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Rail Car Dilemma

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Rail car dilemma

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It's a persistent agony for farmers, elevators, and railroads: toc few rail cars to move grain to market.

The agony is more than the frustration of not being able to freely respond to market moves. It is out-of-pocket costs for storage, and it is a loss of income that might have been received, could the grain have moved.

For example, one study estimated the total cost from the lack of transportation equipment in 1969 to Iowa elevators alone was $2.36 million.[1]

Private industry has not found an answer to rail car shortages. State governments are beginning to suggest solutions.

During the 1980 legislative session, the South Dakota governor suggested the purchase of rail cars by the state to supplement railroad and elevator fleets.

South Dakota is not alone in examining the purchase of rail cars. The Highway and Transportation Department in Michigan has made a similar proposal. North Dakota recently concluded a feasibility study on the same alternative. In October 1979, Saskatchewan ordered 1000 covered hopper rail cars.

This is a new approach to relieve equipment shortages. But when past attempts to resolve a problem have failed, public officials may be forced to venture into uncharted waters. This report is an attempt to assist decision makers in evaluating the probable success of such a move.

History and causes of the rail car shortages

Seasonal shortages of rail cars is an old problem. The very first case heard before the Interstate Commerce Commission (ICC) in 1887 "involved a complaint by the North Dakota Board of Railroad Commissioners against the Northern Pacific Railway for failing to provide adequate car service to North Dakota shippers."[2]

Again, "as early as 1907 the ICC held extensive hearings on freight car shortages, receiving testimony from shippers of grain, coal, and lumber on their inability to obtain freight cars in sufficient numbers at the time requested."[3]

In the fall of 1921, the Joint Commission of Agricultural Inquiry, created by a Senate resolution, found that "the supply of box cars, coal cars, stock cars, and refrigerator cars is inadequate to meet the demand during normal periods of activity and should be rapidly augmented."[4]

In 1953, William Hudson found that "a tight boxcar situation with periodic shortages, particularly of the better class of equipment required for grain and grain products, will probably continue over the next several years."[5]

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[1]All footnotes in this bulletin are located on page 14.

Elevators have started acquiring private fleets to reach markets but this has not been an answer, either.

No single factor is the primary cause of the continuing shortage of rail cars. Instead, the shortage has come from the interaction of numerous economic and non-economic factors over time:

1. The railroads have failed to share in the general economic prosperity.

They have earned an average of 2¼% return on investment between 1964 and 1979; during the last 5 years the return averaged 1.6%.[6] Railroad earnings are not sufficient to meet all their capital requirements, and the low rate of return discourages reinvesting railroad earnings back into the railroad and also fails to attract outside capital.

2. The seasonal production pattern of grain, combined with year-to-year variation in foreign demand, creates shortages and surpluses of rail equipment over time.

The result is that "carriers may invest in capacity that is underutilized during off-peak periods or use existing capacity so intensively that costs increase in greater proportion than output."[7]

These changes in demand over time can be compounded by agricultural production practices. For example, the technological development and adaptation of the picker sheller and corn dryer increased (from 29 to 59%) the amount of corn moving directly to Iowa elevators during harvest.[8]

Increases in farm storage capacity also provided farmers with the ability to alter historical marketing patterns. This creates surges in grain movements in response to changes in grain demand rather than the predictable pattern of grain production.

3. Fewer general purpose cars which can be converted to haul grain are available.[9]

Railroads and shippers are constantly striving to reduce labor requirements while providing greater protection for cargo. The result has been the demise of the plain, 40-foot, narrow door boxcar. It has been replaced by cars specifically designed and equipped to meet the requirements of individual commodities.

This results, however, in an inflexible car fleet which cannot serve multiple uses as transportation demands change. Therefore the percentage of loaded miles has decreased from 67% of total miles in 1946 to 57.9% in 1979.

4. Rail rates remain stable throughout the year, failing to reflect the seasonality of grain production or to allocate demand over time.

While the Railroad Revitalization and Regulatory Reform Act of 1976 (RRRR Act) addressed this issue by instructing the ICC "to provide sufficient incentive to shippers to reduce peak-period shipments,"[10] seasonal rates were not widely adopted and the provision was repealed in 1980.

5. Low per diem rates do not encourage car ownership.

Per diem rates are the fees paid by one railroad to another for using rail cars and are established by the American Association of Railroad (AAR) and the ICC. Historically they have been maintained at a level which is below cost to the railroad owning the car.

