

and have little policy impact. Rail planning has advanced too far in the few short years of its existence not to meet this further challenge.

ACKNOWLEDGMENTS

The opinions expressed in this paper are mine alone and do not necessarily express the views of the Wisconsin Department of Transportation or any other institution or person with which I am affiliated. The efforts of the following people in developing Wisconsin's Rail Plan are gratefully recognized: Leigh Boske, William Hyman, Mark Keaton, and Mark Wolfgram. I also wish especially to thank James C. Nelson of Washington State University, who first introduced me to the full range of issues, problems, and prospects in railroad transportation.

REFERENCES

1. J. C. Nelson. Railroad Transportation and Public Policy. Brookings Institution, Washington, DC, 1959.
2. J. C. Nelson. Improving Railroad Productivity. Government Printing Office, 1973.
3. J. C. Nelson. The Penn Central and Other Railroads. Report to the Senate Committee on Commerce, 92nd Congress, 2nd Session, Government Printing Office, 1973.
4. Northeastern Railroad Problem. U.S. Department of Transportation, Government Printing Office, 1973.
5. Rail Service in the Midwest and Northeast Region. U.S. Department of Transportation, Government Printing Office, 1974.
6. Preliminary System Plan. U.S. Railway Association, Government Printing Office, 1975.
7. Final System Plan. U.S. Railway Association, Government Printing Office, 1975.
8. The Ten Critical Issues in Transportation. Transportation Research News, No. 67, Nov.-Dec. 1976, pp. 2-4.
9. J. W. Fuller and W. A. Hyman. Energy and Environmental Effects of Railroad Abandonment. Papers presented at the 55th Annual Meeting, TRB, 1976; Measuring Energy Efficiency in Freight Transportation. American Trucking Association, Inc., Washington, DC, 1976, pp. 1-18.
10. Impact of Abandoning Eighteen Rail Branch-Lines on Wildlife and Vegetation in Wisconsin. Wisconsin Department of Transportation, Madison, 1976.
11. Yearbook of Railroad Facts, 1976. Association of American Railroads, Washington, DC, 1976.
12. B. Adams. New Directions for Transportation Policy in Last Half of 1970s. Address to the Transportation Association of America, Pebble Beach, California, Oct. 7, 1976; reprinted with slight changes as Government, the Silent Partner for Private Enterprise (Handling and Shipping, Vol. 18, No. 1, Jan. 1977, pp. 49-50).
13. Assistance to States for Rail Service Assistance Under Section 5 of the Department of Transportation Act, Proposed Procedures and Requirements Regarding Allocation and Disbursements. Federal Register, Vol. 41, No. 154, Aug. 9, 1976, pp. 22257-22258.

Publication of this paper sponsored by Committee on State Role in Rail Transport.

Current State Rail Planning and Research Needs

William R. Black, School of Public and Environmental Affairs, Indiana University

The major problems of the railroad branch-line subsidy program are identified. An alternative program that utilizes rail and motor carriers is proposed. This alternative appears to be more efficient from economic, environmental, and energy perspectives. Other research areas related to state rail branch-line planning include areas of competition, shipper roles, liability risk, taxation, prioritization and the identification of alternatives, state role in rail traffic generation, structure of management incentive fees, and labor cost issues at the macrolevel. Other problems presented are in areas of freight forecasting, rail patron credibility, energy utilization and environmental pollution, transportability of products, and highway impacts at the microlevel.

The origin of what has come to be called state rail planning has been presented by Kinstlinger (1), Fuller (2), and others (3, 4). The process itself grew out of the bankruptcy of seven eastern railroads and the federal legislation enacted to cope with that problem.

The purpose of this paper is to evaluate present state rail planning and what its future field will be. A number of significant research needs will be presented. First, however, two major problems related to state rail planning must be identified, because they are so large in scope that they are either accepted as given or ignored.

TWO MAJOR PROBLEMS

The first major problem is that there are rail lines being operated under subsidy that should not be. Specifically, most companies that now use subsidized rail service do not need it. They do need transportation, but the motor carrier sector could provide the service at a lower total cost than the rail sector does. The term "cost" as it is used here is broadly defined and incorporates social, environmental, energy, and economic components.

