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Appendix F

Highways — The Motor Trucking Industry

The motor trucking industry, a still rapidly expanding competitor of other forms of freight transportation, first became important immediately after World War I. Unfortunately, satisfactory statistics for the industry date from a much later period or are today still unobtainable. In this survey we shall do what we can to piece together a picture of the growth and relative position of motor trucking in this country. We begin by considering some estimates for 1940, and from these we shall attempt to work backwards to figures for earlier years. However, no consecutive data on employment or output per worker can be given. For this reason it has seemed best to treat the industry in an appendix, rather than to accord it a chapter in the text.

STRUCTURE OF THE INDUSTRY

Trucking operations may be classified according to several principles of which two are significant for our purpose. First, freight may be carried either in privately owned vehicles, or in trucks operated 'for hire', that is, by commercial carriers. Of the more than four and a half million trucks registered in 1940, by far the greater number were privately owned and were operated in connection with their owner's business.

A second distinction may be made between local trucking and intercity transportation. Intercity traffic can be defined comprehensively as that which moves over all rural roads, i.e., main intercity highways and minor roads lying outside the boundaries of incorporated areas.¹ It is for intercity trucking alone that we are

¹ It should be noted that such a definition includes some traffic not ordinarily regarded as intercity in character — for instance, the movement of goods between farm and local markets. The Interstate Commerce Commission excludes such traffic from its estimates of intercity truck ton-mileage (see below); it is interested especially in comparisons with railroad transportation and does not regard trucking from farm to market as relevant to such a comparison. Farm traffic is included in estimates compiled by the Public Roads Administration.

able to present estimates of output. At the volume of local city traffic we can scarcely even guess.

For most purposes a baker's truck belongs to the baking industry, a gasoline truck to the petroleum industry. In an accounting sense the trucks owned by manufacturers, distributors, and others perform auxiliary operations required in the conduct of business, and their contributions to value and employment are included in the totals for the industry in which the enterprise falls by virtue of its major activity. In principle, therefore, all trucks not operated for hire should be distributed among a wide range of industries using truck transportation at some point in their productive process, and owning the trucks furnishing this transportation. Ideally therefore the trucking industry — in any autonomous sense — is confined to common carrier and contract, i.e., for-hire, trucking. For the trucking industry defined in this way we can estimate some quantities: for example, the number of vehicles attached to it. But for most purposes it is the second rather than the first principle of classification mentioned above which lends itself to statistical treatment. We would like to consider for-hire trucking, intercity and local. We are forced for the most part to consider intercity trucking, for-hire and private.

More than half the trucks used in intercity operations are farm vehicles: naturally they account for a much lower proportion of total intercity ton-mileage. Farm trucks find considerable employment *on* the farm as well as in the transport of goods *between* the farm and urban areas. Thus, it has been estimated that for every ton hauled to or from American farms, four tons are hauled about the farm.² Farm trucks account for much highway traffic in livestock, truck crop and dairy farm areas, and at harvest time, but are far less significant in the over-all intercity trucking picture than are commercially operated vehicles.

Trucks operated for hire fall into two categories: common and contract carriers. Unlike trucks operated by contract, common

² C. D. Kinsman, 'An Appraisal of Power Used on Farms in the United States', *Department Bulletin 1348* (U. S. Department of Agriculture, 1925), p. 71. The absolute amounts mentioned are 240 million and not quite one billion tons, respectively.

carriers render service mainly on fixed routes between terminals, on regular schedule and at published rates. Contract carriers undertake, by written or oral contract, to transport goods for particular shippers and choose their rates accordingly. They frequently haul heavy objects requiring special equipment, deliver shipments of vital machinery in response to public emergencies, and perform other miscellaneous hauling jobs. In general contract carriers are less regulated than common carriers. Some contract operators may carry any type of freight they choose. Others hold permits to haul only certain freight: such are oil tank lines, truck-away automobile carriers, and refrigerator lines.

