THE FREIGHT CAR SITUATION AND PROSPECTS

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THE FREIGHT CAR SITUATION AND PROSPECTS 1/

Agriculture, and especially grain producers and shippers, have a particular interest in the adequacy of rail transport services. Newspaper headlines of grain and lumber being stored on the ground in the Great Plains and Northwest; testimony of railroad executives, shipper representatives and government officials before Congressional committees in 1965 and 1966; and recent actions by widely scattered shippers, railroads, and government agencies all attest to the fact that there are shortages of railroad freight cars at the present time.

In 1964 and 1965, U.S. Class I railroads spent almost $2.5 billion on equipment, yet such expenditures added only 2.7 percent to the carrying capacity of the nation's freight car supply. 2/ If shippers' demand for cars continues at recent levels, increases in equipment may not be sufficient to satisfy fully the needs for freight cars during the grain harvests of 1967.

This article will present some of the factors which have brought about the current shortages of freight cars; some of the measures already taken that have helped to keep the situation from becoming even more desperate; and a few prospects as to changes in the situation in the immediate years ahead. It is not an exhaustive treatment. Many thousands of pages have been written concerning this matter, and it is too complex to be presented with complete clarity within the space available here.

Factors Leading to Current Shortages

Contractions in Car Supply

The nation relied upon railroads very heavily during World War II to transport its freight traffic. The railroads carried 705 billion of the estimated 1,019 billion ton-miles annually of intercity freight traffic, which our wartime economy generated on the average during 1942-45. 3/ At the end of this period, Class I line-haul railroads owned or leased approximately 1.75 million freight cars. 4/ In 1965, when total intercity freight traffic had increased to 1,621 billion ton-miles, Class I railroads moved 705 billion ton-miles but owned or leased only 1.48 million freight cars.

The number of freight cars owned and leased by Class I railroads on August 1, 1960,--1.74 million--was practically identical to the number owned and leased at the end of World War II (table 12). There were, however, some changes in the composition of the fleet in this period. Between August 1, 1960, and August 1, 1966, the number of cars decreased by almost 200,000. Moreover, changes in the composition of the fleet were considerably greater than in the earlier period. Boxcars and plain hoppers, the principal types of cars used in grain gathering, declined by 181,000 during this time.

Influences of per diem rates on car supply.--Low per diem rates (daily rentals a railroad pays another for use of its cars) through 1963 may at times have encouraged an inefficient use of cars, resulting in poor car distribution. These rates also discouraged the building of new cars to be interchanged among railroads.

In terms of ownership and returns to owners for the risks and uncertainties they must shoulder in adding to our productive capacity, we have no national railroad syste-

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1/ Prepared by John O. Gerald, Agricultural Economist, and Mildred R. DeWolfe, Survey Statistician.

2/ Association of American Railroads, Yearbook of Railroad Facts, 1966, p. 70 and p. 63.

3/ Annual reports of the Interstate Commerce Commission.

4/ See p. 60 of reference cited in footnote 2.

Table 12.--Freight cars operated by Class I railroads and cars on order, August 1, 1960-66, and cars installed and retired, year ended July 31, 1960-66

Freight cars	Owned by Class I railroads								Other refrigerator 1/	Total all cars
	Box	Covered hopper	Hopper	Flat	Refrigerator	Gondola	All others	Total		
Cars operated:										
Serviceable										
August 1, 1966	547,578	95,751	407,753	61,892	45,904	197,532	56,895	1,413,305	53,123	1,466,428
August 1, 1960	642,648	61,915	444,599	48,832	19,973	237,597	73,278	1,528,842	66,385	1,595,227
Awaiting repairs										
August 1, 1966	33,491	2,393	18,012	2,410	918	13,686	2,600	73,510	2,407	75,917
August 1, 1960	54,710	1,436	46,108	3,063	1,720	32,743	3,799	143,579	3,101	146,680
Total										
August 1, 1966	581,069	98,144	425,765	64,302	46,822	211,218	59,495	1,486,815	55,530	1,542,345
August 1, 1960	697,358	63,351	490,707	51,895	21,693	270,340	77,077	1,672,421	69,486	1,741,907
Percentage change, 1960-1966	-16.7	54.9	-13.2	23.9	115.8	-21.9	-22.8	-11.1	-20.1	-11.5
Installed										
July 31, 1966	24,685	11,066	18,539	5,289	5,647	6,794	1,818	73,838	3,799	77,637
July 31, 1960	17,034	3,104	15,665	1,957	2,502	6,367	165	46,794	1,002	47,796
Retired										
July 31, 1966	30,178	1,034	23,087	438	2/-592	13,149	2,690	69,984	3,891	73,875
July 31, 1960	32,462	138	29,856	781	2/-970	10,938	2,085	75,290	4,579	79,869
On order										
August 1, 1966	19,557	11,467	9,918	2,612	3,264	5,547	1,697	54,062	1,468	55,530
August 1, 1960	9,032	303	6,230	2,009	2,282	4,429	15	24,300	1,251	25,551

1/ Owned by private car lines, owned and controlled by railroads.