The low level of per diem fees continues primarily through the efforts of those railroads whose total car usage is greater than their ownership.

These carriers are located within territories which terminate more interregional carloads than are originated. Historically, these have been the eastern roads.

The western roads, including those serving South Dakota, are forced to interline carloads of traffic with eastern carriers. Rather than invest in cars to meet their needs, the deficit carriers simply keep the cars and use them as long as they are needed.

During periods of car surpluses, cars are returned to the owning carrier empty, while westbound loads are loaded in the cars owned by the deficit carriers. In addition to an increase in empty miles, which use additional resources, this practice also places a disproportionate share of the cost of the car surplus upon railroads having an adequate car supply.

The Association of American Railroads instituted a multilevel per diem rate on January 1, 1964. Grunfield summarized the impact of the per diem incentive,[11]

> (a) a per diem rate which was less than prospective daily ownership costs of a new freight car would lead to an overall deficiency in freight car ownership; (b) a single per diem rate would discourage the purchase of the more expensive freight cars with their greater annual depreciation expense; and (c) a seasonally inflexible per diem rate would fail to equate freight car demand with opportunity costs during peak and off-peak periods.

6. Existing demurrage charges make rail cars economical storage alternatives during periods of storage stress.

Demurrage is the fee that shippers and receivers pay for holding a rail car beyond the normal time necessary for loading or unloading. While the daily demurrage rate increases with time, elevators which are filled because of heavy grain movement still find rail cars an economical storage alternative. Unfortunately, this inefficient use of grain cars normally occurs during harvest periods when car shortages often are greatest.

7. The ICC is charged with the responsibility of protecting the public interest and must decide between the interests of large and small shippers.

Large elevators, capable of shipping unit trains, use rail cars much more efficiently than smaller elevators. According to an Iowa study, the movement of grain in unit trains requires only 28% of the number of cars that would be needed to transport the grain in single car movements.[12] Thus the ICC is charged with choosing between efficiency and equity.

A recent policy limited the percentage of cars used in unit trains, consequently protecting the interests of the smaller and branchline elevators while reducing the total amount of grain which is moved.

In August 1980 the responsibility for car service was shifted to the AAR. Renewed emphasis on efficiency will likely lead to policies improving car utilization to the detriment of smaller shippers.

8. An eighth factor is the limited capacity of American rail car builders.

Over the past decade, purchasers have faced order backlogs which have delayed delivery of grain cars for many months. This backlog limits the ability of railroads or elevators to respond quickly to changes in demand and it also means public purchases will delay private purchases.

9. The most important factor contributing to rail car shortages is that ownership of cars is simply not

profitable for either railroads or elevators. This is discussed in the following section.

The economics of public car ownership

Owning or leasing rail cars is unprofitable for both elevators and railroads. If it were profitable, railroads would be buying cars, rather than reducing investment as they have in the past. During the last 10 years, for example, class one railroads reduced their car ownership by over 20,000 cars per year.[13]

The argument can also be extended to shippers who would gladly purchase cars if they were a good investment. Shippers have also been reluctant investors. While shipper-owned or leased cars increased by over 6,400 units per year between 1969 and 1979,[13] they were not purchased as an investment but rather as a necessary cost of doing business.

Rail markets often pay more for grain than truck markets, and elevators need rail cars to receive the higher bid. Since railroads do not provide enough rail cars the elevators have had to acquire their own. They lose money on their private fleets, but the higher price received for the grain offsets the loss and their total income is increased.

The major variables that influence profit in owning rail cars are turnaround time, car cost, and mileage credits (Table 1).

Turnaround is the number of trips a car makes each month and is usually higher if the car is in a unit train. Car costs can be estimated either through a lease or purchase price. Both methods are used extensively by shippers. Mileage credits are the fees paid by railroads to shippers when shippers use their own car. The early 1980 rate was 24 cents per loaded mile for covered hopper cars.

Table 1 reveals that car lease payments exceed mileage earnings for all reasonable assumptions. Historically, rail car investments have not been profitable for carriers or shippers. (Figures in Table 1 represent actual turnaround experienced by private shippers.)

State owned or leased cars would incur the same kind of deficit requiring continuing operating support in addition to the initial cost. For these reasons, railroads and elevators have not purchased grain cars.

Turnaround and public ownership of rail cars

A major factor contributing to grain car availability is the efficiency with which rail cars are used (turnaround).

Efficiency and equity

Throughout their history, railroads have been charged with discrimination against some shippers in the allocation of cars. Through the purchase of rail equipment the state could attempt to alleviate this.

