Proceedings of the Transportation Research Forum

Volume 5 **1990**

32nd TRF Annual Forum
Long Beach, California
October 10-12, 1990

- *The Role of Transportation in Recycling: The Case of Using Waste Newspapers for Farm Animal Bedding*
by James G. Beierlein,
The Pennsylvania State Univ.

America is facing a seemingly overwhelming problem of how to dispose of its solid waste. But for solutions to be viable, they must be environmentally sound and financially feasible. Most of the solutions are likely to involve a high reliance on transportation.

Two approaches to this procedure have been developed for analysis. The first is on-farm chopping of waste newspapers. In this case the raw newspapers are transported to the farm and farm personnel, using a stand alone unit, chops the newspaper before putting it into the stalls. This alternative is found to be less expensive than alternative sources of bedding (e.g., straw, sawdust, etc.). The second approach is to complete the chopping of the newspapers at a central site where they are formed into 48 pound bales which are trucked to the farm ready for use. This alternative is less than half as expensive as on-farm chopping and proves to be the best alternative. In the centralized set-up transportation costs now account for more than half of the total delivered cost bedding. Thus, it is financially feasible to use waste newspapers for animal bedding and it is least expensive to use a centralized processing facility. Attempts to raise the level of transportation costs by significant amounts failed to dislodge this conclusion. The maximum distance from the distribution center one can deliver this material and still make it competitive was found to be 91 miles for the on-farm chopping option and in excess of 500 miles for the centralized processing option. Thus, it could be possible for an urban areas' newspapers to be used on fairly distant farms.

The use of chopped waste newspapers transported by truck for use as animal bedding offers a successful partial solution that meets both criteria and directly involves transportation. The results from this feasibility study indicate that transportation has a major role to play in finding financially feasible solutions to our solid waste disposal problems.

- *Backhaul Movements of Produce Haulers in the 1980s*
by Richard Beilock and
James Freeman,
University of Florida

The results are presented of a study of complementary or backhaul movements of carriers hauling largely exempt produce and ornamentals from Florida between 1982 and 1989. The findings reveal that the large majority of inbound freight is regulated. Across the study period, the percentage of vehicles moving empty into Florida declined substantially. Virtually all of the decline in empty movements was among carriers not possessing ICC authorities. The largest declines in empty movements were noted among private carriers, while the smallest declines in empty movements were among for-hire fleets.

Short Line Railroads

Session Moderator: Richard G. Sharp, Transport & Management Consultants, Inc.

Summary by Session Moderator

The first paper, "The Changing Nature of Short Line Railroads," was presented by the author, Frank J. Dooley. The paper's portrait of recently-formed short lines, noting their typically low traffic densities and narrow traffic bases, engendered considerable discussion of the potential economic vulnerability of the short line industry. The audience also debated whether a legacy of deferred maintenance by former Class I operators was a significant problem that could contribute to eventual short line failures. Opinions varied and the issue was deemed to require further research.

The second paper, "Short Line Railway Industry in Canada," by Michael Loughman and Richard Lande was presented by professor Lande. Discussion focused on the numerous differences in the legal and regulatory settings in Canada and the United States that affect short line development. It was noted that Canadian short line creation

has been hampered greatly by various laws inhibiting abandonments, line sales, and relaxation of labor rules for short lines, particularly for grain hauling lines and other routes designated as of national importance. On the other hand, Canadian law was said to permit short lines to be formed to operate over track belonging to the existing carriers, offering a potential vehicle for short line formation not available in the United States.

The third paper, "Investment Strategies for the Rural Road and Branch Rail Line Systems," by Stephen B. Baumhover, Marty J. McVey, Michael Lipsman, and C. Phillip Baumel was presented by Dr. Baumel. The paper concerned investment options (road improvement, grain elevator construction, etc.) that might accompany rail line investment to offset economic losses or create net benefits. The discussion addressed additional options to those delineated in the paper, including short line creation, that might be the subject of additional studies. While the value of the multifaceted investment strategies described in ameliorating rail abandonment impacts were acknowledged, some concern was expressed concerning the distribution of benefits and disbenefits within classes of affected parties, such as grain elevator operators.

- *The Changing Nature of Short Line Railroads*
  by Frank J. Dooley, North Dakota State University

Since the mid-1970s, Class I railroads have been attempting to rationalize their rail networks by either abandoning or selling their light-density branch lines. Since 1970, almost 40,000 miles of road has been abandoned. During the same time, 240 new short lines operating almost 21,000 miles of track have been created.

Short lines created since 1970 are much different from short lines created before 1970. The typical short line created since 1970 is longer, but employs fewer people than short lines formed before 1970. On average, a short line formed since 1970 is 87.3 miles long and employs 31.6 people. In contrast, the average short line formed before 1970 is only 52 miles long, but has 86.5 employees. Thus, the average number of employees per mile of track has fallen from 2.77 to 0.54, or 80.5 percent.