2/ Negative retirement indicates increase in ownership in excess of new installations, resulting from reclassification or transfer of equipment, purchase or lease of used equipment, etc.

Association of American Railroads, Car Service Division, CS-54A.

in the United States. Rather, at the close of 1965, we had 76 independent Class I railroad systems. Our "national supply" of freight cars is owned primarily by these 76 independent railroads (87 percent as of September 1966, according to the Association of American Railroads).

A typical freight train includes cars belonging to many different railroads. A freight car which bears an ownership symbol different from that of the locomotive that pulls the cars will usually be referred to by railroads as a "foreign" car, i.e., one not on its "home road." 5/ Some of these foreign cars may have been loaded on home road for destinations off of home road; others may have been loaded at points on a nonhome road for return to a point closer to or actually on its home road; still others may be moving empty to home road or to a loading point for loading and then movement closer to or on its home road.

Some of these foreign cars may make many loaded trips in a complex manner before ultimately returning to home road. Nonetheless, most railroads in the United States subscribe to the "Code of Car Service Rules" of the AAR, which specify the actions that can be taken by a railroad in regard to foreign cars it may receive on its lines and the manner in which the car owner will be reimbursed for the use made of the car by nonowning roads.

As far back as 1867, some railroads had agreements that the using road would pay the owning road for the use of its cars. Since rail freight cars have come to spend a substantial part (65 percent for plain boxcars 6/) of their life on other than their home roads, some system needed to be devised whereby the owners were compensated for the time spent on foreign roads. The prices to be paid for the use of foreign cars have come to be called "per diem" rates.

At first, payment was made for the loaded miles only; later it also included empty mileage, but at a lower rate. Different types of agreements were entered into until finally the Committee on Car Service presented the AAR with a per diem code which the Association approved. It was accepted by the members and became effective July 1, 1902. The agreement provided that subscribers would abide by the rules adopted by the Association--Code of Per Diem Rules--governing settlement for the use of freight cars. A modified form of this agreement is still in effect.

The per diem rate in 1902 was set at 20 cents per car day. This figure was set with the idea that it might approximate the average daily cost of repairs, interest and depreciation for typical cars. Rates have fluctuated over the years and have at times been set so as to reflect heavy demand and heavy surplus periods (table 13). As costs of car and maintenance increased, there was a temptation for roads to detain cars of other roads for long periods, particularly the better cars. They might permit them to stand idle for unreasonable lengths of time waiting for loads in the direction of the car's home road, or they might violate the car service rules and use the cars for traffic not directed closer to or on home roads. 7/

Over the years the AAR and the ICC have made studies in an effort to cut to a minimum wasteful empty car haul, especially for boxcars. Independent studies of the effects of various per diem rates also have been made. The late Professor Yehuda Grunfeld, University of Chicago, in an article stated: "The main reason for the permanent controversy on the proper way to calculate the per diem rate is that the concept of 'fair yield' which has been taken as the conceptual basis for these rates

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5/ Code of Car Service Rules, AAR, Circular No. OT-10-A, p. 2.

6/ AAR Car Service Division, CS-GIA, Home Cars on Home Roads, (July 1957).

7/ Testimony of Charles A. Webb, Chairman, Interstate Commerce Commission, before the Freight Car Shortage Subcommittee of the Senate Committee on Commerce, Hearings Serial No. 89-23, p. 21.

Table 13.--Per diem rates for railroad freight cars, 1902-1963

Year initiated	Per diem rate	Year initiated	Per diem rate
	Dollars		Dollars
1902	0.20	1920	0.90
1906	.25	1920	1.00
1907	.50	1945	1.15
1908	.25	1947	1.25
1910	.30	1949	1.75
1910	.35	1952	2.00
1913	.45	1953	2.40
1916	.75	1957	2.75
1917	.60	1959	1/ 2.88

1/ This rate applied through 1963. For rates after 1963, see table 15.

Association of American Railroads.

is unsatisfactory..." 8/ He then mentioned the several-part code of AAR for car service, and stated, "It is the function of a good pricing system for car rentals to dispose of as many direct controls as possible..."

