \$62.1 \$64.0 \$35.1 \$36.2 \$307.0 \$316.2 \$18.2 \$18.8 \$88.6 \$91.3 \$5.4 \$5.5	Millions U.S. Millions Cdn Millions U.S. \$738.3 \$760.4 \$2,876.7 \$117.1 \$120.7 \$459.7 \$149.7 \$154.2 \$635.5 \$9.2 \$9.5 \$38.4 \$0.0 \$0.0 \$0.0 \$47.5 \$48.9 \$262.8 \$62.1 \$64.0 \$299.0 \$35.1 \$36.2 \$243.2 \$307.0 \$316.2 \$1,580.6 \$18.2 \$18.8 \$70.5 \$88.6 \$91.3 \$8,269.9 \$5.4 \$5.5 \$53.9	Millions U.S. Millions Cdn Millions U.S. Millions Cdn \$738.3 \$760.4 \$2,876.7 \$2,963.0 \$117.1 \$120.7 \$459.7 \$473.5 \$0.0 \$149.7 \$154.2 \$635.5 \$654.6 \$9.2 \$9.5 \$38.4 \$39.5 \$0.0 \$0.0 \$0.0 \$0.0 \$47.5 \$48.9 \$262.8 \$270.7 \$62.1 \$64.0 \$299.0 \$308.0 \$35.1 \$36.2 \$243.2 \$250.5 \$307.0 \$316.2 \$1,580.6 \$1,628.0 \$18.2 \$18.8 \$70.5 \$72.7 \$88.6 \$91.3 \$8,269.9 \$8,518.0 \$5.4 \$5.5 \$53.9 \$55.5	Millions U.S. Millions Cdn Millions U.S. Millions Cdn Millions U.S. \$738.3 \$760.4 \$2,876.7 \$2,963.0 \$286.0 \$117.1 \$120.7 \$459.7 \$473.5 \$89.6 \$0.0 \$0.0 \$0.0 \$0.0 \$149.7 \$154.2 \$635.5 \$654.6 \$74.0 \$9.2 \$9.5 \$38.4 \$39.5 \$4.9 \$0.0 \$0.0 \$0.0 \$63.6 \$47.5 \$48.9 \$262.8 \$270.7 \$44.5 \$62.1 \$64.0 \$299.0 \$308.0 \$19.1 \$35.1 \$36.2 \$243.2 \$250.5 \$47.9 \$307.0 \$316.2 \$1,580.6 \$1,628.0 \$0.0 \$18.2 \$18.8 \$70.5 \$72.7 \$10.8 \$88.6 \$91.3 \$8,269.9 \$8,518.0 \$1,088.1 \$5.4 \$5.5 \$53.9 \$55.5 \$38.8	Millions U.S. Millions Cdn Millions U.S. Millions Cdn Millions U.S. Millions Millions Cdn \$738.3 \$760.4 \$2,876.7 \$2,963.0 \$286.0 \$294.6 \$117.1 \$120.7 \$459.7 \$473.5 \$89.6 \$92.3 \$0.0 \$0.0 \$0.0 \$0.0 \$0.0 \$149.7 \$154.2 \$635.5 \$654.6 \$74.0 \$76.2 \$9.2 \$9.5 \$38.4 \$39.5 \$4.9 \$5.0 \$0.0 \$0.0 \$0.0 \$63.6 \$65.5 \$47.5 \$48.9 \$262.8 \$270.7 \$44.5 \$45.9 \$62.1 \$64.0 \$299.0 \$308.0 \$19.1 \$19.7 \$35.1 \$36.2 \$243.2 \$250.5 \$47.9 \$49.3 \$307.0 \$316.2 \$1,580.6 \$1,628.0 \$0.0 \$0.0 \$18.2 \$18.8 \$70.5 \$72.7 \$10.8 \$11.2 \$88.6 \$91.3 \$8,269.9 \$8,518.0 \$1,088.1	Millions U.S. Millions Cdn Millions U.S. Millions Cdn Millions U.S. Millions Milli	

4. PERSONAL INCOME AND LOCAL CONSUMPTION IMPACTS

The 92,923 individuals directly employed as a result of cargo moving via the ports and marine terminals on the Great Lakes-Seaway system received US\$4.3 billion (Cdn\$4.5 billion) in wages and salaries. These individuals, in turn, used these earnings to purchase goods and services, to pay taxes, and for savings. The purchase of goods and services from regional sources creates a re-spending effect known as the personal-earnings multiplier effect. For the U.S. Great Lakes ports, this re-spending, or multiplier effect, was estimated using a personal-earnings multiplier for the maritime sector, by state, from the U.S. Bureau of Economic Analysis, RIMSII. The income multipliers by province were developed from Statistics Canada, Industry Accounts Division, for the maritime sectors of Ontario and Quebec. Using the local personal-earnings multipliers by state and province for the relevant ports, an additional US\$6.9 billion (Cdn\$7.1 billion) of income and consumption were created in the Great Lakes regional economy due to the cargo moving via Canadian, U.S. and foreign flag vessels. In addition, the 67,905 indirectly employed workers received indirect wages and salaries totaling US\$2.9 billion (Cdn\$3.0 billion).

The Canadian flag operations created 52.4 percent of the direct income impact, but only 34.6 percent of the total direct, induced and indirect income impact. In contrast, the U.S. flag operations accounted for 38.9 percent of the direct personal income impact but 55.7 percent of the total direct, induced and indirect income impact. The higher share of the total income impact attributed to cargo moving on U.S. flag vessels is due to the fact that a larger share of the U.S. traffic moves via the U.S. ports, and as noted, the re-spending impact of personal income is significantly higher in the United States compared to Canada.

5. FEDERAL, STATE/PROVINCIAL AND LOCAL TAX IMPACT

Federal, state/provincial and local tax impacts generated by the cargo moving by each flag of carriage were estimated from several sources. The U.S. tax impacts were estimated from income indices developed by the Tax Foundation, while the Canadian tax impacts were estimated based on data provided to Martin Associates by Revenue Canada. In addition, adjustments were made to reflect the different tax relationships in Quebec at the federal level. Cargo moving on Canadian flag vessels created 42.8 percent of the US\$4.6 billion (Cdn\$4.7 billion) total tax impact, while the cargo moving on U.S. flag vessels supported 48.2 percent of the total local, state/provincial and federal tax impacts.

6. IMPACTS BY STATE AND PROVINCE

As explained earlier, economic impacts were estimated at the port level for 32 U.S. and Canadian Great Lakes and St. Lawrence River ports. The models developed for these 32 individual ports were then used to develop prototype models for each state and province. This process provided a means to estimate impacts at the state and provincial level by flag of carriage.

Exhibits III-12, III-13, III-14, III-15, III-16, III-17 present the impacts — by state and province — of cargo moving on Canadian flag vessels, U.S. flag vessels and foreign flag vessels on the Great Lakes-Seaway system.

Exhibit III-12 Economic Impacts by State — Cargo Moving on Canadian Flag Vessels via U.S. Ports and Marine Terminals on the Great Lakes-St. Lawrence Seaway System

Canadian Flag Tonnage (1,000)	Indiana 451			Ohio 7,611		Michigan 6,618	
Jobs							
Direct Jobs		195		924	1	1,218	
Induced		219		1,274		896	
Indirect		336		995		361	
Total		750		3,194	2	2,476	
Personal Income (1,000)	US \$	Cdn \$	US \$	Cdn \$	US\$	Cdn \$	
Direct	\$8,872	\$9,138	\$40,584	\$41,802	\$50,336	\$51,846	
Re-Spending/							
Local Consumption	\$30,158	\$31,063	\$136,943	\$141,051	\$119,749	\$123,341	
Indirect	\$13,175	\$13,570	\$43,433	\$44,736	\$14,451	\$14,885	
Total	\$52,204	\$53,770	\$220,960	\$227,589	\$184,536	\$190,072	
Business Revenue (1,000)	\$183,716	\$189,227	\$366,291	\$377,280	\$233,062	\$240,054	
Local Purchases (1,000)	\$25,415	\$26,177	\$88,769	\$91,432	\$28,361	\$29,211	
State and Local Taxes (1,000)	\$4,959	\$5,108	\$21,433	\$22,076	\$17,900	\$18,437	
Federal Taxes (1,000)	\$9,397	\$9,679	\$39,773	\$40,966	\$33,216	\$34,213	

Exhibit III-12 continued

Minnesota 7,753		III	Illinois 899		Wisconsin 8,714	
	642		347		823	
	568		302		696	
	385		225		500	
	1,595		875	<i>t</i>	2,020	
US\$	Cdn \$	US \$	Cdn \$	US \$	Cdn \$	
\$28,946	\$29,815	\$14,516	\$14,951	\$36,816	\$37,921	
\$66,116	\$68,100	\$45,802	\$47,176	\$82,620	\$85,099	
\$15,539	\$16,005	\$10,693	\$11,013	\$20,275	\$20,884	
\$110,602	\$113,920	\$71,010	\$73,141	\$139,712	\$143,903	
\$348,038	\$358,479	\$53,518	\$55,123	\$350,083	\$360,585	
\$29,449	\$30,333	\$18,662	\$19,221	\$38,872	\$40,038	
\$11,779	\$12,132	\$7,101	\$7,314	\$15,036	\$15,487	
\$19,908	\$20,506	\$12,782	\$13,165	\$25,148	\$25,903	
	US \$ \$28,946 \$66,116 \$15,539 \$110,602 \$348,038 \$29,449 \$11,779	7,753 642 568 385 1,595 US \$ Cdn \$ \$28,946 \$29,815 \$66,116 \$68,100 \$15,539 \$16,005 \$110,602 \$113,920 \$348,038 \$358,479 \$29,449 \$30,333 \$11,779 \$12,132	7,753 642 568 385 1,595 US \$ Cdn \$ US \$ \$28,946 \$29,815 \$14,516 \$66,116 \$68,100 \$45,802 \$15,539 \$16,005 \$10,693 \$110,602 \$113,920 \$71,010 \$348,038 \$358,479 \$53,518 \$29,449 \$30,333 \$18,662 \$11,779 \$12,132 \$7,101	7,753 899 642 347 568 302 385 225 1,595 875 US \$ Cdn \$ US \$ Cdn \$ \$28,946 \$29,815 \$14,516 \$14,951 \$66,116 \$68,100 \$45,802 \$47,176 \$15,539 \$16,005 \$10,693 \$11,013 \$110,602 \$113,920 \$71,010 \$73,141 \$348,038 \$358,479 \$53,518 \$55,123 \$29,449 \$30,333 \$18,662 \$19,221 \$11,779 \$12,132 \$7,101 \$7,314	7,753 899 8 642 347 568 302 385 225 1,595 875 US \$ Cdn \$ US \$ US \$ \$28,946 \$29,815 \$14,516 \$14,951 \$36,816 \$66,116 \$68,100 \$45,802 \$47,176 \$82,620 \$15,539 \$16,005 \$10,693 \$11,013 \$20,275 \$110,602 \$113,920 \$71,010 \$73,141 \$139,712 \$348,038 \$358,479 \$53,518 \$55,123 \$350,083 \$29,449 \$30,333 \$18,662 \$19,221 \$38,872 \$11,779 \$12,132 \$7,101 \$7,314 \$15,036	

