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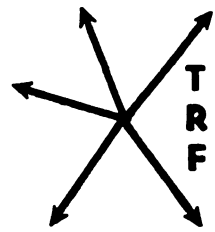

TRANSPORTATION RESEARCH FORUM

Changes in Canadian Great Lakes Shipping Since the Opening of the St. Lawrence Seaway in 1959

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ABSTRACT

THIS PAPER describes the changes in the nature and the volume of the cargoes handled at Ontario ports since 1959, the year of the opening of the St. Lawrence Seaway. It also discusses the corresponding changes in the Canadian Great Lakes fleet.

While the total tonnages handled at these ports increased by 48.5% from 1960 to 1975, this 1975 tonnage was more concentrated among the top twelve ports than in the earlier year. The number of active ports declined. The Seaway permitted the development of large 730' ships which move grain directly from Lake Superior to the St. Lawrence River export ports and return with Labrador iron ore. Other major cargo changes, but not connected with the Seaway, were the decline of the intra-Great Lakes general cargo trades and of the coal movements to the many small ports. Also petroleum cargoes became concentrated in fewer ports. These changes, however, were followed by the growth of large scale coal movements to a relatively few steel making and power generating ports. These cargoes, together with increased salt and stone cargoes, caused the development of the large self-unloader ship, all recent buildings being of this type.

The paper concludes with a discussion of two future problems. These pertain to the construction and financing of super-colliers for the expected movement of Western Canada coal from Thunder Bay and to the economics of retaining a nucleus of smaller ships capable of serving ports and cargoes not suitable for the recently-built large ships.

* * *

This paper describes the changes in the Canadian Great Lakes shipping industry since the St. Lawrence Seaway opened in 1959. These changes will be discussed both as historical facts and as indicators of what concerns may arise in the future.

Those directly concerned with this industry claim that its role in Canadian transportation is not well understood and, hence, under-estimated by society and especially by some in the Federal Government transport agencies. For example, a 1975 survey of the industry claimed that documents tabled in Parliament in June 1975, treated Canadian lake shipping in "an offhand manner, both its present and future roles being played down" ((2), (3), and (1), page 60.) Yet this same survey found that the revenue ton-miles, generated in 1973 by the dry bulk ships alone exceeded the revenue ton-miles for C.P. Rail and were a large proportion of those for Canadian National (Exhibit 1). These shipping data would be even more impressive with the inclusion of the liquid cargoes and the package freight. Also, these dry-bulk cargoes were carried at an average of only 0.24¢ per ton-mile, only a fraction of the corresponding railway averages. While this comparison will not disparage the Canadian railways as they move a wider range of cargoes than do the ships, it does indicate the cost efficiency of the ships for their particular cargoes. Therefore, the importance of the Great Lakes shipping industry should be recognized and any problems, present or future, be identified. This paper is intended to serve these ends.

The aforementioned changes will be identified in two ways. The first will show the changes in the tonnage and in the types of cargoes handled at the active Great Lakes ports since 1959. The second will show the coincident changes in the number and composition of the Canadian flag Great Lakes fleets.

TONNAGES AT ONTARIO PORTS AS A WHOLE

Statistics Canada data showing the number of tons of each broad type of cargo were analyzed for each of the years 1955, 1960, 1965, 1970 and 1975 for each active Ontario port. It was found that two words, "growth" and "concentration" described most of what has happened to these ports and cargoes over these recent fifteen years. Also, as will be later shown, the same two words summarize the corresponding changes in the numbers and total carrying capaci-

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ties of the ships. The principal port changes from 1960 to 1975 are as follows: (Exhibit 2).

(1) there has been about a 47% increase in aggregate tonnage handled to 1970 from 1960 with only a modest further increase to 1975.
(2) there has been a decrease in the number of active ports, i.e., to a total of 44 in 1975 from 57 in

COMPARISON OF AGGREGATE TRAFFIC AND REVENUE DATA, CANADIAN GREAT LAKES SHIPS AND RAILWAYS 1973

	Revenue Ton - Miles (billions)	Revenues ($millions)	Average Revenue per ton-mile
Great Lakes Ships (dry-bulk cargoes only):	58.76	$ 143.2	0.24¢
C.P. Rail	51.24	690.6	1.35¢
C.N.	66.15	1,065.9	1.61¢

Source: Reference 1, page 2.

EXHIBIT 1

SUMMARY OF TRAFFIC CONCENTRATIONS — ONTARIO GREAT LAKES PORTS 1960 - 1975

	1960	1965	1970	1975
Number of reported Active Ports:	57	52	50	44
Number of Ports handling at least 90% of tonnage:	21	16	15	14
% of Tonnage handled by top 12 ports:	79.0%	84.1%	87.6%	87.6%
Total Tonnage handled: (thousands of tons)	53,683.4	66,744.1	79,013.0	79,703.7
Index: 1960=100.	100.0	124.3	147.2	148.5
Total Tonnage handled by top 12 ports:	42,424.1	56,126.1	69,184.8	69,847.6
Index: 1960=100	100.0	132.2	163.1	164.6
Total Tonnage handled by remaining ports:	11,259.3	10,196.3	9,828.2	9,856.2
Index 1960=100	100.0	90.6	87.3	87.5

EXHIBIT 2

1960.

(3) the total tonnage is increasingly more concentrated in relatively fewer of the ports. The top twelve ports handled 79.1% of the total tonnage in 1960 but 87.6% in each of 1970 and 1975. Alternately, at least 90% of the total tonnage was handled in the top 21 ports in 1960 but in only the top fourteen ports in each of 1970 and 1975.

(4) while the total tonnage handled by all ports increased by about 47% to 1970 and 1975 from 1960, the total tonnage handled by the top twelve ports increased by about 64% over these years. (These twelve ports are not entirely the same twelve in the two years.) Over the remaining ports, the tonnage decreased by about 12.5%.

(5) Eight of the top twelve ports for 1960 were among the top twelve for 1975 but the remaining four: Kingston, Prescott, Picton and Midland were replaced by Colborne, Goderich and the newly-developed ports of Lakeview and Nanticoke.

(6) Thunder Bay has handled the largest amount of tonnage in each of the four selected years, while Hamilton has consistently handled the second. Sarnia and Sault Ste. Marie have been within the top five in each of the two years.

(7) there were 38 ports handling at least 100,000 tons of cargo in 1960 and 39 in 1975. However, nine of these in 1960 had become inactive or almost so by 1975. These were: Leamington, Belleville, Port Burwell, Cornwall, Cobourg, Welland and Brockville. These were replaced by nine other ports: Nanticoke, Lakeview, Sombra, Oakville, Serpent River, Cardinal, Kingsville, Courtright and Morrisburg.

CHANGES AT THE INDIVIDUAL PORTS

The changes in each of the twelve ports, which handled the most tonnage in 1975, will be discussed separately to be followed by a remaining 36 smaller ports which are discussed in geographical groupings.

