

August 3, 1999

**THE UPPER HARBOR TERMINAL
AND
COMMERCIAL NAVIGATION ON THE UPPER MISSISSIPPI RIVER**

**AN APPENDIX TO THE
UPPER MISSISSIPPI RIVER MASTER PLAN**

Introduction.

The Upper Harbor Terminal (UHT) is the key strategic element to the redevelopment plan for the west side of the upper Mississippi River. It is also essential to the commercial navigation industry for the same stretch of river. The first part of this appendix describes the physical characteristics and operating activities of the Upper Harbor Terminal. The second part is an economic description of the Upper Harbor Terminal. Finally, the economic aspects of commercial navigation on the upper Mississippi River are discussed.

Upper Harbor Terminal - Physical Characteristics and Operating Activities.

Overview. The Upper Harbor Terminal is a river barge terminal owned by the city of Minneapolis on the west bank of the upper Mississippi River. It is at mile 857.0 of the Mississippi River and faces Northern States Power's Riverside Plant directly east and across the river. The street address for the UHT is 3750 Washington Avenue North, Minneapolis, Minnesota 55412. It is located one block east of the Dowling Avenue exit from Interstate 94.

Site. The total land area utilized by the UHT is 41 acres. It is a relatively long and shallow property. It is over a half mile in length and much of the site is less than 300 feet in depth. There is an additional 7-acre parcel on the river immediately to the south of the UHT that was formerly leased by an asphalt company and is now vacant. The total area owned by the city related to UHT is accordingly 48 acres. The state of Minnesota gave the original 21 tax forfeit parcels to the city at no cost in 1944 and 1952. Between 1969 and 1976 the city acquired an additional 5 parcels at a cost of approximately \$1,368,000. Since then the Minnesota Highway Department took part of one parcel for a maintenance facility and donated another parcel to the city. Also, the city has sold some land to the Minneapolis Housing and Redevelopment Authority and to a warehouse company.

Site Improvements. The following is a description of the improvements and land use of the various sections of the UHT, beginning at the southern end of the Terminal and moving north:

- The southernmost parcel is comprised of approximately 7 acres and is presently vacant. Trumbull Asphalt and Anderson Brothers Construction had used the site as an asphalt terminal until their lease expired in 1994.
- The next parcel is comprised of approximately 9 acres and is used for storage for the sand dredged from the river by the Army Corps of Engineers. The sand is sold.

\$.25 per ton to move commodities up the Minnesota, which is also a twelve hour round trip. It is \$. 10 per ton to move the barges around the Port of Saint Paul.

It may be helpful to put the above transportation rates in perspective. The annual contract rate to move commodities from New Orleans to Saint Paul ranges from \$6.75 to \$7.25 per ton. The annual contract rate from Saint Louis to Saint Paul ranges from \$3.75 to \$4.25 per ton. The rate to move commodities down river ranges from \$11.15 to \$11.75 per ton. There are additional factors that will influence these rates. For example, to move cargo from New Orleans to Saint Paul in May or June may cost \$6.25 to \$6.50 per ton, while moving the same cargo in October may cost \$12.00 to \$13.00 per ton. The rates vary according to changes in supply and demand.

It is also significant that this is a seasonal business. The length of the season is about eight months, from late March to late November, depending on the weather.

UHT Finances. Historically, the UHT has required an annual subsidy from the city of Minneapolis, out of the MCDA's budget, of something between \$500,000 to \$1,000,000. The Terminal has generated a positive cash flow from operations but debt service in the range of \$1,000,000 per year has led to the annual deficit. All the bonds financing the Terminal are scheduled to be paid off by December 1999.

