

Economic Viability of the Great Lakes-St. Lawrence Seaway System with Particular Reference to the Growth Potential of Burns Waterway Harbor, Indiana

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Historical traffic on the Great Lakes-St. Lawrence Seaway System is presented, along with a projection showing traffic growth to the year 2000. Burns Waterway Harbor, Indiana, the newest (1973) and most modern deepwater harbor located on Lake Michigan 30 miles east of Chicago, is shown to have experienced more rapid traffic growth (1979-1981) than the Seaway System generally. This has been because of the ability of port management to attract new, replacement cargoes. The future growth and development of Burns Harbor (and in most cases that of the Great Lakes-St. Lawrence Seaway as a whole) will be affected by success in expanding the navigation season, Seaway tolls, relaxed federal regulatory environment for domestic surface transportation, permission for greater cooperative action among water carriers in the conference structure, inland waterway user charges to develop and maintain ports and waterways, and the changing role of state and federal governments. The Staggers Rail Act of 1980 has had an adverse effect on PL 480 relief cargo at Burns Harbor, at least initially. The Indiana Port Commission should identify a set of ground rules for further port development that are most likely to yield the maximum economic benefit to the state.

Economic viability and growth potential studies usually start with an overview of the area to be considered, bringing to light such matters as the size and characteristics of the population, a description of the labor force including type of employment, manufacturing value added by industry, and so forth. In transportation studies such as this, where the focus is on a particular facility, Burns Waterway Harbor, Indiana (Burns Harbor), the overview should include both a definition and description of the trading area.

Barriers and impediments to trade--called challenges to further development by some--exist everywhere as the result of laws, regulations, trade practice, and sometimes can be explained only by history. The task of the researcher is to come up with some suggestions that will improve the position of the study subject, here Burns Harbor. The material is presented below in three sections: overview of the Burns Harbor trading area; activity at Burns Harbor; and barriers, impediments, or challenges to traffic growth.

OVERVIEW OF THE BURNS HARBOR TRADING AREA

The trading area of Burns Harbor encompasses the industrial and agricultural producing areas of the Midwest (see Figure 1). Although this 19-state region generates about 25 percent of the entire U.S. export general cargo traffic, only 5 percent of the country's general cargo exports move by the Great Lakes-St. Lawrence Seaway System (1, p. I-3). Another study points out that growth in Great Lakes-St. Lawrence Seaway traffic has lagged growth in the standard economic indicators for the entire country. Thus, there was a 1.38 percent average annual decrease from 1968 to 1975 in total U.S. foreign commerce moving through the Great Lakes. During that period the U.S. gross national product increased at an annual rate of 1.92 percent, and total annual U.S. exports of dry cargoes increased at a rate of 5.03 percent (2, p. 2-5). It was also demonstrated that the Great Lakes region was experiencing growth but at a slower rate than other sections of the country.

Traffic on the St. Lawrence Seaway has been growing over the years, as shown in Table 1 (3, pp. 72-73), but growth has been uneven and subject to wide fluctuations from year to year. This is because most of the Seaway traffic is in bulk commodities the movement of which is frequently tied to the health of particular industries or directly influenced by international political objectives of the United States. Depressed economic activity levels and Russian grain embargoes imposed by the United States for political purposes affect Seaway traffic directly. Grains are no longer exported in the same quantities; and ores, ore concentrates, limestone, and coal are not moved in the former quantities because of the economic recession.

One study predicts relatively stable growth in both upbound and downbound traffic on both sections of the Seaway to the year 2000. The results of this study are shown in Table 2 (4, p. 1). Within this overall positive forecast, fluctuations can be expected to continue from year to year.

TODAY'S ACTIVITY AT BURNS HARBOR

Burns Waterway harbor is the newest and most modern deepwater harbor on the Great Lakes. It started operations in 1973, and it is located on the shore of Lake Michigan about 30 miles east of Chicago; it was specifically designed and built for St. Lawrence Seaway traffic. Unlike Chicago and other Great Lakes ports there are no bridges, restrictive channels, or other hazards to navigation. Freighters approach through open water and can dock under their own power without tug assistance. Modern sprinkler-equipped transit sheds are available, and around-the-clock security is provided by a specially trained contingent of the Indiana State Police.