1. THUNDER BAY: (1st in 1960)

Thunder Bay has handled more tonnage than any other Ontario port in each of the four study years. It is principally a port where cargoes are loaded, the tonnage loaded having increased by 71% from 1960 to 1975 (Exhibit 3). The principal outward cargo is grain, most of it moving to other Canadian ports while some, especially barley, moves to U.S. ports. Iron ore, the second most important outward cargo, increased from 1960 to 1970 and then declined in 1975. In 1960, 87% of this ore moved to U.S. ports but in each of 1970 and 1975, about 60% moved to other Canadian ports. The future of this movement may be in doubt due to the announced closure of the Steep Rock Iron Mines, west of Thunder Bay. Loadings of paper related tonnage declined over the post 1960 period, this

THUNDER BAY

(000's of tons)

Loaded	1975	1970	1965	1960
Manufactures, General Cargo	302.8	259.5	379.0	307.4
Grain	13,390.7	12,988.9	11,788.1	7,778.5
Coal	642.3	445.2	-	-
Ores	4,320.9	5,766.3	3,150.3	2,633.1
Paper Products	143.0	276.7	320.5	270.5
Other	92.6	23.6	-	16.0
Total	18,892.3	19,760.2	15,637.9	11,005.5
Unloaded				
Manufactures, General Cargo	414.9	400.8	430.4	384.1
Coal	51.3	42.9	232.1	206.3
Salt	96.9	112.3	74.4	10.2
Stone, Gravel	19.8	13.0	25.2	88.8
Petroleum Products	486.1	400.5	365.7	399.4
Other	66.6	132.3	300.1	18.1
Total	1,135.6	1,101.8	1,397.9	1,106.9

EXHIBIT 3

being due to the diversion of paper to the railways from the lakes. Coal from Western Canada started to move from Thunder Bay in the early 1970's to the Ontario power-generating plants. This movement is expected to become very important in the future.

The tonnage received at Thunder Bay has consistently been small compared to the corresponding tonnage forwarded. It has also shown little if any total growth. While there has been growth in the receipt of petroleum products and of salt, these have been offset by declines in coal and stone tonnages.

Both the receipt and forwarded tonnage of manufactured goods remains significant in each considered year. However, there has been a considerable shift in the mix of this traffic. Tonnages of received general cargo have declined as have forwarded shipments of flour, these cargoes being traditionally associated with the operation of the lake package freighters and the former freight-carrying passenger ships. These have been replaced by receipts of sheet steel and inorganic chemicals and by forwardings of concentrated feeds, the latter moving internationally.

To summarize, the outward tonnage at Thunder Bay is growing. The port is becoming increasingly important in its traditional role as a grain shipping port. (The loaded grain tonnages increased by 51% from 1960 to 1965 and growth has continued since.) Its second major export is becoming coal rather than iron ore. Petroleum related products and inorganic chemicals have become the leading imports. The growth of the grain traffic is at least due to some degree to the opening of the St. Lawrence Seaway. As will be discussed more fully later, the Seaway enabled the grain to be moved directly in 730' Great Lakes vessels from Thunder Bay to the lower St. Lawrence River ports from whence it could be transshipped by new elevators into the ocean ships. These direct voyages by large lake ships eliminated the former practice of transshipping the grain either to railway cars at the Georgian Bay ports or to several small canal vessels at Port Colborne, Kingston or Prescott. The other major cargoes do not involve the Seaway. Changes in their tonnage result, in the case of the outward ore traffic to the depletion of the mines, and for the others to changes in their market demand.

2. HAMILTON: (2nd in 1960)

This port has remained in second place in terms of total tonnage handled for each of the four study years. This is due to a growth of 81% from 1960 to 1975 in tonnage unloaded, most of which is coal and iron ore for the local steel mills (Exhibit 4). These commodities have been predominant over the years and thus there has not been the changes in cargoes at Hamilton that there has been at Thunder Bay and at some others. Stone receipts have increased over the period as did petroleum receipts until 1970 only to decline by 1975.

The total outward tonnage from Hamilton has not increased over the years. Manufactured goods rose then declined. Grain and related products were important in 1965 and 1970 but disappeared by 1975. Coke had also become signifi-

HAMILTON

	(000's of tons)			
Loaded	1975	1970	1965	1960
Manufacturers, General Cargo	393.5	610.3	557.5	504.1
Coke	88.1	61.1	6.4	-
Grain	-	108.1	103.8	-
Other	79.7	19.4	45.1	59.3
Total	561.3	798.9	712.8	563.4
Unloaded				
Manufacturers, General Cargo	183.9	233.0	421.0	187.7
Grain	147.1	369.9	212.2	69.8
Coal	6,051.1	4,483.9	3,205.6	2,999.6
Ore	6,653.9	5,985.4	4,882.7	3,790.8
Stone	185.4	121.5	37.4	118.8
Petroleum	247.3	727.3	572.4	368.4
Other	240.5	160.8	247.7	151.4
Total	13,709.2	12,081.8	9,579.0	7,586.5

EXHIBIT 4

cant in these latter two years. Manufactured goods has remained an important outward cargo but, as with Thunder Bay, its mix has changed. General Merchandise became relatively trivial by 1975 to be replaced to some extent by sheet steel and steel products. The received manufactured tonnage is predominantly from international sources suggesting its receipt from deep sea ships.

The St. Lawrence Seaway has facilitated the aforementioned growth in ore tonnage. It has also helped change the source of this traffic. While of the 3,790.8 thousand tons received in 1960, 93.5% came from international sources, i.e., Minnesota, of the 6,653.9 thousand tons received in 1975, 60.1% came from Canada, i.e., Labrador.

3. SARNIA: (5th in 1960)

Sarnia has proven to be one of the faster growing ports. Loaded and unloaded tonnage increased by 148% and 208% respectively from 1960 to 1975 (Exhibit 5). Whereas, the loaded tonnage exceeded the unloaded tonnage in 1960 and 1965, the reverse became true in 1970 and 1975. The principal loaded tonnage has been petroleum moving, at least in 1975, to both Canadian and international ports. This tonnage has grown in each of the four years. The principal unloaded cargoes which have shown considerable growth are coal and stone. Grain receipts have been relatively small and have tended to decline over the period.

4. SAULT STE. MARIE: (3rd in 1960)

Sault Ste. Marie is predominantly a port where increasing quantities of ore, coal and to a lesser degree, stone, petroleum and salt are received. All of these tonnages have grown over the study period (Exhibit 6) so that the total tonnage unloaded at this port had increased 35% by 1975 from 1960. The tonnage loaded at Sault Ste. Marie has always been small compared to the unloaded tonnage and has declined by 47% over the aforementioned period. Manufactured goods, mostly steel products have always been the major loaded cargo, although there has been some shift in the mix of these. General cargo, as such, disappeared by 1965.

5. NANTICOKE: (not active in 1960)

This port, fifth in tonnage handled by 1975, only appeared that year. It is a recently developed port located on Lake Erie to serve a newly constructed power generating station, steel plant and oil refinery. Its only cargo to date is coal unloaded, 3,941.1 thousand tons in 1975. The development of this port is only beginning since the steel plant and the oil refinery are not yet in full production. Future years should see this port with even larger and more diversified tonnages and as a result rising to more than fifth place.