Exhibit III-12 continued

Canadian Flag Tonnage (1,000)	New York 1,087		Pennsylva	ania 71	Total U.S. 33,204	
Jobs						
Direct Jobs		253		31		4,434
Induced		181		32		4,168
Indirect		61		28		2,891
Total		494		91		1,494
Personal Income (1,000)	US\$	Cdn \$	US \$	Cdn \$	US \$	Cdn \$
Direct	\$11,130	\$11,464	\$1,284	\$1,323	\$192,484	\$198,258
Re-Spending/						
Local Consumption	\$24,501	\$25,236	\$4,365	\$4,496	\$510,254	\$525,561
Indirect	\$3,210	\$3,306	\$1,176	\$1,211	\$121,952	\$125,611
Total	\$38,841	\$40,006	\$6,825	\$7,030	\$824,690	\$849,430
Business Revenue (1,000)	\$37,556	\$38,683	\$5,917	\$6,095	\$1,578,180	\$1,625,525
Local Purchases (1,000)	\$7,423	\$7,646	\$2,142	\$2,207	\$239,093	\$246,266
State and Local Taxes (1,000)	\$4,700	\$4,841	\$689	\$710	\$83,597	\$86,105
Federal Taxes (1,000)	\$6,991	\$7,201	\$1,229	\$1,265	\$148,444	\$152,897

Exhibit III-13 Economic Impacts by Province — Cargo Moving on Canadian Flag Vessels via Canadian Ports and Marine Terminals on the Great Lakes-St. Lawrence Seaway System

Canadian Flag Tonnage (1,00	Ontario 1,000) 56,198			luebec 53,128	Total 109,326		
Jobs							
Direct Jobs		26,320		17,906	44,226		
Induced		11,574		8,446		20,020	
Indirect		19,778		6,050		25,828	
Total		57,673		32,401		90,074	
Personal Income (1,000)	US \$	Cdn \$	US\$	Cdn \$	US \$	Cdn \$	
Direct	\$1,164,480	\$1,199,414	\$931,362	\$959,303	\$2,095,842	\$2,158,718	
Re-Spending/							
Local Consumption	\$465,792	\$479,766	\$333,758	\$343,770	\$799,550	\$823,536	
Indirect	\$849,300	\$874,779	\$314,973	\$324,422	\$1,164,273	\$1,199,201	
Total	\$2,479,572	\$2,553,959	\$1,580,092	\$1,627,495	\$4,059,664	\$4,181,454	
Business Revenue (1,000)	\$8,381,488	\$8,632,932	\$5,718,790	\$5,890,354	\$14,100,278	\$14,523,287	
Local Purchases (1,000)	\$2,184,431	\$2,249,964	\$900,102	\$927,105	\$3,084,533	\$3,177,069	
Provincial Taxes (1,000)	\$213,367	\$219,768	\$320,050	\$329,652	\$533,418	\$549,420	
Federal Taxes (1,000)	\$820,738	\$845,361	\$374,482	\$385,716	\$1,195,220	\$1,231,077	
Note: Totals may not add due to r	ounding						

Exhibit III-14 Economic Impacts by State — Cargo Moving on U.S. Flag Vessels via U.S. Ports and Marine Terminals on the Great Lakes-St. Lawrence Seaway System

U.S. Flag Tonnage (1,000)	Indiana 27,345		2	Ohio 29,335		Michigan 54,061	
Jobs							
Direct Jobs		12,723		7,042		9,094	
Induced		14,615		7,739		6,914	
Indirect		12,566		8,553		7,478	
Total		39,903		23,334	2	3,485	
Personal Income (1,000)	US\$	Cdn \$	US \$	Cdn \$	US \$	Cdn \$	
Direct	\$594,457	\$612,290	\$312,009	\$321,370	\$418,274	\$430,822	
Re-Spending/							
Local Consumption	\$2,020,796	\$2,081,420	\$1,052,813	\$1,084,397	\$905,255	\$932,413	
Indirect	\$493,303	\$508,102	\$358,591	\$369,349	\$307,087	\$316,299	
Total	\$3,108,556	\$3,201,812	\$1,723,414	\$1,775,116	\$1,630,616	\$1,679,534	
Business Revenue (1,000)	\$6,562,975	\$6,759,865	\$2,488,105	\$2,562,748	\$3,470,086	\$3,574,189	
Local Purchases (1,000)	\$951,604	\$980,152	\$613,445	\$631,848	\$584,647	\$602,187	
State and Local Taxes (1,000)	\$295,313	\$304,172	\$167,171	\$172,186	\$158,170	\$162,915	
Federal Taxes (1,000)	\$559,540	\$576,326	\$310,214	\$319,521	\$293,511	\$302,316	

Exhibit III-14 continued

U.S. Flag Tonnage (1,000)	Minnesota 20,930			Illinois 5,277		Wisconsin 21,741	
Jobs							
Direct Jobs		1,728		2,102		2,177	
Induced		1,538		1,861		1,861	
Indirect		1,043		1,393		1,551	
Total		4,309		5,356	!	5,589	
Personal Income (1,000)	US\$	Cdn \$	US \$	Cdn \$	US \$	Cdn \$	
Direct	\$78,501	\$80,856	\$89,766	\$92,459	\$99,122	\$102,095	
Re-Spending/							
Local Consumption	\$179,303	\$184,682	\$283,238	\$291,735	\$221,352	\$227,992	
Indirect	\$42,080	\$43,343	\$66,136	\$68,120	\$63,625	\$65,533	
Total	\$299,884	\$308,880	\$439,140	\$452,314	\$384,098	\$395,621	
Business Revenue (1,000)	\$935,276	\$963,334	\$331,915	\$341,873	\$920,596	\$948,214	
Local Purchases (1,000)	\$79,749	\$82,142	\$115,425	\$118,888	\$122,394	\$126,066	
State and Local Taxes (1,000)	\$31,938	\$32,896	\$43,914	\$45,231	\$41,480	\$42,725	
Federal Taxes (1,000)	\$53,979	\$55,598	\$79,045	\$81,417	\$69,138	\$71,212	
Note: Totals may not add due to roun	ndina						

Exhibit III-14 continued

U.S. Flag Tonnage (1,000)	Nev	v York 693	Pennsylv	/ania 532		al U.S. 59,913
Jobs						
Direct Jobs		108		277		34,913
Induced		108		277		34,913
Indirect		51		224		32,857
Total		305		761	1	03,043
Personal Income (1,000)	US\$	Cdn \$	US \$	Cdn \$	US \$	Cdn \$
Direct	\$6,684	\$6,885	\$11,249	\$11,587	\$1,610,061	\$1,658,363
Re-Spending/						
Local Consumption	\$14,714	\$15,156	\$38,236	\$39,383	\$4,715,708	\$4,857,179
Indirect	\$2,693	\$2,774	\$9,456	\$9,740	\$1,342,970	\$1,383,259
Total	\$24,092	\$24,814	\$58,941	\$60,709	\$7,668,739	\$7,898,801
Business Revenue (1,000)	\$33,717	\$34,728	\$47,580	\$49,008	\$14,790,251	\$15,233,959
Local Purchases (1,000)	\$6,237	\$6,425	\$17,228	\$17,745	\$2,490,731	\$2,565,452
State and Local Taxes (1,000)	\$2,915	\$3,003	\$5,953	\$6,132	\$746,853	\$769,259
Federal Taxes (1,000)	\$4,336	\$4,467	\$10,609	\$10,928	\$1,380,373	\$1,421,784

Exhibit III-15 Economic Impacts by Province — Cargo Moving on U.S. Flag Vessels via Canadian Ports and Marine Terminals on the Great Lakes-St. Lawrence Seaway System

U.S. Flag Tonnage (1,000)	Ontario 4,292		Total 4,292	
Jobs				
Direct Jobs		1,948		1,948
Induced		858		858
Indirect		1,764		1,764
Total		4,570 4,57		4,570
Personal Income (1,000)	US \$	Cdn \$	US \$	Cdn \$
Direct	\$86,615	\$89,214	\$86,615	\$89,214
Re-Spending/				
Local Consumption	\$34,646	\$35,685	\$34,646	\$35,685
Indirect	\$76,158	\$78,442	\$76,158	\$78,442
Total	\$197,419	\$203,342	\$197,419	\$203,342
Business Revenue (1,000)	\$747,349	\$769,769	\$747,349	\$769,769
Local Purchases (1,000)	\$194,394	\$200,226	\$194,394	\$200,226
Provincial Taxes (1,000)	\$16,988	\$17,498	\$16,988	\$17,498
Federal Taxes (1,000)	\$65,346	\$67,306	\$65,346	\$67,306

Note: Totals may not add due to rounding. There was no significant traffic moving on U.S. Flag vessels between U.S. ports and Canadian ports in Quebec.

Exhibit III-16 Economic Impacts by State — Cargo Moving on Foreign Flag Vessels via U.S. Ports and Marine Terminals on the Great Lakes-St. Lawrence Seaway System

Foreign Flag Tonnage (1,000)		Indiana 282		Ohio 1,638	Mich	igan 312
Jobs						
Direct Jobs		2,598		538		291
Induced		3,018		208		251
Indirect		2,062		806		316
Total		7,678		1,553		859
Personal Income (1,000)	US \$	Cdn \$	US \$	Cdn \$	US \$	Cdn \$
Direct	\$122,955	\$126,644	\$26,374	\$27,165	\$15,507	\$15,972
Re-Spending/						
Local Consumption	\$417,973	\$430,512	\$88,995	\$91,664	\$33,953	\$34,971
Indirect	\$80,968	\$83,397	\$34,961	\$36,010	\$13,149	\$13,544
Total	\$621,896	\$640,553	\$150,330	\$154,839	\$62,609	\$64,487
Business Revenue (1,000)	\$1,147,955	\$1,182,394	\$177,934	\$183,272	\$96,751	\$99,653
Local Purchases (1,000)	\$156,190	\$160,876	\$70,588	\$72,706	\$24,546	\$25,282
State and Local Taxes (1,000)	\$59,080	\$60,853	\$14,582	\$15,019	\$6,073	\$6,255
Federal Taxes (1,000)	\$111,941	\$115,299	\$27,059	\$27,871	\$11,270	\$11,608

Exhibit III-16 continued

Foreign Flag Tonnage (1,000)	Minr	esota 739	III	inois 522	Wisc 1	onsin 1,393
Jobs						
Direct Jobs		146		364		466
Induced		152		358		513
Indirect		68		225		189
Total		367		946	-	1,168
Personal Income (1,000)	US\$	Cdn \$	US \$	Cdn \$	US \$	Cdn \$
Direct	\$8,017	\$8,258	\$17,660	\$18,190	\$27,851	\$28,687
Re-Spending/						
Local Consumption	\$18,312	\$18,861	\$55,724	\$57,395	\$63,085	\$64,977
Indirect	\$2,762	\$2,845	\$10,662	\$10,981	\$7,666	\$7,896
Total	\$29,091	\$29,964	\$84,046	\$86,567	\$98,602	\$101,560
Business Revenue (1,000)	\$60,392	\$62,204	\$53,362	\$54,963	\$134,614	\$138,652
Local Purchases (1,000)	\$5,234	\$5,391	\$18,607	\$19,166	\$14,689	\$15,130
State and Local Taxes (1,000)	\$3,098	\$3,191	\$8,405	\$8,657	\$10,557	\$10,874
Federal Taxes (1,000)	\$5,236	\$5,393	\$15,128	\$15,582	\$17,748	\$18,281