As shown in Figure 2, public berth space for eight freighters is available in three docking areas. More than 300 acres are available for further expansion at the port. Midwest Steel and Bethlehem Steel adjoin the port to the west and east and have their own private, proprietary shipping and handling facilities. The port is adjacent to I-94 with connections to I-80, I-95, and I-65. This provides unobstructed access for inbound and outbound motor carrier freight of all kinds of bulk and general merchandise. The port is now served by a single railroad, Conrail. A spur of the South Shore Line serves the Bethlehem steel plant on the east, and the tracks of that line (part of the CSX System) parallel those of Conrail. These rail lines currently have no access to the port.

Traffic has been growing more rapidly at Burns Harbor than for the Seaway as a whole in recent years. Here again, most of the traffic is in bulk commodities tied to particular industries or economic activities. Burns Harbor has been able to develop new or replacement cargoes to make up for the loss of particular cargoes due to changes in U.S. and world economic and political situations. Thus, from 1979 to 1980 there was a dramatic drop in steel imports from 273,978 tons to 63,019 tons--a

Figure 1. St. Lawrence Seaway System.

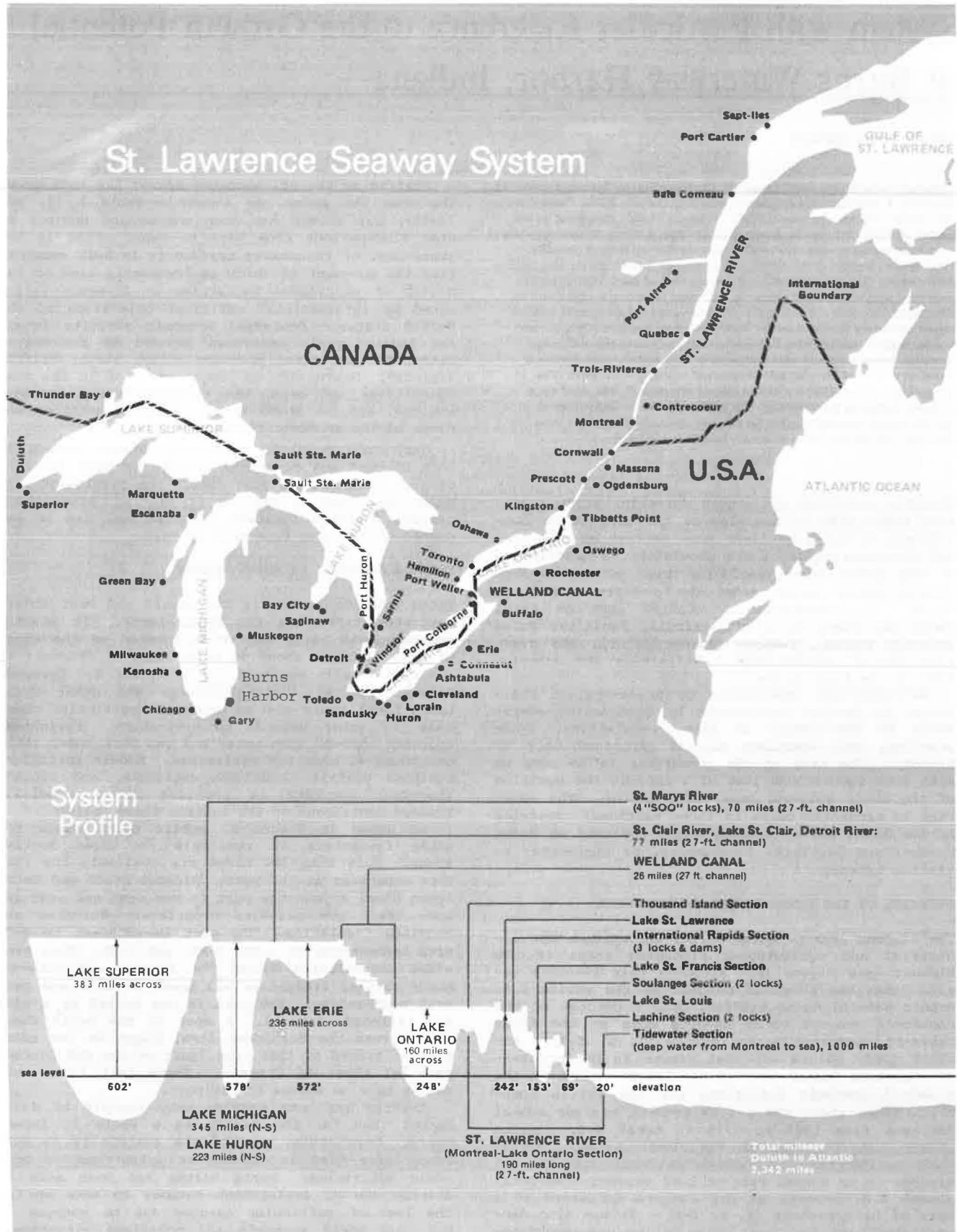


Table 1. Traffic on the St. Lawrence Seaway (tonnage for selected years).

Traffic	1960		1965		1970		1975		1980		1981	
	Tons	Per-centage of Total	Tons	Per-centage of Total	Tons	Per-centage of Total	Tons	Per-centage of Total	Tons	Per-centage of Total	Tons	Per-centage of Total
Montreal-Lake Ontario Section: Tonnage for Selected Years												
Total tonnage	18,425,235	100.0	39,356,271	100.0	46,421,434	100.0	43,554,303	100.0	49,454,109	100.0	50,569,257	100.0
Direction												
Upbound	7,966,552	43.2	20,062,880	51.0	22,872,888	49.3	19,899,874	45.7	14,925,615	30.2	18,822,201	37.2
