Profile of Short Line Railroads in High Grain Production States

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EXECUTIVE SUMMARY

What is the issue and how does the study address it?

Historically, short line railroads have played an important role in the transportation of agricultural products. Additional, up-to-date information is needed about the current short line rail industry and its relationship to agricultural transportation. The purpose of this study is to assess the state of the short line railroad industry and its role in the grain logistics system, including who they are, where they are, which agricultural products they ship in major grain corridors, and in what amounts. Specific objectives include: (1) developing a list of Federal and State short line assistance programs, (2) surveying the operating characteristics of short line railroads, (3) assessing the characteristics of short line agricultural carload traffic, and (4) identifying managers' perceptions on which service characteristics are most important in determining short line success.

How was the study conducted?

The methodology involves personal interviews and surveys of executives of short line railroads and State Department of Transportation (DOT) railroad personnel from 17 States: Iowa, Illinois, Nebraska, Minnesota, Kansas, South Dakota, Indiana, North Dakota, Ohio, Missouri, Wisconsin, Texas, Michigan, Montana, Oklahoma, Idaho, and Washington. The study area was selected on the basis of large crop production and geographic diversity. There is at least one agriculturally-oriented short line in each of these States. In some cases, a short line will own other short lines, in which case each was counted separately, so altogether the sample includes 47 agriculture-oriented short lines.

In the summer of 2016, personal interviews of short line personnel were conducted in the States of Kansas, Oklahoma, Missouri, Nebraska, Iowa, and Illinois. The rest of the sample short lines were contacted by phone. Eighty-six percent of the railroads contacted completed a detailed survey.

DOT personnel from the 17 States were contacted by phone. Fourteen of them completed a separate survey that included questions on the characteristics of the State short line assistance programs, eligibility requirements, benefits and costs, and the impact of short line assistance programs on short line profitability and rural economic development. Three of the contacted States – South Dakota, Missouri, and Texas – do not have railroad assistance programs and therefore did not complete the survey.

What did the study find?

The study examines characteristics of agricultural carload data for four types of traffic by commodity—originated, terminated, local, and overhead, which are outlined below.

1. Originated – Carload shipments of a commodity loaded on a respondent's railroad that have not had previous rail transportation and which terminate on another railroad.
2. Terminated – Carload shipments of a commodity that originated on another railroad but are unloaded off the respondent's railroad with no further rail transportation to follow.

3. Local – Carload shipments of a commodity that both originate and terminate on a respondent's railroad.
4. Overhead – Carload shipments of a commodity that both originate and terminate on other railroads but that are carried by the respondent's railroad in between.

Of the total carload traffic moving by short line railroad in 2015, 273,317 were originated carloads, 54,584 were terminated carloads, 38,263 were local carloads, and 90,358 were overhead carloads. For originated traffic, corn, soybeans, wheat, and distillers dried grains with solubles (DDGs) account for 95 percent of carloads, with corn comprising 43 percent of the total. For terminated traffic, corn, wheat, and fertilizer accounted for nearly 90 percent of carloads, with corn comprising 46 percent of the total. For local traffic, corn, wheat, and soybeans collectively accounted for nearly all carloads, with corn comprising 65 percent of the total. For overhead traffic, corn, wheat, sorghum, and oats accounted for 62 percent of carloads.

The majority of the sampled short lines are "not dependent" on Class I railroads for locomotives, but half the short lines said they are "very dependent" on Class I's for rail cars. The study also found that 66 percent of the total short line track miles in the sample are capable of handling 286,000 pound rail cars.

Managers of sampled short lines cited motor carriers as competition, more often than other modes of transport, for all four carload traffic types. The commodities most subject to intermodal competition are corn, wheat, and soybeans for originated traffic; corn, wheat, and fertilizers for terminated traffic; corn, wheat, and soybeans for local traffic; and wheat and corn for overhead traffic.

Managers answered four open ended questions about competition facing short line railroads and are evenly split on whether changes in the grain logistics system (e.g., the increased use of Class I shuttle trains) are a threat or an opportunity to their railroad's competitiveness. For example, managers of short lines were asked whether their agricultural traffic will increase or decrease if current trends continue (i.e. focus on shuttle trains and increased ethanol production). Only six railroads expected their agriculture-related traffic to decrease, while 18 railroads expected an increase, and 17 expected no change.

In addition, the sampled short line managers were asked if Class I railroad policy (i.e. shuttle train loaders) affect competition between trucks and short lines. Of the 39 short lines that answered the question, 77 percent responded they "agree" that Class I policy affects competition between trucks and short lines.

Short line managers were asked how other transportation modes are becoming more of a challenge to short line success. The short lines pointed to lower truck fuel prices and, thus, lower truck rates. Also, increased truck size and weight were frequently mentioned. The short lines mentioned that shuttle trains on Class I railroads have resulted in increased trucking to these locations as opposed to increased short line shipments.

The study includes a profile of successful (profitable) short lines based on survey responses from short line managers. Collectively, they chose strong shipper support levels as the single most important factor followed by adequate traffic levels and access to more than one connecting carrier.

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INTRODUCTION

The Central Plains region leads the Nation in many areas of agricultural activity. In terms of total production of corn, wheat, sorghum, and soybeans, Iowa leads the Nation and is followed by Illinois, Nebraska, Minnesota, and Kansas. Because many locations in these States are remote from markets and processing centers, they are dependent on railroads for transport of their grain.

Following the deregulation of railroad markets with the passage of the Staggers Rail Act in 1980, Class I railroads adopted a cost reduction strategy that involved the sale or lease of their branch lines to short line railroads rather than abandon the lines altogether. Today, in the eight leading wheat producing States, short lines collectively account for about one-third of the total track miles in that region. These short lines provide rail service to many rural shippers whose access to rail service might otherwise have been lost. Abandonment of rail lines has several potential negative effects on rural areas, such as lower grain prices received by farmers, higher transportation costs and reduced profits for rail shippers, loss of market options for rural shippers, foreclosed economic development options in rural communities, and higher road maintenance and reconstruction costs.

Short lines play a critical role in originating and terminating grain transported by rail and promoting economic development along these lines. Particularly important is providing rail service to rural America with the ability to access the Class I rail network. In the decade following 1980, more than 250 short lines were formed, adding to the approximately 220 short lines that existed as of 1980 (Llorens and Richardson 2014). Their numbers continue to increase with 562 short lines operating in 2016 (AAR 2016).

Many changes have occurred in the grain logistics system since deregulation in 1980, and this paper seeks to explain how those changes have affected short line railroad viability.

Definition of Short Lines

The Surface Transportation Board (STB)—the Federal regulatory agency charged with overseeing railroad rate and service disputes—defines railroads into three classes based on their operating revenue. For 2016:

- Class I railroads have operating revenues of $447.62 million or more.
- Class II railroads have $35.81 million or more but less than the Class I threshold.
- Class III railroads have less than the Class II minimum.

These thresholds are adjusted annually for inflation (AAR 2017). In addition, all switching and terminal railroads are classified as Class III railroads.

The term “short line” refers to all Class II and III railroads. The AAR identifies two groups of non-Class I railroads based on revenue and mileage characteristics. Regional railroads are line-haul railroads below the Class I revenue threshold operating at least 350 miles of road and earning at least $20 million in revenue or earning revenue between $40 million and the Class I revenue threshold regardless of mileage operated. Local railroads are line-haul railroads below the Regional criteria plus switching and terminal railroads (AAR 2017).

Objectives

The overall objective of this study is to assess the state of the short line industry and its role in the grain logistics system, including who they are, where they are, which agricultural products they ship in major grain corridors, and in what amounts. The specific objectives are: (1) developing a list of Federal and State short line assistance programs, (2) surveying the operating characteristics of short line railroads, (3) assessing the characteristics of short line agricultural carload traffic, and (4) identifying managers' perceptions on which service characteristics are most important in determining short line success.

Literature Review

Most short line railroad research in the last 20 years focuses on the economic benefits of short line railroads and the difficulty they face in maintaining their tracks and bridges.

Resor et al. (2000) conducted a study on the effects of 286,000 pound railcars on the U.S short line and regional railroad system. The objectives of the study were to estimate the amount of short line and regional railroad trackage which met minimum standards for the use of heavy axle load (HAL) rail cars, and to estimate the investment in components required to bring the entire short line and regional railroad system up to the minimum standard. Resor et al. (2000) developed a survey of track conditions and characteristics for the U.S. short line and regional railroad industry. A questionnaire was sent to all American Short Line and Regional Railroad Association members and 46 railroads responded. The study found that the U.S. 50,000-mile short line and regional railroad system would need 10 thousand miles of new rail and 20 million ties to bring the entire system up to minimum standard. The total cost to upgrade the system to handle HAL cars was estimated at $6.80 billion.

A study by Casavant and Tolliver (2001) was designed to provide information on the potential impact of 286,000 pound railcars on light density track and short lines railroads in Washington State. The study assessed the likelihood of heavier cars being used, and it examined the condition of the track in the State. The study included technical analysis using railroad track models and it was determined that 90 pounds per yard rail may perform marginally at slow speed if there is good tie and ballast support. The authors concluded that 480 miles of track would need to be upgraded to handle the 286,000-pound rail cars at a cost of between $250,000 and $300,000 per mile with the total cost ranging $117 to $140 million.

Bitzan and Tolliver (2001) contains a discussion of the economics of heavy covered hopper cars. The authors performed simulations of HAL cars to determine what track weight would be able to handle HAL cars. Engineering equations were used to simulate track performance for light rail and for heavier rail. The authors found that any track of less than 90 pounds per yard to be inadequate for HAL rail car traffic.

In 2003, Bitzan and Tolliver provided insights into specific areas where abandonment was likely to occur. Abandonment was treated as a result of an inability to handle 286,000-pound rail cars and insufficient returns from investment in track upgrades. The study modeled a railroad's decision to upgrade as an investment decision. A firm will invest in a project as long as the internal rate of return to the project exceeds the return available from alternative investments. The investment decision approach to line upgrading was a unique aspect of this study. The authors concluded that railroads were unlikely to upgrade a short line with traffic of less than 200 cars per mile. However, the study also discussed alternatives to abandonment. Longer term

financing may allow short lines to upgrade track with traffic density of 150 cars per mile. They said increased revenue splits with Class I railroads and partial subsidies in the amount of avoided highway damage would also provide greater incentives to upgrade track.

Martens (1999) examined the effects of 286,000 pound rail cars on U.S. short line and regional railroads. He developed a 16 question survey which was sent to 88 railroads and 39 were returned. The survey requested information on the amount of track miles likely to be closed or upgraded due to use of HAL cars. It also requested the effects of HAL cars on train speed and how shippers would be affected. In addition Martens (1999) analyzed the impacts of rail line abandonments attributable to use of HAL railcars. The study found that 38 percent of the U.S. short line rail system was incapable of handling 286,000 pound rail cars even at the slowest operating speeds. It was also determined that the average track upgrading cost for lines which would otherwise be abandoned due to increased use of HAL cars would be $118,662 per mile.

Babcock and Sanderson (2006) published a study titled "Should Short line Railroads Upgrade Their Systems to Handle Heavy Axle Load Cars?" Motivated by lower costs per ton-mile, U.S. Class I railroads have been replacing 263,000 pound covered hopper cars with 286,000 pound cars. In many cases, short line railroads would have to upgrade their tracks and bridges to handle the heavier cars. The authors used rate of return analysis for a sample of U.S. short lines to determine if short line owners will likely upgrade their infrastructure or abandon the railroad. Analysis revealed that the total cost to upgrade 1,583 miles of mainline track and 1,352 bridges of five short lines in Kansas was estimated to be $308.7 million. None of the short lines in the analysis can earn an adequate rate of return on upgrading track and bridge investment. If the short lines in the study are abandoned, the annual road damage cost will increase by over $58 million.

The Iowa Department of Transportation study (2002) was motivated by the State's recognition of the need to assess the potential magnitude of rail line abandonment due to increasing use of HAL railcars. An important aspect of the study was the physical inspection of 97 percent of the short line track in Iowa. Track information, such as weight and general condition, was recorded during the inspection. Data was collected on the number of good ties per 39 feet rail length and depth and condition of ballast. Logic tables from Resor (2000) were used to evaluate track components and necessary upgrading costs were calculated. Costs were calculated using material and labor costs from railroads. The minimum short term cost reflected immediate needs utilizing "marginal" rail and upgrading of ties and ballast to an "OK" status. The minimum short term upgrade cost was estimated at $117,000 per mile or a total of $297 million for the State. The study also determined a long term cost of $154,000 per mile.