A further difference between common and contract carriers, of particular interest to us, lies in the character of the load. Contract carriers have greater discretion in the choice of the goods they transport; indeed, common carriers have complained that contract operators take on business only when they find it profitable. In a traffic survey of eleven western states in 1930 it was found that, of 180,000 trucks questioned, 8.7 percent were owned by contract carriers and 5.5 percent by common carriers; the remainder were privately owned vehicles.³ Precise statistics now available as a by-product of ICC regulation relate as yet only to Class I motor carriers, that is, those with annual revenues in excess of \$100,000; among such larger companies common carriers predominate.

For the most part for-hire motor trucking is organized on a relatively small scale. The larger carriers, those known by the Class I designation, are not really comparable with the Class I railroad companies, either in absolute size or as a fraction of the industry. Although they account for more than half the revenue of for-hire motor trucking, the largest of them received less than \$7 million in freight revenue in 1939. The typical commercial trucker has a very modest capital investment; the American Trucking Associa-

³ *Report of a Survey of Traffic on the Federal-Aid Highway Systems of Eleven Western States, 1930* (U. S. Bureau of Public Roads, 1932), p. 29. However, it is considered by the ICC that "a considerable portion of the so-called contract carriers were in reality common carriers operating without certificate or permit" (182 ICC 263 at p. 407). Nonetheless, even if this bias is allowed for, the Commission considers that contract carriers account for perhaps 50 percent more ton-mileage than do common carriers.

tion has estimated that 82 percent of all for-hire trucking enterprises operated only one vehicle in 1935.⁴ The Census of Business reported for the same year that as many as a third of all firms covered received less than \$1,000 annually in gross revenue, although many small firms were omitted from the inquiry.⁵ Large fleets are not common among for-hire carriers; the largest reported to the ICC in 1939 were one fleet which totaled 549 trucks and truck tractors in the case of an intercity common carrier of general freight and one fleet of 656 units in the case of a carrier engaged in local cartage service. The really big trucking fleets are to be found, not among commercial carriers, but among private operators such as the Railway Express Agency and the Bell Telephone Company which owned and operated 45,000 and 16,000 trucks respectively in 1939.

Despite the small scale on which the for-hire trucking industry is organized, its aggregate size is considerable and perhaps not adequately appreciated. The 26,167 commercial carriers subject to the jurisdiction of the ICC in 1939 were estimated to have received \$792 million in gross revenue in that year, of which \$698 million represented predominantly intercity operations.⁶ However, carriers of agricultural products, livestock, fish, and newspapers, and carriers which do not engage in interstate commerce, are exempt from ICC jurisdiction and do not report to the Commission.⁷ Taking account of exempt carriers, we have put 1939 freight-revenues for the entire for-hire intercity trucking industry at \$900 million.⁸ This

⁴ *Automobile Facts and Figures*, 1936 ed., p. 74.

⁵ *Census of Business, 1935*, 'Motor Trucking for Hire', p. 8. 32 percent of the 61,000 firms covered fell within this size group (revenues less than \$1,000), but they received only 2 percent of the total reported revenue. Frequent entrance to and exit from the industry may have boosted part-year operations.

⁶ U. S. National Resources Planning Board, *Transportation and National Policy* (1942), p. 404.

⁷ Thus carriers reporting to the ICC in 1939 operated 111 thousand power units (i.e., truck and tractor truck combinations); whereas we estimate (below) that in 1940 all for-hire trucks engaged in intercity business totaled 283 thousand units.

⁸ Obtained by multiplying 22 billion ton-miles (Table F-4) by 4 cents per ton-mile (ICC, 'Statistics of Class I Motor Carriers, 1939').

compares with railroad freight revenues of over \$3 billion in 1939.

THE NUMBER OF TRUCKS

One indication of the relative importance of different sections of the industry is to be found in the distribution of trucks according to types of operation. In this section we attempt to approximate this distribution.