A recent analysis by the MCDA projects a positive cash flow from Terminal operations of \$350,000 beginning in the year 2000. The analysis further projects that this cash flow will increase by 3% per year through the year 2009. The operator of the Terminal, River Services Inc. (RSI) has projected that no capital investments will be required for the Terminal before the year 2009. RSI believes that its programmed maintenance will obviate the need to replace any equipment or fixed facilities during the next ten years. An appraisal of the property dated July 1989, predicted a remaining economic life of the facility of 25 to 30 years. In 1999 the remaining economic life would be 15 to 20 years based on this analysis. The physical life of the facilities was estimated in this appraisal to be 10 years longer than its economic life.

Several factors should be considered when evaluating the Terminal's cash flow projections:

1. Revenues of the Terminal fluctuate widely. The volume of commodities moved is dependent on a wide range of factors including weather, construction activity, international markets, rates for other modes of transportation, federal, state, and local laws, and system capacity. During the six years from 1992 through 1997, for example, revenues ranged from \$2.3 million to \$3.1 million, a spread of \$800,000. During the same period operating expenses ranged from \$2.1 million to \$2.5 million, a spread of only \$400,000.
2. The UHT has been very flexible over the years in reconfiguring its facilities and equipment to handle new and different commodities. This factor has helped it remain competitive with other terminals in the Twin City metropolitan area. Future opportunities to acquire new business may require additional investment. Future changes in commodity markets and the corresponding changes to the Terminal are difficult to predict.
3. Programmed maintenance of equipment and facilities minimizes repair and replacement expenses over the long term. However, it does not eliminate them and unexpected problems may arise.

Commodity Origin and Destination. A presumed benefit of the UHT is that it will lower the transportation costs for those businesses and organizations in Minneapolis that ship or receive bulk commodities. A 1994 study by the MCDA reported that only 5-8 percent of the traffic was

generated from the city of Minneapolis. An additional 12-15 percent was generated from other metropolitan locations. The balance, or 80 percent, came from greater Minnesota, other states, and Canada. RSI did another survey of their customers at the UHT in 1998 and produced comparable results.

Land Use. The *Upper Mississippi River Master Plan* is fundamentally a land use plan. It is helpful to analyze the 48 acres occupied by the UHT from this perspective.

The economic development activities of most communities generally emphasize maintenance and/or increase in employment and the property tax base. The following land use alternatives will consider these factors.

Present Use. The UHT zoning is presently M2-3 (Medium Industrial). The Terminal employs approximately 30 individuals, half of whom are seasonal. Because the UHT is owned by the city, it does not pay property taxes. While it has historically required an annual subsidy, it is projected to produce a positive cash flow of \$350,000 beginning in the year 2000.

Light Industrial Use. The MCDA did a preliminary analysis of the costs and benefits of converting the Terminal to a light industrial use.

Proceeds from the sale of the UHT could be approximately \$1,500,000. These proceeds reflect a reduction of \$1,000,000 for demolition of the structures on the site. Also, approximately 11 acres along the river would not be included in the sale but retained and developed into a possible parkway and park. The equipment at the terminal has a market value of \$150,000.

Approximately 500,000 square feet of light industrial buildings could be built on the remaining 37 acres. This would generate approximately 700 jobs and \$775,000 of new property taxes (annually).

The MCDA has reportedly done a subsequent analysis that indicates the development of more intensive light industrial projects may generate approximately \$2,000,000 of property taxes.

Recommended Use. The *Upper Mississippi River Master Plan* proposes that the Upper Harbor Terminal be redeveloped into a combination of housing, offices (with accessory retail space) and park. The analysis assumes the following mixture of new development:

| <u>Use</u> | <u>Acres</u> | <u>Units/Acre</u> | <u>Totals</u> | <u>Cost</u> | <u>Investment</u> |
|-----------------|--------------|-------------------|---------------|----------------|-------------------|
| Housing | 15.8 | 20 | 316 units | \$250,000/unit | \$79,000,000 |
| Housing | 6.0 | 35 | 210 units | \$150,000/unit | \$31,500,000 |
| Housing | 3.0 | 40 | 120 units | \$125,000/unit | \$15,000,000 |
| Office & Retail | 9.0 | | 117,000 sq ft | \$75/sq ft | \$ 8,800,000 |
| Totals | 33.8 | | | | \$134,300,000 |

The balance of the Upper Harbor Terminal would be devoted to parkland.

