Effect of Piggyback Operation on Volume of Highway Truck Traffic

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•THE PURPOSE of this paper is to determine what effect, if any, the growth of trailer-on-flat-car (TOFC) or piggyback service will have on the volume of truck traffic on our highways.

There is a need for a clarification of the proper role and purpose of piggybacking in the national transportation system. If piggyback service is to continue to grow, it must fill a need of the nation's commerce. It must contribute better service at lower cost than alternate methods of movement. If these criteria are applied rather than irrelevant propaganda appeals, then this service will find its proper niche in our economy.

In attempting to assess the probable effect of piggyback service on highway truck traffic, it is necessary to determine its present size and its probable future growth. It is equally important to examine the relationship between piggyback transportation and highway truck transportation, particularly with respect to the extent that growth in one may affect that of the other.

SIZE AND GROWTH

Reliable statistics which chart the growth of piggyback service are meager. The only historical data available relate to the number of Class I railroads that originate piggyback traffic and the number of railroad cars loaded with one or more highway trailers. These data have been released regularly by the Association of American Railroads in recent years and are given in Table 1.

In addition to these data, the Interstate Commerce Commission recently released figures on the number of trailers carried and the revenues derived from piggyback service along with certain other information available for the first time.[1]

The ICC data showed that for the year 1964, the railroads terminated 1,216,900 highway trailers for which they received $313,800,000, or an average of $258 per trailer. Comparison of the 1,216,900 trailers terminated with the number of piggyback cars loaded in 1964 yields an average of 1.37 trailers per flat car.

The number of railroads originating piggyback traffic has doubled while the number of cars loaded with highway trailers has increased fivefold in the period. These figures are impressive, but they actually understate the growth of TOFC. They do not reflect the increase in the number of highway trailers loaded on rail flat cars. The latter is of prime importance to this report.

Many railroads that offered piggyback service in 1955 have greatly expanded both the number of points served by piggyback, and the facilities for handling this traffic (1).

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[1] By order dated December 12, 1963, the ICC directed rail, motor, and water carriers as well as freight forwarders to file reports covering movements of trailers and containers in piggyback and fishyback service. Data derived from these reports were released for the first time in the October 1965 issue of Transport Economics, published by that agency.

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TABLE 1

NUMBER OF RAILROADS ORIGINATING PIGGYBACK TRAFFIC AND NUMBER OF RAIL CARS LOADED WITH HIGHWAY TRAILERS, 1955-1965[a]

Year	No. of Railroads	No. of Cars Loaded	Percent Increase In Cars Loaded		Percent of Total Carloadings
			Year	Over 1955	
1955	32	168,150	—	—	0.5
1956	38	207,783	23.6	23.6	0.6
1957	40	249,065	19.9	48.1	0.7
1958	42	278,071	11.2	65.4	0.9
1959	50	416,508	49.8	147.7	1.3
1960	54	554,115	33.0	229.5	1.8
1961	58	591,246	6.7	251.6	2.1
1962	61	706,441	19.5	320.1	2.5
1963	63	797,474	12.9	374.3	2.8
1964	62	890,216	11.6	429.4	3.0
1965	63	1,031,210	15.8	513.3	3.5

[a]Association of American Railroads, C. S. 54A.

Although precise data are not available, it is known that the number of trailers per flat car has increased significantly since 1955. At that time, most rail flat cars carried only one highway trailer, whereas today more than 90 percent are capable of carrying two.

If it is assumed that the average number of trailers per flat car was 1.1 in 1955 and the 1964 ratio applied in 1965, the number of trailers moved in these two years would be 195,000 and 1,415,00 and 1,415,000, respectively. This is an increase of about 626 percent compared to an increase of 516 percent in piggyback carloadings.

TABLE 2

TOTAL RAILROAD CARLOADINGS AND AVERAGE TONS PER CARLOAD, 1955-1965

Year	Total Rail Carloadings (thousands)	Percent Change		Average Tons Per Carload
		Annual	From 1955	
1955	37,636	—	—	42.4
1956	37,844	+0.6	+0.6	43.1
1957	35,500	-6.2	-5.7	43.8
1958	30,222	-14.9	-19.7	43.5
1959	31,015	+2.6	-17.6	43.5
1960	30,441	-1.9	-19.1	44.4
1961	28,590	-6.1	-24.0	44.9
1962	28,722	+0.5	-23.7	45.4
1963	28,867	+0.5	-23.4	46.7
1964	29,438	+2.0	-21.8	48.2
1965	29,968	+1.8	-20.4	N.A.

