Intermodalism and Improved Transportation Productivity

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The advantages of and prospects for water-rail movement of bulk commodities are briefly examined. It is concluded that cooperation between water carriers and the railroads will increase sharply in the 1980s as a result of the pressures of inflation, the need to improve productivity and capacity, anticipated cost and fuel savings, and the likelihood that intermodal cooperation will economically benefit both modes.

A whole new dimension to intermodalism has been quietly developing in the past few years and will accelerate to major new proportions in the 1980s. This is the interchange of millions of tons of bulk materials in the coordination of rail and water services.

Railroads are best equipped to handle bulk materials overland in huge volumes over long distances, and water carriers are even better equipped to handle them over very long distances by the river system. The combination of the best efficiencies of railroading and water transportation can and does make possible significant improvement in productivity in the vital and always expensive distribution process. Involved are the very large movements of coal to the electric utilities, food and feed grains for home consumption and for animal and chicken feeds, chemicals and fertilizers, ores of all kinds, and even steel products.

Any increase in the costs of these products produces a major multiplying effect throughout the economy. Reductions in costs at the transportation level of production can play a substantial role in the battle against inflation. I should point out that transportation is a much more significant part of the end cost of bulk raw materials and semifinished products than it is of the cost of finished products.

It is axiomatic that one of the major weapons in the fight against inflation is improvement in productivity--greater efficiency in the use of resources. Many of us are aware that the current figures on productivity trends are showing a sharp and alarming falloff. Where productivity declines anywhere in the pipeline of production and distribution, inflationary forces build up, but particularly menacing is inflation in the early stages of production. And right there is where the water carrier can make a significant contribution.

It is a fundamental law of physics that it takes less effort to move a floated ton than to transport a ton overland. Labor produces far more ton-miles by water than by any overland means. A barge can carry five times its own weight compared, for example, with a freight car, which carries only twice its own weight. A single towboat can push up to 50 000 tons; the same tonnage would require 15-20 locomotives and at least 500 freight cars. A barge takes less effort and costs far less to maintain than the equivalent string of freight cars. The water mode is at least 50 percent more fuel efficient than the most efficient overland mode. Finally, in terms of the cost of expanding capacity, a critical consideration in the inflation battle, the public and private investment required to increase capacity is far less for water than for any overland mode.

So it is important news that a lot of planning is now going into promoting intermodal water-rail movements--promoting the efficient combination of the lowest-cost means of transportation. Heavy investment is going into water-rail transfer facilities, and more investment is on the way. I do not say we have finally overcome the century-old reluctance of some railroads to join water carriers or yet talked the railroads out of participating in the environmental lawsuit on Locks and Dam 26, but there is evidence of some long-range thinking on these issues.

I take an optimistic view, along with some who have studied the potential for an increase in traffic on the river and rail systems. The main economic imperative is the substantial savings in cost that result from combining the best efficiencies of railroads and water carriers on long-distance moves of bulk materials. But there are other imperatives. Railroads are highly fuel efficient, but barges are even more fuel efficient. Combining both modes, where possible, would save precious fuel. Another imperative is capacity. Take away a single bottleneck at Alton, Illinois, and the Upper Mississippi, which now handles 25 millon tons/year, could easily handle 45 million tons/year. The Illinois River system, which now carries 32 million tons, could handle 60 million tons. The Ohio River handled 151 million tons in 1976. Its design capacity is more than 480 million tons, and the bottlenecks are relatively minor.

The Lower Mississippi, of course, has unlimited capacity from St. Louis south, and the Great Lakes system has no visible limit. More intensive use of this unused capacity is by far the most cost-effective means of improving transportation productivity and expanding transportation capacity in the mid-American region for the millions of tons of heavy-loading bulk commodities that now move long distances and, in the future, are expected to move even longer distances.

The river roadbed, of course, renews itself and cannot be worn out by the passage of traffic or time.

Recent studies have assumed a doubling of river traffic by the end of the century. The most recent, a report prepared for 17 mid-American states and the U.S. Maritime Administration, says that river traffic will increase from 440 million short tons in 1976 to more than 900 billion in the year 2000. The carriage of grains, coal, petroleum, fertilizers, and chemicals will experience especially high growth. The report identifies a need for 1000 new terminals along the rivers, which will require local investment of almost $9.5 billion.

A main reason for optimism over the future of inland navigation is simply geography. The Mississippi, Arkansas, Ohio, Illinois, Missouri, and Great Lakes systems serve the industrial and agricultural heartland of the country. Most of the economic activity between the Rockies and the Alleghenies is within practical reach of inland water transportation.

Currently, the major feeders to the rivers are trucks. I predict, however, that in the 1980s the railroads will want to compete for that business more and more and will thus extend the commercial reach of the rivers far beyond the present truck range of 50-100 miles. Many midwest railroads are built on the east-west axis and are natural feeders to the rivers.