It was estimated that the development listed above would generate total annual property taxes of about \$3,400,000. The total private investment would equal \$134,300,000.

Economics of Commercial Navigation on the Upper Mississippi River.

Overview. A decision to close the UHT and convert the property to another use could potentially have a major impact on other commercial navigation on, the upper Mississippi River, as well as other uses of this stretch of the river. The river is dredged and the locks are maintained by the Army Corps of Engineers. Any decision to close the locks at the Ford Dam (Lock and Dam #1) and the locks at the Upper and Lower Falls of Saint Anthony, and to reduce or eliminate the dredging of the river in this stretch, would be made by the Army Corps and the U.S. Administration and Congress. However, a decision by the city of Minneapolis to close the UHT may increase the probability that such a decision may be made.

It should be emphasized that the UHT could be closed and the Army Corps could continue to operate the upper three locks and dredge the river. Conversely, the UHT could remain open and the Army Corps could decide to close the upper three locks and reduce or eliminate the dredging. Representatives of the Army Corps of Engineers have recently stated "it is very unlikely that the Federal Government would close the system unless the city of Minneapolis eliminates the commercial terminals in the upper pool." Because of the relationship of the UHT to this question, it is important to identify the potential impacts of alternative land uses of the UHT.

Army Corps of Engineers. The Army Corps built the upper river navigation system, including the locks for the Ford Dam, Lower Falls of Saint Anthony, and Upper Falls of Saint Anthony. The bridges over the river had to be rebuilt and a 9-foot channel had to be dredged. In 1998 dollars, the Army Corps has spent \$430 million on construction for this stretch of the upper Mississippi River.

The Army Corps also maintains the locks and channel. Over a recent five-year period, the Army Corps estimated that it spent an average of \$466,000 dredging this stretch of the river. In addition, the Army Corps spent \$2.5 million to \$2.6 million per year to maintain the three sets of locks. The total annual maintenance budget for commercial navigation on the upper stretch of the river is accordingly \$3.1 million.

The Army Corps has established a minimum threshold of 1,000,000 tons of commercial navigation passing through the locks per year in order to justify the continued maintenance of the locks and river channel. The Corps has determined that commercial navigation is the only basis of justification for its federal mission to operate the locks and maintain the channel. It is the responsibility of state and local governments to maintain waterways for recreational and excursion boating.

The Army Corps of Engineers operates a relatively few locks around the country that have little or no commercial navigation traffic, according to the "Performance Monitoring System" published by the Corps. These locks include:

- Felsenthal Lock, Ouachita River [Louisiana/Arkansas]
- Lock 1, West Pearl River [Mississippi]
- South Mills Lock, Dismal Swamp Canal [Virginia]
- Gunterville Lock, Tennessee River [Alabama]
- Buckman Lock, Cross Florida Barge Canal [Florida]
- Inglis Lock, Cross Florida Barge Canal [Florida]

In the 1994 report on the UHT by the MCDA, it was estimated that the UHT handled 1 million tons of commodities and that the other terminals on the upper river handled an additional 500,000 tons. The total commercial tonnage on the upper river was therefore 1.5 million tons. This meant that the UHT was responsible for two-thirds of the total volume of commercial navigation. In 1998, the UHT handled 800,000 tons and the other three terminals on the upper river accounted for an additional 1.2 million tons, for a total of 2.0 million tons.

There are other economic factors that may determine the future of commercial navigation on the upper Mississippi River. The Army Corps completed a national benefit-cost study last year on all their operations. The Corps identified a lockage cost per ton criteria of \$0.16 as a threshold to accomplish an additional cost-efficiency and effectiveness review. Any locks that were more expensive required additional justification for their continued operation. The upper three locks were three times more expensive than this criteria. This is not surprising, given that the locks are at the end of the commercial waterway system. However, if the Army Corps experiences a reduction in their operating and maintenance budget, it is more likely that they will seek to reduce their less efficient operations.