The second major problem is that no one appears to be looking at the rail situation as part of the total national picture. Apparently we do not have the bureaucratic or organizational ability to integrate the disparate visions into a single scene. If we did, we would not be either abandoning more than 4830 km (3000 miles) of rail line this year or subsidizing another 4025 km (2500 miles). In a period of concern over energy consumption, it is unreasonable to remove rail lines from service; at the same time, it is unnecessary to operate branch-line service if trucking is more efficient.

Although the former says we are subsidizing too much and the latter too little, the problem is not insoluble.

What we need is a program that would hold all lines slated for abandonment or subsidy on file for acquisition, leasing, or some other mechanism by the federal government. These lines may very well be necessary rights-of-way at some future date. Efficiency, economics, and regional development should determine whether a line should be served or "rail banked" and by whom.

This is not the case at present. One alternative would be to subsidize not the losses per se of continued rail service, but the difference between the branch-line rail rate and the motor carrier rate for the same haul. The railroad in most cases could continue to transport the traffic over the bulk of its move after it was delivered by motor carrier to one of its stations. The program could impose a limit on the length of the motor carrier haul. Accounting would be much simpler because there would be no need to calculate costs; the mode freight rate differential would equal the subsidy. Of course this is only a rough sketch of a more economical and efficient program, but it is worth further analysis. There is no reason to believe that the existing program cannot be altered.

STATUS AND PROSPECTS OF STATE RAIL PLANNING

Apart from the problems noted, state rail planning appears to have become an integral part of the planning activities in many states. States in the Midwest and the Northeast completed their initial planning efforts nearly a year ago; some even filed amended plans last fall.

Outside this major bankrupt railroad impact area, there is less evidence of overwhelming support for the process of rail planning or for the concept of branch-line subsidies. The prevailing attitude is that uneconomic branch lines should be abandoned, not subsidized. Federal monies should go to the railroads to ensure continued viability. These states also seem to believe that the funds involved do not merit the amount of planning required by the subsidy program.

It is reasonable to ask if there would be state rail planning in the absence of the U.S. Department of Transportation, the U.S. Railway Association, or other national rail planning organizations. Until now states' rail efforts have been reactionary. There is very little actual planning in state rail planning. At most some data are analyzed, and projects identified—nothing more than deciding whether a line should be subsidized or not.

Goldstein (5) reviewed a number of the state rail plans from the perspective of previously completed urban transportation plans and found them deficient. Compared with their counterparts in highway planning, state rail planners at present have no control over the location of routes, their width (number of tracks), or surface type (rail gauge). One and a half kilometers (a mile) of four-lane limited access highway in almost any urban area would take the entire annual rail subsidy for a typical state. Viewed from this perspective, state rail plans are much better than the funds involved might indicate.

Someone once said that the 1960s were the decade of highway planning, and that the 1970s would be the decade of rail planning. It is unlikely that state rail planning will ever be that important, and the 1970s will more likely be seen as the decade when railroads were integrated into the transportation planning process.

RESEARCH NEEDS

Research needs may be divided into macrolevel and microlevel needs. Macrolevel research is generally

systemwide or regional in scope, whereas microlevel research is oriented more to branch lines. Both research levels are needed if the integration of rail planning into a comprehensive, intermodal transportation planning process is to be accomplished. There are also a number of research needs related to the existing rail service continuation program.

Macrolevel Research Needs

It should be apparent that a major research problem is whether the entire rail service continuation program as it currently functions should be terminated and replaced by a motor and rail carrier program. At a glance, such a program would be more efficient and more economical. However, feasibility studies should be undertaken for the utilization of the differential in freight rates between modes as a basis for subsidy payments.