6. CLARKSON: (9th in 1960)

Total tonnage handled at this port increased by 194.6% from 1960 to 1975. This growth is due primarily to a 212.4% increase in the tonnage of stone received (Exhibit 7). Petroleum has also been an important received cargo but sustained a major decline from 1970 to 1975. The

SARNIA

(000's of tons)

Loaded	1975	1970	1965	1960
Merchandise, General Cargo	133.6	371.4	216.9	194.6
Grain	270.5	239.7	129.7	39.2
Petroleum	3,985.7	2,281.2	2,042.1	1,518.2
Other	-	0.9	3.1	16.5
Total	4,389.8	2,893.2	2,451.8	1,768.5
Unloaded				
Merchandise, General Cargo	188.7	295.2	305.6	200.0
Grain	180.8	203.6	232.6	253.7
Coal	2,662.5	3,399.0	873.7	755.0
Stone	1,551.2	376.9	249.3	194.5
Petroleum	107.4	154.6	41.7	123.7
Other	10.1	8.9	62.1	-
Total	4,700.7	4,438.2	1,763.0	1,526.9

EXHIBIT 5

SAULT STE. MARIE

(000's of tons)

Loaded	1975	1970	1965	1960
Merchandise, General Cargo	280.3	357.3	443.2	478.6
Other	19.4	169.2	104.9	47.8
Total	299.7	526.5	548.1	526.4
Unloaded				
Coal	2,077.3	2,349.4	2,271.6	1,765.2
Ore	2,408.5	1,888.5	1,512.2	1,548.4
Stone	672.1	485.7	559.9	436.5
Petroleum	443.4	417.7	416.3	220.6
Other	46.7	85.5	94.8	207.6
Total	5,648.0	5,226.8	4,854.8	4,176.3

EXHIBIT 6

CLARKSON

(000's of tons)

Loaded	1975	1970	1965	1960
Cement	310.2	111.4	39.7	13.2
Petroleum Products	88.5	363.6	357.3	319.2
Other	95.7	9.9	27.1	-
Total	494.4	484.9	424.1	332.4
Unloaded				
Stone	2,556.3	1,670.2	1,109.5	818.3
Petroleum Products	62.5	294.7	294.4	48.3
Other	52.2	49.1	105.3	39.9
Total	2,671.0	2,014.0	1,509.2	906.5

EXHIBIT 7

tonnage loaded at Clarkson, while always less than that unloaded, increased by 48.7% from 1960 to 1975. This was primarily due to cement tonnage increasing to 310.2 thousand tons in 1975 from 13.2 thousand tons in 1960 which increase offset a major decline in petroleum products. The tonnage of manufactured goods loaded, which has become predominant in recent years, is mainly petroleum-related products.

7. TORONTO: (4th in 1960)

This port handles a wider variety of cargoes than do many of the others. However, it is the only port in the top twelve where both the inward and outward tonnage declined over the study period (the inward tonnage to 2475.4 thousand tons in 1975 from 3774.1 in 1960 or by 28.7% while the outward tonnage to 511.8 from 815.2 thousand tons or by 37.2%) (Exhibit 8). This decline in the inward traffic is due to the disappearance of general cargo (321.0 thousand tons in 1960 to 2.6 thousand tons in 1975), marked declines in coal and petroleum receipts, and to a lack of growth in grain receipts. Salt, raw sugar and cement are commodities showing increases over the period. Manufactured goods tonnage, while relatively important as both an inbound and an outbound cargo, experienced some increase over the years but with no consistent upward trend. Most of this moves internationally, presumably in deep-sea ships.

Future growth prospects at this port are uncertain. The prospects for grain depend upon the continuation of several

TORONTO

(000's of tons)

Loaded	1975	1970	1965	1960
Merchandise, General Cargo	155.5	234.8	265.0	428.5
Petroleum	314.8	181.4	220.9	312.6
Other	41.3	36.1	15.4	74.1
Total	511.6	452.3	501.3	815.2
Unloaded				
Merchandise, General Cargo	410.4	492.3	699.1	479.0
Grain	624.7	709.9	587.0	725.2
Coal	201.9	1,615.2	2,832.7	1,195.1
Salt	230.5	293.2	133.3	30.7
Cement	480.9	450.2	264.8	241.4
Stone	0.1	2.5	96.9	464.3
Petroleum	249.0	933.2	561.0	549.5
Other	277.9	214.1	150.1	59.4
Total	2,475.4	4,710.6	5,324.9	3,744.6

EXHIBIT 8

grain receiving elevators in the mid-city harbourfront area. Some of the decline from 1970 to 1975 in the inward coal trade results from the conversion of the Toronto steam generating plant to other fuels. However, this decline in coal receipts at Toronto is offset by the concurrent increases at neighbouring Lakeview.

8. COLBORNE: (15th in 1960)

This Lake Ontario port exists only for the loading of stone, the tonnage of which has increased by 201.7% from 1960 to 1961.

Year	Tons of Stone Loaded	Index
1960	847.2	100.0
1965	1080.0	127.5
1970	1660.2	196.0
1975	2556.3	301.7

9. PORT COLBORNE: (6th in 1960)

This port, like Toronto, is one of the few major ports where tonnages have declined over the study period (Exhibit 9). Tonnage loaded has always exceeded tonnage unloaded but the former has declined 12.5% while the latter declined 20.7% to 1975 from 1960. The decline in the loaded tonnage is due to declines in both manufactured goods (pig iron, iron products and flour) and grain. The decline in grain tonnage, to 221.7 thousand tons in 1975 from 357.8 thousand tons in 1960 (1514.6 thousand tons in 1955) reflects the elimination of transfer cargoes following the 1959 opening of the Seaway. These declines are offset to some extent by increases in the loadings of "Other Minerals," i.e., dolomite. The unloaded tonnage also declined due to reductions in the grain tonnage, again reflecting the loss of the transfer activities at the port. There has also been a decline in the unloaded coal tonnage reflecting in part the decline in the number of coal burning ships on the lakes and, hence, the reduction of the importance of the port as a fueling station. These reductions in the coal receipts are offset by increases in petroleum receipts while iron ore receipts remain important but show no consistent upward or downward trend.

10. WINDSOR (including Walkerville): (7th in 1960)

This port is also one of declining tonnages, at least to 1975. However, some of this is due to a strike in the local salt mines that year (Exhibit 10). The port, in most years, has been one where coal, stone and petroleum are received and where salt and grain are loaded. These commodities, except for coal, are all showing growth trends; the decline in coal receipts in 1975 over 1970 is coincident with the closure of the local power generating station. Tonnage of manufactured products, both inbound and outbound are relatively important but show no consistent upward or downward trends. (The outward manufactured goods are mostly canned goods, food products, chemicals and auto parts

PORT COLBORNE

(000's of tons)

Loaded	1975	1970	1965	1960
Grain	221.7	122.7	184.6	357.8
Other Minerals	1,070.5	957.0	1,099.2	929.4
Other	13.9	117.9	222.3	204.9
Total	1,306.1	1,197.6	1,506.1	1,492.1
Unloaded				
Grain	402.9	582.6	636.1	672.4
Coal	104.0	213.7	207.4	133.7
Ore	211.3	155.4	420.7	150.2
Petroleum	143.9	110.0	98.2	101.3
Other	19.7	0.1	56.5	43.5
Total	881.8	1,061.8	1,418.9	1,111.9

EXHIBIT 9

whereas those inbound are steel and steel products.)

11. LAKEVIEW: (not listed in 1960)

This port only appeared in the 1970 listings and handles only inward shipments of coal for the adjacent power generating station. The increases in received coal tonnage at Lakeview power generating station help offset the previously noted declines in this traffic at nearby Toronto.