The budget of the Army Corps is continually under pressure. Last year, for example, the Administration proposed reducing the operating and maintenance budget of the Corps by 20 percent. Congress ultimately restored the full funding of their budget.

Historical Perspective. Although the upper river project was authorized in the 1930's, final hearings for the authorization of the upper river project (locks for the Upper and Lower Falls of Saint Anthony) took place in 1954. This project was enthusiastically supported by Minneapolis business and labor leaders, as well as elected officials. Congressman Walter Judd stated: "If a good harbor does not come to Minneapolis, much of Minneapolis will go where there is a good harbor."

A representative from the Planning Department of the City of Minneapolis testified that there were 310 acres of vacant industrial land along the upper Mississippi River that would be developed with commercial navigation. In addition, there was an additional 500 acres of land that could be acquired for river-related industrial use and would also be developed. Today, the UHT occupies a net of 41 acres (including the land used to store the sand dredged from the river) and the other three terminals on the river occupy 32 acres, for a total commercial river navigation of 73 acres.

An article in the *Star Tribune* dated March 8, 1999, compared projections of barge traffic with the actual tonnage barged through the upper river:

- Minneapolis planning commission, 1937: 10.3 million tons
- Level projected by Corps in 1950s to justify project: 3 million tons
- 1998 shipping season 2.01 million tons
- Peak shipping year (1975): 2.3 million tons
- 10-year shipping average (1989-1998): 1.58 million tons
- Corps benchmark for 1:1 benefit cost ratio: 1 million tons
- Lowest shipping year (1989): .66 million tons

[Records from the Minnesota Department of Transportation show the peak shipping year (1975) with 3.177 million tons barged through the upper river and the lowest shipping year (1989) with 1.2 million tons barged through the upper river.]

Other Active Terminals. There are three other active terminals on the upper river. A decision to close the locks would have a major impact on their businesses. All commercial navigation on the upper river employs less than 100 individuals.

- Camas (formerly Shiely). This terminal is located on the west side of the river and south of the UHT. Last year Camas shipped 800,000 tons of aggregate up river to this terminal. This volume is up appreciably from prior years.
- Holnam Cement. This terminal is located immediately north and adjacent to the UHT on the west side of the river. Holnam barges imported cement up river.
- American Iron. This business is located south of the UHT on the west side of the river. AIS collects scrap metal from Minneapolis and surrounding areas and barges the material down river.

Inactive Terminals. There are three inactive barge terminals on the upper Mississippi River:

- Northern States Power, Riverside Plant. This terminal is located on the east side of the river, directly across from the UHT. At one time NSP brought Western coal to the Riverside Plant and then barged it down river to other power plants. By 1980 NSP had built rail service to these plants and ceased sending the coal by barge.
- Scherer Brothers Lumber. This terminal is located on the east side of the river near Plymouth Avenue.
- University of Minnesota. This is the only terminal located below the Upper and Lower Falls of Saint Anthony. It was once used to bring coal to the University's generating plant but is no longer in use.

Water-compelled rates. Even though NSP is not using their barge dock, barge transportation provides a competitive alternative to shipping coal by rail. The availability of the barge alternative may permit NSP to negotiate a lower rail rate. This phenomenon is known as "water-compelled rates". The Army Corps did a study of the Illinois Waterway System in 1997 that attempted to analyze the magnitude of the rate differential for the movement of coal. They concluded that the overall impact of available navigation on railroad rates averages a little more than \$.0025 per ton-mile and the geographic influence was limited to ten miles from the river. However, the impact of NSP's rail rates may be mitigated by the fact that they are volume purchasers and have multiple sites.

