Analysis of Probable Impacts of Users' Fees on Minnesota's Great Lakes Shipping

M.W. NEWSTRAND AND STEPHEN THORP

Proposed user charges present perplexing questions of economic impact on major bulk commodity movements and for individual ports on the Great Lakes. Minnesota has a major stake in Great Lakes shipping, and user fees in whatever form will create additional difficulties for the state's commercial navigation activities. Full recovery of U.S. Army Corps of Engineers operations and maintenance expenditures on the Great Lakes would result in a substantial increase in the cost of Minnesota-Great Lakes shipping. This analysis based on a site-specific, per ton charge and applied to Minnesota's share of principal bulk commodity traffic on the Great Lakes indicates that the annual cost recovery burden for the state would amount to more than \$22 million. Among the major bulk commodities affected, iron ore and ore concentrates and grain would incur more than 95 percent of the total projected user charges. Increases in ore transportation costs related to user fees would increase domestic steel prices and make foreign steel more competitive in U.S. markets. As a consequence, U.S. ore production may decline. The additional grain transportation costs resulting from user fees would complicate the marketing situation for Upper Midwest grain producers and merchants especially when combined with increased St. Lawrence Seaway tolls. Another consequence for grain movements may be diversion to other transportation modes or other ports.

In recent years, there has been a growing move to create new user fees for commercial navigation in the United States. In 1980 the first tax ever imposed on the shallow draft inland river system was implemented. Since then additional taxes and new charges for deepwater systems including the Great Lakes have been proposed. User fees are not new to commercial shipping on the Great Lakes-St. Lawrence Seaway system, however. Since the opening of the Seaway in 1959, ships have been paying fees to move through the system. The fees include vessel and cargo tonnage tolls, pilot fees, and handling charges. Seaway charges are scheduled for increases and include new lockage fees for the Welland Canal.

In addition to escalating Seaway tolls there are also proposals for adding user fees intended to recover U.S. Army Corps of Engineers expenditures for operations and maintenance (O&M) and, in some cases, costs of new construction on the Great Lakes (U.S. Senate S.809, Deep Draft Recovery). This cost recovery would be for expenditures made at ports, locks, and in the connecting channels of the system. Many other proposals for deep draft user fees are being considered by the Congress. One innovative approach intended to maintain stability within the deep draft port system entails a nationwide, uniform fee. Other ideas that have received attention include an assessment procedure for Canadian vessel traffic on the Great Lakes that uses U.S. maintained segments, eliminating all U.S. Seaway tolls as part of a deep draft user fee, and tapping customs revenue to help defray federal navigation expenditures.

A major consideration is the need for careful attention to the structure and scope of the charges. For example, a flat fee applied to harbor, channel, or lock transit would discriminate against the smaller vessels and impose a penalty on empty vessels. A fee involving multiple assessments would be burdensome to domestic shipments that must pass through connecting channels or use transshipment terminals. A fee based entirely on tonnage would not account for commodity value and has the potential for charging a high fee for a low value shipment. On the other hand commodity value taxes if based on a port-specific plan would be inequitable for ports that handle a large proportion of low value shipments.

Another issue in the tax proposal is the recovery of costs incurred in Corps operations that are not directly attributable to commercial navigation. Corps budget items such as marinas and visitor center operations cannot logically be placed in the commercial navigation column. Although this expenditure for the Great Lakes is not as large an element of total Corps expense as it is for the river system, it is, nevertheless, important. Another cost allocation consideration is the cost of complying with environmental regulations that create additional expenditures for dredging operations. It is important that these costs be allocated among all of the users according to their respective benefits.

The imposition of user fees will raise shipping costs throughout the Great Lakes system. The probable impact of a Great Lakes cost recovery program on Minnesota's commerical shipping is assessed in this paper.

GENERAL METHODOLOGY

A proposal for full recovery of Corps O&M costs on the Great Lakes provides the basis for determining the potential user charges presented in this analysis. In the method used, Corps expenditures for a specific site were divided by the annual tonnage at the assessment point. This tonnage charge was applied to Minnesota's share of major bulk commodity traffic throughout the Great Lakes. Each year the tonnage charge would have to be revised to reflect changes in O&M expenditures and the tonnage base. The Corps expenditures used in this study are those associated with the ports, connecting channels, and locks that are used by most Minnesota-Great Lakes vessel traffic.

