

Infrastructure Investment Survey of the Great Lakes and St. Lawrence Seaway System

December 2023



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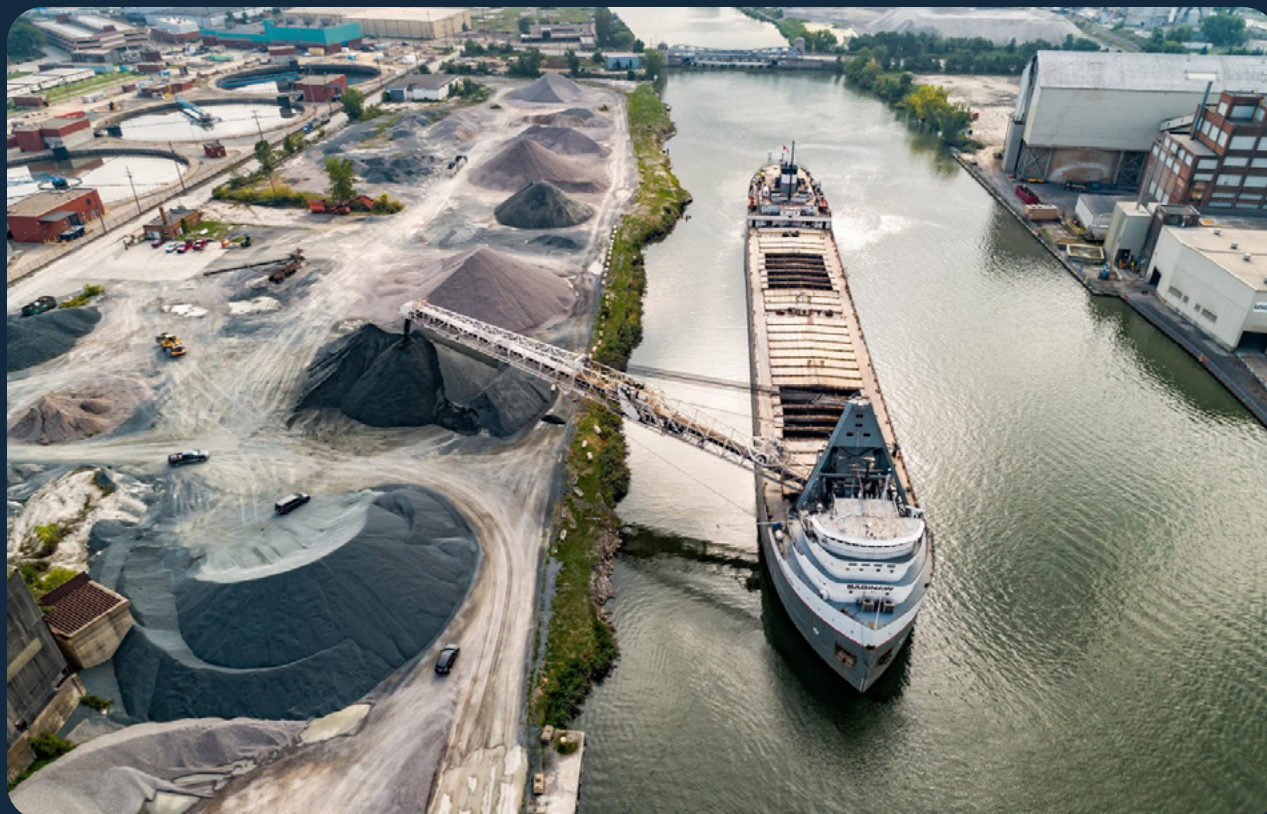
About the Study Sponsors

Martin Associates was retained to perform this analysis by a coalition of U.S. and Canadian Great Lakes and St. Lawrence marine industry stakeholders. Study sponsors include: the Great Lakes St. Lawrence Seaway Development Corporation (U.S.), the St. Lawrence Seaway Management Corporation (Canada), the American Great Lakes Ports Association, the Chamber of Marine Commerce, the Lake Carriers' Association, and the Shipping Federation of Canada.

The following organizations served as members of the project steering committee and provided confidential data, guidance and oversight for this study:

- American Great Lakes Ports Association
- Chamber of Marine Commerce
- Lake Carriers' Association
- Great Lakes St. Lawrence Seaway Development Corporation
- Shipping Federation of Canada
- St. Lawrence Seaway Management Corporation
- Fednav Ltd.
- Transport Canada (Transportation and Economic Analysis Group)





About Martin Associates

Martin Associates of Lancaster, Pennsylvania, is a leading provider of economic analysis and consulting services to the maritime industry. Since 1986, the company has developed more than 1,500 economic impact, strategic planning, financial feasibility and market studies for major ports and waterway systems throughout the United States and Canada, as well as for ports in Europe, Asia, Africa, and the Caribbean. Martin Associates' clients include port authorities, marine terminal operators, private investment groups, ocean carriers and federal, provincial, and state governments, as well as maritime trade organizations.

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Highlights

Total investments (2018 - 2027)

CAD\$ 10.9 B (USD \$8.4 B)

has been committed by the public and private sector in Great Lakes St. Lawrence Seaway System infrastructure

Prior investments (2018-2022)

Approximately

CAD\$ 7.4 B (USD \$5.7 B)

was invested in the Great Lakes St. Lawrence Seaway navigation system between 2018-2022, by both the public and private sector

60% by the public sector

40% by the private sector

Future investments (2023-2027)

A minimum of

CAD \$3.5 B (USD \$2.7 B)

has been committed by governments and companies for future investments in the navigation system

68% will come from the public sector

32% will come from the private sector

Investments by category

Vessels

CAD\$ 828 M (USD\$ 636 M)

Invested by Great Lakes-Seaway vessel operators between the years 2018-2022 for new ships and vessel upgrades

CAD\$ 427 M (USD\$ 328 M)

Committed for future vessel investments by Vessel operators

Ports and Terminals

CAD\$ 2.7 B (USD\$ 2.1 B)

Invested by Great Lakes ports and terminals between the years 2018-2022 in facilities and equipment

CAD\$ 1.5 B (USD\$ 1.1 B)

Committed for future investments by Ports and terminals

Waterway Infrastructure

CAD\$ 3.9 B (USD\$ 3.0 B)

Invested in waterway infrastructure such as locks, breakwaters and navigation channels between 2018-2022

CAD\$ 1.6 B (USD\$ 1.2 B)