Excursion Boating. The Paddleford Packet Boat Company runs an excursion boat business from a barge dock on the east side of the river near the Plymouth Avenue Bridge on Boom Island. Half of this company's business is in Saint Paul; the other half is in Minneapolis. It operates the excursion boats Anson Northrup and Betsy Northrup for dinner, sightseeing, and charter cruises. All of these cruises go through one or two locks on the upper river.

The Paddleford Packet Boat Company has approximately 500 excursions per season in Minneapolis on which they carry 60,000 to 70,000 passengers. Three full time and 25 seasonal employees are involved in this operation. If the upper locks were to close, the Paddleford Packet Boat Company may substantially reduce or cease excursion boating on this stretch of the river.

Recreational Boating. Recreational boats also pass through the locks on the upper river, although they have a lower priority than the barges. The Army Corps collects data on the recreational boats that use the locks. Approximately 2,000 recreational boats are locked-through

the Upper and Lower Falls of Saint Anthony in a season. Approximately 5,000 boats pass through the locks at Lock and Dam # 1. The number of recreational boaters locked through per season jumps to over 10,000 at Hastings and over 16,000 at Red Wing.

The MCDA did a study in 1991 that considered the feasibility of locating a marina for recreational boating on the river near the Grain Belt Brewery. Prepared by David J. Arndorfer, Ph.D., the report concluded that there is sufficient demand for a marina near downtown Minneapolis. The foundation of Arndorfer's report consists of surveys of samples of registered boat owners in the metropolitan area. He noted the following concerns about a marina near downtown Minneapolis:

"8. Limitations exist that may affect boat owners in deciding to place their boat in a marina near downtown:

- a. Approximately 10 percent of the boats owned will be affected by a low chord on bridges of 8 feet.*
- b. The two locks will likely be a disincentive to some boaters, but 58.3 percent have used locks in the past.*
- c. Approximately 40 percent of the boaters state that they will not be affected by having to pass through two locks.*
- d. A significant percentage of boaters are unfamiliar with the river above the Ford Dam. Only 15.8 percent of the boaters have boated between the Ford Dam and St. Anthony Falls. Twenty-one percent have boated above the falls.*

9. If a marina is ever operated below the St. Anthony Falls, a marina located above it could be seriously affected financially. Some of the major attractions near downtown are located below the falls. A marina upstream may not be able to compete. "

If the locks closed and the dredging of the channel was to cease, recreational boats would obviously not be able to move up and down the river. This would be a serious detriment to larger recreational boats. However, this stretch of river would become very similar to a long and narrow lake (although it is still a river with a current, unlike a lake). Boat launches could be added and the opportunity for smaller recreational boats would actually increase. [It should be noted that boat launches could be added today to encourage additional recreational use.] This category would include not only small power boats, but also canoes, wind-surfers, kayaks, rowboats, etc.

Alternative Modes of Transportation. If commercial navigation was discontinued on the upper river, the commodities now moved by barge would have to be moved by some other mode of transportation. The other mode of transportation would most likely be rail or truck.

The Army Corps considered the benefit-cost ratio of moving the commodities that now travel by barge to the upper river by either rail or truck. This study reflected 1996 use and assumed that the commodities traveled all the way by the alternative form of transportation. The Corps determined that these alternative forms of transportation would have cost the shippers \$5.1 million. When this sum was compared to the \$3.1 million annual maintenance expenses incurred by the Corps, a benefit-cost ratio of 1.6 to 1.7 was determined.

Another report by the Minnesota Department of Transportation entitled "Monetary Cost of a Modal Shift" was completed in March of 1997. One of the case studies included in the report explored the cost the Shiely Company would incur if it moved aggregate by truck rather than by barge from its operation on Grey Cloud Island. Using a volume of 2,000,000 tons, the study concluded that Shiely's cost of moving aggregate would go from \$67,000 by barge to \$730,000

by truck. Also, the number of accidents projected would increase from .06 by barge to 2.3 by truck.

