TRB Rail Activities

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The 1970s will go down in history as the decade in which the U.S. railroad problem became supercritical. The decade began with the collapse of the nation's largest railroad, the Penn Central, into bankruptcy in 1970. Hurricane Agnes in 1972 and the recession of the early 1970s further aggravated an already desperate situation for railroads in the northeast.

The federal government responded with legislation that created Amtrak (the National Railroad Passenger Corporation) in 1971 and the United States Railway Association (USRA) in 1973 and laid the groundwork for the emergence in 1976 of the Consolidated Rail Corporation (ConRail). Finally, in 1976 the Railroad Revitalization and Regulatory Reform Act was passed.

But railroad problems are serious throughout the United States and are plaguing nations throughout the world. The critical problems in the United States are in the areas of finance, marketing, and industry structure.

Railroads must improve their service to customers if they are to compete effectively in today's multimodal transport market. They must accurately determine their costs in order to establish effective, profitable rates, and they must upgrade, and in many cases rehabilitate, a physical plant that is a holdover from bygone days. They must somehow modernize both labor agreements and a route structure that date from the era of the steam locomotive.

Railroads must somehow find their place in a post-industrial economy in which competing modes of transport benefit from government assistance in one form or another and which is beset with inflation, recession, and growing shortages of resources.

The 1970s also will go down in history as the decade in which the former Highway Research Board broadened its interests and became the Transportation Research Board. TRB has, since 1972, operated the Railroad Research Information Service as one of its family of transportation research information services to provide researchers with ready access to abstracts of important research reports and technical papers and summaries of current research. In 1974, TRB formed the Special Committee on Rail Transport Activities to evaluate the need for research activities in the areas of rail transport.

In 1975, at the suggestion of the special committee and with the support of the Association of American Railroads and the Federal Railroad Administration, TRB undertook the Railroad Research Study, a major effort to define railroad research needs and priorities for the next decade. A major element of this study was a 4-week Railroad Research Conference during July 1975 at the National Academy of Sciences Summer Studies Center at Woods Hole, Massachusetts. The papers presented at this conference were published in January 1976 as the ***Railroad Research Study Back-***

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ground Papers, and the final report on the study is in press.

TRB has begun to implement the recommendations made by the Special Committee on Rail Transport Activities of TRB. Qualified railroad personnel are being invited to become members of selected existing TRB committees, and five new committees have been formed.

Surface Freight Transport Regulation

In recent years, a broad range of criticism has been directed at government regulation of business in general and at regulation of transport in particular. Although much of this criticism can be attributed to special interest groups including the rail carriers themselves, a significant portion of it has come from the research community. Several major papers have attempted to place a dollar figure on the cost incurred by the public because of inefficiencies promoted by regulation. A serious concern of any regulated industry is that the benefits of regulation and the economic costs imposed by regulation may not in all cases accrue to the same parties.

Traditionally, government regulation has been "vertical" in nature; that is, the regulating agency has authority over and responsibility for an entire industry. A typical arrangement is the regulation of the railroad industry by the Interstate Commerce Commission. Recent years, however, have seen the rise of "horizontal" regulation in which the regulating agency has broad authority over specific aspects of many industries, but total responsibility for none. Typical is the control that the Environmental Protection Agency has over sources of pollution from all industries. Although EPA can control emissions from the railroads, among others, it has no overall responsibility for the well-being of the railroad industry.

Because of the serious railroad problems, the criticism directed at transport regulation, the inability of the research community to unite on the issues, and the recommendation of the special committee, TRB established the Committee on Surface Freight Transport Regulation. The scope of this new committee is as follows:

> This committee shall consider all aspects of research pertaining to surface freight transport regulation of all kinds. Consideration shall be given to research into the impact of regulation on social, public, and private costs and benefits; among the various modes; on regulated vis-à-vis unregulated carriers; and on technological change.

The committee is thus able to consider all kinds of regulation, including environmental regulation, safety regulation as it relates to surface freight transport, and traditional economic regulation.

Electrification Systems

On almost every continent except North America, railroads are turning to electric propulsion as a means of improving service, lowering costs, reducing adverse environmental impact, and in some cases reducing dependence on imported fuels. The Japanese Tokaido Line is, of course, electrified as are the improved services on British and French railways. Electrification is not, however, limited to the wealthy industrialized countries. Indeed, a question often raised is why the wealthy, capital-intensive United States does not electrify its railroads when less wealthy, relatively labor-intensive countries such as Taiwan, Yugoslavia, and Russia spend scarce capital to electrify their railroads. This question has become more timely in view of the shift in the status of the United States from net exporter to net importer of petroleum. Undoubtedly, the answer to this question involves many factors ranging from the private ownership and freight orientation of U.S. railroads to the national policies of the other nations and the passenger orientation of their railroads.

The TRB Committee on Electrification Systems will become involved with economic, social, institutional, and technical research pertaining to railroad electrification.