Exhibit III-16 continued **New York** Pennsylvania Total U.S. Foreign Flag Tonnage (1,000) 5,104 218 Jobs Direct Jobs 524 1 4,928 Induced 474 1 4,976 Indirect 169 1 3,837 Total 1,168 2 13,741 Personal Income (1,000) US\$ Cdn \$ US\$ Cdn \$ US\$ Cdn \$ Direct \$31,832 \$32,787 \$34 \$35 \$250,232 \$257,738 Re-Spending/ Local Consumption \$72,178 \$770,680 \$70,076 \$117 \$120 \$748,233 Indirect \$9,133 \$30 \$31 \$163,837 \$8,867 \$159,065 \$1,192,256 Total \$110,775 \$114,099 \$182 \$187 \$1,157,530 **Business Revenue (1,000)** \$153 \$96,124 \$99,008 \$157 \$1,767,284 \$1,820,302 Local Purchases (1,000) \$20,409 \$21,022 \$55 \$57 \$319,629 \$310,319 State and Local Taxes (1,000) \$13,404 \$13,806 \$18 \$19 \$115,217 \$118,674 \$33 Federal Taxes (1,000) \$19,940 \$20,538 \$34 \$208,355 \$214,606

Exhibit III-17	Economic Impacts by Province — Cargo Moving on Foreign Flag Vessels via Canadian
	Ports and Marine Terminals on the Great Lakes-St. Lawrence Seaway System

Foreign Flag Tonnage (1,000)	C	Intario 902		uebec 1,691		Total 2,593	
Jobs							
Direct Jobs		626		1,489		2,114	
Induced		310		759		1,069	
Indirect		364		365		729	
Total		1,300	2,612		(3,912	
Personal Income (1,000)	US \$	Cdn \$	US \$	Cdn \$	US \$	Cdn \$	
Direct	\$36,923	\$38,031	\$90,828	\$93,553	\$127,751	\$131,584	
Re-Spending/							
Local Consumption	\$14,769	\$15,212	\$30,022	\$30,923	\$44,791	\$46,135	
Indirect	\$14,787	\$15,231	\$18,855	\$19,421	\$33,642	\$34,651	
Total	\$66,480	\$68,474	\$139,705	\$143,896	\$206,185	\$212,370	
Business Revenue (1,000)	\$231,453	\$238,397	\$346,237	\$356,624	\$577,690	\$595,021	
Local Purchases (1,000)	\$41,018	\$42,249	\$53,655	\$55,265	\$94,673	\$97,513	
Provincial Taxes (1,000)	\$5,721	\$5,892	\$28,839	\$29,705	\$34,560	\$35,597	
Federal Taxes (1,000)	\$22,005	\$22,665	\$33,110	\$34,103	\$55,115	\$56,768	



ECONOMIC IMPACTS OF THE ST. LAWRENCE SEAWAY

- 1. Total Economic Impacts
 - 2. Job Impacts
 - 3. Revenue Impacts
- 4. Personal Income and Local Consumption Impacts
 - **5.** Federal, State/Provincial and Local Tax Impacts
- 6. Impacts by State and Province



ECONOMIC IMPACTS OF THE ST. LAWRENCE SEAWAY

This chapter presents the results of the economic impact analysis exclusively for cargo moving through the St. Lawrence Seaway. Vessel traffic that does not utilize the St. Lawrence Seaway is traffic that trades exclusively in the upper four Great Lakes (Superior, Huron, Michigan and Erie) and does not utilize U.S. or Canadian Seaway infrastructure.

Opened to vessel traffic in 1959, the Seaway connects the Great Lakes to the lower St. Lawrence River and Atlantic Ocean. Its infrastructure includes the following segments.

Welland Canal Section

Linking Lake Erie to Lake Ontario, the Welland Canal cuts 42 km (27 miles) across Canada's Niagara Peninsula from Port Colborne, Ontario, to Port Weller, Ontario. A series of eight locks lifts or lowers vessels 99.5 m (326 feet) and enables maritime commerce to bypass Niagara Falls. Each of the eight locks on the Welland Canal measures 233.5 m (766 feet) long x 24 m (80 feet) wide x 9.14 m (30 feet) deep. The Welland Canal is owned by the Government of Canada and managed by the St. Lawrence Seaway Management Corporation (SLSMC).

Montreal-Lake Ontario Section

Located on the St. Lawrence River between Iroquois, Ontario, and Montreal, Quebec, a series of seven locks lifts or lowers vessels 74 m (243 feet) and enables maritime commerce to navigate between

Lake Ontario and the lower St. Lawrence — effectively connecting the Great Lakes to the Atlantic Ocean. Of the seven locks, the Iroquois, Upper Beauharnois, Lower Beauharnois, Cote Ste. Catherine and St. Lambert locks are on the Canadian side of the waterway. These locks are owned by the Government of Canada and managed by the SLSMC. The Eisenhower and Snell locks are located on the American side. They are owned by the U.S. Department of Transportation and managed by the Saint Lawrence Seaway Development Corporation (SLSDC). Each of the seven locks measures 233.5 m (766 feet) long x 24 m (80 feet) wide x 9.14 m (30 feet) deep.

This analysis includes cargo moving through one or both of the sections described above. Impacts are presented in terms of total economic impacts at the regional level, the country level and the state/provincial level.

1. TOTAL ECONOMIC IMPACTS

In 2010, it is estimated that 68.1 million metric tons of "Seaway cargo" (cargo that passed through some portion of the St. Lawrence Seaway as defined above) were handled at ports and marine terminals located on the Great Lakes-St. Lawrence Seaway System. This estimate of tonnage is based on the interviews conducted by Martin Associates and the databases developed from the St. Lawrence Seaway Traffic Report, 2010. It is important to note that this tonnage level includes both shipments and receipts of cargo moving through the St. Lawrence Seaway System,

and therefore counts traffic twice for cargo originating and terminating at a port or marine terminal on the system.

Exhibit IV-1 summarizes the economic impacts of cargo handled via ports on the Great Lakes-Seaway system and moving through the St. Lawrence Seaway.

In 2010, 86,006 jobs in Canada and the United States were in some way related to the cargo moving via the St. Lawrence Seaway to and from ports and marine terminals located on the Great Lakes-Seaway system.

- Of the 86,006 jobs, 37,344 direct jobs were generated by the marine cargo moving through the St. Lawrence Seaway.
- As the result of the regional purchases by those 37,344 individuals holding direct jobs, an additional 21,830 induced jobs were supported in the regional economy.
- 26,832 indirect jobs were supported by US\$2.8 billion (Cdn\$2.9 billion) in regional purchases by businesses supplying services at the ports and marine terminals.

Exhibit IV-1 Economic Impacts of the St. Lawrence Seaway — Regional Level

		Total
Jobs		
Direct Jobs	3	37,344
Induced	2	21,830
Indirect	2	26,832
Total	8	36,006
Personal Income (1,000)	US \$	Cdn \$
Direct	\$1,773,728	\$1,826,940
Re-Spending/Local Consumption	\$1,647,780	\$1,697,213
Indirect	\$1,163,434	\$1,198,337
Total	\$4,584,942	\$4,722,490
Business Revenue (1,000)	\$12,319,813	\$12,689,407
Local Purchases (1,000)	\$2,845,629	\$2,930,998
State/Provincial and Local Taxes (1,000)	\$500,873	\$515,899
Federal Taxes (1,000)	\$1,183,794	\$1,219,308
Note: Totals may not add due to rounding		

In 2010, cargo moving through the St. Lawrence Seaway to and from ports and marine terminals on the Great Lakes-Seaway system generated US\$12.3 billion (Cdn\$12.7 billion) in business revenue.

US\$4.6 billion (Cdn\$4.7 billion) in direct, indirect, induced and local consumption expenditures were also generated by the cargo and vessels activity moving though the St. Lawrence Seaway. The 37,344 direct job holders received US\$1.77 billion (Cdn\$1.83 billion) in direct wage and salary income. This equates to an average salary of nearly US\$47,000 (Cdn\$48,400.)

US\$1.68 billion (Cdn\$1.73 billion), was paid in taxes to local, state/provincial governments and federal governments.

Exhibit IV-2 shows the breakdown of the total impacts by country.

As shown in Exhibit IV-2, direct jobs generated by cargo moving on the St. Lawrence Seaway to and from ports on the Great Lakes-Seaway system were concentrated in Canada. Of the 37,344 direct jobs generated in the region, 79 percent were created in Canada, while 21 percent are created in the U.S.

Indirect jobs generated per dollar of local purchases are lower in Canada than in the U.S., reflecting the fact that there are greater leakages of purchases out of the region in Canada than in the U.S.; as a result, the jobs-to-sales multipliers used in estimating the indirect jobs ratios are lower in Canada than in the United States.

2. JOB IMPACTS

This section focuses on the 37,344 direct jobs created by cargo handled at the ports and marine terminals on the Great Lakes-Seaway system that moved via the St. Lawrence Seaway. Exhibit IV-3 shows the direct jobs impact by commodity. As this exhibit shows, the movement of iron ore, which represents the largest tonnage handled at the ports and marine terminals, created the largest number of direct jobs — 18,957 jobs. The majority of these jobs were with directly dependent shippers/consignees (steel mills) located at the ports that are directly dependent on the receipt of iron ore moving via the St. Lawrence Seaway. The movement of steel products via the St. Lawrence Seaway, particularly imported steel products. generated the second-largest direct jobs impact, and these impacts are concentrated with the operations of tenants located at the individual ports, as well as private terminals and steel fabrication centers located on the Great Lakes, handling imported steel products. Jobs generated by "other dry bulk" consisted of jobs with firms processing dry bulk cargoes such as alumina and other ores, fertilizers and potash.

Impacts		Canada	United	States		Total	
Jobs							
Direct Jobs	29,512			7,832	;	37,344	
Induced		13,310		8,520	:	21,830	
Indirect		20,220		6,613	:	26,832	
Total		63,041	22,965		1	86,006	
Personal Income (1,000)	US\$	Cdn \$	US \$	Cdn \$	US \$	Cdn S	
Direct	\$1,387,919	\$1,429,557	\$385,809	\$397,383	\$1,773,728	\$1,826,940	
Re-Spending/			4	4		*	
Local Consumption	\$522,014	\$537,675	\$1,125,765	\$1,159,538	\$1,647,780	\$1,697,213	
Indirect	\$888,709	\$915,370	\$274,725	\$282,967	\$1,163,434	\$1,198,337	
Total	\$2,798,643	\$2,882,602	\$1,786,299	\$1,839,888	\$4,584,942	\$4,722,490	
Business Revenue (1,000)	\$9,522,050	\$9,807,711	\$2,797,763	\$2,881,696	\$12,319,813	\$12,689,407	
Local Purchases (1,000)	\$2,321,135	\$2,390,769	\$524,495	\$540,230	\$2,845,629	\$2,930,998	
State/Provincial and Local Taxes (1,000)	\$323,447	\$333,150	\$177,427	\$182,749	\$500,873	\$515,899	
Federal Taxes (1,000)	\$862,260	\$888,128	\$321,534	\$331,180	\$1,183,794	\$1,219,308	

Exhibit IV-3 Direct Jobs by Commodity — Regional Level

	Tota	al
	1,000 tons	Direct Jobs
Steel	2,003	3,227
General Cargo	153	108
Iron Ore	23,979	18,957
Grain	16,051	2,469
Stone/Aggregate	3,318	441
Cement	3,446	918
Salt	6,392	1,353
Other Dry Bulk	5,107	3,076
Liquid Bulk	368	179
Coal	6,728	554
Wind Energy	560	290
Not Allocated		5,769
Total	68,106	37,344

Exhibit IV-4 shows the direct jobs by commodity for each country for cargo moving through the St. Lawrence Seaway.

