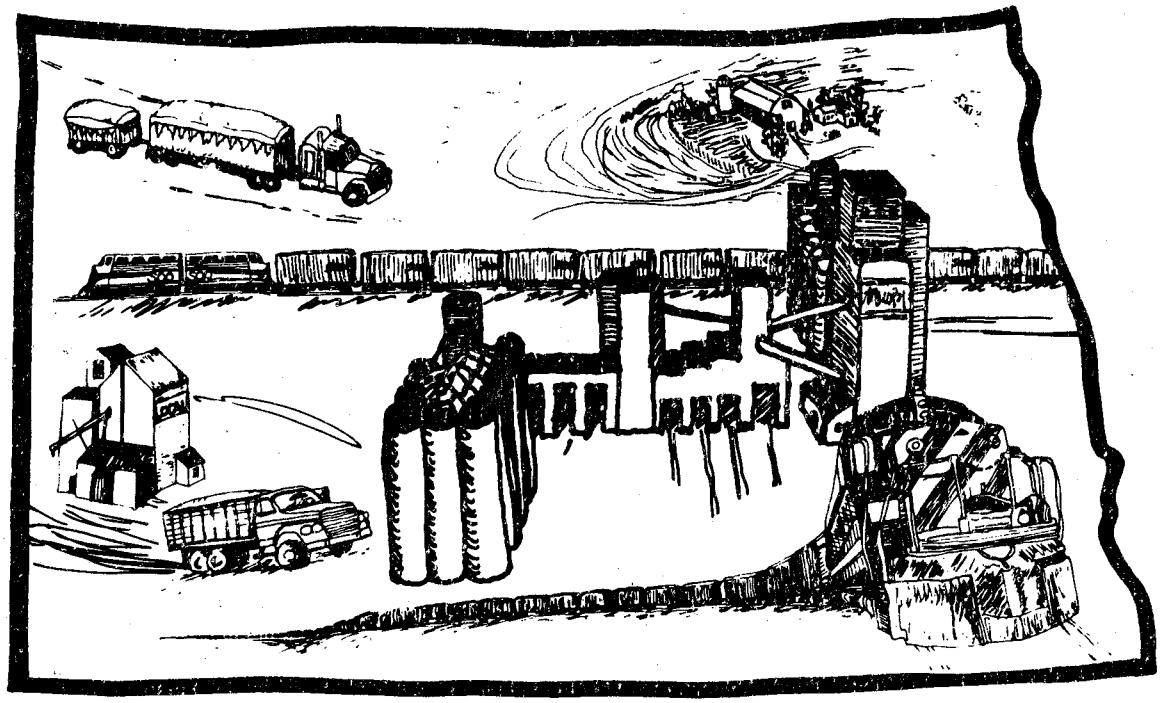
Agricultural Economics Report No. 181
Upper Great Plains Transportation Institute No. 52

May 1984

Analysis of Short Line Railroad Development in North Dakota



by
Daniel L. Zink

Upper Great Plains Transportation Institute
and
Department of Agricultural Economics
North Dakota Agricultural Experiment Station
North Dakota State University
Fargo, North Dakota 58105-5636

Highlights

Statutory changes at the federal level and evolution in grain marketing patterns have affected the role and viability of many light density rail segments in North Dakota. The Staggers Rail Act of 1980 has expedited the rail abandonment procedure, allowing railroads to complete the abandonment process on unprotested cases in as little as 45 days from the date of abandonment application to the Interstate Commerce Commission.

Shippers negatively affected by these changes must search for alternatives to rail service. One of these alternatives may be formation of a short line railroad over the abandoned trackage. Other alternatives may be resorting to service by another mode such as trucks, subsidy to the abandoning carrier, or relocation of the firm.

The purpose of this report is to analyze the feasibility of forming a short line railroad on abandoned trackage, with particular attention paid to grain producing regions and grain shippers in North Dakota. A North Dakota branch line which is under consideration for abandonment was selected and analyzed as a case study for short line railroad feasibility. Economic-engineering analysis revealed that grain volume was not sufficiently high to justify purchase and rehabilitation of the railroad right-of-way and operation of a short line railroad. The high proportion of initial investment costs (trackage, right-of-way, and equipment) may be prohibitively high for start of operations. Also, in the case study analyzed, it is questionable whether revenues could even cover variable costs of operation. Grain volume would have to be increased significantly in order to attain financial viability. Alternatively, costs of the operation would need to be reduced substantially through outside subsidy or operating efficiencies in order for the firm to be profitable at current traffic levels.

The high grain volume required of an area to support a short line operation may be difficult to find because of existing carriers retaining service to such areas. Also, the degree of mobility of grain may be a problem due to the ease of traffic diversion to competing over-the-road grain truckers. Short line railroads will have difficulty supporting operations strictly on the basis of grain traffic and may find it necessary to seek other types of commodities or subsidies from outside sources such as local, state, or federal programs.

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

TABLE OF CONTENTS (CONTINUED)

TABLES

FIGURES

AN OVERVIEW

North Dakota Grain Handling, Transportation, and Merchandising Study

North Dakota's branch line system was developed in the late 1800s and early 1900s primarily for the purpose of moving farm commodities to markets outside the state and to bring freight such as farm inputs and other needed goods to the state's communities. The only other form of surface transportation available for moving bulk freight when the rail network was being developed (excluding some minor river transportation) was the horse-drawn freight wagon. The limited distance that a team of horses and wagon could travel influenced the design of the early branch line railroad network. This development pattern resulted in branch lines that were no further apart than 10 to 20 miles, and even the most remote producing areas were accessible to rail transportation.

Development of the country's grain merchandising system also was influenced by the limited distance a team of horses and wagon could travel, the relative density of the branch line network, and available technology at that time. This resulted in a large number of country elevators spaced only a few miles apart on grain gathering rail lines. Although much of what existed in the past still exists today in the form of the branch line network, economic, and technological forces that influenced its development have changed since the turn of the century. Other factors are currently at work that may influence rationalization of the railroad network and the country grain merchandising system.

Factors which will influence the future grain handling transportation and merchandising system include branch line abandonment, implementation of multiple car and unit train grain rates, and capital replacement decisions.

Other factors include differing rates of cost increases in the two modes, thereby shifting their competitive relationship. Competition between producing regions also will influence the future system. Efficiencies gained as a result of changes in marketing systems by competing producing regions will possibly influence a move to obtain those same efficiencies by other producing regions. The changing technology of farm trucks and the improved quality of our highway system makes it possible for producers to move grain much further today than previously. These forces may very well influence changes in the state's traditional grain merchandising system. Government policies such as railroad deregulation also may have some impact on the system.

As a result of these impending changes that could alter a rather traditional grain handling, transportation, and merchandising system, many private and public decisions will have to be made. These include decisions regarding location, economic viability, size of plant, investment in grain facilities, investment in transportation equipment and infrastructure, efficiencies of merchandising, purchases of farm production equipment, and storage capacity. If such decisions are to be made on an informed basis, it is important that basic information about the industry be developed and published. It was for this reason that the Upper Great Plains Transportation Institute and the Department of Agricultural Economics of North Dakota State University have undertaken a study entitled "North Dakota Grain Handling, Transportation, and Merchandising Study." Cooperators in the study include Burlington Northern Railroad, Farm Bureau, Farmers Union, Grain Terminal Association, North Dakota Agricultural Experiment Station, North Dakota Department of Agriculture, North Dakota Grain Dealers Association, North Dakota Highway Department, North Dakota

Public Service Commission, St. Paul Bank for Cooperatives, and the Soo Line Railroad Company. The purpose of this study is to provide relevant information to decision makers in meeting the challenge of a changing business environment in handling, transportation, and merchandising grain in North Dakota.

The study is composed of a number of research projects that will result in 13 separate publications of which this is one. The publications planned for release at varied time intervals are:

- Description of the Existing Country Elevator System
- Cost Analysis of Existing Country and Farm Storage System
- Cost Analysis of Subterminal Elevators
- Existing and Past Patterns of North Dakota Grain Movements
- Description of Rail Rate Structure, Multiple Car Movements, and Rates and Analysis of Shipper Owned Equipment
- Description and Analysis of Exempt Carrier Industry
- Economics of Branch Line Operation
- Farm Truck Costs
- Seasonal Behavior of Marketing Patterns for Grain from North Dakota
- Grain Merchandising
- Marketing Using Delayed Pricing Controls
- Analytical Model for Analyzing Economic Efficiencies of Subterminals
- North Dakota Grain Handling, Transportation, and Merchandising Study: Summary, Conclusions, and Policy Implications

These reports, as they are completed, will be available upon request from the Department of Agricultural Economics or the Upper Great Plains Transportation Institute, North Dakota State University.

ANALYSIS OF SHORT LINE RAILROAD DEVELOPMENT IN NORTH DAKOTA

by

Daniel L. Zink*

INTRODUCTION, IMPLICATIONS OF BRANCH LINE ABANDONMENT, AND OBJECTIVES OF THE STUDY

Introduction

Agriculture and the railroad network evolved simultaneously in North Dakota. With the development of railroads, farmers had a way to market their grains, and the railroads had an attractive revenue source. Country elevators and small towns sprang up along the railroads as retail centers for rural areas. Technology levels at that time necessitated construction of many branch or "feeder" lines to service all producers. When the railroad was in its infancy, farmers delivered their grains to the country elevators by horse-drawn wagon. Elevators were spaced along the railroad to allow farmers to make the round trip in one day. Hence, branch lines were needed to service the many country elevators which, in turn, were needed to serve the not-so-mobile producers. Also, fierce competition among developing railroads caused duplication of service in some areas. The result was a maze of branch lines in grain producing areas.

Advancements in production agriculture, improved grain handling techniques and technological breakthroughs in truck transportation have changed the picture considerably. Efficient, high capacity trucks allow farmers the flexibility of shipping to more than one elevator within minutes of their farms. Branch lines became less critical to the existence of grain producers as highways and farm truck transportation evolved.

*Research Associate, Upper Great Plains Transportation Institute, North Dakota State University.

Volume and proportional share of grain moved by truck has since expanded, drawing from revenues previously received by the railroads.

Branch lines have become relatively costly operations for line-haul carriers. Capital expenditures needed to maintain the branch line roadways have made some of them uneconomical. Deferred maintenance on those lines has made them hazardous to operate on, requiring lower train speeds and lighter carloads. It is questionable whether revenues accruing from such lines will equal or exceed fully allocated or even variable costs of operation. The Staggers Rail Act of 1980 has allowed railroads to eliminate from their systems any portion creating an economic burden on their operations. The Burlington Northern (and other railroads) have since decided that abandonment of parts of their branch line network will reduce costs more than reduce revenues, resulting in an overall improved profit position.

Implications of Branch Line Abandonment

Implications for the Railroads

Elimination of a portion of its branch line network may improve railroad equipment utilization. Assembling blocks of cars at large elevators on main lines would likely decrease loading times, allowing faster turnaround of equipment. Revenues to the railroad may decrease as some of the grain formerly loaded at the branch line station is diverted to other carriers or other modes. However, at least a portion of that grain may simply be transshipped through a larger facility on a main line or established branch line, resulting in continued revenues to the railroad.

Implications for Shippers and Producers

Upon abandonment of a branch line, shippers on that line are left void of rail service. Most of these shippers are presumably country elevators, although some may be lumber, fertilizer, or machinery dealers. Grain

shipments must move by truck unless alternate arrangements are made (short line railroad operation, contractual arrangements with abandoning carrier, etc.). Trucks may move the grain at a higher freight rate than the railroads did, resulting in a lower bid price for farmers' grains. Producers may find it economical to ship to a different elevator which has rail service and/or higher grain prices. The result would be the eventual demise of the country elevator which has no rail service. However, the increased trucking cost may be negated by efficiencies resulting from subterminal development and trainload grain shipments. On the other hand, some producers may not have another outlet for their grain in which case farmers must bear the additional cost of truck service to the elevator.

Implications for Government

Government agencies, both federal and state, are charged with monitoring the conditions provided by the new re-regulated environment. Rail branch line abandonment must, in the view of government, be in the best interests of the railroads and not put undue social or environmental burdens on the public. Policy implications, however, have been prescribed by the changes in the laws. Railroads have more flexibility in reducing the scope of their rail network as a means to achieve company goals, e.g., increased return on invested capital. Government responsibilities have moved away from the strict regulatory role, somewhat, towards a public welfare position.

The Short Line Railroad Alternative

This study concerns <u>one</u> alternative available to North Dakota to alleviate effects of branch line abandonment--short line railroads. An independent railroad operating on a branch line which has been abandoned by a large carrier may serve shippers more effectively and at a lower cost than the abandoning carrier. It should be noted that a short line railroad is only one of the alternatives available when faced with branch

line abandonment. Some others to consider are subsidies, contracts, and truck service.

Over 380 small railroads were operating in the United States in 1978, and represented about 80 percent of all railroads in the United States.[1] Although these railroads are not recognized as corporate giants typical of the railroad industry, they do represent a notable portion of the industry, nonetheless. The term "small railroad" is used due to the many different types of ownership and operating characteristics of such railroads in the United States. The names "small railroad," "short line railroad," and "Class III railroad" are often used synonomously. The Interstate Commerce Commission's classification of railroads uses total revenues as its basis for size determination (Table 1).

No short line railroads are operating in North Dakota at this writing. In fact, very few are known to be operating in the Great Plains states at all. Most small railroads are located in the industrial states of Pennsylvania, New York, Missouri, Ohio, Vermont, Illinois, and Indiana. Other concentrations are located in California, Oregon, Washington, Arkansas, Louisiana, North Carolina, South Carolina, and Georgia. Thirteen states contain well over half of the small railroads in this country.[2]

Commodities hauled by small railroads include nonmetallic minerals, pulp and paper products, glass and stone, lumber and wood, coal, and a variety of other commodities. Farm products constitute only 2.5 percent of

---

[1]Levine, H. A., C. F. Rockey, C. C. Eby, and J. L. Dale. Small Railroads, Economics and Finance Department, Association of American Railroads. In this book (p. 10) small railroads were defined as Class III line-haul or switching and terminal roads with revenues of $10 million or less. Railroads identified within this restriction numbered 383.

[2]Ibid, p. 169.

TABLE 1. CLASSIFICATION OF U.S. RAILROADS BY REVENUES, 1979, ICC REVENUE CLASSIFICATION

ICC Classification	Revenues ($)	Number of Railroads
I	>50 million	39
II	10-50 million	26
III	<10 million	238
	Unclassified switching and terminal companies, all sizes	176
		479

SOURCE: Levine, H. A., et al.

the total tonnage hauled by small railroads compared to 8.4 percent of total tonnage for all railroads.[3]

Objectives

The general objective of this study is to identify the nature and costs of potential short line railroads in North Dakota as a means to mitigate effects of branch line abandonment. Specific objectives are to:

1) identify branch lines operable as short line railroads and outline ownership alternatives for the purchase of those lines,

2) describe the advantages and disadvantages of short line railroad operation,

3) outline decision criteria when contemplating short line railroad purchase,

4) outline procedures for acquiring a short line railroad,

5) construct a methodology for identifying acquisition and rehabilitation costs of short line railroads, and

6) apply the above model to a selected North Dakota branch line subject to future abandonment and perform an economic analysis to evaluate its operational viability.

[3]Ibid, p. 85.

NORTH DAKOTA BRANCH LINES AND OWNERSHIP ALTERNATIVES FOR THOSE LINES

The objective of this section is to identify North Dakota branch lines that may be operated as short line railroads and outline ownership alternatives for purchase of those lines.

System Diagram Map

Railroads are required under the Staggers Rail Act of 1980 to submit annually a System Diagram Map which identifies branch lines that may or will be subject to future abandonment. The map illustrates the carrier's entire system for the state and portrays which portions of its system will be filed for abandonment and which sections will be studied as potential abandonments.

The intent of the System Diagram Map is to provide all interested parties advance notice of the railroads' abandonment intentions. Shippers and communities are thereby given an opportunity to consider their options when faced with an impending abandonment. Carriers are required to file their System Diagram Map with the Interstate Commerce Commission, State Governor, State Highway Department, and the Public Service Commission.

The 1981 North Dakota System Diagram Map for all rail carriers (published October 1, 1981) is presented in Appendix A. Branch lines subject to abandonment are identified by abandonment category. Category 1 lines are segments for which the operating carrier anticipates filing an abandonment application within three years. Category 2 lines are segments which are under study by the railroad to determine if they should be abandoned at some time in the future. Category 3 lines are segments for which the railroad has petitioned for abandonment with the Interstate Commerce Commission.

Mileage in each abandonment category for North Dakota varies; 425.44 miles in Category 1, 822.15 miles in Category 2, and 230.78 miles in Category 3. Over 55 percent of all North Dakota railway lines subject to abandonment are in Category 2. Lines in Category 1 are to be petitioned for abandonment within that time period (three years)--it is not likely that all 425 miles of trackage could be filed for abandonment any sooner than three years. Also, it should be noted that Category 2 lines are only under study as abandonment cases. This does not mean that all those lines will be abandoned, although some may be eventually considered economically nonviable by the operating carrier and identified as candidates for cessation of service.

Lines Which Can be Operated as Short Line Railroads

Any line that has been abandoned or subject to future abandonment can potentially be marked for purchase and operation as a short line railroad. After a line has been abandoned, an interested party may purchase the line for its net liquidation value.[4] Presumably, the railroad has no use for the abandoned line other than to remove the track material and either sell it as scrap or reuse it on another portion of its system.

Under the Interstate Commerce Commission's Feeder Railroad Development Program, lines in Category 1 or 2 on a carrier's system diagram map can be forced to be sold to a financially responsible party. This program allows branch lines to be acquired by interested parties and converted to short line railroads before they are completely down-graded and need substantial rehabilitation. The Feeder Railroad Development Program is described in detail later in this study.

---

[4]Net liquidation value is defined as the salvage value (either as scrap or for reuse in another segment of the carrier's system) of the remaining track material after abandonment (rail, ties, etc.), less costs of removal and sale.

Potential Owners of North Dakota Feeder Lines

Preservation of branch lines in North Dakota is of utmost concern to many different groups, but none more so than individual shippers on those lines. Loss of rail service would mean a modal switch for transporting their commodities, relying completely on trucks. This switch would likely increase the total freight bill of shippers on the abandoned line. Most of the shippers on North Dakota branch lines are grain elevators, although some machinery and other products may move into agricultural areas by rail. The proportion of grain shipped by truck has increased, but rail is still the predominant mode for North Dakota agricultural commodities. Shippers who consider rail service essential to their operation may consider purchasing the line either privately or cooperatively to sustain that service. However, due to the rehabilitation necessary on many branch lines, private financing of such a project may be a problem.

