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Factors Affecting Rail Car Supply

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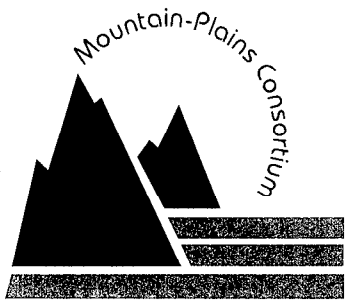

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FACTORS AFFECTING RAIL CAR SUPPLY

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EXECUTIVE SUMMARY

Because of the differentiated car program types, it is essential to understand the costs and benefits of each of them. Depending on your situation, a combination of different programs may have the best return for each organization.

By providing descriptions of programs, decision makers are able to better match needs of the organization to offerings of the railroads. If companies involved with grain procurement are to remain competitive, an accurate projection of shipping needs is necessary. Even if estimates are close to actual demand, other factors must be taken into consideration. If the railroad does not deliver rail cars on a timely basis, increased costs may be incurred from additional handling and storing of grain.

INTRODUCTION

Railroads are the primary means of transporting grain and oilseed production from origins in the upper Midwest to domestic and export positions. Producers in this region of the country, who are principal suppliers of U.S. hard red spring wheat, durum wheat, barley, and sunflowers, constantly are challenged to access transportation rates and equipment that allow them to be competitive in domestic and world markets. Lack of barge facilities in this region means that railroads provide the low-cost alternative for shippers moving large volumes of relatively low-value, bulk agricultural commodities long distances to buyers. Thus, pertinent information regarding the railroad market is a fundamental component of day-to-day marketing decisions.

It seems evident that the U.S. rail industry is continuing to evolve in its relatively new environment of limited government intervention. In 1980, the Staggers Act became tangible evidence that government oversight of the rail industry would be relaxed. With this legislation, a new era of government transportation policy would seek to ensure the longevity of the nation's rail industry and competition for those it served through a deregulated market structure.

The past two decades have held significant changes in the structure of rail industry. Shuttle train rates, unit train rates, rail car "auction" markets, railroad mergers, rail operation streamlining, and an explosion of Class II and III rail carrier activity are a few of the signia used in discussing today's rail market. These market changes have been in large part due to less regulation of the rail market.

The rail industry can be classified into four categories according to revenue and/or size: Classes I, II, III, and switching and terminal. Class I railroads are defined as having operating revenue of $259.4 million or more (Railroad Facts, 1999). Class II railroads are referred to as regional operators. These railroads operate over at least 350 miles of road and/or are earning revenue between $40 million and $255 million (RR Facts Book, 1997). Short lines typically are formed through a lease or purchase of track from a Class I carrier. Advantages to short lines in operating a segment of track, relative to Class I carrier, may lie in short line cost savings from labor, equipment and maintenance of way (Dooley, 1991). Short lines with lease agreements typically offer rail car ordering programs, which are available through their Class I partner. In North Dakota, the three short lines are operated via lease agreements, therefore, are able to offer shippers access to most of their Class I counterpart's car ordering programs. Currently, there are seven Class I rail carriers operating in the United States. These carriers are Burlington Northern and Santa Fe, Canadian Pacific, Kansas City Southern, Union Pacific, Grand Trunk Western, Illinois Central, CSX Transportation, and Norfolk Southern.

Grain movement largely depends on two western carriers — the BNSF and the UP. In 1996, these two carriers accounted for 71 percent of U.S. rail grain origination. In addition, the Canadian Pacific was included in this report as it is an important carrier for the rail dominated market in the north central United States. Class I railroads. These railroads are The Burlington Northern and Sante Fe Railway Company (BNSF), Canadian Pacific Railway (CP), Union Pacific Railroad Company (UP), Norfolk Southern (NS), and CSX Transportation. The three Class I railroads that will be the focus

of this paper are the BNSF, CP, and UP. The rail car ordering programs affiliated with the aforementioned railroads also will be discussed.

