

Our intermodal experience and our transfer of people among the modes themselves and within the management have benefited the general level of management at CP.

CONCLUSIONS

One conclusion that can be drawn from the CP experience is that intermodalism, while clearly becoming a more significant part of the transport sector, is not a magic answer to the problems surrounding that sector. These problems are grounded in public policy, history, technology, markets, industrial location, and so on. Intermodalism is the result of fairly recent technological, economic, and market changes, and those engaged in transport obviously have yet to exploit it.

Second, multimodal ownership can help intermodal handling develop. But, once again, this is not the magic answer to the ills besetting our transport industry.

Third, we believe that there are very real, extensive diseconomies of scale and complexity in the management of multimodal transportation enterprises. This is a problem with which we have struggled for some time, and we have concluded that intermodalism does not war-

rant the development of a highly centralized, closely integrated management structure. Perhaps this is because we are not clever enough or because our computers are too small.

The last remark is that transportation, even in a fully multimodal fashion, has basic difficulties from the investor's viewpoint. For many years, CP pursued a very aggressive expansion policy toward transportation—very broadly defined—to develop a multimodal transport enterprise. Over the past 15 to 20 years, our major development effort has steadily and continuously shifted from transportation to other endeavors, until today transportation represents only 45 percent of our consolidated sales, compared to 90 percent 20 years ago. The ratio is more likely to decrease than to increase in the future. This only emphasizes the need to right some of the basic ills plaguing the industry; this goes far beyond the challenges of intermodalism.

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Intermodal Realities

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The current decline in the market share of U.S. railways for merchandise traffic has led the Federal Railroad Administration to initiate a major study of the shortcomings and potential of rail piggyback and intermodal operations. The study examines merchandise movements, transport services' modal and economic capabilities, and shipper needs and practices. A model of rail intermodal services over a hypothetical 52 000-km (32 500-mile) route structure serving 120 cities was developed. Results indicate that the current piggyback market share of total containerizable freight in the U.S. is about 4 percent and that the principal impediments to the shipper of rail intermodal services were costs and service. The study recommends cost reductions in rail operations and service improvements. The rail network modeled could handle three times the current trailer-on-flatcar volume by 1980, and transport cost might be reduced by an estimated \$200 million a year. The Federal Railroad Administration and cooperating railroads have begun a series of demonstrations to test the practicability of the study results and rail intermodalism.

Secretary Coleman, in his September 17, 1976, statement of national transportation policy, said that

Underlying comprehensive transportation policy is the recognition that diversity and intermodal competition are essential to an effective transportation system. . . . The strength of our transportation system has in its diversity with each mode contributing its unique and inherent advantages. . . . A priority for reform is to encourage intermodal joint use of facilities. . . . the potential of intermodal services remains for the most part unrealized.

He concluded that a transportation system based on the policy outlined in his statement would provide "new, more cost-effective, energy-efficient and intermodal technology."

This statement carries forward the policy of his three predecessors—Boyd, Volpe, and Brinegar. Early statements of Secretary Adams indicate a continuation and even a strengthening of this policy. Enunciating a policy, nevertheless, is a great deal easier than implementing it.

In 1972 it was apparent that intermodalism was not,

in fact, working in the marketplace. The railroad share of merchandise traffic was declining. Piggyback, the great hope of the railroad industry, was until recently in a decline. Several major northeastern carriers either teetered near or had toppled over the edge of bankruptcy.

It became apparent that a major effort of disciplined research was necessary both to document previous shortcomings and to outline future potential for intermodal business.

In cooperation with a liaison committee made of railroad intermodal officers, the Federal Railroad Administration (FRA) designed and launched the National Intermodal Network Feasibility Study (1).

This study was divided into four major areas. The first task was to gather material on market flows of merchandise traffic, the second to estimate carrier service and economic capabilities, the third to identify shipper needs and practices, and the fourth to design a series of models.

The models defined a probable market split and then proceeded through a complex train scheduling exercise. They finally estimated financial, environmental, energy, and employment impacts of the network.

The method is laid out in detail in the study's more than 700 pages. A more digestible summary of it, however, is presented elsewhere (2). The methods used by the study team are both fascinating and complex and have been discussed on a number of previous occasions. I would like, therefore, to deal with the findings of the study.

One caveat is in order before we start. The network structure on which the study was based was designed with two things in mind: to be structurally and analytically simple and to stimulate discussion on potential rail market strategies both within and outside the rail industry. The FRA did not intend to imply that the network concept was either an optimum or the preferred option.