Relatively, piggyback car loadings increased from 0.5 percent of total car loading in 1955 to 3.4 percent in 1965; these figures tend to mask the true situation. Actually, the relative increase in piggyback loading is due in part to a decline in total carloadings. Table 2 shows that while there has been a drop in total carloads, this drop has resulted in part from increased loadings per freight car.

The rails today are operating larger cars and encouraging heavier loading through incentive rates. As a result, the average weight per carload has been increasing steadily over the years (Table 2). Thus, the sharp decline in carloadings reflected in Table 2 has not been carried over to tons, ton-miles, and revenues.

The trucking industry does not compile comprehensive data on the number of trucks or trailers loaded. Traffic data for motor carriers are given in tons, ton-miles, vehicle-miles and revenues. To make meaningful comparisons between the rail and truck figures, they must be placed on a comparable basis.

Estimated Tons, Ton-Miles and Trailer Miles

Since the only data for piggyback service cover cars loaded, trailers carried and revenues, certain assumptions as to average load and average haul must be made to determine tons and ton-miles of piggyback traffic. For this purpose, ranges were chosen and high and low estimates derived. The average tons per trailer was placed between 15 and 25 and the average haul between 400 and 700 miles.

The results of applying these assumptions to the piggyback trailer loadings for 1964 as reported by ICC are given in Table 3. The year 1964 was chosen since it is the latest one for which necessary data are available. The figures in Table 3 are vague but they should represent the upper and lower limits of this service.

Piggyback Compared to Total Rail and Truck Traffic

Table 4 compares the estimated tons originated, ton-miles and revenues for piggyback service with total rail figures for these categories. Table 5 gives a similar comparison with the trucking industry. From the comparisons, it can be seen that piggyback is still a relatively small factor in over-all rail and truck transportation movements. It is, however, continuing to grow at a fast rate and will probably continue to increase in importance in the future.

Since this paper is concerned with the effect of piggyback service on the volume of highway truck traffic and more specifically with truck combination traffic, it is necessary to determine how piggyback service has affected regular intercity truck movements. In order to do this, it is necessary to enter an area of controversy and to resort to broad estimates and assumptions. The effect of piggyback service on highway

TABLE 3

TRAILERS CARRIED, ESTIMATED TONS ORIGINATED, TON-MILES AND TRAILER MILES IN PIGGYBACK SERVICE - 1964

Category	Low Estimate	High Estimate
Highway trailers carried[a]	1,216,900	
Tons originated[b]	18,253,500	30,422,500
Ton-miles (thousands)	7,301,400	21,295,750
Trailer miles	486,760,000	851,830,000

[a] See Reference (2).

[b] For the purpose of this comparison, it was assumed that all piggyback traffic was originated by the railroads; actually about one-fourth of total piggyback trailers move under Plans I and V.

TABLE 4

COMPARISON OF PIGGYBACK WITH TOTAL RAIL TRAFFIC, 1964

Category	Total Rail (thousands)	Percent Piggyback of Total	
		Low Estimate	High Estimate
Tons originated	1,358,000	1.34	2.24
Revenue ton-miles	667,200,000	1.09	3.19
Freight revenues	$ 8,822,000	3.56[a]	

[a]See Reference (3).

truck traffic depends on two principal factors: (a) whether it is diverting to the rails traffic that would otherwise move by highways; and (b) whether it is holding traffic on the rails that would otherwise move to highway.

In a release dated January 7, 1965, the Association of American Railroads stated, "For 1964, rail piggyback service results included the shifting of more than two million truck trailer movements off the nation's crowded highways." The AAR did not indicate how it arrived at this figure, which is at some variance with the total revenue trailer movements of 1,216,900 reported by the ICC for 1964. There were, of course, some nonrevenue movements, including empty trailers which could have raised total trailer movements.

If the AAR figure of 2,000,000 trailers was accepted as representing the total moved in piggyback service, there would still be the question of whether these trailers actually were diverted from the nation's highways. There is evidence that this is not the case and that a substantial portion of piggyback traffic is being taken from rail cars. Whether some of this traffic would have left the rails had it not been diverted to piggyback is problematical.

TABLE 5

COMPARISON OF PIGGYBACK WITH TOTAL TRUCK TRAFFIC-1964

Category	Total Truck (thousands)	Percent Piggyback of Total	
		Low Estimate	High Estimate
Tons	2,854,000	0.64	1.07
Ton-miles	370,500,000	1.97	5.75
Trailer miles (urban and rural)[a]	40,227,000	1.21	2.12
Revenues[b]	$ 9,282,240	3.38[c]	

[a]Trailer miles are based on vehicle-miles for all combinations plus the number of vehicle-miles of combinations with two trailers (4).

