Study of Upstate New York Public Ports

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An unconventional study approach resulted in new perspectives on port objectives and the state role in port development. Real, measurable port benefits are used in the study and are contrasted to those commonly used in earlier studies. The detailed freight demand analysis, or market analysis, necessary to identify these benefits and the general applicability of the approach at local, state, regional, and national levels are discussed. Study recommendations that relate to port development, financing, and marketing and conclusions about the state's role in port development reflect the responsiveness of the study to issues of local and statewide concern. Focusing on the upstate New York ports as means to provide the best possible service to shippers and consignees has encouraged coordination among these ports and provided a basis for state port development policies.

In September 1976, the New York State Department of Transportation (NYSDOT) completed a study to identify and address the major needs and potentials of the upstate New York public ports of Albany, Buffalo, Rochester, Oswego, and Ogdensburg. Some of these needs had been identified in 1972 during the preparation of New York's Master Plan for Transportation. In several public hearings on the master plan, it was claimed that state and local investment in ports had resulted in uncoordinated development; in the construction of unused or lightly used, expensive facilities; or in the taking of traffic away from other ports and from other transportation modes that the state was assisting to sustain its economy.

All upstate New York ports were reported then as operating at a deficit and without the financial resources to meet their capital needs. Historically, port authorities had been established to allow efficient port management at a time when ports were profitable. Their jurisdictional boundaries generally do not reflect the areas receiving the greatest benefits from the ports, and many industries that have vital interests in the ports are not represented by those responsible for deciding on the port's continued operation and development. Their governmental structures vary from one to another but, in general, they are separated from direct local government control and are therefore without the financial and political base needed to meet their changing requirements.

As port agencies faced financial problems, these circumstances made it difficult to obtain local financial support. Several municipalities expressed concern over port deficits supported by their own property taxes, and the state was increasingly called on to provide loans and grants for new facilities and for rehabilitation of existing ones. It became evident that state initiatives in regard to ports were needed, both to promote sound and coordinated port development and to assess the justification for an already significant and possibly expanding public support of port operations.

In the fall of 1974, state funding for a study of the upstate public ports had been approved. It was decided to design the study from an overall transportation perspective consistent with the NYSDOT approach to planning for other transportation modes. This differed from the single-mode concern that was found to be prevalent in other port studies that had been reviewed. Not surprisingly, the final conclusions and recommendations of the study were also different from and somewhat contrary to those of many previous port studies.

The study was carried out by a consultant, Frederick R. Harris, Inc., under close supervision by NYSDOT. F. R. Harris and NYSDOT were assisted by an advisory-liaison committee composed of members of the various port authorities, regional planning boards, metropolitan transportation organizations, and other concerned agencies, including those state agencies concerned with commerce, the environment, and the state budget.

OBJECTIVES

The department sought recommendations in three interrelated areas:

1. Coordinated port development--to identify service, equipment, and facility needs for effective handling of existing and potential freight traffic;
2. Financing--to define the appropriate levels of user charges, the regional economic benefit, the level of public financial support, and the distribution of the cost of this support among state and local governments; and
3. Upstate port management--to select the organizational structure and staffing patterns that will most effectively meet the requirements of current and future port operations.

The basic study objective was to maximize the benefits of waterborne commerce for the upstate regions. It was not to promote the development of upstate ports but rather to determine how upstate ports can best promote the development of the upstate port regions. NYSDOT did not assume that what is good for the ports--as facilities or employers--is necessarily good for their localities or the state's economy.

The underlying assumption was that the reason for any port is to serve the territory to and from which waterborne commerce moves at the lowest possible total system transport cost. The effectiveness of each port should be measured not against any other port (for example, not in how much faster or more efficiently it can move containers through the port) but in how well it meets the needs of shippers and consignees in its least cost hinterland--an area that may not be the same as that represented by the authority or local government responsible for managing the port.

