SHORT LINE IMPACTS ON CUSTOMER SERVICE LEVELS FOR GRAIN SHIPPERS

By

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UGPTI Staff Paper No. 94

July 1989

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JULY 1989

PREFACE

This document is one of several reports that was written as part of the North Dakota Rail Services Planning Study. Other reports which are or will be available from this study include:

Costs and Profitability of Light Density Branch Lines: BN vs. Short Line Ownership. UGPTI Staff Paper No. 85, July 1987.

Report on Rail Services Planning Study Light Density Railroad Costing Methodology. UGPTI Staff Paper No. 84, May 1987.

Operating Costs and Characteristics of North Dakota Grain Trucking Firms. UGPTI Pub. No. 67, Aug. 1988.

Backhaul Opportunities for North Dakota Grain Truckers. UGPTI Pub. No. 69, April 1989.

Short Line Railroad Development Impacts on Rail Labor (forthcoming).

Short Line Impacts on Inter- and Intramodal Competition. (forthcoming).

Conditions and Terms of Short Line Sales. (forthcoming)

This project is being conducted with funds provided by the Federal Railroad Administration. Copies of any of the reports can be obtained from:

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EXECUTIVE SUMMARY

Proponents of short line railroad development hypothesize that rail traffic volumes may increase under short line ownership as a result of better service to shippers. The objective of this paper is to assess the potential effects that short line operations may have upon the level of rail services received by grain shippers on light density rail lines.

Results suggest that most grain shippers, especially rail sensitive multiple-car shippers, feel that they receive better service from short lines than they did from their former Class I railroad. Although not universally true, elevator managers in the Upper Great Plains also reported that they shipped more grain by the short line than by the Class I railroad. However, managers are not willing to attribute the increased rail traffic solely to better service, also citing the importance of changing market conditions and access to new markets.

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I. INTRODUCTION

The market structure of the American railroad industry has significantly changed since the passage of the Stagger's Rail Act of 1980. An important aspect of this change has been the rapid expansion of the short line railroad industry. Since 1980, 196 new short lines operating over 18,400 miles of track have been created (Levine et al.) Many of these new railroads have been organized to operate light-density line segments abandoned or sold by Class I carriers.

There is some controversy as to what effect the creation of short lines will have upon service levels to grain shippers. Proponents of short line development hypothesize that traffic volumes may increase under short line ownership as a result of better service to shippers. Critics counter that service and volume levels may decline as a result of the short line's lack of experience, lack of equipment, and unstable financial conditions.

Given these conflicting positions, the overall purpose of this report is to objectively and quantitatively assess the potential impact that short line operations have upon service levels to grain shippers. Specifically, the first goal is to ascertain whether creating short line railroads has resulted in an improvement or decline in the quality of service provided to country grain elevators. The second goal is to determine

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if elevators located on short lines have increased the volume of grain shipped by rail. Service variables are analyzed for single-car and multiple-car shippers to determine whether the type of shipper influences the perceived benefits or detriments received from short line development.

Information regarding the service levels to light density shippers will hopefully help state transportation officials and other public officials evaluate state and federal policies regarding short line railroads. In addition, such information may assist shippers and carriers ease the transition to short line rail service by identifying important aspects of service.

The remainder of the paper is organized into four sections. The theory of service is briefly reviewed in the next section. The research design is presented in section III. Comparisons of grain shipper views on customer service levels under Class I and short line railroad ownership are presented in section IV. The final section provides a summary and conclusions.

II. THEORY OF SERVICE

Selecting the proper mode of transportation has become a difficult and complex decision process. In the past, modal choice was basically a decision which involved selecting the carrier which offered the lowest transportation rate. However, the recent growth of the logistics concept has encouraged shippers and carriers to consider factors besides rates. In addition to rates, shippers are also considering how the quality of transportation service affects the total cost of operations.[1] According to Coyle and Bardi, the most important service performance variables are transit time, reliability, security (or loss/damage), capability, and accessibility.

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[1]Sterling and Lambert concluded that firms which hope to be successful in the future must "broaden their perspective and study the trade-offs between customer service/physical distribution and the other components of their firm's marketing mix."

Transit time and reliability are believed to be the most important service related factors. Transit time refers to the time involved in moving the goods from origin to destination, while reliability is the consistency of transit time. Without reliability, transit time alone offers little or no benefit to the shipper.

Security or loss and damage refers to the condition of the goods when delivered. Any loss or damage in transit may result in hidden costs. In addition to the direct cost of filing a claim, there may also be a considerable amount of time involved in the claims handling process. Damaged goods may also lead to stockout situations for receivers.

