the Siberian and Asian waterway systems. However, realization of the project is doubtful because of extremely high construction costs.

A difficult problem is that of maintaining the increased channel dimensions on the bars of the rivers of Siberia; this is essential if cargo is to be delivered to the mines and the oil and gas fields of the Far North. Intensive research is in progress, and the maintenance fleet is being increased by the addition of suction hopper dredges.

In the middle and upper flows of the eastern rivers, a number of hydropower dams with heads of 100 m (330 ft) and more have been constructed. The construction of ship lifts is the only solution here. A "sloping" ship lift is currently being completed on the Yenisey River. The lift chamber is to be mounted on a sloping, self-propelled trolley that travels on rails. The first experience has been rather negative because of limited capacity and operational difficulties and because construction and maintenance costs significantly exceed transportation benefits. Investigations are currently going on in the Soviet Union as to other, more efficient, types of lifts.

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Inland Waterway Ports as Intermodal Freight Centers

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The prospect of using terminals to facilitate solutions to the urban goods movement problem has been recognized since the 1930s. The most recent promising proposal has been for a network of interlocked intermodal freight transportation facilitation centers. This has the merit of being one of the few ideas in which all parties—carriers, shippers, consumers, and urban communities—can win. But it is difficult to implement because of archaic regulations, opposition from labor unions, short-sightedness by carriers, and considerable lag in public terminal policy. The inland waterways ports form a good but not an ideal place for launching a regional network of intermodal terminals. This will require the barge lines to diversify more into general cargoes and inland stores, port cities to augment port development, and the federal government to develop a port policy and enforce equitable arrangements of intermodal interchange.

The prospect of using terminals to mitigate the urban goods movement problem has been recognized for generations. Joseph B. Eastman, coordinator of transportation in 1936, proposed that "railroads could save over $50 million a year by consolidating terminals" and that such a move would improve their competitive position and contribute to community development. In the midst of the Depression, the Interstate Commerce Commission once suggested that "all terminal properties should be thrown open to all users on fair and equal terms." In 1946, Wilfred Owen concluded in The Metropolitan Transportation Problem that "the scattered location and obsolete design of freight terminals and the absence of satisfactory physical relationships among the several methods of transportation create a heavy volume of unnecessary traffic as well as delay and high costs that penalize business, the consumer and the community." More recent studies have brought the urban goods movement problem into sharper and city-specific focus. But studies have produced relatively little progress toward a solution to the freight aspect of the urban transportation problem.

PROPOSAL

Of all the proposed solutions to the urban freight problem that came to my attention at the U.S. Department of Transportation, the concept of a network of intermodal freight transportation facilitation centers (IFTFCs) is the most useful. There have been many difficulties in implementing the IFTFC concept, but at this point it is being proposed that the inland ports, seeking diversification and growth, might constitute the ideal launching points for a regional network of such intermodal terminals. This proposal poses three basic questions:

1. What functions would a network of IFTFCs perform?
2. How well would the concept fit into the structure, functions, and objectives of inland ports?
3. What else must be done to implement intermodal freight service at the inland ports and elsewhere?

THE FACILITATION CENTER

In their final configuration, the transportation facilitation centers (TFCs) would consist of a network of freight terminals around the periphery of each major metropolitan area, tied together by a computerized management information system. Individual units would be organized in accordance with local circumstances very much as ports are today. In most instances, they

would be joint ventures that combine public investment with private operations by a third party and serve all carriers on a nondiscriminatory basis.

The TFCs would perform consolidated pickup and delivery service in central business districts on behalf of highway, rail, water, and air client companies. Although designed initially to accommodate small shipments, the TFCs could be used in the collection, storage, transshipment, and distribution of all kinds of freight. They could also be used to provide a basic system of carrier pooling and container interchange. Some carriers could use TFC facilities as inland port of entry for international freight with full or part-time customs and other inspection services. Free-trade-zone and bonded storage facilities could be provided at inland ports. The computerized management information system could perform centralized billing and accounting functions, produce status reports, trace shipments, report container and equipment status, consolidate documentation, perform route and cost analysis, and prepare international shipping documents, export and import reports, and all internal accounts and records.