The majority of the tonnage shipped and received at U.S. ports and terminals on vessels moving via the St. Lawrence Seaway consists of iron ore and grain. Iron ore from the eastern Canadian provinces moving into the Great Lakes creates the largest number of direct jobs in Canada, followed by the shipment and receipt of other dry bulk at Canadian ports. Steel and general cargo moving via the St. Lawrence Seaway create larger impacts in the United States due to the location of major steel fabrication tenants at several of the U.S. Great Lakes ports. These tenants are completely dependent upon the ability to receive products by water.

Exhibit IV-4 Direct Jobs by Commodity — Country Level

		Canada	Unit	ed States	Total	
	1,000 tons	Direct Jobs	1,000 tons	Direct Jobs	1,000 tons	Direct Jobs
Steel	1,181	443	823	2,784	2,003	3,227
General Cargo	13	6	140	102	153	108
Iron Ore	14,699	17,149	9,280	1,809	23,979	18,957
Grain	12,714	1,764	3,337	706	16,051	2,469
Stone/Aggregate	2,264	331	1,054	110	3,318	441
Cement	2,355	683	1,091	235	3,446	918
Salt	5,572	947	820	406	6,392	1,353
Other Dry Bulk	4,959	2,981	148	95	5,107	3,076
Liquid Bulk	300	175	68	4	368	179
Coal	3,446	347	3,282	207	6,728	554
Wind Energy	252	93	308	198	560	290
Not Allocated		4,593		1,177		5,769
Total	47,755	29,512	20,350	7,832	68,106	37,344

Note: Totals may not add due to rounding. Liquid bulk is combined with petroleum.

The direct jobs generated by category are presented in Exhibit IV-5. This exhibit shows that more than 50 percent of the direct jobs impact was with shippers/consignees that are directly dependent upon the shipment and receipt of cargo moving via the St. Lawrence Seaway. As noted, the location of steel mills, alumina smelters and dependent iron ore, salt and alumina mines in proximity to the ports and marine terminals on the Great Lakes-Seaway system underscores the importance of the transportation system in providing raw materials to the region's industrial economy. The second-largest number of direct jobs was created with the trucking firms serving the ports and marine terminals, followed by the terminal workers.

Exhibit IV-6 shows the direct job impacts by category, by country.

As shown in Exhibit IV-6, the level of direct jobs with dependent shippers/consignees is significantly greater in Canada than in the United States, reflecting the location of alumina smelters, steel mills and steel fabrication facilities at Canadian

ports — many of which are dependent on Seaway commerce.

3. REVENUE IMPACTS

In 2010, the 68.1 million tons of marine cargo handled by ports along the system and moving via the St. Lawrence Seaway generated US\$12.3 billion (Cdn\$12.7 billion) in business revenue at firms directly dependent upon the cargo. These firms provide maritime services and inland transportation services for the cargo handled at the marine terminals and the vessels calling at the terminals.

Exhibit IV-5 Direct Jobs Impacts by Category — Regional Level

Tiogranar Lavor	
	Direct Jobs
Surface Transportation	
Rail	988
Truck	4,003
Maritime Service	
Terminal Employees	2,531
ILA/Dockworkers	796
Tug Assists	276
Pilots	223
Agents	146
Maritime Services	489
Forwarders	713
Marine Equipment/Ship Repair	396
Laker	3,234
Barge	457
Dependent Shippers/Consignees	20,858
Port Authority	1,188
Total	37,344
Note: Totals may not add due to rounding	

Exhibit IV-6 Direct Jobs Impacts by Category — Country Level

Di	Canada irect Jobs	United States Direct Jobs	Total
Surface Transportation			
Rail	383	606	988
Truck	2,702	1,301	4,003
Maritime Service			
Terminal Employees	1,854	677	2,531
ILA/Dockworkers	518	278	796
Tug Assists	189	87	276
Pilots	57	166	223
Agents	92	55	146
Maritime Services	304	186	489
Forwarders	500	213	713
Government	273	123	396
Marine Equipment/Ship Repair	2,850	384	3,234
Laker	792	254	1,046
Barge	274	183	457
Dependent Shippers/Consignees	17,836	3,022	20,858
Port Authority	890	298	1,188
Total	29,512	7,832	37,344

Exhibit IV-7 shows the distribution of this direct revenue impact by category and economic sector in both U.S. and Canadian dollars.

The majority of the direct business revenue is received by the dependent shippers/consignees located at the ports and marine terminals operating on the Great Lakes-Seaway system.

The revenue impacts by category, by country, are presented in Exhibit IV-8.

Exhibit IV-7 Revenue Impact by Category — Regional Level

	Revenue (\$1,000) US	Revenue (\$1,000) Cdn
Surface Transportation		
Rail	\$997,186	\$1,027,101
Truck	\$398,653	\$410,612
Maritime Service		
Terminal Employees	\$477,046	\$491,358
Tug Assists	\$25,807	\$26,581
Pilots	\$85,456	\$88,020
Agents	\$34,543	\$35,580
Maritime Services	\$105,360	\$108,521
Forwarders	\$127,358	\$131,178
Marine Equipment/		
Ship Repair	\$478,750	\$493,112
Laker	\$524,256	\$539,983
Barge	\$67,904	\$69,941
Dependent Shippers/		
Consignees	\$8,703,652	\$8,964,761
Port Authority	\$293,843	\$302,658
Total	\$12,319,813	\$12,689,407

Exhibit IV-8 Revenue Impact by Category — Country Level

	Canada		United	d States	
	(\$1,000) US	(\$1,000) Cdn	(\$1,000) US	(\$1,000) Cdn	
Surface Transportation					
Rail	\$525,802	\$541,576	\$471,383	\$485,525	
Truck	\$270,358	\$278,469	\$128,295	\$132,144	
Maritime Service					
Terminal Employees	\$364,509	\$375,444	\$112,537	\$115,913	
Tug Assists	\$17,540	\$18,066	\$8,268	\$8,516	
Pilots	\$21,848	\$22,504	\$63,608	\$65,516	
Agents	\$11,617	\$11,965	\$22,927	\$23,615	
Maritime Services	\$63,542	\$65,448	\$41,818	\$43,073	
Forwarders	\$89,302	\$91,981	\$38,055	\$39,197	
Marine Equipment/Ship Repair	\$419,254	\$431,831	\$59,496	\$61,281	
Laker	\$420,589	\$433,207	\$103,667	\$106,777	
Barge	\$49,334	\$50,814	\$18,570	\$19,127	
Dependent Shippers/Consignees	\$7,072,627	\$7,284,805	\$1,631,025	\$1,679,956	
Port Authority	\$195,729	\$201,601	\$98,114	\$101,057	
Total	\$9,522,050	\$9,807,711	\$2,797,763	\$2,881,696	

4. PERSONAL INCOME AND LOCAL CONSUMPTION IMPACTS

The 37,344 individuals directly employed as a result of the cargo moving through the St. Lawrence Seaway received US\$1.77 billion (Cdn\$1.83 billion) in direct wages and salaries. These individuals, in turn, used these earnings to purchase goods and services, to pay taxes, and for savings. The purchase of goods and services from regional sources creates a re-spending effect known as the personal-earnings multiplier effect. For the U.S., this re-spending, or multiplier effect, was estimated using a personalearnings multiplier for the maritime sector, by state, from the U.S. Bureau of Economic Analysis, RIMSII. For Canada, the income multipliers were developed from Statistics Canada, Industry Accounts Division, for the maritime sectors of Ontario and Quebec. Using the local personal-earnings multipliers by state and province for the relevant ports, an additional US\$1.6 billion (Cdn\$1.7 billion) of income and consumption expenditures were created in the Great Lakes regional economy due to the cargo moving via the St. Lawrence Seaway. In addition, the 26,832 indirectly employed workers received indirect wages and salaries totaling US\$1.16 billion (Cdn\$1.20 billion). Combining the direct, induced and indirect income impacts, the 68.1 million tons of cargo moving through the St. Lawrence Seaway created US\$4.6 billion (Cdn\$4.7 billion) in wages and salaries, and local consumption expenditures in the regional economy.

The 29,512 direct job holders at the Canadian ports and terminals received 78.3 percent of the total direct income impact, for an average salary of US\$47,100 (Cdn\$48,500). The 7,832 direct job holders at the U.S. ports received 21.7 percent of the total direct income impact, for an average salary of US\$49,300 (Cdn\$50,700). As noted, the re-spending impact is much lower for the Canadian ports than for the U.S. ports, reflecting the much higher savings rate for Canadian households compared to those in the U.S. — thus reducing the income-multiplier impact. The Organisation of Economic Co-operation

and Development (OECD) reported that in 2006 and 2007 (the time period for which the income multipliers were derived for the United States and Canada), the percentage of household income saved by Canadians was about three times greater than for U.S. households. This difference in the propensity to save has a significant impact on the level of personalincome multipliers, as reflected by the actual multiplier levels. In addition, to the extent that Statistics Canada and the U.S. Bureau of Economic Analysis develop and define personal income multipliers differently, the income multipliers will differ. However, in developing the personal-income multiplier impacts. Martin Associates used the national government agencies in each country to provide the income multipliers, based on our definitions. It is important to note that the re-spending impact also includes the local consumption impact.

In addition to the direct income impact and the re-spending and consumption impacts, the division of the re-spending impact/local consumption impact by the induced jobs will overstate the actual salary of the induced job holders.

The 26,832 indirect job holders received US\$1.16 billion in personal income (Cdn\$1.20 billion), of which the 20,220 Canadian indirect job holders received US\$888.7 million (Cdn\$915.4 million), while the 6,613 indirect job holders in the U.S. received US\$274.7 million (Cdn\$283.0 million).

5. FEDERAL, STATE/PROVINCIAL AND LOCAL TAX IMPACTS

Total federal, state/provincial and local tax impacts generated by the cargo moving through the St. Lawrence Seaway were estimated from several sources. The U.S. tax impacts were estimated from income indices developed by the Tax Foundation, while the Canadian tax impacts were estimated based on data provided to Martin Associates by Revenue Canada. In addition, adjustments were made to reflect the different tax relationships in Quebec at the federal level. The St. Lawrence Seaway traffic handled

at the U.S. Great Lakes ports and marine terminals created US\$177.4 million (Cdn\$182.8 million) in state and local taxes, and US\$321.5 million (Cdn\$331.2 million) in federal taxes. The cargo activity at the Canadian ports created US\$307.4 million (Cdn\$316.6 million) in provincial taxes, and US\$862.3 million (Cdn\$888.1 million) in federal taxes. The ratio of state and local taxes and federal taxes to total direct, induced (including local consumption expenditures) and indirect income is about 43 percent in Canada and about 28 percent in the U.S.