The extent of future regulation continues to be an uncertainty. Although the Staggers Act limited government involvement in rate making and equipment distribution, it did maintain the Interstate Commerce Commission (ICC) in the role of regulatory oversight, that it had begun over a century earlier. The ICC was replaced with the Surface Transportation Board (STB) in 1994. Unlike the ICC, a fully funded branch of the Interior Department, the STB operates under a three-year appropriation schedule. Although the STB continues to provide government oversight of the rail industry, it is still in the midst of defining its philosophies and developing methods for addressing industry concerns such as the common carrier obligation and maximum rate guidelines.

As the government no longer mandates rates or service, a vital resource in the success of the United States grain industry is information. Reliable, timely information regarding transportation provides the market participants with additional tools for managing risk in a volatile market. As aforementioned, shippers in the upper Midwest are heavily dependent on rail transportation. Thus, information regarding the rail industry is of particular interest to those who participate in the grain market. Currently, many rail carriers provide selected car supply information to their customers directly or through the American Association of Railroads (AAR). Given the compendium of definitions for rail car supply and the importance of this market information, the objectives of this report are to propose a broad definition of rail car supply and suggest alternatives for delivering car supply information to the market.

An element of rail planning and resource utilization that is of particular interest to grain shippers is the hopper car fleet. Railroad hopper car fleets may include railroad owned and leased equipment, and equipment that has been leased by outside entities and included in the carrier fleet via contract. Thus, rail car lease rates and railroad's efficiencies in using the cars affect the economics of alternative fleet configurations.

Railroads manage their hopper car fleet with several different car ordering programs. The car ordering programs offered by the primary Class I grain originations are described in a subsequent section. To make informed logistics decisions, it is necessary to be aware of the rail industry. The objective of this study is to review resources that shippers may use in monitoring rail industry activities.

Within the remainder of this report, is a broad definition of car supply. An overview of the mechanics and programs for car ordering are described. The next section includes information regarding supply and demand. Embedded in this information are a plethora of resources that shippers may employ in predicting rail car supply/demand and monitoring carrier performance. To complete this project, the resources and the importance of shipper knowledge about the rail industry and its market environment will be reviewed.

CAR SUPPLY

Hopper car supply is a facet of railroad operations that encompasses a broad range of values, depending on one's position in the market. The bulk of the attention paid to this particular rail service item by shippers is during periods of car shortages, as they add up revenues lost when they are unable to access the market. Railroads, on the other hand, spend a considerable amount of time adding up the costs associated with periods of excess car supply. Due to production and sales fluctuations, it seems unlikely that the cyclical nature of the grain industry, is going to stabilize in the near-term. Thus, it is important for shippers, carriers, and others involved in the grain market to have an understanding of rail car supply and the factors that influence car availability.

One definition of grain car supply is that it is equal to the number of hopper cars a rail carrier has in its active fleet (Table 1). Over time, this simplistic definition may be an indicator of rail carrier investment and provides a means for comparing relative importance of grain for and among carriers, but gives little insight into the availability of rail cars.

Table 1. Class I Rail Carrier Grain Car Bulletin, Carloads

	Annual		Railroad Fleet Grain Cars in Service -1995		Avg. Car Size (tons)	
	1996	1995	Owned	Leased	1994	1995
BNSF	432,687	410,274	26,777	18,063	98.7	98.4
CP			5,241	1,333	99.2	108.4
CSXT	111,509	133,755	11,297	7,462	98.5	98.7
NS	131,568	139,043	13,690	1,174	99.1	99.3
UPSP	439,865	404,591	26,288	17,340	99.6	99.8

Sources: American Association of Railroads; U.S. Public Use Waybill

In discussing car supply for the remainder of this paper, a much broader definition of car supply will be developed, i.e., that car supply varies not only by carrier, but also by shipper. While a textbook definition will not be presented, a theoretical definition may provide a better understanding of how car supply issues may be addressed. In addition, potential data regarding the rail industry, specifically car supply, and methods for communicating this information to the market will be proposed. Consistent information regarding the rail industry was noted as a crucial information void by grain industry participants in a 1996 USDA focus group survey/discussion[1].