Strictly speaking, of course, the cross classification outlined in the preceding section applies to units of service rather than to units of equipment. Some vehicles are used partly in connection with their owner's business, partly for hire. Again, the segregation between trucks engaged in local and trucks operating in intercity service is an artificial one, for the same vehicle may be engaged in both. Indeed, the intercity trucking industry as we now know it had its very origin in the gradual extension of the field of operations of trucks engaged in local drayage. As highways were constructed and the carrying capacity of trucks increased, the prospect of eliminating loading and unloading operations in the transfer of freight between truck and railroad car led naturally to the creation and expansion of intercity truck haulage. The line dividing intercity from local trucking still is blurred. Yet we are forced to assume for statistical purposes that every truck is engaged exclusively either in city or in intercity operations. Apparently, as we shall see, the great majority of all trucks is engaged in local rather than in intercity service. In the same way we are forced to allocate trucks unambiguously either to private, or to for-hire, service; private are much more numerous than are for-hire vehicles.

In 1940 some 4,543 thousand trucks and tractor trucks were registered in the continental United States.⁹ First we may distribute

⁹ The Public Roads Administration reported 4,590,386 trucks and tractor trucks registered in 1940 (*Statistical Abstract of the U. S., 1941*, p. 455). Registration is of course conducted by states, and definitions differ to some extent among reporting units. Thus, the truck registration totals for New Hampshire, Vermont, Massachusetts, Michigan, Kansas, and Colorado included some 19.4 thousand state, county, and municipal trucks (as estimated by us), which we have deducted. Again, the registration totals for Ohio, Illinois, Iowa, Delaware, Montana, and California included an estimated 7.5 thousand common carrier busses, which we have also excluded from the national total. Finally, for Tennessee and Oregon we deducted 20.3 thousand

these according to ownership. We know that 1,047 thousand trucks were owned by farmers.¹⁰ There were consequently 3,496 thousand vehicles employed outside agriculture. Next we need an estimate of the number of commercial or for-hire trucks, as distinguished from other (private) nonagricultural trucks used to provide transportation in connection with their owners' business. Vehicle registration figures cannot be used here, for most states do not distinguish between privately owned and commercial trucks. We are therefore forced to depend on scattered information from a number of sources. In traffic surveys conducted by the Bureau of Public Roads during the 'twenties, the ratio of for-hire trucks to all loaded trucks stopped on the roads ranged from 8 percent in Maine to 21 percent in Ohio; the corresponding proportion of trucks operating over Connecticut roads in 1922-23 was 20 percent.¹¹ In the survey of eleven western states in 1930 field observers stopped 180,000 trucks of which 14.2 percent were found to be operated on a for-hire basis.¹² Counts of vehicles passing observation posts probably tend to overstate the number of for-hire trucks in existence, for we may suppose that commercial operators use their vehicles more intensively than do private operators. Nevertheless, the results of such surveys agree with other and more recent data.

The first opportunity to measure for-hire trucking on a national scale occurred in 1934 when commercial trucks were registered with the code authority for the trucking industry set up under the National Industrial Recovery Act. The number of for-hire vehicles

units as our estimate of the number of trailers included in the truck registration totals for those states. We made no further adjustment of the registration figures reported for Michigan, which do not separate taxicabs from truck data; nor those for Maine and Kentucky, which include some (but not all) trailers. On the other hand, we made no attempt to add to the truck registration total for Vermont, which failed to include light delivery trucks. The final registration figure for 1940 which we arrive at is 4,543 thousand; this is exclusive of some quarter million tax exempt government owned trucks and tractor truck units. See *Automobile Facts and Figures*, 1941 ed., p. 17.

¹⁰ *Sixteenth Census, 1940, 'Agriculture'*, Volume III, p. 453.

¹¹ 140 ICC 685, at p. 709.

¹² *Survey of Eleven Western States*, p. 29.

so registered was 300,475, but the code authority estimated the coverage at only 60 percent. On this basis the total number of for-hire trucks must have been 500,000, or some 15 percent of total truck registrations in 1934.¹³ In 1940 the ICC also concluded that "the number of trucks operated by for-hire carriers is approximately 15 percent of the total".¹⁴ Accordingly, we may place the number of commercial trucks in 1940 at 15 percent of total registrations, or say 681 thousand. Among for-hire trucks the Office of Defense Transportation has estimated the ratio of local to intercity vehicles at 351:249.¹⁵ We may therefore allocate 283 thousand commercial trucks to intercity and 398 thousand to local service.