[b]ICC regulated motor carriers only. (Revised I.C.C. figure)

[c]See Reference (5).

TABLE 6

NUMBER OF TRAILERS OR CONTAINERS TERMINATED BY CLASS I RAILROADS AND REVENUES BY PLAN, 1964 (6)

Plan	Trailers or Containers Terminated		Revenues[b]	
	Number	Percent	Amount	Percent
I	299,000	24.6	$ 42,466,000	14.1
II	467,800	38.4	136,058,000	45.1
II½	44,300	3.6	16,030,000	5.3
III	281,200	23.1	62,958,000	20.9
IV	68,000	5.6	29,803,000	9.9
V	38,800	3.2	9,750,000	3.2
Other[a]	17,800	1.5	4,437,000	1.5
Total	1,216,900	100.0	$301,500,000	100.0

[a]Other represents movements which do not fit into any of the named plans.

[b]Excludes an estimated $12,300,000 for railroads not reporting off-line revenues on terminated traffic.

TYPES OF PIGGYBACK SERVICE

To arrive at a reasonable estimate of the sources of piggyback traffic, it is necessary to look closely at this service as it relates to rail and highway service.

Piggyback service falls into four broad categories: (a) certificated motor carrier-rail; (b) freight forwarder-rail; (c) all-rail; and (d) private motor carrier or shipper-rail. There are also other types of service, such as Plan II½ which is a hybrid of all-rail and shipper-rail, but none are as yet of major importance.

In comparing the number of trailers and revenues by service (Table 6), it is important to keep in mind differences in the services performed under the several plans. For example, under Plan I the trucking company furnishes the trailer and the railroad performs only ramp to ramp transportation: Plan II involves the use of railroad trailers and the railroad performs door to door service.

Certificated Motor Carrier-Rail Service

Certificated motor carrier-rail piggyback service is performed primarily under Plans I and V with Plan I predominant. ICC data indicate that of 232 carriers reporting for the 1st quarter of 1964—161 reported using Plan I, 67 reported using Plan V, 7 had other arrangements and 25 used water carriers. Some, of course, used more than one plan or arrangement. Only certificated motor carriers (i. e., common carriers holding operating authority from the ICC) can utilize these plans. Under the ICC's decision in Ex Parte 230, which has been appealed to the courts and is currently under litigation, these carriers could also use Plans II and III. Plan IV is open to certificated carriers at the present time but little or no use is being made of it.

In 1964, certificated motor carriers furnished 26 percent of all piggyback movements, accounting for 16 percent of piggyback revenues. It appears that this type of service has grown at about the same rate as motor carrier traffic as a whole.

Table 7 gives a distribution of Class I common carriers of general freight classified by the percentage of total "transportation expense" represented by "other purchased transportation-intercity." There has been little change in the relative use of piggyback service by certificated carriers in recent years. For the year 1964, the number of Class I motor carriers using piggyback (or fishyback) service was 248 or 42 percent of

TABLE 7

RELATIVE USE OF PIGGYBACK SERVICE BY CLASS I COMMON CARRIERS OF GENERAL FREIGHT, 1960 and 1964 (7)

Percent "Other Purchased Transportation" of Total "Transportation Expense"	No. of Carriers		Percent of Total	
	1960	1964	1960	1964
None	283	340	56.3	57.8
Less than 2.5	157	184	31.3	31.3
2.5 to 4.9	29	27	5.7	4.6
5.0 to 7.4	10	13	2.0	2.2
7.5 to 9.9	11	10	2.2	1.7
10 and over	13	14	2.6	2.4
Total using piggyback[a]	220	248	43.7	42.2
Total all carriers	503	588	100.0	100.0

[a] ICC Transport Economics (Oct. 1965). Shows 232 Class I carriers reporting piggyback in the 1st quarter of 1964 and 208 reporting in the 4th quarter.

the 588 carriers reporting. In 1960, the number of carriers piggybacking was 220 out of a total of 503 reporting or 44 percent. For the purpose of this study, any carrier showing expenditures for "other purchased transportation" ICC account 4273, was assumed to be piggybacking. Since this account includes payments to other motor carriers and water carriers as well as to railroads, this procedure results in an overstatement of the number of motor carriers using TOFC.