Producers of rail-transported commodities have a vested interest in preservation of rail service to elevators they patronize. If the outlet for their grain is left without rail service, producers and the elevator will both suffer. At the least, the elevator would have to resort to complete truck service, possibly increasing the freight bill. This cost increase would undoubtedly be passed on to farmers in the form of lower grain prices. This will put the elevator at a competitive disadvantage, causing some patrons to move to other elevators who still have rail service. Elevators with rail service would have lower costs and, therefore, higher grain prices for producers (all other things equal). This cost/price differential would shift inward the boundary defining the market area for the elevator without rail service. Some producers would find it more profitable to ship to a competing elevator. Higher grain prices at that competing elevator would make up for the increased trucking costs for

producers that were formerly close to the boundary of market areas between the two elevators. If the elevator, after losing rail service, cannot continue operations due to decreased volume, all patrons would be forced to truck their products to a competing elevator. This increased shipping cost may provide incentives for producers to consider subsidy or purchase of the line to preserve rail service to their market area. As private financing may be a problem, a cooperatively owned firm may find it easier to obtain capital.

Public ownership of a feeder line is a third alternative to loss of rail service. A community or group of communities on a branch line may consider it in their best interests to continue rail service in their area. Rail service may be essential to the existence of their industrial sector, either in terms of inputs shipped in or products shipped out. In North Dakota, few communities (other than coal-producing areas) have large tonnages of commodities to ship other than grain. Agriculture is the major component of the economic base of those communities--industry shippers other than country elevators are scarce. Therefore, most communities would not face substantial industrial output decline as a result of abandonment, other than the possible demise of grain elevators. Some communities, however, may envision loss of rail service as a deterrent to future industrial growth in their city.

Nonlocal investors may envision North Dakota feeder lines as potentially profitable investments and purchase abandoned branch lines to be operated as for-profit corporations. However, these lines may not have sufficient volumes of freight to warrant their purchase, even by shippers or producers. Operating carriers are considering abandoning these branch lines because of the economic burden on the railroad. If these lines are

economically questionable today, continued downgrading and volume decreases will only make them more unattractive, even to short line operators.

North Dakota Railway Authority Legislation

Chapter 49-17.2 of the North Dakota Century Code allows the formation of Regional Railroad Authorities in North Dakota with the intent of organizing railroads. Presumably, this legislation was formed to allow or permit short line railroads to be organized should a community or region decide to form a railroad. No considerations are given to economics or the reasons behind the railroad organization, only to allow such an entity to be legally formed.

A regional railroad authority may be formed by any "potential subdivision" (county, municipality, etc.) of the state as long as 60 percent of the voting public approves the formation. The Secretary of State issues a certificate of incorporation upon public hearing and notification in each subdivision affected by or included in the proposed authority. This regional authority, as a separate corporate entity, is subject to the same contingencies as any other corporation. It can sue and be sued, execute contracts and other instruments, or take any actions necessary to carry out its purposes. However, one major difference does exist between a regional railroad authority and other corporations--tax exempt status. Property owned and income earned by the authority are exempt from taxation. Also, interest and income earned from bonds issued by the authority are tax exempt.

Regional railroad authorities are financed through a combination of bond issues and tax levies. The authority specifies to the appropriate government body the amount of the levy (not to exceed four mills) to be used for railroad purposes. The authority also may use any public or

private funds made available by grants or loans. The authority may extend to any person the right to use or operate its facilities, as long as that party operates as a common carrier.

Regional railroad authorities have limited chances for success in North Dakota because of the nature of the North Dakota branch line network. First, the authority must get a 60 percent majority of the voting public in the affected areas. This alone may be hard to achieve. Second, if the authority is being formed to support a single feeder line, the affected area would not have sufficient population or property area to support a short line railroad. North Dakota regional railroad authority legislation is presented in its entirety in Appendix B.

Summary

While there are a range of potential owners of short line railroads in North Dakota, the most likely owners would be producers or shippers because of their vested interests. Community or common ownership via the Regional Railroad Authority Act would be less likely to occur because of taxation and voting consideration with respect to formation of the authority.

ADVANTAGES AND DISADVANTAGES OF A SHORT LINE RAILROAD

Introduction

Short line railroads may be considered in North Dakota as an alternative to loss of rail service due to branch line abandonment by Class I carriers. Presumably, short line operation would have certain inherent advantages to shippers and/or producers that the abandoning carrier could not provide. Also, these short line railroads would have to operate more economically (at a lower unit cost) than either Class I rail service or truck service or they would not be considered at all. This section gives an overview of some of the advantages and disadvantages short line operations may have over a Class I carrier operating on branch lines in North Dakota.

Advantages

Elimination of Class I Labor Union Work Rules

Investment in the railroad plant involves a large capital outlay for fixed facilities. Roadway and equipment purchases constitute a considerable proportion of the total costs of railroad ownership and operation. However, labor costs have grown to be a major portion of both railroad operating costs and total costs. Annual reports of three major carriers in Oregon showed wages[5] paid to persons who ran the trains (engineers, fireman, brakemen, and conductors) amounted to 11.8 percent of all railroad operating expenses.[6] Government officials and railroad labor unions have been blamed for retaining legislation and union contractural requirements which unnecessarily inflate railroad labor costs. It has been

---

[5]Exclusive of payroll taxes and health and welfare benefits.

[6]Astle, D. J., Coram, R. W., and Valness, C. N., Analysis of Railroad "Train Crew" Labor Costs in Oregon and Estimated Potential Savings, Railroad Division, Public Utility Commission of Oregon, May 1978.

stated that labor operating costs for through train operation could be reduced by 40 percent with no reduction in safety or service if facilitating agreements were made.[7] Potential areas of cost savings by changing to the short line alternative are revision of the basis of pay (100-mile rule), reduction in crew size, and elimination of initial and final terminal delay. These areas of potential savings, as well as other work rule related topics, are discussed in this section.

Basis of Pay

The present basis of pay is calculated on a 100-mile day. One hundred miles traveled on a freight train represents one day's pay regardless of the time required to make the trip or actual work performed en route. Overtime also accrues on a mileage basis. If a run is 100 miles or less, overtime starts after eight hours. If a run is over 100 miles, overtime is paid for each mile over 100. Each additional mile over 100 is counted as five minutes of overtime (100 miles/8 hours = 12½ miles per hour or about five minutes for each mile traveled).

This basis of pay was originated decades ago when it actually took a full day for a freight train to cover 100 miles. Today, trains can travel much more than 100 miles daily, but the 100-mile day rule is still adhered to. This outdated standard inflates labor costs, particularly for passenger trains which can make a 100-mile trip in two to three hours.[8] The 100-mile day rule is not without its positive points, however. It encourages train crews to cover as many miles as possible in a minimum amount of time, and also provides an opportunity for crew members to earn extra wages.

---

[7] Ibid., p. 9.
[8] Ibid., p. 33.

Crew Size

Current labor-management crew size agreements call for a standard crew of four persons--an engineer, conductor, and two brakemen. Some trains have a fireman, who is actually reserve personnel and trained to eventually become an engineer. Crew personnel needs will vary and depend on many factors. Longer trains require additional persons to watch for operational problems, dragging equipment, and derailments. However, a train shorter than 80 cars or 4,000 feet could be operated by three crew members--two in the engine and one in the caboose.[9] Other considerations when determining crew size are work performed en route, traffic density, level of public safety required, employee safety, and other physical operating characteristics. The key to cost reduction when determining crew consist is to staff each train according to its particular safety and service needs, not simply in accordance with tradition or union guidelines.[10]

Initial and Final Terminal Delay

Train crew personnel are entitled to payment if they are held in the terminal longer than 75 minutes between the time they are called on duty and the time the train leaves the yard. Overtime accrues to the crew members at straight time in addition to wages collected for miles run. No double payment is made for overtime on miles run and on terminal delay--the greater of the two is granted. Crews are also entitled to payment if they are delayed at their final destination. Train personnel are paid overtime from the time they arrive at the final terminal until all duties are completed and the crew has signed out. Final terminal delay is also paid on a straight time rate but is not paid when the crew is already on overtime.

---

[9]Ibid., Appendix II, p. 1.

[10]Ibid., p. 36.

Other Cost-Related Work Rules

Other work rules that cause payments to crews other than regular wages are:

1) Deadheading to Outside Points. Extra employees[11] must be shuffled to fill positions temporarily vacated by regular personnel. These extra crew members must be deadheaded (paid for traveling, not actually working on the site) to their appointed position. They are paid a full day's wage for traveling to the work site, and a full day's pay for returning home (in addition to their regular wage accruing while actually on duty).

2) Pool Caboose Allowance. A payment is made to crews to avoid switching cabooses when crew changes are made. Each crew used to have its own caboose so they could maintain cooking utensils, beds, etc., in the caboose. Faster schedules prompted the railroad to avoid numerous caboose changes; a payment is made to the crew for the inconvenience of not being able to maintain their own caboose.

3) Penalty Payments. Crews receive a payment if their contract is violated. The Railway Labor Act provides that labor may submit a claim for one day's pay if they are required to do work which is in violation of their agreement.

One major advantage of a short line operation is that it does not necessarily have to grant union status to its employees. The railroad need only pay the wage necessary to attract qualified workers. Short line operators have a virtual free hand in deciding on employee compensation; workers may be paid strictly on an hourly or salaried basis. Employees can be paid for their full day's work regardless of the train-miles they achieve or the particular tasks they perform. Employees of a short line may also perform many different jobs. For example, workers may be solicited to perform seasonal maintenance of way operations when needed. However, when negotiating with potential employees, care must be taken not to grant benefits that are self-defeating to the organization. This may be particularly difficult to achieve when employees were formerly covered under Class I railroad union

[11] Unassigned personnel are maintained to fill vacancies as they occur.

rules. More than half of all small railroad employees had some kind of union representation in 1979. However, less than 5 percent of the small railroads possessed all union labor, while 40 percent had all nonunion labor.[12]

Equipment Needs of Short Line Railroads

Short line operations obviously would require less equipment than a Class I carrier. Most short lines have considerably fewer miles of track, so maintenance of way equipment needs would be minimal. Major track rehabilitation or upgrading would likely be done by some outside contractor, while incidential track maintenance would probably be done by the short line employees.

The major equipment needs of the short line would be for locomotive power, freight cars, and service vehicles.[13] Short line railroads' equipment needs will depend entirely upon the type of operation and will certainly vary among companies. Purchase of equipment requires a considerable capital expenditure. One alternative may be to lease some or all the needed units or lease with an option to buy. Under a lease program, initial outlays will be smaller, but in total would likely be more than the sum of all depreciation and interest paid for a purchased unit. However, monthly or annual lease payments may be advantageous to a beginning, highly leveraged railroad. It is possible that the only initial equipment needed is locomotive power, service vehicles and some incidental maintenance equipment. This is an obvious oversimplification, but equipment needs of a short line operation would be considerably less than a Class I carrier.

---

[12]Levine, Harvey A. et al., Small Railroads, op. cit.

[13]Patton, Edwin P. and C. John Langley, Jr., Handbook for Preservation of Local Railroad Service, DOT-TST-77-34, U.S. Department of Transportation, January 1977.

A likely scenario for a North Dakota short line railroad would be to purchase a used or rehabilitated locomotive and service vehicles, and to lease freight cars or use cars owned by its connecting carrier. Power needs of a short line would be minimal. Therefore, a single locomotive would be sufficient for most operations. Overpowering would result in unnecessary capital outlays as well as operational problems. Underpowering would cause unnecessary strain on the locomotive. Purchasing one locomotive and having one more available, either through a lease or borrowing agreement, may be an optimum plan. If only one unit is available, normal maintenance or a breakdown would lead to lengthy periods of service cessation. Major repairs of locomotives or anything but routine repairs would be handled by an outside contractor rather than investing in maintenance equipment and an extensive spare parts inventory.

A small number of service vehicles would be needed to maintain the railroad on a regular basis. Winter snow removal equipment and track maintenance vehicles would comprise the major service units required.

The freight car fleet needed would depend on the individual railroad operation. The firm would need to consider its historical and expected volume of shipments, car turn-around time, available capital, and ownership/lease considerations. A variety of lease arrangements are available and are classified by which parties assume the different ownership costs.[14]

Local Level Ownership Possible

Shippers or communities affected by abandonment may want to purchase and operate the railroad to preserve their rail service. Several

---

[14]Railway Age, "Buy or Lease, Reducing the Guesswork," May 25, 1982, pp. 32-34.

advantages may be realized by local rather than nonlocal ownership. Local ownership would provide increased incentive for use of the railroad. A cooperative attitude would be more likely to prevail where owners are actually users of the operation. The shippers would have a vested interest in the financial success of the company. Increased volume on the line may be a key factor in equipment utilization, so owners/shippers would be more likely to use their railroad than revert to competing modes.

Local financing may be more readily available to a firm owned and operated by community members. Not only would private risk capital be available from owners, local commercial lenders would probably be more interested in loaning to established community members than to outside investors.

If the owners of a short line railroad are "closer" to the local community, they would be more accessible to shippers on the line and would be more able to provide service tailored to their needs. Local businesses may be more willing to deal with a company run by people with which they have grown accustomed to doing business. Local field persons would also be more aware of particular business needs of shippers using the railroad. Local owners of a short line operation also may be more willing to tolerate business downswings and erratic levels of net returns if their business or community depended on rail service.

Future industrial growth in an area may be spurred if rail service is continued in a community. Factories or plants requiring railed-in raw materials or railed-out finished products will be more receptive to a community which is backing the ownership and operation of a railroad. However, most of the shippers in North Dakota affected by discontinuation of rail service are grain elevators. Very few communities have significant

shippers of nongrain materials, and few could be expected to acquire such industries.[15]

Disadvantages

Although organizing a light density rail line as a short line railroad may have attractive features to potential owners and shippers, it does have associated shortcomings. Such an operation would be a lower volume/high fixed cost enterprise compared to large carriers. Capital outlays involved with purchase of a locomotive, equipment, and roadway may prevent the operation from ever being started. Once in operation, the short line would have to rely on rates and divisions for its revenue base.[16] Without a favorable division from the connecting carrier, the short line may be unable to operate unless it surcharges shippers or receives an operating subsidy from a third party.

A new, smaller railroad may have difficulty attracting qualified personnel for company employees. The nonunion status of the short line, although attractive to owners/operators, may be a negative factor when attempting to hire crews and operations personnel. These new railroads presumably would be located in rural areas where qualified railroad people may not live. A higher wage may be needed to coax nonlocal people to work for the new operation.

Short line railroads developed in North Dakota would be primarily dependent on the movement of one commodity--grain. This would be the major

---

[15]Coal producing communities excluded. Coal mining areas are generally not major grain producing regions, and coal is shipped in a manner completely unlike grain.

[16]Short line railroads in North Dakota, like most others in the United States, would interchange cars with one of the larger railroads operating in the state. Revenues generated from shipping the entire distance to market would be apportioned among the cooperating carriers as agreed by the participating parties.

disadvantage of these types of operations in North Dakota. Monthly grain shipments in the 1979-80 crop marketing year ranged from a high of 66.9 million bushels in October to a low of 24.1 million bushels in March (Figure 1). Seasonality of grain shipments would mean seasonal revenues to the carrier. Outbound commodities other than grain are practically nonexistant in North Dakota. Inbound shipments are also scarce, although some fertilizer or lumber may be shipped into the state. Dependence on a single commodity which is seasonal in nature is a precarious situation for a short line railroad.[17]

Summary

Short line railroads in the United States have several advantages inherent in their operations. Relaxing restrictive union labor regulations would likely lower the short line's operating expenses, and equipment needs would be less due to the smaller scale of operations. Local ownership of the railroad may provide for easier access to financing and allow better relations between the carrier and shippers. Also, railroad service in a community may aid in industrial development.

Disadvantages, however, are present as well. Initial investment in the railroad right-of-way and equipment may be prohibitive. Negotiating favorable divisions of revenues may be difficult, particularly if existing railroads operate in any semblance of a monopoly position. Also, short line operations in North Dakota would be hauling primarily grain, a seasonal and very mobile commodity.

---

[17] Patton and Langley, op. cit.

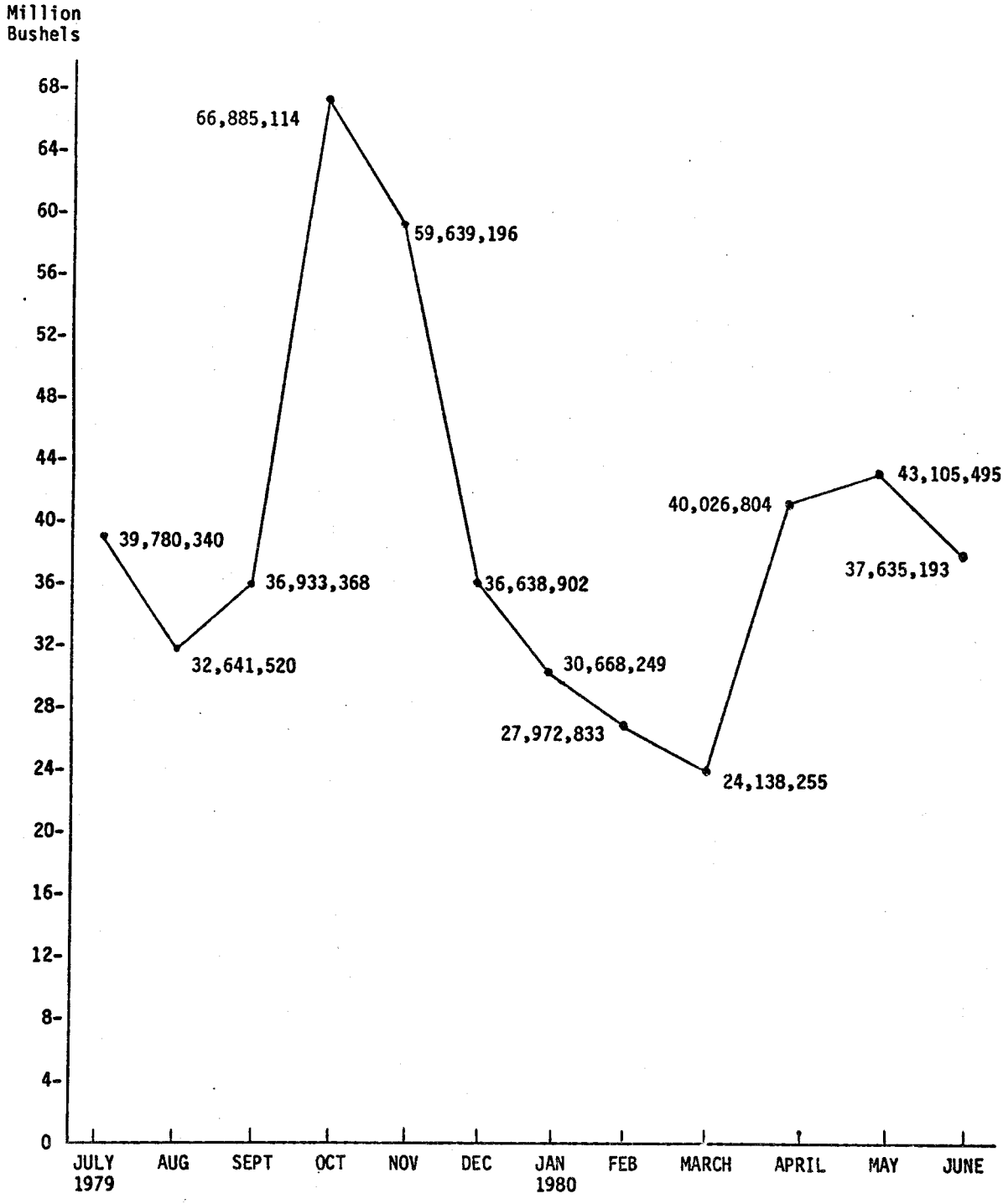


Figure 1. North Dakota Grain and Oilseed Movements by Month, July 1979 Through June 1980

SOURCE: Griffin, Gene C., "North Dakota Grain and Oilseed Transportation Statistics, 1979-80," UGPTI Report No. 36, December 1980.