It remains to segregate nonagricultural private trucks (i.e., vehicles transporting goods belonging to their owners) among local and intercity operations. The *Commercial Car Journal* has analyzed the fleets of operators of eight trucks or more with respect to industrial origin.¹⁶ We assumed that bakeries, confectioners, florists, bottlers, breweries, department stores, laundries, cleaners, dyers, and distributors of dairy products, milk, ice cream, ice, meats, and fish operate fleets predominantly in urban and suburban areas; and that the same may be said for newspapers and public utilities including railroads. The activities of other private shippers such as coal dealers, building contractors, distributors of

¹³ Federal Coordinator of Transportation, *Hours, Wages and Working Conditions in the Intercity Motor Transport Industries* (1936), Part II, p. 167.

¹⁴ ICC, *Motor Carrier Cases*, Volume 23 (1940) p. 12; see also ICC, *Federal Regulation of the Sizes and Weight of Motor Vehicles*, 77th Cong. 1st Sess., House Document 354 (1941), p. 91.

¹⁵ Automobile Manufacturers' Association, *Motor Truck Facts*, 1942 ed., p. 39. (Total for-hire trucks are there given, apparently for 1941, at 600,000. This, however, represents but 12 percent of total registrations, and appears to us to be an underestimate.) The ratio quoted places local for-hire at 58.5 percent of all for-hire trucks. This may be compared with a figure of 57 percent obtainable for census sources for 1935 (*Census of Business, 1935*, 'Motor Trucking for Hire', p. 26). The latter percentage is based on a total canvass of only 148,150 truck and truck tractor units. The coverage of the census survey was far from complete, especially with respect to small concerns. In view of the fact that the smaller truckers, particularly owner-operators of single trucks, are likely to be engaged in local cartage rather than long haul trucking, we may regard the census figure, 57 percent, as a minimum estimate for the proportion of for-hire trucks engaged in local service.

¹⁶ *Automobile Facts and Figures*, 1939 ed., p. 71.

oil and gasoline (the most important component of this group), paints, chemicals, drugs, and farm products, and manufacturers (such as steel mills) are more difficult to classify. It seems reasonable to assign half the trucks operated by these shippers to local and half to intercity service. On this basis we may conclude that, at least for fleets of eight trucks and over, 75 percent of all privately owned vehicles should be assigned to local service.¹⁷ Using this ratio, we may divide the 2,815 thousand privately owned non-agricultural trucks into 2,111 thousand local and 704 thousand intercity vehicles.

Table F-1

MOTOR TRUCK REGISTRATIONS, ESTIMATED
DISTRIBUTION, 1940

Thousands

<i>Type of Ownership</i>	<i>Local Service</i>	<i>Intercity Service</i>	<i>Total</i>
Commercial (for-hire)	398	283	681
Agricultural	....	1,047	1,047
Private	2,111	704	2,815
TOTAL	2,509	2,034	4,543

The results of these various calculations are brought together in Table F-1. Despite the very rough nature of the distribution, it serves to demonstrate that our particular interest in motor trucking centers upon a rather small proportion of all trucks in use. Less than one-sixth of all trucks operate for hire; these constitute the equipment of the trucking industry properly so called. The remaining five-sixths of all trucks in use form part of the productive equipment of other industries — manufacturing, mining, distribution — and the output and employment associated with them are accounted for in the statistics of these other industries. While we

¹⁷ Applied to all such vehicles, the fraction quoted may be on the low side, for operators of fleets of seven trucks and fewer may be still more heavily engaged in local service than are large fleet owners.

cannot measure the output of all for-hire trucks as such, we can estimate the volume of transportation provided by intercity trucking. But even intercity vehicles account for some two-fifths only of total registrations. Further, of these 2 million intercity trucks, half are farm trucks which account for a relatively low proportion of total intercity truck ton-mileage.