The final service variables, capability and accessibility, refer to the carriers ability to perform the transportation service requested. "Capability refers to the ability of the carrier to provide the equipment and facilities required for the movement of a particular commodity . . . . Accessibility considers the ability of the carrier to provide service over the link in question" (Coyle and Bardi).

It is arguable that capability and accessibility are not service characteristics, but rather define the set of carriers which may provide service to any particular shipper. A rail car shortage during harvest season provides an example of capability. Such a shortage of rail equipment may force an elevator to utilize truck service instead of rail.

A carrier's accessibility is constrained by the geographic limits of its network and/or its regulatory operating authority. The availability of carrier routes and the proximity of the carrier's terminal may discourage a shipper from utilizing either truck or rail. Since a railroad's network is fixed, any shipper not adjacent to a track will be forced to utilize a motor carrier for at least part of the way. Trucks, on the other hand, may have regulatory or geographical limitations on the markets they may serve.

The literature review discovered only two studies that considered the effect service quality has upon rail grain shippers.[2] Johnson designed a technique "to estimate the quantitative influence of quality factors upon freight transportation demand." Nelson investigated the attitudes that North Dakota country elevator managers have about the quality of rail service.

Johnson estimated two separate models, an ordinary derived demand function and a modal selection probability function. With respect to the derived demand model, Johnson concluded that delay in car delivery and damage during transit were the only service variables significantly affecting the annual volume of rail shipments. The elasticities of demand with respect to service characteristics were inelastic, suggesting that quantity demanded is not responsive to changes in service levels. Results of the modal selection probability model infer that the proportion of rail to truck grain shipments is responsive to rail and truck promotional efforts, delays in truck delivery, and rail transit times.

Johnson concluded that:

> Results of regression on the derived demand model support the notion that service quality does tend to affect railroad service demand but not to the extent previously suggested. The total quantity of railroad services demanded by grain shippers bears inelastic response to important service quality influences.

Johnson hypothesized that shippers' vocal complaints about rail service may not result in significant modal shifts to truck service because of the limited capability of trucks. That is, elevators find it difficult to move large volumes of grain by truck. The results should be viewed with some caution because the data were collected in a regulated environment and there were only 20 observations in the sample.

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[2]Miklius, Casavant, and Garrod estimated the elasticities for freight transportation services for apple and cherry shipments.

Nelson measured attitudes that elevator managers in North Dakota have about the quality of transportation service. He used a Likert attitude scale to measure attitudes about 23 statements. Three hypotheses related to quality of service were tested. First, does the quality of service vary between elevators on main line and branchlines? Second, does the quality of service vary for areas with more intensive competition? Third, do all railroads provide equal quality of service? Goodman and Kruskal's lambda, lambda-star, and tau statistics, and analysis of variance were used to test the hypotheses.

Nelson first concluded that the quality of service to elevators on main lines and branch lines is about the same. However, branch line elevator managers feel that service to main line elevators is much better. Second, he concluded that the quality of service does not vary with the level of rail competition. Finally, he concluded that the quality of service does not vary by railroad. Nelson also measured problems elevators encountered when shipping grain. The most serious problems in 1977 were box car shortages, car allocation, box car condition, and frequency of pickup and delivery of cars.

III. RESEARCH DESIGN

A. DATA

The primary source of data for this study was a telephone survey of 130 grain elevator managers located on short line railroads in North Dakota, South Dakota, and Minnesota. The questionnaire consisted of 26 questions and gathered information about elevator characteristics, the importance of various service characteristics, and shipping patterns (see Appendix A). Mr. Steve Stregge, Executive Director of the North Dakota Grain Dealers Association, critiqued the questionnaire and offered other suggestions about rail service requirements for grain shippers. The survey was conducted in

late July and early August 1987.[3]

The population of 130 elevators located on short line railroads in the region was censused. The sample frame was developed from elevator directories, rail maps, and *The Official Railway Guide*. The short line railroads surveyed from the study area are the Dakota, Minnesota & Eastern Railroad Co. the Minnesota Valley Transportation Co., and the Otter Tail Valley Railroad. All the elevators had previously been served by a Class I railroad.

Thirty-six of the 130 grain elevators in the sample frame did not use rail service and an additional 14 did not qualify as grain shippers for various reasons. This reduced the usable population to 80, of which 68 or 85.0 percent responded. The sample is felt to be representative of grain elevators operating on short lines in the region. However, small sample problems may be present when analyzing the multiple-car shippers since only 17 multiple-car shippers were surveyed.