Sage et al. (2015) develop an inventory of short line rail infrastructure that can be used to support a data-driven approach to identifying rail system needs. The study provided an inventory of existing infrastructure conditions on short line railroads in Washington State. It developed a detailed, preliminary estimate of the total investment needed to bring the system up to modern industry standards. The study contained case studies highlighting the role short line railroads and regional transload centers play within the State's regional economies. The study provided a review of funding strategies employed by other States to support short line railroads. They found that more than 55 percent of all short line miles within Washington are not able to efficiently handle 286,000-pound rail cars. Overcoming this deficiency would require infrastructure investments of about $610 million. The authors said that this need exceeds the current funding

support by the state even if considered over a 20-year horizon with private industry and/or local jurisdictions providing significant matching funds. The study also found that much of the existing short line system in Washington does not meet the state's current or future capacity and velocity needs for efficient operations. Productivity and safety of the system suffers from deferred maintenance. For example, over 55 percent of the short lines' road miles are less than 112-pound rail, the recommended weight to efficiently operate 286,000-pound rail cars.

Jared Llorens and James A. Richardson (2015) assessed the economic role and impact of short line railroads in the state of Louisiana in "Economic Impact of Short Line Railroads." According to the authors, short line railroads are small but significant components of the state's business connections. They describe the scope and presence of the 11 short line railroads currently operating in Louisiana paying attention to their role in facilitating the transportation of goods to and from Class I railroads. Next they provide a detailed description of the broader economic contribution of short line railroads focusing on employment levels and industries served as well as estimates of the economic impact of the short line railroads on the State and selected regions of the State. The authors found that short lines account for about 1,821 direct and indirect jobs in the State. They found that short lines directly support the State's leading industries (agriculture, oil, and gas) which represent the major drivers of the State's overall economy. These major industries support over 260,000 jobs or close to 15 percent of all jobs in the State, and these core industries create the opportunity for other businesses to be successful. Also, they discuss short line policies that should be considered by Louisiana. These include: (1) State rehabilitation grants, (2) State loan programs, (3) State loan/grant hybrid programs.

U.S. Department of Transportation, Federal Railroad Administration examined short line capital needs and government assistance programs in *Summary of Class II and Class III Railroad Capital Needs and Funding Sources (2014).* The report says short line railroads have relied on State and Federal programs to invest in infrastructure and maintain facilities. Many States have robust programs to assist short line railroads. At the Federal level short lines can access loans through the Railroad Rehabilitation and Improvement Financing (RRIF) program. Also the Transportation Infrastructure Generating Economic Recovery (TIGER) Program has a competitive grants program. The 456 tax credit is another Federal assistance program. The report notes that many States have implemented short line railroad assistance programs that provide low interest loans and grants to improve service, upgrade tracks and bridges, and add capacity. Local benefits of the assistance programs include increased farm and business opportunities, shipper cost saving and avoided business closures.

Qiao et al. authored *Transportation and Economic Impact of Texas Short Line Railroads* (2010). The authors sent survey invitations to 43 Texas short line railroads and 20 responses were received. The software IMPLAN was used to measure the economic impact of short line railroads at both the state and county levels. Transportation impact analysis was conducted to estimate the cost by rail and the cost by truck. Shipping cost, safety cost, maintenance cost, highway congestion costs, and emission cost were calculated in the analysis. Results indicated that on average, the shipping cost of a short line is 7.5 percent less than truck. The total transportation cost of short lines is 24.3 percent less than that of truck. The estimation also shows that the operation of 14 surveyed short lines took 417,177 trucks off Texas highways in 2015. The economic impact analysis results indicate that, at the state-level, the operation of short line railroads in Texas contribute about 1,416 jobs, $113,769,627 in labor compensation, and $354,443,588 in economic output. The report also found that Texas short lines have substantial

infrastructure needs. The need for more State funding was mentioned by several railroads during the survey and interviews. As Texas short lines play a significant role in the State economy there is a necessity to establish assistance programs for short lines to help maintain and improve the existing infrastructure according to the authors. However, most Texas short lines do not have sufficient revenues or access to the large amounts of capital that are necessary to rehabilitate their infrastructure. Track and bridge conditions often cause short lines to operate at minimal train speed which reduces operating efficiency and limits their ability to attract new business to the line.

Methodology

This study's methodology involves personal interviews and surveys of executives of short line railroads and State Department of Transportation (DOT) rail personnel. The sample States are listed in Table 1. They were selected on the basis of large crop production and geographic diversity. In addition, there is at least one agriculturally-oriented short line in each of these States. In some cases, a short line will own other short lines, in which case each was counted individually, so all together the sample includes 47 agriculturally-oriented short lines. The survey (Appendix A) has five parts: (1) General Questions, (2) Traffic by Commodity, (3) Equipment, (4) Markets and Competition, and (5) Short Line success profile.

In the summer of 2016, personal interviews of short line personnel were conducted in the States of Kansas, Oklahoma, Missouri, Nebraska, Iowa, and Illinois. The rest of the sampled short lines were contacted by phone. Eighty six percent of the railroads contacted completed the detailed survey.

DOT personnel from the 17 States were contacted by phone. Fourteen of them completed a separate survey that included questions on the characteristics of the State short line assistance programs, eligibility requirements, benefits and costs, and the impact of short line assistance programs on short line profitability and rural economic development (Appendix B). Three of the contacted States – South Dakota, Missouri, and Texas – do not have railroad assistance programs and therefore did not complete the survey.

Data was supplied on the condition that the railroad's data not be identified by the railroad's name in the final report. Since the study is focused on the agriculturally-oriented railroads as a group, no individual railroad was identified in this report.

Carload survey responses were categorized according to the base agricultural commodity. The "corn" category encompasses corn, corn oil, corn syrup, corn gluten, corn starch, corn germ, and wet corn milling. The category labeled "soybeans" encompasses soybeans, soy bean meal, soybean cake, soybean oil, soybean flour and soybean flake. The category labeled "fruits and vegetables" encompasses vegetable oil, vegetable oil seed cake, canned fruits, frozen vegetables, vegetable meal, and catsup/tomato sauce.

Table 1: 2015 Crop Production of Sample States (thousands of bushels)		
State	Production	Rank
Iowa	3,060,080	1
Illinois	2,593,816	2
Nebraska	2,067,816	3
Minnesota	1,903,834	4
Kansas	1,332,270	5
South Dakota	1,157,659	6
Indiana	1,114,680	7
North Dakota	950,803	8
Ohio	767,940	9
Missouri	663,885	10
Wisconsin	600,930	11
Texas	524,890	12
Michigan	472,795	13
Montana	238,738	14
Oklahoma	167,865	15
Idaho	160,120	16
Washington	128,805	17
*Includes corn, wheat, sorghum, and soybeans Source: U.S. Department of Agriculture, National Agricultural Statistics Services. *Annual Statistical Bulletin.*		

Overview of the Short Line Role in Major Grain Supply Chains

Corn is transported to markets in two patterns—domestic and export. Trucks handle most of the domestic market. Railroads, including short lines and Class I Railroads, handled 33 percent of the export market and 30 percent of the domestic market (Denicoff et al. August 2014). Short lines often originate corn traffic in rural areas and connect to Class I railroads for long distance shipment. They also compete with trucks for shorter-distance, domestic shipments, like from elevator to feed lots.

Soybeans are processed in crush facilities to create soybean meal and oil. Most of the crushing facilities are located in Illinois, Minnesota, Iowa, and Indiana (Denicoff et al. October 2014). Soybeans are exported to the Pacific North West (PNW) by rail. Short lines and Class I railroads collaborate on this traffic. Short lines also compete with trucks to move soybean products like soybean oil from elevators to ethanol plants.

Most wheat is transported by rail to flour mills and ports from Midwest production areas. Wheat is transported from the production areas in Kansas, North Dakota, Montana, Washington and Oklahoma to domestic flour mills and for export through the PNW and the Gulf of Mexico (Denicoff et al. November 2014). Short lines originate some of these movements for connection

to Class I railroads, particularly with exports, and for shorter-distance, domestic shipments to flour mills.

THE STRUCTURE OF THE U.S. SHORT LINE RAILROAD INDUSTRY

Short line railroads have grown from 8,000 miles of track in 1980 to 47,500 miles in 2017 (ASLRRA 2017). In 2015, there were 24 Class II railroads and 579 Class III railroads (ASLRRA 2017, p. 12) that transport agriculture, chemicals, coal, lumber, paper, metal products, motor vehicles, petroleum products, and trailers and containers. In 2015, carloads of grain and food products ranked second behind intermodal for short line carload traffic with slightly more than 1 million carloads, 12 percent of total 2015 carloads (ASLRRA 2017, p. 11).

A notable change in the short line industry has been the consolidation of the Class III railroads under the control of holding companies. In 2014, there were 27 holding companies that control nearly 270 short lines (Federal Railroad Administration 2014). Holding companies have geographic and commodity diversity resulting in a lower risk of default on loans. Holding companies have relied on multiple sources of funds to finance infrastructure projects, but have identified many remaining investments to be made, particularly the upgrade of track to handle 286,000 pound rail cars as well as the repair and replacement of bridges.

FEDERAL AND STATE SHORT LINE FINANCIAL ASSISTANCE PROGRAMS

Many short lines defer maintenance on their tracks because they do not have enough revenue (Sage et al. 2015). Given the significant public benefits of short lines, the Federal government and many States have instituted financial assistance programs to help them develop their infrastructure. Many States have short line assistance programs with the goal of ensuring transportation options and maintaining a balanced transportation program.

Federal Programs

Since 1998, the Railroad Rehabilitation and Improvement Financing (RRIF) program has provided over $70 million in loans to Class II and III railroads (Sage et al. 2015). The act and its amendments provided loans to improve or rehabilitate intermodal facilities and railroad equipment of Class II and III railroads.

In 2004, a Federal short line tax credit, commonly known as a 45G, was passed to enable and encourage private investment in rail line rehabilitation. The 45G is a Federal tax credit for up to 50 percent of track maintenance and qualified infrastructure expenses. The maximum credit available to a short line is determined by the product of the short line's total track miles multiplied by $3,500. Total track miles includes the number of miles of railroad track owned or leased by the short line, as well as the number of miles of railroad track assigned to the short line by a Class II or Class III railroad which owns or leases such railroad track.

In 2009, the American Recovery and Reinvestment Act (ARRA) was passed. It is more commonly known as the law that authorized the very popular Transportation Investment Generating Economic Recovery (TIGER) grants. TIGER grants are typically used to leverage other funds for larger projects (Sage et al. 2015).

State Programs

State assistance to short lines can be classified into three categories: (1) rehabilitation grants, (2) loan programs, and (3) loan/grant hybrid programs. Rehabilitation grants award funds on a

competitive basis for capital improvements that directly benefit economic development interests (Llorens and Richardson 2014). This would include construction of a new line, existing track upgrades, or construction of rail yards. State loan programs are intended to provide financing alternatives for short line railroads where there may not be viable financing for capital improvements. This would include rail track upgrades, as well as purchasing or rehabilitating rail equipment necessary to maintain essential rail service. Loan/grant hybrid programs combine elements of both grants and loans.

While the State programs differ in form, they all support the goal of maintaining a viable short line network in their State, given the challenge of handling 286,000 pound rail cars (Llorens and Richardson 2014). Questions 1 and 2 of the DOT survey (Appendix B) deal with the characteristics and eligibility requirement aspects of short line assistance programs of the sample States with the exception of Nebraska, South Dakota, and Texas which don't have assistance programs for short lines. Questions 3 and 4 deal with the economic effects of State short line assistance programs (Appendix B).

Idaho

Idaho established the Rural Economic Development and Integrated Freight (REDIFiT) program in 2006, which is administered by the Idaho State Department of Agriculture (ISDA). The program serves the State's interest in maintaining competitive transportation services for Idaho's freight shippers, reducing public road maintenance and repair costs, increasing economic development opportunities, increasing domestic and international trade, creating and preserving jobs, and enhancing safety.

To qualify for a loan, the project must assist qualified rail lines or intermodal freight shippers to upgrade, expand, rehabilitate, purchase, or modernize equipment and facilities for freight shipping infrastructure. Loans are administered through a revolving loan fund by ISDA. The loan amount can be up to 90 percent of the total project cost with 10 percent supplied by the applicant, who must demonstrate to the satisfaction of ISDA and an interagency working group the ability to repay the loan and provide one or more forms of collateral. The main costs are associated with loan administration.

Grants are capped at $100,000 annually with the intent to support planning and development of Intermodal Commerce Authorities. Grants are limited to projects that support the planning and development of Intermodal Commerce Authorities.

According to survey responses, the primary benefit of the assistance programs is in facilitating a short line railroad's ability to upgrade aging tracks while maintaining profitability with low profit margins. The program allows short lines to upgrade tracks and make essential connections to Class I railroads in southern Idaho which have a positive effect on the railroads' profitability. In particular, this has allowed one short line to serve the agricultural community in southern Idaho, and its track upgrades have enhanced its ability to connect to a Class I railroad.