A second major research issue is to what extent existing rail subsidy programs negatively impact on regional competition. For example, there are at least three instances of subsidized rail freight service operated with the approval of federal agencies but in violation of the Interstate Commerce Act provisions covering competition. Either the act should be revised or the service should be performed by another railroad. There may be others, and a legal-geographical research study of the region should be undertaken to identify them. A related question is whether the presence of subsidized rail in rural areas is detrimental to or in competition with marginally profitable motor carrier operations.

Another type of policy research question involves the general structure of a federal and shipper subsidy program as opposed to the current federal and state local program. There are indications that the primary beneficiaries of subsidized rail service are the shippers receiving that service; i.e., there do not appear to be the extensive secondary impacts on communities that Congress anticipated when the existing program was proposed. As a result, we must decide whether states or local areas should contribute to the subsidy. In addition, there are numerous instances where a shipper could simply divert a small portion of traffic from motor to rail and in the process make a rail line viable. In these situations, it is inappropriate for public funds to be used for subsidy.

Still another area needing substantive research is the area of branch-line liability and insurance costs. This was a major issue in the first year of negotiations between the Consolidated Rail Corporation and the states in which it now operates subsidized rail freight service (6). An estimate of this liability was made at that time. However, this question needs closer scrutiny. A study will soon be initiated by the Federal Railroad Administration to resolve some of these problems.

Immediate research is necessary in the area of rail taxation by states. An estimated \$55 million is now collected from railroads through state and local taxation practices (7). Whether their taxing systems are discriminatory will undoubtedly be addressed by the courts in the next couple of years. The Railroad Revitalization and Regulatory Reform (4R) Act of 1976 gives states three years to eliminate discriminatory tax practices, yet very little has been initiated.

Railroad taxation practices vary both within and among states (8). This in itself is not a basis for rejecting existing procedures. The point is the railroad tax rate compared to other state economic activities. A uniform taxation procedure must be established according to profits as opposed to value. In addition, each state cannot continue to use the valuation formulas most ad-

vantageous to it, if, on the whole, railroads overpay taxes (9).

One portion of the rail plans completed to date is that concerned with prioritization and the evaluation of alternatives. Although these two areas are not necessarily the same, setting priorities for the alternatives identified can result in a decision on the proper alternative for a given line that affects the priority subsequently assigned to it. Research is needed to determine not only the most important decision-making criteria but also the appropriate weights that should be assigned to each criterion. Some research has been initiated, but far more work is necessary (10).

Another macrolevel research area is state and railroad subsidy negotiations (6). States are currently paying a management fee to railroads operating subsidized service. Several states would like to have this be a management incentive fee; that is, they would like to vary the fee based on railroad performance. What types of incentive fees are possible and desirable from the perspective of the two parties involved in subsidy negotiations? A research project evaluating alternative models would be of considerable value. Their growing interest in the economic viability of railroads within their borders has prompted states to ask exactly what they can do to enhance that viability. One thing would be to lighten the tax burden, but there may be others. Many state institutions are potential patrons of railroads: universities; prisons; hospitals; various types of state homes; highway divisions responsible for construction, resurfacing, sanding, or snow removal; and others. The question is to what extent laws requiring the transportation of certain materials to these institutions by rail would increase viability. This problem has not yet been addressed.

One final macrolevel problem concerns labor costs in railroad operations. Research completed to date suggests that a crew member accounts for approximately 10 percent of the on-branch operating costs (11). Could crew sizes be reduced on all trains? This is a sensitive research and policy area. Congress has ignored the problem completely in most of its recent rail legislation (except for labor protection provisions), even though at Senate hearings many identified labor costs as a crucial problem for the industry. A related question is the impact of crew size on safety. There are numerous contradictory statements in this area. One side states the need for larger crews to ensure safe operations; another claims the greater the crew size, the more accidents. An objective evaluation is clearly in order.

Microlevel Research Needs

At the microlevel, the research questions differ to some extent, although the findings of most of the macrolevel studies would affect them. This microlevel also carries some separate research questions. As it is used here, the microlevel refers to branch-line level. The problems in this area are directly related to specific branch-line questions in the state rail planning process.

