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Branchline Abandonment: A study of the Impact on Selected Communities in Rural South Dakota

Michael J. Alley

C.E. Lamberton

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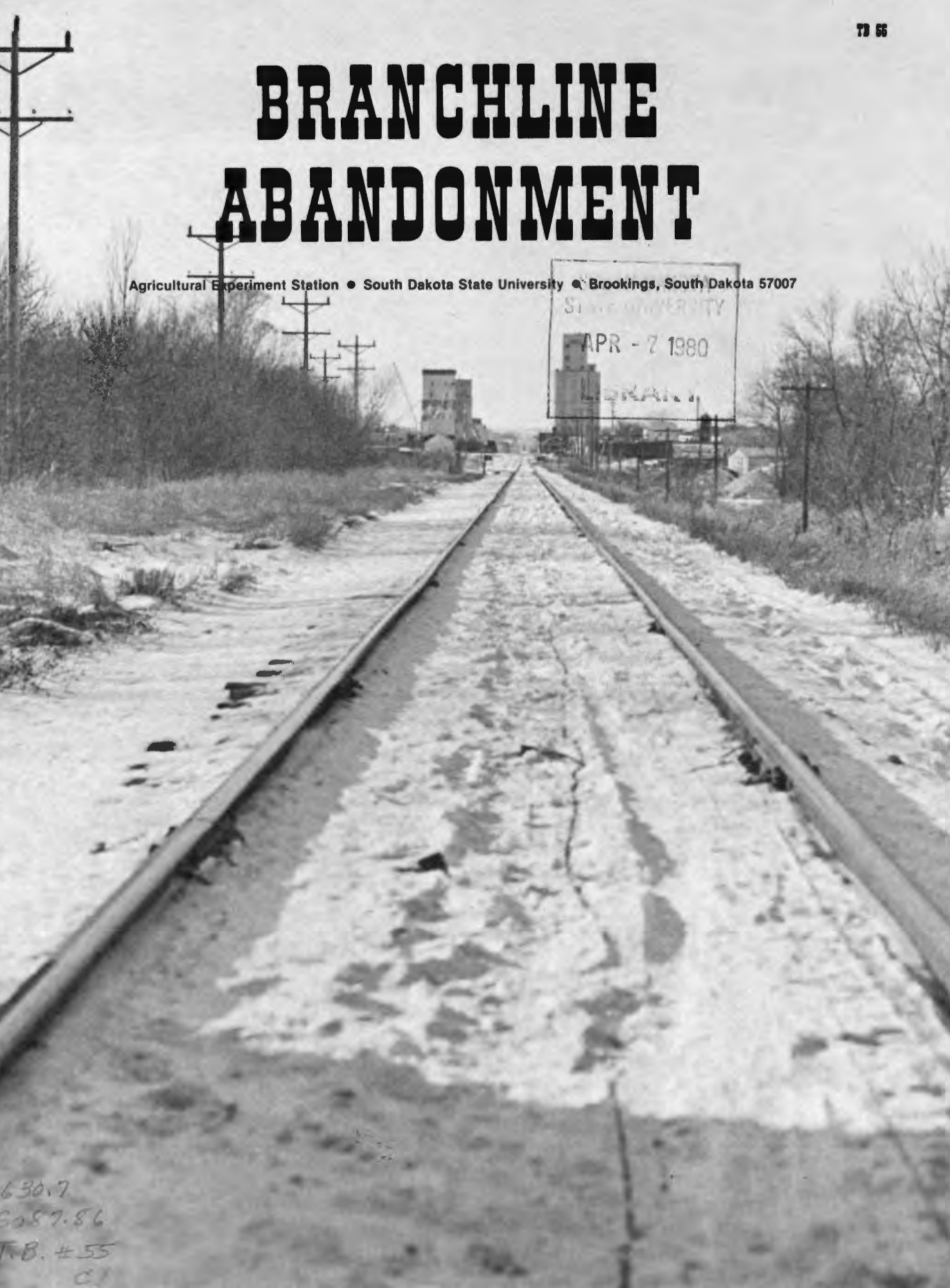
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BRANCHLINE ABANDONMENT

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BRANCHLINE ABANDONMENT

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A STUDY OF THE IMPACT ON SELECTED COMMUNITIES IN RURAL SOUTH DAKOTA

By J. Michael Alley
and C. E. Lambertson

INTRODUCTION

Causes of Abandonment

South Dakota has lost a significant amount of rail mileage to abandonment in recent years. With the exception of the 1950's, rail abandonment increased in South Dakota since the turn of the century (Table 1). South Dakota railroad companies had filed to abandon another 592.7 miles of track by July 1, 1979.¹ This represented about 21% of the remaining rail network in South Dakota. The Interstate Commerce Commission (ICC) has classified the abandonment plans for the remaining rail network in Table 2.

Several factors are responsible for the increased rate of branchline abandonment. The major one has been the development of the motor carrier and related technology. The railroad, introduced in South Dakota during the 1870's, was for several decades the only mode of transportation connecting South Dakota farms to regional and national markets, and tracks extended in all directions to accommodate farming regions of the state. Following completion of this extensive rail network, construction of a statewide highway system began in response to a growing social preference for greater mobility. This system paved the way for a trucking industry in South Dakota which today threatens the economic viability of the once-monopolistic rail industry.

¹Statement by Division of Railroad representative, South Dakota Department of Transportation, March 30, 1979.

Table 1

Decade	Abandoned Miles
pre-1920's	37
1920's	89
1930's	138
1940's	184
1950's	57
1960's	207
1970's	700 +

Source: The South Dakota Railroad Industry Yesterday and Today, Vol. V: South Dakota Public Utilities Commission.

Table 2

ICC Classification	Miles
I abandonment within 3 years	952.2
II abandonment under study	32.8
III abandonment pending	592.7
V no abandonment plans	1148.7

Source: Division of Railroads, South Dakota Department of Transportation; July 17, 1979.

As a result, the market share of South Dakota's rail industry has decreased. In 1970, rails handled 80% of the total shipping by country elevators.² Four years later, the share had fallen to 64%. The loss of traffic to trucks has pushed many rail operations below or near the margin of economic viability. When revenues fail to cover operating and maintenance costs, railroad officials defer maintenance. If maintenance is deferred for an extensive period, the line deteriorates, and trains must operate

²C.E. Lambertson and R.K. Rudel, A Pilot Study to Investigate Efficient Grain Transportation and Marketing Systems for South Dakota, South Dakota State University, June 1976, p. 20.

at slower speeds and with partially filled cars. Introduction of low-cost technology such as jumbo, covered hopper-cars and unit trains also is prevented. Eventually, railroad officials must decide whether to rehabilitate the line, and one which has not been worth maintaining often is abandoned.

Some regulations and other factors inherent to South Dakota's rail and truck industries also are responsible for increasing prominence of the trucking industry. The movement of unprocessed agricultural commodities by truck is not subject to rate or route regulation by the ICC. There are no institutional barriers to industry exit or entry. Further, entry is relatively easy. In fact, a monopoly is less likely to develop in the trucking industry because of this. There is a continuing and ready supply of persons on the fringe of the industry who will enter the business whenever rates are sufficiently high to attract them. A large initial investment in right-of-way also is not necessary because a publicly funded system already is available. These institutional and economic characteristics mean that only a small investment is required to enter the trucking business and they also promote a ready market for used truck equipment. Because trucks have a relatively short useful life, they are depreciated quickly, and many can be retired at low cost. When demand for services declines, truck firms can reduce operations or leave the industry easily and at low cost. Virtually all trucking costs vary with the level of service, so the industry can respond quickly to seasonal and cyclical shifts in transport-service demands. Publicly maintained highways and the short life span of trucks allow rapid introduction of larger and faster trucks.