A port needs to have only those facilities and provide only those services for which there is a tangible requirement. Thus, whether a port is just like any other or whether it does or does not have a particular type of equipment often becomes irrelevant. What is important is that the port carefully identifies and equips itself to meet its service area's needs. Then it will be able to demonstrate its economic contribution in real terms and develop public acceptance and support. It will also be in a much better position to finance its port operations out of realistically structured revenues and perhaps to fund its own future development.

The state must keep in mind that water transport is a capital-intensive industry. For each new job created on the waterfront, others may be lost in trucking or railroading. The net effect of promoting cost-effective water transport is to make industry more competitive. In general, development of jobs at the plant sites is promoted rather than development of jobs in the transport sector.

Port benefits are essentially the reduction in total transport costs that accrue to shippers and consignees compared to the costs they would incur by using the best alternate mode of transportation. This

is a departure from the traditional approach to port benefit assessment. Other studies have determined port benefits as expenditures made in the region because cargo and vessels used the port.

The American Association of Port Authorities and the Maritime Administration have basically used a formula that consists of the following elements:

1. Port and terminal expenditures (pilotage, tug hire, line running, dockage);
2. Government charges (immigration service, entrance and clearance fees);
3. Labor (stevedoring, clerking, checking);
4. Repair (by ships using the port for service and material);
5. Supplies (dinnage, laundry, ships stores);
6. Bunkers (purchase of fuel and water);
7. Port terminal income (car loading and unloading, demurrage); and
8. Rail and motor freight revenue credited to the local area.

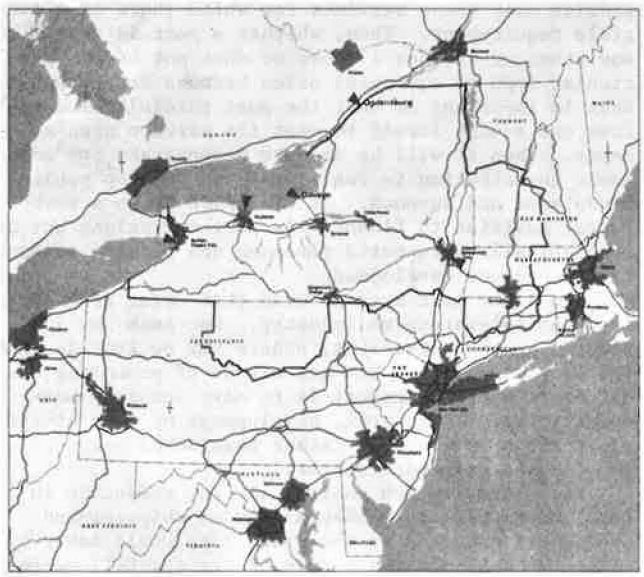
The study of upstate New York ports did not recognize as benefits many of these expenditure items since they are often more than offset by decreased expenditures in other sectors of the economy. Even less did the study accept any formulas stating, a priori, port benefits as a value per megagram of various types of cargo moving through the ports.

APPROACH

To maximize the benefits of the upstate ports, we needed to identify benefits: who benefits and how much. With the above definition of benefits, this required a very detailed freight demand or market analysis, a level of analysis that had apparently never before been attempted. But we felt it was both necessary and worth the cost because of its flexibility as a port analysis base and because of its many useful by-products.

Briefly, the first phase of the study defined a preliminary market potential and regional distribution of port benefits. Phase 2 examined the results of phase 1 in terms of certain noneconomic restraints on the ports' ability to achieve their potential. Finally, the last phase focused the results of the earlier phases on the three areas: port development, financing, and organizational structures.

Figure 1. Preliminary market area for upstate New York ports.



Since the market analysis is the second major departure from the traditional port planning approach, some characteristics of the analytical logic used may be warranted.