Compared with Class I trunk lines, most short lines operate over light density lines. In addition, short lines formed since 1970 have a much lower average traffic density has than those created before 1970. The pre-1970 average density for local and regional railroads was 451.3 cars per mile. Since 1970, the average density for local and regional railroads has fallen by 75.7 percent to 109.6 cars per mile.

In conclusion, short line carriers are an important alternative to the continued abandonment of rail lines by Class I carriers. Class I railroads reported that they may sell as much as 17,265 miles of track in the next five years. The characteristics of the short lines created since 1970 provide a better depiction of these potential new short lines. Given the lower traffic densities on these lines, public policies and private decision-making must recognize that the new short lines will require a more flexible cost structure to operate economically.

- *Shortline Railway Industry in Canada*
  by Michael Loughman, Crane Canada, Inc., Canada, and Richard Lande, Concordia University, Canada

The growth in American shortline railways was in part due to the financial difficulties the larger carriers experienced in the late 1960's and early 1970's. To become more efficient, the Class I railways sold or abandoned many of their branch lines, some of which were purchased by shortline railways. Shortline railways often operate these lines more profitably than the larger carriers could for two reasons; they can provide better service to the shippers located on the line, and lower operating costs, the latter principally because of the labor being utilized more efficiently.

The pressures faced by the Class I railways in the United States are now emerging in Canada. Accordingly, CN and CP have expressed a desire to sell or abandon much of their systems. While there is currently just one shortline railway in Canada, the Central Western, there exists the possibility that others may soon begin operating on CN or CP tracks. The future of the shortline railway industry in Canada will be influenced by several factors. These include the new Canadian transportation legislation, *The National Transportation Act (1987)*; the labor issue and whether a shortline railway will be required to inherit the existing unions; the relationship between CN, CP, and the shortline railways; the issue of abandonment; and securing adequate financing.

- *Investment Strategies for the Rural Road and Branch Rail Line Systems*
  by Stephen B. Baumhover, Marty J. McVey, Michael Lipsman, and C. Phillip Baumel, Iowa State University

Much of the midwest's rural surface transportation infrastructure is overbuilt for today's needs, and resources available to maintain this system of highways and railroads are becoming increasingly scarce. A method of investment analysis has been developed to evaluate the economic feasibility of maintaining and restructuring this infrastructure on an integrated multi-modal basis. This analysis, which is presented in the context of a case study, also incorporates an analysis of establishing a unit-train grain loading facility on a railroad main line following abandonment of the railroad's branch lines in the area. The major finding of this study is that, although branch line abandonments have substantial adverse impacts on grain producer and elevator income, this loss can be largely offset by the appropriate location of new unit-train grain loading facilities. The study also found that although improvement to the local county road and highway system can result in substantial operating cost savings for both farm and nonfarm motor vehicle users, these benefits fall substantially short of covering the cost of such improvements.

PC Database, Software and Telecommunications Advances

Session Moderator: Folger "Jerry" Athearn, Athearn Transportation Consultants

Summary by Session Moderator

Roman Muszynski, a senior consultant with Booz-Allen & Hamilton, Inc., provided the PC Users Chapter with a detailed description of their Railway Network Simulation Model (NSM) and his experiences in converting it from a strictly main-frame computer program working in a time-sharing environment to one which can be ported from their main-frame computer to a PC computer (Compaq 386/33 with 8 megabytes of RAM and a 320 MB hard disk drive) running on Xenix. The process of evaluating PC hardware, operating software, and programming for porting the NSM to a PC took about six man months. The advantages of running on the PC were lower cost, a better development environment, greater flexibility and better control of operating/flow of analysis. As Roman described some of the problems of making the conversion this session moderator was making a mental note that one should not rush in where angels fear to tread. Converting any complex computer program from one which runs in a main-frame environment to one which runs on a PC is not for amateur computer hackers or the fainthearted.

Howard Simkowitz, director of government services for Caliper Corporation, described recent developments and practical applications for PC software which rely on TIGER data. He illustrated his discussion with slides showing how computer generated maps based on TIGER data could be updated after comparison with photographs of an area. He described a complex vehicle dispatching program which uses modified TIGER data. It takes much longer to ask the question (by entering all of the details on the multiple stops to be made by a number of vehicles) than the time (about 20 seconds) it takes the computer to solve the problem of which vehicles will handle which stops, give approximate times of arrival at each point, and outline a map of the shortest route for each vehicle.

- *Porting Systems Software, Or How To Save $$$*
  by Roman Muszynski and John H. Winner, Booz-Allen & Hamilton, Inc.

- *Microcomputer Database Developments*
  by Howard Simkowitz, Caliper Corporation