For this analysis, only Corps O&M expenditures were included. Capital costs for new or rehabilitation construction programs are difficult to forecast and are not included. Also, recovery of Coast Guard costs is not included. There is no doubt that recovery of such costs would increase user fees for the specific project area.

Data for Corps O&M expenditures used in the analysis are for fiscal years 1980 and 1981 (U.S. Army Corps of Engineers North Central Division data for 1979-1981). In addition to these data, 5-year (FY 1977-1982) average O&M costs were used; FY 1982 is a Corps projection. This information was obtained from a 1981 document, "Cost Recovery Analysis," prepared by the staff of the Senate Subcommittee on Water Resources, and from the Senate Committee on Environment and Public Works, Report on National Harbors Improvement and Maintenance Act of 1981. The most current tonnage figures available for the analysis were from the U.S. Army Corps of Engineers (1) (see Table 1), and port-to-port movement statistics were made available from the Corps' North Central Division.

Total assessment of this problem is not feasible because of the great number of potential Minnesota-Great Lakes commercial navigation connections. Nonetheless this survey includes the major bulk commodity shipments originating in the state and ac-

Table 1. Major bulk commodity tonnage for Minnesota commercial ports (1) (short tons, 1978).

Port	Raw or Pelletized Iron Ore	Grain [®]	Coal	Cement and Limestone	Fresh Fish
Duluth-Superior	28,975,319	10,171,691	4,019,807	1,708,379	1,071
Two Harbors	10,517,247				16
Silver Bay	10,828,845		288,546		25
Taconite Harbor	9.809.054		341.567		
Grand Marais			64 849 6 6 6		132
Total	60,130,465	10,171,691	4,649,920	1,708,379	1,244

Grain category includes ollseeds.

Table 2. O&M expenditures for Minnesota, Lake Superior ports, Soo Locks, St. Mary's River, Detroit area channels, and selected lower lake ports (dollars).

	Operation and Maintenance				
Site	1 Year ^a	5-Year Average ^b			
Duluth-Superior	2,170,000	2,508,300			
Two Harbors	45,000	46,400			
Grand Marais	11,000	28,900			
Soo Locks and St. Mary's River	8,922,400	NAC			
St. Clair River	728,000	755,500			
Lake St. Clair	237,000	514,000			
Detroit River	8,187,000	13,984,800			
Cleveland	6.003.000	14.130.100			
Buffalo	1,835,000	2.068.600			
Calumet Harbor, River	529,000	1.085.600			
Indiana Harbor	281,000	156,600			
Burns Waterway Harbor	1.002.000	546,700			
Ashtabula	NA	608,600			
Conneaut	NA	474,100			
Toledo	NA	3.519.600			
Huron	NA	379,800			
Lorain	NA	2,011,200			

⁸O&M for Minnesota ports, Soo area, and Detroit area channels is for FY 1981; hower take ports is FY 1980. 1977-1982 is reported in 1982 constant doitars. "NA indicates that cost data were not available.

counts for more than 90 percent of Minnesota-Great Lakes traffic. Minnesota ports that are essentially recreational in nature were not included. The proportionate shares of O&M costs for Minnesota are given in Table 2; these costs can vary widely on a geographic basis and also over time. For example, the naturally deep harbor at Two Harbors, Minnesota, has been maintained at an average annual (1977-1982 average) expense of \$46,000 compared with \$14,130,000 for the Cleveland, Ohio, harbor (U.S. Senate, "Cost Recovery Analyses"). The high cost for Cleveland is largely attributable to the regular dredging of the Cuyahoga River and breakwater maintenance. Variable conditions affecting sediment accumulation and the undertaking of major dredging as well as special maintenance projects can cause O&M costs for a particular year to differ substantially from avereage figures. It is emphasized that this variability will be reflected in fluctuations in costs and potential user fee levels; and, therefore, any effort to estimate recovery costs will be subject to this inherent uncertainty.