THE OUTPUT OF INTERCITY MOTOR TRUCKING IN 1940

As with other modes of transport, we shall endeavor to measure the physical output of motor trucking in terms of ton-miles. The statistical difficulties are apparent when one considers the obstacles encountered in ascertaining so fundamental a statistical category as the number of trucks engaged in different types of operation. From sheer necessity the ton-mile estimates in the present section are confined to intercity haulage, and take no account of local truck transportation.

Estimates of truck ton-mileage have in the past proceeded from a figure for the number of trucks in intercity use to assumptions of varying validity concerning the average rated capacity of trucks in use, followed by estimates of the percentage extent of actual loading. In computing the latter, the frequency of loading above rated capacity (a common practice) had to be balanced against estimates of empty or partly empty mileage. All these factors had then to be assembled and applied to an estimate of the average annual mileage per truck to yield an over-all truck ton-mileage total. We shall notice some of the estimates made on the above basis, but there have recently become available estimates of ton-mileage that rest on a much firmer base; namely, the ton-mileage totals yielded by the Highway Planning Surveys conducted by most of the states over the period 1936-40 in cooperation with the Public Roads Administration. A few brief comments are in order concerning these surveys.

Financed in part with federal funds provided under the Hayden-Cartwright Act of 1934, the Highway Planning Surveys were primarily designed to yield information necessary to the further development of the rural highway system. As such, the surveys investigated many aspects of highway planning, and included the

compilation of road inventories, studies of highway finance, road use, and pavement life. Of interest to us are the traffic surveys undertaken in each state. These represent the first systematic attempt to assess the volume and character of highway traffic on something approaching a census basis.

The traffic surveys were chiefly concerned with first, the density of traffic on all road sections; and second, the character of truck traffic, truck weights, capacities, and other related characteristics. The first objective, that is, the determination of traffic volume, was ingeniously pursued by means of sampling methods developed by the Bureau of Public Roads, which describes the problem and its solution as follows:

It is obviously impracticable to count the traffic on every road section for an entire year, but studies and past experience have indicated that relatively short sample counts on all sections, when combined with more complete counts at certain strategic points, will provide reasonably accurate estimates of 24-hour traffic on all road sections.¹⁸

The sampling technique employed in the various state surveys usually involved setting up certain key stations at important intersections at which a number of eight-hour counts of traffic were made throughout the year designed to reflect the average experience of each day and night of the week and each month of the year. These counts were supplemented by other eight-hour counts made at various other points of less traffic importance during the year. The twenty-four hour annual average for each road section was estimated by adjusting the eight-hour counts to data recorded by automatic 'electric eyes' which counted traffic continuously at selected points of the state highway system for all hours of the day and night for the entire year. The recording instruments in question were installed permanently and have continued to furnish data ever since the original surveys were made.

Analysis of the volume and composition of truck traffic was made possible by observations taken at 'loadometer' stations, which usually coincided with the key stations recording the volume of

¹⁸ 'Preliminary Report of the Vermont Statewide Highway Planning Survey' (1938), p. 18.

traffic. The trucking information collected at loadometer stations pertained to the kind of goods carried, length of haul, weight of load and truck, and various other aspects of trucking activity. It was primarily upon these two sources of data, the traffic counts and the loadometer station inquiries, that the Public Roads Administration based its estimate of total truck ton-mileage in 1940, the first year for which a calculation was made in the manner indicated.

Table F-2

TRUCK TRAFFIC ON RURAL ROADS, 1940*

Trucks and Truck Combinations

	<i>Private</i>	<i>For-hire</i>	<i>Total</i>
Vehicle-miles (million)	22,217	6,982	29,850
Vehicle-miles, loaded (million)	13,290	4,999	19,432
Average load when loaded (tons)	2.37	5.34	3.04
Ton-miles of load carried (million)	31,444	26,674	59,058

* *Automobile Facts and Figures*, 1941 ed., pp. 66-7; release by U. S. Public Roads Administration, 'Ton-Mile Estimates of Load Carried by Trucks and Combinations on Main and Local Rural Roads in the United States, for the year 1940'. Breakdown fails to agree with total, because the latter has been revised; revision of former not available.