[1]Vachal, Kimberly. Unpublished Focus Group Summary. June, 1996.

Table 2. Survey Respondents' Rating of the Importance of Specific Data Items that are Relevant to the Grain Export Industry (1=not important,5=very important)

	Average Rating
1. Foreign Grain Demands	4.4
2. Export Supply for Major Grain Exporting Regions	4.2
3. Rail Car Loadings by Region and Commodity	3.9
4. Tariff Rates by Commodity and Region	3.8
5. International Market & Production News	3.8

n=38
Source: Vachal, Upper Great Plains Transportation Institute

Rail Programs

Depending on your rail carrier, different programs exist for ordering rail cars. The three major western grain railroads were included in this report. These railroads include the CP, BNSF, and UP. Also included are their affiliated regional railroads, RRVW, NP, and DMVW.

Two general methods of car ordering for the railroads are tariffs and forward contracts. The traditional ordering method of tariffs was the only option until the late 1980s. New programs were introduced after deregulation of the rail industry. For tariff cars, no or minimal penalties are applied for cancellation by the elevators, and railroads pay no penalty for untimely car deliveries. When delivered, car rates are as of the date of delivery, not the time of the order.

Forward contracting varies in length of delivery, penalties, and specific services. The shorter-term programs include the BNSF's Certificates of Transport (COT), CP's

Protected Rail Equipment eXchange (PERX), and UP's Car Supply Vouchers. The longer-term car guarantees include BN's SWAPs program, CP's GEEPs program, and UP's Guaranteed Freight Pool.

The SWAPs and GEEPs provide leased railcars to the carrier in exchange for a fee and specific number of guaranteed trips per month. Penalties exist for the carrier and the shipper, if terms are not met. If shippers do not need the entire monthly contract, the excess can be traded in a secondary market.

In comparison, the COTs and PERX programs are auction-based, shorter-term guarantees. Bids are received for car placement during the first half or last half of the month for up to four or six months, depending on the program. There also are penalties for nonconformance by either the shipper or the elevator.

Another program available through the BNSF is the shuttle train. Union Pacific has contract trains available to customers.

Competitive Forces

In addition to shipping grain out by rail, barge movements of bulk commodities are also possible. Although restricted by location, access to barges increases the competition with rail. Actual barge rates can be calculated by multiplying the southbound barge freight rates by the tariff rates. Table and map may be used to determine barge rates from specific locations. Comparisons can then be made with rail and/or trucking, and the lowest-cost option can be chosen.

In the past few years, the spot market rate for barges has varied between approximately 100 and 300 percent of the tariff rate (Graph). The example shown is on the Illinois River. These variances can be attributed to export and domestic demand, availability of barges, pricing of railcars, and weather conditions.

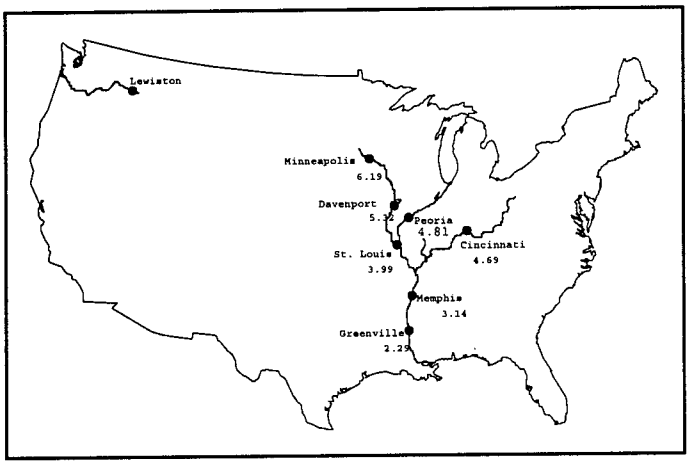

Figure 1.