Indiana

Indiana has two short line assistance programs, the Grade Crossing Fund (GCF) and the Industrial Rail Service Fund (IRSF), started in 1999. Because the GCF is a safety program, the grant requirement is simplified by requiring only a completed application from either a railroad or port authority that is in good standing with the Indiana Department of Transportation (INDOT). Local public agencies, in addition to short line railroads and port authorities, are

eligible to receive grants from the GCF. Eligible grant projects include LED installation, signage, sight obstruction removal, and crossing service maintenance. The State pays 100 percent of material costs for LEDs and signage and 50 percent of the cost for sight obstruction removal and crossing surface.

Under the IRSF, eligible short line railroads and port authorities can apply for loans and grants for tie and/or ballast replacement, rail replacement, bridge construction/repair, rail spur or siding projects, or other types of rail infrastructure projects. The State pays 75 percent of the total project cost, not to exceed $300,000. The IRSF program requires a more detailed application – a project outline and description, management information, detailed project budget, and annual report data -- and that the railroad be current on INDOT reporting requirements. Railroads are encouraged to provide more than 25 percent of project costs.

Reported benefits of the GCF are safety improvements at rail-highway intersections with the goal of reducing accidents. The benefits of IRSF have been the preservation of rail service, and infrastructure improvement on short line railroads.

Indiana legislators, industry specialists, and local units of government believe that since railroads are the most capital intensive industry, programs like the IRSF and GCF allow railroads to be more competitive in their rate structure through publically shared capital expenditures to include upgrading their lines to handle 286,000 pound rail cars.

Illinois

Illinois has the Rail Freight Program administered by the Illinois DOT. The program provides assistance for freight rail capital improvements to railroads, rail shippers, as well as local communities. The project must provide a public benefit (i.e. job creation/retention or transport cost saving) and show a benefit cost ratio of 1.0 or greater to be eligible. However, it doesn't provide assistance for maintenance expenses or equipment purchases. Program-funded improvements must be maintained for a minimum of five years (or in the case of loans, for the duration of the loan period) by the applicant to ensure benefits are achieved that justify the project. The State reviews the financial condition of the applicant before a loan or grant is awarded to verify the ability of the applicant to meet the requirements of the loan/grant agreement.

The program can provide both loans and grants. The State's share of short line assistance varies depending on the project. The program can provide up to 100 percent of the project cost if warranted by the specifics of the project. Between 1983 and 2007 State assistance to short lines amounted to $2,751,097 in loans, $25,671,897 in grants, and $4,725,737 in combination of grants/loans. According to Illinois DOT personnel, total assistance was $33,148,731 to 16 railroads.

Respondents described the primary purpose behind the Rail Freight Program as the preservation of private sector rail service on freight lines and the promotion of economic development of a rail-dependent industry. Within those parameters, the program provides assistance to short lines even though it is not the primary purpose.

Iowa

Iowa has the Railroad Revolving Loan and Grant (RRLG) program, which is the current iteration of a program that began in 2006. However, Iowa DOT (IDOT) has had some type of rail assistance program since 1974. The RRLG program has three types of loans or grants.

1. Target job creation (grant of up to $12,000/job created or retained).
2. Rail network improvement loans at zero interest for up to 10 years. These are normally directed towards railroad rehabilitation, bridge repairs or replacement, or rail capacity improvements but can also be industrial sites without job creation.
3. Rail port feasibility studies (grant of up to $100,000) to determine the feasibility of rail-served, shared facilities.

The selection process takes into consideration such things as increased traffic estimates and operating or efficiency improvements. Industries, railroads, communities, and economic development organizations are eligible to apply, but the programs require a private match conducted on a reimbursement basis.

For targeted job creation, the State's share is 50 percent for a grant up to the limit, but a loan is available for any remaining balance. For rail network improvement, the State's share is 80 percent of the loan, requiring a 20 percent match. For a rail port feasibility study, the State's share is 80 percent of the grant, requiring a 20 percent match up to $100,000. The amount awarded depends on loan repayments and legislative appropriation.

For fiscal years 2016 through 2017, IDOT awarded nearly $18 million in grants and $23.7 million in loans. Of the $18 million in grants, 5.1 million was awarded to short lines. Of the $23.7 million in loans, $12.5 million was loaned to short lines.

One of the most significant impacts of the RRLG program occurred in 2009 when severe flooding drastically affected Iowa railroads. Short lines were asked to provide an abbreviated application for assistance, and as a result, nearly $4 million in immediate assistance helped the short lines speed repairs so they could service customers and reinstate revenues. The following year, an additional $1 million was provided to one short line that had been bisected by a destroyed bridge. Additionally, another short line accelerated a bridge replacement program and was awarded funds in subsequent years to add resiliency from flooding. Bridge replacement and yard and line rehabilitation for short lines have all been assisted by the RRLG program. Since 2006, the RRLG program has provided $5.1 million in grants to short lines and $17.5 million in loans.

Short lines have been able to make improvements to serve or encourage business development, increase yard efficiency, and improve resiliency in the event of future flooding that they may not have been able to make happen without RRLF funding. Several of the short lines have made good use of the funding, creating opportunities for rural economic development while increasing revenue. Other short lines have been able to increase the level of service to customers with yard or line improvements.

Kansas

Kansas has the State Rail Service Improvement Fund (SRSIF), which is funded annually at the beginning of each State fiscal year. Types of assistance include track rehabilitation/maintenance,

track construction, and capacity improvement. Applicants have to provide estimated traffic counts, a project description, and the cost of the project. Applications are graded on a benefit-cost analysis and estimate of economic benefits. Railroads, port authorities, shippers, and local units of government in coordination with the serving railroad are eligible to apply. The program includes loans or grants or both. For loans, the State has a 40 percent loan at a 2 percent interest rate with a 10-year payback. Kansas also provides a 30 percent reimbursable grant with a 30 percent recipient match.

The short line railroad assistance plan has had many benefits including continued rail service (lines that would have been abandoned were not) and improved customer service (improved car delivery times and service schedules). Other benefits include improved operating efficiencies (increased operating speeds, improved use of crew time, and removal of slow orders), which improves railroad profitability and allows the railroads to put additional funds into their capital maintenance programs. The program also resulted in an increase in rail carloads, resulting in fewer trucks on the highways and less highway maintenance costs.

The SRSIF has had a positive economic impact on rural economic development by preventing the abandonment of many short line segments. As a result, continued service has provided rural shippers (primarily agriculture--grain and fertilizer) a more cost effective shipping method for both outbound and inbound carloads.

Michigan

The Michigan Rail Loan Assistance Program (MiRLAP) started in 1997. Any Michigan railroad is eligible to apply but the program was created specifically with short lines in mind. The focus of the program is track rehabilitation and maintenance. The funds can be used for any type of construction or rehabilitation work that is associated with track materials and related structures such as bridges and culverts. Projects are evaluated based on traffic volumes impacted by the project and operational benefits.

The State's share of short line assistance projects is 90 percent of the project costs, up to a maximum of $1 million. Loan funds on private infrastructure are protected with collateral. The program provides no-interest loans through a revolving loan fund that has loaned about $10.3 million to short lines and $18 million in total.

The fund has about a $7.2 million appropriation from the State. Because it is a self-sustaining revolving loan, that appropriation has allowed MDOT to loan $18 million for preservation investments. MiRLAP is designed to help railroads spread infrastructure costs over a 10 year period. However, it has been under-utilized since borrowing in the private sector has become more affordable for short lines.

For the railroads that have used the loan program, it has allowed them to make investments they otherwise would not have the capital to do. Some projects have been directly related to increased traffic volumes associated with new or expanding customers.

Minnesota

The Minnesota Rail Service Improvement Plan (MRSIP) was established in 1976 to preserve and improve essential rail service. The program has 3 components:

1. Rail line rehabilitation – a no-interest loan program providing up to 70 percent (80 percent if the applicant is a regional railroad authority) of total project cost for rail

line rehabilitation. Rail shippers must provide 10 percent of the cost and rail carriers must provide at least 20 percent of total project cost. This part of the program was last used in 2002 to provide the Minnesota Valley Regional Rail Authority a $4.8 million loan as part of a $7 million project to rehabilitate the 94-mile rail line. Projects are eligible for funding if (a) the track does not meet FRA Class I track safety standards or does not have the required structural capacity to support rail cars of 263,000 pounds and (b) is within the physical boundaries of, or predominantly serves rail users in Minnesota.

2. Rail purchasing assistance – involves no interest loans to regional railroad authorities to purchase rail corridors either abandoned or in danger of abandonment. Loans are typically made for up to 50 percent of the lines value. Repayment of the loan is not required as long as the rail line remains in operation and is not sold. If rail operations cease for one year or the rail authority sells any part of the line, repayment is due on negotiated terms.
3. Capital improvement projects – the most common use of the MRSI program involves no interest loan funding to rail users for capital improvement projects up to 100 percent of the total project cost with a maximum amount of $200,000. These funds are subject to a fixed quarterly payment schedule over 10 years.

Projects are then prioritized based on the following criteria: (a) the availability of State or Federal program funds, (b) the probability of the rail line continuing in profitable service after the project is completed, (c) the costs of the project compared to the benefits resulting from the project, (d) financial participation by the rail carrier and rail users in the projects, (e) the significance of the line in relationship to the entire State rail system, and (f) the impact on State, county, and city access to roadways if funding is not provided.

Typical benefits of rail rehabilitation projects are decreased travel time for rail shipments resulting in lower costs for customers, decreased railroad maintenance costs, and operational efficiencies that can be realized and passed on to shippers such as increasing the maximum rail car weight that can be shipped on a line. Another benefit is decreased wear and tear on highways when highway shipments are diverted to rail or existing rail shipments are not lost to trucks because of a more competitive rail service.

Costs generally include capital costs that can be tracked at the project level. Other components of cost are operations and maintenance costs, but these costs are not usually reported.

Many small communities have medium-sized businesses that are rail dependent to both ship and receive goods. The loss of rail service would be detrimental to many of these businesses because the higher cost of other modes might be unsustainable. The MRSIP program provides short lines, regional rail authorities, and shippers with financing tools to improve rail service and, in some cases, prevent rail lines from embargo (service closure) due to track condition and capital needs. Often times, the availability of such financing tools is otherwise either absent in the private market or has an unrealistic cost for the viability of the line.

Montana

Montana's Essential Freight Rail Loan Program (MEFRLP) funds projects that are directly related to the Montana railroad transportation system. Eligible activities include preserving and continuing viable railroad branch lines through development, improvement, construction,

purchase, maintenance, or rehabilitation of intermodal transportation facilities, branch line or short lines sidings, light density railroad lines, and rolling stock, including rail cars. Eligible applicants include railroads, cities, counties, companies, regional railroad authorities, and port authorities.

The MEFRLP is a low interest revolving loan fund administered by Montana DOT. Recipients pay back zero interest loans over 10 years. Matching requirements vary between 30 percent and 50 percent. No loans have been made since 2013.

Rural economic development has been enhanced by the MEFRL program through the improved transportation of rail freight and resulting economic prosperity. Costs are minimal and include programs administration.

North Dakota

The North Dakota Department of Transportation (NDDOT) administers the Rail Loan Program, which comprises the Freight Rail Improvement Program (FRIP) and the Local Rail Freight Assistance (LRFA) program. Loans are available to short line railroads (and other entities such as cities, counties, and users of freight railroad service, but not Class I railroads) for system critical, infrastructure improvement, or economic development projects. The LRFA program evolved from a federal program, the Local Rail Service Assistance (LRSA) program, where North Dakota awarded its first loan in 1979. LRFA funds were considered federal funds until October 2008, when a change in federal law transferred these funds to the States. Between 1982 and 2014, North Dakota LRSA/LRFA activity was $27.6 million with $20.8 million matching for a total of $48.3 million involving 548.4 track miles. NDDOT established the FRIP in 1995, using interest from repaid LRFA loans as a funding source.

The only available assistance to short line railroads from NDDOT is the Railroad Loan Program, but it is not exclusive to short lines. The program adopts a tiered system where the loaned terms depend on whether the project is considered to be mission critical, relating to infrastructure improvement or economic development. This program offers available funding for all types of projects within those categories. NDDOT requests a benefit-cost analysis including the number of carloads per mile, system connectivity, economic development impact, safety issues, and environmental/community benefits.

The benefits of these programs are fewer abandonments, rail system service connectivity to outlying elevators, and strengthening short line railroads so that they may offer competitive rates for transportation services. Other benefits include economic growth of the State as industry is able to get its goods to market.