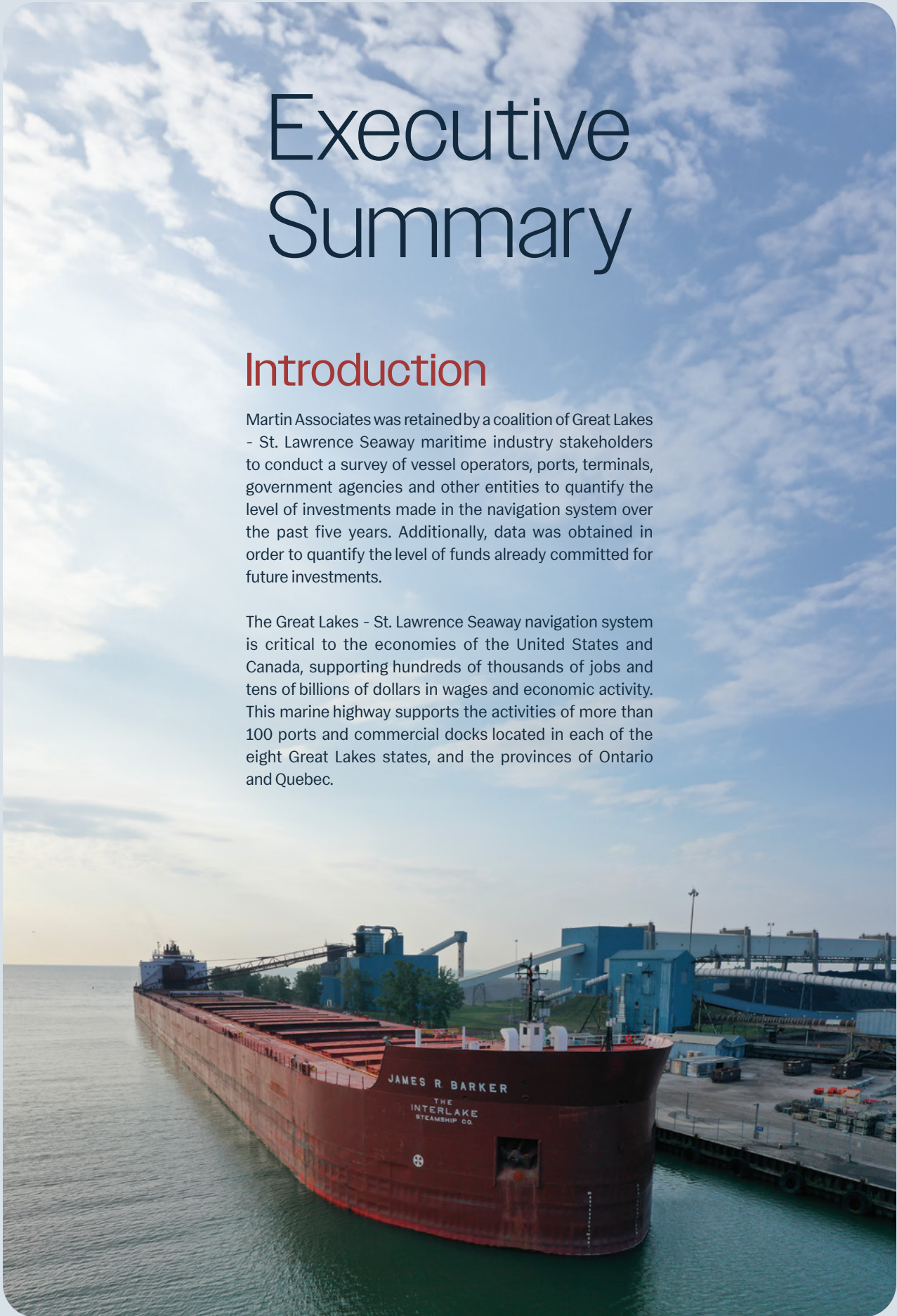
Committed for future investments

Executive Summary

Introduction

Martin Associates was retained by a coalition of Great Lakes - St. Lawrence Seaway maritime industry stakeholders to conduct a survey of vessel operators, ports, terminals, government agencies and other entities to quantify the level of investments made in the navigation system over the past five years. Additionally, data was obtained in order to quantify the level of funds already committed for future investments.

The Great Lakes - St. Lawrence Seaway navigation system is critical to the economies of the United States and Canada, supporting hundreds of thousands of jobs and tens of billions of dollars in wages and economic activity. This marine highway supports the activities of more than 100 ports and commercial docks located in each of the eight Great Lakes states, and the provinces of Ontario and Quebec.



Purpose

The purpose of this survey is to provide the maritime community, policy makers, and the general public with information on the level of investments being made in the Great Lakes - St. Lawrence Seaway navigation system. Quantifying these investments supports long term planning and the achievement of economic development goals, while also building confidence in the future viability of the navigation system.

Methodology

To carry out the survey, Martin Associates developed a list of nearly 800 individual companies and government agencies engaged in some aspect of Great Lakes-Seaway maritime commerce. Respondents were asked to report capital investments they made between the years 2018-2022 as well as funds already committed for future expenditures in the next five years. Because many companies engage in both maritime and non-maritime activities, the survey includes only those investments with a maritime connection.

Landside, or fixed asset, investments include those made for locks, breakwaters, docks, warehouses, road and rail infrastructure, cranes, conveyors, yard equipment, lights, fencing, etc. Vessel investments were made in self-propelled deep draft vessels, ferries, barges, pilot boats, tugs, workboats, icebreakers, etc.

For the purposes of this survey, fixed asset investments were allocated into one of two sectors: *Ports and Terminals* and *Waterway Infrastructure*, which are displayed by country and state/province. This report treats vessel investments as a distinct third sector. Vessel investments cannot be allocated to a specific geographic area as can the *Ports and Terminals* and *Waterway Infrastructure* investments. Thus, *Vessel* investments are shown by the flag of the vessel in which the capital expenditure was made, whereas investments in fixed assets are categorized by the country in which the asset is physically located.

The geographic scope of the survey includes facilities from the western edge of the navigation system in Duluth, Minnesota, to the eastern-most reaches of the system in Sept Iles, Quebec.

Survey Results

Of the stakeholders contacted, nearly 70% were willing to participate in the survey and provide investment data.

The survey results are shown in aggregate, and also broken down by public vs. private sector. Landside investments are shown by geography - by country, and by state and province. Because vessel investments are mobile and not tied to a specific location, these investments were categorized by country of documentation of the vessel, for example: U.S.-flag, Canadian-flag, or third country international-flag.

All data is reported in both U.S. and Canadian dollars.

The private sector investment numbers presented in this document are conservative estimates - it should be understood that private sector investment would actually be larger than reported. There are three reasons why the survey reports conservative numbers:

- 1) **Response Rate:** The response rate for the hundreds of organizations surveyed was 70%, which is an excellent response rate, but nevertheless does not capture the full scope of investment by industry players.
- 2) **Organizations Protecting Sensitive Information:** In the interests of protecting proprietary or otherwise sensitive information, many respondents would only disclose amounts related to past investment, but not specifics about the nature of future investments.
- 3) **Only Committed Funds for New Projects Considered:** An organization may have a major new project listed in its upcoming strategic plans, but if that project did not have a firm budget allocation assigned to it as of the time of the survey, it would not be considered by the survey. Also, this survey does not seek to quantify expenditures for routine maintenance and repairs.