Canada-to-Canada traffic was not included in the tonnage base from which the user fee was derived because most current user fee proposals exempt it. As a consequence the cost-recovery burden for U.S. connecting channel traffic is somewhat higher than it would have been if the Canadian shipments had been included.

Because a few bulk commodities make up nearly all of the Great Lakes traffic, it was not considered necessary to project a user fee for small tonnage commodities; however, they probably would be

charged. The result of this approach is that in this study complete O&M recovery is distributed over most of the traffic but not quite all of it. Even if all of the traffic had been included, the difference in the increased user fees for each bulk commodity would not have been significant. For Minnesota-Great Lakes traffic, five principal bulk commodities were considered: ore, grain, coal, cement, and limestone. These commodities comprise 98.7 percent of the tonnage moving on Lake Superior to and from Minnesota ports. A sixth commodity, fresh fish, has been included to determine the impact of a user charge on Grand Marais, Minnesota, where fish was the only reported commodity for a Corps-maintained harbor for 1978. Although current overall traffic levels, particularly for ore and grain, are running below those of 1978, the figures (when compared with historic averages and certain government study projections) represent a reasonable basis for projecting the future impact of user taxes.

Table 3 gives possible annual user fees for Minnesota origin and destination traffic based on 1- and 5-year average O&M costs from Table 2. Also given in Table 3 are the user fees for Minnesota vessel traffic that would accrue under a partial (25 percent) cost recovery user fee program that incorporates a tax cap of 6.9 cents per ton. The purpose of presenting fees calculated from 1- and 5-year average O&M costs was to show single year variation from a multiple year average and thereby demonstrate that user fees are likely to fluctuate annually. It should be noted that variations in annual tonnage will probably cause even greater fluctuations in user fee levels.

Raw and Pelletized Iron Ore

Minnesota ore and taconite pellet shipments from the North Shore to other Great Lakes ports would incur substantial user fees. In this analysis of full cost recovery, annual user fees assessed against Minnesota based ore traffic would comprise more than four-fifths of the total Minnesota Great Lakes user fee of about \$22.4 million, or an average additional transportation-related cost of 31 cents per ton of ore.

Minnesota ships more iron ore and concentrate than any other state. In 1978 Minnesota shipped more than 60 million tons or about 73 percent of the total U.S. ore transported by water (2). Nearly all Minnesota ore is hauled by unit train from northeastern Minnesota mines to four Lake Superior ports for shipment to lower Great Lakes ports. Except for small amounts of ore shipped to Algoma Steel at Sault Ste. Marie, Ontario, all of Minnesota's Great Lakes ore shipments must pass through the Soo Locks and the St. Mary's River which connect Lake Superior with Lake Huron. The O&M costs for this segment are high; therefore, a substantial user fee would be charged, which could range between 7 and 12 cents per ton depending on annual O&M costs and shipping volume. Not all the U.S. ore that passes through the Soo area is from Minnesota--in 1978 about 5 million tons came from Upper Michigan. This Michigan ore helps reduce user fees for Minnesota traffic by creating a larger tonnage base for Soo O&M costs.

After passage through the Soo region, Minnesota ore shipments diverge, some to lower Lake Michigan mills (40 percent in 1978) and the remainder through Lake Huron to the Detroit area or to Lake Erie and Lake Ontario points (Corps North Central Division data). Shipments from Minnesota to the Detroit area and beyond would be potentially subject to competitive inroads from other ore sources because of the high recovery costs associated with the Detroit area channels.

Table 3. Potential annual user fees for Minnesota-Great Lakes bulk commodity traffic (dollars).