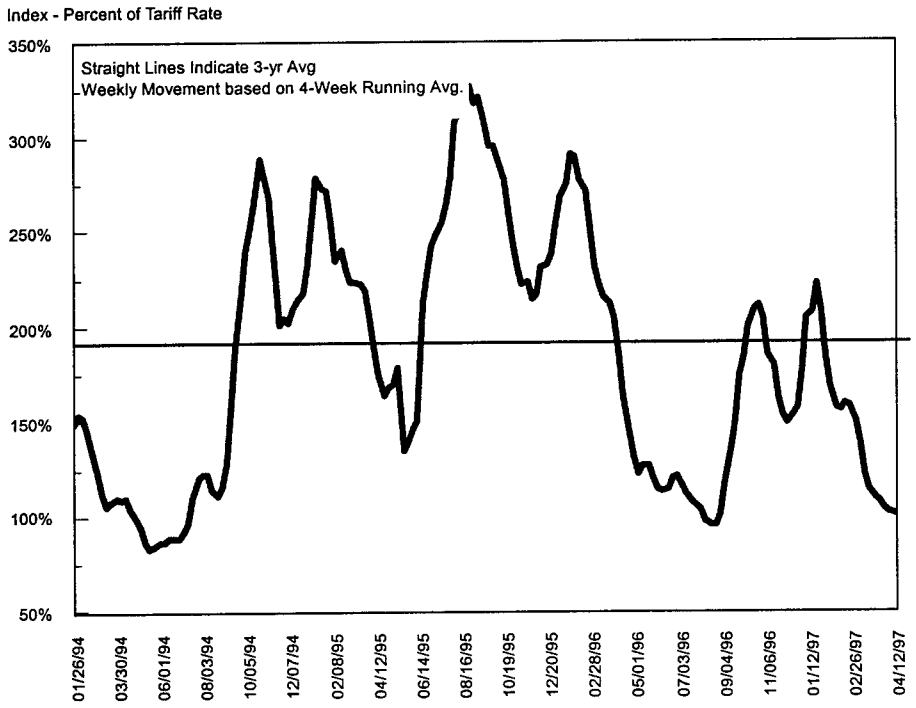

Figure 2.

Another form of competition comes from trucking. Up to a certain mileage, trucking can be more cost effective than rail. Depending on the back haul, trucking costs are less than rail up to approximately 116 miles (Tolliver and Bitzan, 1990). This calculation was made using a 48-foot semi-trailer and a 26-car rail shipment. The semi-truck operates at a cost per ton-mile of $0.056, loaded to 80,000 pounds GVW, and maintaining 15 percent empty miles.

When looking at the total cost per shipment for the three shipping options of truck, rail, and barge, the variable of distances makes a substantial difference on costs. If a point is chosen, and movement costs computed to the Gulf, the differences can be seen between modes. Figure 3 shows the relationship between truck, rail, and barge rates for the shipment of grain.

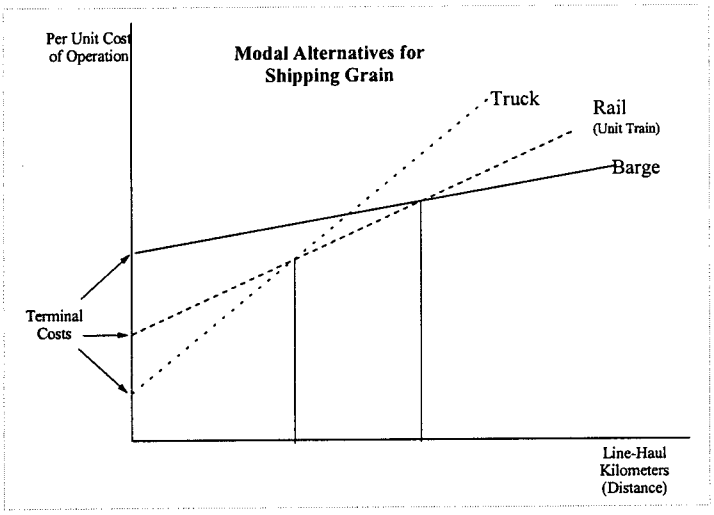

Figure 3. Grain Transportation

Railcar Market

Many factors attribute themselves to a railroad's car supply as it works to service car demands of shippers. A railroad has a specific number of hopper cars able to move grain. The ability to access a specific number of cars depends on many factors. The fleet allocation to each of the aforementioned programs may limit the number of cars included in the ordering mechanism chosen by grain procurers. The use of remaining cars will influence hopper car availability.