Combined
Private and
Public Sector
Capital
Investments

	CAD\$	USD\$
Actual 2018-2022		
Vessel	827,984,381	635,981,550
Ports & Terminals	2,721,986,239	2,090,779,813
Waterway Infrastructure	3,875,674,490	2,976,937,161
Total	7,425,645,109	5,703,698,524
Funds Committed Post-2022		
Vessel	427,000,670	327,982,694
Ports & Terminals	1,495,406,826	1,148,634,170
Waterway Infrastructure	1,617,114,372	1,242,118,728
Total	3,539,521,867	2,718,735,592
2018-2022 and Committed		
Vessel	1,254,985,050	963,964,245
Ports & Terminals	4,217,393,064	3,239,413,983
Waterway Infrastructure	5,492,788,861	4,219,055,889
Total	10,965,166,976	8,422,434,116

* All values in 2022 Dollars

Private and Public
Sector Investments
by Project Type
(ACTUAL 2018-2022
and COMMITTED-
POST 2022)

	CAD\$	USD\$
Vessel		
Major Engine/Propulsion Rehab	76,722,978	58,931,544
New Vessel/Fleet Addition	1,056,365,154	811,402,684
Not Specified	14,844,511	11,402,190
Other Upgrade to Existing Fleet	107,052,407	82,227,827
Total	1,254,985,050	963,964,245
Ports & Terminals		
Crane/Conveyor/Loading Equip	79,297,959	60,909,408
Existing Terminal Upgrades	225,987,172	173,582,589
Infrastructure - Rail	33,194,677	25,497,102
Infrastructure - Road	61,465,180	47,211,906
Lighting/Fencing/Paving/Sewer	24,059,111	18,479,999
Lock/Dock/Wharf	304,988,937	234,264,488
New Development	1,813,002,190	1,392,581,758
Not Specified	376,691,606	289,339,892
Other	1,006,198,927	772,869,596
Security	3,254,750	2,500,000
Warehouse/Admin Building	270,396,983	207,694,127
Yard Equipment	18,855,573	14,483,120
Total	4,217,393,064	3,239,413,983
Waterway Infrastructure		
Breakwater/Navigation/Other Structures	330,671,770	253,991,681
Dredging	483,772,372	371,589,502
Lock/Dockwall/Wharf Rehab	4,323,118,186	3,320,622,310
Other	167,780,469	128,873,546
Spoils Disposal Site	187,446,064	143,978,849
Total	5,492,788,861	4,219,055,889
Grand Total	10,965,166,976	8,422,434,116

* All values in 2022 Dollars

Infrastructure Investment Survey of the Great Lakes and St. Lawrence Seaway System



1. Introduction

The Great Lakes and Saint Lawrence River have historically played a vital role in the Canadian and United States economies. Today there are hundreds of thousands of jobs in the United States and Canada that depend, directly or indirectly, upon maritime activity in the region.¹ Vessels operating on these waters supply steel mills, facilitate the export of grain from the North American prairies to overseas markets, carry stone used to build roads, as well as salt to keep them safe during the winter. This survey quantifies the capital investments made by the firms that rely upon these waterways and the port authorities and government agencies that build and maintain the infrastructure that facilitates the movements of vessels and their cargos.



2. Purpose

The purpose of this survey is to provide the maritime community, policy makers, and the general public with information on the level of investments being made in the Great Lakes - St. Lawrence Seaway navigation system. Quantifying these investments supports long term planning and the achievement of economic development goals, while also building confidence in the future viability of the navigation system.

The survey also provides useful context for public sector spending. Both the U.S. and Canadian governments make annual investments in navigation infrastructure. These investments must be justified and shown as a responsible use of public funds. Data from this survey helps demonstrate that public investment in locks, aids to navigation and port infrastructure is being met by private sector investments in vessels, terminals and equipment.

3. Methodology

Stakeholder List

To quantify the amount of investment on the Great Lakes and St. Lawrence Seaway navigation system, Martin Associates identified 734 stakeholders consisting of United States and Canadian terminal operators, vessel operators, port authorities, and government agencies to be interviewed.

This list was developed from a Martin Associates data base generated as part of our 2013 Infrastructure Investment Survey of the Great Lakes and St. Lawrence Seaway System, *Greenwood's Guide to Great Lakes Shipping, 2022*, and supplemented by Martin Associates' internal databases developed as part of our 2018 and 2022 economic impact studies of the Great Lakes.² Of the 734 stakeholders contacted, about 70% participated in the investment survey. It should be noted that figures presented in this report only represent investments made by those firms who elected to participate. Figures were not extrapolated to the total population, thus the results represent a conservative estimate of investments made in the region's maritime infrastructure.

Geographic Scope

The geographic area covered by this survey includes investments in all portions of the Great Lakes- St. Lawrence Seaway navigation system from Duluth, Minnesota on the west to Sept-Îles, Quebec on the east. Within this geography, there are two areas where the navigation system overlaps with neighboring navigation systems. In these locations, investments were only counted if they related to Great Lakes commerce. For example, facility investments at the Port of Montreal and at St. Lawrence River ports east of Montreal were included in the survey only if they were used to facilitate the movement of commerce to/from the Great Lakes. Similarly, facilities at the Port of Chicago that primarily handle inland river barge shipments were not included in the survey unless they also serve Great Lakes deep-draft vessel cargo.

¹ *Economic Impacts of Maritime Shipping in the Great Lakes- St. Lawrence Region*, Martin Associates, July, 2023.

² IBID.

Past and Future Capital Expenditures

For the purposes of this survey, the term “capital investment” was defined and determined by each respondent and included those investments deemed as capital expenses under the organization’s own accounting and financial reporting practices.

During the interviews, respondents were asked to identify two categories of investment: 1) past capital expenditures made between 2018 through 2022; and 2) funds committed for future capital expenditures (i.e. within the next five years - between 2023-2027).

Future capital expenditures were defined as those in which a respondent had money available and allocated in its budget for coming years. Thus, projects that were merely part of a strategic plan were not included in this analysis unless already contracted for with funds set aside for their completion. This was done to ensure that figures presented in this report represent a conservative estimate of what is likely to be invested in the region’s maritime infrastructure in future years. It should be noted that there were many instances in which firms were willing to provide historical expenditure data (2018-2022), but were unwilling to share information related to future commitments.

Survey Period

The majority of the interviews were conducted between December 2022 and April 2023. This survey treats all 2023 capital expenditures as future projects and classifies them in the “Funds Committed” category in the attached tables. It should also be noted that the survey period included years that were impacted by the COVID-19 pandemic, affecting the amount of money companies and government agencies were able and approved to spend.