Professor Grunfeld next examined the conditions of car owning, maintenance, and use existing in the United States, and found that (1) the per diem rate should be adjusted in line with seasonal and cyclical levels of demand so that each railroad is indifferent on the margin as to whether its own cars are on home roads or foreign roads; (2) if total car supply is to respond to longer-run expected conditions of demand, then the per diem rates must reflect the ownership costs of new cars rather than the actual costs of the existing fleet; (3) a flat per diem rate, rather than a sliding scale of rates depending upon the cost of the individual car, encourages railroads to maintain and purchase lower-cost rather than higher-cost cars.

His analysis indicated that with a life of 30 years per car and a return on investment of 6 percent, the per diem rate of $2.75, then prevailing, would reimburse an owner fairly for a new car costing approximately $6,400. 9/ According to testimony presented by a railroad executive before a Congressional committee in 1965, a new modern boxcar equipped with roller bearings would cost about $12,000 to $15,000. 10/ Under these conditions, the $2.88 per diem rate put into effect in 1959 was far from adequate to compensate car purchasers in the early 1960's for their investments. This helps to explain why railroads have used new, specialized, expensive equipment only on their own lines, or released them to other carriers under strict conditions that insured prompt return to home road. 11/

8/ Grunfeld, Yehuda, "The Effect of the Per Diem Rate on the Efficiency and Size of the American Railroad Freight-Car Fleet," Journal of Business, XXXII, No. 1 (January 1959), pp. 54-55.

9/ See pp. 57, 62, and 73 of publication cited in footnote 8.

10/ Testimony of David E. Smucker, Vice President of Operations, Pennsylvania Railroad, before the Freight Car Shortage Subcommittee of the Senate Committee on Commerce, Hearings Serial No. 89-23, p. 112.

11/ See p. 30 of publication cited in previous footnote.

Influences of demand expectations on car supply.--As mentioned above, railroads hauled more than 69 percent of the nation's freight traffic during World War II. This represented an annual average of about 43 million car loadings. By 1965, car loadings totaled only 30 million, and the railroads hauled only 43 percent of the nation's freight. In the interim, rail ton-miles dropped from 747 billion in 1944, to 597 billion in 1950, and to 579 billion in 1960. 12/ Trucks, barges, and pipelines were rapidly increasing their traffic tonnages and shares during this period.

In view of the declining tonnage hauled by railroads while the nation's total transportation job was increasing from 1,088 billion ton-miles in 1944 to 1,314 billion in 1960, it was expected that potential owners of new freight cars would be pessimistic about ultimate returns on car investments.

Influences of other factors.--Demurrage is a daily price paid by a shipper or receiver for undue delays in loading and unloading a car. Certain free-time is given, and according to testimony of a railroad executive in 1965, detention of cars was permitted to increase during the 1950's as one device to help retain traffic in the fierce intermodal competitive struggle that has existed all during the 1950's and 1960's. 13/ This increased free-time may have reduced the number of cars available for loading at any particular time and also the revenues to the industry. Also, the shift after World War II from a 6-day work week to one of 5 days, with a consequent addition of Saturdays to the Sundays and holidays excluded from counting in free-time allowances, has further reduced the number of cars available for loading.

Expansion in Demand for Cars

The expanding economy.--The very rapid growth in economic activity since 1961 is perhaps the major demand factor bearing on the present car shortage. Our gross national product has grown from a seasonally adjusted annual rate of $503.6 billion in the first quarter of 1961 to $746.0 billion in the third quarter of 1966.

A measure of what this growth has done to the magnitude of our transportation job is provided by the 24 percent increase in total ton-miles between 1961-65 (table 14). None of the modes had made the plans and investments which such traffic increases required. Trends in traffic and revenues gave railroads, in particular, no reason to invest for such growth in their traffic. As recently as April 1962, the traffic and revenue conditions of the railroads were such that the President sent a transportation message to Congress. He proposed some modifications of conditions of competition facing railroads. Even earlier in 1958, Congress revised the Interstate Commerce Act to relieve some competitive restraints on railroads. Investments that the railroads made in the 1950's and early 1960's were intended to retain traffic.

Freight rate reductions.--The traffic shifts between 1946 and 1965 between rails, trucks, barges, and pipelines shown in table 14 demonstrated that the demands of many shippers can be satisfied by any one of two or more of the modes of transportation. This implies that the responses of such shippers to relatively small changes in the relationships of rates charged by the competitive modes can have a major impact on traffic shares.

Until the end of World War II and shortly thereafter, railroads enjoyed considerable freedom from the competition of other modes of transport for much of their traffic. Railroad management had accepted numerous compromises on rate structures within its own ratemaking groups and from the Interstate Commerce Commission which were not fully in accord with ideal goals of economic efficiency for the transport industry.

12/ See p. 39 of publication cited in footnote 2.
13/ See p. 92 of publication cited in footnote 10.