Site	O&M Costs per Ton		Ore		Grain		Coal ^a		Cement and Limestone		Fish	
	l Year	5-Year Average	l Year ^b	5-Year Average ^c	l Year	5-Year Average	1 Year	5-Year Average	1 Year	5-Year Average	l Year	5-Year Average
Minnesota Ports ^d												
Duluth-Superior Two Harbors Grand Marais	0.0473 0.00427 83.33	0.055 0.004 218.930	1,370,535 44,709	1,593,643 42,069	481,479	559,643	190,137	221,089	80,806	93,960	50 0.07 11,000	59 0.06 28,899
Fees for Soo Lock	s and St. Ma	ry's River A	llocated to Mi	nnesota Ports	of Origin							
Duluth-Superior Two Harbors Silver Bay	0.1006 0.1006 0.1006	NA ^e NA NA	2,884,737 1,058,035 1,089,382	NA NA NA	1,023,272	NA	299,546 29,028	NA NA	161,826	NA		
Taconite Harbor	0.1006	NA	986,791	NA			34,362	NA				
Fees for Detroit A	rea Channel	f Allocated	to Minnesota	Ports of Origi	n							
Duluth-Superior Two Harbors	0.085	0.0683	1,389,750 221,425 829,500	1,116,705 177,922 717,150	864,594	694,726	28,139	28,139				
Taconite Harbor	0.085	0.0683	399,500	321,010			29,033	23,329				
Fees for Lower L	ake Ports											
Calumet	0.0209	0.043	106,590	219,300								
Indiana Harbor	0.0121	0.008	83,490	55,200								
Burns Harbor	0.1371	0.075	699,210	382,500								
Huron	NA	0.156	NA	192,080								
Toledo	NA	0.128	NA	680,320								
Lorain	NA	0.244	NA	1,095,000								
Cleveland	0.3053	0.719	2,228,690	5,248,700	30,530	71,900						
Ashtabula	NA	0.047	NA	127,840			NA	9,222				
Conneaut	NA	0.027	NA	103,400		a	NA	7,791				
Buffalo Totals ^{g, h}	0.2008	0,226	$\frac{572,280}{16,163,264}$	<u>644,100</u> 18,735,884	$\frac{281,120}{2,680,995}$	$\frac{316,400}{2,665,741}$	651,784	672,214	242,632	255,786	11,050	28,958
Cost Recovery ¹ a	t the Rate of	25 Percent	with a 2,61	2,319	512	,569	156	,715	51,	.162		9

The user fee for Duluth-Superior western coal ahipments is based entirely on the per ton charge for the St. Clair River. 1-year O&M costs at Minnesota ports, Soo area, and Detroit area channels are for FY 1981; O&M costs at lower lake ports are for FY 1980.

c 1-year voice costs at minimized ports, Soo area, and Detroit area channels are for FY 1981; O&M costs a 5-year average costs (1977-1982) are reported in constant 1982 dollars. Silver Bay and Taconite Harbor are privately maintained and would not have recovery costs at the port. NA = cost data were not available.

The tonnage fee for Lake St. Clair was used in computing this fee. The tonnage fee for Lake St. Clair was used in computing this fee. Total cost recovery burden for all commodities for 1 year would be \$19,749,725;5-year average would be \$22,358,583. Totals were obtained by substituting 1-year or 5-year costs as appropriate for missing data. Total cost recovery burden for all commodities at the rate of 25 percent with a cap of 6.9 cents per ton was \$3,332,774.

The impact of user fees on Minnesota ore traffic will be felt throughout the ore mining and steel industries, but some ports and shipping patterns will suffer more than others. Ore shipments from Duluth-Superior accounted for nearly half of Minnesota ore traffic in 1978. Within the port itself, shipments of ore were 63 percent of the total traffic. During the 1978 shipping season, more than half of the ore tonnage shipped from the Twin Ports was destined for the Detroit area, Lake Erie ports, or Hamilton, Ontario.

Table 4 gives the total user fees that would be assessed against Minnesota for ore shipments in the Great Lakes. For Duluth-Superior ore shipments, the annual user fee total could amount to \$9,005,685 or 48 percent of the total potential user fee assessment against Minnesota ore. The remainder of Minnesota ore traffic in 1978 was divided among Two Harbors, Silver Bay, and Taconite Harbor. Although these ports had similar shipping volumes in 1978, the potential user fees for each port are considerably different. User fees for ore shipments from Silver Bay would be almost three and a half times those for Two Harbors and more than double those for Taconite Harbor. These large differences reflect the distribution patterns for steel companies and variations in maintenance costs at receiving ports.