The majority of the motor carriers using piggyback service used it for only a minor portion of their operations. In 1964, approximately 211, or 85 percent, of the 248 carriers reporting "other purchased transportation-intercity" had less than 5 percent of their total "transportation expense" in that account.

Virtually all certificated motor carrier-rail piggyback traffic could be assumed to have been diverted from highways.

Freight Forwarder-Rail Piggyback Service

Freight forwarder-rail piggyback service is performed under Plans II, II½, III and IV. ICC data indicate that about 134,400 trailers (11 percent of total piggyback traffic) were furnished by freight forwarders. This traffic accounted for $44,112,000 in revenues or 14 percent.

In contrast to the certificated motor carrier-rail service, which is primarily highway traffic moving by rail, available data indicate that freight forwarder-rail piggyback consists almost entirely of former rail traffic. Evidence of this is found in the rail carload waybill analysis which shows freight commodity data by type of car (8).

Rail boxcar loadings of freight forwarder traffic dropped during the period 1955-1962, the latest year for which such data are available, from 319,600 cars to 179,400 cars. During the same period, forwarder traffic loaded on flatcars, assumed to be piggyback, increased from 200 cars to 71,900 cars (Table 8).

While freight forwarders and motor carriers compete vigorously for business, the switch of forwarder traffic to piggyback does not appear to be diverting traffic from the highways, although it is possible that it kept some traffic on the rails that would otherwise have gone to highways.

The trend in freight forwarder revenues and in transportation purchased from the railroads and motor carriers for the years 1955, 1958, 1962, 1963, and 1964 is given in Table 9. Although the gross revenues of freight forwarders increased 21 percent from 1955 to 1964, freight forwarders payments to railroads for purchased transportation dropped 20 percent and payments to motor carriers increased 68 percent.

TABLE 8

RAIL CARLOADINGS BY TYPE OF CAR USED FOR SELECTED COMMODITIES, 1955-1962 (11)

Commodity	1955		1962		Percent Change 1962/1955	
	Boxcars	Flatcars	Boxcars	Flatcars	Boxcars	Flatcars
Meat (fresh, NOS)[a]	227,800[b]	—	126,700[b]	25,900	-44.4	—
Animals & products total	438,800[c]	200	256,600[c]	34,600	-41.5	—[d]
Coffee	25,500	1,600	18,900	4,200	-25.9	+162.5
Candy	3,400	400	2,100	6,400	-38.2	—[d]
Liquors (malt)	15,400	3,300	16,300	13,500	+ 5.8	+309.1
Liquors (aloholic)	21,000	400	17,600	2,000	-16.2	+400.0
Drugs and toiletries	5,100	300	3,700	3,700	-27.5	—[d]
Soap	45,600	1,100	32,800	14,900	-28.1	—[d]
Electrical equipment	66,700	9,800	42,600	12,500	-36.1	+27.6
Abrasives (not crude)	7,300	—	3,900	500	-46.6	—
Total selected commodities above	190,000	16,900	137,900	57,700	-27.4	+241.4
Mfr and misc NOS.	169,500	54,800	136,700	256,400	-19.4	+384.3
Total all mfr and miscellaneous	6,827,500	378,400	4,771,300	947,300	-30.1	+150.3
Forwarder traffic	319,600	200	179,400	71,900	-43.9	—[d]

[a]Not otherwise specified.
[b]Refrigerated.
[c]Box and refrigerated.
[d]More than 1,000 percent.

TABLE 9

TRANSPORTATION REVENUES OF FREIGHT FORWARDERS AND PAYMENTS TO RAILROADS AND MOTOR CARRIERS FOR PURCHASED TRANSPORTATION (9, 10)

Year	Forwarder Transportation Revenues (000)	Purchased Transportation (000)	
		Rail	Motor Carrier
1955	$401,261	$205,245	$47,833
1958	412,903	203,064	50,032
1962	464,583	179,654	68,722
1963	469,647	162,318	70,853
1664	487,031	163,604	80,362

All-Rail and Shipper-Rail Piggyback Service

Traffic moving all-rail under Plan II and shipper-rail under Plan III have been lumped together. These two types of service along with the newer Plan II½ have much in common and can be treated together, particularly with respect to their effect on highway freight service.

All-rail service is the dominant form of piggyback, accounting in 1964 for 42 percent of the total terminations and 50 percent of revenues. These two types combined accounted for 62 percent of all piggyback movements and 71 percent of revenue.