Table 14.--Estimated ton-miles of intercity freight traffic, public and private, by transport agency, average 1942-45, annual 1946-65

Year	Railway	Motor vehicles	Inland waterways	Pipelines	Airways	Total 1/
	Billions	Billions	Billions	Billions	Billions	Billions
1942-45 average	705	60	146	108	0.062	1,019
1946	602	82	124	96	.093	904
1947	665	102	147	105	.158	1,019
1948	647	116	162	120	.223	1,045
1949	535	127	139	115	.235	916
1950	597	173	163	129	.318	1,063
1951	655	188	182	152	.379	1,178
1952	623	195	168	158	.415	1,144
1953	614	217	202	170	.413	1,204
1954	557	213	174	179	.397	1,123
1955	631	223	217	203	.481	1,275
1956	656	249	220	230	.563	1,355
1957	626	254	232	223	.572	1,335
1958	559	256	189	211	.579	1,215
1959	582	279	197	227	.739	1,286
1960	579	285	220	229	.778	1,314
1961	570	296	210	233	.895	1,310
1962	600	309	223	238	1.289	1,371
1963	629	332	234	253	1.296	1,450
1964	666	347	250	266	1.504	1,531
1965 2/	705	375	259	280	1.800	1,621

1/ Totals do not always add because of rounding.
2/ Preliminary.

Annual reports of the Interstate Commerce Commission.

The rate relationships flowing out of such compromises, and no doubt some selfish independent actions, in earlier years could not be maintained with impunity following World War II. Trucks, barges, pipelines and airlines developed rapidly as means of transport. The general rate increases accorded to the railroads shortly after World War II brought considerable traffic of the railroads within the cost abilities of these transport modes.

Trucks competed more and more with railroads for the higher-valued commodities and short-haul and perishable traffic. The traffic most vulnerable to the onslaught of barges consisted of bulk, nonperishable commodities amenable to mechanized materials-handling methods along the navigable waterways. For pipelines, carrying of non-corrosive liquids is all that has been taken in large volume from railroads thus far, although there has been considerable experimentation with crushed coal slurry, potash, etc. And, electric energy is now moved over long distances by means of high voltage cables.

Rail freight rates generally increased through the late 1950's, but have declined since then. 14/ Indexes for agricultural commodities followed a similar pattern,

14/ Interstate Commerce Commission, Indexes of Average Freight Rates on Railroad Carload Traffic.

rising from 81 in 1949 to a peak of 101 in 1957 and 1958. 15/ Since 1958, these indexes have fallen steadily to 90 in 1965 (table 7, p. 17).

Length of haul.--Another minor factor serving to increase demand for freight cars has been the increase in length of the average distance all rail traffic is hauled. This increased from 420 miles in 1951 to 452 in 1961 and 470 in 1965. 16/

Improved design of cars for loading and unloading.--Many improvements were made in the 1950's and 1960's in car design to facilitate the use of modern materials-handling techniques in loading and unloading. These new designs are not yet available for all customers of the railroads, but the addition of some new cars with such features encouraged firms with modern materials-handling techniques either to switch to or stay with rails for their transport needs. These designs also were factors in increasing the speed of turnaround of cars and thus helped to alleviate shortages (pp. 35-36).

What Has Been Done to Alleviate Shortages

Transition to a Graduated Per Diem Scale

A flat per diem rate for car rentals was maintained up through 1963, despite the establishment of proof in the late 1950's by Professor Grunfeld, in the article referred to in footnote 8, that a flat rate tended to concentrate new car purchases on lower-priced cars. However, effective January 1, 1964, AAR instituted a graduated scale of per diem rates. The scales in effect since January 1964 are shown in table 15.

In 1965 and 1966, Congress considered bills aimed at further modifying the method of reimbursing railroad owners of freight cars for their use off home road. The import of testimony given by various grain and lumber shipping interests in hearings on these bills was that the scale of per diem rates put into effect in 1964 did not cause car numbers to increase sufficiently to meet total demands. More importantly, they appeared to have caused further delay in the return of cars to those areas and industries most dependent upon rail service for reaching markets. Spokesmen for the grain and lumber industries believed the "grain loading or better" class of boxcars of the older car fleet to be currently of greater value for loading on a foreign road than the per diem charge applicable on such cars, resulting in their slow return to the home roads serving the Grain Belt. Free-time, demurrage time, and idle time awaiting loads also delay their return. The "grain loading or better" class of boxcars still accounts for the bulk of our car supply suitable for grain gathering. 17/

The scale of per diem rates now in effect is based on "original cost per car depreciated," (table 15). Most of our "plain" boxcar fleet has had considerable depreciation taken. Professor Grunfeld noted that "a per diem scheme that will assure an optimal number of cars purchased by the industry will not necessarily assure an optimal distribution of cars among roads at each point in time." 18/

Professor Burton A. Weisbrod of Washington University at St. Louis, pointed out that in the short run the supply of freight cars is essentially fixed, but that demand for cars is not independent of price (per diem rates, in this instance). He stated that, "At whatever level the per diem rental charge may be fixed, this level will

15/ Agricultural Statistics, 1965, p. 467.
16/ See p. 38 of reference cited in footnote 2.
17/ See p. 13 of reference cited in footnote 7.
18/ See p. 56 of reference cited in footnote 8.