Adjustments for Inflation and Currency

Given the length of time covered by this survey and the fact that capital expenditures were reported in both United States and Canadian Dollars, the use of nominal dollar amounts (the face value amounts reported by the survey participant) would not provide sufficient accuracy. To more accurately combine investment amounts made during different years and in different currencies, a methodology was deployed to convert all amounts to the same currency and adjust for inflation. Using annualized exchange rates, as shown in Table 1, United States Dollar-denominated nominal investment amounts were first converted to Canadian Dollars using the exchange rate from the year during which the investment was made. This converted figure was then inflated to 2022 Canadian Dollars with data from the Canadian Consumer Price Index. Canadian Dollar- denominated projects were simply inflated to

2022 Canadian Dollars. To obtain United States Dollars, these 2022 Canadian Dollar figures were converted using the 2022 exchange rate. With respect to funds committed for future projects, an assumed exchange rate of 1.3441 Canadian Dollars per 1.0000 United States Dollar was used. This rate was obtained by calculating the average exchange rate over the historical duration of the survey period, (January 2018 through June 2023).

Table 1 - Canadian Dollars per United States Dollar, Annual Averages³

1 USD\$ =	
2018	CAD\$ 1.2975
2019	CAD\$ 1.3268
2020	CAD\$ 1.3442
2021	CAD\$ 1.2537
2022	CAD\$ 1.3019

Capital Investments vs. Maintenance Expenditures

It is to be emphasized that the focus of this survey is *capitalized investments* related to the region’s maritime infrastructure made by private firms and government agencies. The survey does not seek to quantify expenditures for routine maintenance and repairs. For instance, the survey includes investments in new road and rail infrastructures that directly facilitate the movement of cargo to and from the terminals such as a new rail spur into a port or improved pavement strength to accommodate heavier trucks. This would not include regular track maintenance by the railroads or repairs to port roads due to winter damage.

Investments with a Maritime Nexus

Respondents were asked to report investments that specifically relate to, and facilitate the movement of maritime commerce. This distinction is particularly important for large facilities such as steel mills, mines and processing plants where maritime operations are an ancillary function and a small part of their overall activity.

³ Annual averages were computed from data published by the Board of Governors of the Federal Reserve System. Foreign Exchange Rates – Table G.5A <https://www.federalreserve.gov/releases/g5a/current/default.htm>

Data Categories

During the interview process, the categories presented in Table 2 were used to focus participants' responses on the maritime aspects of their operations:

Table 2 - Investment Categories

Vessel
Major Engine/Propulsion Rehab
New Vessel/Fleet Addition
Not Specified*
Other Upgrade to Existing Fleet
Ports & Terminals
Crane/Conveyor/Loading Equip
Existing Terminal Upgrades
Infrastructure - Rail
Infrastructure - Road
Lighting/Fencing/Paving/Sewer
Lock/Dock/Wharf
New Development
Not Specified
Other
Security
Warehouse/Admin Building
Yard Equipment
Waterway Infrastructure
Breakwater/Navigation/Other Structures
Dredging
Lock/Dockwall/Wharf Rehab
Other
Dredged material disposal site

* Excludes Routine Dry Docking

As shown, the categories from Table 2 were further refined into three broad sectors: Ports and Terminals, Vessels, and Waterway Infrastructure. Investments were evaluated on a case-by-case basis, rather than by the company making the investment. For instance, a ferry operator could have performed major hull work on their fleet (Vessel sector), and upgraded their shore-side terminal facilities (Ports and Terminals sector). Similarly, many government agencies make investments in all three sectors.

Ports and Terminals

The types of investments included in the *Ports and Terminals* sector include major wharf and dockwall repairs, improvements to truck or rail access, new development, upgrades to loading/unloading equipment such as cranes and conveyors as well as other yard equipment, upgrades to on-site buildings, (whether administrative or storage warehouses), and other on-site work such as new or upgraded lighting, fencing, utilities, paving or security measures.

Waterway Infrastructure

As a rule of thumb, investments included in the *Waterway Infrastructure* sector typically benefit multiple system users rather than a single terminal. Examples of projects classified as waterway infrastructure would include upgrades to locks and breakwaters throughout the system, navigation aids, dredging and new or expanded Confined Disposal Facilities (CDFs) for dredge material placement.

Vessels

The Vessel Sector consists of capital expenditures related to the various ship fleets operating on the Great Lakes-St. Lawrence Seaway System. The system is served by three distinct vessel operator groups.

- 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.
- Foreign-flag or international operators also referred to as ocean-going vessels (or "salties") are those carriers whose vessels are documented under the laws of a country other than the United States or Canada. These vessels operate between system ports and overseas destinations.

No matter the vessel flag, investments quantified in this survey include those for self-propelled vessels, barges, tugs, ferries, pilot boats, and government vessels. The types of projects categorized in this sector include new vessel construction, existing vessel purchases, major engine or propulsion work, research and development (including environmental research), and other major/capital upgrades to existing fleets. Expenditures related to routinely scheduled dry-docking work were excluded. It should be noted that the sub-category “New Vessels and Fleet Additions” includes both new builds and the purchase of existing vessels that may or may not have previously operated within the system. Even though such expenditures do not necessarily signify an expansion to the overall fleet, these second-hand vessel purchases still represent a large investment by firms to enhance their ability to operate in the region.

Most vessels operating in the Great Lakes-Seaway system are dedicated to the navigation system year round. However, ocean-going vessels spend a portion of each year serving ports outside the system. The survey includes ocean-going vessel investments if made by an operator who is a regular system user, and made for a vessel that serves the system some portion of the year. Similarly, federal investments in Coast Guard assets that provide service to the region for all or a portion of the year were included in the survey.

Public vs. Private Capital Investments

Data was collected in a manner that allows this survey to distinguish between public sector and private sector capital investments. In general, “public” investments were defined as anything funded by taxpayer dollars. This would include federally funded lock maintenance or new vessel purchases by the Canadian or United States Coast Guards. Additionally, investments by public port authorities were treated as “public” expenditures, even though in many cases projects could theoretically be, at least partially, funded through operating revenues, derived from streams such as tenant rents, dockage, wharfage, etc. Finally, some past and planned investments were Public- Private Partnerships. In such cases, estimates of the shares of public versus private sources of funding were obtained so as to allocate the total value of the project into appropriate categories.

Investments by Location

Fixed asset capital investments, those in the *Ports and Terminals* and *Waterway Infrastructure* sectors, were grouped by the country in which the expenditures were made. Further, detail has been provided in the following tables breaking out fixed asset capital investments by state and province. Due to the fact that many companies

have multiple operations throughout the region, Martin Associates collected site-specific capital expenditure data. Thus, this survey can distinguish between a Canadian corporation’s investments in a facility in Michigan versus those made at another facility in Ontario.