Of these three ports, only Two Harbors has a user fee obligation for Corps O&M costs. The other two are privately maintained and port maintenance costs are included in regular operating costs. The Soo area user fee is similar for the three ports, but the user fees for the Detroit area and the lower lake operations are substantially different for each port. For example, nearly all of the ore tonnage shipped from Silver Bay in 1978 was unloaded in Lake Erie ports and about 40 percent of this ore was unloaded in Cleveland, where the maintenance costs are high. This situation contributes to a disproportionately high cost recovery burden for shipments originating at Silver Bay compared with the other two North Shore ports.

User fees would be an additional transportation cost for the American ore and steel industry. The average increase of 31 cents per ton on Minnesota ore would certainly be added to the costs of operations, but its long-range effect on shipping volume and distribution patterns is not clear. However, the specter of enhanced foreign competition is always present. Other studies of the movement of ore in the Great Lakes region have shown only a small difference among the delivered prices of foreign, Canadian, and domestic ore. Additional transportation costs would increase the cost of Minnesota ore and thereby reduce its competitive position.

Although the user fee for some ports and shipping routes would be higher than for others, there is little likelihood of substantial logistical change

Table 4. Annual user fees for Minnesota ore traffic by port of origin (dollars).

	Port of Origin							
Assessment Point	Duluth- Superior	Two Harbors	Silver Bay	Taconite Harbor				
Duluth-Superior	1,593,643		-	-				
Two Harbors		42,069	-	-				
Soo Area	2,884,737	1,058,035	1,089,382	986,791				
Detroit Area Channels	1,116,705	177,922	717,150	321,010				
Cleveland	1,869,400	71,900	3,019,800	287,600				
Buffalo	56,500	-	45,200	542,400				
Calumet	64,500	103,200	8,600	43,000				
Indiana Harbor	9,600	17,600	800	27,200				
Burns Waterway Harbor	360,000	-	-	22,500				
Ashtabula	75,200	940	18,800	32,900				
Conneaut	27,800	45,900	21,600	8,100				
Toledo	102,400	1,920	550,400	25,600				
Huron	140,600	4,680	46,800	-				
Lorain	704,600	170,800	73,200	146,400				
Total	9,005,685	1,694,966	5,591,732	2,443,501				

Note: User fees are based on 1978 traffic levels and 5-year (1977-1982) O&M averages except for the Soo area where FY 1981 costs are used.

on a port-by-port basis because of capital investments in physical plant and intracompany supply commitments. The possibility does exist for greater use of certain lower lake transshipment facilities; this would reduce delivery through high cost ports and reduce reliance on higher cost transshipment points. The threat to Minnesota of competition from domestic ore production is less than that from foreign ore. Even though Minnesota ore has generally higher lake transportation costs than Michigan ore, the other major U.S. source, its overall cost is competitive (2). Thus, if domestic sources are to be relied on, the large volume of taconite ore in Minnesota compared with the available resources in Michigan will assure a continued demand for Minnesota ore.

A greater competitive threat to Minnesota ore production comes from foreign ore. Currently, American ore supplies about two-thirds of domestic steel-making needs. Of the U.S. imported ore supply, 90 percent comes from three countries: Canada, Venezuela, and Brazil. The use of South American ore is concentrated in the southern and East Coast steel production districts, and very little of it is delivered to mills near the Great Lakes. About 10 to 15 percent of U.S. Great Lakes region ore requirements are met by Canadian companies; this is about 63 percent of total 1978 Canadian-to-U.S. exports of ore. Some Canadian ore originates in Ontario and is shipped by vessel through Thunder Bay or by rail to Sault Ste. Marie and other Canadian steel centers, but most of the ore is mined in Labrador and Quebec and transshipped via rail-vessel movements to both U.S. and Canadian mills. Even though Canadian ore has generally higher transportation costs, other cost factors allow essentially competitive prices with American ore at U.S. mills (2). Major increases in St. Lawrence Seaway tolls for the 1982 and 1983 navigation seasons will increase vessel transportation costs for eastern Canada ore that is shipped to Great Lakes ports. These toll increases could help Minnesota ore to remain in a competitive position if a Great Lakes recovery program were enacted.