Downbound	10,458,683	56.8	19,293,391	49.0	23,548,546	50.7	23,654,429	54.3	34,528,494	69.8	31,747,056	62.8
Type												
Bulk	16,380,534	88.9	34,294,717	87.1	40,481,680	87.2	40,272,182	92.5	46,775,186	94.6	47,098,991	93.1
General	2,044,701	11.1	5,061,554	12.9	5,939,754	12.8	3,282,121	7.5	2,678,923	5.4	3,470,266	6.9
Origin or destination												
U.S.	10,219,772	42.1	24,647,367	45.0	28,160,584	43.8	26,053,713	43.1	25,648,162	38.9	28,936,751	41.0
Canada	14,010,289	57.8	30,103,635	55.0	36,164,931	56.2	34,397,147	56.9	40,347,121	61.1	41,713,974	59.0
Welland Canal Section: Tonnage for Selected Years												
Total tonnage	26,534,870	100.0	48,461,969	100.0	57,118,846	100.0	54,294,121	100.0	59,605,981	100.0	58,850,875	100.0
Direction												
Upbound	7,595,598	28.6	18,097,086	37.3	19,208,782	33.6	17,137,559	31.6	11,986,348	20.1	16,601,880	28.2
Downbound	18,939,272	71.4	30,364,883	62.7	37,910,064	66.4	37,156,562	68.4	47,619,633	79.9	42,248,995	71.8
Type												
Bulk	24,818,852	93.5	44,198,339	91.2	51,806,382	90.7	51,542,946	94.9	57,910,302	97.2	56,084,190	95.3
General	1,716,018	6.5	4,263,630	8.8	5,312,464	9.3	2,751,175	5.1	1,695,679	2.8	2,766,685	4.7
Origin or destination												
U.S.	19,593,773	48.0	37,186,510	49.1	41,738,376	47.5	37,769,520	45.7	39,039,892	43.8	39,012,418	43.9
Canada	21,252,598	52.0	38,576,957	50.9	46,141,529	52.5	44,957,094	54.3	50,189,988	56.2	49,828,323	56.1

Note: Information was taken from (3), pp. 72 and 73.

Table 2. St. Lawrence Seaway System: forecast of traffic 1985-2000.

Year	Total Traffic (million tonnes)					
	Upbound		Downbound		Total	
	MLO ^a	Welland ^b	MLO	Welland	MLO	Welland
1978-1980 ^c	21.20	17.80	32.50	46.10	53.70	63.90
1985	23.67	19.67	36.55	49.90	60.22	69.57
1990	25.59	21.10	41.29	54.65	66.88	75.75
1995	25.90	21.97	46.46	60.94	72.36	82.91
2000	27.79	23.69	52.34	65.96	80.13	89.65