Benefits

All parties can win in the TFC concept. The carriers can reduce escalating terminal and pickup and delivery costs through economies of scale and improved vehicle utilization. The cities can reduce street congestion and conserve energy by having fewer partially loaded vehicles traversing streets, waiting, and loading and unloading. The shipper, the receiver, and the consumer can achieve lower inventory and distribution costs, better levels of service, and a greater variety of goods at lower prices respectively. Trade-offs will inevitably be involved in any initiative, but this is one of the unique cases in which the major parties in transportation can all win something.

Problems

What has held up such a concept? Beyond the normal inertia confronted by any major idea, however economically feasible or socially acceptable, implementation of the TFC concept is confronted by some pragmatic institutional problems, such as

1. Archaic federal, state, and local regulations that inhibit entry and adjustment of truck service;
2. Union agreements that hinder the efficient intermodal handling, pickup, and delivery of goods in urban areas;
3. Myopic carrier rivalries and practices that interfere with the provision of intermodal service, through routes, and joint rates; and
4. The lack of a positive federal port policy for ports or freight terminals of any kind.

Although the institutional obstacles may appear formidable, the benefits are sufficient to warrant a major try. The point to start may well be the ports, which have had over a century of experience with joint ventures in terminal development. The first step might well be a positive declaration of federal interest in port development backed by some plan approval authority and some funding. Federal support of research and development and demonstration projects are not enough (1).

INLAND WATERWAY PORTS

Whether the inland waterway ports are the ideal launching points for the TFC concept remains to be examined. There are several points in favor of launching TFCs or intermodal terminals. The ocean lines have been in the vanguard of offering intermodal through service. Some are already offering intermodal service arrangements that link all modes of transportation in through routes, joint rates, and single billings. It is conceivable that it may, in the near future, be easier to ship abroad than to some domestic destinations. The ocean lines have the technology to extend these intermodal service arrangements inland and ashore where most of the overseas cargoes originate and terminate. The intermodal containers, roll-on/roll-off ships, and barge-carrying ships enable the ocean lines to transship through the coastal ports and perform other port-related functions (packing, marking, documenting, financing, forwarding, and clearing) at inland points. It is noteworthy, however, that the barge-carrying LASH and Seabee ships are the only technologies that offer the inland waterway ports a distinct advantage over other inland terminal points. There is increasing incentive to perform these functions inland as the coastal ports become less efficient, more costly, and more constrained by encompassing labor agreements.

The energy argument is also favorable to the inland waterway ports. The barge and tow operations are conducted at a fraction of the energy costs for overland trucking and are less energy intensive than rail service in most instances. As energy becomes more restricted and expensive, the advantage of inland ports may increase.

That advantage, however, may be offset by fuel taxes or waterway user charges, depending on what emerges from the joint congressional committee that now has the matter under consideration. The combined impact of user charges and increased opposition to waterway expansion has placed the waterway carriers in a difficult position. The way out could entail some diversification from industrial bulk commodities to a broader base of commercial general cargoes. If this becomes the case, and the carriers are supported in their diversification efforts by local and state port agencies along the rivers, the basis could be laid for a series of intermodal port terminals.

Some federal action would still be required along two lines. The first involves assuring the inland ports of equitable access to inland traffic. This implies proportional inland rates, through routing, and equitable division of through rates. The second involves a positive federal policy on port development with some participation in port and freight terminal financing. These matters are more difficult to accomplish than it is commonly believed.

The difficulties of launching intermodal terminals at the inland ports should not be overlooked. The problems of archaic regulation, labor opposition, and carrier shortsightedness will not simply disappear. The coastal ports will resist being bypassed and having some of their conventional functions transferred to inland ports. They will be joined in this opposition by the long-haul railroads, some of the container lines that use bridge rates, and the longshoremen's unions. Barge lines will have to gear their industrial operations to commercial service and expand their marketing programs. This will be a difficult and audacious undertaking in the face of expanding user charges and a contracting waterway program. Barge-line terminals are primarily transshipment points scattered somewhat indiscriminately along the rivers. Powerful state and local support will be required to create consolidated ports capable of backing up the line's market diversification.