It must be emphasized that this analysis was unable to take into consideration slack shipment-demand years when the O6M costs would be spread over fewer shipments causing user fees per shipment to rise considerably. The uncertainties of demand, whether from variations in domestic demand or the level of foreign steel imports, would be a controlling factor in determining the actual impact of user fees on the ore industry in Minnesota. Domestic steel prices would reflect the additional costs of user fees, thus increasing the price differential between foreign and domestic steel. As foreign steel becomes more competitive in domestic markets, U.S. ore production would decline. Therefore, user fees would not only increase the price of U.S. steel but may significantly reduce U.S. ore production.

Grain

The impact of user fees is potentially greater for Minnesota-Great Lakes grain shipments than it is for ore. Along with probable increases in Seaway tolls, user fees assessed against grain traffic could divert Great Lakes-Seaway shipments to rail for transport to coastal terminals or may shift Duluth-Superior shipments to elevators in other Great Lakes ports. Fluctuating annual grain shipments from individual Great Lakes ports demonstrate the delicate balance between delivered price and foreign demand.

All of Minnesota's Great Lakes grain shipments originate at Duluth-Superior which has eight large elevator systems with a storage capacity of 70 million bushels. About 22 percent of the 1978 waterborne traffic was comprised of grain and oilseeds. This traffic included both direct overseas shipments and shipments to U.S. elevators and mills and Canadian export terminals on the St. Lawrence River. The user fees for Minnesota-Great Lakes grain will accrue at Duluth-Superior, the Soo area, the Detroit area channels, and a few lower lake ports. Table 3 indicates that annual user fees for grain traffic could amount to 29 cents a metric ton for a total of \$2,665,741 or about 12 percent of annual Minnesota bulk commodity user fees. This amount is based on the 1978 tonnage data and 5-year O&M cost figures used in this study.

Even though the potential impact of user fees is greater for grain than for ore, increased user fees on shipments of ore would have a greater overall effect on Minnesota. Ore traffic user fees are more than seven times those for grain but the ore tonnage is only six times that of grain. The principal explanation for the discrepancy in the tonnage-to-fee ratios is the relatively few unloadings of grain at lower lake ports where the user fee would be high.

Most Minnesota-based bulk commodity traffic, whether shipments or receipts, realizes some benefit from other commercial waterway traffic on the system because of the larger tonnage base. However, the route structure of some non-Minnesota shipments may give a port or group of ports an advantage over Minnesota ports. Grain exports illustrate such a case. Although the distance from Duluth-Superior to the Atlantic is about the same as it is from Chicago, Minnesota shipments must pass through the Soo area and incur a user fee whereas Lake Michiganbased shipments bypass this costly segment.

The average user fee for Minnesota-Great Lakes grain would amount to about 1 cent per bushel. This additional cost complicates the marketing situation for Upper Midwest grain merchants. The international grain trade operates on small margins and a penny increase per bushel can have a major influence on market demand and distribution patterns. With possible diversions to rail and other ports, some changes in the domestic Great Lakes movement of grain may occur. Minnesota vessel shipments to the lower lake ports of Cleveland and Buffalo could be jeopardized because of high maintenance costs and user fees at these ports. For export-bound shipments, an increase in Seaway tolls would exacerbate the grain price difficulties resulting from user fees. As with ore and other bulk commodities, any decrease in shipments or receipts at Minnesota ports would result in higher user fees and, therefore, a greater impact on the cost of shipping grain than has been projected in this analysis. Likewise, an increase in grain shipments would increase the share of Corps O&M costs allocated to grain.

Coa1

Most of the coal moved through Minnesota ports is western subbituminous coal which is transported by rail to Superior and by ship to Detroit area power plants; smaller amounts go to upper Michigan $(\underline{3})$. In 1978, 727,739 tons or 13.5 percent of the total coal traffic was shipped from lower lake ports up to Silver Bay and Taconite Harbor for use in taconite pellet processing plants and for generating electric power. Other local shipments include those inbound to Duluth and between Minnesota ports. Projected annual user fees for coal shipments other than western coal amount to \$123,440.