Capital investments in the Vessel sector were grouped by vessel flag community. By their very nature, these investments cannot be tied to a specific geography. By law, U.S.-flag vessel investments are made in the United States. Canadian-flag vessel investments may be made in Canada or another country. International-flag vessel investments may be made in any country. Whether a vessel investment is made in North America or overseas, it is relevant to this survey if it is made for the purposes of providing waterborne transportation services on the Great Lakes-Seaway system.

Not Specified Investments

It should be noted that certain participants were unwilling or unable to share the precise nature of their investments but did provide aggregate figures. For example, there were instances in which participants provided the total cost of major projects that had been completed within the survey’s timeframe but did not provide specifics on the allocation of costs, i.e., for lighting and fencing versus warehouse improvements versus paving. Alternatively, there were firms that were simply unwilling to divulge how they had invested or intended to invest but did provide the total amount invested in their Great Lakes - St. Lawrence Seaway facility. This reluctance to provide detailed descriptions was a particular issue regarding future investments. Investments for which no project description was provided are classified as “Not Specified” in the results.



4. Results

The results of the investment survey are presented in the following exhibits.

Exhibits I-III present sector-level summary data in both Canadian and United States dollars. Exhibits IV-XIX present the survey results in greater levels of detail. Even-numbered exhibits, beginning with Exhibit IV, are presented entirely in Canadian Dollars. Odd-numbered exhibits, beginning with Exhibit V, are presented entirely in United States Dollars.



Exhibit I

Public and Private Capital Expenditure by Sector*

	CAD\$	USD\$
Actual 2018-2022		
Vessel	827,984,381	635,981,550
Ports & Terminals	2,721,986,239	2,090,779,813
Waterway Infrastructure	3,875,674,490	2,976,937,161
Total 2018-2022	7,425,645,109	5,703,698,524
Funds Committed Post-2022		
Vessel	427,000,670	327,982,694
Ports & Terminals	1,495,406,826	1,148,634,170
Waterway Infrastructure	1,617,114,372	1,242,118,728
Total Funds Committed Post-2022	3,539,521,867	2,718,735,592
2018-2022 and Committed		
Vessel	1,254,985,050	963,964,245
Ports & Terminals	4,217,393,064	3,239,413,983
Waterway Infrastructure	5,492,788,861	4,219,055,889
Total	10,965,166,976	8,422,434,116

* All values in 2022 Dollars

Exhibit II

Private Capital
Expenditure
by Sector*

	CAD\$	USD\$
Actual 2018-2022		
Vessel	718,214,977	551,666,777
Ports & Terminals	2,219,478,355	1,704,799,412
Waterway Infrastructure	38,462,485	29,543,348
Total 2018-2022	2,976,155,817	2,286,009,538
Funds Committed Post-2022		
Vessel	427,000,670	327,982,694
Ports & Terminals	672,390,775	516,468,834
Waterway Infrastructure	37,007,331	28,425,632
Total Funds Committed Post-2022	1,136,398,776	872,877,161
2018-2022 and Committed		
Vessel	1,145,215,647	879,649,472
Ports & Terminals	2,891,869,130	2,221,268,247
Waterway Infrastructure	75,469,816	57,968,980
Total	4,112,554,593	3,158,886,699

* All values in 2022 Dollars

Exhibit III

Public Capital
Expenditure
by Sector*

	CAD\$	USD\$
Actual 2018-2022		
Vessel	109,769,403	84,314,773
Ports & Terminals	502,507,883	385,980,401
Waterway Infrastructure	3,837,212,005	2,947,393,813
Total 2018-2022	4,449,489,292	3,417,688,987
Funds Committed Post-2022		
Vessel	-	-
Ports & Terminals	823,016,051	632,165,336
Waterway Infrastructure	1,580,107,041	1,213,693,095
Total Funds Committed Post-2022	2,403,123,092	1,845,858,431
2018-2022 and Committed		
Vessel	109,769,403	84,314,773
Ports & Terminals	1,325,523,934	1,018,145,736
Waterway Infrastructure	5,417,319,046	4,161,086,908
Total	6,852,612,383	5,263,547,418

* All values in 2022 Dollars

Exhibit IV

Private and Public Sector Investments by Detailed Project Type,
*All Values in Canadian Dollars**

	Actual 2018-2022	Funds Committed Post-2022	TOTAL
Vessel	CAD\$	CAD\$	CAD\$
Major Engine/Propulsion Rehab	76,722,978	-	76,722,978
New Vessel/Fleet Addition	634,433,200	421,931,954	1,056,365,154
Not Specified	14,844,511	-	14,844,511
Other Upgrade to Existing Fleet	101,983,691	5,068,716	107,052,407
Total	827,984,381	427,000,670	1,254,985,050
Ports & Terminals	CAD\$	CAD\$	CAD\$
Crane/Conveyor/Loading Equip	39,663,117	39,634,842	79,297,959
Existing Terminal Upgrades	207,336,631	18,650,541	225,987,172
Infrastructure - Rail	28,076,212	5,118,465	33,194,677
Infrastructure - Road	48,993,600	12,471,581	61,465,180
Lighting/Fencing/Paving/Sewer	16,931,208	7,127,903	24,059,111
Lock/Dock/Wharf	216,343,525	88,645,412	304,988,937
New Development	1,676,243,973	136,758,217	1,813,002,190
Not Specified	277,668,346	99,023,260	376,691,606
Other	52,468,737	953,730,189	1,006,198,927
Security	-	3,254,750	3,254,750
Warehouse/Admin Building	157,631,916	112,765,067	270,396,983
Yard Equipment	628,973	18,226,600	18,855,573
Total	2,721,986,239	1,495,406,826	4,217,393,064
Waterway Infrastructure	CAD\$	CAD\$	CAD\$
Breakwater/Navigation/Other Structures	323,641,510	7,030,260	330,671,770
Dredging	392,899,752	90,872,620	483,772,372
Lock/Dockwall/Wharf Rehab	2,901,686,452	1,421,431,734	4,323,118,186
Other	81,717,811	86,062,658	167,780,469
Spoils Disposal Site	175,728,964	11,717,100	187,446,064
Total	3,875,674,490	1,617,114,372	5,492,788,861
GRAND TOTAL	7,425,645,109	3,539,521,867	10,965,166,976

* All values in 2022 Dollars

Exhibit V

Private and Public Sector Investments by Detailed Project Type,
*All Values in United States Dollars**