What is called the preliminary market area for upstate port services is shown in Figure 1 and includes 44 counties in upstate New York and portions of Connecticut, Massachusetts, New Hampshire, Vermont, and Pennsylvania. One preliminary market area is used for the analysis of all the ports. Within the boundary of this market area, waterborne transportation through an upstate port is likely to be the least cost alternative for some commodity or shipment being transported. The area outside would be served by other modes or routes through other ports.

The actual market area of each port may change over time because of fluctuations in transportation costs, and it will differ depending on the type and value of the commodity handled, the technology of the modes used, and the foreign origins or destinations. For these reasons, it was necessary to describe a preliminary area large enough to encompass reasonable fluctuations in the extent of both the current and potential market areas of the ports.

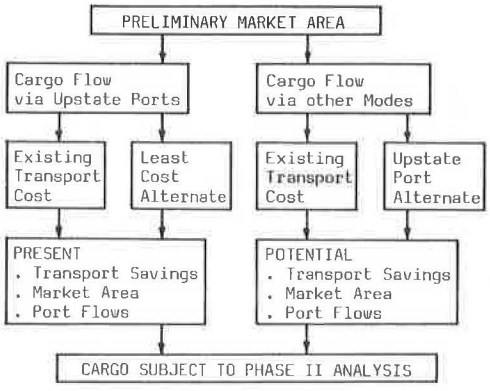
Figure 2 shows the process used to determine current and potential commerce and the regional benefits of upstate ports during phase 1. Although very simple in principle, it is a demanding process in practice because a very large data base must be subjected to essentially a multimodal minimum path analysis.

First of all, we focused on the existing port potential--traffic that now moves and that should be moving through the ports but for one reason or other is not. We did not ignore future growth but included future traffic only when it could be identified by shipper, cargo type, and other specifics.

All 1974 waterborne flows to shippers and consignees within the preliminary market area were determined and made part of a computerized data file. The analysis of flows that now use the upstate ports is shown on the left. The least cost alternatives through nonupstate ports were defined for each shipment in order to determine current cost savings and the likelihood of losing any of this traffic to other ports.

The similar but much more difficult analysis of traffic that now uses other ports--be that New York, Baltimore, Houston, or Seattle--is shown on the right in Figure 2. The data base here was a combination of U.S. Bureau of Customs data, made available commercially through the Journal of Commerce, and shipper interviews. For each individual shipment of 1633 shippers and consignees, the total cost of the existing routing, from the upstate shipper or consignee to the foreign port, was first determined. The overland mode used was not available from the customs record.

Figure 2. Phase 1 of market analysis.



A truck-rail comparison therefore had to be computed, and the least cost alternative was assumed.

The total cost to the shipper was then compared with routes similarly computed through one, two, or three upstate ports. This gave us an estimate of potential cost savings caused by rerouting. All commodity flows found to be least cost when assigned to an upstate port were combined to form the preliminary commodity flow list or traffic potential for the ports. Consequent cost savings are combined to form the potential regional benefit for each port on a preliminary basis.

Since the primary aim was to promote New York industry, most attention was focused on the traffic originating in or destined to the upstate area. Through traffic, which would only marginally benefit and in some cases disbenefit the upstate region, was identified in a manner less rigorous than traffic to New York shippers and consignees.

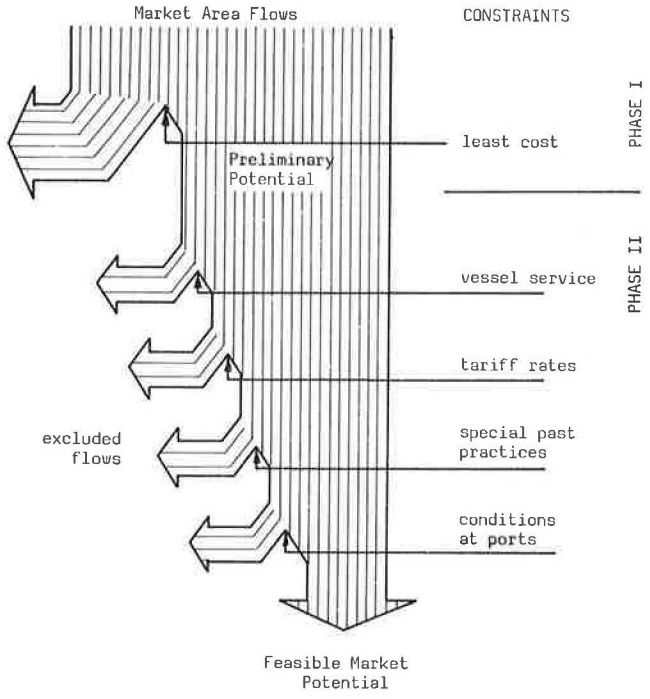
To illustrate the level of detail, total transport systems costs were considered to consist of seven main cost elements:

1. Vessel operating costs;
2. Seaway, Hudson River, and harbor pilotage and tariff charges;
3. Port user charges;
4. Vessel loading or unloading costs;
5. Overland carrier loading or unloading costs;
6. Overland carrier operating costs; and
7. Inventory costs (the cost of the need for a larger inventory because of time in transit).

The analytical process of the second phase of the market analysis consists of a "squeeze-out" procedure, shown graphically in Figure 3, whereby those commodity flows found to be least cost when routed through one of the upstate ports are subjected to four service constraints:

1. Overland and ocean carrier service factors;
2. Overland and ocean freight rates;
3. Unique shipper or consignee service factors; and
4. Constraints of the current marine, physical, and operational conditions of the upstate ports.

Figure 3. Phase 2 of market analysis.



This brief outline of the analytical logic is intended to give a basis for evaluating the usefulness of this approach in other states and regions. We believe it can be accomplished at reasonable cost for different geographic scales of study. It is detailed enough to answer plan and policy questions on an individual port basis and identify impacts on a local scale; it is expandable from a nucleus study to adjacent areas and, similarly, studies in different areas can be merged and thus provide larger scale coverage at major cost savings. Finally, it can be kept current through computerized annual updates at small additional costs.

RESULTS

The result of the market analysis was a substantial increase in identified port potentials. The analysis demonstrated the value of our upstate ports for the economy of New York State.

In 1974, the availability of the upstate ports saved New York shippers and consignees $9.1 million in transportation costs. Equally large additional savings would have been realized if traffic now moving through other ports had been routed through upstate ports. Further savings can also be expected from future traffic that has been specifically identified but is not now moving at all.

Major capital improvements and a coordinated marketing approach will be required, however, to make full use of our ports in the future. About $14 million will be needed for a container and a dry bulk facility at Albany. Because of western coal coming into New York through the ports of Buffalo and Ogdensburg, new bulk handling facilities may be needed at these ports as well. Investments in facilities for each port to develop its special potential were subjected to a detailed financial analysis and found to yield high benefits to the state as well as to individual ports.

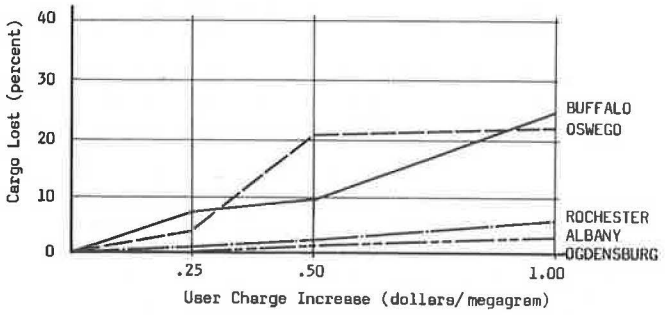
The study showed that the trend toward increasing public port deficits can be reversed. The table below gives three options for the adjustment in user charges in cents per megagram that is necessary to make the ports self-sustaining:

Port	A	B	C
Albany	12	23	23
Buffalo	0	9	25
Rochester	0	0	4
Oswego	0	0	0
Ogdensburg	8	17	32

Option C is the increase that would be required to cover all operating and capital costs, including a reasonable payback of previous grants to the ports. Option B would cover operating costs plus payback of state or county loans, and option A would cover operating costs only. Note that required user charge increases average at most $0.32/Mg. This is substantial compared with existing port charges but a very small amount of the door-to-door total transport cost to the shipper.