Table 15.--Per diem rates for the use of railroad owned freight cars operating in the U.S. between common carrier railroads, January 1, 1964 1/

Original cost of car depreciated	Per diem group	Per diem rate per car day
Dollars		Dollars
1,000 and less	1	2.16
1,000.01 to 5,000.00	2	2.79
5,000.01 to 10,000.00	3	3.58
10,000.01 to 15,000.00	4	4.50
15,000.01 to 20,000.00	5	6.15
20,000.01 to 25,000.00	6	2/ 7.11
25,000.01 to 30,000.00	7	9.00
30,000.01 to 35,000.00	8	10.18
35,000.01 and over	9	12.18

1/ Rates for use of U.S. freight cars in Mexico and Canada are different. For per diem rates to January 1, 1964, see table 13.

2/ Between January 1, 1964, and March 31, 1965, all cars over $20,000 in original cost per car depreciated were rented at $7.74 per day.

Association of American Railroads, Circular No. OT-10-A.

almost certainly be above or below, but not at, the free market equilibrium price at any particular time...." Under conditions of excess demand for the fixed fleet,".... in the interests of its profits, carrier B may hold a car which promises to add more to its net revenue than the (per diem) rental charge for the car." 19/

Professor Weisbrod went on to test the hypothesis that in cycles of freight car demand, the relative amount of empty car movements back to home road would increase as demand fell, and decrease as demand rose. He found general agreement with this hypothesis by comparing empty car miles as a percentage of loaded to operating revenue on an annual basis. 20/ The transport market of the past 3 years has provided further testing, and the headlines and clamor in particular areas further support the tenor of the hypothesis.

In 1966, Congress amended Section 1(14)(a) of the Interstate Commerce Act. The amendment instructed ICC to give consideration to the national level of ownership of each type of car and determine whether compensation for each type should be computed solely on the basis of elements of ownership expense, or whether the rates should reflect an incentive to encourage sound car service practices in utilization and distribution.

The Interstate Commerce Commission has proposed an interim incentive increase of $2.50 per car on the per diem charge which the railroads pay for the use of any type of car belonging to another road. When the Commission asked the railroads for their opinion on this additional charge, more than 100 statements were filed. Generally, the western roads support the idea and eastern and shortline roads oppose it, according to the Journal of Commerce, October 10, 1966.

19/ Weisbrod, Burton A., "The Per Diem Freight-Car Rate and Railroad Efficiency--The Short-Run Problem," Journal of Business, XXXII, No. 1 (January 1959), p. 381.

20/ See p. 384 of reference cited in previous footnote.

A number of railroads think the incentive increase would encourage owners of old cars to keep them in service, and that there would be no assurance the incentive money would be spent on new cars. Others think that ICC's move is premature--that the Commission should await the outcome of the inquiry (under Ex Parte 241) into the adequacy and utilization of the present car fleet. Verified statements were due on that study October 15, with the Association of American Railroads representing the industry. One of the large eastern roads said that it did not intend to buy more plain boxcars (claimed to be in short supply on western roads); that instead of putting its money into small, general purpose boxcars it plans to invest in larger-load cars and market-oriented equipment. Another railroad challenged the legality of the proceeding saying that ICC would first have to make a final determination of ordinary per diem compensation. Yet another wanted "realistic" per diem charges, and suggested that ICC raise the present $2.16 to $12.18 range to $2.31 to $17.64. There were many other counter suggestions together with reasons why the proposed interim per diem increase was not the answer to the problem.

Car service orders.--Early in 1966, the Interstate Commerce Commission issued a series of car service orders intended to promote efficient use of the available freight car supply. At that time there was a daily shortage of 13,000 plain boxcars, primarily for loading with grain, lumber and plywood in the Northern Great Plains and Pacific Northwest.

The orders apply to all railroad common carriers subject to the Interstate Commerce Act. In general, they: (1) Restrict free time at ports to 5 days for boxcars and hopper cars; (2) require carriers to handle traffic expeditiously and "place, pull, and forward" cars within 24 hours, and (3) permit substitution of stock cars for boxcars. Also, the Commission has issued orders for specific distribution directions to relieve the car situation of carriers having a drastic deficiency of cars on line in relation to both need for cars and ownership of cars. These deficiency orders have been placed against carriers having a more favorable car supply.