By contrast, railroad entry and exit is subject to regulation and large investment. Extension of service to an area requires expensive effort to obtain approval, purchase right-of-way, and lay track. Eliminating service also re-

quires a lengthy and expensive approval process, and there often is no ready market for abandoned right-of-way. Thus, changes in railroad service areas occur slowly and in response to long-term shifts in transport demand. Where railroad lines already exist, it also is a long and expensive process to respond to demand changes. There is a one- to two-year delay between ordering and delivery of a new \$45,000 covered hopper-car to move grain. Such cars have a useful life of 20 to 40 years and impose a significant capital cost when idled because of a decrease in transport demand. Because of their institutional and economic characteristics, railroads are best suited to move large volumes of freight over long distances and in response to a steady demand for service.

Other factors which help explain the rate of branchline abandonment are drought, inflation, subsidization of competing transportation modes, and increased on-farm storage. Periodic drought and other natural disasters reduce crop yields. This imposes a cyclical demand to which trucking is better suited. When demand is reduced, trucking officials -- exempt from rate regulations -- can cut their rates below the regulated rail rates to capture what grain traffic there is. If truck firms fail in these times of low demand, the industry's low capital requirements make new entry relatively easy in times of higher demand. In contrast, rail industry officials are faced with an "all-or-nothing" decision because of enormous rebuilding costs.

Inflation and the lag involved in adjusting regulated rates also injure the rail industry. When rates don't allow for inflation, railroad financial stability is threatened. In times of fuller utilization, the more flexible and unregulated trucking industry can raise rates to maintain its financial stability. If excess rail capacity exists, the smaller truck firms can survive by reducing wages of their owners, who provide much of the labor force.

Railroad officials have long claimed part of their industry's relative decline is caused by government subsidization of the trucking industry through highway and interstate maintenance and construction. Railroads, on the other hand, have received virtually no federal aid since the period of initial land grants. Although truckers pay substantial user taxes, rail officials believe truckers do not pay their fair share relative to the wear and tear trucks cause. Several recent developments tend to support this belief.³ Officials in many states that have assessed road damage by heavy trucks have concluded that truckers should be paying higher user taxes to defray these expenses. The U.S. Department of Transportation has considered restricting large trucks to a limited number of interstate highways after the Federal Highway Administration found that interstates are wearing out much faster than they are being repaired. In addition, the federal government has threatened to withhold highway construction money from 14 states accused of not enforcing truck-weight laws. South Dakota, in particular, has invested in several portable scales and plans to purchase others in the future.

On-farm grain storage in South Dakota has increased substantially in recent years. When grain prices are low, farmers store their grain, and this weakens demand for transportation. With a weak demand, unregulated trucks can cut their rates and leave railroads with excess capacity. When grain prices rise, farmers ship stored grain to peak the demand for transportation. When rails become fully utilized, truckers then can raise rates above rail rates and earn greater profits. Railroads cannot raise rates to profit from the

greater demand. Thus, increased grain storage capacity enhances seasonal and cyclical fluctuations in demand for which railroads are not well suited.

Competitive and regulatory problems have combined to trouble South Dakota's rail industry. Unless some of the problems are alleviated, the abandonment trend will continue.

Perspectives on Abandonment

Most abandonment petitions have opponents. James A. Hagen stated, "A light-density line can be viewed as a liability to a carrier, a necessary transportation facility to a shipper, and a development tool to a state or local community. Understanding and resolving the light-density problem requires complete cognizance of each viewpoint."⁴ Principals in the debate usually include: 1) railroad companies; 2) farmers and shippers directly affected; 3) community businessmen and leaders; and 4) state and local governments.

Railroad companies file for abandonment when revenues from operations fail to justify operating and rebuilding costs. They contend that the continued operation of unprofitable lines threatens the viability of their profitable lines. They further contend that investment in upgrading the line would be financially unsound given the low estimated demand for future services.

Directly affected farmers and shippers often claim the loss of the rail service will severely injure or close their operations. They often anticipate higher transportation costs because

³David M. Elsner, "Highway Damage by Big Trucks Worries Various Agencies, and Crackdowns Loom," The Wall Street Journal (Midwest Edition, Chicago, Illinois), April 6, 1978, p. 1.

⁴James A. Hagen, "Panel: Perspectives on the Light Density Line Problem," in Proceedings Symposium on Economic and Public Policy Factors in Influencing Light Density Rail Line Operations (Washington, D.C.: Federal Railroad Administration, 1973), p. 26.

trucks, the only alternative, would have more rate-charging leverage. They contend upgrading trackage and improving services would increase the traffic and profitability of the line.

Some citizens contend the loss of rail service will substantially increase transportation costs to reduce the purchasing power and patronage of area farmers whose trade is considered essential for community viability.

Local businessmen fear abandonment because there may be no feasible alternative. The utility plant near Big Stone City, South Dakota, illustrates this point. The plant's energy source is coal which has been shipped to the plant by railroad. A plant spokesman says if this service is discontinued, the plant will close because truck service would be too costly.⁵ In addition, he added, the costs of keeping the highways in service under coal traffic for the first five years would total about \$80 million.⁶

Citizens and local government officials fear unemployment, tax losses, declining property values, and diminished economic development. Employment losses may result from closing the local grain elevator or a layoff of help at a general store that suffers from slower business. Tax losses may reduce public services. Economic development may be retarded in two ways. First, potential

businesses dependent on low-cost rail service cannot be attracted to the community. Second, existing businesses may curtail their expansion plans if these would depend on the option of future rail service. Retaining rail service as an option becomes important in light of today's oil shortage and the estimated availability of coal. As oil becomes more scarce, coal becomes attractive as an energy source for generating electric power. Trains are more efficient than trucks in hauling large quantities of coal.

The state's concern over branch-line abandonment and its impacts has recently intensified with the formulation of RAILPLAN SOUTH DAKOTA by the South Dakota Department of Transportation.⁷ This plan, the first of its kind in South Dakota, spells out the state's role in determining the future of the rail industry.

That role is:⁸

1) South Dakota's recommended policy toward rail transportation is one of cooperation. Rail users, railroad companies, local governments, and the state should cooperate to solve state transportation problems.

2) The South Dakota Department of Transportation will first consider the potential for viable operation of the line, social and economic impacts caused by abandonment of the line, the determination of shipper and community interest in the affected area, and other factors which may be unique to a given area or, line before opposing a railroad abandonment application.

⁵Testimony given by R.O.M. Grutle, Senior Vice President, of the Otter Tail Power Company before the Joint Economic Committee, Congress of the United States, George McGovern Chairman.

⁶South Dakota Department of Transportation, Division of Policy Development and Evaluation, Office of Transportation Planning, An Analysis of the Added Cost of Maintenance and Construction if the Coal to Supply the Big Stone Power Plant were Hauled from Gascoyne, North Dakota over U.S. 12, p. 9.