The first research needed at this level is a method of forecasting rail traffic on branch lines, if possible. Most plans have treated future traffic as stable. In view of the unique character of each branch line, it may not be possible to do any more than use growth factors to estimate aggregate traffic.

Also at the microlevel is the question of to what extent rail patrons can be trusted to supply honest abandonment impact statements. A number of states were misled by shippers in terms of the rail traffic they had generated or would generate if certain lines were subsidized. Today a shipper's credibility is rather weak

when he states he will go out of business if he loses rail service. Goldstein (5) criticized many state rail planners for accepting such statements as fact. However, an interesting study on the impacts of rail abandonment by Simat, Hellisen, and Eichner, Inc. (12), suggests that such impact statements are true most of the time.

Another aspect of branch-line rail planning is measuring energy consumption and environmental pollution. Contrary to common belief, branch-line operations are not necessarily energy efficient or environmentally desirable. This has been verified to some extent by two studies (13, 14). However, we need to know exactly where the breakpoint between energy efficiency and energy wastefulness is. Train size for realizing environmental advantages also needs to be determined.

Problems of energy consumption and environmental pollution stem from the alternate mode analysis of the rail planning process. Specific procedures should be followed in setting up an alternative that involves the use of another mode such as motor carriers. If a rail line is abandoned, will its traffic move by motor carrier to the nearest rail freight station offering service? Or will the motor carrier make the whole trip? Although the former is the more logical, some states prefer the latter.

During the hearings on branch lines conducted by the Rail Services Planning Office, one often heard statements that a particular firm must have rail service. The rationale was frequently the oversized or overweight nature of the shipment or the nature of the shipment (such as radioactive waste) and safety. There are very few products or materials that cannot be shipped by motor carriers, even though oversized or overweight products might need to be disassembled. If this is the case, the cost of assembling the parts should be considered and compared with the estimate of rail subsidy. This particular area, nevertheless, needs examination to determine cases where rail transport is a necessity.

Some states oppose rail abandonment because of what they identify as the negative impact on their state highway systems. Recent in-depth case studies of two branch lines in Indiana (15) revealed that in one case the highway could handle the rail traffic without any improvements, but in another case a capital expenditure of \$145 000 would have been necessary (this exceeded annual highway maintenance costs). However, rehabilitation of the rail lines involved to meet class I standards would have cost approximately \$281 000 in the first case and \$660 000 in the second. It is unwise to generalize from two case studies, but these two do not appear to support a rail subsidy decision. More of these case studies should be undertaken to clarify the local impact of rail traffic diversion on highway systems.

These, then, represent the major research needs in the area of state rail planning. Among the further problems are operating cost estimations, the relations between rail network geometry and operating costs, and the feasibility of what the state of New York has called "negotiated solutions." There are some states interested in mainline system planning, and research methods for analyzing trunk lines have recently been proposed (16). However, some believe that mainline system planning should be a federal or rail industry planning function and should not be a part of the state role in rail planning.

CONCLUSIONS

This paper has attempted to identify the major research areas related to state rail planning. Planners must clearly delineate these areas if objective rail planning is to become a reality. However, even if some answers are known, this is no guarantee that the quality of state

rail plans will improve; for example, a simple decision to subsidize every line is not much of a decision. At the same time, states should not be content to look only at branch lines scheduled for abandonment. No state has reached the point where it will recommend that a railroad abandon a given line. This is admittedly a difficult role, and some do not like the political implications of it. However, if states fail to accept the role, how can there be state rail planning?

At the outset of this paper, I noted that rail planning would be integrated into the transportation planning process during the 1970s. However, objectivity is clearly a prerequisite to such integration. If we conclude that state unwillingness to abandon rail lines stems from a desire to analyze the lines in more depth, resolution of the research problems and questions noted here should lead to a general improvement in the quality of rail plans and to the establishment of a true state role in rail planning.