Shipper-Owned Equipment and Incentive Carloading

Shippers, and to some degree receivers, have taken action to help alleviate car shortages. Shipper organizations have owned some freight cars for many years, and between 1963 and July 1966 increased the number of cars owned by more than 8 percent, from 271,737 to 294,217. 21/ Aggregate capacity of these cars has not been computed.

Shippers have also learned to load cars to heavier weights, increasing from 40 tons per car during the second World War to almost 50 tons per car in 1965 (table 16). In some cases, this learning was encouraged through special incentive rates. Also, cars are now more nearly loaded to their full capacities, 83 percent in 1965 compared to 79 percent during the early 1940's.

Annual Carrying Capacity of Freight Car Fleet

The decrease in the number of freight cars owned by Class I railroads from 1.75 million at the close of World War II to 1.48 million at the end of 1965 does not necessarily mean that there was a similar decrease in annual carrying capacity. Numerous factors interact in determining this latter ideal measure of supply. Some of these are average capacity per car, speed of line-haul trains and in switching, length of time used in loading and unloading, length of haul, etc. Taken individually or as a group, these measures reflect considerable progress in carrying capacity over the past 4 years or longer (table 16).

21/ Abstracted by Association of American Railroads from Official Equipment Register.

Table 16.--Measures of trends in annual carrying capacity of the U.S. freight car fleet, averages 1941-45, 1951-55, annual 1961-65

Item	Unit	1941-45 average	1951-55 average	1961 1/	1962	1963	1964	1965 2/
Average capacity per car	Tons	50.7	53.4	55.7	56.3	56.8	58.3	59.6
Average load per car	Tons	39.9	41.9	44.9	45.4	46.7	47.8	49.4
Load as percentage of capacity	Percent	79	78	81	81	82	82	83
Total capacity of fleet	1,000 tons	88,534	93,143	89,292	87,224	85,943	86,771	88,300
Average speed of freight trains	Miles per hour	15.8	18.0	19.9	20.0	20.1	20.2	20.1
Hot box set out rate per million car miles	---	N.A.	3/ 4.13	2.54	1.06	.98	.85	.74
Unserviceable freight cars as percentage of total cars	Percent	3.1	5.1	8.4	7.6	7.0	5.4	5.1
Net ton-miles per car day	---	1,012	965	966	1,041	1,113	1,160	1,251
Average freight train	No. of cars	51.3	62.3	70.4	70.5	70.3	69.7	69.6
Centralized traffic control track--December 31	Miles	4/7,384	5/ 28,428	38,264	39,918	40,670	42,282	44,108
Locomotives in service								
Diesel	Number	2,385	21,761	28,169	28,104	27,945	27,837	27,715
Total (including diesel)	Number	42,736	35,338	28,815	28,639	28,449	28,295	28,139

1/ End of year.
2/ Preliminary.
3/ Year 1955.
4/ December 31, 1945.
5/ December 31, 1955.

Association of American Railroads, Yearbook of Railroad Facts, 1966 Edition.

Improvements in operating and technical design.--Many of the actions which are now helping to alleviate the severity of car shortages were intended originally to modernize the railroads' plants as a means of reducing costs and giving the railroads a better chance to retain traffic against the inroads of competing modes or to regain lost traffic. The operating and technical improvements made by railroads in recent years have been described in considerable detail in the technical and popular press. However, some comments on these technological advances will help to explain how improved performance has been achieved.

Boxcars are being built to carry heavier loads. Wide doors, sliding center sills, aluminum doors that fit flush with the car interior to form a smooth side wall, load dividers which fasten across the car, and side fillers that adjust inward to prevent shifting are some of the additional features.

A king-size boxcar having almost 10,000 cubic feet of space and 10-foot wide roll-up doors--which insure easy access to the car for mechanical-handling equipment--has been especially designed to carry tobacco in hogsheads. It holds 98 hogsheads.

An all-door boxcar has been put in service that combines ease of loading of an open car with the protection of a closed car. Aluminum doors and posts move out of the way to make an opening the full length of the car. Although it was built for and tested by lumber shippers, this car is also useful for many other commodities.

Covered hopper cars are carrying bulk loads, some of which were once carried in 40-foot boxcars. They are especially suitable for carrying grain because of their many roof hatches for loading and hopper outlets in the floor for unloading. Some are equipped with separate compartments to provide for loading of different kinds of grain in one car.