6. IMPACTS BY STATE AND PROVINCE

The economic impacts were estimated at the port level for the 32 U.S. and Canadian Great Lakes and St. Lawrence River ports. The models developed for these 32 individual ports were then used to develop prototype models for each Great Lakes state and

province, in order to capture the impacts of the cargo activity moving through ports and marine terminals for which specific models were not developed. This process provided a model for each state and province to estimate the total impacts at the state and provincial level. It is important to note that the direct impacts generated at the 32 modeled ports accounted for 88.2 percent of the total expanded direct job impacts created by cargo moving via the St. Lawrence Seaway. The 16 U.S. ports accounted for 90.5 percent of the total estimated U.S. direct job impacts, while the 16 Canadian ports accounted for 87.5 percent of the total estimated Canadian impacts.

Exhibit IV-9 presents the state-by-state impacts of the cargo handled via U.S. ports and marine terminals located on the Great Lakes-Seaway system and moved through the St. Lawrence Seaway.

St. Lawrence Seaway Tonnage		Indiana 1,649		Ohio 3,051		nigan ,812
Jobs						
Direct Jobs		3,055		1,392	1	1,153
Induced		3,551		1,890		921
Indirect		2,468		1,780	1	1,449
Total		9,074		5,063	3	3,524
Personal Income (1,000)	US\$	Cdn \$	US \$	Cdn \$	US\$	Cdn \$
Direct	\$144,684	\$149,025	\$64,411	\$66,344	\$55,953	\$57,632
Re-Spending/						
Local Consumption	\$491,839	\$506,595	\$217,343	\$223,864	\$122,604	\$126,282
Indirect	\$96,903	\$99,810	\$76,134	\$78,418	\$60,237	\$62,044
Total	\$733,427	\$755,430	\$357,889	\$368,625	\$238,794	\$245,958
Business Revenue (1,000)	\$1,365,223	\$1,406,180	\$493,734	\$508,546	\$429,446	\$442,330
Local Purchases (1,000)	\$186,931	\$192,539	\$143,648	\$147,957	\$112,576	\$115,953
State and Local Taxes (1,000)	\$69,676	\$71,766	\$34,715	\$35,757	\$23,163	\$23,858
Federal Taxes (1,000)	\$132,017	\$135,977	\$64,420	\$66,353	\$42,983	\$44,272

Exhibit IV-9 continued

St. Lawrence Seaway Tonnage		nesota 3,070		linois 1,247	Wisco 3	onsin 8,656
Jobs						
Direct Jobs		298		524		748
Induced		294		506		764
Indirect		167		268		256
Total		759		1,298	-	1,767
Personal Income (1,000)	US\$	Cdn \$	US \$	Cdn \$	US\$	Cdn \$
Direct	\$15,322	\$15,782	\$24,895	\$25,642	\$41,735	\$42,987
Re-Spending/						
Local Consumption	\$34,997	\$36,047	\$78,552	\$80,908	\$93,732	\$96,544
Indirect	\$6,747	\$6,949	\$12,715	\$13,097	\$10,351	\$10,662
Total	\$57,066	\$58,778	\$116,162	\$119,647	\$145,819	\$150,194
Business Revenue (1,000)	\$137,723	\$141,854	\$63,642	\$65,551	\$183,941	\$189,459
Local Purchases (1,000)	\$12,786	\$13,170	\$22,192	\$22,858	\$19,800	\$20,394
State and Local Taxes (1,000)	\$6,078	\$6,260	\$11,616	\$11,965	\$15,687	\$16,158
Federal Taxes (1,000)	\$10,272	\$10,580	\$20,909	\$21,537	\$26,247	\$27,035

Exhibit IV-9 continued

St. Lawrence Seaway Tonnage		ew York 863	Pennsylv	ania 2	Т	otal US 47,755
Jobs						
Direct Jobs		646		16		7,832
Induced		568		25		8,520
Indirect		212		11		6,613
Total		1,427		52		22,965
Personal Income (1,000)	US \$	Cdn \$	US \$	Cdn \$	US \$	Cdn \$
Direct	\$37,751	\$38,884	\$1,057	\$1,088	\$385,809	\$397,383.12
Re-Spending/						
Local Consumption	\$83,105	\$85,599	\$3,592	\$3,700	\$1,125,765	\$1,159,538.46
Indirect	\$11,153	\$11,487	\$484	\$499	\$274,725	\$282,966.84
Total	\$132,009	\$135,970	\$5,133	\$5,287	\$1,786,299	\$1,839,888.42
Business Revenue (1,000)	\$121,619	\$125,268	\$2,436	\$2,509	\$2,797,763	\$2,881,696.25
Local Purchases (1,000)	\$25,680	\$26,450	\$882	\$908	\$524,495	\$540,229.60
State and Local Taxes (1,000)	\$15,973	\$16,452	\$518	\$534	\$177,427	\$182,749.40
Federal Taxes (1,000)	\$23,762	\$24,475	\$924	\$952	\$321,534	\$331,179.92

Exhibit IV-10 shows the impacts of cargo moving via the St. Lawrence Seaway to and from ports in the provinces of Ontario and Quebec. Note that these impacts do not include the impacts of the international (non-Seaway) cargo handled at the St. Lawrence River ports.

St. Lawrence Seaway Tonnag	je (1,000)	Ontario 26,984		luebec 20,771	2	Total 0,350
Jobs						
Direct Jobs		21,355		8,157	2	29,512
Induced		9,459		3,851	1	3,310
Indirect		17,909		2,311	2	20,220
Total		48,723	-	14,318	6	3,041
Personal Income (1,000)	US\$	Cdn \$	US \$	Cdn \$	US \$	Cdn \$
Direct	\$962,875	\$991,761	\$425,045	\$437,796	\$1,387,919	\$1,429,557
Re-Spending/						
Local Consumption	\$385,150	\$396,704	\$136,864	\$140,970	\$522,014	\$537,675
Indirect	\$768,803	\$791,867	\$119,906	\$123,503	\$888,709	\$915,370
Total	\$2,116,827	\$2,180,332	\$681,815	\$702,270	\$2,798,643	\$2,882,602
Business Revenue (1,000)	\$7,489,598	\$7,714,286	\$2,032,452	\$2,093,425	\$9,522,050	\$9,807,711
Local Purchases (1,000)	\$1,979,454	\$2,038,837	\$341,681	\$351,932	\$2,321,135	\$2,390,769
Provincial Taxes (1,000)	\$182,153	\$187,618	\$141,294	\$145,532	\$323,447	\$333,150
Federal Taxes (1,000)	\$700,670	\$721,690	\$161,590	\$166,438	\$862,260	\$888,128

Chapter

ECONOMIC IMPACTS
OF COMMERCE
TRANSITING
NEW YORK WATERS
OF THE GREAT LAKESSEAWAY SYSTEM

- 1. Total Economic Impacts
 - 2. Job Impacts
 - 3. Revenue Impacts
- 4. Personal Income and Local Consumption Impacts
 - **5.** Federal, State/Provincial and Local Tax Impacts
- 6. Impacts by State and Province



ECONOMIC IMPACTS OF COMMERCE TRANSITING NEW YORK WATERS OF THE GREAT LAKES-SEAWAY SYSTEM

This chapter describes the economic impacts of the commercial cargo handled at ports in the Great Lakes-St. Lawrence Seaway System and which moved through New York waters. This traffic includes the cargo moving though the Montreal-Lake Ontario (MLO) section of the St. Lawrence Seaway to and from ports and marine terminals located on the system, as well as cargo moving to and from Buffalo, N.Y. (intra-lake commerce) and not transiting any Seaway locks. The impacts are presented in terms of total economic impacts at the regional level, the country level and the state/provincial level.

This analysis is meant to inform the public policy debate surrounding New York State Department of Environmental Conservation (NYDEC) ballast water regulations on vessels transiting New York waters. In December 2008, the NYDEC issued state regulations governing the discharge of ballast water from commercial vessels. The regulations seek to address the problem of aquatic nuisance species being introduced into New York waters via ships' ballast water.

Under these rules, by August 1, 2013, all vessels operating in New York waters will be required to install environmental technology that can clean or treat ballast water to meet a specific water quality standard. The State of New York's ballast water quality standard is 100 times stronger than the standards established by the International Maritime Organization (IMO), an agency of the United Nations. By January 1, 2013, any new vessels (constructed after that date) that

operate in New York waters must install environmental technology that can clean or treat ballast water to a level 1000 times stronger than the international standards. The maritime industry indicates that no technology exists to meet these requirements.

These regulations are the most stringent in North America and the topic of considerable controversy. The maritime industry believes the regulations to be unworkable and, if left unchanged, will result in economic harm when they come into effect — resulting in complete cessation of commercial maritime commerce in New York waters. The economic impacts presented in this document demonstrate the potential loss of benefits to the U.S. and Canadian economies should the regulations take effect and negatively impact commerce.

1. TOTAL ECONOMIC IMPACTS

In 2010, 47.1 million metric tons of cargo handled by ports on the Great Lakes-Seaway system moved through New York waters. This estimate of tonnage is based on the interviews conducted by Martin Associates and the databases developed from the 2010 St. Lawrence Seaway Traffic Report and the Canadian St. Lawrence Seaway Management Corporation (SLSMC). This activity created a range of economic impacts (described below) to the region, defined as the Canadian provinces of Ontario and Quebec, and the States of New York, Pennsylvania, Ohio, Indiana, Illinois, Wisconsin, Michigan and Minnesota.

Exhibit V-1 summarizes the economic impacts of cargo handled at Great Lakes-Seaway ports and moving through New York waters. The related user impacts (Chapter VI) are not included in the analysis, in order to present the most conservative estimate of the economic impacts.

In 2010, 47.1 million metric tons of cargo handled at marine terminals located on the Great Lakes-Seaway system transited New York waters.¹ The movement of this cargo generated the following economic impacts in the United States and Canada:

72,061 jobs in Canada and the United States were in some way related to the cargo moving via New York waters of the Great Lakes-Seaway system.

- Of the 72,061 jobs, 31,314 direct jobs were generated by Great Lakes-Seaway commerce transiting New York waters.
- As the result of the regional purchases by those 31,314 individuals holding the direct jobs, an additional 18,306 induced jobs were supported in the regional economy.
- 22,442 indirect jobs were supported by US\$2.4 billion (Cdn\$2.5 billion) in regional purchases by businesses supplying services at the marine terminals and ports.

In 2010, the marine cargo and vessel activity at system ports that moved through New York waters generated a total of US\$10.5 billion (Cdn\$10.8 billion) in direct business revenue in the United States and Canada.

Exhibit V-1 Economic Impacts of the Commerce Transiting
New York Waters of the Great Lakes-Seaway System —
Regional Level

Impacts Total			
Jobs			
Direct Jobs	3	31,314	
Induced	1	8,306	
Indirect	22,442		
Total	72,061		
Personal Income (1,000)	US \$	Cdn \$	
Direct	\$1,503,713	\$1,548,824	
Re-Spending/Local Consumption	\$1,346,393	\$1,386,785	
Indirect	\$976,806	\$1,006,110	
Total	\$3,826,912	\$3,941,719	
Business Revenue (1,000)	\$10,485,343	\$10,799,904	
Local Purchases (1,000)	\$2,439,782	\$2,512,976	
State/Provincial and Local Taxes (1,000)	\$426,427	\$439,219	
Federal Taxes (1,000)	\$997,991	\$1,027,930	

¹ The 47.1 million metric tons of cargo moving via New York waters to and from U.S. and Canadian ports and marine terminals located on the Great Lakes-Seaway system include cargo shipped via the ports within the system, as well as that same cargo received by the ports in the system.