OWNERSHIP CONSIDERATIONS

Investing in a railroad operation is no small undertaking by any standards. Before potential North Dakota short line railroad owners put capital into a particular line, a complete feasibility study would be required to evaluate its economic viability. This section reviews some of the ownership considerations that would need evaluation when determining the potential for a short line operation.

Physical Condition of the Road

Many North Dakota branch lines are in dire need of improvement, either through an accelerated maintenance program or outright rehabilitation. Years of neglect and deferred maintenance have made the lines more dangerous to operate over, requiring slower train speeds or an embargo of the line. Also, when North Dakota's rail network was constructed, average car-loadings were considerably lighter than today.

Rail

Many branch lines (or portions of them) have light rail. New 100 ton hopper cars cannot be shipped regularly over rail lighter than approximately 72 pounds,[18] and only under certain conditions on rail lighter than about 90 pounds.[19] Rail weight on North Dakota branch lines is highly variable, even on the same line. For example, the York to Dunseith line has six different weights of rail, ranging from 56 pounds to 115 pounds. It would be inappropriate to state an "average" or statewide standard rail weight due to this variation. In general, most branch lines

---

[18] Rail weight is measured in pounds per lineal yard.

[19] These are only approximate rules of thumb; many other factors affect roadway strength such as tie condition, thickness of ballast and subgrade, drainage, etc. All these components combined determine roadway strength.

have at least some rail that is too light for regular shipment of large hopper cars or cars of equivalent weight. In the rehabilitation or upgrading process, the cost of new or relay (used) rail is a major portion of the total costs. Therefore, the weight of existing rail becomes a prime consideration when deciding on the short-term viability of a branch line.

Tie Condition

Probably more important than weight of rail is the quality and condition of crossties under the rail. The function of ties is to properly align the rail and evenly distribute the weight of trains downward throughout the roadway. Without proper placement and function, the rail can be pushed downward through the ties and destroy the roadway, eventually causing derailments.

Main line roadways generally have excellent ties to support the heavy, continuous traffic that moves over them--very few defective ties[20] exist in such roadways. However, branch lines are often plagued by ties that have been neglected or improperly maintained. The regular maintenance cycle has not been followed; therefore, many broken or split ties exist or ties are simply so old they no longer can support heavy weight. Before larger trains with heavier carloadings can be operated over these lines, some ties would have to be replaced to bring the line up to Federal Railroad Administration (FRA) operating standards. Most lines would presently meet FRA Class 1 standards (10 mph. maximum), but should be at least Class 2 speed (25 mph. maximum) to effectively service a line and reduce the likelihood of derailment. Class 1 FRA Track Safety Standards require at least five nondefective ties per 39 feet of track with no more than 100 inches between

[20]FRA Track Safety Standards define a defective tie as one that: 1) is broken through; 2) is split so that it will not hold a spike, or allows ballast to work through; 3) allows movement of the tie plate; 4) is cut by the tie plate; or 5) is not spiked properly.

nondefective ties. Class 2 and 3 track (25 and 40 mph., respectively) require at least eight nondefective ties per 39 feet of track and no more than 70 inches between good ties (Table 2). It is inconceivable to think that any train operating on a North Dakota branch line would be traveling at speeds much greater than 40 miles per hour.

TABLE 2. TIE CONDITION AND PLACEMENT BY CLASS OF TRACK

Class of Track	Minimum Number of Nondefective Ties Per 39 Ft. of Track	Maximum Distance Between Nondefective Ties (inches)
1	5	100
2-3	8	70
4-5	12	48
6	14	48

SOURCE: U.S. Department of Transportation, FRA Office of Safety, Track Safety Standards, March 1975.

Ballast

Ballast consists of the crushed rock or gravel the ties are set in. Its function is to support the weight of trains and track and transfer that weight evenly downward. Ballast also holds the rail aligment laterally and provides drainage to direct water away from the roadway.

FRA Track Safety Standards are not specific as to ballast condition, only to state that ballast should; 1) transmit the load to the subgrade; 2) restrain the track laterally, longitudinally, and vertically; 3) provide drainage; and 4) maintain proper track cross-level, surface, and alignment. However, to extend tie life and permit safer operation of trains, proper ballast should be maintained. When ballast becomes fouled with dirt or vegetation, or unnecessarily crushed, it should be replenished with new crushed rock.

Other Roadway Considerations

Structures such as bridges and culverts may need rehabilitation if they are deemed unsafe to operate over. Relatively few major structures exist in North Dakota due to the nature of the terrain. An individual inspection of each structure would be necessary to determine needed rehabilitation or upgrading.

The roadway subgrade must be sufficiently landscaped to allow water to drain away from the track. Excess water in the ballast, subgrade, or around ties will cause accelerated track deterioration and unnecessary vegetation growth.

Vegetation in the roadbed is undesirable for several reasons. First, plant roots hold water within the ballast and subgrade and cause water-related track deterioration. Second, plants between the rail and locomotive wheel reduce traction and will accelerate rail wear. Finally, vegetation can be a hazard to crew members. Branches or weeds scraping the side of the train can cause injury when signaling or switching.

Freight on the Branch Line

The degree of success of a short line railroad in North Dakota, as with any for-profit entity, will ultimately depend on its revenue/cost position. Railroad costing methodologies exist to estimate one side of that situation, but estimating revenues is not such a straightforward procedure. Unpredictable volumes on branch lines has been a problem for railroads in the past. For a private or cooperatively owned short line that depends upon revenues solely from that branch line, variability in volume would be even more of a problem. The firm would have no other regions or shipments to compensate for the variable shipping patterns. This section outlines some of the freight-related concerns of a short line considering operation in North Dakota.

Number and Types of Shippers

The primary commodity shipped on North Dakota branch lines is grain. Some machinery and fertilizer is shipped by rail to North Dakota communities, but the total tonnage of these commodities shipped on branch lines is small compared to grain. Hard red spring wheat, durum wheat, sunflower, and barley constitute the major commodities shipped by rail (Table 3). If an interested party were considering a particular line as a potential short line railroad, a site specific shipper enumeration and survey would be required to evaluate the potential for inbound shipments. In the 1978-79 crop year, three North Dakota branch lines potentially subject to abandonment had an average of about 100,000 cwt. of inbound fertilizer and 16,000 cwt. of inbound machinery move to implement dealers and elevators on the lines.[21] The ICC 1 percent waybill sample indicated about 50 cars of fertilizer moved on North Dakota branch lines in 1979. If this 1 percent is indeed a representative sample of inbound shipments, approximately 5,000 cars of fertilizer were railed-in to destinations on North Dakota branch lines.[22]

The North Dakota System Diagram Map (Appendix A) showed 384 miles of Category 1 lines and 822 miles of Category 2 lines. The branch lines listed in Category 1 had an average of three grain elevators on each line ranging from zero to nine. The 42 elevators on those Category 1 lines had an average storage capacity of 218,000 bushels.[23] Category 1 lines had an

---

[21]Mittleider, John F. and Harvey G. Vreugdenhil, An Economic Analysis of Selected Branch Lines in North Dakota, Ag. Econ. Rpt. No. 144, Department of Agricultural Economics, Agricultural Experiment Station, North Dakota State University, May 1981.

[22]This is admittedly a questionable sample for inbound North Dakota shipments of fertilizer. The sample also identified a limited number of inbound shipments of lumber and crushed limestone; no machinery shipments were identified when, in fact, machinery is railed into many North Dakota communities.

[23]North Dakota Grain Dealers Association, Directory of Licensed and Bonded Country Elevators in North Dakota, Fargo, 1982.

TABLE 3. NORTH DAKOTA GRAIN AND OILSEED SHIPMENTS, 1969-70 TO 1980-81[a]

	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81
						(thousand bu.)						
Hard Red Spring	120,330 (39%)	105,800 (35%)	119,944 (40%)	191,696 (44%)	183,567 (45%)	122,934 (42%)	139,361 (44%)	123,976 (41%)	127,953 (36%)	184,923 (41%)	169,573 (36%)	126,115 (31%)
Durum	58,540 (19%)	57,317 (19%)	66,184 (22%)	83,351 (19%)	60,758 (15%)	68,781 (24%)	74,817 (23%)	65,024 (21%)	88,366 (25%)	88,659 (19%)	94,581 (20%)	63,193 (16%)
Barley	74,528 (24%)	68,996 (23%)	68,436 (23%)	78,384 (18%)	91,739 (22%)	56,671 (19%)	56,355 (18%)	73,314 (24%)	63,115 (18%)	69,648 (15%)	78,621 (17%)	62,672 (15%)
Sunflowers	N.A.	N.A.	N.A.	9,183 (2%)	9,246 (2%)	9,013 (3%)	14,554 (5%)	15,622 (5%)	51,278 (14%)	79,253 (17%)	95,940 (20%)	114,866 (28%)
Oats	37,008 (12%)	55,049 (18%)	32,009 (11%)	44,222 (10%)	41,338 (10%)	19,322 (7%)	15,104 (5%)	12,158 (4%)	10,492 (3%)	12,087 (3%)	7,959 (2%)	3,515 (1%)
Rye	1,672 (1%)	4,675 (2%)	3,701 (1%)	5,009 (1%)	7,721 (2%)	2,513 (1%)	3,293 (1%)	2,769 (1%)	1,772 (1%)	2,811 (1%)	3,598 (1%)	2,020 (1%)
Flax Seed	13,133 (4%)	13,540 (4%)	8,796 (3%)	11,411 (3%)	6,871 (2%)	5,300 (2%)	6,590 (2%)	4,883 (2%)	6,174 (2%)	4,541 (1%)	4,580 (1%)	4,176 (1%)
Miscellaneous	N.A.	N.A.	N.A.	9,952 (2%)	10,141 (2%)	7,042 (2%)	10,211 (3%)	8,166 (3%)	9,454 (3%)	14,312 (3%)	21,212 (4%)	10,587 (3%)
Corn	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	13,951 (3%)
Total	305,211 (100%)	305,377 (100%)	299,070 (100%)	433,208 (100%)	411,381 (100%)	291,576 (100%)	320,285 (100%)	305,912 (100%)	358,604 (100%)	456,234 (100%)	476,064 (100%)	401,085 (100%)

[a]Includes CCC shipments.

SOURCE: Griffin, Gene C., "North Dakota Grain and Oilseed Transportation Statistics, 1980-81," Upper Great Plains Transportation Institute Report No. 42, March 1982.

average length of 27.4 miles. It should be noted that many shippers on a line is a desirable factor for a short line railroad. However, due to the nature of the North Dakota grain elevator industry, more shippers on a line means a longer branch line. Hence, the line would have a higher purchase price as well as increased rehabilitation and maintenance costs.

Car Types

The 100 ton hopper car has become increasingly popular for moving bulk commodities such as grain. Railroads have strived for increased equipment utilization and thereby have increased their fleet of heavy hopper cars (Table 4). Also, indications are that railroads will continue this trend.[24] Elevator operators would rather load 100 ton hopper cars than smaller cars due to the increased bushel capacity and convenient loading features. Heavier carloadings have created some problems, however. The added weight on track which was originally built to withstand 220,000 pound gross weights has necessitated upgrading of some rail lines to 263,000 pound gross weight capacity. Boxcars are still used to haul grain and oilseeds, however. In the 1979-80 crop marketing year, 27 percent of all North Dakota grains and oilseeds shipped by rail were hauled in boxcars.[25] The implications for the potential short line operators are that some upgrading of track and facilities will be necessary to accomodate the trend toward heavier carloadings. Otherwise the traffic will contain a relatively high mix of light cargo boxcars, or high track maintenance will be experienced due to heavier carloadings.

---

[24]Ahlf, Robert E., "The Implications of the 100 Ton Car," in Modern Railroads, February 1980.

[25]UGPTI unpublished data.

TABLE 4. UNITED STATES GRAIN RAILCAR FLEET, JANUARY 1, 1970 - JANUARY 1, 1980

Year	40-Foot Narrow Door Boxcars	Covered Hoppers	Total Grain Cars	Total Capacity in Bushels
1970	180,881	161,068	341,949	909,393,200
1971	207,594[a]	170,742	378,436	995,910,800
1972	190,036	179,875	369,911	991,647,000
1973	178,512	186,219	364,731	990,168,600
1974	164,662	204,926	369,588	1,026,072,400
1975	149,514	219,362	368,876	1,044,858,800
1976	131,640	228,265	359,905	1,039,381,000
1977	107,748	230,069	337,817	997,730,600
1978[b]	86,460	148,696	235,156	678,486,400
1979[b]	66,186	161,762	227,948	682,362,800
1980[b]	58,506	185,506	244,458	749,248,800

Note: Calculations above assume average boxcar capacity of 2,000 bushels and average covered hopper capacity of 3,400 bushels.

[a]Increase due to reclassification of a number of cars from wide to narrow door.

[b]Figures for the years 1978 and on onward are noncomparable with prior figures due to computer separation, beginning January 1, 1978, of grain carrying jumbo covered hoppers from smaller hoppers in the fleet which are not used for hauling grain except on rare occasions. Figuring 1980 grain fleet capacity on the same basis as that used prior to 1978 would show a total capacity of 1,031,335 bushels, with 268,919 covered hoppers in the fleet and 58,506 40-foot, narrow door boxcars.

SOURCE: Association of American Railroads, taken from Milling and Baking News' 1982 Grain Directory Buyers Guide, p. 150.

Volume Shipped and Projected Volume

The quantity of grain shipped is highly variable among North Dakota branch lines. Production among Crop Reporting Districts (CRDs) varies (Table 5), as does the modal share (Table 6). The revenue potential of a short line railroad would depend, in part, on its ability to capture as much of the grain movement market as possible. The firm's ability to draw traffic away from trucks may determine its long-run viability. A diversion of traffic to trucks may have been one of the primary reasons for the economic dilemma branch lines have given Class I carriers. The new short line would have to rely on its own competitive ability to attain that traffic and revenue, rather than on shipper projections or historic shipping patterns. A marketing analysis of the line would indicate what proportion could be recaptured from trucks and at what cost.

Short line revenues can be of several types. Nonoperating revenues may consist of per diem charges and demurrage.[26] Operating revenues available to a short line would consist of two types: divisions and switch payments. A short line participating in a joint haul movement is entitled to a portion (division) of the total revenues generated by movement of a car. For example, if a short line division on a movement is 10 percent and the total revenue on a carload is $500, the small carrier's revenue would be $50. Switch payments are made to a carrier for picking up, delivering, or interchanging cars between other carriers or shippers.

Rail Siding (Car Capacity)

The advent of the multiple car rate structure has prompted country elevators to attempt loading multiple car shipments to access the lower

---

[26]Per diem is a payment to the owning railroad for each day a car is used or is on the property of a borrowing railraod. Demurrage is a penalty placed on shippers holding cars longer than a specified time period.

TABLE 5. NORTH DAKOTA GRAIN AND OILSEED SHIPMENTS, BY CROP REPORTING DISTRICT, 1974-75 TO 1980-81[a]

Crop Reporting District	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81
				(thousand bu.)			
1	44,971 (15%)	39,254 (12%)	38,628 (13%)	47,881 (13%)	55,802 (12%)	55,571 (12%)	41,942 (10%)
2	28,141 (10%)	27,362 (9%)	29,421 (10%)	32,552 (9%)	38,668 (8%)	39,278 (8%)	32,879 (8%)
3	65,398 (22%)	78,193 (24%)	80,085 (26%)	92,607 (26%)	103,393 (23%)	116,150 (24%)	94,203 (24%)
4	10,852 (4%)	13,941 (4%)	13,315 (4%)	14,323 (4%)	17,394 (4%)	18,722 (4%)	12,540 (3%)
5	25,997 (9%)	33,031 (10%)	29,763 (10%)	32,575 (9%)	49,133 (11%)	44,364 (9%)	44,670 (11%)
6	50,683 (17%)	55,875 (17%)	58,924 (19%)	74,423 (21%)	97,722 (21%)	97,513 (20%)	88,147 (20%)
7	19,533 (7%)	20,044 (6%)	17,044 (6%)	14,150 (4%)	23,776 (5%)	24,865 (5%)	12,060 (3%)
8	7,696 (3%)	12,834 (4%)	9,454 (3%)	6,373 (2%)	12,099 (3%)	12,761 (3%)	7,864 (2%)
9	38,311 (13%)	39,748 (12%)	29,280 (10%)	43,721 (12%)	58,249 (13%)	66,843 (14%)	66,779 (17%)
Total	291,582 (100%)	320,282 (100%)	305,914 (100%)	358,605 (100%)	456,236 (100%)	476,067 (100%)	401,085 (100%)

[a] Includes hard red spring, durum, sunflowers, barley, oats, rye, flax, and miscellaneous commodities.

TABLE 6. MODAL SHARE OF NORTH DAKOTA GRAIN AND OILSEED SHIPMENTS, BY CROP REPORTING DISTRICT, 1980-81

CRD	Rail (%)	Truck (%)
1	78	22
2	67	33
3	68	32
4	60	40
5	57	43
6	57	43
7	21	79
8	26	74
9	68	32
North Dakota	63	37

SOURCE: Upper Great Plains Transportation Institute, unpublished data.

rate provided. Significant freight bill savings can be realized by shipping grain in multiple car lots. Even though some elevators possess the necessary storage capacity to load such a train, few have side tracks long enough to store sufficient cars to utilize the multiple car rate. Their sidings were built years ago when elevators normally did not load more than a few cars in a day. Today, elevators have more storage, higher load-out capacity, and the desire to save on their freight bill via unit shipments. Shippers who have siding long enough to hold more cars or have additional land to install more siding may have a competitive advantage. A short line railroad serving such shippers would probably gain efficiencies through multiple car movements just as large carriers have. However, a North Dakota branch line over which multiple car trains are shipped may be viable for the larger carrier and not available for purchase by a short line operator.

Also, it is unlikely that the same level of efficiencies are in 26-car movements for short line operations as for the line-haul carrier. The gathering operation by a short line is less sensitive to equipment efficiencies than line-haul carriers, who have the opportunity to reposition equipment throughout their total system. The scale of operations is entirely different.

