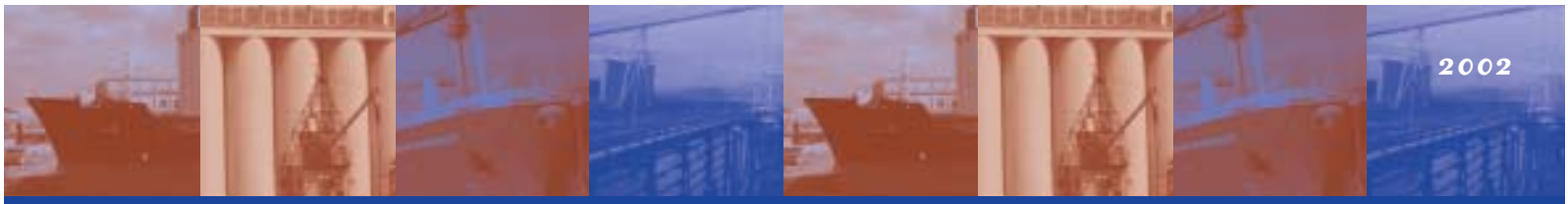

2002

MYTH: BARGES ARE THE MOST FUEL EFFICIENT MODE OF TRANSPORTATION FOR AGRICULTURE COMMODITIES.

Commodity groups and the barge industry are advocating for the expansion of the Upper Mississippi locks and dams, a project which would cost $1 billion dollars, half of which will come from taxpayers' dollars. These groups contend that enhancing the barge capacity will benefit the Upper Midwest economy by permitting the export of more raw commodities, particularly corn and soybeans, down the Mississippi River.

One issue central to their argument is that barge transport is the most environmentally friendly and energy efficient mode of agricultural transportation.[1] They argue that NOT expanding the locks and dams would shift traffic to a less efficient transport mode (i.e. trucks or rail) rather than energy efficient barges.

While it may have been true in past decades that water transport, when compared to rail, truck and air transportation, was more energy efficient, recent evidence suggests otherwise. Three factors support this assertion:

- ***Revised estimates of transportation fuel efficiencies show that water transport is less efficient than rail transport.***
- ***Barge transport is dependent on truck transport, therefore the combined total should be considered in energy efficiency estimates.***
- ***Over the last 20 years, corn and soybeans, two commodities traditionally barged down the Mississippi and shipped to Europe, are increasingly destined for Asia, making rail to the West coast a more energy-efficient option.***

All three factors call into question the wisdom of an expansion project that would require the investment of millions of taxpayer dollars and jeopardize the ecological integrity of the Mississippi River.

Rail and Barge Fuel Efficiencies Are Getting Closer

Barge advocates suggest that, on average, a gallon of fuel allows one ton of cargo to be shipped 59 miles by truck, 202 miles by rail and 514 miles by barge.[2] This data, as presented by the U.S. Department of Transportation, was published in 1981. Given the rapid turnover of technology and the changes that have occurred in all aforementioned industries, it begs to question the relevance of this frequently cited argument.[3] In a study on the energy impacts of alternative improvements of the Upper Mississippi waterway system, Tolliver (2000) shows that the margin of difference between rail and barge energy efficiencies has decreased considerably over time. Consequently, railroads have become more fuel efficient, and the economic efficiencies of waterway transport have diminished.[4] This conclusion supports a fuel consumption study by Baumel and Gervais (1999), who found that barge fuel efficiencies had the least technological improvement since 1985, behind both truck and rail.[5]

More recent energy data measures energy expenditure in British Thermal Units (BTU) per-ton mile. Whereas barge advocates argue that water transport is far more efficient, current literature shows conflicting data. The U.S. Department of Transportation estimates that BTUs extended on per-ton mile total 433 for water transport and 696 for rail transport. However, Greene and Fan (1995)[6] found rail and barge efficiencies to be much closer with the BTUs per-ton mile being 344, and 398 respectively. Davis (1999) found rail to be more energy efficient, with rail and barge BTUs being 368 and 412 (Figure 1).[7]

Future technological improvements in efficiency are affected by the level of competition within the transportation industry. The highly subsidized barge industry lacks the cost efficiency incentives that would normally force industries to invest in technological research and development to improve efficiency. The deregulation of the rail and truck industry has promoted technological development; in 1995 the rail industry invested over $63 billion in research and development.[8] The lack of competitive pressure in the barge industry indicates that rail and truck industries will continue to distance themselves from the barge industry in energy efficiency.