Western coal shipments from Duluth-Superior would be charged a 5-year annual average of \$520,635. In addition, \$28,139 would be added for the Detroit area annual user fee. The latter amount is derived not from the 5-year average Detroit area fee of 6.83 cents per ton, but from the higher 1-year fee of 8.5 cents per ton, which represents a reasonable estimate of a St. Clair River user charge. The higher charge is used because Minnesota origin coal shipments go to points along the St. Clair River and do not usually go beyond the river. Because the charges at St. Clair are higher than those beyond the river, the use of the average Detroit area fee would not be accurate for this particular commodity movement. Future changes in coal transportation patterns could be caused by contractual arrangements, technological advances, and regulatory reform. Changes in either domestic regulations or foreign coal burning technology could create significant increases in western coal movements on the Great Lakes. As with ore and grain, changes in coal shipment levels would cause changes in user fees for other commodities.

Limestone and Cement

The potential impact of any type of user tax on limestone and cement movement does not appear to be significant when compared with other major bulk commodities. Nearly all of this traffic for Minnesota originates on Lake Huron at privately maintained ports and is delivered at Duluth-Superior ($\underline{4}$). According to this analysis, the total annual user fee burden would come to \$255,786 for cement and limestone, divided fairly evenly.

Fish

The commercial harvest of fish from Minnesota's North Shore is approximately a million pounds a year. Most of the catch is from ports where other commodities absorb the larger share of recovery costs and there would be little impact on fish as a separate commodity. At Grand Marais, however, commercial fishing operations could be severely affected. Full recovery of federal port expenditures would overwhelm the small volume of traffic and cripple commercial fishing. Using the Corps 5-year O&M average, the user fee per pound of fish would be about 11 cents. This would create an even less competitive position for Grand Marais fisheries compared with other U.S. and Canadian fisheries. Canadian Government subsidies to their fishermen are 7 to 10 cents per pound. According to Dale Baker of

the Lake Superior Basin Studies Center at Duluth, any additional costs for American fishermen that are not also incurred by their Canadian counterparts would exacerbate an already unbalanced competitive situation.

OVERVIEW

The projected cost recovery burden for Minnesota's five principal bulk commodities involved in Great Lakes commerce would amount to more than \$22 million based on this site-specific analysis. Annual fluctuations in tonnage levels and O&M expenditures that would cause variations in user charges have been accounted for in the study methodology.

The possibility that the effects of user fees would snowball because of periodic fluctuations in traffic levels is a major potential problem. For example, a decline in tonnage for one commodity would cause proportionately higher taxes on other traffic. As the fees increase on specific commodities, the prospect for modal or port diversion grows, creating the probability of greater fee increases on the remaining traffic and still more diversions.

The degree of impact of a user fee on particular commodities is affected by a number of factors including value of goods, potential for substitution, competitiveness of market, route structure, and shipment levels for major commodity traffic. This last factor deserves some elaboration, because levels for the 1981 navigation season were somewhat below those for 1978.

Total 1981 waterborne commodity tonnage at Duluth-Superior was about 5-1/2 million short tons less than it was during the 1978 sample year. However, the total traffic was only slightly less than the average for the last 5 years. A continuation of this decline would have a substantial effect on user charge levels and total cost recovery burden. Even though the tonnage base declines, O&M costs do not and may increase at or beyond inflationary rates resulting in significantly higher user fees. A new Duluth-Superior user fee calculated by using the 5year O&M average and the 1981 traffic level would be about 6.25 cents per ton or 0.75 cent more than using the 1978 tonnage base.

Another major user fee question concerns the treatment of Canada-based vessel traffic. Under several legislative proposals, some types of Canadian vessel movements would be exempt from fees assessed at connecting channels and locks. It is apparent that United States O&M expenditures at these connections benefit Canadian traffic as well as U.S. traffic and that exempting foreign tonnage from fee assessment would increase user charges for the remaining traffic.

Cost recovery allocation presents another difficult problem regarding the implementation of a user fee program on the Great Lakes. As with the inland river system, effective cost recovery is dependent on an accurate assessment of the user population and an allocation of respective costs to users according to relative benefit. The Corps O&M budget contains nonnavigation expenditures such as visitor center operations, and these special costs cannot be legitimately assigned to commercial navigation. An equally perplexing matter concerns environmental related costs and to what extent these costs should be borne by the general public. For example, environmental regulations that create additional expenditures for dredging and material disposal add greatly to the Corps O&M budget for some ports and would result in higher user fees for those ports. It has been argued that such additional costs should be considered as a legitimate business expense. However, if large cost differences result from excessively strict local regulation, there is a need for further consideration. Before any cost recovery program is implemented, it is important that a thorough study be made to devise a cost allocation program equitable to all the system beneficiaries.