	Actual 2018-2022	Funds Committed Post-2022	TOTAL
Vessel	USD\$	USD\$	USD\$
Major Engine/Propulsion Rehab	58,931,544	-	58,931,544
New Vessel/Fleet Addition	487,313,312	324,089,372	811,402,684
Not Specified	11,402,190	-	11,402,190
Other Upgrade to Existing Fleet	78,334,505	3,893,322	82,227,827
Total	635,981,550	327,982,694	963,964,245
Ports & Terminals	USD\$	USD\$	USD\$
Crane/Conveyor/Loading Equip	30,465,563	30,443,845	60,909,408
Existing Terminal Upgrades	159,256,956	14,325,632	173,582,589
Infrastructure - Rail	21,565,567	3,931,535	25,497,102
Infrastructure - Road	37,632,383	9,579,523	47,211,906
Lighting/Fencing/Paving/Sewer	13,004,999	5,475,000	18,479,999
Lock/Dock/Wharf	166,175,225	68,089,263	234,264,488
New Development	1,287,536,656	105,045,101	1,392,581,758
Not Specified	213,279,319	76,060,573	289,339,892
Other	40,301,665	732,567,931	772,869,596
Security	-	2,500,000	2,500,000
Warehouse/Admin Building	121,078,359	86,615,767	207,694,127
Yard Equipment	483,120	14,000,000	14,483,120
Total	2,090,779,813	1,148,634,170	3,239,413,983
Waterway Infrastructure	USD\$	USD\$	USD\$
Breakwater/Navigation/Other Structures	248,591,681	5,400,000	253,991,681
Dredging	301,789,502	69,800,000	371,589,502
Lock/Dockwall/Wharf Rehab	2,228,809,012	1,091,813,299	3,320,622,310
Other	62,768,117	66,105,429	128,873,546
Spoils Disposal Site	134,978,849	9,000,000	143,978,849
Total	2,976,937,161	1,242,118,728	4,219,055,889
GRAND TOTAL	5,703,698,524	2,718,735,592	8,422,434,116

* All values in 2022 Dollars

Exhibit VI

**Vessel Capital Investments by Flag, Public and Private Sectors,
Actual 2018-2022 and Committed Post-2022, All Values in Canadian Dollars***

	Canadian-Flag	US-Flag	International-Flag	TOTAL
Vessel	CAD\$	CAD\$	CAD\$	CAD\$
Major Engine/ Propulsion Rehab	-	76,722,978	-	76,722,978
New Vessel/ Fleet Addition	228,233,808	157,581,027	670,550,320	1,056,365,154
Not Specified	14,844,511	-	-	14,844,511
Other Upgrade to Existing Fleet	-	107,052,407	-	\$107,052,407
Total Vessel	243,078,319	341,356,412	670,550,320	1,254,985,050

* All values in 2022 Dollars

Exhibit VII

**Vessel Capital Investments by Flag, Public and Private Sectors,
Actual 2018-2022 and Committed Post-2022, All Values in United States Dollars***

	Canadian-Flag	US-Flag	International-Flag	TOTAL
Vessel	USD\$	USD\$	USD\$	USD\$
Major Engine/ Propulsion Rehab	-	58,931,544	-	58,931,544
New Vessel/ Fleet Addition	175,308,248	121,039,271	515,055,165	811,402,684
Not Specified	11,402,190	-	-	11,402,190
Other Upgrade to Existing Fleet	-	82,227,827	-	82,227,827
Total Vessel	186,710,438	262,198,642	515,055,165	\$963,964,245

* All values in 2022 Dollars

Exhibit VIII

Fixed Asset Capital Investments, Public and Private Sectors, Actual 2018-2022 and Committed Post-2022, All Values in Canadian Dollars*

	Canada	US	TOTAL
Ports & Terminals	CAD\$	CAD\$	CAD\$
Crane/Conveyor/Loading Equip	14,049,199	65,248,759	79,297,959
Existing Terminal Upgrades	217,264,442	8,722,730	225,987,172
Infrastructure - Rail	17,350,537	15,844,140	33,194,677
Infrastructure - Road	8,241,120	53,224,060	61,465,180
Lighting/Fencing/Paving/Sewer	4,165,103	19,894,008	24,059,111
Lock/Dock/Wharf	23,380,977	281,607,960	304,988,937
New Development	141,929,712	1,671,072,479	1,813,002,190
Not Specified	172,392,580	204,299,025	376,691,606
Other	989,898,305	16,300,621	1,006,198,927
Security	-	3,254,750	3,254,750
Warehouse/Admin Building	77,557,377	192,839,607	270,396,983
Yard Equipment	-	18,855,573	18,855,573
Total Ports & Terminals	1,666,229,353	2,551,163,711	4,217,393,064
Waterway Infrastructure	CAD\$	CAD\$	CAD\$
Breakwater/Navigation/Other Structures	-	330,671,770	330,671,770
Dredging	24,495,478	459,276,895	483,772,372
Lock/Dockwall/Wharf Rehab	379,533,116	3,943,585,070	4,323,118,186
Other	-	167,780,469	167,780,469
Spoils Disposal Site	-	187,446,064	187,446,064
Total Waterway Infrastructure	404,028,594	5,088,760,268	5,492,788,861
GRAND TOTAL	2,070,257,947	7,639,923,979	9,710,181,926

* All values in 2022 Dollars

Exhibit IX

Fixed Asset Capital Investments, Public and Private Sectors,
Actual 2018-2022 and Committed Post-2022, All Values in United States Dollars*

	Canada	US	TOTAL
Ports & Terminals	USD\$	USD\$	USD\$
Crane/Conveyor/Loading Equip	10,791,305	50,118,104	60,909,408
Existing Terminal Upgrades	166,882,589	6,700,000	173,582,589
Infrastructure - Rail	13,327,089	12,170,013	25,497,102
Infrastructure - Road	6,330,072	40,881,834	47,211,906
Lighting/Fencing/Paving/Sewer	3,199,250	15,280,749	18,479,999
Lock/Dock/Wharf	17,959,119	216,305,369	234,264,488
New Development	109,017,368	1,283,564,389	1,392,581,758
Not Specified	132,416,146	156,923,746	289,339,892
Other	760,348,955	12,520,640	772,869,596
Security	-	2,500,000	2,500,000
Warehouse/Admin Building	59,572,453	148,121,674	207,694,127
Yard Equipment	-	14,483,120	14,483,120
Total Ports & Terminals	1,279,844,345	1,959,569,638	3,239,413,983
Waterway Infrastructure	USD\$	USD\$	USD\$
Breakwater/Navigation/Other Structures	-	253,991,681	253,991,681
Dredging	18,815,176	352,774,326	371,589,502
Lock/Dockwall/Wharf Rehab	291,522,479	3,029,099,831	3,320,622,310
Other	-	128,873,546	128,873,546
Spoils Disposal Site	-	143,978,849	143,978,849
Total Waterway Infrastructure	310,337,656	3,908,718,233	4,219,055,889
GRAND TOTAL	1,590,182,001	5,868,287,871	7,458,469,872