As the railroads already have, the state will find, however, that efficiency and equity are often mutually exclusive goals.

The elevators which are experiencing the greatest shortage are also the most expensive to serve, i.e., the small or branchline elevators. If it serves these elevators, the state will reduce turnaround and increase the net cost per bushel.

The state would have to choose between efficiency and equity, between moving the greater volume of grain for each dollar invested and serving all the elevators in South Dakota. This would be an extremely difficult decision for any public employee.

Assignment problems

The state could assign cars permanently to individual shippers, but this would result in a fleet which would be inflexible and unresponsive to changes in demand.

Further, a permanent assignment based on shipper needs is difficult to justify. If a shipper would benefit enough to merit a permanently assigned state car, he should invest in a private fleet.

The state could also assign the cars to the railroad's fleet, but this would mean the carriers would allocate the cars. And if the cars ever returned to South Dakota, the same allocation problems created by the railroads in the past would continue.

Empty cars could also be assigned after each trip but this requires extra handling by the railroads and takes extra time, which increases costs.

Management

The elevators which have used their fleets the most efficiently have hired full-time traffic managers. A fleet of 1,000 cars would take a minimum staff of three state employees and a high-speed computer compatible with the railroad computers.

Periods of surplus equipment

The seasonality of grain marketing creates fluctuations in demand for transportation services. Some firms have gotten around this and achieved a higher level of utilization by co-leasing with shippers with different seasonal demand patterns. For example, grain dealers and fertilizer dealers occasionally co-lease equipment, and each shipper uses the cars during his period of greatest need.

Occasionally, a shipper will find that seasonal patterns have fluctuated, and he needs the cars when they are assigned to the co-lessee. A private business recognizes this may happen, that to maximize long-term profits, an occasional short-term loss may be incurred.

Considering the political problems that could result if state owned rail cars were moving fertilizer during a grain car shortage, it is unlikely any public official could advocate a co-lease.

Under existing tariff regulations[14] railroads need not accept private (state owned) cars during periods of car surpluses. And the significant variation in the volume of grain marketed within and between crop years can quickly turn car shortages into surpluses.

For example, weekly shortages of 8,000 covered hoppers during October 1976 evaporated into surpluses of nearly 5,000 cars per week by the end of the year. Surpluses also existed during most of May through September 1977 (Table 2).

During the time of surplus equipment, the state would encounter the same dilemma as the other non-rail owners: how to capitalize on an investment which is continuing to incur costs but which cannot be used.

In addition, cars not in use incur a storage charge if they are held on a railroad-owned siding, and many elevators in South Dakota do not own their sidings.

The problem of surplus equipment could be resolved in the short run by requiring that publicly owned rail cars be utilized before carrier or shipper-supplied equipment. This would minimize the net public cost, but as the railroads and elevators became the residual car supplier, utilization of their equipment would decrease, making ownership more expensive and encouraging an even faster disinvestment for railroads and the reduction of shipper investment. This would be counter-productive to the long run objective

that state provision of rail cars was designed to achieve.

Impact of public provision upon car supply

In spite of potential management difficulties or operating costs, the critical issue in determining if the state should purchase rail cars is the long-run impact. Will public provision permanently increase the total supply of rail cars available for South Dakota grain shippers, or could the supply actually be decreased over time?

The answer is dependent upon the expected behavior or response of existing car owners, including railroads and elevators.

If one assumes that public investment will have no impact upon either private investment or car allocation, the additional investor would increase the total car supply and relieve a portion of the cost imposed by shortages.

Unfortunately, this is an unlikely outcome for several reasons.

First, limited capacity exists for building rail cars, and delivery usually varies from between 1 and 2 years. Consequently, the total number of cars which can be manufactured will not increase with state purchase, and an investment would simply delay delivery to private purchasers. Second, the assumption does not consider the economic incentives for either the railroad or elevators which own or lease cars.

If, on the other hand, one assumes that the railroads and shippers will react, naturally in the manner that will best benefit them, the effective increase in rail cars will be far less than the state's purchase. In fact, it is possible that the long-term impact will be to reduce the number of cars available to move grain. We cannot expect that current car owners will not react.

Railroads have existed in a highly regulated environment for many years and have learned to make calculated decisions based upon the response they expect from the public sector. In fact, railroads are often accused of strategic manipulation in other decision making processes such as branch-line abandonment cases. It would indeed be unfortunate for those who consider themselves victims of present railroad manipulative behavior to design new institutions which would encourage further behavior of a similar nature!