B. RESEARCH METHOD

Transit time, reliability, and loss/damage were the service variables included in this study.[4] Capability and accessibility were excluded as service variables since a grain elevator's transportation alternatives usually are well defined. An additional service variable, customer service, was also included in the survey. In addition to availability of service, customer service was broadly defined to include other variables such as shipment tracing, billing procedures, and sales calls. Rates were also included as a variable in the analysis to determine the importance grain elevator managers place on quality of service relative to rates.

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[3]As such, the information was gathered before the 1988 grain hopper car shortage and the introduction of Burlington Northern's Certificate of Transportation program.

[4]These variables are similar to those used in a recent study of industrial shippers. Grimm and Smith measured four dimensions of quality of service: speed of service, reliability of service, loss and damage, and car supply. Also see Chow and Poist.

Customer service levels were measured in five ways. First, grain shippers were asked to rank five variables in order: rates, reliability, customer service, transit time, and loss/damage. Second, a five point Likert scale, ranging from much better to much worse, was used to compare attitudes about customer service between short line and Class I railroads. Third, the respondents were asked to indicate for eight areas whether they have encountered more, the same, or fewer problems under short line as opposed to Class I ownership. Fourth, shippers were asked to provide transit times and frequency of service. Finally, shippers were asked to indicate their overall level of satisfaction with rail service and volumes of grain shipped under short line and Class I ownership.

IV. RESULTS

The elevators surveyed are typical of country grain elevators found in the Upper Great Plains. The storage capacities of the elevators ranged from 20,000 to 6,500,000 bushels with an average of 853,400 bushels (Table 1). On average, these elevators can load 7,560 bushels per-hour by rail and 6,100 bushels per-hour by truck. They have the track capacity to handle approximately twenty rail cars at one time without a switch. Seventeen of the elevators can ship 26-car or larger rail shipments while the other 51 elevators are single-car rail shippers. In an average year, 66 percent of the elevator's combined gross revenue is realized from the handling and storage of grain.

TABLE 1. General Operating Characteristics of Elevators Surveyed, 1987

Capacity	Average	Range
Storage	853,400 bu	20,000 - 6,500,000 bu
Rail Loading	7,560 BPH	1,500 - 40,000 BPH
Truck Loading	6,100 BPH	1,000 - 40,000 BPH
Rail cars w/out switch	20.16 cars	3 - 100 cars

NOTE: bu = bushels and BPH = bushels per hour

A. RANKING OF SERVICE CHARACTERISTICS AND RATES

Elevator managers were asked to rank five variables in order (1 to 5), to determine the degree of importance they place on various quality of service characteristics and rates. The characteristic is of greater importance as the value of the mean is closer to one. Rates and reliability were established as the two most important factors when choosing a mode of transportation (Table 2). The ranked order of the remaining characteristics was customer service, transit time, and loss/damage.

TABLE 2. Rank of Transportation Service Variables

Service Characteristic	All Elevators	Multiple-car Shippers	Single-car Shippers
	----------Mean Response----------		
Rates	1.96	1.65	2.06
Reliability	2.29	2.24	2.31
Customer Service	3.09	3.24	3.04
Transit Time	3.31	3.18	3.35
Loss/Damage	4.35	4.71	4.24

There are two reasons why rates may be more important for multiple-car shippers than single-car shippers. First, many multiple-car shippers made significant investments in their elevators to access lower multiple-car rates. Thus, multiple-car shippers view continued low rates as important to recovering their investment. Second, multiple-car shippers receive better service than single-car shippers (see following sections). Under such circumstances, the multiple-car shipper most likely prefers the tangible savings from lower rates as opposed to the vagueness of better service.

Reliability is the second most important criteria when selecting a mode of transportation for both multiple-car and single-car shippers (Table 2). An elevator's ability to plan outbound shipments depends upon the reliability of its carriers. For example, an elevator may encounter storage capacity problems or incur additional inventory costs if an order of rail cars does not arrive when scheduled. As theory suggests, reliability is more important than transit time. Thus, a reliable rail carrier should be able to compete with a faster mode of transportation, given comparable rates.

Multiple-car and single-car shippers ranked customer service and transit time approximately the same, although in different order (Table 2). Customer service is broadly defined and is subject to various interpretations by different elevator managers. Finally, loss and damage was considered to be the least important service characteristic. Given the nature of the commodities shipped by grain elevators, damage or loss was not perceived to be a significant problem.