Railcar utilization depends on car velocity, market distance, and load/unload effectiveness (Priewe, 1996). The velocity is related to labor, since crews are given daily limits for mileage. Another variable is distance to market. The farther the shipment is moving, the longer it will take for the equipment to be returned. Turnover rates also affect utilization. The quicker a shipper can load and spot cars, the quicker a carrier can move them. Since the passing of the Staggers Act, car allocation programs actually have increased turnover because of demurrage debit/credit programs.

Another topic of interest has been the change in service levels after the merging of railroads. The UP/SP merger produced a railroad that must provide a weekly report to the STB. Areas covered include train delays, average train speed, grain stockpiling, grain cars loaded, and additional information, which is updated on a weekly basis — www.ugpti.org/grain_trax/pdf/3railbid.pdf.

Production

Production relates highly to the export market. Table 3. provides information on the shipments of several commodities to their export regions.

Table 3. Distribution of Commodities Among Export Regions

1,000 Bushels

	1991	1992	1993	1994	1995	1996
			HRS			
Lakes	23,509	0	45,656	37,105	56,476	76,449
Atlantic	99	18	0	0	988	1,010
Gulf	146,838	221,244	168,964	55,576	80,873	86,945
Pacific	117,638	128,725	164,211	174,487	178,717	155,591
Interior	9	0	2,142	0	469	1,920
Total	288,093	395,060	380,973	267,168	317,523	321,915
			HRW			
Lakes	0	80	290	512	349	786
Atlantic	0	0	0	0	0	0
Gulf	393,485	358,424	413,850	293,291	282,165	274,097
Pacific	82,246	106,284	94,621	108,040	90,553	77,264
Interior	1,964	4,593	14,581	9,180	12,640	15,656
Total	477,695	469,381	523,342	411,023	385,707	367,803
			SRW			
Lakes	0	10,689	2,309	7,788	37,638	9,751
Atlantic	25,937	25,810	32,528	25,148	47,476	28,295
Gulf	126,301	141,060	128,452	135,952	179,005	164,048
Pacific	20	17	0	0	0	0
Interior	0	159	78	125	19	70
Total	152,258	177,735	163,367	169,013	264,138	202,164
			SW			
Lakes	630	457	210	2,610	0	278
Atlantic	0	0	748	0	967	0
Gulf	241	0	0	2,003	0	0
Pacific	213,168	201,523	197,675	262,194	228,703	235,868
Interior	537	474	21	407	201	382
Total	214,576	202,454	198,654	267,214	229,871	236,528
			Corn			
Lakes	39,962	49,458	50,942	44,826	92,438	55,773
Atlantic	64,938	21,993	51,387	9,973	36,354	16,398
Gulf	1,318,777	1,354,213	1,209,047	1,102,374	1,557,827	1,474,485
Pacific	319,721	258,383	238,314	146,476	614,177	415,465
Interior	8,718	7,757	3,720	26,915	29,087	44,318
Total	1,752,116	1,691,804	1,553,410	1,330,564	2,329,883	2,006,439

			Soybean			
Lakes	13,427	34,531	22,193	54,220	61,106	74,419
Atlantic	37,471	52,541	45,195	20,726	23,172	25,323
Gulf	514,683	580,695	555,088	520,178	652,268	702,802
Pacific	38,669	45,181	36,502	28,093	77,028	66,782
Interior	34,521	44,221	52,683	45,583	50,550	66,115
Total	638,771	757,169	711,661	668,800	864,124	935,441

Source: "Grain & Feed Market News," U.S. Department of Agriculture, various years.