Cargo moving via New York waters on the Great Lakes-Seaway system supported US\$3.8 billion (Cdn\$3.9 billion) in total personal wage and salary income and local consumption expenditures for residents of the U.S. and Canada. The 31,314 direct job holders received US\$1.5 billion (Cdn\$1.6 billion) in direct wage and salary income. This equates to an average salary of US\$48,100 (Cdn\$49,500).

A total of US\$1.4 billion (Cdn\$1.5 billion) in direct, induced and indirect federal, state/provincial and local tax revenue was generated by cargo handled at the ports and terminals located on the Great Lakes-Seaway system and transiting New York waters.

 Of the US\$1.4 billion (Cdn\$1.5 billion), US\$426.5 million (Cdn\$439.2 million) was paid in taxes to local and state/provincial governments, while US\$998.0 million (Cdn\$1,027.9 million) was paid in federal taxes.

Exhibit V-2 shows the breakdown of the total impacts by country.

As shown in Exhibit V-2, direct jobs generated by the cargo moving on New York waters to and from ports on the Great Lakes-Seaway system were concentrated in Canada. Of the 31,314 direct jobs generated in the region, 81.0 percent were created in Canada.

Indirect jobs generated per dollar of local purchases were lower in Canada than in the U.S., reflecting the fact that there are greater leakages of purchases out of the region in Canada than is the case for the U.S.; as result, the jobs-to-sales multipliers used in estimating the indirect jobs ratios are lower in Canada than in the United States.

2. JOB IMPACTS

This section focuses on the 31,314 direct jobs created by cargo handled at the ports and marine terminals on the Great Lakes-Seaway system that moved via New York waters. Exhibit V-3 presents the direct jobs impact by commodity. As this exhibit shows, the movement of iron ore, which represents the largest tonnage handled at the ports and marine terminals. created the largest number of direct jobs — 16,288 jobs. The majority of these jobs was with directly dependent shippers/consignees (for example, steel mills) located at the ports that are directly dependent on the receipt of iron ore moving via New York waters. The movement of steel, particularly imported steel, generates the second-largest direct job impacts, and these impacts are concentrated with the operations of tenants located at the individual ports as well as private terminals and steel fabrication

Exhibit V-2	Economic Impacts of the Commerce Seaway System — Country Level	Transiting New York Waters of the C	Great Lakes-
Impacts	Canada	United States	Tota
Jobs			

•						
Jobs						
Direct Jobs		25,360		5,954		31,314
Induced		11,477		6,829		18,306
Indirect		18,117		4,324		22,442
Total		54,954		17,108		72,061
Personal Income (1,000)	US \$	Cdn \$	US\$	Cdn \$	US \$	Cdn \$
Direct	\$1,202,427	\$1,238,500	\$301,286	\$310,325	\$1,503,713	\$1,548,824
Re-Spending/						
Local Consumption	\$448,315	\$461,765	\$898,078	\$925,021	\$1,346,393	\$1,386,785
Indirect	\$797,643	\$821,573	\$179,162	\$184,537	\$976,806	\$1,006,110
Total	\$2,448,385	\$2,521,837	\$1,378,526	\$1,419,882	\$3,826,912	\$3,941,719
Business Revenue (1,000)	\$8,404,342	\$8,656,472	\$2,081,001	\$2,143,431	\$10,485,343	\$10,799,904
Local Purchases (1,000)	\$2,090,243	\$2,152,950	\$349,540	\$360,026	\$2,439,782	\$2,512,976
State/Provincial and						
Local Taxes (1,000)	\$289,027	\$297,697	\$137,400	\$141,522	\$426,427	\$439,219
Federal Taxes (1,000)	\$749,856	\$772,351	\$248,135	\$255,579	\$997,991	\$1,027,930
Note: Totals may not add due to r	ounding					

centers located on the Great Lakes, handling imported steel products. Jobs generated by other dry bulk consist of jobs with firms/port tenants processing dry bulk cargoes such as alumina and other ores, fertilizers and potash.

Exhibit V-4 shows the direct jobs by commodity for each country for cargo moving through the New York waters of the Great Lakes-Seaway system.

The majority of the tonnage shipped and received at the U.S. ports and terminals on vessels moving via the New York waters of the Great Lakes-Seaway system consists of iron ore and grain. Iron ore from the eastern Canadian provinces moving into the Great Lakes created the largest number of direct jobs in Canada, followed by the shipment and receipt of other dry and liquid bulk at Canadian ports. Steel and general cargo moving via the system's New York waters created larger impacts in the United States, due to the location of major steel fabrication tenants at several of the U.S. Great Lakes ports; these tenants are completely dependent upon the ability to receive products by water.

Exhibit V-3 Direct Jobs by Commodity — Regional Level

	Tota	al
	1,000 tons	Direct Jobs
Steel	2,003	3,227
General Cargo	153	108
Iron Ore	18,739	16,288
Grain	15,698	2,407
Stone/Aggregate	2,245	302
Salt	2,474	668
Other Dry Bulk	3,856	2,665
Liquid Bulk	209	148
Coal	1,193	60
Wind Energy	560	290
Not Allocated		5,150
Total	47,131	31,314

Exhibit V-4 Direct Jobs by Commodity — Country Level	Exhibit V-4	Direct Jobs by	v Commoditv —	Country Level
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	Canada		Canada United States		Total	
	1,000 tons	Direct Jobs	1,000 tons	Direct Jobs	1,000 tons	Direct Jobs
Steel	1,181	443	823	2,784	2,003	3,227
General Cargo	13	6	140	102	153	108
Iron Ore	13,074	15,499	5,665	789	18,739	16,288
Grain	12,399	1,714	3,299	692	15,698	2,407
Stone/Aggregate	850	61	1,396	241	2,245	302
Salt	2,414	659	60	9	2,474	668
Other Dry Bulk	3,708	2,570	148	95	3,856	2,665
Liquid Bulk	142	143	68	4	209	148
Coal	308	16	884	44	1,193	60
Wind Energy	252	93	308	198	560	290
Not Allocated		4,154		997		5,150
Total	34,340	25,360	12,791	5,954	47,131	31,314

The direct jobs generated by category are presented in Exhibit V-5. This exhibit shows that more than 50 percent of the direct jobs impact is with shippers/consignees that are directly dependent upon the shipment and receipt of cargo moving via New York waters on the Great Lakes-Seaway system. As noted, the location of steel mills, alumina smelters and dependent iron ore, salt and alumina mines in proximity to the ports and marine terminals on the system underscores the importance of the transportation system in providing raw materials to the region's steel mills and industrial economy. The second-largest number of direct jobs was created with marine repair and ship and boat yards. Trucking firms serving the ports and marine terminals received the third-largest job impacts.

Exhibit V-6 shows the direct job impacts by category, by country, for cargo handled at all ports and terminals on the Great Lakes-Seaway system that transited the New York waters of the system.

As shown in Exhibit V-6, the level of direct jobs with dependent shippers/consignees is greater in Canada than in the United States, reflecting the location of alumina smelters on port facilities, as well as fertilizer operations, in addition to the steel mills and steel fabrication complexes both in Canada and the United States.

Exhibit V-5	Direct Jobs Impacts by Category — Regional Level
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	Direct Jobs
Surface Transportation	
Rail	882
Truck	2,468
Maritime Service	
Terminal Employees	1,970
ILA/Dockworkers	549
Tug Assists	207
Pilots	223
Agents	146
Maritime Services	370
Forwarders	494
Government	268
Marine Equipment/Ship Repair	2,951
Laker	538
Barge	369
Dependent Shippers/Consignees	18,690
Port Authority	1,188
Total	31,314

Exhibit V-6 Direct Jobs Impacts by Category — Country Level

Di	Canada rect Jobs	United States Direct Jobs	Total
Surface Transportation			
Rail	350	533	882
Truck	1,530	938	2,468
Maritime Service			
Terminal Employees	1,414	556	1,970
ILA/Dockworkers	277	272	549
Tug Assists	140	67	207
Pilots	57	166	223
Agents	92	55	146
Maritime Services	248	122	370
Forwarders	360	134	494
Government	193	75	268
Marine Equipment/Ship Repair	2,608	343	2,951
Laker	506	32	538
Barge	212	157	369
Dependent Shippers/Consignees	16,484	2,206	18,690
Port Authority	890	298	1,188
Total	25,360	5,954	31,314

3. REVENUE IMPACTS

In 2010, the 47.1 million tons of marine cargo moving via New York waters on the Great Lakes-Seaway system generated a total of US\$10.5 billion (Cdn\$10.8 billion). The firms receiving this revenue provide maritime services and inland transportation services for the cargo handled at the marine terminals and the vessels calling at the terminals.

Exhibit V-7 shows the distribution of this direct revenue impact by category and economic sector in both U.S. and Canadian dollars.

The majority of the direct business revenue is received by the dependent shippers/consignees located at the ports and marine terminals.

The revenue impacts by category, by country are presented in Exhibit V-8.

Consistent with the distribution of direct jobs by category, the largest revenue impacts are with the dependent shippers/consignees.

Exhibit V-7	Revenue Impact by Category — Regional Level
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•		
	Revenue (\$1,000) US	Revenue (\$1,000) Cdn
Surface Transportation		
Rail	\$771,494	\$794,639
Truck	\$246,795	\$254,199
Maritime Service		
Terminal Employees	\$392,379	\$404,151
Tug Assists	\$17,016	\$17,526
Pilots	\$85,453	\$88,017
Agents	\$34,543	\$35,580
Maritime Services	\$74,681	\$76,922
Forwarders	\$88,135	\$90,779
Marine Equipment/		*
Ship Repair	\$419,708	\$432,299
Laker	\$337,255	\$347,373
Barge	\$51,941	\$53,500
Dependent Shippers/		
Consignees	\$7,672,099	\$7,902,262
Port Authority	\$293,843	\$302,658
Total	\$10,485,343	\$10,799,904

Exhibit V-8 Revenue Impact by Category — Country Level

	Ca	nada	United States		
	(\$1,000) US	(\$1,000) Cdn	(\$1,000) US	(\$1,000) Cdn	
Surface Transportation					
Rail	\$435,891	\$448,967	\$335,604	\$345,672	
Truck	\$155,114	\$159,768	\$91,681	\$94,431	
Maritime Service					
Terminal Employees	\$308,010	\$317,250	\$84,369	\$86,900	
Tug Assists	\$11,788	\$12,142	\$5,227	\$5,384	
Pilots	\$21,845	\$22,500	\$63,608	\$65,516	
Agents	\$11,617	\$11,965	\$22,927	\$23,615	
Maritime Services	\$49,303	\$50,782	\$25,378	\$26,140	
Forwarders	\$64,216	\$66,142	\$23,919	\$24,637	
Marine Equipment/Ship Repair	\$369,794	\$380,888	\$49,913	\$51,411	
Laker	\$308,217	\$317,463	\$29,038	\$29,909	
Barge	\$38,196	\$39,342	\$13,746	\$14,158	
Dependent Shippers/Consignees	\$6,434,623	\$6,627,661	\$1,237,476	\$1,274,601	
Port Authority	\$195,729	\$201,601	\$98,114	\$101,057	
Total	\$8,404,342	\$8,656,472	\$2,081,001	\$2,143,431	

4. PERSONAL INCOME AND LOCAL CONSUMPTION IMPACTS

The 31,314 individuals directly employed as a result of the cargo moving via the New York waters of the Great Lakes-St. Lawrence Seaway system received US\$1.5 billion (Cdn\$1.6 billion) in direct wages and salaries. These individuals, in turn, used these earnings to purchase goods and services, to pay taxes, and for savings. The purchase of goods and services from regional sources creates a re-spending effect known as the personal-earnings multiplier effect. For the U.S. Great Lakes ports, this re-spending, or multiplier effect, was estimated using a personalearnings multiplier for the maritime sector, by state, from the U.S. Bureau of Economic Analysis, RIMSII. The income multipliers by province were developed from Statistics Canada, Industry Accounts Division. for the maritime sectors of Ontario and Quebec. Using the local personal-earnings multipliers by state and province for the relevant ports, an additional US\$1.3 billion (Cdn\$1.4 billion) of income and consumption expenditures were created in the regional economy due to the cargo moving via the New York waters of the Great Lakes-Seaway system. In addition, the 22,442 indirectly employed workers received indirect wages and salaries totaling US\$976.8 million (Cdn\$1.0 billion). Combining the direct, induced and indirect income impacts, the 47.1 million tons of cargo moving on the New York waters of the Great Lakes-Seaway system created US\$3.8 billion (Cdn\$3.9 billion) in wages and salaries and local consumption expenditures in the regional economy.