Some of the ownership considerations of potential short line railroad owners include the physical condition of the roadway and the nature of the freight shipped over the proposed line. The weight of rail and condition of ties, ballast, and subgrade determine the strength of the track structure and must be maintained in order to increase operating efficiencies and decrease hazards. A branch line needing substantial maintenance or rehabilitation may prove to be an expensive proposition for a short line operator.

A realistic projection of revenues must be attained from historic traffic patterns and estimates of future freight volumes. The operator must consider changes occurring in the grain marketing system and be able to adjust his operation accordingly. Otherwise, the short line may suffer the same fate as a branch line operated by the Class I carrier.

ACQUISITION PROCEDURES AND ALTERNATIVES

Shippers and communities impacted by rail abandonment have some alternatives to consider when faced with loss of rail service. However, it should be noted that railroads are considering branch line abandonment because of operating losses or substantial rehabilitation necessary on a line. Any alternatives that are available to impacted parties will have an attached cost--no easy or inexpensive solutions are evident.

Alternatives Before and After Abandonment

Prior to abandonment, a shipper may contract with a carrier for a specified level of service and rate (contract rates were illegal before the Staggers Act of 1980). The line may also be surcharged to bring revenues up to reasonable costs of operating the line. Shippers or communities may purchase a line under the Feeder Railroad Development Program before the line is completely downgraded, if the ICC determines that either public convenience or necessity permit or require the sale. The feeder line program will be discussed in more detail later in this report. Finally, affected parties may subsidize the line by sharing the costs of rehabilitation or operation of the line.

During the abandonment process, interested parties may protest against the filing. Evidence may be submitted to the ICC to persuade the Commission to initiate an investigation. If the investigation is granted, parties may then rebut the railroad's data and provide any testimony that may negate the abandonment application. Also, if the ICC issues the abandonment, protestants may appeal the initial decision within 20 days

After the ICC has approved the abandonment, the public has one final option to preserve their rail service. Parties who wish to acquire or subsidize the line must submit their offer within 10 days after the initial decision granted by the Commission. Otherwise, the abandoning railroad may begin salvage operations on the line.

Purchase Price of a Line

The Interstate Commerce Commission ultimately has the final decision in determining the value of a line to be sold as railroad property. In an ICC abandonment proceeding, one of the considerations in the decision is the value of the line as nonrailroad property, or the salvage value if the line is torn up and sold on a piecemeal basis. This value is referred to as net liquidation value (NLV). It is computed as the difference between the value of the track material and railway less costs of removal and sale. Unless the line was purchased for its going concern value,[27] the buyer would have to pay NLV for the line. The abandoning railroad and all protestants submit evidence supporting their version of NLV or rebutting the other's data.

State Involvement in Purchase or Operation

The state of North Dakota has indicated an emphatic aversion to owning or operating a railroad. However, the state has shown considerable interest in minimizing the social and economic impacts of rail branch line abandonment.[28] The Railroad Revitalization and Regulatory Reform Act of

---

[27]Going concern value is the value of the property in railroad use. If a line is being abandoned, however, it is unreasonable to think that going concern value would be greater than net liquidation value.

[28]North Dakota 1981 State Rail Plan Update, prepared by the Intermodal Planning and Rail Assistance Division, North Dakota State Highway Department, Bismarck, North Dakota.

1976 (4R Act) provides funds to be administered by the state and used to (1) finance acquisition or rehabilitation of rail lines; (2) provide substitute transportation services to reduce abandonment impacts; (3) construct rail-related facilities to streamline transportation services; (4) provide for revision and updating of the State Rail Plan; and (5) cover costs of administering the program. However, North Dakota has never received over $1.6 million in federal aid for rail assistance. Considering that North Dakota has about 1,400 miles of trackage identified as potential abandonments on the System Diagram Map (7-1-81), federal aid can only partially mitigate abandonment impacts.

Feeder Railroad Development Program

The Staggers Rail Act of 1980 established the Feeder Railroad Development Program to allow purchase of rail lines potentially subject to abandonment before complete downgrading by the operating carrier. The line in question must have carried less than three million gross tons per mile in the preceeding year and be listed in Category 1 or 2 on the carrier's System Diagram Map. (Most branch lines in North Dakota carry less than one million gross tons per mile per year.) Also, the ICC requires that the public convenience and necessity must permit or require the sale, and that the line be sold to a "financially responsible" party.

The Staggers Act states that the purchase price of the line shall not be less than "constitutional minimum value." The act further states that the constitutional minimum value is the net liquidation value (NLV) or going concern value (GCV), whichever is greater. If the acquiring party and the railroad agree on a price, that figure is final and not subject to approval by the ICC. The Commission will determine the price upon request by the applicant if the two parties cannot agree. The parties then may

either submit to final and binding arbitration or ask the ICC to evaluate each party's version of NLV and GCV and set the price.

The selling railroad is required to grant necessary trackage and interchange rights and must negotiate "reasonable" rates and divisions with the purchaser. The acquiring party may determine preconditions, such as subsidies, which shippers must meet in order to be served by the newly formed railroad. If the acquiring carrier resells the property, the original selling railroad has right of first refusal.

At this writing there is only one feeder line in the United States which has been purchased by an independent operator under the Feeder Railroad Development Program.[29]

---

[29] Traffic World, August 23, 1982.

MODEL OF ACQUISITION, REHABILITATION, AND OPERATING COSTS

The objective of this section is to specify acquisition, rehabilitation and operating costs for a model North Dakota branch line to be operated as a short line railroad.

Roadway Acquisition Cost

One of the major cost components of a new short line operation is the cost of buying the right-of-way and track structure from the abandoning carrier. (The assumption is made that any new short line operating in North Dakota will be on a line that was abandoned by a larger railroad.) If, in fact, the line was abandoned or identified as a candidate for abandonment, there is no reason to expect to pay more than net liquidation value (NLV) for the line. In the abandonment process, the railroad submits to the Interstate Commerce Commission its version of NLV to support their contention that the line is worth more torn up than as part of their railroad network.

The net liquidation value of North Dakota branch lines will be highly variable and dependent on many factors. In general, NLV will be a function of the physical condition of the roadway, extent of material removal and regrading, and the length of the line. Roadway condition will vary with the weight of rail, tie condition, and quality of other track material. Costs of removing the track material will change depending on the extent the railroad wishes (or is required) to restore the roadway to its original condition before the track was laid. If the railroad removed the rail, ties, and all track materials, hauled out any unwanted ballast and regraded the right-of-way to its original condition, the cost would be considerably more than if only the rail and reusable ties were removed and other roadway

materials left untouched. (North Dakota law requires removal of all track materials including bad ties, spikes, etc., but not regrading of the roadway.) Net liquidation value will vary in direct proportion to length of a line, since NLV is computed on a per mile basis. North Dakota branch lines identified on the 1981 System Diagram Map (as of 10-1-81) ranged in length from less than five miles to almost 100 miles. If, for example, the NLV per mile is $20,000, the cost of acquiring the Mott to Mandan line would be $2 million. At the same cost per mile, the Hazen to Truax line (6.37 miles) would have a NLV of only $127,000.

Sample Net Liquidation Value Exercise

The value of track material is a prime consideration when evaluating NLV. This section will detail the various portions of the track, their contribution to (or detraction from) NLV and variations in values of track material and roadway.

Rail

Rail sufficiently heavy to be reused on another portion of the carrier's system is referred to as relay rail. In general, any rail heavier than 90 pounds per yard may be used as relay rail. Light relay rail, say 90 to 105 pounds, would likely be placed in switchyards for temporary use and eventually be scrapped. Rail heavier than 105 pounds would be relaid on light density mainlines or viable branch lines to carry heavier, continuous traffic such as 26 car movements. Rail lighter than 90 pounds will be sold as scrap. Price differentials between scrap and relay rail depend on published prices of scrap and the railroad needs for relay rail. But in general, relay rail is priced at least two to three times higher than scrap. The Burlington Northern Railroad has priced relay rail at 75 percent of new rail, or about $375 per ton. The January 19,

1982 steel price at Chicago (North Dakota's closest market) was $88 per ton.[30]

Ties

Ties are generally not reused for railroad purposes, although some are occasionally plugged and respiked under new rail. Most used ties are either sold for landscaping purposes or to short lines, or piled and burned. Salvage operations are normally too costly to allow economical retrieval of all but the newer ties. The net cash value to the railroads for reusable ties to be used for landscaping is approximately four dollars per tie.[31] Ties of sufficient quality to be reused on railroad property would be priced according to their condition and useful life remaining. A tie with 75 percent of its useful life remaining priced at three-fourths of the cost of a new tie would be worth approximately $20 to $30.

Land

The value of land in the railroad right-of-way is determined by comparing sales of like property in the right-of-way's highest and best nonrailroad use. Most property on North Dakota branch lines is adjacent to farmland and would be valued as if it were to be reverted back to agricultural use. North Dakota farmland values vary considerably within the state; individual parcels would have to be evaluated within each county to determine a fair market value for branch line right-of-way.

The ease with which branch line right-of-way can be converted to farmland will vary considerably. In areas where very little ditching and grading were necessary to build the line, the cost of converting the right-of-way back to farmland would be relatively small. However, costs of

---

[30] Wall Street Journal, January 19, 1982.

[31] Paul Reistrup, R. L. Banks & Associates, Inc., Washington, D.C., October 1981.

restoration back to productive farmland may be prohibitive in territory where deep cuts and substantial grading were necessary to construct a level grade on which to place the track. For purposes of this study, it was assumed that 90 percent of the right-of-way is restorable back to tillable farmland. The remaining 10 percent is assumed to have no value in computing a line's net liquidation value.

Miscellaneous Track Material

Other salvageable track materials include tie plates, anchors, spikes, bolts, and switches. Generally only the larger tie plates which can be respiked under heavier rail are considered reusable. Some rail spikes and anchors are reused, but on a deteriorated North Dakota branch line, most would go for scrap. These materials would be valued at the market price for scrap metal. Special switching apparatus are assumed reusable and valued depending on their overall condition. For purposes of this study, each switch is assumed to be worth $6,000 to the carrier, less shipping charges.[32] Track structures such as bridges and culverts are assumed to have zero net salvage value due to the prohibitively high dismantling costs.

Removal Costs

Track dismantling and material removal costs will vary depending on the extent to which the railroad wishes (or is required) to restore the roadway to original condition before the track was laid. If only the rail is removed, and all ties, ballast, and other track materials are left, removal costs will be approximately $1.25 per lineal foot. Removing the rail, one-half the ties, and other track material (spikes, plates, etc.) will cost about $2.00 per foot. Removing all track material, removing the ballast and structures and regrading the right-of-way will cost about $5.00

---

[32] Reistrup, Ibid.

per foot.[33] For purposes of this analysis, a removal cost of $4 per foot is used to remove all track materials, ballast, and structures. A freight charge is applied to all rail and miscellaneous track material as a cost of transfer from the salvage site to consumption point.

Net Liquidation Value Calculation

Table 7 contains a hypothetical branch line NLV calculation using the guidelines discussed above. Assumptions are made concerning track condition, length of the line, and other information needed to complete the exercise.

The net liquidation value computed above is on a per mile basis. The total NLV of this hypothetical line will vary in direct proportion with its length. A carrying charge is applied to the NLV to account for the time required to dismantle the track and sell the materials.

Roadway Rehabilitation Costs

North Dakota branch lines which have been identified as abandonment candidates have or will be victims of deferred maintenance. This deferred maintenance has caused reduced train speeds and more frequent derailments. Most of the lines are equipped with light rail and poor ties and have ballast insufficient to support regular movement of heavy hopper cars. Therefore, if the line is to be kept in regular service or upgraded to handle movement of grain unit trains, it will need at least an accelerated maintenance program or possibly rehabilitation. At this point, a distinction should be made between normalized maintenance, rehabilitation and upgrading. Normalized maintenance is the regular, cyclical maintenance performed to keep the track at a specified service level or quality.

---

[33]Reistrup, Ibid.

TABLE 7. SAMPLE NET LIQUIDATION VALUE CALCULATION FOR A HYPOTHETICAL BRANCH LINE

Track Component	Revenue/Cost Due to Salvage
	($/mile)
Rail[a]	
Reroll rail - 52.8 tons @ $108	5,702.40
Relay rail - 106.4 tons @ $375	39,900.00
Croppings - 8.0 tons @ $100	800.00
Tie Plates[b]	
3,000 reusable @ $4.28	12,840.00
3,000 scrap @ $0.46	1,380.00
Misc. Scrap[c]	
Anchors	237.60
Spikes	316.80
Joint bars, bolts, washers, etc.	418.88
Ties[d]	
Reusable for rail purposes	4,500.00
Reusable for nonrail purposes	6,000.00
Switches[e]	540.00
Land[f]	1,980.00
Gross Liquidation Value	74,615.68
Less: Removal costs, freight, and carrying costs[g]	29,420.26
Net Liquidation Value	45,192.52

[a]Assumes half 60 lb. scrap rail (reroll rail), half 130 lb. relay rail, and 7 percent waste from cropping. "Reroll," "relay," and "cropping" are classifications of various qualities of rail acquired in the salvage process.

[b]Assumes 3,000 ties per mile (6,000 plates); 3,000 are assumed reusable, priced at $468.75 per ton and weigh 18.25 lbs. each. The remaining are assumed scrapped, priced at $88 per ton and weigh 10.125 lbs. each.

[c]Assumes 6 anchors per rail, 320 rails per mile, 2.8 lbs. per anchor, 4 spikes per tie, 3,000 ties per mile, 0.6 lbs. per spike, and 4.76 tons per mile of joint bars, bolts, washers, and other scrap. All miscellaneous scrap metal is priced at $88 per ton.

[d]Assumes 3,000 ties per mile, 10 percent reusable for rail purposes (value = $15 per tie), and 50 percent reusable for nonrail purposes (value = $4 per tie).

[e]Assumes one switch per 10 miles each valued at 6,000 dollars. A 10 percent cost of shipping is assessed to each.

[f]Assumes 12 acres per mile valued at $300 per acre. Also assumes 90 percent restorable, 65 percent clear title, and cost of sale is 6 percent of value.

[g]Removal costs were specified at $4 per foot, freight costs of shipping rail and scrap were specified at $21 per ton on 220.9 tons. A carrying charge (15 percent of value annually) was applied for 6 months.

Rehabilitation is performed when a line has been downgraded through deferred maintenance and cannot be improved by only an accelerated maintenance (catch-up maintenance) program. Upgrading is an improvement in the line to accommodate a change in the future, such as heavier cars or unit train movement.

The cost of a track maintenance or rehabilitation program can vary dramatically depending on the condition of the roadway and track quality desired for the expected traffic. The variability in branch line condition in North Dakota would necessitate an individual evaluation of each line to determine the cost of rehabilitation or upgrading necessary. Some lines may have sufficiently heavy rail to accomodate heavy car loadings and may need only ties replaced or reballasting. In fact, most North Dakota branch lines would eventually need heavier rail, a thorough tie replacement program and reballasting if operation by a short line railroad utilizing heavy cars were to be feasible. Cost variation among rehabilitation procedures are discussed in this section and a sample rehabilitation exercise is reviewed.

Branch line rehabilitation (or upgrading) is performed to accommodate traffic that occurs now or will occur in the future. The amount of rehabilitation needed will depend on many factors. First, volume of traffic will affect the required track condition. Additional carloadings will necessitate either a more thorough rehabilitation program or additional maintenance. Second, tonnages on the line will dictate the amount of upgrading needed. The heavier, 100 ton hopper cars are becoming the predominant car for shipping grain. Using these cars on branch lines will, in many cases, require heavier rail than presently exists and a stronger tie population. Speed of the trains is also a consideration when determining required track condition. Trains can operate on poorer quality track at reduced speeds and still maintain a level of safety sufficient for operation.

If only these slower speeds are required, rehabilitation costs would be considerably less. However, considerations such as length of the line and districts which particular train crews operate within may necessitate more than, say, Class 1 (10 mph.) operating speeds.

Costs of rehabilitation will vary as the amount of the components needed changes. The most costly portion of the process is rail. The cost to lay 100-pound relay rail is approximately $100,000 per mile.[34] Adding spikes, anchors, and tie plates will cost an additional $15,000 to $20,000 per mile. Labor comprises about one-third to one-half the cost of relaying rail. Tie replacement cost estimates range from $19.25 to $40.00 per tie.[35] The Burlington Northern Railroad uses $19.25 per tie as their cost. Reballasting costs are approximately $5,000 per mile depending on the depth of ballast desired. Six inches of stone ballast will require 900 cubic yards per mile at a unit cost of about $5.00 per cubic yard. Comparing the costs of the individual track components reveals that ballasting may be the best dollar invested in rehabilitation. Analysis of track component prices and contribution to roadway strength indicates that the order of priority of rehabilitation for a short line operation may be ties, ballast, then rail replacement.

A sample rehabilitation cost estimate is presented below.

Assume: No rail relaid; five bad ties/rail (33');
needs three inches of ballast

	Cost/Mile
Replace 5 ties/rail; 160 rails/mile 160 x 5 = 800 ties/mile @ $30 =	$24,000
Ballast - surface correction 3" stone; 500 cy/mile @ $5 =	$ 2,500
Total Rehabilitation Cost	$26,500

[34] Reistrup, op, cit. The net cost will be considerably less than this, however. Reselling the old rail will reduce the cost of the operation by approximately one-half.

[35] Reistrup, op. cit.

Equipment Acquisition Costs

Locomotive

Short line railroad locomotive needs would be different than carriers presently operating in North Dakota. Class 1 main line operations need a high horsepower, heavy locomotive for moving large tonnages over different types of terrain. Heavy, long trains require heavy locomotives to attain the tractive force needed to utilize their horsepower effectively. A short line operating on a North Dakota feeder line would require locomotives completely unlike the units seen pulling 100 car coal trains. The smaller carrier would require a lighter, lower horsepower engine to pull the smaller number of cars originating on a feeder line. The actual size of the unit would depend on the type of operation and vary with the volume and tonnage shipped, as well as the topographical characteristics of the line.

Costs of acquiring locomotives vary with size and condition of the engine. Used or rebuilt units would fit the needs of short line operations most effectively. Many smaller, used locomotives exist that are at or nearing the end of their useful life, and may be rebuilt or sold for use in a lighter capacity. Rebuilding costs, however, are also high, but a rebuilt unit is generally upgraded and equipped for heavier service.

Locomotives used by the Burlington Northern on North Dakota branch lines for way train service are generally the GE-EMD GP7 or GP9[36] (1,250 to 1,500 hp.). These engines have sufficient horsepower to pull 20 to 25 loaded hopper cars if track conditions permit.[37] At this writing, used GP7s and GP9s are selling for $80,000 to $115,000, depending on their operating condition.[38]

---

[36]General Electric - Electromotive Division locomotives built in the early 1950s as "General Purpose" (GP) units.