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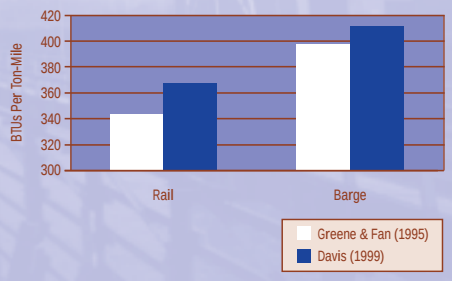
The highly subsidized barge industry lacks the cost efficiency incentives that would normally force industries to invest in technological research and development to improve efficiency.

Figure 1

Energy Consumption in Two Recent Studies



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2 U.S. Department of Transportation, Maritime Administration. Inland Rivers, Ports and Terminals, Inc. Environmental Advantages of Inland Barge Transportation. Online: http://irpt.com/environ1.htm
3 Casavant, K. 2000. Agricultural Transportation Challenges in the 21st Century. Inland Waterborne Transportation – An Industry Under Siege. United States Department of Agriculture. November 2000.
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5 Baumel, C.P. and J. Gervais. "Estimates of Fuel Consumption in Transporting Grain from Iowa to Major Markets by Alternatives Modes". Iowa State University, June 1999.
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10 Tolliver, 2000.
11 Regmi, A and M. Gehlhar. 2001.Forces Shaping Global Food Demand and Agricultural Trade. Agricultural Outlook. May. Pg. 10.
12 Forkenbrock, D.J., Foster, N.S.J. and M.R. Crum. 1993. Transportation and Iowa's Economic Future.
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Barge and Rail Transport Are Bi-Modal

As Casavant (2000) points out in his report, *Agricultural Transportation Challenges in the 21st Century*, trucks serve as the feeders of both the rail and barge shipping points.[9] Therefore, the truck distance traveled may be the ultimate determinant of which inter-modal combination of transport is most energy efficient from commodity origin to destination. Tolliver (2000) acknowledges that the failure to incorporate the truck transport that is directly associated with barge and rail transport is problematic. Tolliver suggests that this be considered in future assessments of transport efficiencies.[10] If truck transport distances into rail and barge stations differ substantially, then combined truck-rail and truck-barge fuel efficiencies may significantly change from the direct modal estimates in related studies.

Commodity Destinations and Values Are Shifting

Increases in domestic processing of commodity crops over the last thirty years have lessened the emphasis on waterway transport. For example, domestic corn processing has increased from 9% in 1976 to 18% in the late 1990s. This is significant for the barging industry because domestic corn products are generally moved by rail to the destination ports. Rail transport tends to be faster, more reliable and more predictable than water transport and thus preferable for perishable commodity transport.

Over the last 20 years, the value of U.S. commodities shipped for export have declined and destinations have changed. In 1980, bulk exports accounted for nearly 70% of the value of total U.S. agricultural exports, but the share declined steadily to less than 40% in 1998. With relatively low bulk prices in the late 1990's and a slow volume growth, the value of U.S. bulk trade in 1998 was below the value in 1980.[11]

Another trend has been the shift in export destination. In the early 1980's, the U.S. shipped most of its export grain to New Orleans en route to Europe. Barges operating on the Mississippi dominated the movement of Midwestern bulk exports.[12] By 1990 drastic changes had occurred; Asia had become the primary export market for U.S. grain products. Because exports to Asia are better served by west coast ports, and because barges are limited to hauling grain to ports located on navigable rivers, the rail industry now dominates domestic transport of agricultural goods. In sum, the overall use of waterway transport is decreasing, as is the value of the commodities that continue to use the water mode of transport. Why invest additional dollars to expand infrastructure on a waterway system that is becoming obsolete and cost-inefficient?

Conclusion

The barge industry is already the most subsidized form of transport in the United States. Their fuel taxes cover only 10% of the annual $647 million that the U.S. Army Corps of Engineers spends building, operating and maintaining locks, dams and navigation channels. The rest is paid by taxpayer dollars. In contrast, the truck industry pays fuel and user taxes for their use of, and damage to the interstate.[13] The rail industry receives virtually no federal aid to help curb industry expenditures on railroad infrastructure.[14] Expansion of Upper Mississippi locks and dams will be yet another cost incurred at the taxpayer's expense. Although the available research is indecisive, the data do indicate significant increases in rail efficiency, while barge efficiencies are relatively stagnant. Moreover, changes in the commodity industry over the last twenty years have favored rail transport with growing trends towards an Asian based export market and overall decrease in bulk commodity exports. The expansion of the Upper Mississippi locks and dams is, therefore, neither warranted nor justified.