Thousands of Tons of Coal Unloaded

Year	Toronto	Lakeview	Total
1960	1195.1	—	1195.1
1965	2832.7	—	2832.7
1970	1615.2	376.8	1992.0
1975	201.9	1903.5	2105.4

12. GODERICH: (17th in 1960)

While the tonnage handled at this port has greatly increased since 1960, its character has changed. In 1960, the port existed primarily for the receipt of grain cargoes and only to a much lesser extent to the dispatch of salt. Since that time, the inward grain tonnages have steadily decreased, as with Sarnia, reflecting the increased tendency for export grain to move directly by water to the east coast export ports. However, loaded tonnages of salt have increased steadily over these years, being insignificant in 1955, being 243.4 thousand tons in 1960 and reaching 1,559.3 thousand tons in 1975. Also in 1975, outward tonnages of grain became significant. Thus, since 1960, this port changed from a grain receiving to a salt forwarding port. (Exhibit 11).

THE GEORGIAN BAY GRAIN PORTS (Exhibit 12)

These include the four ports: Collingwood, Midland, Owen Sound and Port McNichol which, along with Goderich and Sarnia are often referred to as the "Bayports." At one time, before the opening of the current Welland Canal in 1932, these six ports, along with Buffalo, N.Y. handled most of the Canadian export grain movement. However, their role declined to now relatively minor importance with the opening of this latest Welland Canal and still more with the opening of the St. Lawrence Seaway in 1959. These canals enabled the 730' ships, built to navigate the upper lakes, to carry grain directly to the Atlantic export ports without transferring cargoes to smaller ships or to railway cars enroute. The Georgian Bay ports now handle some grain for local consumption and for furtherance by rail to the Atlantic ports during the winter months when the through water routes are closed. The continuation of this latter movement, reportedly, is dependent upon the continuance of the "Eastern Rates," that is rail rates between these bayports and the Atlantic Coast ports which are frozen at the 1960 levels. With this history, it is not surprising that the grain tonnage unloaded at these ports has declined. Since Collingwood and Port McNicol are almost exclusively grain handling ports, their total tonnage has al-

WINDSOR (includes Walkerville)

Loaded	1975	1970	1965	1960
	(000's of tons)			
Manufactures, General Cargo	117.1	90.3	119.3	75.9
Grain	120.8	11.1	23.2	33.8
Salt	365.5	1,267.2	689.9	364.2
Other	18.0	15.9	31.3	1.8
Total	621.4	1,384.5	863.7	475.7
Unloaded				
Manufacturers, General Cargo	220.2	321.0	146.5	40.6
Grain	9.5	-	74.7	100.6
Coal	27.2	1,041.6	924.0	466.3
Cement	55.8	39.1	-	2.9
Stone	492.5	484.9	500.1	445.0
Petroleum	221.6	262.3	372.7	254.5
Other	93.7	17.1	14.5	24.0
Total	1,120.5	2,166.0	2,032.5	1,333.9

EXHIBIT 10

GODERICH

Loaded	1975	1970	1965	1960
	(000's of tons)			
Salt	1559.3	1066.5	618.3	243.4
Grain	95.5	4.0	23.9	-
Other	-	-	-	6.3
Total	1654.8	1070.5	642.2	249.7
Unloaded				
Grain	172.8	409.7	415.2	507.8
Other	-	-	20.3	31.3
Total	172.8	409.7	435.5	539.1

EXHIBIT 11

so declined. At Owen Sound, however, the declines in the grain tonnage has been offset partially by petroleum shipments, although that tonnage also declined in 1975 from 1970. At Midland, the most active of these ports, the grain traffic actually increased in 1975 over 1970 while there were also substantial increases in the tonnage of stone unloaded. Clearly, Midland is the only port of this group now showing growth prospects. (Lake historians will recall that earlier in the century all of these ports, like Sarnia, were also noted for the dispatch of general cargo, often handled on passenger ships. While some of this tonnage existed in 1955 and in 1960, it terminated in 1965 with the withdrawal of the Canadian Pacific lake passenger-package freight ships at Port McNicol.)

OTHER LAKE SUPERIOR, LAKE HURON PORTS (Exhibit 13)

These include eight ports most of which cater to one commodity. Of the

THE "GEORGIAN BAY GRAIN PORTS"

			1975	1970	1965	1960
Collingwood	L	-	25.4	-	2.1	-
	U	grain	75.2	96.5	127.9	192.5
Midland	L	grain	84.5	27.0	62.5	-
	U	grain, stone	972.5	781.3	661.9	986.5
Owen Sound	L	-	40.5	-	11.2	4.4
	U	grain, petroleum	271.3	375.8	399.6	344.3
Port McNicol	L	-	42.8	-	3.9	6.3
	U	grain	235.9	200.0	371.2	335.9

EXHIBIT 12

OTHER LAKE SUPERIOR, LAKE HURON PORTS

Britt	L	-	2.1	-	52.8	-
	U	petroleum	272.2	244.8	245.6	169.2
Byng Inlet	L	-	-	-	-	-
	U	petroleum	-	45.7	37.3	-
Depot Harbour	L	iron ore	734.8	720.9	726.1	595.5
	U	-	-	-	8.3	-
Little Current	L	iron ore	489.7	646.5	568.1	167.1
	U	petroleum, coal	65.4	216.1	583.3	641.6
Marathon	L	paper products	91.3	139.7	137.4	129.7
	U	coal, petroleum, salt	165.0	177.1	188.6	135.2
Michipicoten	L	iron ore	31.9	286.3	371.7	752.6
	U	stone, coal	219.6	270.8	42.9	111.1
Nipigon	L	paper products	-	102.5	214.8	31.5
	U	-	-	13.5	-	-
Parry Sound	L	-	4.1	17.6	3.0	10.3
	U	petroleum, salt	552.2	444.2	418.1	418.3

EXHIBIT 13

eight, Depot Harbour, Little Current and Michipicoten have been ports loading iron ore for international movement. The next three, Britt, Byng Inlet and Parry Sound have been receivers of petroleum products with salt at the latter port having become very important since 1970. The final two, Marathon and Nipigon, have exported paper products. Of the three ore ports, Depot Harbour's loaded tonnage of iron ore shows a steady upward trend; Little Current's shows an increase to 1970, thence a decline in 1975 while that of Michipicoten shows a steady downward trend in each year to become negligible by 1975. Depot Harbour had almost no unloaded tonnage for the study period. Little Current was once a major receiver of coal but this tonnage became negligible by 1970. The port did, however, handle small amounts of cement, petroleum and other minerals. Michipicoten, again once a major receiver of coal, found this traffic

small after 1965 but in 1970 and 1975 had started receiving stone cargoes.

Of the three "petroleum" ports, the tonnages at Byng Inlet were small in both 1965 and 1970 and the port was not used in 1975. The received petroleum tonnages have increased at both Britt and Parry Sound in each study year. The total tonnage for Parry Sound has also increased due to the port also becoming a major receiver of salt cargoes.

The two "paper ports," Marathon and Nipigon are declining due to the diversion of the outward paper to surface transportation. While there were no cargoes at Nipigon by 1970, Marathon continued to ship some, albeit reduced amounts, of paper and to maintain its inward tonnages with cargoes of coal, petroleum and salt.