⁷South Dakota Department of Transportation, Railplan South Dakota, submitted to the Federal Railroad Administration, U.S. Department of Transportation, March 1978, p. 5.

⁸Ibid, p. 5.

3) The South Dakota Department of Transportation will not advocate a subsidy for rail service unless for a short term to deter abandonment until other means of transportation are developed, to establish profitability of a line, or in the best interests of the state.

RAILPLAN also includes eight goals which define desired characteristics of the railroad system in South Dakota. These goals are:⁹

1) To foster a rail transportation system that will dependably, efficiently, economically, and profitably move South Dakota's agricultural, natural resource, and industrial production to market in a manner which will maintain and improve the competitive position of the state, its farmers, and its industry.

2) To encourage and develop a rail system that will provide adequate rail service for all freight and passengers.

3) To promote increased use of rail service in ways for which it is best suited.

4) To develop flexibility and responsiveness to changing shippers' requirements in the rail system.

5) To develop, through multimodal transportation arrangements, options for those communities that lose rail service.

6) To provide for handling unprofitable rail services where the loss of such services will cause severe economic or social hardship.

7) To promote financial stability and operational efficiency in the rail system.

8) To develop, maintain, and improve the institutional capability for

implementing state railroad policy by legislation and funding.

Federal agencies and Congress have also taken a more active role in addressing the abandonment issue. Congress, in response to a growing concern over the financial difficulties of railroads in the Northeast and Midwest, enacted the Regional Rail Reorganization Act of 1973 (3-R's Act) and the Railroad Revitalization and Regulatory Reform Act of 1976 (4-R's Act). One section in the 3-R's Act directed the Federal Railroad Administration (FRA) to evaluate the Northeast and Midwest railroads relative to abandonment and plant rationalization. The FRA final report to the Secretary of Transportation recommended abandonment of the light-density lines as a solution to the problem. The report indicated that nearly 25% of the lines in these regions were potentially excess.¹⁰

The Interstate Commerce Act, amended by the 3-R's and 4-R's Acts, designated the responsibility for judging abandonment petitions to the ICC. Historically, the ICC had required that rail services be maintained on lines considered necessary for public convenience despite financial difficulty. Its philosophy was to treat railroads as a public utility with a social responsibility. This philosophy was changed with enactment of the 3-R's Act. The Act not only changed the procedure for abandonment, but it also placed the burden of proof of social repercussions on the rail service users.

Justification of the Study

This study is intended to fill an important gap in the knowledge of the

¹⁰The National Task Force on Rail Line Abandonment - Curtailment and Rural Development, The States and Rural Rail Preservations: Alternative Strategies (Lexington, Kentucky: The Council of State Governments Iron Works Pike, October 1975), p. 16.

⁹Ibid., p. 6.

impacts of branchline abandonment on rural South Dakota communities. Opinions voiced during many abandonment hearings are often those of vested interests and potentially not objective.

The need for this knowledge is indicated in some of the policies and goals formulated in South Dakota's RAILPLAN. The second policy of the South Dakota Department of Transportation requires consideration of the potential for the viable operation of the line, social and economic impacts of abandonment, and determination of community interest. The sixth goal specifically requires knowledge of the impacts of abandonment. The intent of goal six is "to provide for the handling of unprofitable rail services where the loss of such services will cause severe economic or socio-economic hardship." Obviously, correct information on the actual impacts of abandonment on the community is essential for correct policy design and implementation.

This study's purpose is to enhance the public ability to deal with rail-road abandonment by providing an understanding of how South Dakota communities have adjusted to past abandonments.

Objectives of the Study

The general objective of this study is to estimate selected impacts of past branchline abandonments on rural South Dakota communities. The general hypothesis is that small, rural trade-centers depend on the direct and indirect business activities generated by area farmers who, in turn, depend on low-cost rail service. The argument that a farmer's economic viability depends on rail availability is based primarily on the expectation that substituted motor transport would be too costly.

Specific objectives guiding the study are:

1) To estimate whether selected communities which have experienced abandonment have experienced a decline

in selected performance measures compared with that of similar, nearby communities which still have rail service.

2) To estimate any differences in selected performance measures between pre-abandonment and post-abandonment periods for selected, rail-abandoned communities.

3) To estimate specifically when effects of abandonment occur in relation to the year of abandonment.

4) To estimate the nature of any relationship between the size of a community and its ability to adjust to branchline abandonment.

ANALYTICAL PROCEDURES

Locations

The 16 selected communities that have experienced branchline abandonment are listed in Table 3. These test communities were selected because their recent loss of rail service would best reflect the probable impacts of rail abandonment today. Another reason was that they are located near communities of similar size and economic base still served by rails. These similar communities served as the control group. The choice of test communities therefore allowed comparisons and reduced possible biases by eliminating factors such as drought that might also adversely affect a community. The test and control communities are located on or near the following abandoned lines: (Tables 3 and 4).

Doland-to Groton Line¹

On July 25, 1969, the Chicago & North Western Railroad Company (C&NW) filed for abandonment on 38.4 miles between Groton and Doland, South Dakota. The abandonment, approved June 24, 1970, resulted in the loss of rail service to Turton, Verdon, and Ferney, South Dakota. The C&NW filed because declining grain

Table 3
Test Communities

Community	1970 Population	Year of Abandonment	Bank
1. Turton	121	1970	1
2. Eden	132	1971	1
3. Roslyn	250	1971	1
4. Grenville	154	1971	0
5. Toronto	216	1967	1
6. Brandt	132	1967	0
7. Revillo	142	1968	0
8. Strandburg	100	1968	0
9. Astoria	153	1970	0
10. Clear Lake	1152	1967	1
11. White	418	1967	1
12. Ferney	NA	1970	0
13. Verdon	18	1970	0
14. Hillhead	NA	1971	0
15. Bushnell	70	1967	0
16. Lake City	42	1971	0

NA - data not available

traffic, which resulted from the poor condition of the line, did not generate enough revenue to justify continued operation. C&NW claimed that \$965,000 needed to rehabilitate the line was too enormous in relation to projected grain traffic.

¹Certificate and Order issued by the ICC permitting the Chicago & North Western Railroad Company, to abandon its branchline extending between Doland and Groton, South Dakota, Finance Docket 25788, June 24, 1970.

Abandonment opponents appearing at the ICC hearing included several grain shippers and representatives of a cooperative grain elevator, a high-grade oil company, and the Railway Labor Executive Association. The grain shippers had no objection to the abandonment if the existing substituted motor-for-rail services were continued. The cooperative grain elevator and oil company representatives had no objections, with the condition that the switching services in Groton, South Dakota, be continued (Groton is on the northern end of this line and still has east-west rail

Table 4
Control Communities

Community	1970 Population	Year of Abandonment*	Bank
1. Stockholm	116	1968	1
2. South Shore	199	1968	0
3. Ortle	111	1971	0
4. Pierpont	241	1971	1
5. Frankfort	192	1970	0
6. Raymond	114	1970	0
7. Bruce	217	1967	1
8. Andover	138	1971	0
9. Claire City	100	1971	0
10. Stratford	202	1970	0
11. Peever	106	1971	0
12. Mansfield	111	1970	1
13. Conde	279	1970	1
14. Estelline	624	1967	1
15. Albee	26	1968	0
16. Labolt	90	1968	0
17. Crocker	NA	1971	0
18. Castlewood	523	1967	1
19. Gary	366	1968	1
20. Britton	1465	1971	1**

NA - data not available.