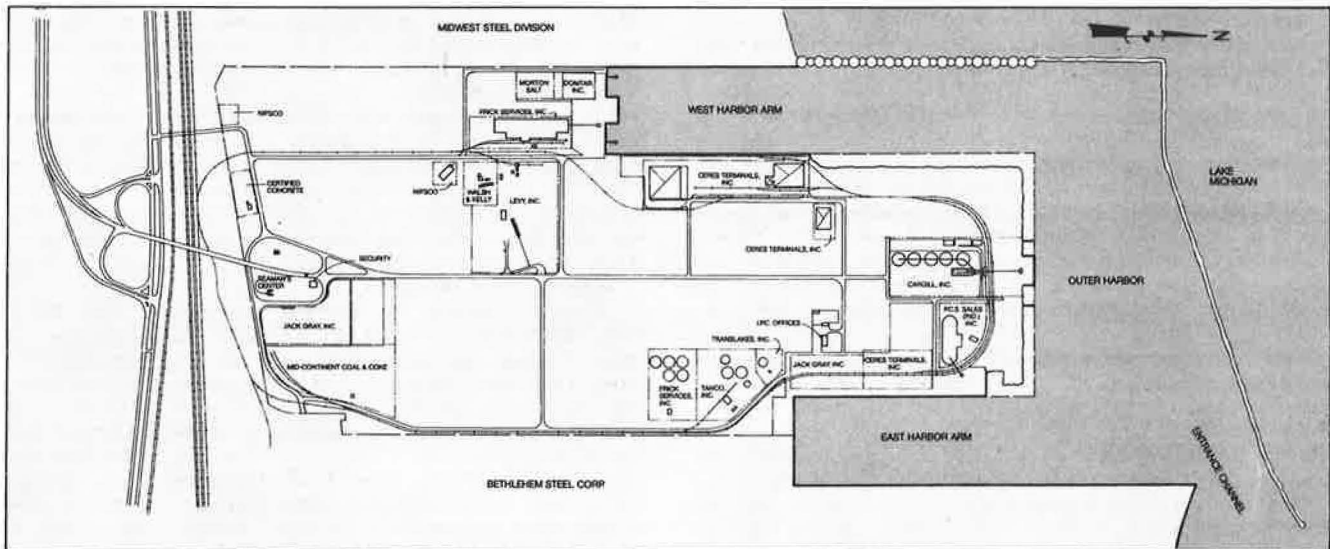
Note: Source of this forecast is (4).

^aMontreal-Lake Ontario Section.

^bWelland section.

^cActual average.

Figure 2. Burns Waterway Harbor, Indiana.



loss of 210,959 tons which was almost 20 percent of all 1979 cargoes (see Tables 3 and 4). This was more than made up by the introduction of 126,898 tons of potash (new cargo to Burns Harbor in 1980) and an increase from 216,877 tons of slag and fly ash in 1979 to 370,157 tons in 1980. Slag and fly ash traffic declined in 1981 even more than steel imports had dropped the year before, but it was made up by 182,928 tons of grain (a new cargo to Burns Harbor in 1981), substantial growth in potash, and a sizable increase in liquid fertilizer and caustics.

Clearly, the success of Burns Harbor to date has been the development of a number of specialized bulk cargoes, many of which are associated with processing and storage facilities within the port complex itself. General cargo, including PL 480 relief cargo discussed in more detail below, has played a minor role particularly in terms of revenue to the Indiana Port Commission which must have earnings adequate to cover the maintenance and operations expenses of the port.

BARRIERS, IMPEDIMENTS, OR CHALLENGES TO TRAFFIC GROWTH

There are a number of barriers or impediments--some people prefer to say challenges--to the future growth and development of Burns Harbor. Some of these exist as limitations on the St. Lawrence Seaway System, and some are unique to Burns Harbor. These will be discussed in turn, not necessarily in order of importance and impact on Burns Harbor.

Limited Navigation Season

The current shipping season on the Seaway System is limited to the 8.5 months of the year when the system is free of ice and open to navigation. This limited navigation season discourages vessel owners from committing vessels to a service on the Seaway System (including Burns Harbor) because it means a 3.5 month lay-up of their vessels, a period when their investment is unproductive. As long as there are other trades in which they can operate their vessels year round, the Seaway is a less competitive and less efficient use of their investment. The lack of stability that results from the limited navigation season and the unwillingness of vessel owners to commit ships to the trade on regular scheduled service, year in and year out, discourages shippers from using Burns Harbor. An expanded navigation season for the Seaway has been studied. There is little doubt that such an extension would encourage ship owners to dedicate vessels to the Seaway trades, including Burns Harbor (5).