Comparing the amount of production with the amount of exports will provide a ratio of the volume of corn, wheat, and soybeans that would remain domestic. The difference between wheat and corn is the larger spread of 30 percent. Soybeans is between the other commodities in domestic use.

Table 4. U.S. Production and Export Volumes for Corn, Wheat, and Soybeans, 1990-96

	Corn	Wheat	Soybeans
Average Annual Production (million bushels)	8,117	2,348	2,111
Average Annual Exports (million bushels)	1,784	1,226	715
Ratio of Exports to Production	22%	52%	34%

Export Industry

A large amount of western grain is delivered to export markets. Table 5 shows the amount of grain shipped by each region and port area. Table 5 shows the differences of export regions for different commodities. Generally, wheat moves out through the Pacific Northwest, while corn and soybeans are shipped out of the Gulf.

Table 5. Grain Inspected and/or Weighed for Export by Region and Port Area

	Pacific Region		Mississippi Gulf			Texas Gulf		
	Wheat	Soybean	Wheat	Corn	Soybean	Wheat	Corn	Soybean
05/29/97	*194*	*0*	*84*	*504*	*127*	*62*	*4*	*0*
*1997 YTD ***	*4,817*	*882*	*1,497*	*12,358*	*8,067*	*1,029*	*916*	*422*
*1996 YTD ***	*13,036*	*1,888*	*7,097*	*35,444*	*17,345*	*7,564*	*1,162*	*930*
% of Last Year	*37%*	*47%*	*21%*	*35%*	*47%*	*14%*	*79%*	*45%*
1996 Total	*12,803*	*1,820*	*7,207*	*36,634*	*17,687*	*7,766*	*1,226*	*772*

Source: USDA

Rail deliveries to port can be seen in Table 6. Listed here are the number of carloads delivered to each port. Ports are the Mississippi River, Texas, Pacific, and Atlantic and East Gulf.

Table 6. Rail Deliveries to Port

	Mississippi River	Texas	Pacific	Atlantic & East Gulf
12/18/96	620	1,658	5,620	23
12/25/96	217	1,653	4,015	382
01/01/97	331	1,396	1,812	214
YTD 1997	331	1,396	1,812	214
YTD 1996	603	2,494	6,954	161
Total 1996	25,608	112,293	197,758	11,090
Total 1995	57,124	111,028	268,783	15,437

Source:USDA

Table 7. provides the number of cars loaded by each railroad, separated by the general location of the railroad. The BNSF and UP dominate grain rail shipments in the western regions of the United States. The CSXT and NS, the primary easstern carriers, handle volumes that are less than one-third the volumes handled by major western carriers.

Table 7. Class I Railroad Grain Carloadings

	East				West			Canada	
	CR	CSXT	IC	NS	BNSF	KCS	UP	CN	CP
05/31/97	376	2,003	1,488	2,223	5,930	762	6,489	3,686	5,073
This Week Last Year	359	2,425	945	2,528	7,006	438	7,761	2,275	1,899
1997 YTD	3,794	17,937	11,436	17,602	55,902	5,777	54,654	26,425	37,708
1996 YTD	14,783	51,317	22,099	54,349	188,469	12,883	195,150	47,708	47,780
1996 Total	31,733	111,509	48,695	131,568	432,687	30,009	439,865	129,714	181,387
1995 Total	37,851	133,755	61,612	139,043	410,274	34,393	447,786		

Source:USDA

CONCLUSION

Because of the differentiated car program types, it is essential to understand the costs and benefits of each of them. Depending on your situation, a combination of different programs may have the best return for each organization.

By providing descriptions of programs, decision makers are able to better match needs of the organization to offerings of the railroads. If companies involved with grain procurement are to remain competitive, an accurate projection of shipping needs is necessary. Even if estimates are close to actual demand, other factors must be taken into consideration. If the railroad does not deliver rail cars on a timely basis, increased costs may be incurred from additional handling and storing of grain.

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