These allegations, however, are simply charges that the railroads are attempting to maximize profits within the parameters in which they work. There is little reason to expect them to alter their profit-maximizing behavior when planning car investment.

The continuing low rate of return to car ownership provides no incentive for the railroads to purchase additional cars or even to maintain the existing fleet. It is more profitable to disinvest in rail cars and use the capital for other purposes, very likely non-rail investment.

A change in the rules of the game will encourage railroads to carry this further. If they believe that states will purchase rail cars, they will encourage even greater public investment. This could be accomplished by (1) continuation of their disinvestment policy and (2) reassigning cars to states not purchasing rail cars.

The other major source of grain cars is the elevators, which have become unwilling investors in response to the railroad's disinvestment.

Rail cars are profitable for grain elevators because greater net returns can be secured in rail-based markets.

But because of rail disinvestment, carrier supplied cars are not readily available, and many elevators have responded by purchasing or leasing cars. However, mileage credits do not offset lease costs; consequently, the rail cars themselves result in a net cost.

Thus while access to their own rail cars is profitable for elevators access to someone else's car is even more profitable. The elevators will also approve rail equipment purchase by the state.

The ultimate strategy which would be adopted by elevators is, however more difficult to project.

They have more to lose if rail cars are unavailable, but they also have better access to public opinion and to state officials. Consequently, they are in a better position to affect public behavior. As long as shippers believe that a public investment might be forthcoming, they will put off private investment. Shippers will also actively encourage public investment through lobbying and news releases.

Once the rumor starts of a possible public purchase, the state must move promptly and make a forceful decision. As long as the decision remains unresolved or private investors perceive an irresolute decision, they will delay additional rail car purchases.

Because public investment discourages private investment, once the state has initiated a fleet, the pressure will be to expand the public fleet as private owners disinvest.

Of course, it can be argued that the state can purchase perhaps 1,000 cars and announce that it is a one-time transaction, never to be repeated. This is simply Round 2 of game theory. In Round 3, most shippers probably would believe further public pressure could force another round of state investment, and then another.

The exact outcome is difficult to call without estimating supply and demand functions. However, there is no doubt that in the short run, the increase in the total supply of grain cars will be significantly less than the number of cars the state purchased.

A decrease in the supply of rail cars

It is possible, under some conditions, that by purchasing rail cars the state would actually decrease the supply which is available to move grain.

Should private investors believe that additional public purchases are possible, the long-term impact could actually be a reduction in cars available as private interests attempt to "force" additional public investment.

Second, the ultimate measurement is car capacity, which is a function of the number of cars and the turnaround. Turnaround for state owned cars may well be less than for privately owned cars. A decrease in turnaround amounts to reduced capacity available to move grain. Third, railroads could shift cars to other states.

Should each of these probable outcomes occur, the long-term impact would be a net decrease in the number of cars available to move grain.

The fact that the net increase in cars is less than the total state purchase of cars yields interesting economic results.

Normal accounting practices would divide the total cost of owning the rail fleet by the bushels of grain moved, thus determining the state's cost per bushel and measuring the effectiveness of the state investment. This would underestimate the actual additional cost per bushel.

The net cost per bushel of the state car purchase should be determined by dividing the total cost of the state fleet by the number of bushels moved in excess of the grain which would have

moved without the state purchase. If the net additional car capacity is significantly less than the state's total acquisition, the cost of moving the additional grain becomes rather large.

Summary: impact of public provision upon car supply

Analysis suggests that state acquisition of rail cars would have little positive impact upon the total supply in the long run. It is also very likely that the result would be a decrease in the total supply. Consequently, any additional bushels of grain moved would be extremely costly.

This plan addresses only the symptoms and does not treat the causes. The state does have some viable alternatives to public ownership available which would address the causes, increase car supply, and stabilize demand.

Viable alternatives to increase rail car availability

Supply side modifications

Rental rates--in the form of per diem, demurrage, and shipping rates--are at a level below ownership costs. An unregulated pricing structure would increase the return to car ownership and would thereby encourage additional investment.

A proven way to increase the supply of rail cars is collective action between various elevators.

In some instances the purchase of rail cars has been included in an overall cooperative effort such as building a subterminal. In other cases the only collective action effort has been to acquire and manage a cooperative fleet of rail cars.

In spite of its success, collective action has not become widely adopted in South Dakota because of insufficient information and organizational costs. One answer would be a rail car expert within the State Department of Transportation. This individual would have the needed information regarding all aspects of car leases, including cost and risk, and could facilitate organizational efforts.