*The year that the test community, to which the control community is to be compared, last its rail service.

**The Britton bank was not included in the bank analyses because the information was unavailable.

service). The Railway Labor Executive Association representatives objected to the abandonment because several of their members feared the loss of employment.

The ICC, after considering the objections, granted the petition. It held that the rehabilitation, maintenance, and operation costs of the line would impose an unnecessary burden on the C&NW and interstate commerce. The petition was granted with the stipulation that the motor-for-rail and switching service agreements of the C&NW be continued.

Veblen to Grenville Line²

On March 30, 1970, the Soo Line Railroad Company filed for an abandonment certificate of public convenience and necessity on the 41.65 mile line between Veblen and Grenville, South Dakota. The abandonment, authorized April 30, 1971, eliminated rail service to Grenville, Roslyn, Lake City, and Hillhead, South Dakota. The Soo Line Company reported that the line, built in 1913, was unsafe for transport and needed extensive rebuilding. The Company contended that the rehabilitation costs would be enormous and unjustified in relation to the projected demand for transport service.

Several elevator managers and a lumber company spokesman opposed the abandonment. Their major objection was that their operations depended on rail service, and its loss would result in their closing. They claimed that motor transport cost 4 to 6 cents more per bushel of grain, and was not economically feasible. One elevator company spokesman argued that operating losses of the Soo Line Company could be eliminated if enough boxcars could be supplied.

²Certificate and Order issued permitting the Soo Line Railroad Company to abandon its branchline extending between Veblen and Grenville, South Dakota, Finance Docket No. 26139, March 30, 1970.

In considering the public convenience and necessity certificate request, the ICC weighed the adverse effects on the customers served by the branchline and the substantial operating losses suffered by the Soo Line Railroad Company. The ICC granted the certificate on the basis that there was no requirement the Soo Line should subsidize shippers using the line. In response to the boxcar-shortage argument, the ICC held that the losses would not be offset by an ample supply of boxcars.

Clear Lake to Minnesota Border Line³

On September 17, 1965, the Chicago, Rock Island & Pacific Railroad Company (CRI&P) filed for abandonment on the 47.73 miles between the Minnesota border and Clear Lake, South Dakota. The proposed abandonment, granted April 18, 1967, resulted in the closure of stations in Bushnell, Elkton, White, Toronto, Brandt and Clear Lake, South Dakota. Of the stations served by the line, only Elkton was served by another railroad.

The line was then in poor condition, and some of its ties dated to 1908. Rehabilitating the line for normal 40 mph speeds would require spending about \$1,300,000 over several years. An additional \$150,000 would be needed to upgrade several budgets. The CRI&P also faced a boxcar shortage (although this shortage was prevalent throughout their system).

The CRI&P based its need to abandon on the enormous rebuilding costs and the substantial operating losses it had suffered during the past three years. The CRI&P management further claimed that increased services on the line increased deficits. The management testified that the savings that could

³Certificate and Order issued permitting abandonment by the Chicago, Rock Island & Pacific Railroad Company of its line between Pipestone, Minnesota and Clear Lake, South Dakota, Finance Docket No. 23811, April 17, 1967.

be realized from the elimination of operating losses and the salvage value were badly needed to acquire equipment and upgrade physical plants elsewhere.

The South Dakota Public Utilities Commission, the Railway Labor Executives Association, and several local businessmen opposed the abandonment petition. The Commission, in considering the economic destiny of the area, dependent on rail service, wanted the final decision to be deferred, pending the outcome of a proposed rail merger which might make the branchline viable again. The Association feared loss of employment for several of its members. The businessmen testified that the rail service was their only viable mode of transport. Two arguments were made that would justify continued operations. First, it was argued that the CRI&P's operating losses would be eliminated if a sufficient number of boxcars were made available. Several shippers told of storing grain on the ground while waiting for car orders to be filled. The second argument was that more traffic would result from the release of a significant number of acres from Soil Bank.

In response to the PUC's request for a deferred decision, the ICC felt the pending merger was too speculative to warrant delaying the application. In response to the business interest's boxcar shortage and Soil Bank arguments, the ICC held that the increased revenue would not justify the rehabilitation costs and operating losses, the latter having crippled the CRI&P's entire financial system.

Reville to Strandburg Line⁴

On June 11, 1968, the Chicago & North Western Railroad Company filed to

⁴Certificate and Order issued permitting the Chicago & North Western Railway Company to abandon the branchline extending between Reville and Strandburg, South Dakota, Finance Docket No. 25142, August 22, 1968.

abandon 10.5 miles between Reville and Strandburg, South Dakota. The South Dakota Department of Highways and Public Utilities Commission also filed a petition of intervention in support of the proposed abandonment on the grounds that the abandonment would eliminate the costs of an underpass on Interstate Highway 29 East. The Railway Labor Executives Association filed an application of protest, fearing loss of employment for several of its members.

On August 28, 1968, the ICC granted the petition and held that a hearing was not necessary because the interests of the employees already were protected.⁵

Strandburg to Watertown Line⁶

On May 19, 1969, the C&NW filed for abandonment on 6.8 miles between Strandburg and Watertown, South Dakota. The Railway Labor Executives Association filed an application of protest. The ICC granted the petition on the basis that employees already were protected. The Commission further held that the lack of prospect for developing freight traffic and the enormous rebuilding costs would impose an undue burden on the C&NW and interstate commerce.

⁵The ICC has authority to impose conditions for the protection of employees. *Interstate Commerce Commission v. Chicago, Burlington and Quincy Abandonment*, 257 ICC 700; see also *Smith v. U.S.*, 211 F. Supp. 66, sustaining retroactive impositions of conditions for protection of rail employees adversely affected by abandonment.

⁶Certificate and Order issued permitting abandonment by the Chicago and North Western Railway Company of the branchline extending between Strandburg and Watertown, South Dakota, Finance Docket No. 25691, September 30, 1969.

On May 19, 1969, the C&NW filed for abandonment of 32.3 miles between Astoria, South Dakota and Tyler, Minnesota. Only 6.8 of the miles were in South Dakota. The abandonment, approved on February 10, 1970, resulted in the loss of rail service to Astoria, South Dakota, and several Minnesota communities. The C&NW filed because the line needed extensive rebuilding and had operated at a loss for several years.

The South Dakota opponents at the hearing including the Chairman of the South Dakota Public Utilities Commission, several Astoria elevator representatives, and the Railway Labor Executives Association. The Chairman of the Commission argued that public convenience and necessity required continued operation of the line. The Astoria elevator representatives argued that the line could be profitable if the track was reconstructed and maintained. They also blamed railroad management for the poor financial condition of the line. The ICC granted the petition, subject to the conditions for the protection of the railway employees based on the "public convenience and necessity" clause.

Selected Performance Variables

The three proxies selected for one or more of the four study objectives were the growth rates of: (1) estimated market value of real property; (2) utility usage (kilowatt hours); and (3) bank demand and time deposits. These were for estimating responses in community activity that would be expected if the loss of rail service hurt the economy.

⁷Certificate and Order issued permitting the Chicago & North Western Railway Company to abandon the branchline extending between Tyler, Minnesota and Astoria, South Dakota, Finance Docket No. 25690, August 4, 1970.