One factor that will certainly exacerbate the negative effects of possible user fees for Great Lakes navigation and Minnesota based vessel traffic is increases in the toll level for the St. Lawrence Seaway. Grain shipments from Duluth-Superior will be the principal commodity traffic affected. Scheduled toll increases for the 1982 and 1983 navigation seasons will range between 0.5 and 1 cent per bushel of grain depending on vessel load and size. Global grain prices and shipment activity are especially sensitive to the vagaries of demand in the marketplace. Transportation costs are a large component of the delivered price for grain and as a result factors such as differential user fees, including tolls that give one origin-destination combination an advantage over another, strongly influence route patterns and schedule frequency.

In addition to the impact on grain, higher tolls combined with proposed user fees would seriously handicap general cargo including containerized shipments. Even though historical tonnage levels for general cargo are not large, these shipments are quite important to the ports because of their labor intensive and high value characteristics.

SUMMARY

This analysis of user fees is based on site specific or segmentized user charges applied in the form of a tonnage fee to Minnesota's share of Great Lakes bulk commodity traffic. Minnesota commercial traffic could incur annual user charges in excess of \$22 million under proposals for full recovery of the U.S. Army Corps of Engineers operations and maintenance expenditures on the Great Lakes. Under a partial recovery user fee program representing 25 percent of O&M costs and incorporating a 6.9 cent per ton limit, the user fee total would come to about \$3.4 million. These amounts represent the accrual of user charges at nearly all potential assessment points: ports, connecting channels, and the lock complex at Sault Ste. Marie.

Iron ore and taconite shipments from the four ore ports would incur about 80 percent of the cost recovery burden for Minnesota. Under a full recovery program, this would amount to an average of about 31 cents per short ton. Variations in user fee totals at the four ore ports reflect port-toport movement patterns. Higher ore and other raw material transportation costs would result in higher prices for U.S. steel and enhance the competitive position of foreign steel. This could reduce the demand for U.S. ore and create higher user charges for the remaining ore and other commodity shipments.

Additional grain transportation costs created by user fees could produce a problem more serious than for ore. The analysis shows that a full recovery user charge would amount to about 29 cents a metric ton or about 1 cent per bushel. Because grain markets react quickly to slight cost increases, modal and port diversion prospects are much greater for grain than for other commodities. Export grain is particularly vulnerable because it must also absorb increasing St. Lawrence Seaway tolls.

Full recovery of Corps O&M costs on both inbound and outbound Minnesota coal shipments would amount to 14 cents a ton. This additional cost would accrue mostly to electricity generating plants, and their customer base is so large that little individual impact would be felt.

Limestone and cement shipments would be charged an additional \$255,000 under full cost recovery. Higher commodity cost and no diversion are expected.

The Great Lakes commercial fish catch for Minnesota averages about a million pounds a year. Little overall impact from user fees is anticipated except in Grand Marais, Minnesota, where it is expected that the tax could reach 11 cents per pound. At that level of tax, the port's commercial fishing activity could be eliminated.

General cargo and containerized shipments would be adversely affected by an increase in Seaway tolls and a user charge, As for grain shipments, these high value cargoes could be subject to diversion to other transportation modes or ports if transportation costs were increased substantially.

Proposed user charges and Seaway toll increases present perplexing questions regarding economic impact for particular commodity movements and for individual ports on the Great Lakes. A complete assessment of user fees and their economic impact for Great Lakes commerical navigation must await a specific determination of the structure and exact level of such fees. Minnesota, at the head of the Great Lakes-St. Lawrence Seaway system, is at a distinct geographical disadvantage because of distance from major markets and related higher transportation costs. Higher user charges in whatever form can only create additional difficulties for Minnesota's commercial navigation activities.

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