[37]Telephone conversation with BN personnel, January 13, 1982.

[38]Telephone conversation with Ross Loudon, D. A. Wilson Co., Ames, Iowa, January 13, 1982.

A completely rebuilt engine of equivalent size sells for approximately $400,000, while a new unit sells for about $750,000.[39]

Service Vehicles, Tools, and Track Maintenance Equipment

Service and repair vehicles would be needed by short line employees to maintain the track structure and other equipment. Initial outlay for service vehicles is specified at $20,000; tool and track maintenance materials are assumed to cost $4,000. Useful lives of service vehicles and tools are specified at five years.

Freight Cars

A newly formed short line railroad in North Dakota would be more likely to lease freight cars or rent connecting carriers' cars than purchase its own fleet. Initial capital outlays would be prohibitively high for purchasing a fleet of freight cars. In 1980, new 100 ton covered hopper cars cost approximately $43,600.[40] A more reasonable alternative may be to use leased equipment to supplement the short line's supply of cars available from the connecting carrier. Leasing cars would free the short line from depending on its connecting carrier for freight cars. A pool of leased cars may smooth out the cyclical nature of freight car supplies characteristic of the industry in recent years.

The North Dakota average hopper car lease cost in 1981 was $430 per month.[41] However, leases are presently available for less than this. The mileage rate allowance on new covered hopper cars is 39.45 cents per loaded mile.[42] Mileage rate allowances are payments made by a carrier for using

---

[39]Telephone conversation with Morrison-Knudsen, Co. personnel, January 13, 1982.

[40]American Association of Railroads.

[41]Ming, Dennis, "Analysis of Shipper-Owned Rail Equipment," UGPTI Report, forthcoming.

[42]Interstate Commerce Commission Supplement 46 to mileage tariff PHJ 6007-G, effective November 1, 1981.

another party's privately owned or leased car. These payments are credited to the lessee's account, effectively reducing his lease cost.

Alternatively, the short line would use a connecting carrier's freight cars and pay appropriate per diem charges for those cars. This practice would probably lower initial outlay costs compared to owning or leasing cars. The short line, however, would be subject to any equipment shortages that connecting carriers may experience. In the event of such a shortage, the short line would not be likely to receive preferential treatment over the larger carrier's own shippers when freight cars are allocated among customers.

Car rental costs are computed on a per day and per mile basis. The cost of using covered hopper cars on a North Dakota branch line were computed as follows:[43]

Daily Cost	$13.56
Per Mile Cost	$ .0484

Assuming a three-day car cycle and a 61 mile line, per car rental cost (1980) would be:

($13.56 x 3) + (61 x 2 x .0484) = $46.58

Updating this figure to 1981 dollars, using the Association of American Railroad's 1981 Cost Recovery Index,

$46.58 x 1.087 = $50.63

For purposes of this study, total car rental costs were rounded to $50 per car.

Maintenance of Way Costs

Track and right-of-way maintenance expenses are estimated by specifying a normalized maintenance cycle. The cycle specified is a program that would maintain, but not upgrade, the existing physical condition of the

---

[43]See Interstate Commerce Commission Finance Docket AB-6 (Sub-No. 104F), reply verified statement of Patrick F. Cosgrove, Burlington Northern Railroad Company.

track. The following section outlines a normalized maintenance cycle and costs that may be typical of a North Dakota short line railroad.

In order to estimate maintenance of way expenses via normalized maintenance cycle procedures, simplifying assumptions have to be made for the individual track components. Tie population is assumed to be 3,000 ties per mile; each tie is expected to last 40 years. Therefore, an average of 2.5 percent of all ties are replaced annually.[44] Each tie is assumed to cost $30 installed, including spikes. All rail in place and relaid is assumed to have half its useful life remaining (300 million gross tons). If expected traffic is three million gross tons per year, the rail would last 100 years. Most rails would not last this long, but deterioration would be caused by weathering rather than by weight of trains. Rail is assumed to be replaced only because of defects or incidental breakage. For this exercise, one rail per mile is replaced annually; rail is assumed to cost $300 per ton delivered. Three inches of new ballast is put down every seven years prior to resurfacing the track. Resurfacing costs are specified at 80 cents per foot and ballast costs $5 per cubic yard in place. Tie plates and anchors are not major components of normal track repair. For this exercise, $10 tie plates and $10 anchors are assumed replaced per mile each year. Crossing maintenance is assumed to cost $75 per crossing with one crossing per 1.5 miles of road. Vegetation control costs are specified at $75 per mile and snow removal at $100 per mile. An additional $100 per mile is included for drainage, maintenance of structures, and miscellaneous track repairs.[45]

---

[44] This figure will vary in the actual computation due to the different levels of rehabilitation performed on a line.

[45] Assumptions contained in this section concerning tie life and cost, railroad ballast costs, etc., are based on estimates obtained via personal and telephone conversations with Mr. Paul Reistrup; R. L. Banks and Associates; Mr. P. J. DeWolf, Consultant; and Mr. P. H. Croft, President, American Short Line Railroad Association.

Track must be inspected weekly for defects and hazards, depending on the frequency of service. Inspection personnel will perform routine track maintenance while checking the track. Therefore, a portion of their salary will be imbedded in other track maintenance cost components. The assumption is made in this exercise that half of a full time salary will be specified as an inspection cost and half imbedded in the aforementioned component costs. A summary of a sample normalized maintenance cycle is presented below.

Sample Normalized Maintenance Cycle Procedure

	Annual Cost Per Mile
Tie Replacement 3,000 ties/mile x 2.5%/year = 75 ties replaced 75 ties x $30/tie (includes spikes) =	$2,250
Rail Replacement 2 rails/year; 110 lbs./yard 1.2 tons x $300/ton	360
Resurfacing and Ballast 3" every 7 years Surfacing - 80 cents/foot 603 Ballast - $5/CY x 500 CY 357	$ 960
Tie Plates 10/year x $6.50 each	65
Anchors 10/year x $1.00	10
Vegetation Control	75
Snow Removal	100
Crossing Maintenance $75/crossing; 40 crossings/60 miles	50
Inspection Cost	1,400
Miscellaneous Repair Structures, drainage, etc.	100
Total Annual Maintenance Cost	$5,370

Maintenance of Equipment Costs

Equipment maintenance would consist of locomotive repair and service, service vehicle maintenance and upkeep on freight cars, if any. The locomotive acquisition costs specified are for a used unit. Maintenance costs for this unit can be expected to be considerably higher than for a new or completely rebuilt locomotive. If only oil changes and lubrication are necessary, the company would incur locomotive upkeep costs considerably less than if minor work on the power plant and electric motor rewinds are necessary. A complete overhaul of one traction motor alone will cost almost $10,000.[46] For purposes of this exercise, a graduated annual locomotive maintenance cost is specified (Table 8). After the seventh year of ownership, the maintenance cycle would repeat. The useful life of the locomotive described previously is estimated at 10 to 15 years, after which a complete overhaul would be necessary to put the unit back into reliable operating condition. Maintenance of service vehicles is specified at $1,000 per year.

TABLE 8. LOCOMOTIVE MAINTENANCE AND REPAIR COSTS

Year of Ownership	Annual Maintenance Cost (Dollars)
1-3	14,000
4-6	24,000
7	34,000

SOURCE: Ross Louden, D. A. Wilson Co., Ames, Iowa, January 13, 1982.

[46] Telephone conversation with Mr. Ross Louden, D. A. Wilson Co., Ames, Iowa, January 1982.

Leased freight cars would not involve a maintenance cost to the lessee unless the lease specified assumption of nonownership costs by the lessee. Most private and shipper leases in North Dakota are "full service" leases where the lessee is not responsible for maintaining the cars. The assumption is made for this study that a short line operator in North Dakota would be using connecting carriers' freight cars, so no car maintenance costs would be incurred by the short line.

Fuel Costs

Fuel costs will depend on intensity of operations and type of equipment used. Heavier, more powerful locomotives pulling large tonnages will consume more fuel than lighter density operations using small locomotives. Branch line operations in North Dakota are normally light density lines with slow way train service due to the track condition. It is assumed in this study that an older, lighter locomotive is used for the short line operation. The locomotive is assumed to use 50 gallons of fuel per hour running at 20 miles per hour.[47]

Administrative Expenses

Management and administrative expenses would change depending on the type and scope of operation. If all billing and accounting details are handled by the short line, administrative costs would increase sharply. If administrative duties were handled by an existing carrier or shipper, office facilities and clerical staff may be already in place and costs to the short line may be lower. For purposes of this study, a general manager was assumed to be paid $39,000 per year (including benefits) and have an additional $14,000 per year in office and clerical expenses. Office equipment costs are specified at $5,000 with a 10-year useful life.

---

[47] This figure is assumed to represent total fuel consumption for operations on the line, when in fact, fuel usage will be dependent on many factors such as operating speed, trailing tons, idling time, etc.

Employee Expense

Employee needs would depend on the scale of operations in which the short line is involved. Operating expenses thus far have included some costs for labor. For example, tie replacement costs include installation--a labor cost is imbedded in the per tie cost. Crews to run the train have not been included. Trains operated by a short line railroad in North Dakota would not need a crew of more than two persons. The scale of operations dictates that switching needs or train length would not necessitate a larger crew. Total train crew wages (including benefits) for this study are assumed to be $52,000 annually. Engineer and brakeman salaries (including benefits) are specified at $28,600 and $23,400, respectively.[48]

Insurance Costs

Short line operations generally desire approximately $5 million of liability coverage to safeguard against accidents. In reality, most companies cannot afford to pay the premiums associated with such policies. A more realistic policy is a $2 million--$25,000 deductible program. The annual premium for this policy is approximately $20,000. This coverage would include general railroad operations including the locomotive and rolling stock.[49]

---

[48] Personal conversation with Mr. Paul Reistrup, R. L. Banks and Associates, in Bismarck, North Dakota, November 20, 1981.

[49] Telephone conversation with Mr. P. H. Croft, President, American Short Line Railroad Association, January 1982.

Summary

Initial costs of acquiring and rehabilitating the railroad right-of-way constitute a major proportion of total short line operation costs. These costs would vary with the condition and length of the line. Equipment used by the short line would probably be lighter duty in nature and consist of a small capacity locomotive, service and maintenance vehicles, and freight cars. Other costs include maintenance of roadway and equipment, fuel, administration overhead, employee wages, and insurance.

MODEL COSTS APPLIED TO A SELECTED BRANCH LINE

Introduction

The objective of this section is to select a North Dakota branch line identified for possible abandonment and evaluate its economic potential as a short line railroad. Costs identified in the previous section will be applied to the selected line to evaluate its profitability.

Branch Line Selection

A short line operating in North Dakota would desire market conditions similar to those sought by a large railroad--captive and isolated shippers with fixed facilities. Depending on the type of ownership structure, operators of the short line would like a great deal of flexibility in pricing without fear of traffic diversion to other modes. Mobility of the commodity would affect the ability of competing modes to penetrate the railroad's market. Also, if shippers on the line have large fixed facilities, they will be unable to freely relocate their plant if faced with increasing transportation costs. The short line would prefer to interline with a minimum number of railroads, thus sharing revenues with fewer carriers.

If possible, the short line would like its trackage to connect with two or more different carriers. A more attractive division of the revenues may be obtained if the short line can interchange with both the Burlington Northern and the Soo Line. Both railroads would be interested in hauling grain on their system, so the short line may receive a better division as the connecting carriers "bid" for the grain. Due to tremendous economies of utilization available to railroad operation, the short line would like to be located in an area of high crop concentration. Increased volumes would help spread the operation's fixed costs over more units and contribute to better utilization of plant and equipment.

The line chosen for analysis in this study is the Burlington Northern's Casselton to Marion branch line located in southeastern North Dakota. This 61 mile line originates in Cass County at Casselton and extends west-southwestward to Marion in LaMoure County. The line is rated at Class 3 (40 mph). Two trains per week service six stations and 10 shippers--five grain elevators, two lumber companies, a fertilizer company, a farm implement dealer, and a hardware store.[50] Rail service is utilized both inbound and outbound.

The Casselton-Marion line was selected due to its geographic position in a concentrated grain producing area and its competitive position between railroads. Southeastern North Dakota is a relatively heavy grain producing area and traditionally has a high proportion of truck shipments in relation to other areas in North Dakota. The line is presently owned and operated by the Burlington Northern and is crossed approximately at its midpoint by the Soo Line. Accessibility to two competing railroads could be attained by construction of an interchange with the Soo line.

According to Burlington Northern personnel, 1,025 loaded cars were originated on the Casselton-Marion branch line in 1980 while 45 loaded cars were terminated. A summary of traffic levels and revenues is presented in Table 9.

TABLE 9. ORIGINATING CARLOADS, TERMINATING CARLOADS AND REVENUES, CASSELTON-MARION BRANCH LINE, 1978-80

Year	Originating Carloads	Terminating Carloads	Revenue ($)
1978	732	38	799,000
1979	637	38	864,000
1980	1,025	45	1,696,000

SOURCE: Burlington Northern Railroad, Inc., January 28, 1982.

[50] 1981 State Rail Plan Update Appendices, Intermodal Planning and Rail Assistance Division, North Dakota State Highway Department. (Nongrain shippers were identified as in existence in 1979; the grain elevators were all active in the 1980-81 crop year.)

Condition of the roadway varies considerably between segments. The first 12 miles is equipped with light rail and would need heavier rail laid to support regular movement of heavy cars (Table 10). According to Burlington Northern personnel, the line needs 500 to 1,000 ties per mile replaced depending on the expected intensity of hopper car shipments. Most of the ties are acceptable for present traffic levels. Resurfacing and ballast needs are $4,000 to $15,000 per mile for present traffic levels and regular 26 car train movements, respectively.[51]

TABLE 10. RAIL WEIGHT AND APPROXIMATE MILEAGES, CASSELTON-MARION BRANCH LINE

Rail Weight (lbs./yard)	Miles
72	12
90	28
100	7
112	8
131	6

SOURCE: Burlington Northern Railroad, Inc., January 28, 1982.

Total shipments by rail on the Casselton-Marion branch line are presented in Table 11. Rail's proportional share of the total movement decreased until 1979-80, reaching a low of 39 percent in the 1978-79 crop marketing year. Rail share has since increased and comprised 51 percent of the total movements in 1980-81.

Grain shipments from the Casselton-Marion branch line by commodity and destination are presented in Table 12. Duluth has been the predominant market for grain and sunflower, reaching a high of 3.8 million bushels in 1979-80. Wheat, barley, and sunflower comprised the majority of shipments to all markets.

[51]Burlington Northern Railroad Inc., January 28, 1982.

TABLE 11. GRAIN ORIGINATED FROM COUNTRY ELEVATORS LOCATED ON THE CASSELTON TO MARION BRANCH LINE TO ALL DESTINATIONS, BY MODE, SELECTED CROP YEARS

Item	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81
	bushels						
Hopper	1,197,500 (40%)	987,537 (38%)	889,723 (46%)	1,134,610 (63%)	1,765,920 (83%)	2,092,847 (71%)	2,374,287 (88%)
Box	1,765,889 (60%)	1,582,980 (62%)	1,056,043 (54%)	660,179 (37%)	354,258 (17%)	858,709 (29%)	320,645 (12%)
Total Rail	2,963,389 (72%)	2,570,517 (63%)	1,945,766 (59%)	1,794,789 (56%)	2,120,178 (39%)	2,951,556 (45%)	2,694,932 (51%)
Truck	1,159,136 (28%)	1,517,664 (37%)	1,324,808 (61%)	1,400,777 (44%)	3,331,781 (61%)	3,607,910 (55%)	2,628,292 (49%)
Total Bushels	4,122,525 (100%)	4,088,181 (100%)	3,270,574 (100%)	3,195,566 (100%)	5,451,959 (100%)	6,559,466 (100%)	5,323,224 (100%)

SOURCE: Upper Great Plains Transportation Institute unpublished Grain Movement Data.

TABLE 12. GRAIN ORIGINATED ON THE CASSELTON TO MARION BRANCH LINE BY TYPE OF GRAIN AND DESTINATION, SELECTED CROP YEARS

Destination/Commodity	Crop Year 1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81
				bushels			
Duluth-Superior							
HRS Wheat	815,044	1,044,197	679,354	708,708	1,499,348	1,616,271	1,815,847
Durum	167,327	187,948	99,600	155,300	194,682	134,310	90,553
Rye	122,394	49,759	--	--	59,083	48,086	36,093
Flax	1,599	12,276	4,236	5,598	--	2,348	846
Barley	104,629	113,289	242,055	184,592	141,007	182,030	57,248
Oats	100,899	42,074	60,278	87,745	102,753	5,213	29,773
Sunflower	363,039	759,579	485,763	609,676	1,132,565	1,714,201	1,506,397
Other	--	4,747	4,603	--	4,175	56,493	7,027
Total	1,674,931	2,213,869	1,575,889	1,751,619	3,133,613	3,758,952	3,543,784
Mps.-St. Paul and Other Minnesota							
HRS Wheat	916,972	450,055	536,688	378,936	560,322	615,512	478,427
Durum	103,696	83,601	47,831	29,556	62,774	69,653	58,018
Rye	36,801	65,453	82,317	8,005	56,416	20,645	30,621
Flax	66,557	55,092	36,366	92,390	74,231	83,939	82,437
Barley	597,987	361,718	200,624	166,193	135,688	455,786	230,477
Oats	477,141	441,655	280,493	216,458	254,195	231,751	42,222
Sunflower	116,753	64,136	139,068	147,640	116,419	79,189	265,764
Other	14,964[a]	8,019	4,401	13,138[b]	16,478[c]	20,906	31,464
Other	11,761	--	--	2,850	--	--	--
Total	2,342,632	1,529,729	2,512,107	1,055,166	1,276,523	1,577,381	1,219,430
Western States							
HRS Wheat	4,310	40,477	45,115	51,153	67,309	6,563	43,342
Other Destinations							
HRS Wheat	2,104	66,357	77,948	54,376	139,628	153,739	39,760
Durum	--	10,015	12,913	20,213	825	12,061	--
Rye	--	9,381	1,653	3,146	50,138	23,539	--
Flax	--	--	--	800	--	9,963	--
Barley	25,770	82,635	38,181	35,557	321,723	455,785	333,057
Oats	39,310	58,639	118,691	45,706	46,086	111,708	6,512
Sunflower	33,568	65,114	19,084[b]	75,785	360,880[b]	232,127	213,137
Other	--	5,300	40,540	55,295	51,989	--	2,184
Other	--	5,300	11,950	25,550	3,245	--	2,184
Total	100,652	297,441	320,960	316,428	974,514	1,017,013	594,650

[a]All corn
[b]All millet
[c]All soybeans

SOURCE: Upper Great Plains Transportation Institute, North Dakota State University, Fargo. Unpublished Grain Movement Data.

The following sections specify costs of acquisition, rehabilitation and operation of a short line railroad operating over the Casselton-Marion branch line. This procedure is an economic-engineering approach where conditions under which the railroad will operate are specified and costs and revenues from operations are estimated.