Property value change was selected because opponents often fear property devaluation will result from abandonment. An annual estimate of market value of real property was made by dividing the total assessed true-and-full property value⁸ by a county-weighted sales ratio calculated by the South Dakota Department of Revenue.⁹ This is a ratio of the total assessed true-and-full value of properties sold in a given year to the total of actual sale prices.

Growth of utility use was selected because commercial and residential expansion is positively correlated with its increase overall. The growth of bank time-and-demand deposits was selected to estimate the growth of community income and the level of economic activity.

Time Periods

Both five-year and three-year periods before and after the official year of abandonment were selected for study. The three-year periods were selected because abandonment impacts might be averaged out if too long a period was analyzed. The periods prior to the year of abandonment were selected because abandonment impacts may be felt before the official abandonment takes place; e.g., the C&NW line from Stranburg to Watertown, South Dakota, had no traffic four months prior to the official abandonment. Often, the mere suggestion that a line is being considered for abandonment results in a self-fulfilling prophecy. Farmers, for example, may begin

⁸Because personal property could not be separated from real property it was included in the estimate. Personal property constitutes a relatively small percent of total property value and therefore adds little bias to the estimate.

⁹Property Tax Division, Department of Revenue, South Dakota, Annual Assessment and Sales Information 1962-76.

to use alternative transport services, and grain elevator managers may reduce overhead and change product mixes. The five-year and three-year post-abandonment periods were selected to measure the variable duration of the community adjustment process.

Objective One

To estimate whether selected rail-abandoned communities have experienced a decline in selected performance measures relative to those of similar, nearby communities which still have rail service.

One discriminant analysis model for the five-year periods, and one for the three-year periods were to determine if several selected performance proxies for rail-abandoned communities have significantly declined in comparison to the same performance proxies of nearby, similar communities still served by rails. Discriminant models also were used to estimate if bank deposits in rail-abandoned communities have declined in comparison to those of communities still served by rails. The objective of discriminant analysis (DA) was to distinguish between two groups of observations that had been identified prior to the analysis. In these analyses, the two groups were either the test and control communities or the test and control banks, whereas the observations were of the individual communities or banks. Statistically, DA weights and linearly combines the discriminating variable so the two groups are forced to be as statistically distinct as possible.¹⁰ In this study, DA reduced a multivariate problem lacking inferential clarity into a simple univariate problem in which inference can be drawn on one composite score. The single composite score is valuable not only because tests of significance can be

made, but also because the group classification for each individual observation can be made using probability tables based on the normal distribution.

In all Objective One analyses, a discriminant model of the functional form

$$D = d_1 Z_1 + d_2 Z_2 + \dots + d_p Z_p$$

is used where D is the discriminant score, the d's are the weighting coefficients, and the Z's are the standardized values of the discriminating variables used in the model.¹¹ The stepwise method was used in all Objective One analyses so that the discriminating variable that best contributed to the distinction of the two groups could be identified. Wilks' lambda was selected to control the stepwise discriminations.

Only communities in which data were available and which had 1960 populations between 100 and 275 were selected for the statistical analysis relative to the growth of utility usage and property value. The test communities are the first nine in Table 3 and the control communities are the first ten in Table 4. The larger and smaller communities were not selected for the statistical analysis because their local economies were either larger and more diverse or so small that their ability to adjust to rail loss might not be representative of the entire set of communities studied. The analyses made using the growth rates of bank deposits included the six test community banks and eight control community banks despite community size, (Tables 3 and 4). This less restrictive analysis assumes that deposits of small rural banks are more reflective of the general area than the community alone.

Community Analyses

The four selected variables that

¹⁰Norman Nie et. al., Statistical Package for the Social Sciences 2 ed. McGraw-Hill, 1975, p. 435.

¹¹Ibid.

were expected to differ for the test and control communities were:

- (1) The average pre-abandonment growth rate of real property market value measured in dollars.
- (2) The average post-abandonment growth rate of real property market value measured in dollars.
- (3) The average pre-abandonment growth rate of utility usage measured in kilowatt hours.
- (4) The average post-abandonment growth rate of utility usage measured in kilowatt hours.

Two differing analyses were made using these discriminating variables. One analysis used five-year pre-abandonment and post-abandonment periods whereas the other analysis used three-year pre-abandonment and post-abandonment periods.

Bank Analyses

The two variables selected that were expected to differ for the test and control community banks were:

- (1) The average pre-abandonment growth rate of bank deposits.
- (2) The average post-abandonment growth rate of bank deposits.

Three analyses were made of these variables. One adjusted the growth rates of bank deposits to an index based on the annual farm receipts¹² for the farmers in the counties in which the banks were located. The index was used because:

- (1) The abandonments took place in different years; and,
- (2) 1972 and 1973 were prosperous years for farmers because of a high foreign demand for grain.

¹²South Dakota Crop and Livestock Reporting Service, Agricultural Statistics, 1962-76.

Both of these conditions could bias the results because of the sensitivity of the growth of bank deposits to inflation and increased farm income. The communities that lost rail service in 1967, 1968, or 1969 also would not reflect the increased farm receipts of 1972 and 1973 in their post-abandonment period. Because farm receipt data were not available for several years, this analysis used only the three-year periods. The other two analyses used unadjusted growth rates. One analysis used average three-year growth periods and the other used average five-year growth periods.

Objective Two

To estimate any differences for selected abandoned communities in selected performance measures between pre-abandonment and post-abandonment periods.

Paired difference t-tests were used to determine whether the pre-abandonment growth rates of utility usage and property value for rail-abandoned communities were significantly different than their post-abandonment counterparts. The test communities were the same nine communities as in the Objective One analysis. Two tests were made on each proxy. One test used the three-year growth rates, and the other used the five-year growth rates.

Paired difference t-tests also were used to test for significant differences between pre-abandonment and post-abandonment periods in the growth of bank deposits. The farm-receipts index was used for the three-year period only. The analyses made without the farm-receipt index included both the three-year and five-year periods.

The null hypothesis that was to be accepted if no significant differences were found was

$$H_0 : M_1 = M_2$$

against the alternative hypothesis

$$H_a : M_1 \neq M_2$$

that was to be accepted if the pre-abandonment and post-abandonment periods were significantly different. M_1 is the mean growth rate of the pre-abandonment period, whether property value, utility usage, or bank deposits, and M_2 is the mean growth rate of the post-abandonment period.

Objective Three

To estimate specifically when, any effects of abandonment occur in relation to the year of abandonment.

Several one-way analysis of variance (anova) models were used to estimate specifically when abandonment effects took place. The anova model took the form

$$Y_{ij} = u + t_i + E_{ij}$$

where Y_{ij} is the j th annual growth rate for the i th sample (treatment), u is the grand mean, t_i is the effect of the i th treatment, and E_{ij} represents the deviation of the j th growth rate of the i th sample from the corresponding treatment mean.

The null hypothesis that was to be rejected if at least one of the treatment effects were significant was

$$H_0 : t_i = 0 ; i = 1, \dots, 6$$

against the alternative hypothesis

$$H_a : \text{at least one of the } t\text{'s is not equal to zero.}$$

The six treatments for each of the three analyses were the annual growth rates of utility usage, property value, and bank deposits in the three years before and after the year of official abandonment.

Because sensitivity in detecting differences is lost when several means are tested simultaneously at one significance level, several one-way anova models were used to test for differences within the three-year pre-abandonment

and post-abandonment periods.¹³ Further, several orthogonal contrasts¹³ and t -tests were constructed to test for significant differences in various combinations of years.