We may now consider the extent and nature of intercity truck ton-mileage as compiled from the Highway Planning Surveys. For 1940 the Public Roads Administration placed the total at 59 billion ton-miles (Table F-2), a figure which may be compared with 375 billion ton-miles for steam railroads. In terms of revenues the relative importance of motor truck transportation is much greater than these figures would suggest. Thus, in 1940 the large commercial intercity trucking firms reporting ton-mile revenue data to the ICC received about 4 cents per ton-mile. The use of this average with total truck ton-mileage suggests a figure of \$2.4 billion for the aggregate value of all intercity trucking in 1940; about \$1 billion was actually collected by for-hire (contract and common carrier) operators, and the remainder is the imputed value of the trans-

portation service rendered by their trucks to owners moving their own goods. These totals compare with railroad freight revenues of \$3,584 million.

Most vehicle-mileage over rural roads is seen to be accounted for by private vehicles, as would be expected from the overwhelming proportion that private trucks bear to the total (Table F-1). However, the commercial carrier is a much more efficient carrier in two respects: the average load carried by commercial trucks and combinations is almost twice that of private trucking units, and the ratio of loaded vehicle-miles to total miles traveled is higher for commercial units (72 percent) than for private units (60 percent). It is readily apparent that private carriers have less control over the volume of tonnage carried on return trips than commercial carriers who can to some extent solicit traffic in either direction. Commercial carriers also make greater use of trailer combinations and trucks of high rated capacity than private truckers; this explains the marked difference in average load carried. The net effect of such differentials is to enable for-hire carriers to come close to sharing total ton-mileage evenly with the private truckers, although the latter account for more than three-quarters of total vehicle mileage.

CHARACTERISTICS OF TRUCK TRAFFIC

The kind of commodity transported by trucks is heavily conditioned by the physical limitations of the trucking industry. Despite the large gains in truck capacity in recent years, the average truck load carried in 1940 by private and commercial carriers was 3.04 tons. In the same year, the average freight tonnage carried by a single loaded railroad car was 25.4 tons. This wide divergence in load per unit of equipment suggests that the greater capacity of the railroad car renders the latter more suitable for commodities whose transportation is facilitated by bulk shipments in large quantities.¹⁹ Thus, we would not expect motor truckers to be particularly attracted toward such agricultural commodities as grain, or such mineral products as coal and iron ore, or such forest products

¹⁹ To say nothing about the average capacity of the rail train, which may perhaps be considered the true loading unit in rail freight service.

as lumber, all of which are customarily transported in large bulk shipments, often in train or boat loads.

The compensating factor for the relatively small capacity of the motor truck is the fact that small shipments are attended by far fewer delays incident to loading and unloading, and offer an extremely flexible service. The Coordinator of Transportation found in 1933 that more than 68 percent of the total time taken by rail transport was occupied with terminal operations — at the origin, at the destination, and at intermediate points.²⁰ Such delays stem partly from the fact that railroad cars have on the average a larger capacity than trucks, so that the assembly of less-than-carload shipments into carload lots consumes more time than the consolidation of less-than-truckload shipments into truckload lots. Railroad movements are also slower because of the need to assemble carlot units into trains for movement between terminals. These differences make it possible for the motor truck to offer a faster over-all service than rail freight. We would expect motor trucking to attract those commodities, such as perishable fruits and vegetables, meats, and livestock, for which speed of delivery is an important shipping factor.²¹

The advantage of the motor truck in speed diminishes, however, as the haul lengthens and terminal delays come to represent a smaller and smaller component of total transport time. Again, as the distance between the points of origin and destination widens, the greater economies of large scale rail movement become increasingly reflected in ton-mile transport costs. On this score, we would expect to find motor trucking more firmly established in the movement of short haul goods. Indeed, the short haul factor frequently

²⁰ *Freight Traffic Report*, Volume II, p. 71.