In conclusion, tradeoffs exist between service and rates. While it is desirable to have both excellent service and low rates, this is not always possible. It is difficult to analyze the tradeoff between service and rates because service is not readily quantifiable. Thus, many elevator managers may prefer lower rates over service because they recognize the savings with low rates. Analysis of this tradeoff may be more important in the future if railroads focus on service. For example, the Burlington Northern's Certificate of Transportation program is premised on the belief that grain shippers are willing to pay a higher rate to guarantee car supply and delivery date (Cawthorne).

B. ATTITUDES ABOUT CUSTOMER SERVICE

As previously discussed, customer service is a somewhat ambiguous concept. Respondents were asked to compare four customer service variables for short line and Class I railroads, delivery time, free time, billing, and sales calls. They were also

asked to compare billing and sales calls for short lines and motor carriers. For each variable, the respondent was asked whether short line service was much better, better, the same, worse, or much worse than the Class I railroad's or motor carrier's service.

In general, shipper attitudes about short line and Class I railroad service are normally distributed (Table 3). That is, the number of respondents feeling that customer service has improved with short lines is offset by an equal number feeling that customer service has become worse. The general consensus is that motor carriers provide better customer service than short lines.

Approximately 30 percent of the respondents feel that short lines do a better job of delivering cars on time than Class I railroads, while 27 percent feel Class I railroads do a better job (Table 3). Unfortunately, manager's perceptions on delivery time during a period of equipment shortage are unknown since the survey was conducted before the 1988 rail car shortage. The multiple-car rail shippers are more divided in their opinion than single-car shippers. While more multiple-car shippers found car delivery service improved with short lines (35 percent), more also felt that their car delivery service was worse (35 percent). Recall that elevator managers ranked reliability as the most important service characteristic (Table 2). Thus, a short line may seek to improve service by delivering cars more promptly and reliably.

The amount of free time provided by a railroad before charging demurrage fees may be a more serious problem for short lines than Class I carriers. Overall, 35 percent of the elevator managers reported that they have experienced more problems in this area with short lines (Table 3). There is no significant difference between multiple-car and single-car shippers. However, it is quite possible that free time may not be a serious problem area for short lines. Several of the respondents complained that short lines are ready to pull the cars in a day or two. In contrast, the former Class I railroad used to let the cars sit on the track at least a week. Thus, some

TABLE 3. Attitudes About Customer Service Frequency Distribution

Customer Service Item Type of Elevator	Short Line Much Better	Short Line Better	Short Line Same	Short Line Worse	Short Line Much Worse	No Answer
Short line vs Class I						
Delivery Time						
All Elevators	13.2	16.2	44.1	20.6	5.9	0.0
Multiple-car	11.8	23.5	29.4	17.6	17.6	0.0
Single-car	13.7	13.7	49.0	21.6	2.0	0.0
Billing						
All Elevators	4.4	13.2	67.6	13.2	0.0	1.5
Multiple-car	5.9	17.6	58.8	17.6	0.0	0.0
Single-car	3.9	11.8	70.6	11.8	0.0	2.0
Sales Calls						
All Elevators	7.4	19.1	47.1	20.6	4.4	1.5
Multiple-car	17.6	29.4	35.3	11.8	5.9	0.0
Single-car	3.9	15.7	51.0	23.5	3.9	2.0
Free Time						
All Elevators	8.8	8.8	45.6	20.6	16.2	0.0
Multiple-car	5.9	11.8	47.1	23.5	11.8	0.0
Single-car	9.8	7.8	45.1	19.6	17.6	0.0
Short line vs. Trucker						
Billing						
All Elevators	2.9	7.4	48.5	32.4	2.9	5.9
Multiple-car	0.0	5.9	58.8	35.3	0.0	0.0
Single-car	3.9	7.8	45.1	31.4	3.9	7.9
Sales Calls						
All Elevators	1.5	17.6	36.8	33.8	4.4	5.9
Multiple-car	5.9	23.5	41.2	29.4	0.0	0.0
Single-car	0.0	15.7	35.3	35.3	5.9	7.8

elevator managers accustomed to lenient Class I carrier free time policies may find it difficult to load cars when they receive more frequent service from the short line.