Roadway Acquisition Costs

The cost of purchasing the railroad right-of-way and track is computed via a net liquidation value procedure. The salvage value of rail, ties, and other track material, less removal costs and freight, yields an estimate of the branch line's value to the railroad if torn up and sold piecemeal. The estimate for the 61 mile Casselton-Marion line is presented below; detailed presentation of the Net Liquidation Value is shown in Appendix C.

Revenues from salvage	$3,379,243
Less: Removal costs and freight	1,561,677
	$1,817,566
Less: Carrying costs (15%/year for 6 months)	136,317
NET LIQUIDATION VALUE	$1,681,249

A carrying charge is applied to the net liquidation value to assess a cost associated with the time required to dismantle the track and sell the salvaged materials. In this case an annual interest rate of 15 percent is used, and it is assumed that six months is required to complete salvage operations and sell the track material.

Roadway Rehabilitiation Costs

Portions of the Casselton-Marion line need rehabilitation or upgrading, depending on the type of expected traffic. For this exercise, two rehabilitation programs are specified. First, the track is rehabilitated to support traffic levels as they exist today. That is, few trainload shipments

are expected. Second, the line is upgraded to a level sufficient to support regular movement of 26-car trains of heavy hopper cars. The cost of each component of the two rehabilitation programs is presented below.

Present Traffic

Rail (No Rail Needs Relaying)		$ 0
Ties: 22 miles 550 ties/mile @ $30/tie		363,000
Surfacing: 61 miles @ $4,000/mile		244,000
	Total	607,000

Future Traffic (26 Car Trains, Heavy Hopper Cars)

Rail: Replace 12 miles of 72 lb. jointed rail with used 100 lb. jointed rail $275/ton plus $137.50/ton installation $412.50/ton x 176 tons/mile = $72,600/mile $72,600/mile x 12 miles =			$871,200
Less: Salvage value of old rail, ties plates, spikes, anchors, and misc. scrap $17,330.98/mile x 12 miles (Appendix D)			207,971
Plus: Tie plates, spikes, anchors, etc. for installed rail $17,500/mile x 12 miles			210,000
Net Rail Cost			$873,229
Ties: 22 miles 1,000 ties/mile @ $30/tie	$660,000		
39 miles 700 ties/mile @ $30/tie	819,000		
			$1,479,000
Surfacing: 61 miles @ $15,000/mile			915,000
	Total		$3,267,229

Equipment Costs

Four components of total equipment costs were specified: a used locomotive, per diem charges of $50 per car on connecting carriers' freight cars, service vehicles, and tools and track maintenance materials. A summary of equipment costs is presented below.

Locomotive: Used GE-EMD GP-7	$ 79,000
Freight Cars: $50/car x 1,000 cars	50,000
Service Vehicles	20,000
Tools and Track Maintenance Materials	4,000
Total	$153,000

Maintenance of Way Costs

Track maintenance costs are specified at two levels, depending on the level of rehabilitation performed on the line. As the amount of new material installed in a rehabilitation program increases, maintenance required on the line will decrease. Two rehabilitation programs were explained previously; maintenance of way costs for each are presented in Table 13. A detailed explanation of maintenance of way cost estimates is presented in Appendix E.

TABLE 13. ANNUAL MAINTENANCE OF WAY COSTS AT TWO LEVELS OF REHABILITATION FOR THE CASSELTON-MARION BRANCH LINE

Traffic Level	Rehabilitation Expenditure	Annual Maintenance of Way Costs Per Mile
	----- dollars -----	
Present Traffic	607,000	5,820
26 Car Trains	3,267,229	4,325

Maintenance of Equipment Costs

Locomotive and service vehicle maintenance is specified as an annual average of $21,150 and $1,000, respectively. In reality, maintenance costs would vary with the age of the equipment and intensity of operations.

An annual maintenance schedule for the locomotive described previously is presented in Table 14. After year seven, the maintenance schedule would repeat.

TABLE 14. ESTIMATED ANNUAL LOCOMOTIVE MAINTENANCE COSTS, GE-EMD GP7

Year of Ownership	Annual Cost
1-3	$14,000
4-6	24,000
7	34,000

SOURCE: Ross Louden, D. A. Wilson Co., Ames, Iowa, January 13, 1982.

Fuel Costs

Fuel cost is computed by specifying the number of trips annually and assigning a price and consumptive rate for diesel fuel. For the Casselton-Marion branch line, 100 trips per year and 300 gallons per trip were assumed (six hours per trip, 50 gallons per hour). The cost of diesel fuel was estimated at $1.10 per gallon, yielding a total annual fuel cost of $33,000.

Administrative and Employee Expenses

Administrative personnel needs would vary considerably as the ownership characteristics and intensity of operations changed. For this exercise, it was assumed that a general manager and one clerical assistant could perform all administrative duties. Salaries of administrative personnel and other related expenses are summarized below.

General Manager (including benefits)	$39,000
Clerical (including benefits)	13,000
Office Equipment	5,000
Office Supplies	1,000

Other employees would consist of a train engineer and brakeman. These personnel could also be utilized for track maintenance and miscellaneous duties.

Salaries, including benefits, for the engineer and brakeman are specified at $28,600 and $23,400, respectively.

Insurance Costs

A standard $2 million liability policy with $25,000 deductible requires an annual premium of approximately $20,000. This policy would cover all business activity and equipment.

Profitability Analysis

Five different conditions (scenarios) under which the short line railroad may operate were analyzed. Different levels of rehabilitation expenditures, maintenance of way costs, interest rates or revenues were used to determine the profitability of the operation under changing operating conditions. Most of the cost components remained unchanged; costs that did change are discussed with each scenario below. Under each condition, total annualized costs of purchase and operation were computed and compared to estimated revenues. Expenses were classified into three categories: depreciable fixed costs such as plant and equipment, nondepreciable fixed costs such as manager salary and insurance costs, and variable costs such as fuel and equipment repairs. The useful life of depreciable cost elements was estimated and an annual maintenance and repair expense stated as a percentage of new cost.

Economic-Engineering Model

The model used in this section to estimate firm profitability is an adaptation of a simulation model developed at Texas Tech University.[52]

---

[52]Hise, Billy R., Don E. Ethridge, and Dale L. Shaw, "Processing Plant Cost Estimation System: Documentation and User's Guide," Agricultural Economics Report No. T-1-189, Texas Tech University, April 1980.

Fixed Cost Calculations

Fixed costs are divided into two groups--depreciable and nondepreciable items. Depreciable fixed costs are those such as plant, equipment, and vehicles, while nondepreciable fixed costs consist of management salaries and insurance costs. An annual equivalent cost (annualized over the life of each fixed cost adjusted for opportunity cost of capital) for each depreciable fixed cost item is calculated in general as:

$$AEC_i = DI_i + REP_i$$

where AEC_i = annual equivalency cost of item i

DI_i = annual depreciation and interest cost of item i

REP_i = fixed repair of item i

Depreciable fixed cost items for which an annual equivalent cost were calculated included:

1) roadway--cost of track structure and right-of-way
2) rehabilitation--cost of initial track rehabilitation (does not include normal maintenance)
3) locomotive--cost of single locomotive unit
4) tools--cost of tools and other related equipment
5) vehicles--cost of maintenance and service vehicles
6) office equipment--cost of furniture and other office machines and equipment

The annual equivalency cost of nondepreciable fixed cost items is calculated in general as:

$$AEC_k = (FOB \times NUM)(1 + R)$$

where AEC_k = annual equivalency cost of item k

FOB = annual cost of one nondepreciable fixed cost item

NUM = number of units required

R = interest rate or opportunity cost of capital

Nondepreciable fixed cost items for which an annual equivalent cost were calculated included:

1) manager salary
2) insurance premium

Variable Cost Calculations

Variable costs were estimated via a simple multiplication procedure:

$$VC_{ij} = (NUM_j)\ (PR_i)$$

where VC_{ij} = variable cost of input i at output level j

NUM_j = number of inputs i required at output level j

PR_i = cost per unit of input i

Variable cost items included:

1) bookkeeper wages
2) engineer wages
3) brakeman wages
4) office supplies
5) fuel

Other repair and maintenance costs such as track maintenance would be incurred, however, these are already accounted for under repairs on depreciable fixed cost items.

Revenue Calculations

Revenues are calculated simply as the number of products sold multiplied by the respective prices:

$$TR = \sum_{i=1}^{n} (Q_i \times P_i)$$

where TR = total revenue

Q_i = quantity produced of product i

P_i = selling price of product i

n = number of different products sold

"Products" from which revenues are generated include only carloads of grain hauled by the short line operation. Revenue from this "product" is in the

form of division of revenues with connecting carriers. For a detailed explanation of cost determination under this modeling technique, see Hise, Billy R., et al., 1980.

Scenario 1

Total revenues under Scenario 1 were specified at $150,000--1,000 cars at $150/car.[53] Interest on fixed capital and operating capital was specified at 14 and 17 percent, respectively. Per diem charges were estimated at $50 per car. Rehabilitation costs were specified at the lower of the two levels discussed previously ($607,000), to reflect a track condition of sufficient quality to continue traffic movements at present levels. A summary of the profitability of the operation under Scenario 1 is presented below.

Total Fixed Costs	$ 861,756
Total Variable Costs	157,769
Total Costs	$1,019,525
Total Revenue	150,000
Total Net Revenue	$ -869,525
Average Fixed Cost Per Car	862
Average Variable Cost Per Car	158
Average Total Cost Per Car	1,020
Average Revenue Per Car	150
Average Net Revenue Per Car	-870

Under the above conditions, the operation realizes a revenue shortfall of 869,525 dollars. Revenues do not even cover variable costs of operation. Fixed costs represent approximately 84 percent of the operation's total costs. A detailed report of Scenario 1 results is presented in Appendix F.

---

[53] This estimate of revenues per carload was used after consultation with various industry personnel. Actual revenues per car would depend on many factors such as the division of revenues with connecting carriers, etc. Effects of changing revenues per car are analyzed later in this report.

Scenario 2

Rehabilitation costs were increased under Scenario 2 to allow for regular movement of heavy hopper cars in trainload shipments. Maintenance of way expenditures were specified at a lower level to account for improved track condition after rehabilitation. All other assumptions concerning costs and revenues were unchanged from Scenario 1. A summary of the profitability of the operation under Scenario 2 is presented below.

Total Fixed Costs	$1,123,586
Total Variable Costs	157,769
Total Costs	$1,281,355
Total Revenue	150,000
Total Net Revenue	-1,131,355
Average Fixed Cost Per Car	1,124
Average Variable Cost Per Car	158
Average Total Cost Per Car	1,281
Average Revenue Per Car	150
Average Net Revenue Per Car	-1,131

Higher costs of rehabilitation more than offset the savings gained by lower maintenance of way costs. Losses increased to over one million dollars under Scenario 2. A detailed explanation of costs and revenue is presented in Appendix G.

Scenario 3

Revenues per car were increased from $150 to $300 under Scenario 3 to analyze the effects of changing divisions of revenues or substantially higher freight rates. The lower of the two track rehabiliation costs was used ($607,000) and its associated annual track maintenance figure ($5,820/mile).

Total Fixed Costs	$ 861,756
Total Variable Costs	157,769
Total Costs	$1,019,525
Total Revenue	300,000
Total Net Revenue	$ -719,525
Average Fixed Cost Per Car	826
Average Variable Cost Per Car	158
Average Total Cost Per Car	1,020
Average Revenue Per Car	300
Average Net Revenue Per Car	-720

Even when revenue per car is doubled from the previous exercise, revenues were still far below total costs of operation. A detailed summary of costs and revenues under Scenario 3 presented in Appendix H.

Scenario 4

Revenues were sustained at the higher level ($300/car) under Scenario 4. Rehabilitation costs were raised to reflect upgrading to support trainload movements. Again, as in Scenario 2, additional rehabilitation costs did not sufficiently reduce annual maintenance of way costs to lower total costs. However, no value is assigned to the gains achieved through higher train speeds, increased productivity from better track condition, etc., although these efficiences may not be significant for a short line. A summary of Scenario 4 results is presented below with a detailed description in Appendix I.

Total Fixed Costs	$1,123,586
Total Variable Costs	157,769
Total Costs	$1,281,355
Total Revenue	300,000
Total Net Revenue	-981,355
Average Fixed Cost Per Car	1,124
Average Variable Cost Per Car	158
Average Total Cost Per Car	1,281
Average Revenue Per Car	300
Average Net Revenue Per Car	-981

Scenario 5

Under Scenario 5, interest rates for fixed and operating capital were reduced by half to 7 and 10 percent, respectively. Rehabilitation costs were left at the lower level; revenues were still computed on the basis of 1,000 cars at $300 per car. All other costs remained unchanged. A summary of costs and revenues under Scenario 5 is given below.

Total Fixed Costs	$689,373
Total Variable Costs	154,158
Total Costs	$843,531
Total Revenue	300,000
Total Net Renenue	-543,531
Average Fixed Costs Per Car	689
Average Variable Costs Per Car	154
Average Total Costs Per Car	844
Average Revenue Per Car	300
Average Net Revenue Per Car	-544

Interest costs did not drop sufficiently to offset the inadequacy of revenues. Fixed costs continued to comprise a substantial proportion of total costs. Even if revenue per car or carloads were doubled again to $600 per car, a revenue shortfall of about $250,000 would still prevail. A detailed explanation of results under Scenario 5 is presented in Appendix J.

Conclusions

Grain-dependent short line railroad operations need extremely high volumes and grain densities in order to support the high fixed cost nature of their operation. For the region tested, density of grain production was not nearly high enough to justify or economically support a short line railroad.

The revenues from operations for the Casselton to Marion branch line are not adequate to justify formation of a short line railroad. Purchasing and rehabilitating the roadway constitutes a prohibitively high fixed capital investment. Depending on the interest rates used, level of rehabilitiation, and revenues per car, a short fall of approximately $500,000 to $1.1 million per year is realized. Assuming utilization of large hopper cars, an additional 15 to 30 cents per bushel would have to be extracted from a third source such as shipper surcharges or state subsidies. Large shipper surcharges would shrink the short line's market area as producers shipped their grain to competing elevators having higher grain prices. This decrease in volume would only compound the railroad's problem of low fixed plant utilization.

The evaluative framework for testing short line railroad feasibility is well suited where the traffic mix and volume is reasonably predictable, and where revenues and costs are also therefore predictable. An economic-engineering approach such as this is dependent on the ability to accurately project the nature and scope of operations. Under such circumstances, an annual equivalent cost may be calculated and compared to projected revenues.

One problem with the above approach is the level of completeness and the accuracy with which all costs of operation are estimated and how realistically traffic levels and revenues are projected. Although grain dependent short line railroads are likely to be narrow in their scope of operations and not frequented by a variety of products, revenues and volume of traffic may not be accurately predictable due to the irregularity of annual grain production and the seasonality of grain shipments.

Implications for Grain Dependent Short Line Railroads

The high grain volume required of an area to support a short line operation may be difficult to find because of existing carriers retaining their service to such areas. Extremely low volume lines would not likely be profitable under any circumstances. However, line segments which are marginally profitable for larger carriers may be attractive for short line operations if proposed for abandonment by the larger railroad.

The degree of mobility of grain may be a problem for short line operators. Presence of captive shippers would be desirable for any rail operation, regardless of size. However, due to the developed road network and large capacity farm trucks in existence today, a completely captive grain shipper may be difficult to find.

Intermodal competition from over-the-road grain truckers may divert grain traffic from rail operations if railroads cannot compete with current truck rate/backhaul combinations. A short line's ability to capture this truck traffic may be crucial in its ability to remain viable.

Short line railroads in primarily grain producing areas may find it necessary to seek traffic other than grains and oilseeds. However, these agriculturally based economies may not have a significant industrial sector. The short line operation may find itself dependent on subsidies from outside sources such as local, state, or federal programs.

APPENDIX A

System Diagram Map
(October 1, 1981)