Voyage Times

All things being equal, equivalent voyages between U.S. east coast ports and ports in western Europe can be made in less time than voyages from ports west of the Welland Canal on the Seaway. The difficulty with such comparisons is that voyages are rarely equivalent. It is therefore difficult to generalize--each voyage must be looked at individually.

Generally a sailing from the Great Lakes calls at more ports than a sailing from the east coast. A cooperative effort among ports on the Lakes to reduce the number of ports at which calls are made is in the planning stage. The difficulty with this approach for Burns Harbor is that, in such planning, it is considered a tributary port to Chicago (2, p. 5-8) and no vessels would call there. It is hard to see how this effort would add significantly to the revenues for Burns Harbor.

Table 3. Cargo comparison for Burns Waterway Harbor 1979-1981.

Cargo	1981 (%)	1980 (%)	1979 (%)
Incoming	46	48	71.3
Outgoing	54	52	28.7
Foreign, including	65.6	50.3	58
Canadian			
Domestic	34.4	49.7	42
By ship	66.2	74.2	70
By barge	33.8	25.8	30
Type			
Bulk dry	56.8	67.8	43.7
General	19.8	13.1	37.7
Container	0.1	0.3	0.3
Bulk liquid	23.3	18.8	18.3

Note: Information was obtained from Indiana Port Commission, Portage (6).

Table 4. Cargo for Burns Waterway Harbor 1979-1981 (tons).

Class	1981	1980	1979
Steel	218,471	63,019	273,978
Slag and fly ash	100,886	370,157	216,877
Liquid fertilizer and caustic	314,751	230,717	210,013
General	20,672	45,764	82,220
Pig iron	80,142	38,681	55,780
Cobble plate	2,492	38,403	47,725
Coke	55,028	142,482	177,303
AID (PL 480)	26,877	17,722	30,896
Coal	8,734	-	-
Scrap metal	22,883	28,859	19,535
Scrap motors	2,421	7,000	16,143
Salt	33,091	92,825	15,100
Flux stone	-	2,785	-
Grain	182,928	-	-
Potash	276,289	126,898	-
Total	1,345,665	1,205,312	1,145,570

Note: Information was obtained from Indiana Port Commission, Portage, (6).

Comparative Transportation Costs

The subject of comparative costs for export shipments from Great Lakes ports, including Burns Harbor, and from Atlantic Coast ports must, today, be approached with a great deal of caution. As recently as 1972, a consultant's study prepared for the Indiana Port Commission demonstrated that the combination of inland rail and truck rates plus ocean freight to western European ports was often less for shipments originating in the Midwest when routed via Burns Harbor than when routed via New York or Baltimore (1, p. 3-1). Much was made in the study of the transportation cost advantage of the Burns Harbor routing.

The Burns Harbor cost advantage for those export shipments where it was found to exist was based on rail and water carrier port equalization policies then in practice. This cost advantage was simply the difference between the higher rail or truck rate to New York from the Midwest origin and the lower rail or truck rate from that origin to Burns Harbor, a much shorter distance.

This situation has changed markedly. The Staggers Rail Act of 1980 deregulated the railroads to some degree and gave them new pricing flexibility, free from regulation by the Interstate Commerce Commission. In addition new legislation introduced in the Congress will, when enacted, give international water carriers much greater freedom to price and operate in concert, free from the operation of the antitrust laws. Finally legislation is pending that would reverse the role of the federal government in the development and maintenance of ports and waterways by imposing user charges, and there is pressure

Table 5. Rail rates from origin to port (dollars per hundredweight).

Supplier (Origin of Cargo)	Burns Waterway Harbor		Chicago		Milwaukee		U.S. Gulf Ports	Mississippi River Ports
	New Rate	Old Rate ^a	New Rate	Old Rate ^a	New Rate	Old Rate ^a		
Lauhoff (Crete, Neb.)	1.82	1.76	1.37	1.49	1.37	1.49	1.37	1.37
CONAGRA (Omaha, Neb.)	1.55	1.26	1.06	1.26	1.06	1.26	1.37	1.37
ADM, Cereal Foods, International Multifoods (North Kansas City, Mo.)	1.98	1.26	1.06	1.26	1.37	1.26	1.26	1.26
CONAGRA (Minneapolis, Minn.)	1.74	1.04	1.25	1.04	1.25	1.04	3.18	2.64
Lauhoff (Danville, Ill.)	0.73	0.60	0.60	0.55	1.12	1.03	1.53	1.37

Note: Information was provided in a letter from Christos N. Kritikos, President, Ceres Maine Terminals Inc., to Honorable Adam Benjamin, Jr., Member of Congress, dated February 6, 1982.