If we analyze the economics of rail-water movements, for example, we see substantial advantages for railroads. The increased river traffic will not be diverted from the railroads; it will stimulate increases in rail traffic. Stanley L. Crane, pres-

ident of the highly successful Southern Railway, expects rail-freight ton miles to increase 143 percent by 1990 and rail market shares to increase 24 percent.

Take an east-west railroad like the Milwaukee, the Chicago and North Western, or the Burlington Northern. To reach the grain export markets in the Gulf of Mexico, they must agree with another railroad on divisions of an overall rate. Such an all-rail movement is subject to competition from the river, which is fed by trucks over long distances. There is a competitive ceiling on the all-rail rate. It is very likely, even certain, that the railroad can get a higher rate division by connecting with the barge line than by connecting with another railroad. Such a connecting railroad benefits from the efficiency of river service. Part of the saving is passed on to the shipper, but part is shared by the railroad in higher divisions.

The railroad also makes a higher profit per trip more frequently. Instead of the freight car going all the way to the Gulf and possibly waiting at congested terminals for unloading, it stays on the tracks of the originating line at all times. Use of the freight car is thus under far better control. The car may be loaded four or five times as often, at a higher division, by using the barge connection than by using the all-rail connection. Even when the originating railroad has authority for the entire trip to the south, the same economics of car use make it advantageous to interline with barge lines. Significantly higher use is, of course, the cheapest way to expand capacity.

Just last year, a coal terminal in St. Louis began shipping to a utility in Louisiana western coal that was transported to the river by rail from Wyoming. Federal Barge Lines, Inc., is constructing a similar facility 80 miles south of St. Louis at Cora, Illinois. When completed in 1980, it will be capable of handling 15 million tons of Illinois and western coal. It is certain that this would not have been possible if we had not had the cooperation of some progressive, economically realistic railroad executives.

Most rail-water movements of coal on the Ohio River and from the West to the Mississippi are voluntary within the present basic legal framework, which is intended to encourage rail-water coordination. But there have been situations in which a railroad would refuse outright to join with a water carrier. On those occasions, the railroad saw an opportunity to raise its rate to the port in order to force the traffic to go all rail at a higher cost to the consumer.

Although the law is clear enough and the Supreme Court has said often enough that the railroad has no right, by exploiting its monopoly of the services to the port, to deprive the inland shipper of the competitive rail-water alternative to an all-rail service, we think any new legislation should clarify and solidify this point. A current proposal to the Congress clearly prohibits the practice of squeezing out the water carrier by the artificial manipulation of the rate to the port. It has been suggested that a treble damage penalty be introduced for such tactics. This proposal simply preserves a shipper's right to a competitive alternative. The public is always better off when a competitive alternative is not artificially suppressed.

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Forecasts of Key Commodity Flows at a Regional Port

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Some practical aspects of forecasting key commodity flows for the Port of Metropolitan St. Louis are heuristically examined. Scenarios of regional economic growth are developed, detailed industrial market studies are assessed, and regressions are adjusted from baseline output to reflect the impact of intermodal opportunities, the needs and demands of target industries, and the unique position of the port below Locks and Dam 26. Key forecasts of flows of cash grains and grain products, coal, petroleum and petroleum products, chemicals, and fabricated metals are examined. Operational problems resulting from growth in commodity flows at the port are identified. Finally, the need for port studies to identify and capitalize on the unique locational and industrial assets of individual regions is discussed.

The objective of this paper is to examine the flows of key commodities into the Port of Metropolitan St. Louis during the current period of shifting energy policy, more intensive import-export programs, and inflationary pressures on industrial expansion. It is important to examine national movements of key commodities such as coal and petroleum in the context of a regional port. Furthermore, it is particularly important to examine them in the context of the St. Louis port because of its strategic location on the national inland waterway system.

The unique characteristics of the Port of Metropolitan St. Louis that are relevant are the following:

1. In terms of tonnage, it is the largest inland port on the system.
2. It is crucially placed just below Locks and Dam 26 at Alton, Illinois, and thus acts as a nodal point on the river for tow sorting and makeup.
3. It interacts with a large midwest rail network and so is capable of acting as a test-bed for potential rail-water cooperation.
4. It lies at the edge of the midwest corn and wheat belt and acts as the metropolitan starting point for much of the agricultural movement of products destined for international distribution.

In light of the above, altered construction at Locks and Dam 26, user-charge mechanics, and trade policies will be felt in commodity flows and interchanges at the St. Louis port. The balance of this paper presents a detailed and regionally refined set of commodity-flow forecasts and a discussion prepared for a local port district study now under way.

REGIONAL SCENARIOS

To facilitate the understanding of origin-destination and commodity-flow levels in the St. Louis bi-state region, a set of regional scenarios was