The North Dakota Rail Loan Program replenishes itself via loan and interest payments. Despite a recent $7 million infusion, the program has not needed outside funding throughout its duration. To date, the program has not seen a default on any loan provided to a short line.

Ohio

The Ohio Rail Development Commission (ORDC) has a grant and loan program consisting of about $3 million in grant funding and $2 million in loan funding available annually. ORDC solicits railroads in March for the projects but accepts projects on a rolling basis throughout the year. Project eligibility includes track rehabilitation, bridge/culvert/tunnel repair, spur tracks, sidings, and rail infrastructure that can be linked to economic development opportunities in the

State. Grant amounts are based on need, job creation, carload commitments, and outside investment but are usually no more than 50 percent of project costs. For loan projects, ORDC will consider providing more than 50 percent of total project cost.

ORDC believes a good short line project is one that would not be done without State help. Ideally, if a short line has a list of 6 projects that it has decided to fund from its own resources, ORDC strives to fund projects 7 and 8 on the list with State resources. In addition to due diligence prior to approval, ORDC has performance metrics in its contracts which delineate a project's scope, required private investment, infrastructure maintenance post completion, as well as investment and job creation/retention. If a grantee fails to meet grant requirements ORDC requires repayment of grant funding.

By assisting short line railroads, ORDC has ensured companies remain in Ohio, spurred millions of dollars in private investment in Ohio industries resulting in a more profitable short line industry, guaranteed access to shippers resulting in transportation savings to their companies, and reduced highway maintenance costs to the State.

ORDC's assistance programs have been a vital component to keeping hundreds of miles of short lines operational, which in turn has helped preserve thousands of jobs. These lines are essential to a robust and competitive transportation network for Ohio shippers. The existence of short lines in Ohio has allowed transportation options for new and existing companies, ones that attract and retain rural businesses.

Oklahoma

Oklahoma has a long history of purchasing lines to preserve them. At one time, Oklahoma owned 818 miles of railroad and used the lease payments to rehabilitate many of the lines. Today Oklahoma owns 135 miles and is in the process of selling another 40 miles of line. Of the 135 miles, 25 miles are out of service. The Oklahoma loan program is similar to that in Kansas, but it has not been used since passage in 2003. If Oklahoma used a loan program, the applicant project would need to have a benefit-cost ratio of 1.0 or better to qualify for a loan.

The State-owned construction and maintenance work plan provides an annual projection for construction and maintenance needs of the State-owned railroad infrastructure. Railroads are required to comply with the agreement between Oklahoma Department of Transportation (ODOT) and the operators to maintain State owned rail property. Only the lessee of the State owned rail property is eligible for assistance.

Respondents said the Oklahoma program has preserved the economy of rural Oklahoma. It has preserved the business that existed before and allowed the growth of oil, gas, sand, rock, and agriculture to continue in rural Oklahoma.

Washington

The State of Washington administers both a grant program and a loan program designed to support freight rail capital needs. The grant and loan programs are administered by Washington DOT and require applicants to provide a business plan for the project and are subject to a benefit-cost calculation to ensure they are generating public benefits.

The Freight Rail Investment Bank (FRIB) is a loan program available to the public sector. This program is intended for either smaller projects or as a smaller part of a larger project where State

funds would enable the project to be completed. The loan program is open to organizations in the public sector only.

The Freight Rail Assistance Program (FRAP) is a grant program open to applicants in both the public and private sectors. This program is directed toward larger projects where it is difficult to obtain sufficient funding and where the rail location or project is of strategic importance to the local community and the State. The grant program is open to cities, county railroad districts, counties, economic development councils, port districts, and privately and publicly owned railroads. Projects must be shown to maintain or improve the freight rail system. The application process for loans allows the applicant to self-score 80 percent of their marks which are based on their own financial contribution and the number of jobs that the project will bring to the area. All applicants for a loan must provide a minimum 20 percent match, and the loan maximum is $250,000.

Wisconsin

The Freight Railroad Preservation Program (FRPP) is a grant program that provides up to 100 percent funding for line acquisition (typically when a line is abandoned or threatened with abandonment) and up to 80 percent funding toward the cost of rehabilitation of publically-owned lines to preserve essential freight rail service. Eligible projects are scored on transportation efficiency, railroad system (e.g. connections to other railroads), and location criteria (e.g. rural vs. urban). A local partner, such as local government, rail commission, shipper, and/or a railroad, is required. FRPP does not fund normal maintenance activities. Since 1980, Wisconsin DOT has provided grants totaling $265 million for acquisition of rail lines and rehabilitation of tracks and bridges.

The Freight Railroad Infrastructure and Improvement Program (FRIIP) provides loans that enable the State to encourage a broader array of improvements to the rail system. The FRIIP provides up to 100 percent loans for rail projects that connect an industry to the national rail system; make improvements that enhance transportation efficiency, safety, and intermodal movement; accomplish line rehabilitation; or develop the economy. Available funding is from the repayment of prior loans. It also provides for rail-related projects such as loading and trans-loading facilities.

Assistance is usually limited to no more than $3 million and is provided in the form of a loan requiring payment of a minimum of 2 percent interest per year. The total amount of any loan committed to non-rail purposes is limited to $1.5 million dollars. To be eligible for loans, the applicant must be a city, county, railroad, or a current or potential user of freight rail service.

The FRPP has benefitted the State by rehabilitation of rail lines and preserving essential freight rail service. The FRIIP has resulted in a broader array of improvements to the rail system with rail-related projects such as loading and trans-loading facilitates. Wisconsin's programs are designed to provide capital that enhances transport efficiency. Thus, the assistance programs succeeded in preserving freight railroad lines that are economically feasible. The programs reduce the railroads' cost of capital for facilities, improving their profitability and reliability in servicing shippers. Since 1980, the number and size of shippers on assisted lines have grown substantially based on the increase in gross carloads and carloads per mile. Anecdotally, Wisconsin DOT personnel hear that when farmers use a railroad instead of a truck, they obtain higher prices for their agricultural products due to lower shipping costs.

RESULTS OF THE SHORT LINE RAILROADS AND AGRICULTURE SURVEY

The principal data source for this study is the survey (Appendix A) administered to 47 short line railroads (Class II and III railroads). A few railroads had incomplete surveys, but additional information needed to complete the survey was obtained for the railroads through on-site visits in the summer of 2016. These visits occurred in Kansas, Missouri, Arkansas, Oklahoma, Nebraska, Iowa, and Illinois. The survey contains five parts which are:

Part A – General Questions

Part B – Traffic

Part C – Equipment

Part D – Markets and Competition

Part E – Short Line Success Profile

Results – Part A – General Information

Part A contains general information about the agriculture oriented railroads. Part A requests the following information:

When did the railroad begin operating?

Employment?

Ownership?

Route Miles?

How many track miles can handle 286,000 pound rail cars?

Connecting railroads?

Received State government financial assistance?

Received Federal government financial assistance?

Table 2 contains the results for initiation of operations. As indicated by the data in Table 2, about 42 percent of the sample railroads began operating in the 1990s. The 2000s accounted for about 29 percent and the 1980s for about 27 percent. Therefore, 98 percent of the sample railroads began operations after the Staggers Rail Act was passed in October 1980.

Table 2: Decade of Start of Operations of Agriculture Oriented Short Lines		
Decade	**Number of Railroads**	**Percent of Total**
2000s	12	29
1990s	17	42
1980s	11	27
1970s and earlier	1	2

Figure 1 and Figure 2 show the distribution of short line railroads and total employment by short line size. Employment per railroad varied from 2 to 1,200. Most (84 percent) short lines have fewer than 100 employees. However, the majority of total employment in the short line industry lies in short lines with greater than 100 employees. Railroads with 100 employees or more, together, accounted for 69 percent of the total sample railroad employment of 4,038. The top railroad alone had nearly 30 percent of total sample railroad employment.

Figure 1: Distribution of Short Line Railroads by Short Line Size

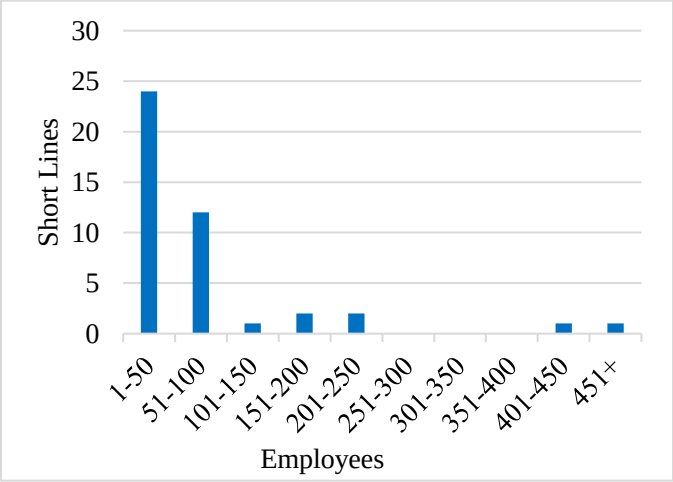


Figure 2: Distribution of Total Employment by Short Line Size

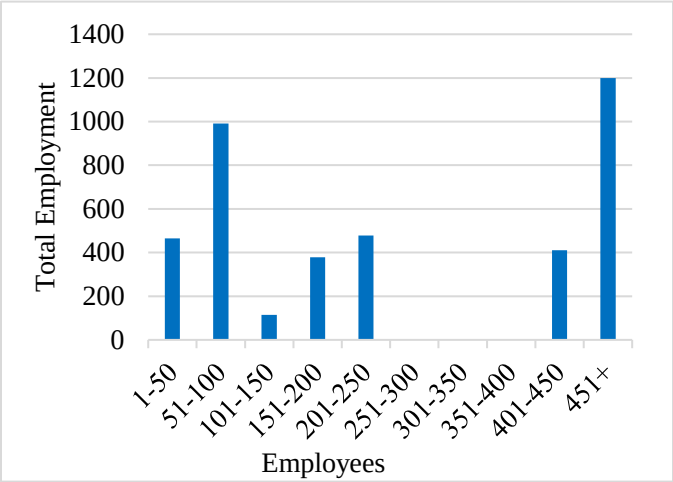


Table 3 contains total track mile data and miles of track capable of handling 286,000 pound rail cars. The track miles of the sample short lines vary widely from a low of 29 to a high of 937. For the 39 short line sample railroads, total track miles are 11,091, while track miles capable of handling Heavy Axle Load (HAL) cars are 7,358 or 66 percent of the total miles. The table shows that most (79 percent) short line railroads have less than 500 miles of track, while 35 percent of short line track miles are accounted for by short lines with more than 500 miles of track.

Table 3: Distribution of Total Track Miles and 286K Track Miles

Category (Miles)	Railroads in Category by Total Track	Percent of Sampled Railroads	Miles of Total Track in Category	Percent of Total Track Miles	Railroads in Category by 286K Track	Percent of Sampled Railroads	Miles of 286K Track in Category	Percent of 286K Track Miles
0-100	12	31	716	6	19	49	710	10
101-200	7	18	936	8	8	21	1,226	17
201-300	7	18	1,802	16	5	13	1,275	17
301-400	4	10	1,462	13	3	8	1,065	14
401-500	1	3	433	4	0	0	0	0
501-600	4	10	2,249	20	1	3	555	8
601-700	0	0	0	0	0	0	0	0
701-800	0	0	0	0	0	0	0	0
801-900	2	5	1652	15	3	8	2527	34
901-1000	2	5	1841	17	0	0	0	0
Total	39	100	11091	100	39	100	7358	100

Figure 3 and Figure 4 show the distribution of the short lines and track miles that are capable of handling 286,000 pound rail cars. Most short lines are close to being able to fully handle 286,000 pound cars. Fifty-one percent of the responses said that at least 85 percent of their track could

handle the larger cars. Moreover, a total of 14 railroads (36 percent) said that 100 percent of their track miles are capable of handling HAL rail cars. On the other hand, a significant portion of short lines have a ways to go before being able to fully handle 286,000 pound cars. Twenty-eight percent said less than 50 percent of their track is HAL capable. Moreover, five railroads said that none of their track miles can support the heavier cars. As an interesting side note, the fact that the two distributions are so similar indicates that there is not a strong correlation between short line size and share of track that is 286,000 pound car ready.