* All values in 2022 Dollars

Exhibit X

**Vessel Capital Investments by Flag, Public and Private Sectors,
Actual 2018-2022, All Values in Canadian Dollars***

	Canadian-Flag	US-Flag	International-Flag	TOTAL
Vessel	CAD\$	CAD\$	CAD\$	CAD\$
Major Engine/ Propulsion Rehab	-	76,722,978	-	76,722,978
New Vessel/ Fleet Addition	203,414,281	157,581,027	273,437,892	634,433,200
Not Specified	14,844,511	-	-	14,844,511
Other Upgrade to Existing Fleet	-	101,983,691	-	101,983,691
Total Vessel	218,258,792	336,287,696	273,437,892	827,984,381

* All values in 2022 Dollars

Exhibit XI

**Vessel Capital Investments by Flag, Public and Private Sectors,
Actual 2018-2022, All Values in United States Dollars***

	Canadian-Flag	US-Flag	International-Flag	TOTAL
Vessel	USD\$	USD\$	USD\$	USD\$
Major Engine/ Propulsion Rehab	-	58,931,544	-	58,931,544
New Vessel/ Fleet Addition	156,244,167	121,039,271	210,029,873	487,313,312
Not Specified	11,402,190	-	-	11,402,190
Other Upgrade to Existing Fleet	-	78,334,505	-	78,334,505
Total Vessel	167,646,357	258,305,320	210,029,873	635,981,550

* All values in 2022 Dollars

Exhibit XII

Fixed Asset Capital Investments, Public and Private Sectors,
Actual 2018-2022, All Values in Canadian Dollars*

	Canada	US	TOTAL
Ports & Terminals	CAD\$	CAD\$	CAD\$
Crane/Conveyor/Loading Equip	12,560,028	27,103,089	39,663,117
Existing Terminal Upgrades	207,336,631	-	207,336,631
Infrastructure - Rail	12,883,023	15,193,190	28,076,212
Infrastructure - Road	4,940,123	44,053,476	48,993,600
Lighting/Fencing/Paving/Sewer	4,165,103	12,766,105	16,931,208
Lock/Dock/Wharf	22,388,196	193,955,329	216,343,525
New Development	140,341,262	1,535,902,711	1,676,243,973
Not Specified	124,143,421	153,524,925	277,668,346
Other	40,627,356	11,841,381	52,468,737
Security	-	-	-
Warehouse/Admin Building	75,323,619	82,308,297	157,631,916
Yard Equipment	-	628,973	628,973
Total Ports & Terminals	644,708,762	2,077,277,477	2,721,986,239
Waterway Infrastructure	CAD\$	CAD\$	CAD\$
Breakwater/Navigation/Other Structures	-	323,641,510	323,641,510
Dredging	24,495,478	368,404,275	392,899,752
Lock/Dockwall/Wharf Rehab	364,244,287	2,537,442,165	2,901,686,452
Other	-	81,717,811	81,717,811
Spoils Disposal Site	-	175,728,964	175,728,964
Total Waterway Infrastructure	388,739,765	3,486,934,725	3,875,674,490
GRAND TOTAL	1,033,448,527	5,564,212,201	6,597,660,728

* All values in 2022 Dollars

Exhibit XIII

Fixed Asset Capital Investments, Public and Private Sectors, Actual 2018-2022, All Values in United States Dollars*

	Canada	US	TOTAL
Ports & Terminals	USD\$	USD\$	USD\$
Crane/Conveyor/Loading Equip	9,647,460	20,818,104	30,465,563
Existing Terminal Upgrades	159,256,956	-	159,256,956
Infrastructure - Rail	9,895,555	11,670,013	21,565,567
Infrastructure - Road	3,794,549	33,837,834	37,632,383
Lighting/Fencing/Paving/Sewer	3,199,250	9,805,749	13,004,999
Lock/Dock/Wharf	17,196,556	148,978,669	166,175,225
New Development	107,797,267	1,179,739,389	1,287,536,656
Not Specified	95,355,573	117,923,746	213,279,319
Other	31,206,204	9,095,461	40,301,665
Security	-	-	-
Warehouse/Admin Building	57,856,686	63,221,674	121,078,359
Yard Equipment	-	483,120	483,120
Total Ports & Terminals	495,206,054	1,595,573,759	2,090,779,813
Waterway Infrastructure	USD\$	USD\$	USD\$
Breakwater/Navigation/Other Structures	-	248,591,681	248,591,681
Dredging	18,815,176	282,974,326	301,789,502
Lock/Dockwall/Wharf Rehab	279,779,006	1,949,030,006	2,228,809,012
Other	-	62,768,117	62,768,117
Spoils Disposal Site	-	134,978,849	134,978,849
Total Waterway Infrastructure	298,594,182	2,678,342,979	2,976,937,161
GRAND TOTAL	793,800,236	4,273,916,738	5,067,716,974

* All values in 2022 Dollars

Exhibit XIV

**Vessel Capital Investments by Flag, Public and Private Sectors,
Committed Post-2022, All Values in Canadian Dollars***

	Canadian-Flag	US-Flag	International-Flag	TOTAL
Vessel	CAD\$	CAD\$	CAD\$	CAD\$
Major Engine/ Propulsion Rehab	-	-	-	-
New Vessel/ Fleet Addition	24,819,527	-	397,112,427	421,931,954
Not Specified	-	-	-	-
Other Upgrade to Existing Fleet	-	5,068,716	-	5,068,716
Total Vessel	24,819,527	5,068,716	397,112,427	427,000,670

* All values in 2022 Dollars

Exhibit XV

**Vessel Capital Investments by Flag, Public and Private Sectors,
Committed Post-2022, All Values in United States Dollars***

	Canadian-Flag	US-Flag	International-Flag	TOTAL
Vessel	USD\$	USD\$	USD\$	USD\$
Major Engine/ Propulsion Rehab	-	-	-	-
New Vessel/ Fleet Addition	19,064,081	-	305,025,292	324,089,372
Not Specified	-	-	-	-
Other Upgrade to Existing Fleet	-	3,893,322	-	3,893,322
Total Vessel	19,064,081	3,893,322	305,025,292	327,982,694

* All values in 2022 Dollars

**Fixed Asset Capital Investments, Public and Private Sectors,
Committed Post-2022, All Values in Canadian Dollars***

	Canada	US	TOTAL
Ports & Terminals	CAD\$	CAD\$	CAD\$
Crane/Conveyor/Loading Equip	1,489,172	38,145,670	39,634,842
Existing Terminal Upgrades	9,927,811	8,722,730	18,650,541
Infrastructure - Rail	4,467,515	650,950	5,118,465
Infrastructure - Road	3,300,997	9,170,584	12,471,581
Lighting/Fencing/Paving/Sewer	-	7,127,903	7,127,903
Lock/Dock/Wharf	992,781	87,652,631	88,645,412
New Development	1,588,450	135,169,768	136,758,217
Not Specified	48,249,160	50,774,100	99,023,260
Other	949,270,949	4,459,241	953,730,189
Security	-	3,254,750	3,254,750
Warehouse/Admin Building	2,233,757	110,531,310	112,765,067
Yard Equipment	-	18,226,600	18,226,600
Total Ports & Terminals	1,021,520,591	473,886,235	1,495,406,826
Waterway Infrastructure	CAD\$	CAD\$	CAD\$
Breakwater/Navigation/Other Structures	-	7,030,260	7,030,260
Dredging	-	90,872,620	90,872,620
Lock/Dockwall/Wharf Rehab	15,288,828	1,406,142,905	1,421,431,734
Other	-	86,062,658	86,062,658
Spoils Disposal Site	-	11,717,100	11,717,100
Total Waterway Infrastructure	15,288,828	1,601,825,543	1,617,114,372
GRAND TOTAL	1,036,809,419	2,075,711,778	3,112,521,197