The 25,360 direct job holders at the Canadian ports and terminals received 80 percent of the total direct income impact, for an average salary of US\$48,100 (Cdn\$49,600). The 5,954 direct job holders at the U.S. ports received the remaining 20 percent of the total direct income impact, for an average salary of US\$50,600 (Cdn\$52,100). As noted, the re-spending impact is much lower for the Canadian ports than for the U.S. ports, reflecting the much higher savings

rate for Canadian households compared to those in the U.S. — thus reducing the income-multiplier impact. The Organisation of Economic Co-operation and Development (OECD) reported that in 2006 and 2007 (the time period for which the income multipliers were derived for the United States and Canada), the percentage of household income saved by Canadians was more than three times greater than for U.S. households. This difference in the propensity to save has a significant impact on the level of personal-income multipliers, as reflected by the actual multiplier levels. In addition, to the extent that Statistics Canada and the U.S. Bureau of Economic Analysis develop and define personal income multipliers differently, the income multipliers will differ. However, in developing the personal-income multiplier impacts, Martin Associates used the national government agencies in each country to provide the income multipliers, based on our definitions. Note that the re-spending impact also includes the local consumption impact.

In addition to the direct income impact and the re-spending and consumption impacts, the division of the re-spending impact/local consumption impact by the induced jobs will overstate the actual salary of the induced job holders.

The 22,442 indirect job holders received US\$976.8 million in personal income (Cdn\$1.0 billion), of which the 18,117 Canadian indirect job holders received US\$797.6 million (Cdn\$821.6 million), while the 4,324 indirect job holders in the U.S. received US\$179.1 million (Cdn\$184.5 million).

5. FEDERAL, STATE/PROVINCIAL AND LOCAL TAX IMPACTS

Total federal, state/provincial and local tax impacts were estimated from several sources. The U.S. tax impacts were estimated from income indices developed by the Tax Foundation, while the Canadian tax impacts were estimated based on data provided to Martin Associates by Revenue Canada. In addition, adjustments were made to reflect the different tax relationships in Quebec at the federal level. The cargo handled at U.S. ports and terminals and moving on the New York waters of the system created US\$137.4 million (Cdn\$141.5 million) in state and local taxes, and US\$248.1 million (Cdn\$255.6 million) in federal taxes. The cargo activity at the Canadian ports created US\$289.0 million (Cdn\$297.7 million) in provincial taxes, and US\$749.9 million (Cdn\$772.4 million) in federal taxes. The ratio of state, local and federal taxes to total direct, induced (including local consumption expenditures) and indirect income is about 43 percent in Canada and about 28 percent in the U.S.

6. IMPACTS BY STATE AND PROVINCE

The economic impacts of the cargo and vessel activity moving via New York waters on the Great Lakes-Seaway system were estimated at the port level for the 32 U.S. and Canadian Great Lakes and St. Lawrence River ports. The models developed for these 32 individual ports were then used to develop prototype models for each Great Lakes state and province, in order to capture the impacts of the cargo activity moving through ports and marine terminals for which specific models were not developed. This process provided a model for each state and province to estimate the total impacts at the state and provincial level. It is important to note that the direct impacts generated at the 32 individual ports accounted for 89 percent of the total expanded direct iob impacts created by cargo moving on the New York waters of the Great Lakes-Seaway System. The 16 U.S. ports accounted for 93.1 percent of the total estimated U.S. direct job impacts, while the 16 Canadian ports accounted for 88.3 percent of the total estimated Canadian impacts.

Exhibit V-9 presents the impacts of the cargo and vessel activity moving via the New York waters of the Great Lakes-Seaway system for each of the eight Great Lakes states.

Exhibit V-9 Economic Impacts by State — Commerce Transiting New York Waters of the Great Lakes-Seaway System

Tonnage (1,000)	Indiana 1,417			Ohio 4,681		Michigan 624	
Jobs							
Direct Jobs		2,969		711		341	
Induced		3,452		1,184		292	
Indirect		2,385		859		342	
Total		8,806		2,754		975	
Personal Income (1,000)	US\$	Cdn \$	US \$	Cdn \$	US\$	Cdn \$	
Direct	\$140,649	\$144,869	\$35,082	\$36,134	\$17,973	\$18,512	
Re-Spending/							
Local Consumption	\$478,123	\$492,466	\$118,376	\$121,927	\$39,526	\$40,712	
Indirect	\$93,645	\$96,454	\$37,278	\$38,396	\$14,185	\$14,611	
Total	\$712,417	\$733,789	\$190,735	\$196,457	\$71,684	\$73,834	
Business Revenue (1,000)	\$1,322,509	\$1,362,184	\$264,091	\$272,014	\$106,695	\$109,896	
Local Purchases (1,000)	\$180,646	\$186,065	\$74,979	\$77,228	\$26,640	\$27,440	
State and Local Taxes (1,000)	\$67,680	\$69,710	\$18,501	\$19,056	\$6,953	\$7,162	
Federal Taxes (1,000)	\$128,235	\$132,082	\$34,332	\$35,362	\$12,903	\$13,290	

Exhibit V-9 continued

Tonnage (1,000)	Minnesota 1,477			Illinois 1,043		Wisconsin 2,786	
Jobs							
Direct Jobs		165		469		675	
Induced		176		459		699	
Indirect		75		244		205	
Total		417		1,173		1,579	
Personal Income (1,000)	US \$	Cdn \$	US \$	Cdn \$	US \$	Cdn \$	
Direct	\$9,322	\$9,602	\$22,643	\$23,322	\$38,448	\$39,602	
Re-Spending/							
Local Consumption	\$21,293	\$21,931	\$71,445	\$73,588	\$86,226	\$88,813	
Indirect	\$3,037	\$3,128	\$11,610	\$11,958	\$8,311	\$8,561	
Total	\$33,651	\$34,661	\$105,698	\$108,869	\$132,986	\$136,976	
Business Revenue (1,000)	\$65,695	\$67,666	\$58,109	\$59,852	\$144,589	\$148,926	
Local Purchases (1,000)	\$5,755	\$5,928	\$20,263	\$20,870	\$15,934	\$16,412	
State and Local Taxes (1,000)	\$3,584	\$3,691	\$10,570	\$10,887	\$14,321	\$14,750	
Federal Taxes (1,000)	\$6,057	\$6,239	\$19,026	\$19,596	\$23,937	\$24,656	

Exhibit V-9 continued		
Tonnage (1,000)	New York 761	Pennsylvania 2
Jobs		
Direct Jobs	608	16

Tonnage (1,000)	Ne	w York 761	Pennsylvania 2			tal US 12,791
Jobs						
Direct Jobs		608		16		5,954
Induced		541		25		6,829
Indirect		202		11		4,324
Total		1,351	52		-	17,108
Personal Income (1,000)	US\$	Cdn \$	US \$	Cdn \$	US \$	Cdn \$
Direct	\$36,113	\$37,196	\$1,057	\$1,088	\$301,286	\$310,324.62
Re-Spending/						
Local Consumption	\$79,498	\$81,883	\$3,592	\$3,700	\$898,078	\$925,020.54
Indirect	\$10,612	\$10,931	\$484	\$499	\$179,162	\$184,537.00
Total	\$126,223	\$130,010	\$5,133	\$5,287	\$1,378,526	\$1,419,882.16
Business Revenue (1,000)	\$116,878	\$120,384	\$2,436	\$2,509	\$2,081,001	\$2,143,431.25
Local Purchases (1,000)	\$24,441	\$25,175	\$882	\$908	\$349,540	\$360,025.77
State and Local Taxes (1,000)	\$15,273	\$15,731	\$518	\$534	\$137,400	\$141,521.92
Federal Taxes (1,000)	\$22,720	\$23,402	\$924	\$952	\$248,135	\$255,578.79

Exhibit V-10 shows the impacts of the cargo and vessel activity moving via the New York waters of the system for the provinces of Ontario and Quebec.

Provincial Taxes (1,000)

Federal Taxes (1,000)

Exhibit V-10 Economi Great La	c Impacts by I kes-Seaway S	Province — Co System	mmerce Transi	iting New York	Waters of the		
Tonnage (1,000)		Ontario 14,638		luebec 19,701	3	Total 34,339	
Jobs							
Direct Jobs		17,719		7,641	2	25,360	
Induced		7,861		3,616	1	11,477	
Indirect		15,869	5,869 2,248		18,117		
Total		41,449	13,504		Ę	54,954	
Personal Income (1,000)	US \$	Cdn \$	US \$	Cdn \$	US \$	Cdn \$	
Direct	\$802,269	\$826,337	\$400,158	\$412,163	\$1,202,427	\$1,238,500	
Re-Spending/							
Local Consumption	\$320,908	\$330,535	\$127,407	\$131,230	\$448,315	\$461,765	
Indirect	\$680,956	\$701,384	\$116,688	\$120,188	\$797,643	\$821,573	
Total	\$1,804,132	\$1,858,256	\$644,253	\$663,581	\$2,448,385	\$2,521,837	
Business Revenue (1,000)	\$6,452,834	\$6,646,419	\$1,951,508	\$2,010,054	\$8,404,342	\$8,656,472	
Local Purchases (1,000)	\$1,757,584	\$1,810,311	\$332,659	\$342,639	\$2,090,243	\$2,152,950	

\$133,781

\$152,688

\$137,795

\$157,269

\$159,903

\$615,083

\$155,246

\$597,168

\$297,697

\$772,351

\$289,027

\$749,856



RELATED USER IMPACTS

- 1. Total Economic Impacts
 - 2. Job Impacts
 - 3. Revenue Impacts
- 4. Personal Income Impacts
- **5.** Federal, State/Provincial and Local Tax Impacts
- 6. Impacts by State and Province



RELATED USER IMPACTS

This chapter presents information on related user impacts, which measure jobs, income, output and tax impacts with shippers/consignees and supporting industries that move cargo through the marine terminals at each of the 32 ports modeled for this study. These impacts are classified as "related" because the firms using system ports and marine terminals to move cargo can — and, in some cases, do — use other ports and marine terminals outside the Great Lakes-St. Lawrence Seaway System. For example, exporters of breakbulk cargo often use freight forwarders, who might choose any of a number of ports of export. Importers of breakbulk cargo often use several ports, based on market locations. Because of the proximity of other ports and the associated steamship services at these ports — particularly coastal ports such as New York, Baltimore, Montreal and Halifax — both importers and exporters of breakbulk and bulk cargo have some flexibility in port choice. As a result, the impacts with these exporters and importers cannot be counted as dependent upon the marine terminals in the Great Lakes-Seaway system.