These types of service are substantially different from the other two categories in that they are primarily "rail" services. These are the services through which the railroads are competing with highway service. They are the ones with which the rails have been trying to recapture freight or prevent diversion to certificated motor carriers, private carriers, and exempt carriers.

The question of how much of the traffic involved in all-rail and shipper-rail piggyback is being diverted from highways is debatable. Rail interests claim that virtually all of this traffic is coming from the highways. There is evidence, however, of diversion of piggyback traffic from other rail service. This consists largely of changes in the types of cars used for specific commodities.

Evidence of Diversion From Rail Freight Service

Table 8 shows rail loadings by types of cars for certain selected commodities between 1955 and 1962, the latest year for which such data are available. It shows shifts from boxcars and refrigerator cars to flatcars. It is assumed for the commodities listed that flatcars loaded are piggyback cars. A small number of shipments of some of the commodities listed, such as heavy electrical equipment, probably move on flatcars in regular service, but for the most part, this assumption is believed to be reliable.

The shift in fresh meat has been particularly dramatic. The large increase in flatcar loadings of manufacturers and miscellaneous NOS probably resulted from shifts of commodities formerly moving under specific commodity descriptions to this classification when moving in mixed carloads under FAK (freight all kinds) and similar rates.

Other evidence that railroads are diverting a substantial portion of piggyback traffic from other rail services, rather than from highways, is found in the comparative trends in rail and highway service. A comparison can be made through 1965 on the basis of tons and ton-miles. Indexes of tons originated by Class I railroads and tons of intercity freight transported by Class I and II motor carriers are given in Table 10.

Similarly indexes of ton-miles performed by railroads and intercity trucks for the period 1955-1965 are given in Table 11. These data show that the tons and ton-miles handled by the trucking industry have continued to increase during the period that piggyback service has been making its rapid growth. Tons and ton-miles handled by the railroads have shown a much slower growth.

TABLE 10

INDEXES OF TONS ORIGINATED BY CLASS I RAILROADS AND TONS OF INTERCITY FREIGHT CARRIED BY CLASS I AND II MOTOR CARRIERS, 1955-1965 (12, 13)

Year	Class I Railroads	Class I & II Motor Carriers
1955	100	100
1956	104	103
1957	99	104
1958	85	102
1959	88	116
1960	89	117
1961	86	118
1962	87	129
1963	90	135
1964	97	148
1965	102[e]	161[e]

[e]Estimate.

TABLE 11

INDEXES OF RAILROAD AND INTERCITY TRUCK TON-MILES, 1955-1965 (12, 13)

Year	Revenue Ton-Miles (Class I Railroads)	Intercity Truck Ton-Miles	
		ICC-Regulated	All Trucks
1955	100	100	100
1956	104	100	111
1957	99	102	114
1958	88	102	114
1959	92	122	129
1960	92	125	133
1961	90	126	140
1962	95	135	148
1963	100	144	156
1964	106	150[e]	166[e]
1965	112[e]	157[e]	179[e]

[e]Estimate.

SUMMARY

Based on latest available data, there were 1,216,000 trailer movements handled in piggyback service of all kinds in 1964. These movements aggregated between 487 million and 852 million trailer miles. Trailer miles on highways totaled about 40 billion in that year; thus piggyback trailer miles amounted to somewhere around 2 percent of total highway truck trailer miles.

It appears obvious that only a portion, perhaps no more "than half of the total trailer miles operated in piggyback service," could be classified as being diverted from highways. Thus, the maximum amount of traffic that was diverted from highways to rails by piggyback service in 1964 was probably well below 2 percent of total combination truck movements and less than 0.1 percent of total highway traffic in terms of vehicle-miles. Traffic volume changes of these magnitudes would not appear to have any effect on highway needs or design.

Future of Piggyback

It seems apparent that piggyback service will continue to grow in the years ahead. In a recent study of shipping practices conducted by a large independent research organization, 250 traffic executives of large corporations in all sections of the country were personally interviewed about many aspects of their shipping practices (14). These interviews indicated that shippers, at least large shippers, intend to increase their use of piggyback during the next five years. The increased use indicated was not dramatic, however.

Of primary importance in attempting to assess the effect of piggyback on highway truck traffic is the source of future piggyback traffic. Whether such traffic will be diverted from the highways or whether it will be obtained from regular rail freight service is a basic question which must be answered. In the absence of pertinent data, the answer to this question must depend primarily upon judgment and reason.

In my opinion, the source of future piggyback traffic will be heavily influenced by two factors. One is the rules under which this service will be conducted, and the other is the relative cost of moving trailers over the highway as compared to moving them via rail.