* All values in 2022 Dollars

Exhibit XVII

**Fixed Asset Capital Investments, Public and Private Sectors,
Committed Post-2022, All Values in United States Dollars***

	Canada	US	TOTAL
Ports & Terminals	USD\$	USD\$	USD\$
Crane/Conveyor/Loading Equip	1,143,845	29,300,000	30,443,845
Existing Terminal Upgrades	7,625,632	6,700,000	14,325,632
Infrastructure - Rail	3,431,535	500,000	3,931,535
Infrastructure - Road	2,535,523	7,044,000	9,579,523
Lighting/Fencing/Paving/Sewer	-	5,475,000	5,475,000
Lock/Dock/Wharf	762,563	67,326,700	68,089,263
New Development	1,220,101	103,825,000	105,045,101
Not Specified	37,060,573	39,000,000	76,060,573
Other	729,142,752	3,425,174	732,567,931
Security	-	2,500,000	2,500,000
Warehouse/Admin Building	1,715,767	84,900,000	86,615,767
Yard Equipment	-	14,000,000	14,000,000
Total Ports & Terminals	784,638,291	363,995,879	1,148,634,170
Waterway Infrastructure	USD\$	USD\$	USD\$
Breakwater/Navigation/Other Structures	-	5,400,000	5,400,000
Dredging	-	69,800,000	69,800,000
Lock/Dockwall/Wharf Rehab	11,743,474	1,080,069,825	1,091,813,299
Other	-	66,105,429	66,105,429
Spoils Disposal Site	-	9,000,000	9,000,000
Total Waterway Infrastructure	11,743,474	1,230,375,254	1,242,118,728
GRAND TOTAL	796,381,765	1,594,371,133	2,390,752,898

* All values in 2022 Dollars

Fixed Asset Capital Investments, Public and Private Sectors
by State and Province, *All Values in Canadian Dollars**

	Actual 2018-2022	Funds Committed Post-2022	TOTAL
Ports & Terminals	CAD\$	CAD\$	CAD\$
Illinois	43,111,790	1,098,804	44,210,594
Indiana	4,193,559	3,124,560	7,318,119
Michigan	49,283,007	78,650,225	127,933,232
Minnesota	228,745,066	78,211,643	306,956,708
New York	27,688,253	4,296,270	31,984,523
Ohio	1,618,782,225	183,047,140	1,801,829,365
Pennsylvania	-	30,594,650	30,594,650
Wisconsin	104,930,458	94,862,944	199,793,402
Not Specified	543,118	-	543,118
Total U.S.	2,077,277,477	473,886,235	2,551,163,711
Ontario	256,500,710	716,048,309	972,549,019
Quebec	388,208,052	305,472,282	693,680,334
Total Canada	644,708,762	1,021,520,591	1,666,229,353
Total Ports & Terminals	2,721,986,239	1,495,406,826	4,217,393,064
Waterway Infrastructure	CAD\$	CAD\$	CAD\$
Illinois	244,290,345	1,301,900	245,592,245
Indiana	90,256,968	-	90,256,968
Michigan	2,481,863,195	1,334,707,880	3,816,571,075
Minnesota	59,275,044	16,273,750	75,548,794
New York	243,211,121	101,938,770	345,149,891
Ohio	191,383,272	146,040,963	337,424,235
Pennsylvania	-	-	-
Wisconsin	62,648,422	1,562,280	64,210,702
Not Specified	114,006,357	-	114,006,357
Total U.S.	3,486,934,725	1,601,825,543	5,088,760,268
Ontario	388,739,765	5,361,018	394,100,783
Quebec	-	9,927,811	9,927,811
Total Canada	388,739,765	15,288,828	404,028,594
Total Waterway Infrastructure	3,875,674,490	1,617,114,372	5,492,788,861
GRAND TOTAL	6,597,660,728	3,112,521,197	9,710,181,926

* All values in 2022 Dollars

Exhibit XIX

**Fixed Asset Capital Investments, Public and Private Sectors
by State and Province, All Values in United States Dollars***

	Actual 2018-2022	Funds Committed Post-2022	TOTAL
Ports & Terminals	USD\$	USD\$	USD\$
Illinois	33,114,518	844,000	33,958,518
Indiana	3,221,107	2,400,000	5,621,107
Michigan	37,854,679	60,411,879	98,266,558
Minnesota	175,700,949	60,075,000	235,775,949
New York	21,267,573	3,300,000	24,567,573
Ohio	1,243,399,820	140,600,000	1,383,999,820
Pennsylvania	-	23,500,000	23,500,000
Wisconsin	80,597,940	72,865,000	153,462,940
Not Specified	417,174	-	417,174
Total U.S.	1,595,573,759	363,995,879	1,959,569,638
Ontario	197,020,286	550,002,542	747,022,827
Quebec	298,185,769	234,635,749	532,821,518
Total Canada	495,206,054	784,638,291	1,279,844,345
Total Ports & Terminals	2,090,779,813	1,148,634,170	3,239,413,983
Waterway Infrastructure	USD\$	USD\$	USD\$
Illinois	187,641,405	1,000,000	188,641,405
Indiana	69,327,113	-	69,327,113
Michigan	1,906,339,346	1,025,200,000	2,931,539,346
Minnesota	45,529,644	12,500,000	58,029,644
New York	186,812,444	78,300,000	265,112,444
Ohio	147,003,051	112,175,254	259,178,305
Pennsylvania	-	-	-
Wisconsin	48,120,764	1,200,000	49,320,764
Not Specified	87,569,212	-	87,569,212
Total U.S.	2,678,342,979	1,230,375,254	3,908,718,233
Ontario	298,594,182	4,117,841	302,712,023
Quebec	-	7,625,632	7,625,632
Total Canada	298,594,182	11,743,474	310,337,656
Total Waterway Infrastructure	2,976,937,161	1,242,118,728	4,219,055,889
GRAND TOTAL	5,067,716,974	2,390,752,898	7,458,469,872

* All values in 2022 Dollars

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