This institutional arrangement would, of course, reinforce the railroads' current disinvestment strategy.

Demand side modifications

When grain prices are high or during harvest season, cars can't be found. At other times, rail cars stand idle. If, by some method, demand can be spread out through the year, existing cars will be used more efficiently and new ones may not need to be purchased.

Felton has suggested a rail car market in which potential users could bid for railroad equipment.[15] In addition to encouraging additional investment on the supply side, this would allocate equipment more effectively and partially eliminate the problems of seasonal demand variation, non-compensatory per diem and demurrage rates, allocation among shippers, and the decrease in utilization.

Other methods which would effectively change time of demand include flexible rail rates and seasonal rates.

Should variable rates be implemented, elevators could not lock in a transportation rate as they contract grain for future delivery. Therefore, elevator margin would widen unless a futures market in transportation service were developed to protect elevators against transportation risk. Wider margins would be borne by the farmer.

However, the volume of grain requiring transportation is too volatile to suggest that these marginal changes would be completely effective in allocating demand over time.

While domestic demand for grain is relatively stable over time, export demand fluctuates greatly in response to various factors such as weather-generated shortfalls of grain in other countries, embargoes and other foreign policy, and policies of other nations.

Each time export (and thus domestic) prices decline, farmers react by reducing the volume they are willing to sell and increasing the amount they store. As part of its food policy, the public sector responds by making on-farm storage easier. Both construction and carrying charges are subsidized. But when prices improve, an even larger volume of grain will require transportation, compounding car shortages and creating even larger transportation bottlenecks.

Again, a public policy designed to assist a segment of the citizenry generates reactions which may be totally contrary to perceived public good.

It should be noted that on-farm storage which allocates grain over the marketing year contributes to the orderly utilization of rail cars. On-farm storage which enables farmers to store production from more than one crop year compounds the cyclical nature of grain marketing and compounds car allocation problems.

Direct farmer ownership of storage facilities at ports would reduce build-up of grain at the point of production and even out the seasonal demand for cars.

Farmers, acting collectively, would build storage facilities near a port with some type of transfer to the export houses. Their grain would be shipped via the normal mode, mixed with grain of others, to this storage facility during periods of low prices. When an individual was ready to sell, he would issue instructions to the facility manager to deliver the grain to an export house.

Obviously this suggestion is plagued with numerous problems: (1) potential managerial difficulties, (2) liability claims for transit or storage damage, (3) unwillingness of local elevators to load farmer-owned grain, (4) lack of physical control by farmers, and (5) the higher construction, land, and tax costs at an urban facility. Finally, farmers generally do not count up all the costs of on-farm storage. Off-farm storage will appear expensive by comparison.

Nevertheless, the potential benefits of a storage facility justify further exploration. The public sector could facilitate collective action and provide information. Existing agricultural and food programs and tax laws would also need to be modified before off-farm storage could materialize.

The exact impact that direct farmer ownership of storage facilities at ports would have upon agricultural production and marketing is unclear. However, existing agricultural policy and tax laws which encourage investment in farm storage facilities beyond one year's crop are probably going to compound the rail car shortage over time.

Conclusions

The state is correct that public intervention is necessary before supply and demand for rail cars will match more evenly than they do now.

State purchase of rail cars will not ease the problem of seasonal and costly car shortages. It may make the situation even worse. Another entity, whether it be private or government, which will take over the expense of owning rail cars is exactly what railroads and shippers want. They could then reduce their own investments in the cars and reinvest their money in (for them) more economical assets.

Consequently, the increase in rail car supply will be significantly less than the total number of cars acquired

by the state. The final impact could actually be a decrease in the total supply of cars.

A more positive and permanent solution would be state activity encouraging collective and cooperative action among the various elevators.

The problem of seasonal grain car shortages will not go away until we change or correct the causes of the problem. Only then will an adequate fleet of cars be available to transport grain produced in South Dakota.

Table 1. Cost of monthly rail car ownership

Assume: (1) A 15-year lease signed during the first quarter of 1980. A likely lease rate would include a monthly payment of $570 and an annual charge of $0.02 for each mile over 30,000. This rate is subject to increases as maintenance costs increase.
(2) Railroads pay $0.24 per loaded mile for privately leased or owned covered hoppers during early 1980.
(3) These figures represent 100% utilization, 12 months per year. Costs increase rapidly if the cars are idle.