Figure 3: Distribution of Short Line Railroads by Percent of Track that is 286K Capable

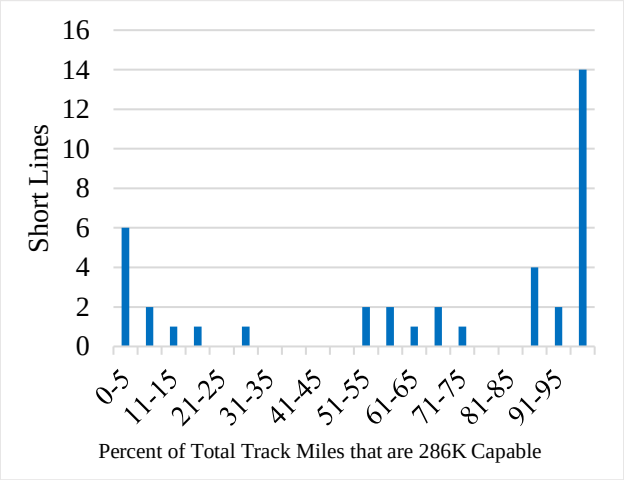


Figure 4: Distribution of Total Short Line Track Miles by Percent of Track that is 286K Capable

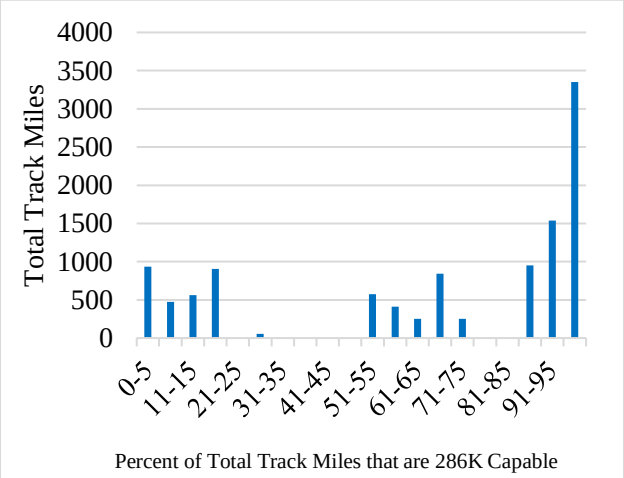
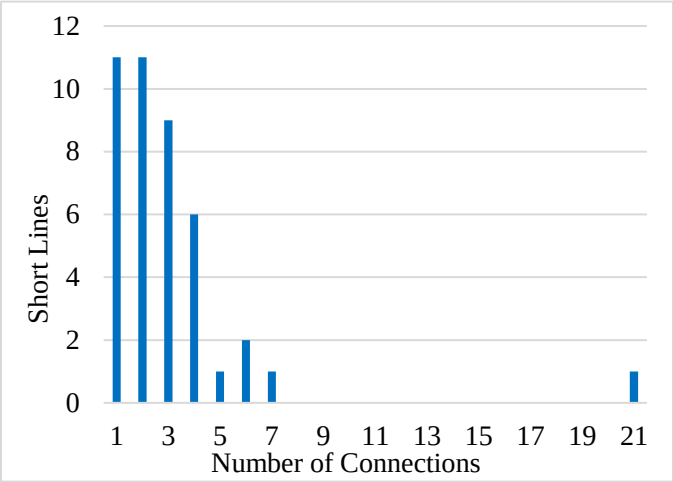


Figure 5 displays the distribution of short lines by their connections to other railroads. The higher the number of connections, the greater is the revenue since the short line would have access to more Class I railroad equipment and access to more markets. Also the greater number of connections, the greater is bargaining leverage over revenue splits with Class I railroads. Survey results indicate that 11 of the 42 sample railroads have connections to only one Class I railroad and are thus "captive" to that connecting railroad. However, the mean number of connections is about three.

Figure 5: Distribution of Short Line Railroads by Connections to Other Railroads



Of 42 sample short lines, 28 reported that they received State assistance in the last 5 years, and 14 reported that they had not received State assistance. A total of 25 short lines reported that they received Federal assistance (mainly 45G tax credits) and 17 said they had not received Federal assistance in the last five years.

Results – Part B –Traffic

This section provides characteristics of agricultural-related traffic by commodity. The short lines were asked to provide data for four types of traffic which are:

1. Originated – Carload shipments of a commodity loaded on a respondent's railroad that have not had previous rail transportation and which terminate on another railroad.
2. Terminated – Carload shipments of a commodity that originated on another railroad but are unloaded off the respondent's railroad with no further rail transportation to follow.
3. Local – Carload shipments of a commodity that both originate and terminate on a respondent's railroad.
4. Overhead – Carload shipments of a commodity that both originate and terminate on other railroads but that are carried by the respondent's railroad in between.

Table 4 displays originated carloads by agricultural commodity shipped by the 47 sample short lines during 2015. Table 4 also shows the percentage distribution of the nine commodity groups along with the minimum, maximum, and mean carloads reported for the commodity group. As indicated by the data in Table 4, corn, soybeans, and wheat collectively accounted for about 80 percent of the total.

Table 4: 2015 Originated Agricultural Carloads by Commodity						
Commodity	**Responses**	**Carloads**	**Percent of Total**	**Min**	**Max**	**Mean**
Corn[1]	29	116,298	42.6	44	12,031	4,010
Soybeans[2]	21	57,668	21.1	3	8,740	2,846
Wheat[3]	22	46,380	17.0	6	13,000	2,108
Ethanol & DDGs	12	40,061	14.7	384	12,780	3,338
Durum Wheat	1	4,467	1.6	4,467	4,467	4,467
Sorghum	4	2,657	1.0	6	2,579	664
Molasses and Sugar	3	2,520	0.9	437	1,496	840
Barley	3	1,921	0.7	46	1,625	640
Canned and Frozen Vegetables	2	1,345	0.4	373	972	673
Total	**-**	**273,317**	**100**	-	-	-

[1] In addition to corn, the figure includes corn oil, corn syrup, corn gluten feed, corn starch, corn germ, and wet corn milling
[2] In addition to soybeans, the figure includes soybean meal, soybean oil, soybean cake, soybean flour, and soybean flake.
[3] In addition to wheat, the figure also includes wheat flour.

Table 5 summarizes the short line terminated traffic by agricultural commodity. Table 5 also contains the share, minimum, maximum, and mean carloads reported for the commodity group. Corn accounts for 46 percent of the total carloads. Corn, fertilizer, and wheat account for almost 90 percent of the total. The total terminated traffic of sample short lines was 54,584 carloads.

Table 5: 2015 Terminated Agricultural Carloads by Commodity						
Commodity	**Responses**	**Carloads**	**Percent of Total**	**Min**	**Max**	**Mean**
Corn[1]	22	25,156	46.1	1	22,608	1,143
Fertilizer	25	14,404	26.4	13	2,684	576
Wheat[2]	18	9,386	17.2	1	3,796	521
Fruits and Vegetables[3]	12	2,452	4.5	1	1,113	204
Soybeans[4]	10	2,018	3.7	2	824	202
Animal Feed	2	1,168	2.1	308	860	584
Total	-	54,584	100	-	-	-

[1] The figure for corn also includes corn syrup, wet process corn milling, corn oil, and corn meal.
[2] The figure for wheat includes flour and grain mill products.
[3] The figure for fruits and vegetables includes vegetable oil, vegetable oilseed cake, canned fruits, frozen vegetables, vegetable meal, and catsup/tomato sauce.
[4] The figure for soybeans also includes soybean oil, soybean cake, and soybean meal.

Next, the "local" carload movements of the 47 short line sample are concentrated in four commodities, all grain, including corn wheat, soybeans, and other grain (sorghum, barley, and oats). Table 6 summarizes the local traffic for these commodities. The total local carloads are 38,263 with corn, including corn meal, accounting for 65 percent of the total.

Table 6: 2015 Local Agricultural Carloads by Commodity						
Commodity	**Responses**	**Carloads**	**Percent of Total**	**Min**	**Max**	**Mean**
Corn[1]	16	24,949	65.2	3	6,509	1,559
Wheat	12	6,916	18.1	6	3,132	576
Soybeans[2]	10	5,671	14.8	1	1,386	567
Other Grains[3]	6	727	1.9	19	304	121
Total	-	38,263	100	-	-	-

[1] In addition to corn, the figure also includes corn meal.
[2] In addition to soybeans, the figure also includes soybean meal.
[3] Other grains include sorghum, barley, and oats.

Overhead carloads for corn and soybeans are complicated by the presence of a relatively large outlier railroad that identified 92,846 overhead carloads. On the survey, the 92,846 carloads were evenly split between corn and soybeans, resulting in 46,423 carloads for each of the two commodities. This figure is 12 times higher than the mean corn carloads and 11 times higher than the mean soybean carloads. Therefore, the overhead carloads for corn and soybeans are calculated with and without the outlier carloads included in the analysis.

Overhead carloads in 2015 are summarized in Table 7, which includes the large outlier railroads' corn and soybean traffic. Corn and soybeans have the largest carloads and the largest percentages among the top 8 overhead commodities with 38 percent and 29 percent respectively.

Table 7: 2015 Overhead Carloads by Commodity Including Outlier Railroad						
Commodity	**Responses**	**Carloads (without outlier)**	**Percent of Total**	**Min**	**Max**	**Mean**
Corn[1]	25	69,820	38.1	2	46,423	2,793
Soybeans[2]	13	53,605	29.3	4	46,423	4,123
Wheat[3]	21	22,318	12.2	1	10,743	1,063
Sorghum and Oats	6	10,060	5.5	3	7,895	1,676
Fruit and Vegetables[4]	14	8,299	4.5	3	3,559	593
Fertilizer	9	8,105	4.4	5	5,487	901
Molasses and Sugar[5]	13	6,979	3.8	3	5,331	537
Barley	3	4,018	2.2	185	3,368	1,339
Total	-	183,204	100	-	-	-

[1] In addition to corn, the figure in the above table includes corn syrup, corn starch, cornmeal, and wet corn milling products.
[2] In addition to soybeans, the figure in the above table includes soybean oil and soybean cake.
[3] In addition to wheat, the figure in the above table includes wheat flour, wheat bran, and grain mill products.
[4] The figure in the above table includes frozen vegetables, vegetable oil, and vegetable see cake.
[5] The figure in the above table includes molasses, blackstrap molasses, sugar mill products, sugar refining byproducts and granulated sugar powder.

However, if the outlier railroad carloads are removed from the analysis, the corn and soybean carloads are significantly reduced. Corn carloads decline to 23,397 (69,820 total carloads less 46,423 of the "outlier" respondent) and soybean carloads fall to 7,182 (53,605 total carloads less 46,423).Table 7 data indicates that corn is still the top commodity if the outlier is removed, but its percentage share of the combined commodities falls from 38 percent to 26 percent. A similar effect occurs with overhead soybean carloads whose percentage share of overhead commodities

falls from 29 percent to 8 percent. The share of overhead carloads for wheat rises from 12 percent to 25 percent.

Table 8 summarizes sample short line carloads by type of traffic with and without the outlier overhead carloads. The distribution of carloads with the outlier overhead carloads results in about half of the total carloads in the originated category, about 10 percent in terminated carloads, 7 percent in local traffic, and 33 percent in overhead carloads. When the outlier overhead carloads are removed from the analysis, the originated traffic share of the total carloads rises from 50 percent to 60 percent. The terminated and local shares rise slightly while the overhead share falls to about 20 percent. Originated traffic is the major traffic type (with and without the outlier overhead carloads in the analysis), and local traffic has the fewest carloads of the 4 types of traffic.

Table 8: Total Carloads With and Without Outlier Overhead Carloads by Type of Traffic

Total Carloads With Outlier Overhead Carloads

Type of Traffic	Carloads	Percent of Total
Originated Carloads	273,317	49.8
Terminated Carloads	54,584	9.9
Local Carloads	38,263	7.0
Overhead Carloads	183,204	33.3
Total	549,368	100

Total Carloads Without Outlier Overhead Carloads

Type of Traffic	Carloads	Percent of Total
Originated Carloads	273,317	59.9
Terminated Carloads	54,584	11.9
Local Carloads	38,263	8.4
Overhead Carloads	90,358	19.8
Total	456,522	100

Results – Part C – Equipment

The first four questions of Part C of the questionnaire deal with the number of locomotives and rail cars owned and leased.

Figure 6 and Figure 7 show the distributions of short lines by total owned and leased locomotives and by the share of locomotives owned. The number of locomotives owned totaled 874, ranging from low of zero to a high of 96. The top 7 railroads (those which own 30 or above locomotives) accounted for 47 percent of the owned locomotives. Twenty-four of the 42 sample short lines leased no locomotives. The other 18 short lines leased 75 locomotives. In total, owned and/or leased locomotives were 949 in 2015. Figure 7 reflects the fact that the large majority of locomotives are owned rather than leased by short line railroads.