THE LAKE ERIE AND LOWER RIVER PORTS (Exhibit 14)

With the exception of Amherstburg and Wallaceburg, these ports were predominantly receivers of cargo. Of these exceptions, Amherstburg has been loading increased quantities of metallic salts while Wallaceburg loaded increased quantities of grain (corn). However, the inward cargoes at these two ports has declined due, principally, to the decline in the coal tonnage at Amherstburg and in the stone tonnage at Wallaceburg. This latter decline may be due to the withdrawal of small ships able to reach Wallaceburg as much as it is due to a decline in demand. Of this set, there are three ports, Courtright, Kingsville and Sombra where the received tonnage is

THE LAKE ERIE AND LOWER RIVER PORTS

			1975	1970	1965	1960
Amherstburg	L	metalic salts	215.6	115.3	25.0	2.8
	U	coal	4.9	116.9	160.0	178.2
Courtright	L	-	-	-	2.7	4.7
	U	coal, stone	118.9	31.5	107.7	32.5
Erieau	L	-	-	-	-	3.0
	U	coal	-	4.7	134.6	237.7
Kingsville	L	-	1.4	1.2	1.8	1.5
	U	stone	141.8	86.1	119.9	40.5
Leamington	L	-	-	-	1.6	54.1
	U	-	-	-	0.7	2.4
Port Burwell	L	-	-	-	0.4	-
	U	coal	-	-	312.4	235.1
Port Stanley	L	grain	49.7	24.6	14.3	13.2
	U	petroleum, coal	152.6	345.6	383.8	383.8
Sombra	L	-	-	-	-	-
	U	stone	317.0	29.1	-	-
St. Catharines	L	-	0.3	0.7	1.7	0.8
	U	petroleum, stone	279.0	310.3	270.0	372.0
Thorold	L	paper	9.5	150.0	161.1	205.8
	U	paper, coal, misc.	156.8	433.8	510.6	677.8
Wallaceburg	L	grain	125.9	133.2	25.2	33.9
	U	stone, misc.	15.3	113.9	9.4	97.8
Welland	L	-	-	2.5	4.9	7.8
	U	other minerals, petroleum	-	204.6	156.8	126.3

EXHIBIT 14

increasing. In the case of Courtright this is due to the receipt of large coal cargoes to fuel a newly-established power generating station. As for Kingsville and Sombra, the increase is due to the rise of stone cargoes. The remaining six ports are all declining ports due, principally, to the loss of coal traffic and, in some cases, such as Port Stanley and St. Catharines, to declining petroleum receipts. In fact Erieau and Port Burwell, once receivers of coal for the Chesapeake and Ohio and Canadian Pacific rail lines have become extinct. The decline at Thorold are also due to the diversion of the paper traffic to railways from ships. A final port in this set is Welland. Its principal cargo was the receipts of "other metals" and petroleum. While these tonnages were increasing over the study period, until 1970, the port ceased to be used after 1974. This decline may result from the diversion of the Welland Canal to a new location away from the principal Welland industries. This Welland tonnage may now be moving through nearby Port Colborne and helping to account for the growth in "other mineral" traffic at this latter port.

LAKE ONTARIO AND THE ST. LAWRENCE RIVER (Exhibit 15)

Seven of the twelve ports, considered in this category, show declining tonnages. Of these, Belleville, Brockville, Cobourg, Cornwall have become extinct or almost so by 1975 due to the previously-noted reductions in the coal and petroleum movements to the smaller ports. Another two, Kingston and Prescott, declined pricipally due to the loss of much of their former grain transshipment business. After the opening of the St. Lawrence Seaway in 1959, the 730' upper lake ships could carry their grain cargoes directly to Montreal and to other St. Lawrence export ports from the upper lakes and thus the previous need to transfer grain at Kingston or Prescott from one upper laker to several smaller canal vessels was removed. The seventh of these declining ports is Port Credit which in 1955 and 1960 was a major receiver of petroleum. This trade faded by 1965. This was replaced in 1965 and 1970 respectively by 1547 and 3801 thousands of tons of coal but this movement had terminated by 1975 coincident with the advent of the adjacent new port of Lakeview. Port Credit had a burst of manufactured goods and paper tonnage in 1965 and 1970 when the Canada Steamship Lines' Metro Toronto package freight terminal moved there from downtown Toronto. However, this trade also vanished by 1975 when this Company withdrew from most of this business. Throughout the years, Port Credit has loaded considerable quantities of petroleum products. It also loaded great quantities of manufactured goods, general cargo and cement during the 1965-1970 era of the package freight terminal.

The remaining five ports have shown some tonnage growth, Picton being the one with the largest absolute amount. This port both receives and dispatches cargo. It loads both cement and iron ore. The tonnage of the former has increased each year from 1960 to 1975 while the iron ore tonnage has declined in each of 1970 and 1975 from a peak of 504.0 tons in 1965. (This ore cargo may vanish if the announced decision is implemented to close the mine at Marmora, Ontario, about sixty miles by rail north of Picton.) Picton has also been receiving coal reasonably consistently in this period and since 1965, about 50.0 thousand tons of "other minerals." Of the remaining four ports, Cardinal has been receiving increasing quantities of grain (corn) and Morrisburg of petroleum. Oakville has been loading modest by increasing amounts of petroleum since 1970 while Oshawa has been receiving throughout the period increased quantities of coal, petroleum and, in 1970 and 1975, salt.

CONCLUSIONS ABOUT THE PORTS:

The foregoing port-by-port analysis indicated that certain ports have shown increased tonnages handled while others have become almost extinct. The following general conclusions are drawn:

(1) Grain: While the number of tons of grain loaded at Thunder Bay has increased over the 1960-1975 period, the tonnage received at the other Ontario ports declined. This is particularly so with the six Bayports and the three former transfer ports, Port Colborne, Kingston and Prescott. This shows the tendency for relatively more of the grain to proceed directly by large lake ship to the St. Lawrence export ports. (Exhibit 16)

However, grain loadings at many other Ontario ports have increased, showing the rising importance of certain Ontario grain crops: wheat, corn, soya beans.

(2) Iron ore tonnages received have increased at Hamilton and Sault Ste. Marie, the two principal Ontario steel making centres. At the same time, except for Depot Harbour, tonnages of iron ore shipped

LAKE ONTARIO AND THE ST. LAWRENCE RIVER

			1975	1970	1965	1960
Belleville	L	cement	-	145.8	116.0	151.9
	U	coal, petroleum	-	31.2	221.2	147.3
Brockville	L	-	-	-	-	-
	U	coal, petroleum	-	12.2	33.4	104.8
Cardinal	L	-	-	-	-	-
	U	grain (corn)	216.5	108.0	29.5	-
Cobourg	L	-	7.1	-	20.5	-
	U	petroleum	8.2	96.5	137.4	152.2
Cornwall	L	paper	20.4	8.6	4.5	-
	U	petroleum, coal	57.1	80.4	130.4	206.1
Kingston	L	grain	56.9	38.8	196.2	447.8
	U	grain, salt, petroleum	429.2	428.8	479.3	836.7
Morrisburg	L	-	-	-	-	-
	U	petroleum	101.5	106.2	-	32.2
Oakville	L	petroleum	266.2	226.1	-	-
	U	petroleum	12.5	124.3	-	-
Oshawa	L	-	0.2	12.2	0.7	0.2
	U	coal, salt, petroleum	436.9	332.0	301.9	332.2
Picton	L	cement, iron ore	893.6	1019.2	1004.2	972.7
	U	coal, other minerals	161.6	158.3	195.1	57.1
Port Credit	L	petroleum, mdse.	253.8	635.9	202.8	117.3
	U	cement coal, mdse.	1.1	3946.9	1775.4	591.6
Prescott	L	grain	128.1	168.0	317.4	318.6
	U	grain, salt	413.0	509.7	989.5	782.3

EXHIBIT 15

from Ontario ports have declined. (Exhibit 17) This shows the increased dependency of these Ontario steel mills on Labrador and or Minnesota ore. (Detailed data for Hamilton shows that most of its ore now comes from Canadian sources, i.e., Labrador.)