Characteristically, river cities and states have had little involvement in port development. In the 1970s, they have put only 0.1 percent of their transportation funds into port development compared with over 3.0 percent by coastal states. Few of the river states have port authorities or any liaison organiza-

tion in their departments of transportation that is responsible for port development. Clearly, the river states and cities will have to give more priority to ports and their investment in ports. They would be assisted in such a shift in transportation priorities and investments if federal assistance were given to water ports in the same proportion as it is given to airports, highways, transit, and other modes. A positive statement of federal interest in port development would also assist in rearranging state priorities.

But such a policy declaration does not appear to be forthcoming. Moreover, the federal government appears to be so preoccupied with deregulation that it is not apt to recognize the need for coordinative types of regulation in the near future. Inland ports must be assured of equitable inland access if they are to perservere in the face of almost arbitrary bridge rates to coastal ports. Laws that require rates that are not unduly discriminatory against regional ports, make through routes and rates mandatory, and provide for equitable divisions of through rates are already on the books. Unless they are enforced, the barge lines will not enjoy equitable inland access to diversified general cargoes by rail and truck. Instead of acting as intermodal feeders, the trucks and railroads will cut parallel long-haul rates and keep short-haul rates for the river ports prohibitively high.

CONCLUSIONS

1. The IFTFC is potentially the best answer to the urban goods movement problem.
2. The IFTFC is one of the few ideas that is beneficial to carriers, shippers, consumers, and the urban public.
3. The IFTFC is difficult to implement because of archaic regulation, some union opposition, some shortsightedness by carriers, and some lag in public port and terminal policy.
4. The inland waterway ports form a good but not an ideal network for launching a regional network of IFTFCs.
5. Implementation of an intermodal terminal network at the inland ports will require (a) the barge lines to diversify and expand their penetration of the general cargo markets, (b) the river port cities and states to consolidate terminals and increase the priority accorded to ports in transportation financing, and (c) a positive federal ports policy and enforcement of coordinative regulations that require equitable interchange at the river ports.

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Local and Regional Socioeconomic Impact of the Intermodal Freight Transportation Facilitation Center

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The objective of this research is to formulate a methodology that can be used to evaluate the feasibility of developing an intermodal freight transportation facilitation center (IFTFC) for a region. The purpose of this methodology is to test the feasibility of the IFTFC and to examine its regional effect.

This paper is concerned with the regional socioeconomic impact of an intermodal freight transportation facilitation center (IFTFC). Because of the importance and growing awareness of the concept of IFTFC, the following thoughts on the subject by John T. Norris of the Office of Facilitation, U.S. Department of Transportation, should be reiterated.

Traditionally, a measure of the economic impact of a coastal port on local and regional interests has been a criterion of measurement to justify (a) the existence of the port and (b) the alteration or expansion of the port or both. In more recent years, social impact has become a required consideration, primarily in the context of environmental protection. Even more recently, social impact is occurring in a few major port areas from the point of view of aesthetic and environmental beautification. In almost all cases, however, considerations of socioeconomic impact have been either shortsighted or even after-the-fact processes. The emergence of the inland waterway-Great Lakes port "system," however, provides a new opportunity. That emergence is motivated by new transport technology such as LASH, Seabee, containerization, and roll-on/roll-off (ro/ro); by new techniques of transportation facilitation such as feeder support systems that penetrate the coastal and inland waterways of the nation; and by intermodalism. Thus, the timing is right for before-the-fact, long-range considerations of socioeconomic impact with regard to U.S. inland waterway and Great Lakes ports in the context of IFTFCs.

Systematic analysis through research will ensure advance (before-the-fact) consideration of the local-regional socioeconomic impact of the IFTFC concept for waterway ports. The predicted impact should be