Objective Four

To estimate the nature of any relationship between community size and its ability to adjust to branchline abandonment.

All test communities in which information was available were analyzed for a relationship between community size and the ability to adjust to branchline abandonment. The hypothesis guiding this analysis is that larger communities are more capable of adjusting to abandonment because of their larger and more diverse economies. The average six-year (three before and three after) growth rate of utility usage (kwh) relative to the year of abandonment was selected to estimate ability to adjust to abandonment.¹⁴ Linear, logarithmic, and semilogarithmic relationships were explored. The ordinary least-squares regression model was used in all analyses. The ordinary least-squares regression model is represented by the equation.

$$Y_i = \beta_0 + \beta_1 X_i + E$$

where:

Y_i is the mean growth of utility usage for community i given X ,

¹³Orthogonal contrasts are used when the experimenter is interested in partitioning the treatment variation into independent components. See Walpole and Myers, 2 ed., Probability and Statistics for Engineers and Scientists, MacMillan Publishing Co., Inc., 1978.

¹⁴The average six year growth rate, three years before and after the official year of abandonment, was used.

X_1 is the estimated population of community 1 for the year in which abandonment took place,

β_0 and β_1 are the true regression coefficients,

E is the error term.

The population for communities rail-abandoned before 1970 was estimated by linearly interpolating between the 1960 and 1970 census figures. The population for communities rail-abandoned in 1971 was estimated by linearly interpolating between the 1970 census figure and the 1975 estimate of the Bureau of Census. Linear interpolation was used after Objective 1, 2, and 3 analyses were completed. The findings of these analyses suggested that a linear interpolation was the proper interpolation.

STATISTICAL RESULTS

Objective One Findings

The discriminant models used to test whether rail-abandoned communities have declined in the growth of selected performance proxies in comparison to communities still served by rails failed to indicate a significant distinction. Wilks' lambda was the test criteria. Wilks' lambda represents the percentage change in the discriminant score that is unexplained by the discriminating variables. The percentage of observations correctly classified was also considered.

The community analysis which used the growth rates of utility usage and property value for the five-year pre-abandonment and post-abandonment periods failed to yield either a significant stepwise or overall Wilks' lambda, (Table 5). Moreover, only 58% of the cases were correctly classified.

The community analysis referring to the three-year pre-abandonment and post-abandonment periods for the same discriminating variables also failed to yield a significant Wilks' lambda, (Table 6). This analysis classified

74% of the cases correctly, counting marginal cases.¹

The analysis of the growth of bank deposits, adjusted to the farm receipts index, failed to indicate a distinction between the test and control banks (Table 7). The overall Wilks' lambda was .815, and 71% of the cases were correctly classified.

The bank deposits analysis of both the five-year and three-year periods failed to indicate a significant distinction between the test banks and control banks. Neither analysis yielded a significant Wilks' lambda, (Tables 8 and 9). Moreover, the percentage of cases correctly classified for both analyses was 54% and 53%, respectively.

Objective Two Findings

The paired difference t-tests used to test for significant differences between the pre-abandonment and post-abandonment periods, relative to the growth of property value for test communities, indicated significant differences. Both analyses suggested the post-abandonment growth of bank deposits was greater than the pre-abandonment growth. The t-values for the five-year and three-year periods were 4.59 and 4.35 respectively. Both are significant at the .01 levels.

No significant differences were found between the pre-abandonment and post-abandonment growth rates relative to utility usage. The five-year period t-value was .529, whereas the three-year period t-value was .493. Both are insignificant at the .05 level.

¹A marginal case is an instance where the probability that a case has been correctly classified is slightly greater than .50. By classifying these borderline cases the probability of misclassification increases substantially.

Table 5
Objective One, Five Year Periods

Variable	Period	Wilks' Lambda	Univariate F
Property Value	Post-abandonment	.963	.656
Utility Usage	Post-abandonment	.932	.292
Property Value	Pre-abandonment	.910	.066
Utility Usage	Pre-abandonment	.909**	.136

* indicates significance at .10 level

** The order of the Wilks' lambdas is that in which the variables entered into the discrimination. The final Wilks' lambda is therefore the overall Wilks' lambda.

Table 6
Objective One, Three Year Periods

Variable	Period	Wilks' Lambda	Univariate F
Property Value	Post-abandonment	.949	.918
Property Value	Pre-abandonment	.907	.343
Utility Usage	Pre-abandonment	.897	.005
Utility Usage	Post-abandonment	.894	.046

* indicates significance at .10 level

Table 7
Bank Deposits, Three Year Periods, Farm Receipts Index

Variable	Period	Wilks' Lambda	Univariate F
Bank Deposits	Post-abandonment	.895	1.407
Bank Deposits	Pre-abandonment	.815	.487

* indicates significance at .10 level

Table 8
Bank Deposits; Three Year Period, Not Indexed

Variable	Period	Wilks' Lambda	Univariate F
Bank Deposits	Post-abandonment	.897	1.380
Bank Deposits	Pre-abandonment	.893	.405

* indicates significance at .10 level

Table 9
Bank Deposits; Five Year Period, Not Indexed

Variable	Period	Wilks' Lambda	Univariate F
Bank Deposits	Post-abandonment	.996	.044
Bank Deposits	Pre-abandonment	.995	.000

* indicates significance at .10 level

The paired difference t-value for the indexed bank deposit analysis indicated no significant differences. The t-value for the three-year periods analysis was .274. No analysis was made using five-year periods.

The t-values for the bank deposit, non-indexed analyses indicated that significant differences existed between pre-abandonment and post-abandonment periods. The differences in both time periods suggested that the growth of bank deposits in the post-abandonment period was greater than pre-abandonment growth. The t-values for the five-year period and three-year period analyses were both 2.4 which is significant at the .05 level.

Objective Three Findings

All one-way anova models that simultaneously tested for significant differences in the means of the annual growth rates for the selected performance proxies for the six years (three before and three after) failed to reject the null hypothesis that the six treatment effects were equal to zero, (Tables 10-13).

The one-way analysis of variance tests used to test for significant differences within the pre-abandonment and post-abandonment periods also failed to indicate significant differences. Several orthogonal contrasts did indicate differences between pre-abandonment years and post-abandonment years for property value and bank deposits not adjusted to the farm receipts index.

Several t-tests also indicated differences in years within periods.

Objective Four Findings

No significant linear, logarithmic, or semi-logarithmic relationship was found to exist between estimated community population and the average growth rate of utility usage for the six-year period. The estimated linear regression equation was:

$$Y_i = 4.97 + .003 X_i$$

where: Y_i is the growth of utility usage for community i:

X_i is the estimated population for community i in the year of abandonment.

The estimated regression coefficients are 4.97 and .003 and the coefficient of determination was an insignificant .13.

The r^2 was .09 and insignificant for the estimated logarithmic regression

$$* Y_i = 4.17 + .565 X_i$$

where: Y is the natural log of the growth of utility usage for community i;

* X is the natural log of the estimated population for community i; and,

4.17 and .565 are the estimated regression coefficients.