The foregoing two studies looked at moving commodities entirely by another mode of transportation other than barge. This methodology is appropriate for Camas, whose shipments originate at Grey Cloud Island south of Saint Paul. With other commodities, if commercial navigation were to end on the upper river, there are over 30 other barge terminals in the Twin City metropolitan area that could handle the traffic. The barge terminals in Saint Paul, for example, handle 10 million to 15 million tons a year, with an average around 13 million tons. The upper river in Minneapolis, in contrast, handled only 15 percent of this volume.

If commercial navigation were to end on the upper river, the alternative in many instances would be to ship commodities up and down river from another barge terminal in the Twin Cities. For example, there is a competitive barge terminal located in Saint Paul that is 17.4 miles from the UHT. Commodities could be shipped to this terminal on the river by barge and then moved by truck to the UHT. (This is probably the worst-case scenario.) In such cases, the net increase to shippers would average something in the range of \$2.00 per ton.

Environmental Considerations. Water transportation is more fuel-efficient than its alternative land based modes. One gallon of fuel on the inland waterway will move one ton of freight 514 miles. The same gallon will move one ton of freight 202 miles by rail and 59.2 miles by truck. In addition, there are other considerations such as air pollution (hydrocarbons, carbon monoxide, and nitrous oxide) and safety.

The statistic in the preceding paragraph about the fuel efficiency of barges (one gallon will move one ton of freight 514 miles) was a national statistic based on the Inland Waterway System. This assumes tows on the river that range up to 15 barges each. The trip from Saint Paul to Minneapolis is less fuel-efficient. Because of the three locks, it takes longer to go a relatively shorter distance than further down river. Also, it is less efficient to push only two rather than fifteen barges. The result is that one gallon of fuel will move one ton of freight about 257 miles on this stretch of the river.

Other Possible Impacts. There are other possible consequences in the event that the locks are closed and the dredging of the channel ceases. One concern is flooding. The channel that is now maintained at a depth of 9 feet will most likely eventually silt-in. A preliminary hydrology study by the University of Minnesota's Water Resources Center indicated that the water levels of this stretch of the upper river would be impacted if the dredging of the channel ended but that further study was needed to more precisely determine these impacts. [There will always be a channel to pass the water. It may not be where we want it.]

Commercial Navigation Operational Cost Savings. Several possible alternative ways to reduce the Army Corps' cost of operating the locks and maintaining the river channel have been discussed. The analysis that follows identifies these alternatives and discusses their feasibility and potential impact.

- Reduce channel widths. [The channel widths are a function of the federal designation at 100 feet (more at bends) and cannot practically be reduced.]
- Reduce channel depth from 9 feet. [The 9-foot depth permits fully loaded barges to navigate the river. A lesser depth would require that the barges be partially off-loaded prior to traversing the upper river.]

- Reduce the length of the season. [This would reduce the costs of operation but would also reduce the total tonnage barged in a year.]
- Shorten the hours of operation. [The locks are now open 24 hours a day; if they were to close for 8 hours at night the cost of a total of three operators would be saved, although there would be additional cost for security. This savings is not significant.]
- Cost sharing with state and local governments. [This remains a possibility that could be pursued among various governmental entities.]

There does not appear to be a way to significantly reduce the cost of operating the locks and maintaining the channel of the upper river.

Projected Cost of a Modal Shift. The table at the end of this appendix entitled: "Projected Cost of a Modal Shift" compares the total costs of shipping goods by barge on the upper Mississippi River versus truck over the same distance. The 1998 total shipping volume of 2,000,000 tons, less an estimated 200,000 tons moved by rail, is utilized for this analysis. The distance on the Mississippi River from a barge terminal in Saint Paul to the Upper Harbor Terminal is 19 miles. The same distance by truck is 17 miles. This analysis includes direct and indirect costs of shipping by truck and barge for federal, state, and local governments; environmental considerations such as hydrocarbons, carbon monoxide, nitrous oxide, and tire disposal; and the costs to the shippers.