Figure 6: Distribution of Short Lines by Locomotives Owned and Leased

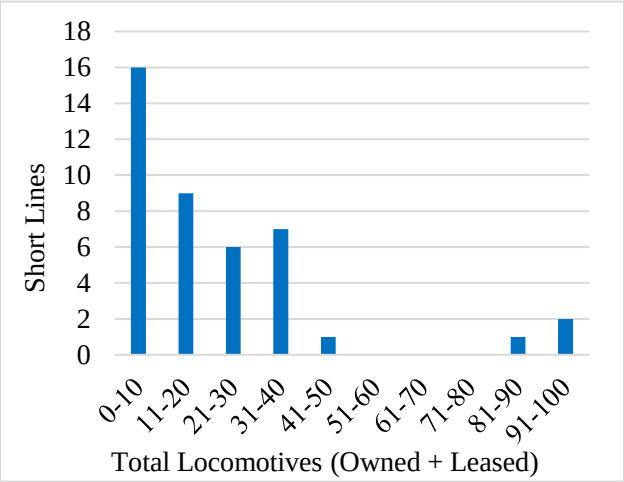


Figure 7: Distribution of Short Lines by the Percentage of Locomotives Owned

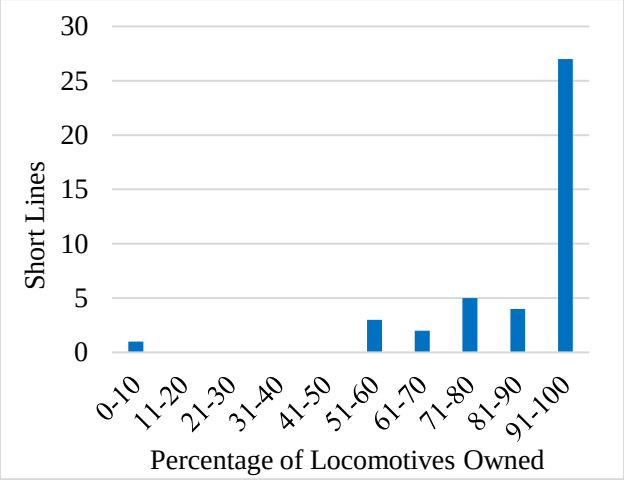


Figure 8 and Figure 9 show the distribution of short lines by rail cars owned or leased and by the fraction of rail cars owned. Rail cars owned ranged from a low of zero to a high of 1,300. The top 6 railroads (290 cars or above) accounted for 71 percent of the total of 6,121 rail cars owned. Rail cars leased ranged from a high of 977 to a low of zero, out of a total 3,841 cars. Thus, total owned cars plus leased cars was 9,962 in 2015.

Figure 8: Distribution of Short Lines by Total Rail Cars

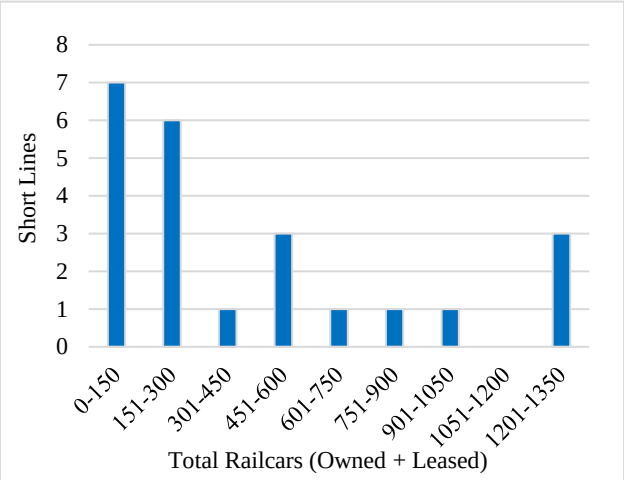
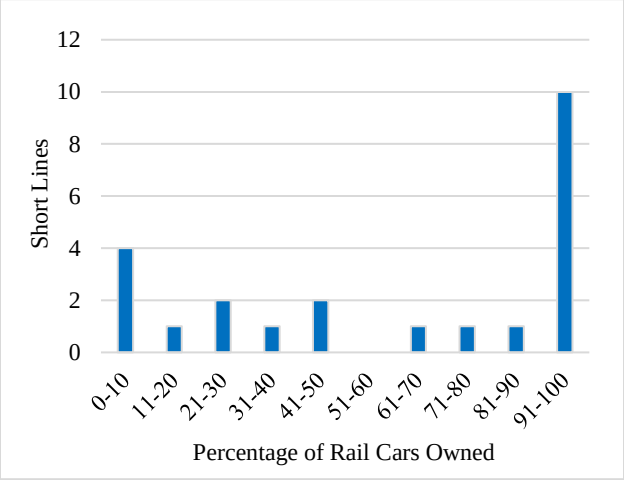


Figure 9: Distribution of Short Lines by Percentage of Railcars Owned



In addition, Part C asks the short lines if they are dependent on Class I railroads for locomotives and rail cars. For locomotives, only 13 percent said they were "very dependent," 23 percent said they were "somewhat dependent," and 65 percent said they were "not dependent" (Table 9). A few of the short lines qualified their response by stating that they were somewhat dependent on Class I unit trains but not dependent for non-unit trains.

Regarding the dependence on Class I railroads for rail cars, 50 percent of the sample short lines said they were "very dependent," 25 percent responded that they were "somewhat dependent," and 25 percent said they were "not dependent" (Table 9). A few short lines said they were very dependent on unit trains but not dependent on non-unit trains.

Part C of the survey also asked the short lines if they had trouble obtaining needed equipment (locomotives and rail cars) during peak periods, such as grain harvests if their railroad was dependent on Class I railroads for that equipment. Only about 3 percent said "all of the time," 61 percent replied "some of the time," and about 37 percent said "none of the time." Thus, the

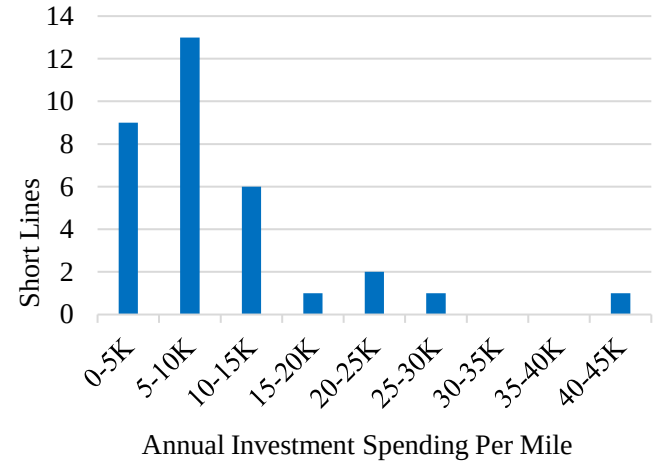
majority of sample short lines are not dependent on Class I railroads for locomotives, but half the short lines said they are very dependent on Class I railroads for rail cars. Short lines do not appear to have difficulty obtaining equipment during peak periods.

Table 9: Short Line Dependence on Connecting Class I Railroads for Locomotives and Rail Cars

Locomotives		
Dependency	**Number of Short Lines**	**Percent of Total**
Very Dependent	5	12.5
Somewhat Dependent	9	22.5
Not Dependent	26	65
Total	40	100
Rail Cars		
Dependency	**Number of Short Lines**	**Percent of Total**
Very Dependent	20	50
Somewhat Dependent	10	25
Not Dependent	10	25
Total	40	100

The final question in Part C is a request for the annual investment to maintain rail tracks and road bed per mile of track. Expenditure per mile varied from a low of $658 to a high of $42,689 (Figure 10). A total of 33 sample short lines provided their annual maintenance per mile. The mean maintenance expenditure per mile was $9,894.

Figure 10: Distribution of Short Lines by Investment Expenditure per Mile



Results – Part D – Markets and Competition

Part D examines agricultural commodities that are subject to intermodal competition for each of four types of traffic. A total of 85 percent of the short lines said they are “very dependent” on

Class I railroads to reach the principle markets they serve, and another 13 percent said they are "somewhat dependent." This is consistent with local traffic being the smallest traffic category and originated traffic being the largest traffic type.

Short lines were also asked to identify modes that compete with respect to their originated agricultural traffic. Forty-seven percent of short line respondents said motor carriers are competitors, while 31 percent said Class I railroads compete with them. A total of 12 percent said they compete with other short lines, and 11 percent said water carriers compete with them. Short line respondents identified corn, wheat, and soybeans as the top 3 agricultural commodities subject to intermodal competition for originated traffic (Table 10).

Table 10: Number of Railroads Identifying Agricultural Commodities as Subject to Intermodal Competition – Originated Traffic

Commodities	Number of Railroads
Corn	24
Wheat	21
Soybeans	13
Animal Feed	8
Ethanol	5
Sugar and Molasses	5
DDGs	4
Sorghum and Oats	3

A total of 54 percent of short lines said motor carriers are the principal intermodal competitor for terminated traffic, followed by Class I railroads (27 percent), other short lines (12 percent), and water carriers (7 percent). Corn, fertilizer, wheat, soybeans, and animal feed were the commodities selected by most sample short lines as the commodities subject to intermodal competition for terminated traffic (Table 11).

Table 11: Number of Railroads Identifying Agricultural Commodities as Subject to Intermodal Competition – Terminated Traffic	
Commodities	**Number of Railroads**
Corn[1]	20
Fertilizer	19
Wheat and Flour	11
Animal Feed	9
Soybeans[2]	8

[1] The figure for corn also includes corn syrup and corn oil.
[2] The figure for soybeans also includes soybean oil and meal.

Survey responses concerning fertilizer shipments provided illustrative examples on how short lines compete with other modes on terminated traffic. One of the short lines said that fertilizer plants have trucks that go to other rail terminals and inland ports to pick up most types of fertilizer. Another short line manager said some shippers have shipped fertilizer via a Class I railroad and then by truck to local buyers. Another short line manager said that fertilizer is shipped to a central location by Class I railroads and distributed by truck to local users.

Next, short line managers indicated which modes compete with them with respect to local traffic. The mode identified as a competitor for local traffic by most short lines was motor carriers (74 percent of sample short lines), followed by Class I railroads (15 percent), other short lines (8 percent), and water carriers (3 percent). Short line managers mentioned corn, wheat, and soybeans as the agricultural commodities most subject to intermodal competition for local traffic.

Table 12: Number of Short Lines Identifying Agricultural Commodities as Subject to Intermodal Competition – Local Traffic

Table 12: Number of Short Lines Identifying Agricultural Commodities as Subject to Intermodal Competition – Local Traffic	
Commodities	**Number of Short Lines**
Corn[1]	19
Wheat[2]	18
Soybeans[3]	10
Barley	5
Sorghum	5
Oats	4
Fertilizer	4

[1] The figure for corn also includes corn syrup and corn oil.
[2] The figure for wheat also includes wheat flour.
[3] The figure for soybeans also includes soybean meal.

The number of railroad managers indicating modal competitors for overhead agricultural traffic was much less than for the other three types of traffic. Only nine managers (19 percent) mentioned trucks as intermodal competitors, and seven (15 percent) indicated Class I railroads are a competitor for overhead agricultural traffic. Reflecting the lower intensity of competition for overhead traffic, wheat and flour, and corn and corn oil had only 7 to 8 short line managers indicating the agricultural commodities were subject to intermodal competition for overhead traffic (Table 13).

Table 13: Number of Short Lines Identifying Agricultural Commodities as Subject to Intermodal Competition – Overhead Traffic	
Commodities	**Number of Railroads**
Wheat and Flour	8
Corn and Corn Oil	7
Soybeans and Soybean Oil	3
Fertilizer	2

In summary, short line managers cited motor carriers as competition for all four types of traffic more often than the other modes of transportation. The commodities most subject to intermodal competition were corn, wheat, and soybeans for both originated and local traffic; corn, wheat, and fertilizer for terminated traffic; and wheat and corn for overhead traffic.

Results – Part E – Open Ended Questions

The following is a summary of responses by short line managers to four open ended questions about competition facing short line railroads. For a selection of actual responses, see Appendix C.

Question 1: *Are shifts in Class I pricing and the move to shuttle trains in grain transport creating an opportunity or a threat to your railroad's competiveness?*

Short line managers that said the changes are a threat stressed the intensity of the competition for grain and fertilizer traffic. One manager, for instance, said Class I pricing favors Class I grain shippers and is putting short lines at a disadvantage. Another said that 20 years ago, their short line had 10 origin wheat shippers and now the railroad has only one. A general theme of the managers viewing changes as a threat is that they have to compete for grain that is trucked to the nearest shuttle facility.

Question 2: *Will your agricultural traffic increase or decrease if current trends continue (i.e., focus on shuttle trains and increased ethanol production)?*

The comments of short line managers for this question on whether they expect their agricultural traffic to increase or decrease depends on market conditions. They said that their traffic is dependent on crop yields and development of drought resistant corn. Another manager emphasized location. He said "our grain shippers are far enough from ethanol producers so as not to lose market share." He also noted that their primary grain shipper participates in the express load programs of two Class I railroads. Another manager also emphasized location, noting that his railroad does not see any new unit trains around him or new ethanol or soybean plants. However, another manager said he expected agricultural traffic to decrease because ethanol plants are expanding in his area.