Through the assessment of alternative transportation costs, the study identified the savings per megagram of each individual shipment. An aggregation of these results by port is shown in Figure 4. The figure shows two things: first, the percentage of existing and potential traffic as a function of total

Figure 4. Percentage cargo lost versus port charge increases.



transport savings from shipper to foreign port. For example, for the port of Buffalo, about 7 percent of the potential cargo saves less than $0.25/Mg, 10 percent saves less than $0.50/Mg, 26 percent saves less than $1/Mg, and 74 percent saves more than $1/Mg.

Since Buffalo would have to increase its average rates by $0.25/Mg to be fully self supporting, we can see that 7 percent of the identified traffic no longer would be least cost if this additional charge were implemented. Thus, the graph is also a representation of cargo likely to be lost as a function of user charge increases.

A closer examination of the Buffalo situation revealed that all the traffic loss due to a $0.25 user charge increase would be from potential flows--traffic that does not presently move through the port.

Other recommendations of the study included state assistance with common problems through participation in the proposed Upstate Ports Council and formation of a shippers association but no change in the functions or responsibilities of existing authorities.

STATE ROLE

On the basis of this study and the relatively brief experience of NYSDOT in port planning, some general conclusions have been drawn as to an appropriate state role in this area.

States should recognize that ports within their boundaries, like any other transportation facilities, are only means to achieve a more basic objective--in this case, to maximize the benefits of waterborne commerce for all shippers and consignees within their jurisdiction. However, the study found that it is generally in the state's interest to promote the development of the small upstate New York public ports and to maximize their use, and these are certainly concerns of individual port authorities.

A state department of transportation can assist small ports by undertaking planning, marketing, and engineering studies that such ports seldom can afford on their own. Much of NYSDOT interaction with small ports is now handled through our membership in the Upstate Ports Council established as a result of this study. The council provides a forum for the discussion and resolution of mutual problems of the ports in the areas of operations, marketing, facility development, tariffs and port charges, shipper negotiations, and public information.

For the ports to provide necessary services and facilities on a timely basis, they must have a sound financial foundation. This study showed that increased user charges can and should provide this foundation. We see few benefits in making the ports dependent on the public purse. Our role is one of encouraging gradual adjustment of user charges that minimize adverse impacts on our shippers and at the same time allowing the ports to become self-sustaining operating agencies.

These are some port-related activities now seen as consistent with the NYSDOT mandate for planning and development in water transportation. No doubt, as we gain more experience, and as we and others identify new, necessary, and useful state activities, our role will change. At this point, some of the groundwork has been done that will permit us to adapt to new conditions and demands in a responsible and effective manner.

CONCLUSION

The initial study objectives were more than fulfilled. In addition to being a valuable guide for state port policy development, this study provides NYSDOT with additional insights for broad freight, regulatory, and state-local relations concerns. But most important, the study provides valuable guidance to individual port authorities that have now managed to reverse the earlier discouraging trends regarding port deficits.

The study has been given considerable attention in the design of port studies for the New England and the Great Lakes regions. Ultimately, we would like to see the U.S. Maritime Administration maintain a data base for the whole country similar to the one used in this study that could be accessible to New York and other states for low-cost periodic study updates.

We should focus on the ports not as local, state, or regional assets (which they indeed are) but as means to provide the best possible transport service to shippers and consignees. Only then can we encourage coordination rather than competition among the ports and prevent the costly construction of unnecessary facilities and wasteful soliciting of traffic that should move via other modes and ports. Only then can rational state and national policies be developed in regard to future port development.

ACKNOWLEDGMENT

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