^aRates in effect before Conrail's cancellation of joint rates.

for the states to undertake a greater role in financing public works--the New Federalism. The forces for change that these new developments have unleashed are only beginning to be felt and understood. Each subject merits careful attention.

Rail Deregulation

The cancellation by Conrail of its participation in making joint rail rates with western railroads for cargo originating west of Chicago has already affected Burns Harbor. In making a joint rate with a western road, Conrail received a small proportion of the total rate because (a) the cargo did not originate on its line and (b) the length of haul on Conrail was, typically, only a few miles (Burns Harbor is only 30 miles east of Chicago). Congress has told Conrail it must become profitable or be sold. The Staggers Act gave Conrail the authority to cancel its participation in joint rates when it believed its share of the division was not large enough to meet its standards for profitability; this it did. Rates quoted today are the sum of two local rates, the western railroad's to its interchange with Conrail and Conrail's local rate from the interchange to Burns Harbor. Together the rate is higher than the old joint rate and high enough to take Burns Harbor out of the competition for PL 480 relief cargo routed by the Department of Agriculture standard of "lowest landed cost."

In addition rail rates to Chicago and Milwaukee, ports that compete with Burns Harbor, have been reduced from previous levels from some shipping points (Table 5). Therefore, not only has the rail rate to Burns Harbor been increased but the rate to competing ports has been reduced. Railroads have also established train loading stations in Indiana where unit train loads are accumulated (100 cars or more for low-cost rail transportation to east coast ports for export). These practices, encouraged by the Staggers Act to help the railroads, have adversely affected export shipments from Burns Harbor of grains originating in Indiana.

The foregoing discussion suggests that Burns Harbor might benefit if served by another railroad in addition to Conrail. The Indiana Port Commission is aware of this and is attempting to do something about it.

Seaway Tolls

No discussion of comparative transportation costs would be complete without consideration of the toll charges against vessels and cargoes for using the St. Lawrence Seaway System (which ranges from about \$1.00 to \$2.50 per ton). Present law requires the St. Lawrence Seaway Development Corporation to charge tolls that cover its costs of operation.

The whole question of federal government waterway user charges--for deepening existing harbors, new construction, maintenance, and operation conducted by the U.S. Army Corps of Engineers and for some services provided by the U.S. Coast Guard--has been under debate by Congress during 1980, 1981, and 1982. So far there has been no new legislation. Tolls on the Seaway System may be affected by what Congress ultimately decides to do about user charges for waterways in general. There is no question, however, that the current toll is an added cost to shippers for use of the Seaway System.

New Services and New Maritime Policy

In "The Requisites for Recovery," 1981, the Great Lakes Task Force argues that the growth and development of the Great Lakes area is held back because of the failure of policies of the federal government to provide adequate shipping services on the St. Lawrence Seaway System. It argues that billions of public tax dollars are spent to build and operate the American flag merchant marine, virtually none of which has benefited the Seaway and the Lakes. Of 1,400 American flag sailings from all American coastlines in 1980, only five sailings originated from or terminated at all Great Lakes ports combined--the nation's legally constituted fourth coast. Because of the lack of American flag sailings from the area, cargo preference laws, which require a certain percentage of some government cargoes to be carried in American bottoms, prescribe that such cargoes originating in the Great Lakes area be routed via Atlantic and Gulf ports where American flag vessels are available. The task force also advocated, among other things, changes in the availability of operating and construction differential subsidies that would make Great Lakes cargoes attractive to American flag vessels.

A fundamental difficulty with these proposals stems from the way the trades between the North Atlantic/Gulf and western Europe/Mediterranean trades are developing. First the shift has been, and continues to be, toward more and more containerization. Vessels developed and under construction for these trades are large containerships--2,000 to 3,000 TEU (20-foot container equivalents). These large, fast ships are powered by low-speed diesel engines that are quite fuel efficient. They call at as few ports as possible on fast turnaround schedules that are dictated by the huge investment and desire for maximum productivity.