Only six railroads expected their agriculture-related traffic to decrease, while 18 expected an increase, and 17 expected no change. Of the 41 railroads, 44 percent expected an increase, 42 percent expected no change, and 15 percent expected a decrease.

Question 3: *Does Class I railroad policy (i.e., shuttle train loaders) affect competition between trucks and short lines?*

One manager said his connecting Class I railroad recognizes all three of his 85-car unit train loaders as "direct origins," so truck competition is not an issue. Another manager said that low fuel prices for some shippers make it cheaper to ship their product by truck than rail. He says this pertains to small customers that do not load shuttles. A third manager said that Class I policy affects competition between trucks and short lines, particularly for loads of less than 50 miles to the shuttle loader. Based on the comments, the impact of truck competition on short lines depends on the distance of the shipper to the nearest shuttle loader or ethanol plant.

Question 4: *What modes are becoming more of a challenge to short line success? Why is this so?*

Most of the short line managers focused on factors that have enhanced truck competition including the following:

- Low fuel prices resulting in lower truck prices
- Trucks have greater scheduling and routing flexibility resulting in competition based on price
- Heavy trucks allowed outside harvest season
- Delivery of grain to shuttle train locations as opposed to shipping by short line

- The trend to increase size and weight of trucks makes it more difficult for short lines to compete with them

Managers of short line railroads indicated the main factors behind motor carriers' competitiveness with short lines were lower truck fuel prices relative to railroads in recent years, translating into lower rates, and increases in the size and weights of trucks, which lower a truck's operating cost through increased load sizes. Also, because trucks have greater scheduling and routing flexibility than short lines, short lines' must compete against trucks using their competitive advantage on price. Despite falling truck fuel prices, railroads still remain the most efficient land-based transporter of goods on a per ton-mile basis.

The short lines mentioned that shuttle trains on Class I railroads have resulted in increased trucking to these locations as opposed to short line shipment. Also, the short lines mentioned their dependency on Class I's for rail cars, switching rates, and price structures.

SHORT LINE SUCCESS PROFILE

The survey contained a dozen service characteristics of a profitable short line railroad obtained from previous research (Babcock 1993 & 1994). From the choices given, the short line managers were asked to select the three most important determinants of success (profits). They were asked to put a 1 next to the most important, 2 next to the next important, and 3 to the third most important. The characteristics were ranked by the number of short lines selecting the characteristic with a 1, 2, or 3 importance ranks.

The total points for a profitability characteristic were obtained by multiplying each first in importance "vote" by three points, each second in importance "vote" by two points and each third in importance "vote" by one point.

Short line managers ranked the top three most important characteristics for a short line's success as "strong shipper support," "adequate traffic levels," and "access to more than one connecting carrier." The complete set of characteristics and their rankings are shown below in Table 14.

Table 14: Characteristics of Short Line Railroad Success Ranked by Rail Managers		
Rank	**Characteristic**	**Points**
1	Strong Shipper Support	50
2	Adequate Traffic Levels	42
3	Access to More Than One Connecting Carriers	26
4	Cooperation from Connecting Carriers on Joint Rates and Revenue Splits	23
5	Adequate Track Quality	20
6	Ship Many Different Commodities	18
7	Reliance on Equity Financing	6
8	Ability to Compete With Motor Carriers	5
9	Reasonable Purchase Price	4
10	Experienced Management	4
11	Access to Own Equipment	2
12	State Financial Assistance	1

CONCLUSION

There have been few studies that seek to identify the determinants of a profitable short line railroad or that focus on the relationship between short line railroads and agriculture. This study documents the state of the short line industry and its relationship to the grain logistics system.

The Central Plains region leads the nation in grain production, but since many locations in this region are remote from markets and processing centers, they are dependent on railroads to transport their grain. Short lines play a critical role in originating and terminating agricultural products and promoting economic development along these lines.

The economic significance of short line transport of agricultural products is demonstrated by carload data. The sample short lines originated corn and corn products, soybean products, wheat, ethanol, and DDGs. They terminated corn and corn products, fertilizer, and wheat. Local traffic consisted of corn and corn products, soybeans and soybean products, and wheat. Overhead commodities shipped by short lines consisted of corn and corn products, wheat, sorghum, and oats. For 2015, total agricultural carloads were 456,522 with 273,317 originated, 54,584 terminated, 38,263 local, and 90,358 overhead.

Many short lines continually defer maintenance of their system due to insufficient annual revenues. Since short line shipments of agricultural products produce a public benefit, such as less air pollution and roadway congestion compared to truck transport, the Federal and State governments have instituted financial assistance programs to help short lines make infrastructure improvements. In this study, 14 of the 17 States in the sample have short line railroad assistance programs. In view of the positive public benefits of short lines, it is recommended that the States without assistance programs consider adopting them.

The study documented the nature of competition in the grain logistics system. Results support the idea that Class I railroad policy influences the competitiveness of short lines relative to other modes. For example, 75 percent of the managers of sample short lines said they are “very” or “somewhat dependent” on Class I railroads for railcars.

The effect of Class I policy (i.e. focus on shuttle trains) appears to vary with location, with those located 50 miles or more from a shuttle-loading location experiencing less of an impact on carloadings than those facilities located close to shuttle loading locations where truck competition is more intense. This is reinforced by the fact that 77 percent of the short line managers stated that Class I policy affects competition between trucks and short lines. The managers of short lines mentioned that shuttle trains on Class I railroads have resulted in increased trucking to shuttle-loading locations as opposed to short line shipment.

Short line managers mentioned truck competition has intensified due to several developments such as lower fuel costs (thus lower rates) as well as increased truck size and weights, which lowers motor carrier costs per ton-mile.

Another short line competition issue is the number of connections to other railroads. If a short line railroad has several connections, it increases the number of markets that agricultural shippers using short lines can reach. If the connecting railroad is a Class I, it may increase the number of rail cars available to the short line. Although the mean number of connections is 3, 26 percent (11 railroads) of sampled short line railroads have connections to only one railroad.

Another issue affecting shippers of agricultural products is the quality of the short line's track. The railroad industry is moving toward an industry standard of 286,000 pound cars to ship grain and other products. The study found that one-third of the track miles of the sample short lines are not capable of handling 286,000 pound cars.

Possible areas of future research are measuring the determinants of short line agricultural carloads versus truck traffic and examining the characteristics of multi-short line holding companies, such as their strengths and weaknesses, and how these impact the performance of short line railroads.

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APPENDIX A: SHORT LINE RAILROADS AND AGRICULTURE SURVEY

Railroad Name: _____

Respondent Name: _____

Part A: GENERAL QUESTIONS

1. When did you buy, lease, or begin operating the railroad?
2. How many people are employed full time by the railroad?
3. Do you own, lease, or operate the line for another entity (i.e., another railroad or State government)?
4. What is the current number of route miles of your railroad? Have there been any changes in the last five years? If so, please describe the changes.
5. Of your total route miles how many miles can handle 286,000 pound rail cars?
6. From what railroad or other party did you buy or lease the short line? If you operate the railroad for another party, who is the owner?
7. List all the railroads that you have connections with. List the junction locations for each connection.
8. Has your railroad received any State government assistance in the last five years? If so, please describe the assistance.
9. Has your railroad received any Federal government assistance in the last five years? If so, please describe the assistance.

Part B: TRAFFIC

In answering the following questions regarding agricultural-related traffic on your railroad, please use the following traffic class definitions.

Originated – Agricultural-related traffic (i.e. grain, soybeans, processed food products, etc.) that originates on your railroad and terminates on another railroad

Terminated – Agricultural-related traffic that originates on another railroad and terminates on your railroad

Local – Agricultural-related traffic that originates and terminates on your railroad

Overhead – Agricultural-related traffic handled by your railroad but which originates and terminates on other railroads

1. List all the agricultural-related commodities originated by your railroad.
2. For the agricultural-related commodities listed in the previous question, please provide the number of carloads for each agricultural-related good for the past three calendar years. Attach a separate sheet if there are more than four agricultural-related commodities.

Originated Carloads

	Commodity Name	Commodity Name	Commodity Name	Commodity Name
Year	_____	_____	_____	_____
2015	_____	_____	_____	_____
2014	_____	_____	_____	_____
2013	_____	_____	_____	_____

3. What are the principal destination markets for each of your originated agricultural-related commodities?
4. List all the agricultural-related commodities terminated by your railroad.
5. For each of the agricultural-related commodities listed in the previous question, please provide the number of carloads for each agriculture-related commodity for the past three calendar years. Attach a separate sheet if there are more than four agriculture-related terminated commodities.

Terminated Carloads

	Commodity Name	Commodity Name	Commodity Name	Commodity Name
Year	_____	_____	_____	_____
2015	_____	_____	_____	_____
2014	_____	_____	_____	_____
2013	_____	_____	_____	_____

6. What are the principal origins of each of the agricultural-related commodities terminated on your railroad?
7. List all the local agricultural-related commodities handled by your railroad.
8. For the agriculture-related commodities listed in the previous question, please provide the number of carloads for each commodity for the following three calendar years. Attach a separate sheet in there are more than four local agricultural-related commodities.

Local Carloads

	Commodity Name	Commodity Name	Commodity Name	Commodity Name
Year	_____	_____	_____	_____
2015	_____	_____	_____	_____
2014	_____	_____	_____	_____
2013	_____	_____	_____	_____

9. What are the principle destination markets for each of your agriculture-related local traffic?
10. List all the agricultural-related overhead commodities handled by your railroad.

11. For the agricultural-related commodities listed in the previous question, please provide the number of carloads for each commodity for the following three calendar years. Attach a separate sheet if there are more than four overhead agricultural-related commodities.

Overhead Carloads

	Commodity Name	Commodity Name	Commodity Name	Commodity Name
Year	_____	_____	_____	_____
2015	_____	_____	_____	_____
2014	_____	_____	_____	_____
2013	_____	_____	_____	_____

12. If you know the ultimate destinations of overhead agricultural-related traffic shipped on your railroad please provide that information.

Part C: EQUIPMENT

1. How many locomotives does your railroad own? Please list the number of locomotives by type.
2. How many locomotives does your railroad lease? From whom do you lease locomotives?
3. How many rail cars does your railroad own? Please give the number of cars by type of rail car (i.e., covered hopper cars etc.).
4. How many rail cars does your railroad lease? From whom do you lease rail cars?
5. How dependent is your railroad on connecting Class I railroads for locomotives? Check one of the following:

   Very Dependent _____

   Somewhat Dependent _____

   Not Dependent _____

6. How dependent is your railroad on connecting Class I railroads for rail cars? Check one of the following:

   Very Dependent _____

   Somewhat Dependent _____

   Not Dependent _____

7. If your railroad is dependent on other Class I railroads for locomotives and rail cars, do you have trouble obtaining the equipment you need during peak periods such as grain harvest? Check one of the following:

   All of the time _____

   Some of the time _____

None of the time _____

8. How much money does the railroad typically invest on an annual basis to maintain the rail tracks and road bed on your railroad?

Part D: MARKETS AND COMPETITION

1. How dependent is your railroad on connecting Class I railroads to reach the principal markets that you serve? Check one of the following:

   Very Dependent _____

   Somewhat Dependent _____

   Not Dependent _____

2. With respect to your originated traffic, which of the following does your railroad compete against? Check all that apply:

   Motor Carriers _____

   Class I railroads _____

   Short line railroads _____

   Water Carriers _____

   Other (Specify) _____

   None of the above _____

3. In the preceding question, if your railroad has competition, which agriculture-related commodities are subject to competition?

   With respect to your terminated traffic which of the following does your railroad compete against? Check all that apply.

   Motor Carriers _____

   Class I railroads _____

   Short line railroads _____

   Water Carriers _____

   Other (Specify) _____

   None of the above _____

4. In the preceding question, if your railroad has competition, which agriculture-related commodities are subject to competition?

5. With respect to your local traffic, which of the following does your short line compete against? Check all that apply.

   Motor Carriers _____

Class I railroads _____

Short line railroads _____

Water Carriers _____

Other (Specify) _____

None of the above _____

6. In the preceding question, if your railroad has competition, which agriculture-related commodities are subject to competition?
7. With respect to your overhead traffic, which of the following does your railroad compete against? Check all that apply.