The source for the statistics in the table dealing with tons of commodities moved, distances, ton miles, fuel consumed, road wear, externalities, and accidents is a recent study by the Minnesota Department of Transportation. The study includes a number of assumptions, such as a relatively high efficiency for back hauls by barge and a relatively low efficiency for back hauls by trucks. The figures used in the MNDOT study have been utilized in the table, with one exception relating to the fuel efficiency of barges. As noted earlier in this appendix, the national statistic for the fuel efficiency of barges was based on the Inland Waterway System and the larger towboats used. The statistic was changed in the table to reflect the smaller number of barges in a tow and the additional time in transit caused by the locks, as well as the use of Switch Towboats rather than Line Haul Towboats.

The table also does not address the differential of a modal shift between rail and barge. For many of the commodities moved through the upper river, there is not a viable rail alternative. As described in MNDOT's study, the 1998 river tonnage normally moving into the Minneapolis ports include sand, gravel, aggregates, cement, fertilizer, salt, coal, steel and twine totaling about 1,400,000 tons. The balance of the 2 million river tons moves out of Minneapolis and includes corn, soybeans, wheat, oats, potash and scrap iron. About 200,000 tons of the southbound freight moves to the river by railroad. The remaining 1,800,000 tons is delivered or taken away by truck. The truck alternative is a worst case approach. The additional impact of rail would not significantly affect the economics described in the table. The substitution of rail for truck alternatives would significantly reduce the cost of the alternative to barge transportation.

The estimated annual cost of maintaining the upper river's locks and channel came from the Army Corps of Engineers. The projected cash flow for the UHT came from the MCDA and BRW estimated the property taxes that might be realized from the residential use of the UHT site. The cost to shippers came from industry sources including trucking and barge firms and terminal operators.

The importance of the table is that it presents a big-picture look at the various costs associated with commercial navigation on the upper river in Minneapolis. The relevance of the figures is

their order of magnitude, rather than precise calculations of cost. For example, the tons of commodities moved utilized in the table is 1,800,000. This was the same tonnage used in the MNDOT study for the tonnage moved by truck. The total tonnage moved on the upper river in 1998 was 2,000,000. A recent ten year average of tonnage moved on the upper river is 1.58 million tons.

The analysis in the table does not differentiate between the various sources and types of costs. The costs described in the table are incurred by different levels of government and the private sector; some of the costs are externalities. There is no differentiation between the cost incurred by the Army Corps to maintain the locks or a shipper to move a commodity, in contrast to a transfer payment that occurs when a private property owner pays property taxes to the city. The table also does not estimate the cost of services to the city for new residents. Finally, capital costs are not reflected in this table. The Army Corps spent approximately \$430 million on construction for this stretch of the river. The City of Minneapolis paid debt service of approximately \$1 million a year for a number of years on the bonds for the capital improvements to the UHT.

The table does not reflect the increase in traffic congestion on the highways in the metropolitan area if trucks are used rather than barges. The recent MNDOT study estimated that there would be an additional 144,000 one-way truck trips needed to handle the commodities moved by barge. This figure includes the back hauls and assumes that relatively few back hauls carry any commodities. The 144,000 truck trips translates to a figure of 395 per day (average annual daily traffic, or AADT's). Much of this traffic will be dispersed about the metropolitan area, reflecting the origins and destinations of the commodities. If all the truck trips were to occur on Interstate 94, the total AADT's would increase by less than 0.3% and the Heavy Commercial AADT's would increase by less than 5% (based on a 1996 report from MNDOT).

The conclusion of this analysis is that it is \$4,300,000 more expensive to ship 1,800,000 tons of commodities by barge on the upper Mississippi River than to ship the same commodities by truck over the same distance. This equates to an additional cost of \$2.40 per ton of commodity shipped. In substance, the reason that the barge alternative is more expensive is that the cost borne by the Army Corps to maintain the channel and locks plus the opportunity cost to the City of Minneapolis to keep the UHT in its present use substantially exceeds the incremental cost of shipping commodities by truck.