Table 10
Objective Three, Property Value, Six Year Growth Rate

Source of Variation	D.F.	Sum of Squares	Mean Square	F
among groups	5	361	72.17	1.452
within groups	48	2385	49.69	
Total	53	2746		

* significant at .05 level

Table 11
Objective Three, Utility Usage, Six Year Growth Rate

Source of Variations	D.F.	Sum of Squares	Mean Square	F
among groups	5	194.65	38.93	1.010
within groups	48	1848.72	38.52	
Total	53	2043.38		

* significant at .05 level

Table 12
Objective Three, Bank Deposits (indexed), Six Year Growth Rate

Source of Variation	D.F.	Sum of Squares	Mean Square	F
among groups	5	829.37	165.88	.834
within groups	30	5967.67	198.92	
Total	35	6797.05		

* significant at .05 level

Table 13
Objective Three, Bank Deposits (not indexed), Six Year Growth Rate

Source of Variation	D.F.	Sum of Squares	Mean Square	F
among groups	5	805.425	161.08	1.702
within groups	30	2839.660	94.66	
Total	35			

* significant at .05 level

The r^2 was .14 and insignificant for the estimated semi-logarithmic regression

$$Y_1 = 1.52 + .00056 X_1$$

where: Y is the growth of utility usage for community i;

X is the estimated population for community i in the year of abandonment; and,

1.52 and .00056 are the estimated regression coefficients.

Interpretations

The discriminant models failed to suggest that test-community growth in selected performance proxies differed from that of the control communities. The weakness of all the discriminations is indicated by the overall Wilks' lambdas. For example, the overall Wilks' lambda was .909 for the analysis using the growth rates of property value and utility usage. This means that only 9% of the change in the discriminant score is explained by the discriminating variables. The univariate F ratios (which are one-way anova F ratios) also indicated the weak distinctions between the test and control groups when any single variable is considered. Furthermore, all the discriminating variables that were the best discriminators in their analyses were insignificant.

Objective 2 findings indicated mixed results. No significant differences were found between the pre-abandonment and post-abandonment growth rates of utility usage and indexed bank deposits. However, the pre-abandonment growth of property value was found to be significantly less than the post-abandonment growth for both five-year and three-year periods. Two plausible interpretation are possible:

- (1) abandonment effects could have occurred in the pre-abandonment period, whether they were premature business

closures or dampened prospects relative to perceived future values that could reduce sales prices; or,

- (2) property values, in general, may have risen, which suggests no abandonment effects.

To help determine if either was the case, the ten control communities were put to the same test. The t-values were significant, which suggests that the pre-abandonment growth of property value for communities still served by rails also was significantly less than the post-abandonment growth. This lends support to the interpretation that a general, not abandonment-related, rise in property value was responsible for the differences.

The post-abandonment growth of bank deposits not adjusted by the farm-receipts index also was found to be significantly larger than the pre-abandonment growth. However, factors other than abandonment also seem evident. First, the pre-abandonment growth of unadjusted bank deposits for the control banks was found to be significantly less than the post-abandonment growth. Second, the post-abandonment and pre-abandonment growths of bank deposits adjusted to the farm receipts index were not found to be significantly different. Both of these suggest significant differences in growth rates between periods were not abandonment-related but were caused by extraneous factors such as inflation and the large increases in farm income in 1972 and 1973.

The analysis of Objective 3 failed to suggest that abandonment affects a community in any specific period because:

- (1) no specific year for any selected performance proxy was significantly different when the six years were tested simultaneously;
- (2) no specific year for any selected performance proxy was different within the periods when the three years were tested simultaneously;

Further Considerations

- (3) the orthogonal contrasts that were significant only indicated a difference between pre-abandonment and post-abandonment years and thus supported Objective 2 findings; and
- (4) the t-tests indicating significant differences within the pre-abandonment periods for either property value or bank deposits all indicated earlier-year growth was significantly less than later-year growth. This agrees with both the general rise in property value, inflation, and increased farm income propositions.

The absence of any significant linear, logarithmic, or semi-logarithmic relationship between estimated community population and the growth of utility usage suggests that, for the communities tested, larger communities do not adjust to rail abandonment any better than smaller communities.

In summary:

- (1) no significant differences between the growth of selected performance proxies of test and control communities were found to suggest that rail abandonment has had adverse effects on the test communities;
- (2) for the test communities, no abandonment effects were evident in the pre-abandonment period relative to the post-abandonment period;
- (3) no evidence suggested that either temporary or permanent abandonment effects occurred in any specific year relative to the year of abandonment; and
- (4) no relationship between community size and the growth of utility usage suggested that larger communities can adapt more easily to rail loss.

The purpose of this study was to estimate whether rail abandonment has affected the growth of selected performance proxies for rail-abandoned communities relative to similar, nearby communities still served by rails. The question of whether rail abandonment hastens the decline of these communities has not been directly addressed. Further, the direction of causation has not been considered. Does rail abandonment lead to community decline, or does community decline lead to rail abandonment?

The majority of rural South Dakota communities have declined in population for the past two intercensal periods. Between 1950 and 1970, 179 of the 278 communities with populations less than 2500 declined in population.² Between 1960 and 1970, about 76% of all rural communities with populations below 500 also declined.³ As shown in Tables 14 and 15, both the test and control communities of this study are representative of these trends, and 12 of the 14 test communities declined in population between 1950 and 1960. Of the control communities, 15 of the 18 declined during the same period. Between 1960 and 1970, 11 of the 14 test communities declined in population. Similarly, 15 of the 18 control communities declined in population. Of the three communities that experienced increases in both periods (Clear Lake, Castlewood, Britton), Clear Lake and Britton are county seats and, therefore, less likely to experience decline.⁴

²Sidney G. Goss, "Factors Associated with Population Changes in Rural South Dakota Communities," unpublished M.S. thesis, South Dakota State University, April 23, 1974, p. 29.

³Ibid., p. 33.

⁴Goss concluded that county seats were more apt to gain in population between 1960 and 1970 than non-county seats.

Table 14
Population Change of Test Communities 1950-1970

	1950		1960		1970	1950-1970
	Population		Population		Population	% Change
Turton	201	-	140	-	121	-13.6
Eden	149	-	136	-	132	- 2.9
Roslyn	222	+	256	-	250	- 2.3
Grenville	207	-	151	+	154	+ 2.0
Toronto	322	-	268	-	216	-19.4
Brandt	211	-	148	-	132	-10.8
Revilla	249	-	202	-	142	-29.7
Strandburg	144	-	105	-	98	- 5.7
Astoria	206	-	176	-	153	-13.0
Clear Lake	1105	+	1137	+	1157	+ 1.8
White	525	-	417	+	418	+ 0
Bushnell	96	-	92	-	65	- 2.9
Verdon	34	-	28	-	18	-35.7
Lake City	110	-	81	-	44	-44.0
Ferney	NA*		NA		NA	--
Hillhead	NA		NA		NA	--

*Information not available.

SOURCE: Population Change of Counties and Incorporated Places, South Dakota 1950-1970, Agricultural Experiment Station, South Dakota State University, Bulletin 586, July 1971.