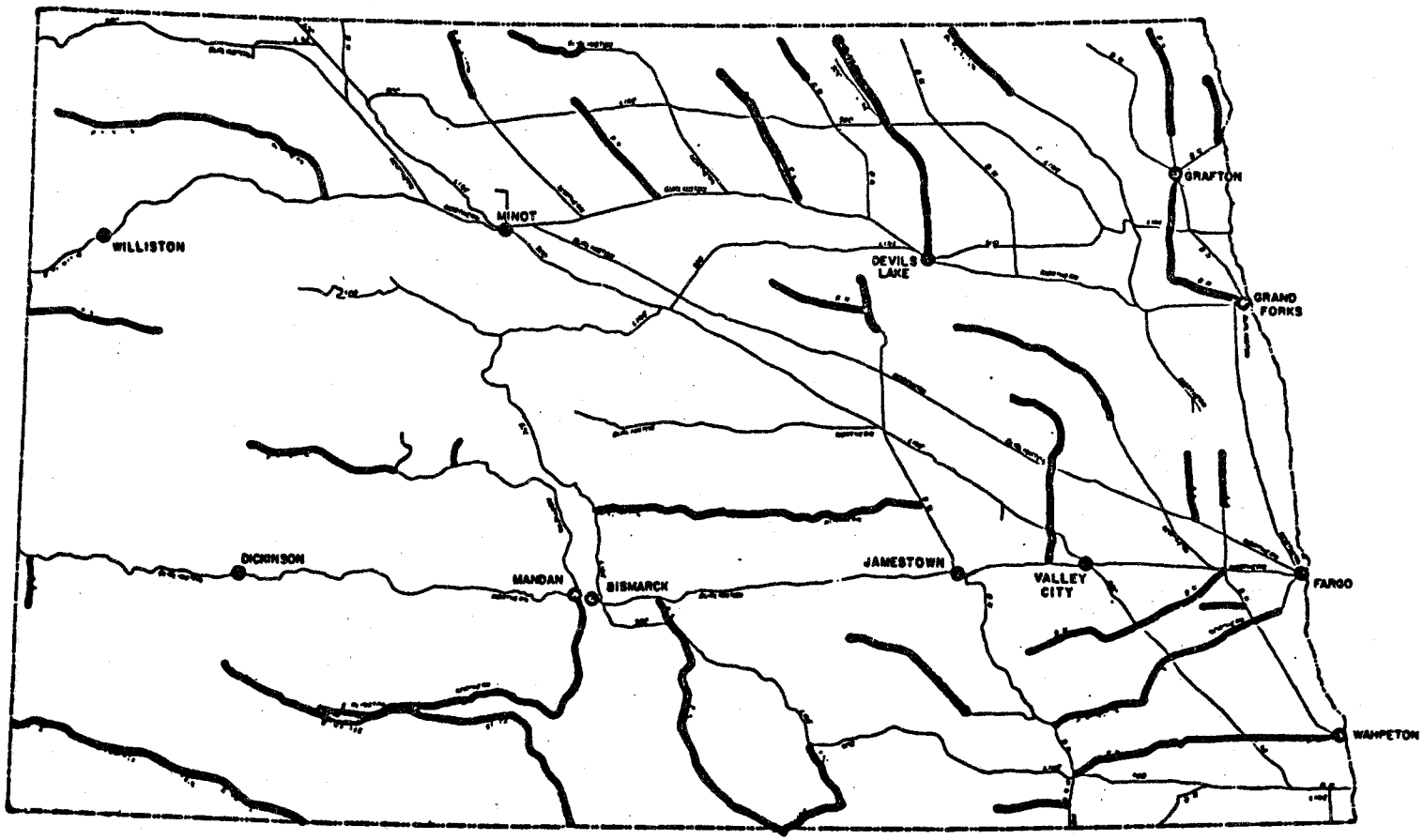


Figure A1. North Dakota Lines Subject to Abandonment

October 1, 1981

NORTH DAKOTA
RAILWAY LINES SUBJECT TO ABANDONMENT

LINE DESCRIPTION	R.R.	CATEGORY	DATE FILED	ND MILEAGE
New England to McLaughlin, SD	MILW	3	05-15-81	123.61
Marmarth to Lemmon, SD	MILW	3	05-15-81	102.73
Wishek to Pollock, SD	SOO	2	05-01-78	35.93
Ellendale to Oakes	BN	1	06-26-81	27.82*
Milnor to Oakes	BN	1	06-26-81	32.20
Oakes to Crete	BN	1	05-01-77	-
Crete to Gwinner	BN	1	03-31-80	-
Drayton to Joliette	BN	1	06-26-81	15.50
Hannaford to Binford	BN	1	03-31-80	24.90
Towner to Newburg	BN	1	03-31-80	35.26
Hunter to Blanchard	BN	1	06-26-81	10.42
Rolla to St. John	BN	1	06-26-81	7.24
Devils Lake to Hansboro	BN	1	06-26-81	66.59
Edgeley to Streeter	BN	1	06-26-81	39.83
Tuttle to Wilton	BN	1	06-26-81	37.77
Sanborn to Hannaford	BN	1	06-26-81	26.03
Hazen to Truax	BN	1	06-26-81	6.37
Zap to Killdeer	BN	1	06-26-81	40.86
Beach to Golva	BN	1	06-26-81	12.86
Wahpeton to Milnor	BN	2	06-26-81	40.49
Langdon to Hannah	BN	2	06-26-81	21.00
St. Thomas to Neche	BN	2	03-31-80	25.08
Grand Forks to Grafton	BN	2	03-31-80	44.65
Clifford to Erie	BN	2	06-26-81	17.75
Addison to Chaffee	BN	2	06-26-81	11.79
Casselton to Marion	BN	2	03-31-80	60.18
Sheyenne to Minnewaukan	BN	2	03-31-80	18.66
Oberon to Esmond	BN	2	03-31-80	28.07
McKenzie to Linton	BN	2	03-31-80	44.22
Linton to Eureka, SD	BN	2	06-26-81	37.67
Pingree to Tuttle	BN	2	03-31-80	55.00
Valley City Low Line	BN	2	06-26-81	4.82
Mohall to Sherwood	BN	2	06-26-81	14.58
Lisbon to Independence	BN	2	03-31-80	25.60
Horace to Lisbon	BN	2	06-26-81	46.29
Finley to Warwick	BN	2	06-26-81	50.02
Landa to Antler	BN	2	06-26-81	17.58
Stanley to Grenora	BN	2	06-26-81	87.09
Watford City to Fairview,MT	BN	2	06-26-81	36.58
Mandan to Mott	BN	2	06-26-81	99.10
York to Dunseith	BN	3	08-27-81	41.79
			TOTAL	1,473.93

*Includes 7.83 miles of trackage rights on CNW from Oakes to Ludden.

TOTAL ND MILEAGE IN CATEGORY:

Category 1 (3 years)	-	383.65
Category 2 (Future)	-	822.15
Category 3 (Pending)	-	268.13

Prepared by: North Dakota State Highway Department, Intermodal Planning and Rail Assistance Division

APPENDIX B

North Dakota Regional Railroad Authorities Act

49-17.1-06. Railroad plan and proposals. The department and the commission may develop and make available to interested persons feasibility plans, proposals, and recommendations for mergers, consolidations, reorganizations, and other unification or coordination projects for rail services which the department and the commission believe would result in a rail system which is more efficient and consistent with public interest.

Source: S.L. 1979, ch. 502, § 6.

CHAPTER 49-17.2

REGIONAL RAILROAD AUTHORITIES

49-17.2-01. Definition of terms. As used in this chapter, unless the context plainly otherwise requires:

1. "Bonds" means any bonds, notes, interim certificates, debentures, or similar obligations issued by an authority pursuant to this chapter.
2. "Governing body" means the official or officials authorized by law to exercise ordinance making or other lawmaking powers of a political subdivision.
3. "Political subdivision" or "subdivision" means any county, municipality, or other body politic of this state.
4. "Project" means any railroad or related facilities operated or owned by an authority, including all real and personal property, structures, machinery, equipment, and appurtenances or facilities which are part of the railroad and useful in connection therewith, including facilities for the convenience of handling passengers and freight or as part of railroad operations.
5. "Railroad authority" or "authority" means an authority created pursuant to this chapter.
6. "Real property" means lands, structures, and interests in land, including lands under water and riparian rights, and including any and all lesser interests, legal or equitable, pertaining to real property.

Source: S.L. 1981, ch. 477, § 1.

Note.

Section 41 of S.L. 1981, ch. 477, provided: "This Act may be cited as the 'Regional Railroad Authorities Act'".

49-17.2-02. Creation of authority by agreement of subdivisions. Two or more political subdivisions may form a regional railroad authority by execution of an agreement authorized by resolution of the governing body of each subdivision and approved by a sixty percent majority of the electors of the subdivisions voting on the question of adoption of the resolution.

Source: S.L. 1981, ch. 477, § 2.

49-17.2-03. Contents of agreement creating authority. The agreement authorized in section 49-17.2-02 shall state all of the following:

1. That the railroad authority is created and incorporated under the provisions of this chapter as a political subdivision of this state.
2. The name of the authority which shall include the words "regional railroad authority".
3. The names of the subdivisions which have approved the agreement and are the initial members of the regional railroad authority.
4. The names and addresses of the persons initially appointed by the resolutions approving the agreement to act as the representatives or alternate representatives of the subdivisions.
5. The address of the registered office of the authority and the name of its registered agent at such office.
6. That the subdivisions which are members of the regional railroad authority and its commissioners, officers, and agents are not liable for its obligations.

7. Any other provision for regulating the business of the regional railroad authority which may be agreed upon by the subdivisions.

Source: S.L. 1981, ch. 477, § 3.

49-17.2-04. Filing of agreement and resolutions — Certificate of incorporation — Beginning of corporate existence. The agreement and a certified copy of the resolution of each subdivision shall be filed with the secretary of state. If the agreement conforms to the requirements of this chapter, the secretary of state shall file it and issue a certificate of incorporation, which shall state the name of the authority and the date of incorporation. The existence of the authority as a political subdivision of this state shall begin upon the issuance of the certificate of incorporation. The certificate of incorporation shall be conclusive evidence of the existence of the authority.

Source: S.L. 1981, ch. 477, § 4.

49-17.2-05. Hearing before adoption of resolution — Publication of notice. No resolution authorized by section 49-17.2-02 or 49-17.2-11 shall be adopted without a public hearing in each subdivision involved. Notice of such hearing shall be given at least ten days prior thereto in the official newspaper of the subdivision, or if the subdivision has no official newspaper, then in a newspaper having general circulation in the subdivision.

Source: S.L. 1981, ch. 477, § 5.

49-17.2-06. Appointment of commissioners of authority — Terms of office — Vacancies. The governing bodies of the subdivisions participating in a regional railroad authority shall appoint not less than five persons as commissioners of the regional railroad authority. The number to be appointed and their representation shall be provided for in the agreement. All commissioners of a regional railroad authority shall be appointed for a term of one year. Vacancies shall be filled for the unexpired term in the same manner as the original appointments. Each commissioner shall hold office until his successor has been appointed and qualified.

Source: S.L. 1981, ch. 477, § 6.

49-17.2-07. Power vested in commissioners — Rules for operation. The power of each regional authority is vested in the commissioners. Each authority may adopt and amend rules for its own operations subject to the agreement of the subdivisions establishing the authority and subject to the provisions of this chapter.

Source: S.L. 1981, ch. 477, § 7.

49-17.2-08. Chairman and secretary-treasurer of authority. Each regional authority shall elect a chairman and a secretary-treasurer, from among the commissioners.

Source: S.L. 1981, ch. 477, § 8.

49-17.2-09. Executive director and other agents — Delegation of powers and duties. A regional authority may appoint or elect an executive director, and such other officers, agents, and employees as it may determine. An authority may delegate its powers and duties to one or more of its officers, agents, or employees.

Source: S.L. 1981, ch. 477, § 9.

49-17.2-10. Reimbursement of commissioners' expenses. A commissioner shall receive no compensation for his services but shall be reimbursed for the necessary expenses incurred in the discharge of his duties at the rates provided in sections 44-08-04 and 54-06-09.

Source: S.L. 1981, ch. 477, § 10.

49-17.2-11. Addition of subdivisions to authority. A regional authority may be increased to serve one or more additional subdivisions upon the approval by resolution of each such additional subdivision and of each of the subdivisions then parties to the agreement, and upon approval of a sixty percent majority of the electors, of each of the subdivisions to be added, voting on the question of the adoption of the resolution.

Source: S.L. 1981, ch. 477, § 11.

49-17.2-12. Withdrawal of subdivision from authority — Disposition of assets and liabilities. A member subdivision may withdraw from the authority if the commissioners of the authority consent to the withdrawal. In such event, the commissioners shall provide for the retention or disposition of its assets and liabilities. However, if the authority has any bonds outstanding no withdrawal shall be effected unless one hundred percent of the holders of the bonds consent in writing to the withdrawal.

Source: S.L. 1981, ch. 477, § 12.

49-17.2-13. Filing of resolution increasing or decreasing authority — Amended certificate of incorporation. If the number of subdivisions participating in a regional authority is increased or decreased pursuant to section 49-17.2-11 or 49-17.2-12, it shall forward to the secretary of state a certified copy of each resolution adopted pursuant thereto. Upon receipt of the resolution or resolutions, the secretary of state shall issue an amended certificate of incorporation.

Source: S.L. 1981, ch. 477, § 13.

49-17.2-14. Powers of political subdivisions in aid of regional authority. Any subdivision participating in an authority may:

1. Lend or donate money to the authority.
2. Provide that all or a portion of the taxes or funds available to the subdivision for railroad purposes, be transferred or paid directly to the authority.
3. Cause water, sewer, or drainage facilities, or any other facilities which it is authorized to provide, to be furnished adjacent to or in connection with railroads or facilities.

4. Dedicate, sell, convey, or lease any of its interest in any property, or grant easements, licenses, or any other rights or privileges therein to the authority.
5. Furnish, dedicate, close, pave, install, grade, regrade, plan, or replan, to the extent allowed by title 24, streets, roads, roadways, and walks from established streets or roads to such railroad facilities.
6. Aid and cooperate with the authority in the planning, undertaking, construction, or operation of railroad facilities.
7. Enter into agreements with the authority regarding action to be taken by the subdivision pursuant to the provisions of this section.

Source: S.L. 1981, ch. 477, § 14.

49-17.2-15. Corporate powers of authority. A regional authority may:

1. Sue and be sued, have a seal, and have perpetual succession.
2. Execute such contracts, other instruments, and take such action as may be necessary to carry out the purposes of this chapter.

Every authority may exercise such powers as are necessary or incidental to carry out the purposes of this chapter.

Source: S.L. 1981, ch. 477, § 15.

49-17.2-16. Planning, acquisition, and operation of railroads and facilities — Acquisition of property. A regional authority may plan, establish, acquire, develop, construct, purchase, enlarge, improve, maintain, equip, operate, regulate, and protect its railroads, and railroad facilities used or useful in the operation of a railroad. For these purposes an authority may acquire by purchase, gift, devise, lease, or condemnation any real or personal property or any interest therein.

Source: S.L. 1981, ch. 477, § 16.

49-17.2-17. Use of public waters by authority — Buildings, roadways, and bridges. A regional authority may establish or acquire and maintain railroads over any public waters of this state and any submerged lands under such public waters. It may construct and maintain terminal buildings, causeways, roadways, and bridges for approaches to or connecting with any such railroads.

Source: S.L. 1981, ch. 477, § 17.

49-17.2-18. Power of eminent domain — Restrictions on acquisition of public or railroad property. An authority may acquire all real or personal property that it deems necessary for carrying out the purposes of this chapter, whether in fee simple absolute or lesser interest, by condemnation and the exercise of the power of eminent domain in accordance with chapter 49-09. An authority shall have no power of eminent domain with respect to property owned by another authority or subdivision or public agency of this or any other state without the consent of such authority, subdivision, or public agency. The authority shall not condemn property owned or used by a railroad corporation unless the interstate commerce commission, or other authority with power to make the finding, has found

that the public convenience and necessity permit discontinuance of the rail service on the property.

Source: S.L. 1981, ch. 477, § 18.

49-17.2-19. Public purpose and necessity for acquisitions. All land and other property and privileges acquired and used by or on behalf of any authority are hereby declared to be acquired and used for public and governmental purposes and as a matter of public necessity.

Source: S.L. 1981, ch. 477, § 19.

49-17.2-20. Exemption from taxation of property and income of authority. Any property acquired by an authority and any income derived by the authority shall be exempt from taxation.

Source: S.L. 1981, ch. 477, § 20.

49-17.2-21. Annual certification of tax levy for authority — Levy of tax — Collection. An authority may certify annually to the governing bodies the amount of tax to be levied by said governing bodies for railroad purposes. Each subdivision shall levy the amount certified, pursuant to provisions of law authorizing political subdivisions of this state to levy property taxes. The levy may not exceed the maximum levy permitted by section 49-17.2-23. Each subdivision shall collect the taxes certified by a railroad authority in the same manner as other taxes are levied and collected and shall pay the revenues to the railroad authority.

Source: S.L. 1981, ch. 477, § 21.

49-17.2-22. Zones of benefit — Tax levy applied to. The authority may, in connection with the certification of an annual tax levy pursuant to section 49-17.2-21, designate various zones of benefit or geographical portions of the member subdivisions which, in the judgment of the authority, will be or have been benefited by projects. The authority may then certify that such annual levy be applied only to such benefited area.

Source: S.L. 1981, ch. 477, § 22.

49-17.2-23. Maximum tax levy — County levy not applied in subdivision making levy. In subdivisions which are parties to an agreement creating a regional railroad authority, a levy, in addition to all other levies authorized by law, not to exceed four mills on the taxable valuation of property in such subdivisions, may be made for such purposes. A county levy pursuant to section 49-17.2-21 shall not apply to any other subdivision within that county making a levy under section 49-17.2-21.

Source: S.L. 1981, ch. 477, § 23.

49-17.2-24. Deposit of tax proceeds — Expenditure. The proceeds of taxes for support of a railroad authority shall be deposited in such account or accounts in which other revenues of the authority are deposited and may be expended by the authority as provided in this chapter.

Source: S.L. 1981, ch. 477, § 24.

49-17.2-25. Covenant to levy taxes until bonds paid. Prior to the issuance of bonds, the authority may by resolution covenant and agree that the total amount of such taxes authorized or any portion thereof will be certified, levied, and deposited annually as herein provided, until the bonds and interest thereon are fully paid.

Source: S.L. 1981, ch. 477, § 25.

49-17.2-26. Acceptance and expenditure of federal and other grants and loans. An authority may accept, receive, receipt for, disburse, and expend federal and state moneys and other moneys, public or private, made available by grant or loan or both, to accomplish, in whole or in part, any of the purposes of this chapter.

Source: S.L. 1981, ch. 477, § 26.

49-17.2-27. Designation of highway commissioner as agent of authority — Funds held in separate account — Vouchers and warrants. An authority may designate the highway commissioner as its agent to accept, receive, receipt for, and disburse federal and state moneys, and other moneys, public or private, made available by grant or loan or both, to accomplish in whole or in part, any of the purposes of this chapter. It may designate the highway commissioner as its agent to contract for and supervise the planning, acquisition, development, construction, improvement, maintenance, equipping, or operation of any railroad or railroad facility.

All funds received by the highway commissioner pursuant to this section shall be deposited in the state treasury. Unless otherwise prescribed by the agency from which such funds were received, the funds shall be kept in separate accounts according to the purposes for which the funds were made available. Such funds shall be held by the state in trust for such purposes, and paid on warrants drawn by the state auditor on vouchers approved by the highway commissioner.

Source: S.L. 1981, ch. 477, § 27.

49-17.2-28. Issuance of bonds and notes — Purposes for which proceeds used. An authority may from time to time issue its bonds or notes in such principal amounts as the authority shall deem necessary to carry out any of its corporate purposes and powers, including, but not limited to the funding or refunding of the principal of or interest or redemption premiums on, any bonds or notes issued by it whether or not the bonds or notes or interest to be funded or refunded have or have not become due, the establishment or increase of reserves to secure or to pay the bonds or notes or interest thereon, and the payment of or establishment of reserves for all other costs or expenses of the authority incident to and necessary to carry out its corporate purposes and powers.

Source: S.L. 1981, ch. 477, § 28.

49-17.2-29. Revenues and funds pledged to payment of bonds and notes — Negotiability. Every issue of bonds or notes of the authority shall

be payable out of revenues or funds of the authority, subject only to agreements with the holders of particular bonds or notes pledging any particular revenues or funds. An authority may issue types of bonds or notes as it may determine, including those payable as to principal and interest solely from one or more revenue producing contracts made by the authority or from its revenues generally. Any bonds or notes may additionally be secured by a pledge of any grant, subsidy, or contribution from any public agency, or other person, or a pledge of revenue, income, or funds from any source whatsoever. All such bonds and notes shall be negotiable within the meaning of the Uniform Commercial Code, subject only to any registration requirement.

Source: S.L. 1981, ch. 477, § 29.

49-17.2-30. Resolutions for bonds or notes — Security agreement — Terms and conditions. Bonds or notes of the authority shall be authorized by resolution of the commissioners and may be issued under the resolution or under a trust indenture or other security agreement, in one or more series, and shall bear such date or dates, mature at such time or times, bear interest at such rate or rates, be in such denominations, be in such form, either coupon or registered, carry such conversion, exchange, and registration privileges, have such rank or priority, be executed in such manner, be payable in such medium of payment at such place or places within or outside the state, be subject to such terms of redemption with or without premium, and contain or be subject to such other terms as the resolution, trust indenture, or security agreement may provide, and shall not be restricted by any other law limiting amounts, maturities, interest rates, or other terms or obligations of public agencies or private persons.

Source: S.L. 1981, ch. 477, § 30.