The related user jobs are estimated based on the value-per-ton of the commodities exported and imported through each of the 32 ports and the associated jobs to value-of-output ratios for the respective producing and consuming industries located in the state. The value-per-ton of each key commodity moving via each port was developed from the U.S. Census Bureau, USA Trade Online, and also converted into Canadian dollars for the Canadian ports. The average value-per-ton for each commodity moving through each port was then multiplied by the respective tonnage moved in 2010. Martin Associates developed ratios of jobs to value-of-output for the corresponding consuming and producing industries, using data from the U.S. Bureau of Economic Analysis, Regional Input-Output Modeling System for the United States, and from Statistics Canada Industry Accounts for Canada. These jobs-to-value coefficients include the national spin-off impacts that would occur to produce the export commodity or use the import commodity in production. The ratios of jobs to value-of-export or import cargo were then combined with the national value of the respective commodities moving through each of the 32 ports;

this allowed for the estimation of related jobs and spin-off jobs in the national economies to support the export and import industries using the Great Lakes-Seaway system.

The related user impacts include the following: iron ore mining associated with the volume of iron ore shipped via Great Lakes-Seaway ports; the steel industries consuming the iron ore for use in the production of steel; the utilities consuming the coal received by water at each of the ports; the coal mining impacts created by the volume of coal moving through each port; and the impact on grain farming resulting from the volume of grain moving through each port.

Note that the related user impacts include only the impacts created by the volume of the cargo moving via each specific port. The related impacts include the impacts with the shipper/consignee of the cargo, and also include the impacts with the support industries necessary to deliver that volume of cargo to a port for shipment.

For raw materials and intermediate products received at a port — iron ore, for example — the value of the volume of ore received at the specific port is converted into a "value of steel produced." This value of the steel produced (based on the volume and value of the ore received) is then used to develop the related user jobs, income, inter-industry purchases, value of output, and the taxes paid resulting from the volume and value of the iron ore received at the specific port and resulting steel production.

For example, for a steel mill located in proximity to a port — but receiving a portion of raw materials by rail — the related impact is based only on the volume of the raw materials received via the port **by water**. Therefore, the total employment at the mill is not included in the related jobs, only that share specifically related to the volume of the raw material moving through the marine terminals.

The respective income and output multipliers associated with the industries for which the employment coefficients were developed were used to estimate the related personal-income impacts, as well as the total value of economic output and taxes generated by each of the 32 ports, and for the total system. Note that care was taken to control for double counting of the direct, induced and indirect impacts.

Furthermore, the related user impacts are counted only once for the shipment or receipt of cargo by port/marine terminal, in contrast to the calculations used for the other types of impacts. For example — for grain shipped via Thunder Bay, Ontario, then

received at a St. Lawrence River port such as Quebec City, and then reloaded onto a foreign-flag vessel for export — direct, induced and indirect impacts are created at each of the three ports of handling. Therefore, the same ton of grain creates direct, induced and indirect impacts at each point of handling. This is not the case for the related impacts, as the user impacts with the grain — primarily the farm jobs, income, revenue, taxes and supporting industries required to deliver a ton of grain to the port for shipment (excluding direct, induced and indirect impacts created at the port) — are counted only for the initial shipment of the grain from Thunder Bay.

A related user model was developed for each of the 32 ports and then used in each prototype model for "non port specific" cargo and vessel activity, to estimate the total related user impacts for the system as a whole.

1. TOTAL ECONOMIC IMPACTS

In 2010, the 322.1 million tons of cargo handled at Great Lakes-Seaway system ports and terminals created the following related user impacts, presented in Exhibit VI-1.

As shown in Exhibit VI-1, the majority of the related user impacts occur in the U.S. as the result of iron ore and coal moving on the Great Lakes-Seaway system.

User Impacts		Canada	United	States		Total
Jobs		84,331	393,262		477,593	
	US \$	Cdn \$	US \$	Cdn \$	US \$	Cdn \$
Personal Income (1,000)	\$4,552,340	\$4,688,910	\$18,179,620	\$18,725,008	\$22,731,960	\$23,413,919
Business Revenue (1,000)	\$31,608,507	\$32,556,763	\$83,906,441	\$86,423,634	\$115,514,949	\$118,980,397
State/Provincial and Local Taxes (1,000)	\$543,053	\$559,345	\$1,853,928	\$1,909,546	\$2,396,981	\$2,468,891
Federal Taxes (1,000)	\$1,382,022	\$1,423,482	\$3,272,332	\$3,370,501	\$4,654,353	\$4,793,984

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2. JOB IMPACTS

It is important to note that the 477,593 related user jobs include the impact not only with the actual producer of the raw material, but also with the industries involved in supporting the production of a ton of material for export. This includes not only farm jobs associated with harvesting one ton of grain for export, but also the impacts created in supporting industries to produce that one ton of grain. These industries include the providers of the following: equipment to farm the grain, fuel,

fertilizers, insurance, financial services, and inland elevator services prior to moving the grain to the port. These related user jobs also include the induced jobs created by purchases by those directly employed in the user industries and supporting industries.

Exhibit VI-2 shows the distribution of the related user jobs associated with the various types of cargo moving on the Great Lakes-Seaway system. The impact of iron ore on related users, both in mining and steel production, is evident in this exhibit. The largest impact with related users in Canada is with the production of grain moving via the navigation system. Note that the related user jobs with the movement of steel are in construction, auto and appliance manufacturing, and in the actual production of steel products, which is also associated with iron ore and limestone moving on the system.

Exhibit VI-2 Distribution of Related User Jobs by Commodity							
Commodity	Canada	United States	Total				
Steel	4,535	43,048	47,584				
General Cargo	12,508	21,465	33,972				
Iron Ore	9,851	153,218	163,069				
Grain	31,773	24,742	56,515				
Stone Aggregates/Cement	2,190	31,061	33,251				
Other Dry Bulk	2,086	21,646	23,732				
Other Liquid Bulk	2,732	13,019	15,752				
Coal	12,903	82,952	95,855				
Petroleum Products	5,753	2,111	7,865				
Total	84,331	393,262	477,593				
Note: Totals may not add due to rounding							

3. REVENUE IMPACTS

Related user business revenue impact is a measure of the total value of economic activity in the national economies that is supported by the cargo moving via the Great Lakes-Seaway system. US\$115.5 billion (Cdn\$119.0 billion) represents the value of the output to the national economies that is created by cargo moving through the ports and marine terminals. This includes the value added at each stage of producing an export cargo, as well as the value added at each stage of production for the firms using imported raw materials and intermediate products that flow via the ports and marine terminals.

4. PERSONAL INCOME IMPACTS

A portion of the related user business revenue impact is used to pay the 477,593 related user job holders. In 2010, these 477,593 job holders received US\$22.7 billion (Cdn\$23.4 billion) in income.

5. FEDERAL, STATE/PROVINCIAL AND LOCAL TAX IMPACTS

As the result of the activity created in the related user sector due to the 322.1 million tons of cargo handled on the Great Lakes-Seaway system, a total of US\$7.1 billion (Cdn\$7.4 billion) in local, state/provincial and federal taxes was generated. Of this total, US\$4.7 billion (Cdn\$4.8 billion) was received at the federal level.

6. IMPACTS BY STATE AND PROVINCE

Exhibits VI-3 and VI-4 show the related user impacts by state and province.

Exhibit VI-3 Related User Impacts by	ov State
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User Impacts	Indiana Ohio 28,360 40,222 46,172 88,527		Ohio		Michigan		
Tonnage (1,000)				40,222		61,302	
Jobs			88,527	91,748			
	US\$	Cdn \$	US \$	Cdn \$	US \$	Cdn \$	
Personal Income (1,000)	\$1,904,943	\$1,962,091	\$4,333,948	\$4,463,966	\$4,322,275	\$4,451,943	
Business Revenue (1,000)	\$11,825,024	\$12,179,775	\$20,740,308	\$21,362,517	\$18,703,335	\$19,264,435	
State and Local Taxes (1,000) \$180,970	\$186,399	\$421,359	\$434,000	\$444,506	\$457,841	
Federal Taxes (1,000)	\$342,890	\$353,176	\$780,111	\$803,514	\$778,009	\$801,350	

Exhibit VI-3 continued

User Impacts	Minnesota 30,160		Illinois 7,219		Wisconsin 33,241	
Tonnage (1,000)						
Jobs		54,429	43,298		58,722	
	US\$	Cdn \$	US \$	Cdn \$	US \$	Cdn \$
Personal Income (1,000)	\$2,598,600	\$2,676,558	\$1,987,469	\$2,047,094	\$2,573,961	\$2,651,180
Business Revenue (1,000)	\$9,701,717	\$9,992,768	\$9,868,027	\$10,164,068	\$10,958,419	\$11,287,172
State and Local Taxes (1,000)	\$276,751	\$285,053	\$198,747	\$204,709	\$276,397	\$284,689
Federal Taxes (1,000)	\$467,748	\$481,780	\$357,745	\$368,477	\$463,313	\$477,212

Exhibit VI-3 continued

User Impacts	New York 2,216		Pennsylvania 605		Total US 203,325	
Tonnage (1,000)						
Jobs		9,881		486	393,262	
	US\$	Cdn \$	US\$	Cdn \$	US \$	Cdn \$
Personal Income (1,000)	\$444,861	\$458,207	\$13,563	\$13,970	\$18,179,620	\$18,725,008
Business Revenue (1,000)	\$2,014,326	\$2,074,756	\$95,286	\$98,145	\$83,906,441	\$86,423,634
State and Local Taxes (1,000)	\$53,828	\$55,443	\$1,370	\$1,411	\$1,853,928	\$1,909,546
Federal Taxes (1,000)	\$80,075	\$82,477	\$2,441	\$2,515	\$3,272,332	\$3,370,501

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User Impacts	Ontario			Quebec		Total	
Tonnage (1,000)	62,293		56,511		118,804		
Jobs		68,123	16,209		84,331		
	US \$	Cdn \$	US \$	Cdn \$	US \$	Cdn \$	
Personal Income (1,000)	\$3,224,648	\$3,321,388	\$1,327,692	\$1,367,523	\$4,552,340	\$4,688,910	
Business Revenue (1,000)	\$19,617,884	\$20,206,421	\$11,990,623	\$12,350,342	\$31,608,507	\$32,556,763	
Provincial Taxes (1,000)	\$277,515	\$285,841	\$265,538	\$273,505	\$543,053	\$559,345	
Federal Taxes (1,000)	\$1,067,359	\$1,099,379	\$314,663	\$324,103	\$1,382,022	\$1,423,482	

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