In order for the barge alternative to become less expensive than the truck when considering the total costs, the volume of commodities shipped would have to more than triple, to something over six million tons.

Subsidy of Upper Harbor Terminal. A fundamental question in this analysis is whether the City of Minneapolis should subsidize the operation of the UHT and what criteria it should use to make a decision.

The Corporate Subsidy Reform Commission established by the Minnesota Legislature was co-chaired by State Representative Karen Clark and State Senator John Hottinger. Its purpose was to evaluate selected subsidy programs and tax laws for public purpose, criteria for award, and accountability and enforcement mechanisms. It issued a report of its findings on February 6, 1998.

The Commission recommended that state and local units of government develop specific statements of what constitutes public purpose. According to the Commission, public purpose should include at least two of the following:

- Enhancing economic diversity
- Creating high quality job growth
- Providing for job retention, where loss is imminent and demonstrable
- Stabilizing the community
- Increasing the tax base

The UHT has required subsidy by the city in the past and may require it again in the future. The UHT is not a new project, but a continuing commitment by the City of Minneapolis, which makes it somewhat different to analyze. A decision to close the UHT may have repercussions on other commercial navigation, excursion, and recreational boating on the upper river. The UHT provides a river transportation alternative for local businesses. It employs few people and does not contribute to the property tax base. New residential and park development on this site would arguably stabilize the community more than the present heavy industrial use. The application of the foregoing criteria to decisions about whether to subsidize the UHT make a subsidy by the city difficult to justify.

Conclusion. The principal benefits of the Upper Harbor Terminal extend beyond the city of Minneapolis to the region. After the bonds are paid off this year, the UTH should generate a cash flow of \$350,000 per year. This is significantly less, however, than the \$3,400,000 that would be produced if the site were redeveloped as park and housing. Closing the UHT may increase the probability that the upper river locks may be closed and dredging the channel may cease. This will have an adverse impact on the other commercial navigation activities, as well as recreational and excursion boating. These adverse impacts should be compared to the overall benefit of implementing the master plan.

UPPER MISSISSIPPI RIVER MASTER PLAN
 Projected Cost of a Modal Shift
 August 3, 1999

| Mode | Barge | Cost | Truck | Cost |
|--|-------------|---------------------|-------------|---------------------|
| Commodities moved (tons) | 1,800,000 | | 1,800,000 | |
| Distance (miles) | 19 | | 17 | |
| <i>Ton Miles (includes back-haul)</i> | 52,725,000 | | 61,200,000 | |
| Fuel consumed (gallons) | 205,156 | | 1,033,784 | |
| Federal: Army Corps | | \$3,100,000 | | \$ |
| State: Road wear-net subsidy (miles) | | \$ - | 2,448,000 | \$ 58,752 |
| Minneapolis: UHT opportunity cost | | \$3,050,000 | | \$ |
| Externalities: | | | | |
| Hydrocarbons (tons) | 4.7 | | 19.3 | |
| Carbon monoxide (tons) | 10.5 | \$ 11 | 58.2 | \$ 58 |
| Nitrous oxide (tons) | 27.8 | \$ 10,063 | 311.2 | \$ 112,662 |
| Tire disposal (number of tires) | | \$ - | 1,441 | \$ 7,205 |
| UHT: Cost to shippers | | \$ 300,000 | | \$ 468,000 |
| Other terminals: Cost to shippers | | \$ 600,000 | | \$ 2,100,000 |
| Total costs | | \$ 7,060,074 | | \$ 2,746,677 |
| Cost/ton | | 3.92 | | \$ 1.53 |
| Cost/ton mile | | \$ 0.1339 | | \$ 0.0449 |
| Differential: barge cost - truck cost | | \$ 4,313,397 | | |
| Differential per ton | | \$ 2.40 | | |
| Projected accidents per year | 0.09 | | 2.30 | |