REFERENCES

1. J. Kinstlinger. Rail Planning: A State Viewpoint. TRB, Transportation Research Record 582, 1976, pp. 50-60.
2. J. W. Fuller. Development of State Railroad Planning. TRB, Transportation Research Record 577, 1976, pp. 27-34.
3. W. R. Black. The Regional Rail Reorganization Act of 1973: The Role of the States. State Government, Winter 1975, pp. 37-42.
4. W. R. Black. The Indiana Rail Plan: A Case Study. Proc., 1976 Regional Rail Planning Seminar, Federal Railroad Administration, U.S. Department of Transportation, in press.
5. S. Goldstein. Summary of the State Rail Planning Process. Proc., 1976 Regional Rail Planning Seminar, Federal Railroad Administration, U.S. Department of Transportation, in press.
6. W. R. Black. Negotiations for Local Rail Service Continuation: The Major Issues. Traffic Quarterly, in press.
7. T. J. Graves. Conrail—A Solution. Proc., 68th Annual Conference of the National Tax Association, Tax Institute of America, 1976, pp. 230-234.
8. W. R. Black and J. F. Runke. The States and Rural Rail Preservation: Alternative Strategies. Council of State Governments, 1975.
9. W. R. Black. The Regional Rail Reorganization Act of 1973: The Impacts of Abandonment. Proc., 68th Annual Conference of the National Tax Association, Tax Institute of America, 1976, pp. 234-239.
10. H. J. Schuler and D. C. Prosperi. Rail Service Continuation Subsidies: A Model to Assist State Governments. Center for Urban and Regional Analysis, Indiana Univ., Rail Planning and Policy Series, No. 5, 1976.
11. W. R. Black and B. W. Pigozzi. Changing Service Levels as an Alternative to Rail Line Abandonment: The Case of On-Branch Costs. Paper presented at the West Lakes Meeting of the Association of American Geographers, 1975.
12. Simat, Hellisen, and Eichner, Inc. Retrospective Rail Line Abandonment Study. Office of the Secretary, U.S. Department of Transportation, 1973.
13. Indiana State Rail Plan, Final Phase 2. Center for Urban and Regional Analysis, Indiana Univ., 1975.
14. J. W. Fuller and W. A. Hyman. Energy and Environmental Effects of Rail Abandonment. Paper presented at the 55th Annual Meeting, TRB, 1976.
15. L. O. Purnell. A Methodology for Evaluating the Impact of Railroad Abandonment on Rural Highways. Joint Highway Research Project, Purdue Univ., 1976.
16. F. W. Memmott and F. S. Scholz. Trunk Route Analyses: A Useful Tool for Statewide and Regional Rail Planning. TRB, Transportation Research Record 591, 1976, pp. 44-50.

Publication of this paper sponsored by Committee on State Role in Rail Transport.

One State's View of State Rail Planning

William Conley Harsh, Jr., Bureau of Railroads, Illinois Department of Transportation

This paper describes a variety of views on rail planning now held by states. It differentiates between the state role in planning for rail lines that have interstate significance and those that do not, and it describes three possible levels of involvement for the states with regard to each type of line. The paper also discusses the way in which state rail planning relates to planning by the railroads and federal rail agencies.

Although it is a major railroad center, Illinois to date, compared with a number of the northeastern states, has lost relatively little rail service by abandonment. Today, Illinois supports continued rail service on only 292 km (182 miles) of track and leases another 15 km (9 miles) on which no service is currently provided. We are entitled to less than 4 percent of the rail service continuation funds provided pursuant to Title IV of the Regional Rail Reorganization (3R) Act of 1973. How-

ever, Illinois is involved in 8 of the 10 corridors of consolidation potential defined in the Final Standards, Classification, and Designation of Lines of Class I Railroads in the United States published by the Secretary of Transportation on January 19, 1977, and 1952 km (1213 miles), or 11.3 percent, of the state's railroad system has either been filed for abandonment or identified as potentially subject to abandonment by the railroad companies. We do anticipate playing a major role in rail planning in the future.

This paper reflects one state's view, not the states' view. In my capacity with Illinois and with the National Conference of State Railway Officials, which is a confederation of state rail planners and administrators from all regions of the country that is affiliated with the American Association of State Highway and Transportation