Most grain shippers (68 percent) feel there is little difference between the billing practices of short line and Class I railroads (Table 3). This is not surprising since billing services continue to be provided by the Class I carrier in some cases. Over 26 percent of all elevators and 47 percent of the multiple-car shippers feel that quality and frequency of railroad sales calls have improved since the short line took over operations (Table 3). Shippers feel that short lines are providing better sales call service because they are more responsive to local needs.

While many elevator managers feel that short lines provide better customer service than the Class I carrier, they still feel that motor carriers provide better customer service than short lines. Over 35 percent of the elevator managers prefer a trucking firm's billing procedures over those of a short line, while nearly half feel they are about the same (Table 3). Over 38 percent of the shippers feel that motor carriers provide better sales call service than short lines while 19 percent felt the opposite (Table 3). Single-car shippers, those most likely to rely on trucking service, prefer motor carriers somewhat more than multiple-car shippers.

In conclusion, multiple-car shippers appear to receive slightly better service than single-car shippers. Multiple-car shippers seemed more pleased with short line's free time, quality of sales calls, and billing procedures. Short lines may be targeting their customer service efforts to appeal to the larger elevators in attempt to increase their shipping volume. Short line service, however, is still perceived as inferior to that of motor carriers.

C. OPERATIONAL PROBLEMS ASSOCIATED WITH SHORT LINES

Respondents were also asked to indicate whether the number of operational problems differs between short line and Class I railroads. The eight potential problem areas are car shortages, locomotive shortages, track maintenance, car switching, shipment tracing, snow removal, loss and damage, and condition of the equipment.

In general, most shippers did not encounter more operational problems under short line service. Ninety percent or more of the elevator managers feel that the number of problems is the same or less with short line railroads for car switching, shipment tracing, snow removal, loss and damage, and equipment condition (Table 4). Shippers pointed out that it is difficult to evaluate snow removal since they have not encountered a "hard" winter since their short line began operation. Single-car shippers generally reported fewer problems than multiple-car shippers, although it is uncertain whether this is the result of different service levels or expectations.

There is strong evidence that grain shippers experience fewer track maintenance and condition problems under short line ownership. Almost 43 percent of the shippers reported fewer track maintenance and condition problems under the short line, while 10.3 reported more problems (Table 4). Some feel that Class I railroads practiced a policy of deferred or limited maintenance on their line. Others mentioned that the short line has plans for track improvements in the development stage.

Car and locomotive shortages were the only areas where grain shippers had significantly more problems under short line ownership. Even before the recent car shortage, 25.0 percent of the shippers reported more problems with car shortages under short line ownership, while 14.7 percent reported more problems with locomotive shortages (Table 4). Some grain elevator managers feel that being located on a short line may cause car supply problems. They note that many of the short lines don't own their own rail cars. Rather they rely upon their connecting Class I railroad for their car supply.

In conclusion, even before the recent severe equipment shortages, car and locomotive power shortages were the most serious operational problems encountered by grain shippers on short lines. On the other hand, a large portion of the shippers experienced fewer problems with track condition and maintenance. This is significant

TABLE 4. Problems with Railroads by Shipper Type

Problem/Type of Elevator	More with short line	Same	Less with short line
	----------Percent----------		
Locomotive shortages			
All elevators	14.7	80.9	4.4
Multiple-car	41.2	47.1	11.8
Single-car	5.9	92.2	2.0
Car shortages			
All elevators	25.0	57.4	17.6
Multiple-car	35.3	58.8	5.9
Single-car	21.6	56.9	21.6
Car switching			
All elevators	5.9	91.2	2.9
Multiple-car	17.6	70.6	11.8
Single-car	2.0	98.0	0.0
Shipment tracing			
All elevators	5.9	89.7	4.4
Multiple-car	17.6	82.4	0.0
Single-car	2.0	92.1	5.9
Snow removal			
All elevators	2.9	94.1	2.9
Multiple-car	0.0	94.1	5.9
Single-car	3.9	94.1	2.0
Damage/loss			
All elevators	2.9	89.7	7.4
Multiple-car	11.8	88.2	0.0
Single-car	0.0	90.2	9.8
Condition of equipment			
All elevators	1.5	89.7	8.8
Multiple-car	0.0	94.1	5.9
Single-car	2.0	88.2	9.8
Track maintenance			
All elevators	10.3	47.1	42.6
Multiple-car	5.9	58.8	35.3
Single-car	11.8	43.1	45.1

because one of the major fears cited by critics is that short lines will fail to maintain their track. In other areas, most grain shippers had the same or fewer operational problems under short line ownership.