The vessels are too large for the Seaway and would have to be fed by a laker service. This would require establishment of a container terminal that would accumulate enough cargo to make a call by the large containership worthwhile. It would have to be price competitive with the container traffic now

moving by rail from the U.S. Midwest to Montreal and Halifax for deep-water loading. Such a feeder service was established on the Great Lakes exclusively for container trades, without U.S. maritime subsidy, but was abandoned as unprofitable at the end of the 1980 shipping season.

A final development must be noted even though the ultimate effect is largely unknown (as in the case of rail deregulation, tolls and user charges, and larger containerships). U.S. maritime policy is undergoing major changes. In an effort to reduce operating subsidies in foreign trades, legislation has been introduced in Congress (1982) that would partly free liner operators from the antitrust laws and allow them to pool operations and revenues among conference members more freely than they are allowed to do today. Although no final legislation has been passed, the general effect of this new policy is clearly to reduce competition in foreign commerce. History shows such arrangements typically result in less service while maintaining prices to make operations more profitable. That same history also shows that such practices often invite nonconference competition offering lower than conference rates, particularly if the conference is successful in keeping its rates high. Such a situation, should it occur, might attract new services to the Great Lakes where there are no conferences.

The Changing Role of Government

Mention was previously made of Seaway tolls and the possibility of waterway user charges for services provided by the federal government. If enacted these would, in effect, shift expenditures, in whole or in part, for public works from the general tax fund to the waterway users. Rates would go up and waterway transportation might be less competitive with other surface modes than before.

The changing role of government will affect Burns Harbor day-to-day operations and, more important, will affect the rules of the game which define how, when, and where port development can take place. These changes may bring new barriers and challenges, but they may also present new opportunities. It will not be possible to ignore them even though it is not possible at the moment to determine what will happen or what the effect will be.

Optimizing the Total Economic Benefits of Burns Harbor

Positive economic effects or benefits are both direct and indirect (or induced). Wages paid stevedores to handle general cargo processed or manufactured elsewhere create more direct benefit to the state of Indiana when they are in addition to the dockage and wharfage fees collected for the mooring of ships and the handling of bulk cargoes. However, bulk cargoes (and general cargoes as well) may be part of a local processing or manufacturing activity, possibly carried on at the port itself; this provides jobs and investment in plant and equipment--more economic benefit. Beyond the direct benefits of wages paid at the port, dockage, and wharfage revenues is the indirect economic benefit determined by how these moneys are spent. Also, the processing or manufacturing may use local goods and services thus generating additional economic benefits.

Burns Harbor is an economic resource of the state of Indiana, one which provides the state positive economic benefits well beyond the direct impact of the port operation alone (6). The Indiana Port Commission has limited resources to develop new cargoes for the port simply as cargoes or to further develop

land for processing and manufacturing facilities that would provide new cargoes. Where a choice is to be made among several possible projects, the objective should be to maximize all positive economic benefits to the state, both direct and indirect. It is often difficult to quantify these benefits among projects competing for Indiana's financial support, but a careful analysis should be worth the effort.

SUMMARY AND CONCLUSIONS

Traffic on the Great Lakes-St. Lawrence Seaway System is predicted to grow every year to the end of the century, primarily in bulk cargoes. The traffic growth rate at Burns Harbor exceeded that of the Seaway System in the years studied (1979-1981). Burns Harbor's superior performance resulted from the ability of port management to attract new, replacement cargoes. Much of this cargo is processed and stored at facilities at the port.

Trade on the Great Lakes-St. Lawrence Seaway System suffers from the lack of scheduled, reliable services by vessels dedicated to the Seaway. In addition railroad deregulation has, at least initially, adversely affected the movement of PL 480 relief cargoes, and possibly other cargoes, at Burns Harbor.

Possible increases in waterway user charges for services provided by federal government agencies, proposed changes in the role of state and federal government in financing public works, and changes in maritime policy and ocean liner services provided by conference carriers--in addition to rail deregulation--will affect growth and development at Burns Harbor, not necessarily adversely.

Several proposals are currently under study to expand trade at the port that will enhance the positive economic benefits the port already provides the state of Indiana. These require further study and follow-up, as does the development of a set of ground rules that would indicate the kind of port development activity most likely to yield the maximum economic benefit to the state.

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