State Role in Rail Transport

A relatively new area of concern for the individual states in the United States is rail transport. That concern with rail transport is new for the states, for historically railroads in the United States have generally been privately owned. The recent northeastern railroad crisis forced states in that region to become involved with their railroads in order to avoid the potentially economic impact of a crippling loss of rail service. For many years, the federal government has worked with the states in the area of highway transport, and recent federal legislation in the area of rail transport has in some measure followed this same approach. Thus, not only the railroad crisis but also the federal efforts to resolve it are forcing states to become involved with rail transport, and the federal legislation applies to all states, not just those in the northeast.

Thus, states that were well prepared to handle highway matters suddenly find themselves faced with serious rail transport matters that they are poorly, if at all, prepared to handle. Likewise, the railroads are now dealing with the states in an unfamiliar role. TRB's long-standing and excellent cooperation with the federal government and the states in the area of highway transport provides the basis for an effective program to disseminate information to the states on vital rail matters. The TRB Committee on the State Role in Rail Transport will be the vehicle for this effort. This committee

shall consider all aspects of research in the emerg-

ing role of the states in the field of rail transport. The committee's work shall be to encourage research and communication in, but not be limited to state rail planning; financing, organization, and administration of state rail programs; and integration of rail transport into the overall state transport planning process.

The states face many problems in their involvement with the railroads. Some of the immediate issues that must be resolved include subsidization of service, rehabilitation of plant on branch lines, and, for some states, commuter rail service. On a longer range basis, the states must decide what role they want rail transport to play in the state economy. Should they continue to support branch-line freight service? Should they subsidize the shift of the freight to trucks? What will that do to the highways? Should they abandon the service and simply accept the economic impact?

Track Structure System Design

Nothing is more characteristic of a railroad than track, and nothing is more fundamental to a railroad than track. Yet, in recent years, track has become a serious problem on many U.S. railroads. Years of deferred maintenance (neglect) has permitted once good track to deteriorate to the point at which train speeds over such track must be drastically reduced to avoid derailments. Although the principal need is for money to rehabilitate this track, research can help by improving maintenance management and methods, by developing improved materials, and by transferring technology from other areas. Although railway track is different from highway pavement, the railway is not that different from the highway. Both consist of a structure (track or pavement) laid on an earth embankment. The highway community has completed much worthwhile research in the areas of soils, materials, embankment stabilization, drainage, bridges, and wayside environment that can be transferred to the railroad community.

The state of the art for track has been advanced in other parts of the world, particularly in Europe and in Japan. Although such developments cannot always be adopted for U.S. railroads because of heavier axle loadings in the United States and the great distance (costs) involved, much can be learned from other countries. Here, again, research has a role to play. The current scarcity of timber and the resulting higher prices for timber crossties have aroused the interest of U.S. railroads in the development of an adequate concrete crosstie, and planning for high-speed passenger trains in the Northeast Corridor has stimulated interest in new approaches to the track structure.

The transfer of technology from the highways to railroads has already begun. The American Railway Engineering Association (AREA) has adopted most of the steel construction specifications of the American Association of State Highway and Transportation Officials, and AREA is in the process of rewriting its concrete construction specifications using information generated by highway research.

In view of these needs for research in railway track systems and with a solid position in highway research and development, TRB formed the Committee on Track Structure System Design. This committee will approach track research from a total systems viewpoint and consider the track structure, the individual components, the supporting roadbed, the loading applied to the track, and the resulting interactions among loading, track components, and roadbed.

Intermodal Freight Transport

One of the more impressive developments in transport in the last score of years has been the growth of intermodal freight traffic that moves through without transloading. The development of specialized containerships and containerports has been a part of the almost total commitment of the maritime operators to containers for all except bulk cargo. This commitment of the maritime operators to containers has, of course, been transferred inland to the origin and destination points for the freight that moves in the containers. For the inland part of the movement, the container is generally handled by highway truck or by railroad.

Yet, inland transport has not adopted containerization for its own purposes. The railroads seem to perfer to handle highway trailers rather than containers. Containerization for inland movements always seems to be "just around the corner," yet that corner is never turned. The obstacles to wider use of containerization in inland transport appear to be institutional and historical rather than technological and appear to be related to the structure of inland transport in the United States.

The energy situation has given new emphasis to intermodal freight movements, for a potential fuel saving is seen by combining the efficient local delivery of the motor truck with the efficient line-haul of the railroad. Yet, intermodal transport has never reached the level of success inland that many had predicted for it.

TRB has formed a new Committee on Intermodal Freight Transport to consider research into all of these aspects of intermodal freight transport.

Concluding Remarks

With substantial financial support in hand from the Federal Railroad Administration of the U.S. Department of Transportation and from the privately based Association of American Railroads, TRB is in an excellent position to continue to expand its rail transport activities in the interest of a truly multimodal and multidisciplinary approach to the socioeconomic and physical problems in transportation today and in the years ahead.