D. TRANSIT TIMES AND FREQUENCY OF SERVICE

Over 80 percent of the elevators in the study region ship the majority of their grain to the Minneapolis market. The reported average transit time to Minneapolis is .65 days by truck, 5.22 days by short line railroad, and 5.20 days by Class I railroad. Rail transit times should be viewed with some caution as many of the elevator managers seemed uncertain about the exact transit time. Recall that transit time ranked behind reliability and customer service as the third most important quality of service variable (Table 2).

Short lines provide more frequent pickup and delivery of rail cars than Class I railroads. Almost 60 percent of all elevators receive on demand or daily service from a short line compared to 33.8 percent from their former Class I railroads (Table 5). The difference is more dramatic for multiple-car shippers, with the number receiving on demand or daily service increasing from 41.1 percent to 70.5 percent (Table 5). The number of single-car shippers with on-demand or daily service rose over 23 percentage points, to 54.9 percent (Table 5).

In conclusion, little difference was reported between the transit times for short line and Class I railroads. However, short line transit times should be less because short lines provide more frequent service than Class I railroads. Most likely, elevator managers are unaware of transit times to market. The increased frequency of service is not universally acclaimed by all elevators as some shippers find it difficult to load shipments when they have less free time.

TABLE 5. Frequency of Service Distribution by Shipper Type

Service Level	All Elevators		Multiple-car		Single-car	
	Short line	Class I	Short line	Class I	Shortline	Class I
Daily or On Demand	58.8	33.8	70.5	41.1	54.9	31.4
3 or 4 times/week	14.7	19.1	11.8	29.4	15.7	15.7
1 or 2 times/week	20.6	39.7	5.9	23.6	25.5	45.1
Other	5.9	7.4	11.8	5.9	3.9	7.8
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0

E. SHIPPING BEHAVIOR AND OVERALL PREFERENCES

Almost 40 percent of all elevators reported that they shipped more grain by the short line railroads than they did by the Class I railroads (Table 6). There is a significant difference in the shipping behavior between multiple-car and single-car shippers. Almost 59 percent of the multiple-car shippers reported increased usage of rail while only 33 percent of the single-car shippers increased their usage of rail.

Although the level of rail shipments increased for many grain elevators, most shippers do not solely attribute this increase to an improvement in the quality of service. Rather, shippers indicated that the level of rail shipments increased because of changing market conditions and as a result of gaining access to new markets. Many of the elevators located on the Dakota, Minnesota and Eastern and the Minnesota Valley Railroad gained access to the Pacific Northwest (PNW) which could not previously be reached over the Chicago and Northwestern. The new short lines act as feeder lines to the Burlington Northern, which in turn moves the grain west. Some of these elevators indicated that access to new markets has increased their business and they now ship the majority of their grain to the PNW markets. A few shippers also mentioned that they ship more grain by rail because of their desire to maintain local rail service and

TABLE 6. Level of Rail Shipments Under Short Line, by Shipper Type

Type of Shipper	Level of rail shipment under short line is:				
	Much More	More	Same	Less	Much Less
	----------Percent----------				
All Elevators	11.8	27.9	44.1	11.8	4.4
Multiple-car	17.6	41.2	29.4	0.0	11.8
Single-car	9.8	23.5	49.0	15.7	2.0

because of better service from the short line. For those shipping less grain with the short line, the apparent reasons are market conditions and increased competition from trucks.

For all elevators, rail service was preferred over truck by 70% of the respondents (Table 7). Once again, multiple-car and single-car shippers differed in their preference. While 94.1 percent of the multiple-car shippers preferred rail service, only 62.7 percent of the single-car shippers preferred rail service (Table 7). In addition, none of the multiple-car shippers preferred truck service while 25.5 percent of the single-car shippers preferred truck service (Table 7).

The majority of elevator managers feel that shipping grain by rail is more efficient and cost effective. Elevators, especially multiple-car facilities, are designed for high-speed rail loadout. The majority of elevator managers who preferred truck over rail shipped grain for short distances and felt that short transit times are more important than the quantity shipped. Truck and rail rates were mentioned as additional reasons for preferring one mode over another.

The majority of elevator managers feel that they receive better overall service from short lines than Class I railroads. Over half of all elevator managers prefer the

TABLE 7. Modal Preference by Shipper Type

Mode	All Elevators	Multiple-car	Single-car
	----------Percent----------		
Prefer Rail	70.6	94.1	62.7
Prefer Truck	19.1	0.0	25.5
Indifferent	8.8	5.9	9.8
No Opinion	1.5	0.0	2.0
TOTAL	100.0	100.0	100.0

overall service of short lines while 25 percent feel they received better overall service from their former Class I carrier (Table 8). More multiple-car shippers expressed a preference for short line service, 64.7 percent, than single-car shippers, 47.1 percent (Table 8). The percentage of multiple-car and single car shippers who prefer Class I service is about the same (Table 8).