STUDY NETWORK

In terms of the description that was developed, there were roughly 500 trains/d in the network, the majority of them nonstop, over 52 000 km (32 500 miles) of route, serving 120 cities. The route density was 10 or more trains per day on 60 percent of the network links, and many cities required new terminals to handle up to 2600 transfers a day. A total of 120 highly improved mechanized terminals were required—fewer than today's 1400 piggyback terminals, 90 percent of which are ramp-style operations. Traffic growth on the network was projected at 6.6 million loads a year by 1980, three times the current piggyback traffic level. The revenue was projected to be \$2.5 billion by 1980, and the net return projected was roughly \$1 billion before taxes.

The study contained some very conservative biases. It was assumed, for example, that traffic would be diverted only when network service itself matched or could exceed all highway service. External financing required for all new terminals, additional equipment, and some line upgrading was to range between \$300 million and \$3 billion, depending on the amount of upgrading to be done.

CONCLUSIONS OF THE FRA STUDY

Perhaps the most startling conclusion of the study was that all-highway carriage is much more cost competitive with either current all-rail or piggyback service than was previously suspected. To become competitive for merchandise traffic in any form, railroads will have to substantially sharpen their operations. The study's major findings were that

1. Piggyback service currently has about 4 percent of the total containerizable freight market (this definition of total market does not include bulk materials such as coal);
2. Piggyback growth in real terms has declined or stopped over the recent years; and
3. Profitability of a substantial portion of piggyback service is, at best, questionable.

The study also outlines what is needed for developing viable intermodal service from both a rail and a customer standpoint: more speed dock-to-dock and reliability, costs competitive with all-highway operations, high standards of equipment and facility maintenance, upgraded trackage and roadway along certain routes, proper pricing and selective selling for directional balance, and better management control through an improved terminal control and management information system.

The study also found that shippers would benefit from additional competitive service as well as savings of almost \$200 million a year. Public benefits include possible reduction of future aid to the railroad industry, which, as we have seen from recent legislation, could be substantial. In addition, fuel savings of about 284 million dm³ (75 million gal) a year and reduced air emissions were projected. Current results of FRA's Office of Research and Development indicate that these savings may, in fact, be much larger. For highway carriers, both increased traffic and drayage activity and drayage jobs are anticipated. For the railroads, increased profits through network operations and more and better quality rail jobs are obvious benefits.

The study found that improved intermodal service is feasible; now we must test the theories in practice, which FRA is in the process of doing. Several rail carriers and their labor organizations are jointly investigating putting demonstrations on specific route segments together.

PROGRAM OBJECTIVES

The objectives of their program include measuring intermodal traffic growth to determine whether the industry, if it does the things that the study pointed out, can in fact increase intermodal traffic growth and improve return on investment for railroads. Many chief executive officers looked at intermodal and concluded, even before our study, that today's intermodal business is not producing investment returns for their firms.

Another objective is to see whether the shippers would view the new services as a new service option. This relates to one of the U.S. Department of Transportation's (DOT's) experiences with the Metroliner demonstration, in which it was found that many passengers, particularly the new ones, did not consider Metroliners as rail service but as a new mode. DOT wants to see if this intermodal experience will result in something similar.

DEMONSTRATION SPECIFICATION

Specifications for the demonstration itself include piggyback trains handling no other freight and being free from classification yard handling en route or at end points. Next, multiple frequency train operation at a level of service competitive with all highway operations will be offered. As an example, if three current market carriers all have 10:30 cut off, 11:00 departure, and little in terms of an alternative time frequency choice to shippers, DOT will try to spread the frequencies to departure throughout the day. Next, a balancing of loads in and out of terminals for optimum car and locomotive use, increased labor productivity, and a limitation on trains in terms of the amount of empty trailers and empty cars will all be required to keep costs in line. Simplified terminal operation for rapid and less costly transfers, including intermediate points, and a real-time car and trailer control system and management information system complete the demonstration specifications.

There are several carriers and their labor organizations currently prepared to participate in the demonstration in the Midwest and West in cooperation with shippers and truckers. DOT hopes to be able to turn the first wheel of the demonstration shortly. In the meantime there is a substantial amount of supporting work going on within FRA and elsewhere.

SUPPORT STUDIES

This work includes the development of a management information system and gateway terminal consolidation and improvement. The FRA R&D people are also conducting light-weight car evaluations, car vibration testing, fuel consumption testing, and aerodynamics drag studies; reports are due soon.

In addition, a total systems engineering study of all hardware aspects of intermodal and their interfaces is about to begin. These studies should produce hardware innovations over the next decade. DOT and FRA look forward to an exciting and nationally significant series of experiments in implementing intermodal policy.

REFERENCES

1. National Intermodal Network Feasibility Study. Federal Railroad Administration, Rept. FRA/OPPD-76/2:1, May 1976.
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