Motor Carriers _____

Class I railroads _____

Short line railroads _____

Water Carriers _____

Other (Specify) _____

None of the above _____

8. In the preceding question, if your railroad has competition which agriculture-related commodities are subject to competition?
9. Are shifts in Class I pricing and the move to shuttle trains in grain transport creating an opportunity or a threat to your railroad competitiveness? Please explain.
10. Will your agriculture-related traffic increase or decrease if current trends continue (i.e., focus on shuttle trains and increased ethanol production)?
11. Does Class I railroad policy (i.e., shuttle train loaders) affect competition between trucks and short lines?
12. What modes are becoming more of a challenge to short line success? Why is this so?

Part E: SHORT LINE SUCCESS PROFILE

1. Below are listed several potential ingredients for a profitable short line railroad. From the choices given, select what you feel to be the three most important determinates of success (profits). Put 1 next to most important, 2 next to the second most important and 3 next to the third most important.

Strong Shipper Support _____

Adequate Track Quality _____

Reasonable Purchase Price _____

Adequate Traffic Levels _____

Ship Many Different Commodities _____

Access to More Than One Connecting Carrier _____

State Financial Assistance _____

Ability to Compete With Motor Carriers _____

Experienced Management _____

Reliance on Equity Financing _____

Access to Own Equipment _____

Cooperation From Connecting Railroads on

Joint Rates and Revenue Splits _____

2. If the above list omits something you feel is important to short line profitability, please explain and discuss in detail.

APPENDIX B: SURVEY OF STATE ASSISTANCE PROGRAMS FOR SHORT LINE RAILROADS

Name and State_____

1. What are the characteristics of short line assistance programs in your State including the following:

   Program Names and Start Dates

   What types of assistance are available (i.e. track rehab/maintenance)

   Loans or grants or both

   States share of short line assistance projects

   Total dollar annual amounts of assistance

   Which railroad received assistance in what amounts

2. To minimize the risk of loss of State funds it is important to have criteria for a profitable short line assistance project such as realistic estimates of traffic, revenue, operating expense, and track maintenance expense. Also required equity investment by both shippers and the railroad. What criteria do your assistance programs have for eligibility for assistance?
3. What have been benefits of short line railroad assistance programs and what have been the costs?
4. In your opinion what impact have the short line assistance programs had on short line profitability and rural economic development in your State? Explain.

APPENDIX C: SELECTED SURVEY DATA AND QUESTION RESPONSES

Table 15: 2015 Employment Distribution by Size in Sample Short Lines
Employment
1,200
410
248
230
190
189
115
100
100
98
97
93
89
85
82
80
60
55
52
43
42
38
37
35
29
26
25
24
22
20
15
14
13
13
13
10
10
10
8
7
6
3
2

Table 16: Percent of Total Track Miles That Are Capable of Handling 286,000 Pound Rail Cars		
Total Track Miles	**286,000 Miles**	**Percent**
937	875	93
904	159	18
850	850	100
802	802	100
600	555	93
576	391	68
561	82	15
512	273	53
433	24	6
400	350	88
359	324	90
356	205	58
347	0	0
300	300	100
276	276	100
265	178	67
253	180	71
250	159	64
237	0	0
221	221	100
155	155	100
147	4	3
143	143	100
135	0	0
130	130	100
122	122	100
104	93	89
94	94	100
87	87	100
87	75	86
68	68	100
63	32	51
57	57	100
56	32	57
53	15	28
44	44	100
40	3	8
38	0	0
29	0	0

Table 17: Number of Sample Short Line Connections to Other Railroads, Ranked the Highest to the Lowest
21
7
6
6
5
4
4
4
4
4
4
4
3
3
3
3
3
3
3
3
3
3
2
2
2
2
2
2
2
2
2
2
2
2
1
1
1
1
1
1
1
1
1
1
1

Table 18: Sample Short Lines Leased and Owned Locomotives, 2015		
Locomotives Owned	**Locomotives Leased**	**Total Locomotives**
96	0	96
94	0	94
81	0	81
38	0	38
38	0	38
35	0	35
30	12	42
29	3	32
28	3	31
27	0	27
25	0	25
24	9	33
24	0	24
22	12	34
21	0	21
21	0	21
20	0	20
19	0	19
19	4	23
17	0	17
16	0	16
14	3	17
12	1	13
12	3	15
11	0	11
10	0	10
9	0	9
9	1	10
9	0	9
8	0	8
8	0	8
8	7	15
6	2	8
5	1	6
5	0	5
5	0	5
5	0	5
4	1	5
4	2	6
3	2	5
3	2	5
0	7	7

Table 19: Sample Short Lines Leased and Owned Rail Cars, 2015		
Rail Cars Owned	**Rail Cars Leased**	**Total Rail Cars**
1,300	0	1,300
1,086	204	1,290
867	25	892
498	130	628
317	148	465
300	0	300
290	977	1,267
250	0	250
194	297	491
188	0	188
185	816	1,001
160	0	160
114	133	247
100	0	100
79	240	319
72	0	72
61	67	128
29	434	463
25	0	25
6	0	6
0	284	284
0	44	44
0	42	42

Table 20: Sample Short Line Annual Investment to Maintain Rail Tracks and Road Bed, Maintenance Expenditure Per Mile
$42,689
29,412
25,000
21,277
15,810
14,666
12,500
12,445
11,905
11,783
10,143
10,000
8,413
8,133
7,813
7,606
7,240
6,902
6,751
6,522
6,492
6,024
5,660
5,122
4,213
4,000
4,000
3,748
3,472
2,500
2,041
1,575
658

The following are selected responses by short line managers to four open ended questions about competition facing short line railroads.

Question 1

Are shifts in Class I pricing and the move to shuttle trains in grain transport creating an opportunity or a threat to your railroad's competiveness?

"Opportunity, improved economics of shuttle trains results in additional overhead traffic."

"Shippers on our railroad have potential exposure to market loss due to Class I price increases and changes in public tariffs. There is also a potential for Class I pricing to favor Class I grain shippers putting short lines at a potential freight/market disadvantage. This would be lessened if the short line had more than on Class I interchange connections."

"The changes provide an opportunity to move more shuttle trains."

"Unit trains are no threat. We like big ones. However, changing "spread" prices are a big threat. The changes are a threat. The State has 114,006 truck weight limits. When Class I railroads lower price grain moves by truck to an instate ethanol location."

"The changes are a threat. 20 years ago we had 10 origin shippers of wheat, but now we have one left."

"The changes are a threat. Cattle feed has been a single car market, but the changes are undercutting the market."

"The changes are an opportunity. We served 9 grain shuttle facilities and originated greater than 200 shuttles in 2016."

"The changes are both an opportunity and a threat. We have new elevators on our lines but that is to offset the competition's elevator expansions."

"The changes are both an opportunity and a threat. They help the facilities that expand and build shuttle loaders and they hurt the small elevators that can't expand. The biggest problem is small elevators trucking grain to shuttle loaders on Class I railroads."

"The changes are an opportunity. We move shuttles for a Class I railroad."

"The changes are both an opportunity and a threat. It gives our shipper access to unit train markets. The threat is the long term impact on road infrastructure."

"The changes are both an opportunity and a threat. In the last 6 years we have gone from one shuttle elevator to the current four with potential for another. The smaller elevators have been forced to work with the closest shuttle loader either by shipping their product by local rail or by trucking it. With the pricing

the Class I railroad is quoting on shuttle trains we get less than half per car than we would on a local traffic car. Being a short line, shuttle trains cause overtime, delay of local traffic at times, and extra fuel costs. So I guess it is an opportunity since we are keeping the business but also a threat because we aren't making much more as well as losing some business going to shuttle loaders not on our railroad."

"The changes are a threat since they force consolidation at centralized locations eliminating direct rail needed at smaller locations."

"The changes are an opportunity. We already have two shuttle facilities on our railroad."

"The changes are an opportunity but it is making our customers source grain differently, i.e. buy rail service from short lines rather than Class I's."

"The effect of the changes depends on the harvest size locally and globally, Class I behavior can help or hurt our railroad."

"The changes are an opportunity for lower costs and higher price since we terminate freight shipped by shuttle loaders."

"The changes are a threat forcing us to price directly against trucks making short haul trips to the shuttle loaders. Railroad revenue per carload is reduced versus former interline shipments directly from origins."

"The changes are a threat. Larger train units sourced from longer distances hurt shorter haul train traffic."

"The changes are an opportunity due to our ability to distribute cars to different locations on our line."

"The changes are an opportunity since shuttle loaders on the Class I railroads compete for grain business."

"The changes are creating an opportunity so that customers can participate in more than one Class I program"

"The changes create an opportunity since shuttle loaders on Class I railroad compete for grain and fertilizer business."

"The changes are an opportunity since shuttle loaders on Class I railroads compete for corn for the chicken market feed business."

"The changes are a threat since shuttle loaders on Class I railroads captured some of our business."

"The changes are a threat due to shuttle loaders competing for grain that is trucked to the nearest shuttle facility."

"The changes create a threat since shuttle loaders on Class I railroads compete with our railroad for grain and fertilizer business."

"The changes are a threat since shuttle location on the Class I railroad captured the inbound corn business."

Question 2

Will your agricultural traffic increase or decrease if current trends continue (i.e., focus on shuttle trains and increased ethanol production)?

"Wheat production has been so erratic that it is hard to say. We have been able to increase inbound corn and feed grains as animal feed."

"Our agriculture-related traffic is very dependent on yields per acre of grain."

"Whether our traffic decreases or increases depends on market conditions."

"Our agriculture related traffic would correlate with crop yields. Development of drought resistant corn had a significant positive impact on our traffic."

"Our agricultural-related traffic will probably stay the same. Many of the small elevators have either gone out of business or have agreements with nearby shuttle loaders."

"Our grain shippers are far enough from ethanol producers so as not to lose market share. The railroads primary grain shipper already participates in the express load programs of two Class I railroads."

"We don't see any new unit grain trains around us or new ethanol or soybean plants. So we expect traffic to remain steady, dependent on the size of the local grain crop."

"We expect our agricultural traffic to decrease as ethanol plants are expanding in our area."

Question 3

Does Class I railroad policy (i.e., shuttle train loaders) affect competition between trucks and short lines?

"The Class I railroad recognizes all three of our 85 car unit train loaders as "direct origins" so truck competition is not an issues at this point."

"Truck competition is not much in our markets."

"If the Class I sets pricing it does affect competition between short lines and trucks."

"We are seeing a trend with low fuel prices that for some customers it is cheaper to truck their product than ship via rail. This pertains to small customers that don't load shuttles."

"Trucks carry grain to shuttle train locations versus load on the short line."

"Shuttle train loaders don't affect our business as much as motor carriers do because our location is the largest consumer of agricultural products."

"Class I policy affects competition between trucks and short lines, particularly for hauls of less than 50 miles to the shuttle loaders."

Question 4

What modes are becoming more of a challenge to short line success? Why is this so?

"Trucks have low fuel costs resulting in low truck prices."

"Barge-proximity to the Mississippi River to reach new markets."

"For our line the only other mode is truck which depends on the size of the harvest. The larger the harvest the more trucks. But usually trucks don't impact our business."

"Containers. We can't compete with the markets Class I's deliver to."

"Trucking. Drivers are charging lower rates than they did 5 years ago."

"Truckers have greater scheduling and routing flexibility, resulting in competition focused on price."

"Trucks carry grain to shuttle train locations as opposed shipping via the short line."

"Barges and intermodal due to cost savings and/or transit time savings."

"Trucks are our biggest competitors and short line traffic will be greatly affected if heavier trucks are allowed outside the harvest season."

"Our main competition for originated freight is Class I railroads with trucks. Truck ships grain to unit train loaders instead of the short line. Trucks are the principal competitor for local traffic."

"Class I railroads with truck. Local trucking is sometimes more cost effective than rail direct."

"The challenge is local traffic demand is greater than the number of cars to accommodate our customers."

"Our dependency on Class I's is definitely a challenge. If they don't deliver cars we have no business. If they don't pick up our cars our yards are plugged up. They determine all our switch rates. Their unwillingness to work with short lines is very clear in the last six years I have been here."

"The trend to increased size and weight trucks compete vigorously in our area."

"Class I railroads set our prices."

"Truck prices are cheap making it difficult to compete with them."

"Motor carriers increased size and weight changes make it difficult to compete."

"Class I operational changes and service problems can create issues for short line success. In our service area our trains operation on track age rights of Class I carriers. If interchange yards with Class I carriers become too congested traffic to or from our customers can be delayed."

"Being captive to a single Class I railroad is a concern as our grain traffic is dependent on rates and service that they set. The Class I requirement that we equip our interchange locomotives with PTC (Positive Train Control) by early 2018 will be a big financial burden to our railroad and likely continuing financial commitment with zero financial benefit for our railroad."

"Class I rate structures are the biggest factor."

"Class I rates and increased size and weight of trucks are the biggest challenges."

"Class I's are the biggest factor since they view short lines as a competitor."