Josephine Ayre, in her paper on the "History and Regulation of Trailer on Flat Car" goes into detail with respect to the rules governing the use of piggyback traffic. These rules are mentioned here because of their vital bearing on the future direction of growth of piggyback service as it affects highway truck traffic.

As mentioned earlier, certificated motor carrier-rail piggyback movements under Plan I account for about one-fourth of all piggyback traffic, despite the fact that only 36 of the 63 railroads that originate such service will accept motor carrier trailers. The future of motor-carrier-rail piggyback will depend to a large extent on the outcome of court cases now testing the rules laid down by the ICC in Ex Parte 230. Since motor-carrier-rail piggyback service is virtually all diverted from highways any favorable decision that will permit expansion of this service is bound to reduce long-haul highway movements. Short-haul truck traffic and movements of semitrailers within urban areas will not be affected to any great degree by these rules since these movements must be made regardless of how a given trailer travels, over the highway or over the rails, between traffic centers.

Another factor that will affect the long-haul movement of goods by piggyback is the relative cost of performing the service by road or by rail. Certificated motor carriers have shown that they will use piggyback service, where it is available to them, if they can do so profitably. To these carriers the decision is based on simple economics. If they can move a given trailer over the rails more cheaply than they can move it over the road, and still maintain the quality of their service, they will do so. Private carriers, or more specifically shippers who operate their own trucks in intercity service, probably apply the same test.

The cost of moving goods by road is strongly influenced by the size and weight of vehicles that may be operated on the highways and the charges made for highway use. Where there is no alternative to highway movement, such as in the case of short hauls and of movements between points without rail service, the charges must be paid. Where there is an alternative, however, such as in the case of piggyback or toll roads, the choice will usually be made on the basis of relative cost. Thus, this factor will have a decided bearing on the amount of highway truck traffic that will be diverted from highways in the future.

The quality of the service that can be offered by piggyback as compared to all highway or all rail service will also have an important bearing on the relative growth of this service and the source from which it will be drawn. By quality is meant the speed, completeness of the service, freedom from damage and similar factors.

In general, the shipper has available to him a wide range of transport services, at a broad range of prices. He is free to pay his money and take his choice, or the other way around. In any event, all shippers usually want the best service they can get at the lowest possible price.

From the standpoint of quality, truck service is generally better than rail and is priced higher. As a rule, piggyback service falls somewhere between all-truck and all-rail service. For many commodities, the price spread is relatively narrow; however, the shippers' decision is made on the basis of service.

Since piggyback service is generally superior to all-rail freight service, and since it is priced below truck service, it is bound to attract traffic from both types. However, the superiority of piggyback service compared to rail freight service for many commodities is so marked and the difference in price is so small that piggyback service seems destined to draw much more of its growth from rail box and refrigerator car service. Consequently, the large purchases of refrigerated trailers by the refrigerator car lines such as Fruit Growers Express and Pacific Fruit Express are significant. A large portion of the traffic now moving in rail box and refrigerator cars is susceptible of diversion to piggyback.

One reason for this is that the highway trailer has replaced the boxcar as the standard unit of transportation for much of industry. Another important factor is the dynamics of plant relocation, with the emphasis on proximity to good highways (15). Many industries that have been traditionally rail-oriented and continue to favor rail service, will find it is practical, through piggyback, to follow the new trend in highway-oriented plant location and still retain access to rail service.

The attractiveness of truck service to shippers stems from its flexibility in operations and routes, and its ability to adapt quickly to changing conditions. Motor carriers, therefore, are most reluctant to disregard these advantages by tying any large segment of their operations to rail service.

These advantageous characteristics continue to make it possible for motor carriers to gain new traffic even at the expense of competing modes.

Of course the rate at which such diversion takes place will depend to a large extent on the policies of the railroads, but there are indications that some rail managements recognize the desireability of shifting certain boxcar traffic to piggyback.

CONCLUSIONS

Piggyback service will affect the volume of intercity truck traffic on our highways. Its principal effect will be to inhibit the growth of traffic between major population centers, particularly where such centers are fairly far apart. The dampening effect on traffic, however, will not be great enough to reduce highway needs in any area for the foreseeable future.

On the other hand, if a substantial amount of rail box and refrigerator car traffic is to be diverted to highways in the future, this could have serious implications for the highways. Since the principal reason for the shift would be to permit faster door-to-door service between metropolitan areas there would be a significant increase in the amount of tractor-semitrailer movements in these areas. This is where our greatest traffic problems now exist.

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