(3) **Coal:** While the numbers of tons of coal received at Ontario ports in 1975 was 17,656.2 thousand tons or 69.3% greater than the 10,426.3 thousand tons in 1960, the number of involved ports was only 20 in 1975 as compared to 36 in 1960. Moreover, 95.4% of this 1975 movement was destined to five major ports, most of which had steel mills (Hamilton and Sault Ste. Marie), power generating stations (Nanticoke and Lakeview) or heavy industry (Sarnia). This percentage is in contrast with the corresponding figure of 63.9% in 1960. Clearly, as the use of coal is declining as a general residential and industrial fuel, its use as a specialized fuel for large users is increasing. However, this concentrated growth means increased demands for the large ships serving these large ports but decreased demand for smaller ships serving the smaller ports. (Exhibit 18)

(4) **Salt:** This commodity is used in Ontario mainly for de-icing roads. It originates at two Ontario ports, Windsor and Goderich. This tonnage has increased 3.17 times

SUMMARY OF GRAIN LOADINGS AND UNLOADINGS ONTARIO PORTS 1960, 1965, 1970, 1975

(000's of tons)

Tons Loaded	1975	1970	1965	1960
Thunder Bay	13,390.7	12,988.9	11,788.1	7,778.5
Sarnia	270.5	239.7	129.7	39.2
Wallaceburg	125.9	133.2	25.2	33.9
Windsor	120.8	11.1	23.2	33.8
Port Colborne	221.7	122.7	184.6	357.8
Kingston	128.1	164.6	314.5	318.6
Prescott	53.6	38.8	187.4	422.3
Other	(7) 344.0	(4) 136.8	(7) 218.5	(3) 87.1
Total	(14) 14,655.3	(11) 13,835.8	(14) 12,871.2	(10) 9,071.2

(000's of tons)

Tons Unloaded	1975	1970	1965	1960
Six Bayports	1,505.8	1,726.7	1,986.6	2,179.7
Port Colborne	402.9	582.6	636.1	672.4
Toronto	624.7	709.9	587.0	725.2
Kingston	108.5	63.3	197.5	477.8
Prescott	284.7	347.8	648.7	701.6
Cardinal	216.5	106.2	29.5	-
Other	(2) 156.6	(2) 371.4	(4) 238.8	(3) 171.7
Total	(13) 3,299.7	(13) 3,907.9	(15) 4,324.2	(13) 4,928.4

NOTE: Bracketed figures indicate number of involved ports.

EXHIBIT 16

SUMMARY OF IRON ORE LOADINGS AND UNLOADINGS ONTARIO PORTS 1960, 1965, 1970, 1975

(000's of tons)

Tons Loaded	1975	1970	1965	1960
Depot Harbor	734.8	720.9	726.1	595.5
Little Current	489.6	576.7	568.0	104.8
Picton	304.3	497.0	504.0	196.0
Michipicoten Harbor	31.9	286.3	371.6	750.6
Total	1,560.6	2,080.9	2,169.7	1,646.9

(000's of tons)

Tons Unloaded	1975	1970	1965	1960
Hamilton	6,653.9	5,985.4	4,882.7	3,790.8
Sault Ste Marie	2,408.5	1,888.5	1,512.2	1,546.4
Port Colborne	211.3	155.4	420.7	150.2
Total	9,273.7	8,029.3	6,815.6	5,487.4

EXHIBIT 17

SUMMARY OF COAL UNLOADINGS

	(000's of tons) 1975		1970		1965		1960	
Hamilton		6,051.1		4,483.9		3,205.6		2,899.6
Sarnia		2,662.5		3,399.0		873.7		755.0
Sault Ste Marie		2,077.3		2,349.4		2,281.6		1,765.2
Nanticoke		3,941.1		-		-		-
Port Credit		-		3,801.4		1,546.4		50.4
Lakeview		1,903.5		376.8		-		-
Toronto		201.9		1,615.2		2,832.7		1,195.1
Subtotal	(6)	16,837.4	(6)	16,025.1	(5)	10,730.0	(1)	6,655.3
Other Ports								
500-1050.0	-	-	(1)	1,041.6	(2)	1,465.8	(1)	598.5
200- 499.9	-	-	(1)	213.7	(6)	1,545.8	(3)	889.2
100- 199.9	(3)	346.2	(5)	633.1	(6)	973.7	(11)	1,729.2
0- 99.9	(11)	472.6	(14)	480.4	(15)	432.3	(16)	544.1
Subtotal	(14)	818.8	(21)	2,368.8	(29)	4,417.6	(31)	3,761.0
Totals	(20)	17,656.2	(27)	18,394.5	(34)	15,147.6	(36)	10,426.3

NOTE: Bracketed figures indicate number of involved ports.

EXHIBIT 18

from 1960 to 1975. Much moves internationally but that unloaded at other Ontario ports has increased 8.17 times from 1960 to 1975. The number of involved ports has also increased, being eight in 1960 and 14 in 1975. Since this salt tonnage is being distributed in increasing quantities to an increasing number of ports, it should be providing employment for both full and moderate-sized self-unloading ships. (Exhibit 19)

(5) **Stone**: The number of tons of stone unloaded in Ontario ports has grown considerably, the 1975 tonnage being 6,804.1 thousand tons or 2.12 times that of 1960. Most of this stone, apart from that destined to Clarkson, comes from United States sources. It is also distributed to 18 to 20 ports. Again, like salt this traffic should produce employment to both full and moderate-sized self-unloading ships. (Exhibit 20)

(6) **Petroleum**: This traffic which includes gasoline and all petroleum products, has been loaded at Ontario ports and especially Sarnia in increasing quantities since 1960. However, much has tended to move internationally and the total tonnage unloaded at the Ontario ports grew from 1960 to a peak in 1970 (at least of the four years with available figures) and then declined to the 1975 figure, the lowest of all four years. This decline in tonnage was accompanied by a decline in the number of ports, i.e., to 30 ports in 1975 from 48 in 1960. In spite of this total decline, tonnage receipts have consistently increased at each of Thunder Bay, Sault Ste. Marie and Parry Sound. (The declines have occurred at many of the southern Ontario ports: Toronto, Hamilton, Clarkson, Kingston, etc., which it is understood are now being serviced by product pipelines or tank trucks. The foregoing along with the construction of two new tanker vessels in recent years ("Imperial St. Clair" of 1974 and "Texaco Brave" of 1977) suggests that there is a future for this trade, at least between the refineries and receiving ports whose volumes are great enough to warrant marine transportation but are not great enough, along with their remote location, to warrant pipeline construction. (Exhibit 21)

SUMMARY OF SALT LOADINGS AND UNLOADINGS ONTARIO PORTS 1960, 1965, 1970, 1975

Tons Loaded	(000's of tons) 1975	1970	1965	1960
Goderich	1,559.3	1,066.5	618.3	243.4
Windsor	365.5	1,267.2	689.9	364.2
Total	1,924.8	2,333.7	1,308.2	607.6

Tons Unloaded	1975		1970		1965		1960	
Toronto		230.5		293.2		133.3		30.7
Parry Sound		101.4		40.2		40.9		21.3
Thunder Bay		96.9		112.3		74.4		10.2
Prescott		91.5		99.8		28.9		-
Hamilton		85.7		72.7		45.4		5.2
Sub-total	(5)	606.0	(5)	618.2	(5)	322.9	(4)	67.4
Others	(9)	241.2	(8)	181.2	(6)	60.6	(4)	36.2
Totals	(14)	847.2	(13)	799.4	(11)	383.5	(8)	103.6

NOTE: Bracketed figures indicate number of involved ports.