Cost of lease per month	Number of loads per month	Monthly mileage credit earned	Profit or (loss) per car per month
		300-mile one-way trip	
$570	1[1]	$ 72	$(498)
570	2[1]	144	(426)
570	3	216	(354)
		700-mile one-way trip	
570	1[1]	168	(402)
576	2[2]	336	(240)
604	3	504	(100)
		1500-mile one-way trip	
580	1	360	(220)
640	1.66[3]	600[5]	(40)
640	2[4]	525[5]	(115)

[1] Probable turnaround for single car movement, current turnaround for
[2] Burlington Northern (BN)
Probable turnaround for unit train
[3] Turnaround achieved by unit train shippers in Nebraska using BN
[4] Turnaround achieved by unit train shippers in Nebraska using Union Pacific
[5] The Union Pacific has a lower rate rather than a mileage credit which works out to about $0.175 per loaded mile

Table 2. Surplus and (shortage) of the U.S. rail car supply for a 70-week period[1]

Week	40-foot narrow door box cars	Covered hopper	Week	40-foot narrow door box cars	Covered hopper
9/ 4/76	9,311	(3,621)	5/ 7/77	3,946	(996)
9/11/76	9,220	(2,623)	5/14/77	5,284	627
9/25/76	9,185	(3,980	5/21/77	5,940	1,955
10/ 2/76	8,242	(4,017)	6/ 4/77	7,811	2,577
10/ 9/76	7,346	(3,919)	6/11/77	8,238	2,020
10/16/76	3,673	(8,130)	6/18/77	8,595	386
10/23/76	3,072	(9,142)	6/25/77	8,302	705
10/30/76	3,209	(8,056)	7/ 2/77	7,912	1,486
11/ 6/76	2,740	(7,261)	7/ 9/77	6,318	(32)
11/13/76	6,329	(5,671)	7/16/77	5,140	(62)
11/20/76	7,509	(3,848)	7/23/77	3,773	(1,415)
11/27/76	9,500	(1,104)	7/30/77	3,024	(1,035)
12/ 4/76	10,923	1,463	8/ 6/77	2,656	(1,050)
12/11/76	11,129	2,800	8/13/77	2,251	(543)
12/18/76	11,805	4,884	8/20/77	3,121	41
12/25/76	12,996	5,216	8/27/77	3,129	1,098
1/ 1/77	12,734	5,279	9/ 3/77	3,706	1,935
1/ 8/77	11,695	2,641	9/10/77	3,542	949
1/15/77	10,700	(835)	9/17/77	3,030	(897)
1/22/77	7,980	(3,624)	9/24/77	2,202	(2,052)
1/29/77	3,714	(7,291)	10/ 1/77	1,246	(4,111)
2/ 5/77	1,433	(9,666)	10/ 8/77	462	(4,647)
2/12/77	(1,053)	(12,140)	10/15/77	175	(3,753)
2/19/77	(1,722)	(11,957)	10/22/77	(269)	(6,836)
2/26/77	(2,213)	(10,050)	10/29/77	(837)	(8,145)
3/ 5/77	(2,924	(11,433)	11/ 5/77	(1,157)	(9,796)
3/12/77	(2,479)	(11,381)	11/12/77	(1,226)	(9,100)
3/19/77	(1,550)	(10,839)	11/19/77	(1,255)	(9,215)
3/26/77	(1,042)	(9,246)	11/26/77	(1,202)	(7,464)
4/ 2/77	(1,028)	(8,321)	12/ 3/77	(1,851)	(7,186)
4/ 9/77	(817)	(7,396)	12/10/77	(1,655)	(6,947)
4/16/77	(301)	(6,994)	12/17/77	(1,512)	(7,068)
4/23/77	(1,018)	(5,921)	12/24/77	(1,353)	(7,182)
4/30/77	1,445	(4,378	12/31/77	(1,273)	(6,865)

[1]North Dakota Public Service Commission. Preliminary report on feasibility of state of North Dakota acquiring a covered hopper rail fleet. Bismarck, N.Dak., Nov. 1978.

Footnotes

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[10]Ninety-fourth congress. February 5, 1976. Railroad revitalization and regulatory reform act of 1976, S2718, public law 94-210.

[11]Y. Grunfeld. 1959. The effect of the per diem rate on the efficiency and size of the American railroad freight car fleet. Journal of Business :56.

[12]C.P. Baumel and et al. op. cit. :100.

[13]AAR. op.cit. :49.

[14]Association of American Railroads. Agreement OT-5.

[15]Felton. op. cit. :272.