Another kind of covered hopper car often used to transport bulk flour, sugar and similar commodities has canvas pads in the sloping bottoms of the hopper compartments. Compressed air blown through the pads loosens flour or sugar, which packs under its own weight to form a "bridge," and makes it flow freely through the hopper outlets. This saves a great deal of time in unloading.

Unit trains make cars available more quickly for additional loads by cutting down turnaround time. A unit train, which may consist of as many as 125 cars, hauls one commodity from a single origin to a single destination and usually returns empty for another load. Speed of the train is much faster than those of ordinary trains. It saves time because switching and uncoupling is eliminated and weighing is accomplished en route. Some grain is hauled in unit trains, but most grain shippers are not large enough to use such methods.

Piggyback (TOFC) service has been used for many years. In 1955, approximately 168,000 carloads were moved by TOFC; 10 years later the number had increased to more than a million. The increase between 1964 and 1965 was 15 percent. About 25,000 flatcars are being used now in piggyback service. The flatcar in piggyback service turns around three times as fast as the average freight car. Thus, better utilization of equipment comes about through this kind of service.

Containerized traffic facilitates transfers and speeds up movements. It has come into a significant role in recent years. Some containers are equipped with refrigeration units to help insure a satisfactory product on arrival, if temperature and humidity control must be maintained. Compartmentized containers also have been developed for mixed loads made up of commodities each of which requires different temperatures and degrees of humidity. These help eliminate partial loading of cars, to some degree.

Containers may be truck trailers with their wheels attached, used in TOFC service, or they can be demountable van containers which have their wheels and trucks detached. They can move by ship, flatcar, truck or air, and are less expensive than a full freight car with similar capacity.

Traffic control systems in which the operators see the tracks in miniature on control panels have been developed and put into use by several railroads. Lights on the panel show the location of trains at all times. The operator, through remote control of switches and signals, directs train movements over distances of a few miles to as far away as several hundred miles. This device permits faster trains to run around slow trains, and helps trains meet and pass, with minimum delays.

Television, radio, and radar are being used in control towers and railroad yards where cars are sorted and trains are put together. At a given point television cameras photograph each car in a train and transmit the record to a switching list. Two-way radio sets mounted in locomotives and cabooses help train crews work together more effectively. Car speeds in automated switching yards are measured by radar and are controlled by retarder brakes in the tracks.

Trackside hot-box detectors are heat sensitive cells installed beside the track. They measure infra-red radiation from passing freight car journals. Readings from these detectors are recorded on tape at a central office. If unusually high temperatures are recorded, the train crew is alerted by radio to stop for a look before it becomes a hot box. Through early detection, corrective measures can be taken before damage occurs. Now freight cars travel more than 1.5 million miles for each hot-box incident.

Roller bearings, better lubricants, improved lubricating devices, and stabilized and improved solid bearings are largely responsible for the reduction of hot-box incidents. This keeps many cars in service which would have otherwise been tied up for repairs.

One of the large eastern railroads operates a million-dollar electronic nerve center. It keeps minute by minute account of what is going on. This railroad also has a network of microwave communications, second in size only to those owned by communications companies. This system was designed to give the railroad information, and thereby centralized control, of every detail of its traffic. It helps to prevent improper freight car movements, control empty car distribution, re-direct cars that have become separated from the waybills that guide them, and route oversize loads.

Officials of a large railroad serving the West and Midwest have initiated a car watching project which is solving the problem of terminal delays--often mentioned as one of the main reasons of railcar shortages. A computerized terminal service evaluation report is distributed daily to superintendents of terminals. The report shows details of each car handled through the terminal and summaries of the number of cars processed in 6 hours or less, in 7-12 hours, etc. It also shows the average time used to deliver cars to connecting railroads.

Prospects for the Immediate Years Ahead

A major industry such as the railroad industry does not suddenly undergo large changes in its capacity to produce. For example, a release of the AAR, September 1966, states that U.S. railroads and private car lines will spend around $1.5 billion in 1966 to place more than 100,000 new and rebuilt freight cars in service. 22/ However, this represents a net addition of only 20,000 cars to the total railroad and

22/ Association of American Railroads, Facts on Freight Car Supply, September 1966.

privately owned fleet of 1.8 million cars, since 80,000 old cars have been or will be retired this year.

Despite the fact that the net capacity added to the car fleet in 1966 may amount to more than 3 percent of total capacity at the beginning of the year, the same release of AAR reported that carloadings had increased in 1966 putting rising pressure on the supplies of boxcars, hopper cars, gondolas, and flatcars in particular. Projections of increased economic activity in 1967 indicate that there will be further increases in demand for freight cars.

New and rebuilt car orders as of August 1, 1966, represent a backlog of 6 to 7 months work by the carbuilding industry, 23/ or an increase of 56 percent in backlog orders since 1965. 24/ Thus, railroads have little opportunity of increasing their carrying capacity in the immediate future beyond that of making more effective use of car supplies.