Table 15
Population Change of Control Communities 1950-1970

	1950		1960		1970	1950-1970
	Population		Population		Population	% Change
Stockholm	114	+	155	-	116	-25.2
South Shore	269	-	259	-	199	-23.1
Ortley	144	-	127	-	111	-12.6
Pierpont	326	-	258	-	241	-18.2
Frankfort	331	-	240	-	192	-20.0
Raymond	174	-	168	-	114	-33.9
Bruce	305	-	272	-	217	-20.0
Andover	277	-	224	-	138	-38.0
Claire City	109	-	86	+	100	+16.7
Stratford	164	-	109	-	106	- 2.7
Peever	221	-	208	-	202	- 2.9
Conde	409	-	288	-	279	- 2.8
Estelline	760	-	722	-	624	-13.6
Albee	75	-	42	-	26	-38.0
Britton	1430	+	1442	+	1465	+ 1.6
Crocker	NA*		NA		NA	--
Mansfield	NA		NA		NA	--
Castlewood	498	+	500	+	523	+ 5.0
Labolt	164	-	125	-	90	-45.0
Gary	558	-	471	-	366	-34.4

*Information not available.

SOURCE: Population Change of Counties and Incorporated Places, South Dakota 1950-1970, Agricultural Experiment Station, South Dakota State University, Bulletin 586, July 1971.

Although most data for the 1970 to 1980 period is yet unavailable, there is little evidence to suggest that this trend has changed significantly. Population estimates by the Bureau of Census⁵ indicate that the majority of the test and control still are declining in population as indicated in Tables 16 and 17. On average, the test communities declined 14.6%, whereas the control communities declined 16.2%.

The implications of these trends and the findings of this study suggest the following conclusions:

- (1) rural South Dakota communities, in general, have declined in population and activity caused by reasons other than rail abandonment; and
- (2) rail abandonment does not hasten a pre-existing decline in community size and activity.

⁵Bureau of the Census, U.S. Department of Commerce, Population Estimates and Projections, Series P-25, No. 689, April 77, pp. 3-26.

SUMMARY AND RECOMMENDATIONS

Summary of Study Results

Railroads in South Dakota have fallen on difficult times. The frequency of rail abandonment has increased the concerns of shippers and other citizens involved. Farmers fear abandonment will increase operating costs and leave them at a comparative disadvantage to farmers still served by rail. Businessmen fear increased transportation costs and declining patronage. Community representatives contend that their economic viability is at stake. Regulators and government officials at all levels face the task of balancing the immediate effect of abandonment with its future implications to best serve the public.

The major aim of this study was to estimate the indirect impacts of past branchline abandonments on selected rural communities in South Dakota. A group of similar and nearby communities controlled the analysis. The comparison of the two community groups was based on the growth of selected performance proxies that were expected to differ if abandonment effects took place. Both pre-abandonment and post-abandonment periods were studied.

The statistical analyses failed to distinguish between the two community groups regarding any of the variables in either the pre-abandonment and post-abandonment periods. Also, no specific year(s) relative to the years of official abandonment indicates when abandonment effects might have been evident. Finally, no relationship was found between community population and the growth of utility usage that would suggest that larger communities can more easily adapt to rail abandonment than smaller communities.

Further, less analytical inquiry was made into several abandonment-related questions. The findings of no significant abandonment effects were considered relative to:

- (1) the gradual decline of the majority of rural communities in South Dakota since 1950; and
- (2) the similarity of population decline in percentage and duration for both the test- and control-communities studied.

It was concluded that:

- (1) rural communities in South Dakota generally have been declining in population and activity caused by reasons other than rail abandonment; and,
- (2) rail abandonment does not hasten the pre-existing decline in rural South Dakota commu-

Table 16
Population Change of Test Communities 1970-1975

	1970 Population	Estimated 1975 Population	1970-1975 % Change
Turton	121	127	+ 5.0
Eden	132	115	-12.8
Roslyn	250	196	-21.6
Grenville	154	114	-25.9
Toronto	216	202	- 6.5
Brandt	132	106	-19.7
Revilla	142	129	- 9.2
Strandburg	98	85	-13.3
Astoria	153	147	- 3.9
Clear Lake	1157	1149	- .7
White	418	454	+ 8.6
Bushnell	65	51	-21.5
Verdi	18	11	-38.9
Lake City	44	39	-11.4
Ferney	NA*	NA	--
Hillhead	NA	NA	--

*Information not available.

SOURCE: Population Estimates and Projections, Bureau of Census, U.S. Department of Commerce, Series P-25, No. 689, April 1977.

Table 17
Population Change of Control Communities 1970-1975

	1970 Population	Estimated 1975 Population	1970-1975 % Change
Stockholm	116	100	-16.0
South Shore	199	236	+18.6
Ortley	111	98	-11.7
Pierpont	241	221	- 8.2
Frankfort	192	159	-17.1
Raymond	114	117	+ 2.6
Bruce	217	215	- 1.0
Andover	138	129	- 6.5
Claire City	100	94	- 6.0
Peever	202	218	+ 7.9
Conde	279	279	0
Estelline	624	624	0
Albee	26	14	-46.0
Britton	1465	1507	+ 2.9
Castlewood	523	538	+ 2.9
Labolt	90	65	-39.9
Stratford	106	141	-33.0
Gary	366	389	+ 6.3
Mansfield	NA*	NA	--
Crocker	NA	NA	--

*Information not available.

SOURCE: Population Estimates and Projections, Bureau of Census, U.S. Department of Commerce, Series P-25, No. 689, April 1977.

nity populations and economic activity.

Limitations of the Study

Geographically, this study is limited to east-river South Dakota with emphasis on the central, northeast, and eastern sections of this area. Whether findings are relevant to other areas and states is questionable. Some unique conditions in South Dakota could make community adjustment in South Dakota the exception. South Dakota is unique in that:

- (1) there are no major industrial or commercial bases;
- (2) land is less productive than in many other states;
- (3) there are no major north-south rail lines; and,
- (4) it is sparsely populated and characterized by a declining, rural, non-farm population.

The assumptions of the study may also limit the value of the results. The selected performance proxies may not be appropriate variables to represent community response, and the chosen time periods may not be long enough to reveal the total adjustment processes.

No attempt was made to estimate any direct economic effects of rail abandonment on shippers and producers. Thus, appear to have been no significant indirect community effects, there may be significant direct effects.

Finally, this study's findings are limited in that they are based on an aggregate analysis. When one analyzes an aggregate response, specifics are sacrificed for generalities. Because the profiles of most communities differ, it is possible that some communities, because of some combination of characteristics, will react and adjust differently when faced with rail abandonment. For example, a community located near an interstate highway or

other rail line can more easily adapt to abandonment than can a community isolated from alternative transportation services. Therefore, any extrapolation of the findings of this study to other situations should be made with care.

Recommendations

The economic analysis of the role and viability of any branchline requires an evaluation of all of the costs and benefits of the interrelated transportation system. The transportation system is interrelated in that:

- (1) traffic originating and terminating on local branchlines moves over other lines in the state and region and provides supporting revenues. Thus, it is more than just a local concern; and
- (2) truck and rail systems are often parallel and close substitutes, so any evaluation of the need for branchline service requires an analysis of the effects on and costs of both modes.

One of the costs of abandoning a branchline and relying on highway service can be the indirect cost of reduced economic activity imposed upon the rail-abandoned community. This study was an attempt to estimate such costs for rural communities in South Dakota. The failure to identify any significant effects suggests that, for rail abandonment in similar situations, the economic analysis may be able to ignore such costs.

The results of this study imply that, in future analyses of the state's transportation system, the indirect costs of rail abandonment to communities can be ignored unless circumstances in a specific situation are significantly different from those in the communities considered in this study.

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