EXHIBIT 19

SUMMARY OF STONE, UNLOADINGS, ONTARIO PORTS 1960, 1965, 1970, 1975

Tons Unloaded	(000's of tons) 1975	1970	1965	1960
Clarkson	2,556.3	1,670.2	1,109.5	818.3
Sarnia	1,551.2	376.9	249.3	744.5
Sault Ste. Marie	672.1	485.7	559.9	496.9
Windsor	492.5	484.9	500.1	445.0
Sombra	317.0	29.1	-	-
Midland	306.8	137.2	-	-
Serpent River	198.0	-	-	-
Hamilton	185.4	121.5	87.4	332.3
Kingsville	135.1	65.7	3.3	-
Michipicoten Harbour	132.1	188.7	-	-
	(10) 6,546.5	(9) 3,559.9	(6) 2,489.5	(5) 2,836.5
Others	(8) 257.6	(9) 230.5	(11) 358.3	(15) 1,358.6
Total	(18) 6,804.1	(18) 3,790.4	(17) 2,817.8	(20) 3,212.1

NOTE: Bracketed figures indicate number of involved ports.

EXHIBIT 20

THE EFFECTS OF THESE TONNAGE CHANGES ON THE VESSEL INVENTORY

The opening of the St. Lawrence Seaway in 1959 permitted the large ships, designed for service on the upper lakes, to carry grain cargoes directly from Thunder Bay to the St. Lawrence River export ports (without the necessity to transfer these cargoes at some intermediary port to either railway cars or

SUMMARY OF PETROLEUM AND RELATED PRODUCTS LOADINGS AND UNLOADINGS ONTARIO PORTS 1960, 1965, 1970, 1975

(000's of tons)

Tons Loaded	1975	1970	1965	1960
Sarnia	3,985.7	2,281.2	2,042.1	1,518.1
Toronto	314.8	181.4	220.9	312.6
Oakville	266.2	226.1	-	-
Clarkson	88.5	363.6	357.3	319.2
Port Credit	253.8	219.4	57.8	117.3
Others	(6) 75.6	(2) 31.5	(2) 27.4	(2) 50.8
Total	(11) 4,984.6	(7) 3,303.2	(7) 2,705.5	(7) 2,318.0

(000's of tons)

Tons Unloaded	1975	1970	1965	1960
Thunder Bay	486.1	400.5	365.7	399.4
Sault Ste. Marie	443.4	417.7	416.3	220.6
Parry Sound	406.1	388.0	355.0	389.7
Toronto	249.0	933.2	561.0	549.5
Hamilton	247.3	727.3	572.4	368.4
Kingston	244.7	289.6	188.2	202.3
Windsor	221.6	262.3	372.7	254.5
Oshawa	147.7	149.5	93.7	51.1
Port Colborne	143.9	110.0	98.2	101.2
St. Catharines	120.3	209.8	167.6	144.6
Sarnia	107.4	154.6	41.7	123.7
Clarkson	62.5	294.7	294.7	48.3
Other Ports	(10) 458.4	(16) 1,109.7	(18) 1,074.9	(18) 1,180.6
Total	(22) 3,338.4	(28) 5,446.9	(30) 4,601.8	(30) 4,082.2

NOTE: Bracketed figures indicate number of involved ports.

EXHIBIT 21

smaller ships). This opening also coincided with the opening of the Labrador iron mines which in turn provided a westward flow of iron ore, a backload for the large ships carrying the eastward grain. Thus was started what may now be designated as the "main-line" route of contemporary Great Lakes traffic, i.e., "grain-down and ore-back." Since this round trip cycle requires about 21 days with only two unloadings in this period, it is not surprising that most of the new vessels built in 1959 and in the early 1960's were "Seaway-sized bulkers." That is, they were large vessels, 730' long by 75' wide, or the maximum dimensions for the new Seaway canals, but they did not have the expensive additional equipment needed to unload without shore facilities (this self-unloading equipment is of limited use with grain cargoes anyway). The advent of these new ships with the improved canal infrastructure permitted the early retirement of considerable numbers of the 250' "canallers," the small bulkers which before 1959 carried the eastward grain between Kingston or Prescott (the eastward termini for the large upper lake ships) and the export ports of Montreal or Quebec. Thus, the number of canallers declined to 33 in 1965 from 103 in 1960 (Class I ships, Exhibit 22) while the number of Seaway-sized bulkers increased to 22 from one. With the number of ships in the other size categories remaining relatively constant, there was a reduction of 40 ships but an increase in the fleet carrying capacity of 41.4%. This attrition in the numbers of the smaller and usually older bulkers has continued until by 1976, there are only 81 ships but with total deadweight tonnage only slightly less than that of 1965.

Also, in the late 1950's and early 1960's, at about the time of the opening of the St. Lawrence Seaway but unre-

lated to it, there was also a general displacement of coal in favour of oil or gas for industrial and residential heating and for railways. This meant the end of many "canaller-sized" or slightly larger small "self-unloaders." These vessels had been designed to deliver relatively small cargoes of coal to many small ports that did not have shore-based unloading systems. Then by the middle 1960's, the use of coal increased for the steel mills at Hamilton and Sault Ste. Marie and for the several new Ontario Hydro power-generating stations. Since these cargoes involved vast quantities of coal to be carried on relatively short voyages of only 2-3 days round trip, the ships designed for these voyages were both of the full Seaway size and were equipped with self-unloading gear to minimize port time. These Seaway-sized self-unloaders were also used in the burgeoning stone and salt trades, at least for voyages where large quantities could be moved at one time to harbours able to accommodate these huge ships.

The net result of these retirements of the smaller and older ships and their replacement since 1959 with the Seaway-sized bulkers and self-unloaders was a reduction in the number of ships to 122 in 1970 from 186 in 1960, but with a 68% increase in carrying capacity as measured by total deadweight tons. (Exhibit 22.) This attrition in ships has continued until by the end of 1976, there were only 111 dry-bulk ships but with a total deadweight carrying capacity of 2,054,411 deadweight tons. The result of this modernization was that the "main-line" lake trades, that is the "grain-down, ore back" movements and the

SUMMARY OF NUMBER AND DEADWEIGHT TONNAGE DRY BULK VESSELS 1955, 1960, 1970, 1976

	Under 4500 DWT "Canallers"		4501-15000 DWT		15000-25000 DWT		Over 25000 DWT "Seaway-Sized"		Total	
1955										
Bulkers	122	371,101	45	358,679	17	320,161	-	-	184	1,049,941
Self Unloaders	12	27,716	3	19,600	-	-	-	-	15	47,316
Total	134	398,817	48	378,279	17	320,161	-	-	199	1,097,257
1960										
Bulkers	103	327,475	45	360,127	21	409,476	1	33,150	170	1,130,228
Self Unloaders	11	28,066	4	24,975	1	15,750	-	-	16	68,791
Total	114	355,541	49	385,102	22	425,226	1	33,150	186	1,199,019
1965										
Bulkers	33	119,650	52	447,265	23	443,164	22	588,922	130	1,599,001
Self Unloaders	8	21,145	8	63,570	3	55,200	3	76,221	22	216,136
Total	41	140,795	60	510,835	26	498,364	25	665,143	152	1,815,137
1970										
Bulkers	13	51,677	34	312,295	20	379,046	31	837,658	98	1,580,676
Self Unloader	1	3,210	10	95,278	6	127,274	7	204,738	24	430,500
Total	14	54,887	44	407,573	26	506,320	38	1,042,396	122	2,011,176
1976										
Bulkers	4	15,620	28	300,553	21	402,086	28	757,815	81	1,476,074
Self Unloaders	1	3,210	12	117,304	6	129,024	11	328,799	30	578,337
Total	5	18,830	40	417,857	27	531,110	39	1,086,614	111	2,054,411

Source: Canadian Merchant Fleet (Inland Waters) Water Transport Committee Reports.