TABLE 8. Rail Service Preferences, by Shipper Type

Mode	All Elevators	Multiple-car	Single-car
	----------Percent----------		
Prefer Short Line	51.5	64.7	47.1
Prefer Class I	25.0	23.5	25.5
Indifferent	17.6	11.8	19.6
No Opinion	5.9	0.0	7.8
TOTAL	100.0	100.0	100.0

Some elevator managers believe that short line's smaller size allows them to provide more individual attention to shippers. Other shippers claim that they have a better working relationships with short lines because as a local business, short lines seem to care more than the former Class I railroads. Many shippers attribute the short line's better service to its need for the traffic to survive.

The majority of shippers who prefer Class I service are displeased with the short line's advance notice requirement for ordering cars and short line demurrage fees. They apparently were used to the Class I railroads leaving surplus cars sit on their tracks. Some shippers also cite car supply problems.

V. SUMMARY AND CONCLUSIONS

Proponents of short line development hypothesize that traffic levels will increase under short line ownership as a result of better service. In order, grain shippers ranked reliability, customer service, transit time, and loss/damage as the most important service characteristics. However, elevator managers prefer lower rates over any quality of service variable.

Most shippers, especially rail sensitive multiple-car shippers, perceived that short lines provide better overall service than the former Class I carrier did. Almost 40 percent of all elevators and 58.8 percent of multiple-car shippers in the Upper Great Plains also reported that they shipped more grain by the short line than by the Class I railroad. However, the managers are not willing to attribute the increased rail traffic solely to better service, also citing the importance of changing market conditions and access to new markets.

In addition to improving the on-time delivery of rail cars, short line railroads have the potential to enhance reliability by providing more frequent service to elevators. However, short lines may find attempts to improve reliability resisted by some elevator managers who prefer the longer free times provided by Class I railroads.

In addition, many elevator managers seem to be unaware about the relationship between frequency of service and rail transit times.

Grain shippers reported fewer track condition and maintenance problems when the lines were transferred to short line ownership. However, even before the hopper car shortages in 1988, almost 25 percent of the elevator managers reported more car supply problems with the short line. Thus, car and locomotive shortages may be the Achilles heel for short lines.

In conclusion, service is not as crucial to grain short line railroads as those with a mixed commodity base. Grain is a bulky, low-valued commodity and shippers are more interested in low rates than service. However, service may become more important in the future, if more railroads follow the Burlington Northern's lead and provide premium service in exchange for higher rates.

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APPENDIX A

SURVEY OF COUNTRY GRAIN ELEVATORS

FIRST, WE NEED SOME BACKGROUND INFORMATION.

1. What railroad are you receiving service from at the present time? _____
(IF THEIR RAILROAD IS NOT A SHORT-LINE DO NOT CONTINUE SURVEY.)
a._____ DME
b._____ MN Valley
c._____ OV
d._____ other,_____

2. What railroad previously served you?
a._____ BN
b._____ CNW
c._____ Soo
d._____ Mil Rd
e._____ other,_____

3. How long has (DME, MN Valley, or Ottertail Valley) been serving you? _____ years

4. For an average year, what is the approximate percentage of gross revenue realized from:
Handling and storing grain _____%
Sales of other services and merchandise _____%

5. What is the storage capacity of your elevator? _____ bushels

6. What is your rail bushels/hr loading capacity? _____ BPH
approx. (2,000 - 15,000)

7. What is your truck bushels/hr loading capacity? _____ BPH

8. How many rail cars can you handle without a switch? _____
approx. (1-52)

NEXT, WE WOULD LIKE TO DETERMINE THE DEGREE OF IMPORTANCE GRAIN ELEVATORS PLACE ON VARIOUS QUALITY OF SERVICE CHARACTERISTICS:

9. Please rank the following five service characteristics in order, with 1 being the most important and 5 the least important.
a._____ Transit time (speed of shipment)
b._____ Reliability (consistent transit time)
c._____ Rate/cost
d._____ Loss/damage
e._____ Customer service

10. When you order a car, does (DME, MV or OV) do a better job of delivering that car on time than (BN, CNW, SOO or Mil Rd)?
_____ much better
_____ better
_____ about the same
_____ worse
_____ much worse