Effective use and equitable distribution of car supplies will require joint planning and cooperative action of the railroads, shippers and government. All three groups are now participating in discussions to determine alternative courses of action available to them. News media report that railroads are presently considering a penalty rate on partially loaded cars, as a means of further encouraging effective utilization of cars.

In connection with the discussions now underway at ICC Hearings into the adequacy of railroad freight car ownership, car utilization, distribution, rules and practices, the statement of U.S. Department of Agriculture concluded as follows:

"From a review of the expressions of position in this proceeding, we believe that the most positive program for a solution to the problem would be a joint carrier--ICC data processing system with continuous input of information for improvement of utility of the entire carfleet. This solution was suggested by Commissioner Brown on June 24, 1966. Such a system could provide current information on car supply problems, keep inventory, and sound an alert when any deviations occur. This system would undoubtedly cause an increase in the utility of freight cars. It would, of course, require the cooperation of the carriers, which in our opinion, should be forthcoming, because such a step would be of obvious benefit to carrier management.

"We believe that adoption of such a system would lead to such an increase in car utilization that an expansion of the nation's carfleet may not be necessary. For example, statistics were presented in our earlier Verified Statement showing that the average car moves loaded between terminals only 5 percent of its total time. The Commission should so find. Also, it should determine whether present utilization is adequate. We believe that the best solution to the boxcar shortage would be for the Commission to prescribe certain car service rules on an interim basis and that it require the rail carriers and the Commission to initiate the development of a central data processing system which would keep track of the entire freight car system." 25/

The data in table 12 showing changes in the composition of our car fleet should provide some guides to action for those grain shippers and receivers not yet tooled up to handle specialized cars such as covered hoppers.

Trucks would seem to represent some possibilities for use in gathering operations. A study of 1963 Census of Transportation showed that only 37 percent of typical round

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23/ Journal of Commerce, October 7, 1966.

24/ Reference cited in footnote 22.

25/ Heitz, Edward F.,Verified Statement on Behalf of Orville F. Freeman, Secretary of Agriculture of the United States, before the ICC in Ex Parte 241, October 15, 1966, pp. 10-11.

trips by exempt motor carriers had loads in both directions. 26/ Many of the truckers reporting one-way hauls were in grain areas. Favorable rates and services on backhauls can be obtained by negotiation with such truckers or with truck brokers. Alteration of usual direction of shipment might be necessary in some cases to take advantage of such possibilities. Shippers should ascertain in advance that such arrangements will not result in discounts on the grain at intermediate destinations because proportional rates, through rates, and other pricing practices in use by railroads for the total hauls of grain often result in lower charges for rail movements from intermediate to ultimate destinations, if the grain is moved to the intermediate destination by rail.

Mr. Ben W. Heineman, Chairman of the Board, Chicago and Northwestern Railroad, in commenting upon a 1965 report of this Department 27/, stated: "The report demonstrates a fact of life that really does not require, one would think, extensive discussion, namely, that price moves merchandise... This report demonstrates to anyone who will take the time to read its very simple language that competition does not go away. It increases." 28/ However, freight cars may not be uniformly distributed by the pricing system in use. Many communities still rely to a considerable extent on rail services for shipping local products of fields, forests and mines to intermediate or ultimate markets and for receiving drugs, clothing and other needs of every day living. Grain and lumber areas have been of this type in recent years. The graduated per diem scale now in effect may show favorable results by drawing some of the new, large capacity cars into grain and lumber producing areas. It will not immediately solve the problem of appropriate distribution of freight cars.

Seeing that areas and communities are not overlooked, bypassed, or otherwise inequitably dealt with by either home road managers or managers of foreign lines, who "capture" the rolling property of the home roads in the normal course of commerce, in their quests for the heavy, well paying, but perhaps ephemeral traffic loads is one of the special tasks of government. Thus, car service orders and numerous other special rules, pleas, etc., seem likely to continue to be issued from regulatory and other officials for some years into the future. Efforts are now being made to solve the car shortage problem, but equitable and effective solutions may not be found in time to prevent serious problems during the 1967 harvest.

26/ Miklius, Walter, Comparisons of For-Hire Motor Carriers Operating Under the Agricultural Exemption with Regulated Motor Carriers, MRR-769, USDA, August 1966, p.14.

27/ Wright, Bruce H., Changes in Transportation Used by Country Grain Elevators in the North Central Region, 1958-63, USDA, MRR-724, July 1965.

28/ Heineman, Ben W., "Wanted: A Railroad Consensus," Traffic World, Vol. 125, No. 1, January 1, 1966, p. 6.