EXHIBIT 22

cross-lake coal trades were served mostly by these large new ships with low unit operating costs. These permitted grain rates from Thunder Bay to the St. Lawrence ports to fall from 16¢ per bushel in the pre-Seaway year of 1958 to a low of 8¢ in 1969. In spite of the escalating costs, especially for fuel in the 1970's, these rates only reached 15½¢ by 1975. ((1), Page 79.)

However, these ships are supplemented in these trades by other ships of 10,000-25,000 deadweight tons. These latter ships also served much of the other trades which constitute significant proportions of the total (Exhibit 23). These include the grain shipments to the bay-ports, and from the lower Lake Ontario ports, the ore shipments from Picton and the smaller Georgian Bay ports and the more diversified salt, coal and miscellaneous trades. Many of these latter ships date from pre-World War II years and thus have a limited life expectancy. (Exhibit 24.) Since the freight rates for many of these trades are set by those of the Seaway-sized ships, the operators of these smaller ships claim that the possible revenues for these ships do not warrant their replacement even with a modern ship of lower operating, albeit with higher capital costs. Many of these ships are, in fact, "hand-me-downs." Some, like the "Royalton" of Scott Misener Steamships were once the pride of the Canadian upper lakes fleet of the 1920's, while others such as the "Pierson Daughters" of the Soo River Company fleet were once United States ore carriers. These latter vessels were displaced in their home fleets by the newer and larger ships. In fact several of the smaller Canadian lake operators which serve these fringe trades have built their fleets largely of

DIVISION OF GREAT LAKES DRY-BULK CARGOES BETWEEN MAIN-LINE AND OTHER TRADES, 1973

	Tons (000's)	Ton-Miles (millions)	Revenues $(000)
Grain			
Thunder Bay - St. Lawrence:	8,928	13,096	$29,634
Duluth Superior- St. Lawrence:	3,919	6,448	16,227
Ore			
St. Lawrence-Canadian ports:	5,236	3,833	6,526
St. Lawrence-U.S.A. ports:	12,649	15,019	20,504
Coal			
U.S.A. to Canadian ports:	18,750	4,505	18,007
Misc. Ore			
Thunder Bay to Canadian ports:	3,487	1,902	4,841
Duluth/Superior to Canadian ports:	2,016	1,864	4,047
Total "Large Ship" Cargoes:	54,985 (71%)	46,667 (79%)	$99,786 (70%)
Remaining Cargoes:	22,085 (29%)	12,092 (21%)	43,423 (30%)
Grand Total:	77,070	58,759	$143,209

Source: Compiled From Reference 1, Table 3. pp. 75,77.

EXHIBIT 23

CLASSIFICATION OF 1976 DRY BULK FLEET BY SIZE AND CONSTRUCTION DATE

	Under 4500 DWT		4501-15000 DWT		14001-25000 DWT		Over 25000 DWT		Total	
Before 1920										
Bulker	-	-	13	148,268	-	-	-	-	23	148,268
Self Unloader	-	-	6	56,566	-	-	-	-	6	56,566
1920-1929										
Bulker	-	-	8	109,265	-	-	-	-	8	109,265
Self Unloader	1	3,210	2	25,380	-	-	-	-	3	28,590
1930-1939										
Bulker	-	-	1	5,143	-	-	-	-	1	5,143
Self Unloader	-	-	-	-	-	-	-	-	-	-
1940-1949										
Bulker	-	-	-	-	1	18,010	-	-	1	18,010
Self Unloader	-	-	-	-	1	16,700	-	-	1	16,700
1950-1959										
Bulker	2	6,880	-	-	10	188,050	-	-	12	194,930
Self Unloader	-	-	2	19,323	1	17,376	-	-	3	36,699
1960-1969										
Bulker	2	8,740	4	23,927	10	196,026	28	757,815	44	986,508
Self Unloader	-	-	2	16,035	2	46,708	8	233,264	12	296,007
Since 1970										
Bulker	-	-	2	13,950	-	-	-	-	2	13,950
Self Unloader	-	-	-	-	2	48,240	3	95,535	5	143,775
Total										
Bulker	4	15,620	28	300,553	21	402,086	28	757,815	81	1,476,074
Self Unloader	1	3,210	12	117,304	6	129,024	11	328,799	30	578,337
	5	18,830	40	417,857	27	531,110	39	1,086,614	111	2,054,411

Source: Canadian Merchant Fleet (Inland Waters) Water Transport Committee Reports.

EXHIBIT 24

these smaller and displaced U.S. vessels. Each ship is purchased for several hundred thousand dollars, a fraction of its $20-25 million replacement cost. It is then modernized to some degree, thus providing work for Canadian shipyards, and operated for some years until it requires new boilers or some such major expenditure. Since the economics of the trade do not warrant this expenditure, the ship is then scrapped and replaced by some similar second-hand ship. The use of such ships, contrary to some opinions of Canadian shipyard spokesmen, is not to be deplored. Their presence under the Canadian flag provides considerable employment for Canadians, both aboard ship and in the shipyards. Without these ships, the traffic might not move by water. Also, they permit certain shippers bulk freight transportation at extremely low rates. The only problem is that this pattern of ship supply cannot be indefinitely continued. As we have seen, the new large ships on the main-line trades often cannot enter the harbours served by these smaller older ships. Thus, the future of some mines and quarries, which depend upon low lake transportation, is in jeopardy. (The stone quarry at Kelly Island, Ohio, reportedly was forced to close a few years ago following the sinking of the last ship small enough to serve it. Wallaceburg, an Ontario port, is now similarly concerned about its ship supply.) The solution to this foreseen problem is not clear. In some cases, the life expectancy of the mine or quarry is comparable to that of the ships and thus the trade may

vanish from the lakes, as has the pulpwood, local coal and other former trades. In other cases, the cargo may move by rail or highway. However, in this regard, concern has been expressed by some planners in the Ontario Ministry of Transport and Communications about eventual road and railway congestion in southern Ontario. Thus, it would appear, where possible, that it is desirable to keep these bulk cargoes on the lakes. To do this will be difficult and the following approaches are recommended:

(i) that shippers, union and government officials be made aware of this problem.

(ii) an effort be made to develop new technology such as highly automated small engine rooms and/or some form of tug and barge units.

(iii) direct encouragement by Federal officials to give adequate financial encouragement for Canadian shipowners to enter deep-sea trades. While the 730′ Seaway-sized ships are not designed for ocean use, some of the smaller lake ships are. These latter vessels could then integrate these "fringe" lake services with certain ocean and coastwise services and thus spread their capital costs over twelve rather than nine months of the year. Such extended utilization could help bring their per revenue ton-mile costs to a level near that of the lake-restricted 730′ ships.

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