11. How does (DME, MV or OV's) billing procedures compare to (BN, CNW, Soo or Mil Rd's)?
_____ much better
_____ better
_____ about the same
_____ worse
_____ much worse

12. How does a trucking firm's billing procedures compare to (DME, MV or OV's)?
_____ much better
_____ better
_____ about the same
_____ worse
_____ much worse

13. How do you compare the frequency and quality of (DME, MV, or OV) sales calls to (CNW, Soo or Mil Rd)?
_____ much better
_____ better
_____ about the same
_____ worse
_____ much worse

14. How do you compare the frequency and quality of trucking firm's sales calls to (DME, MV or OV's)?
_____ much better
_____ better
_____ about the same
_____ worse
_____ much worse

15. How does the amount of free time (DME, MV, OV) provides before they charge demurrage fees compare to (BN, CNW, Soo or Mil Rd)?
_____ much better
_____ better
_____ about the same
_____ worse
_____ much worse

16. Have you encountered any problems with the following?

a. car shortages

_____ DME	_____ CNW	_____ Both
_____ MV	_____ BN	_____ More w/ short line
_____ OV	_____ Soo	_____ Less w/ short line
_____ none	_____ Mil Rd	_____ about the same

b. locomotive power shortages

_____ DME	_____ CNW	_____ Both
_____ MV	_____ BN	_____ More w/ short line
_____ OV	_____ Soo	_____ Less w/ short line
_____ none	_____ Mil Rd	_____ about the same

c. damage/loss

_____ DME	_____ CNW	_____ Both
_____ MV	_____ BN	_____ More w/ short line
_____ OV	_____ Soo	_____ Less w/ short line
_____ none	_____ Mil Rd	_____ about the same

d. track maintenance and condition

_____ DME	_____ CNW	_____ Both
_____ MV	_____ BN	_____ More w/ short line
_____ OV	_____ Soo	_____ Less w/ short line
_____ none	_____ Mil Rd	_____ about the same

e. shipment tracing

_____ DME	_____ CNW	_____ Both
_____ MV	_____ BN	_____ More w/ short line
_____ OV	_____ Soo	_____ Less w/ short line
_____ none	_____ Mil Rd	_____ about the same

f. condition of the equipment

_____ DME	_____ CNW	_____ Both
_____ MV	_____ BN	_____ More w/ short line
_____ OV	_____ Soo	_____ Less w/ short line
_____ none	_____ Mil Rd	_____ about the same

g. snow removal

_____ DME	_____ CNW	_____ Both
_____ MV	_____ BN	_____ More w/ short line
_____ OV	_____ Soo	_____ Less w/ short line
_____ none	_____ Mil Rd	_____ about the same

h. car switching

_____ DME	_____ CNW	_____ Both
_____ MV	_____ BN	_____ More w/ short line
_____ OV	_____ Soo	_____ Less w/ short line
_____ none	_____ Mil Rd	_____ about the same

i. other, please specify _____

_____ DME	_____ CNW	_____ Both
_____ MV	_____ BN	_____ More w/ short line
_____ OV	_____ Soo	_____ Less w/ short line
_____ none	_____ Mil Rd	_____ about the same

17. Where do ship the majority of your grain to? _____

18. What percentage of your grain moved to this market is by truck? _____%

19. What is the average transit time this takes? _____

20. Are you shipping more, less, or about the same amount of grain to this market by (DME, MN Valley or Ottertail Valley) than you did with (BN, CNW, Soo or Mil RD)?
_____ much more
_____ more
_____ about the same
_____ less
_____ much less

Why?

21. What is the average length of time it takes to ship grain to this market by (DME, MN Valley or Ottertail Valley)? _____

22. What was the average length of time it took to ship grain to this market by (BN, CNW, Soo or Mil RD)? _____

23. Finally, how frequent is (DME, MN Valley, Ottertail Valley) pick-up and delivery of cars?
_____ daily
_____ 3 times a week
_____ 2 times a week
_____ once a week
_____ on demand
_____ other _____

24. How frequent was (BN, CNW, Soo, or Mil RD) pick-up and delivery of cars?
_____ daily
_____ 3 times a week
_____ 2 times a week
_____ once a week
_____ other _____

25. Who do you feel gave you better service, (DME, MN Valley, or Ottertail Valley) or (BN, CNW, Soo, or Mil RD)?

Why?

26. Do you prefer to ship by truck or rail?

Why?