49-17.2-31. Mortgages and deeds of trust to secure obligations — Filing. For the security of such bonds or notes the authority may execute and make mortgages or deeds of trust of the whole or any part of its property in the same manner and with the same effect as provided for railroads in section 49-09-08 which, together with any assignments or release thereof, shall be filed in the office of the secretary of state with the same force and effect as provided in section 49-09-14.

Source: S.L. 1981, ch. 477, § 31.

49-17.2-32. Bond recital conclusive as to authority and purpose. Any bond reciting that it has been issued by the authority pursuant to the provisions and for the purposes of this chapter shall be conclusively deemed to have been issued pursuant to such provisions and for such purposes.

Source: S.L. 1981, ch. 477, § 32.

49-17.2-33. Continuing validity of signatures on bonds and notes — Temporary bonds. Any bonds or notes may be issued and delivered notwithstanding that any of the commissioners or officers executing them shall have ceased to hold office at the time of actual delivery. Pending preparation

of definitive bonds, an authority may issue temporary bonds which shall be exchanged for definitive bonds.

Source: S.L. 1981, ch. 477, § 33.

49-17.2-34. Sale of bonds. Bonds issued shall be sold at public or private sale for a price and in a manner determined by the authority.

Source: S.L. 1981, ch. 477, § 34.

49-17.2-35. Bonds exempt from taxation. Bonds issued by an authority pursuant to the provisions of this chapter, together with interest and income therefrom, shall be exempt from all taxes.

Source: S.L. 1981, ch. 477, § 35.

49-17.2-36. Persons executing bonds not personally liable. The commissioners of an authority or any person executing such bonds shall not be liable personally by reason of their issuance.

Source: S.L. 1981, ch. 477, § 36.

49-17.2-37. Arrangements for operating and providing railroad service. The authority may enter into contracts, leases, and other arrangements for such term as the authority may determine with any persons:

1. Granting the privilege of using or improving the railroad or any portion or facility or space for commercial purposes.
2. Conferring the privilege of supplying goods, commodities, things, services, or facilities along the railroad.
3. Making available services to be furnished by the authority or its agents.

In each case the authority may establish the terms and conditions and fix the charges, rentals, or fees for the privileges or services, which shall be reasonable and uniform for the same class of privilege or service.

Source: S.L. 1981, ch. 477, § 37.

49-17.2-38. Grant of operating privileges and use of railroad and facilities. Except as may be limited by the terms and conditions of any grant, loan, or agreement authorized by this chapter, an authority may by contract, lease, or otherwise, for such consideration and term as it may determine, grant to any person the privilege of operating or using any railroad or railroad facilities or property, owned or controlled by the authority. No person may be granted any authority to operate a railroad other than as a common carrier.

Source: S.L. 1981, ch. 477, § 38.

49-17.2-39. Payments in lieu of property taxes by contractors using railroad and facilities. All contracts, leases, or other arrangements entered into by an authority pursuant to sections 49-17.2-37 and 49-17.2-38 shall provide for payment of a sum equal to the amount of property taxes which would be due if the property were owned by the person contracting with

the authority, to be prorated by the authority among the taxing districts involved, which payment shall be limited, however, so as not to exceed the net income earned by such person from the use of such property.

Source: S.L. 1981, ch. 477, § 39.

49-17.2-40. Disposition of property of authority. Except as may be limited by the terms and conditions of any grant, loan, or agreement, made or received by the authority, an authority may, by sale, lease, or otherwise, dispose of any of its property, or portion thereof or interest therein.

Source: S.L. 1981, ch. 477, § 40.

CHAPTER 49-18

MOTOR CARRIERS

49-18-01. Definitions. In this chapter, unless the context or subject matter otherwise requires:

1. "Motor vehicle" shall mean any automobile, truck, trailer, semitrailer, tractor, motorbus, or any self-propelled or motor-driven vehicle used upon any public highway of the state for the purpose of transporting persons or property.
2. "Person" shall include an individual, firm, copartnership, corporation, company, association, and any lessee, trustee, or receiver.
3. "Public highway" shall mean every public street, alley, road, highway, or thoroughfare of any kind used by the public.

APPENDIX C

Net Liquidation Value--Casselton to Marion Branch Line

Net Liquidation Value--Casselton to Marion Branch Line

Prices quoted in this net liquidation value calculation are based on estimates from Mr. Paul Reistrup, R. L. Banks and Associates. These prices would be changing almost constantly due to changing market conditions. For example, prices for "reroll" rail and relay rail are cited as $108 and $375 per ton, respectively. These prices would be subject to change depending on the supply of and demand for used rail, scrap metal prices, etc.

Revenues from Salvage

Rail — 47 mi. "reroll" rail (72 lb. to 100 lb.); $108/ton
14 mi. relay rail (112 lb. and 131 lb.); $375/ton

Reroll rail ($108/ton)
12 mi. 72 lb. = 1,520.04 tons
28 mi. 90 lb. = 4,435.20 tons
7 mi. 100 lb. = 1,232.00 tons
7,187.84 tons x $108/ton = $ 776,287

Relay Rail ($375/ton)
8 mi. 112 lb. = 1,576.96 tons
6 mi. 131 lb. = 1,383.36 tons
2,960.32 tons
x .93 (cropping loss)
2,753.1 tons after cropping
x $375/ton 1,032,413

Croppings 2,960.32 x 7% = 207.22 tons
x $100/ton 20,722
$1,829,422

Tie Plates
47 mi. scrap
14 mi. reusable
6,000 plates/mi.

Scrap 47 mi. x 6,000 plates/mi. x 10.125 lbs./plate = 1,4276 tons

1,427.6 tons x $88/ton = $125,628.80

Reusable 14 mi. x 6,000 plates/mi. x 18.25 lbs./plate = 766.5 tons

766.5 tons x $468.75/ton = $359,296.90

$ 484,926

Misc. Scrap

Anchors 6/rail; 320 rails/mi.

6 x 320 x 2.8 lbs./anchor = 2.7 tons/mi.
61 mi. x 2.7 tons x $88/ton = $ 14,493.60

Spikes 4/tie
4 x 3,000 ties/mi. x 0.6 lbs./spike
= 3.6 tons/mi.
3.6 tons/mi. x 61 mi. x $88/ton = $ 19,324.80

Joint bars, bolts, washers, etc.
4.76 tons/mi.
61 mi. x 4.76 tons/mi. x $88/ton = $ 25,551.68
$ 59,370.08

Ties Assume: 10% reusable for railroad purposes ($15/tie)
50% reusable for nonrailroad purposes ($4/tie)
3,000 x 0.1 = 300 x $15/tie x 61 mi. = $274,500
3,000 x 0.5 = 1,500 x $4/tie x 61 mi. = $366,000
$ 640,500

Switches Assume: One per 10 mi.; $6,000/switch
$6,000 x 10% = $600/mi.
Less 10% shipping = $540 x 61 mi. = $ 32,940

Land

County	Proportion of Rail Line Contained in County	Value/Acre[a]
Cass	50%	$1,030
Barnes	45%	625
LaMoure	5%	569

[a]SOURCE: 1978 Census of Agriculture Preliminary Report, updated to 1981 using USDA indexes of average value per acre.

Weighted Land Value = $825/acre

65 percent clear title (absolute ownership rather than under land lease or easement only)

6 percent cost of sale

90 percent saleable and restorable for productive nonrailroad use

61 mi. x 12 acres/mi. x $825/A x .65 x .94 x .9 = $ 332,085

Gross Liquidation Value $3,379,243

LESS: Removal Costs (recover all materials including ballast)
$4/foot x 5,280 ft./mi. x 61 mi. = $1,288,320

Freight--rail and scrap
$21/ton x 13,017 tons = 273,357
$1,561,677

Gross Liquidation Value after removal costs and freight = $1,817,566

Less carrying costs for six months
15% x 6/12 x 1,817,566 = 316,317

NET LIQUIDATION VALUE $1,681,249

or $ 27,561/mi.

APPENDIX D

Salvage Value of Rail Under Future Traffic Rehabilitation Program

Salvage Value of Old Rail Under Future Traffic
Rehabilitation Program

Rail

12 mi. of 72/lb. in place Reroll rail price = $108/ton 72 lb./yd. x 1,760 yds. x 2 rails 2,000 lbs./ton = 126.72 tons 126.72 tons x $108/ton =	$13,685.76
Joint bars, bolts, washers, etc. 4.76 tons/mi. x $88/ton =	418.88
Tie plates 6,000/mi. x 10.125 lbs./plate = 30.375 30.375 tons / $88/ton =	2,673.00
Anchors 6/rail 320 rails/mi. 6 x 320 x 2.8 lbs./anchor = 2.688 tons 2.688 tons x $88/ton	236.54
Spikes 4/tie 4 x 3,000 ties/mi. x 0.6 lbs. = 3.6 tons 3.6 tons x $88/ton =	316.80
	$17,330.98

APPENDIX E

Maintenance of Way Expense Casselton to Marion Short Line Railroad

Maintenance of Way Expense Under Present Traffic Scenario, Casselton-Marion Short Line Railroad (Rehabilitation Expenditure = $607,000)

Maintenance of way costs estimated below are economic-engineering estimates of a "normalized maintenance" program, whereby the track structure is maintained at some current quality level or service capability. No improvement (rehabilitation) or deterioration (deferred maintenance) is allowed for other than specified elsewhere in the report.

Cost estimates for vegetation control, snow removal, crossing maintenance, inspection, and miscellaneous repairs were estimated after consultation with industry personnel. These costs will certainly vary depending on weather conditions, geographical considerations, nature of the rural road network, etc.

Tie Replacement		
3,000 ties/mi. x 3%/year = 90 ties replaced 90 ties x $30/tie (includes spikes) =		$2,700
Rail Replacement		
2 rails/year; 100 lbs./yard 1.2 tons x $300/ton =		360
Resurfacing and Ballast		
3" every 7 years Surfacing - 80 cents/ft. =	603	
Ballast - $5/cubic yd. x 500 cy =	357	
		960
Tie Plates		
10/year x $6.50 each		65
Anchors		
10/year x $1.00		10
Vegetation Control		75
Snow Removal		100
Crossing Maintenance		
$75/crossing; 40 crossings/61 mi.		50
Inspection Cost		1,400
Miscellaneous Repair		
Structures, drainage, etc.		100
TOTAL		$5,820/mi./year

Maintenance of Way Expense Under 26 Car Train
Scenario Casselton-Marion Short Line Railroad
(Rehabilitation Expenditure = $3,267,229)

Tie Replacement		
3,000/mi. x 2%/year = 60 ties replaced		
60 ties x $30/tie =		$1,800
Rail Replacement		
One rail every 2 years; 100 lbs./yeard		
0.3 tons x $300/ton =		90
Resurfacing and Ballast		
3" every 10 years		
Surfacing - 80 cents/ft.	422	
Ballast - $5/cy x 400 cy	250	
		672
Tie Plates		
5/year x $6.50 each		33
Anchors		
5/year x $1.00 each		5
Vegetation Control		75
Snow Control		100
Crossing Maintenance		
$75/crossing; 40 crossings/61 mil		50
Inspection Cost		1,400
Miscellaneous Repair		
Structures, drainage, etc.		100
TOTAL		$4,325/mi./year

APPENDIX F
(Scenario 1)

Profitability of Casselton to Marion Short Line Railroad at Present Traffic Levels

Construction and Operating Costs at Present Traffic Levels--
Casselton to Marion Short Line Railroad

Fixed Costs

Item Name	Initial Cost	Useful Life	Annual Repairs	Salvage Value	Annual Equivalent Cost
Roadway	1,681,249	50	355,020	3,000,000	667,696
Rehabilitation	607,000	50	--	0	85,102
Locomotive	79,000	15	21,330	50,000	33,051
Tools	4,000	5	--	0	1,165
Vehicles	20,000	5	1,000	2,000	6,523
Office Equipment	5,000	10	--	0	959
Manager	39,000	--	--	--	44,460
Insurance	20,000	--	--	--	22,800
				Total Fixed Cost	861,756

Variable Costs

Item Name	Cost
Bookkeeper	13,000
Engineer	28,600
Brakeman	23,400
Office Supplies	1,000
Fuel	33,000
Total Production Stage Costs	99,000
Per Diem Charges	50,000
Interest on Operating Capital	8,769
Total Variable Costs	157,769
Total Revenue	150,000

Results of the Model

Total Fixed Cost	$ 861,756
Total Variable Cost	157,769
Total Cost	$1,019,525
Total Revenue	150,000
Total Net Revenue	$ -869,525

Average Fixed Cost/Car	862
Average Variable Cost/Car	158
Average Total Cost/Car	1,020
Average Revenue/Car	150
Average Net Revenue/Car	-870

APPENDIX G
(Scenario 2)

Profitability of Casselton to Marion Short Line Railroad at 26 Car Train Levels

Construction and Operating Costs

Casselton to Marion Short Line Railroad

Fixed Costs

Item Name	Initial Cost	Useful Life	Annual Repairs	Salvage Value	Annual Equivalent Cost
Roadway	1,681,249	50	263,825	3,000,000	556,565
Rehabilitation	3,267,229	50	--	--	458,066
Locomotive	79,000	15	21,330	50,000	33,051
Tools	4,000	5	--	--	1,165
Vehicles	20,000	5	1,000	2,000	6,523
Office Equipment	5,000	10	--	--	959
Manager	39,000	--	--	--	44,460
Insurance	20,000	--	--	--	22,800
				Total Fixed Costs	$1,123,586

Variable Costs

Item Name	Cost
Bookkeeper	13,000
Engineer	28,600
Brakeman	23,400
Office Supplies	1,000
Fuel	33,000
Total Production Stage Costs	99,000
Per Diem Charges	50,000
Interest on Operating Capital	8,769
Total Variable Costs	157,769
Total Revenue	150,000

Results of the Model

Total Fixed Cost	$1,123,586
Total Variable Cost	157,769
Total Cost	$1,281,355
Total Revenue	150,000
Total Net Revenue	-1,131,355
Average Fixed Cost/Car	1,124
Average Variable Cost/Car	158
Average Total Cost/Car	1,281
Average Revenue/Car	150
Average Net Revenue/Car	-1,131

APPENDIX H
(Scenario 3)

Profitability of Casselton to Marion Short Line Railroad
at Present Traffic Levels and Revenues Per Car of $300

Construction and Operating Costs at Present Traffic Levels and Revenues Per Car of $300

Casselton to Marion Short Line Railroad

Fixed Costs

Item Name	Initial Cost	Useful Life	Annual Repairs	Salvage Value	Annual Equivalent Cost
Roadway	1,681,249	50	355,020	3,000,000	667,696
Rehabilitation	607,000	50	--	--	85,102
Locomotive	79,000	15	21,330	50,000	33,051
Tools	4,000	5	--	--	1,165
Vehicles	20,000	5	1,000	2,000	6,523
Office Equipment	5,000	10	--	--	959
Manager	39,000	--	--	--	44,460
Insurance	20,000	--	--	--	22,800
				Total Fixed Costs	$861,756

Variable Costs

Item Name	Cost
Bookkeeper	13,000
Engineer	28,600
Brakeman	23,400
Office Supplies	1,000
Fuel	33,000
Total Production Stage Costs	99,000
Per Diem Charges	50,000
Interest on Operating Capital	8,769
Total Variable Costs	157,769
Total Revenue	$300,000

Results of the Model

Total Fixed Cost	$ 861,756
Total Variable Cost	157,769
Total Cost	$1,019,525
Total Revenue	300,000
Total Net Revenue	$ -719,525
Average Fixed Cost/Car	862
Average Variable Cost/Car	158
Average Total Cost/Car	1,020
Average Revenue/Car	300
Average Net Revenue/Car	-720

APPENDIX I
(Scenario 4)

Profitability of Casselton to Marion Short Line Railroad
at 26 Car Train Levels and Revenues Per Car of $300

Construction and Operating Costs at 26 Car Train Levels
and Revenues Per Car of $300

Casselton to Marion Short Line Railroad

Fixed Costs

Item Name	Initial Cost	Useful Life	Annual Repairs	Salvage Value	Annual Equivalent Cost
Roadway	1,681,249	50	263,825	3,000,000	556,565
Rehabilitation	3,267,229	50	--	--	458,066
Locomotive	79,000	15	21,330	50,000	33,051
Tools	4,000	5	--	--	1,165
Vehicles	20,000	5	1,000	2,000	6,523
Office Equipment	5,000	10	--	--	959
Manager	39,000	--	--	--	44,460
Insurance	20,000	--	--	--	22,800
				Total Fixed Costs	$1,123,586

Variable Costs

Item Name	Cost
Bookkeeper	13,000
Engineer	28,600
Brakeman	23,400
Office Supplies	1,000
Fuel	33,000
Total Production Stage Costs	99,000
Per Diem Charges	50,000
Interest on Operating Capital	8,769
Total Variable	157,769
Total Revenue	300,000

Results of the Model

Total Fixed Cost	$1,123,586
Total Variable Cost	157,769
Total Cost	1,281,355
Total Revenue	300,000
Total Net Revenue	$ -981,355
Average Fixed Cost/Car	1,124
Average Variable Cost/Car	158
Average Total Cost/Car	1,281
Average Revenue/Car	300
Average Net Revenue/Car	-981

APPENDIX J
(Scenario 5)

Profitability of Casselton to Marion Short Line Railroad at Present Traffic Levels, Revenues Per Car of $300, and Short-Term and Long-Term Interest Rates of Ten and Seven Percent, Respectively

Construction and Operating Costs at Present Traffic Levels, Revenues Per Car of $300, and Short-Term and Long-Term Interest Rates of 10 and 7 Percent, Respectively

Casselton to Marion Short Line Railroad

Fixed Costs

Item Name	Initial Cost	Useful Life	Annual Repairs	Salvage Value	Annual Equivalent Cost
Roadway	1,681,249	50	355,020	3,000,000	547,029
Rehabilitiation	607,000	50	--	--	43,983
Locomotive	79,000	15	21,330	50,000	28,014
Tools	4,000	5	--	--	976
Vehicles	200,000	5	1,000	20,000	5,530
Office Equipment	5,000	10	--	--	712
Manager	39,000	--	--	--	41,730
Insurance	20,000	--	--	--	21,400
				Total Fixed Costs	$689,373

Variable Costs

Item Name	Cost
Bookkeeper	13,000
Engineer	28,600
Brakeman	23,400
Office Supplies	1,000
Fuel	33,000
Total Production Stage Costs	99,000
Per Diem Charges	50,000
Interest on Operating Capital	5,158
Total Variable Costs	154,158
Total Revenue	300,000

Results of the Model

Total Fixed Cost	$689,373
Total Variable Cost	154,158
Total Cost	$843,531
Total Revenue	300,000
Total Net Revenue	-543,531
Average Fixed Cost/Car	689
Average Variable Cost/Car	154
Average Total Cost/Car	844
Average Revenue/Car	300
Average Net Revenue/Car	-544