²¹ Mostly figures are available for recent years only. Of total receipts in 1940 at 68 public stockyards the following percentages arrived by truck: cattle, 66; calves, 64; hogs, 68; sheep and lambs, 32; horses and mules, 52. In the same year New York City, Chicago, Philadelphia and Boston together received 28 percent of their butter and 45 percent of their egg supply by truck; 69 percent of live poultry receipts in New York City were by truck. Truck receipts of fruits and vegetables in 1939 varied from 11 percent for Milwaukee to 88 percent for Los Angeles and averaged 43 percent for 12 cities. (Data compiled by U. S. Department of Agriculture and summarized in *Automobile Facts and Figures*, 1941 ed.)

overshadows other considerations. We find, for example, that such commodities as stone, sand, and gravel, perhaps most efficiently moved in large bulk shipments, are typically moved by truck because points of production and consumption are usually close together, so that the haul is very short.

Truck traffic then, is typically short-haul and usually high grade in character. The ton-mile rates for such traffic by rail are quite high in relation to the ton-mile rates for rail traffic as a whole.²² It is in this sense that truck operators are said to "skim the cream of the traffic". While the latter charge may apply to commercial truckers, it is reasonable to assume that private operators too follow the line of least resistance and concentrate their trucking activities on the kinds of traffic which they find most profitable.

While there is no consistent body of data that would permit analysis of the development of truck traffic and its composition, some generalizations concerning recent trends may be made with scattered material at our disposal. The loadometer stations, operated under the supervision of the Public Roads Administration in 38 states during 1936-40, afford a sample of truck transportation in which the contents of over one and a half million vehicles was recorded (Table F-3).

Manufactures and miscellaneous freight is seen to account for more than half of all truck traffic; such tonnage, which consists mainly of finished commodities of relatively high value in relation to bulk, makes up only about one-quarter of total rail traffic. Mixed freight is really a less comprehensive category than LCL rail tonnage, for much other truck traffic would move in less-than-carload lots if it moved by rail. Like the latter, mixed freight yields a high revenue per ton-mile. In recent years it has been a far more important component of truck traffic than has LCL freight on the railroads: LCL freight constituted less than 2 percent of total rail freight; for trucks the mixed freight proportion is over 10 percent.

In the case of animal products, i.e., mainly livestock, the difference is similarly striking. Over the past two decades motor trucking

²² These conclusions may be confirmed by observing the character of traffic lost by the railroads. See Appendix C above.

Table F-3

COMPOSITION OF TRUCK TRAFFIC, 1936-1940*

Commodities Carried	Average Load (tons per truck)	Total Load	
		(th. tons)	%
Products of agriculture	3.7	749	14.2
Animal products	2.6	530	10.0
Products of mines	4.3	434	8.2
Products of forests	4.1	324	6.1
Manufactures and miscellaneous	3.3	2,712	51.3
Mixed freight	4.1	541	10.2
TOTAL	3.5	5,290	100.0

* Public Roads Administration. See ICC, *Federal Regulation of the Sizes and Weight of Motor Vehicles*, 77th Cong. 1st Sess. House Document 354 (1941), p. 442. These figures, while they apply to intercity traffic, are not of course confined to for-hire vehicles.

has attained a dominant position in the transportation of livestock. Thus, in 1916 the proportion of all livestock receipts 'driven in' by truck in the principal livestock markets was less than 2 percent, but by 1940 the 'driven in' proportion was more than half total receipts.²³ Animal products, which like all perishables require high transport charges, make up 10 percent of total truck tonnage, but less than 2 percent of present day rail tonnage. Motor trucks also carry many perishable fruits and vegetables. This explains the relatively high proportion of total tonnage contributed by agricultural products — 14 percent; the corresponding figure for rail traffic was less than 9 percent in 1940. On the other hand, the low-revenue products of mines, which make up over half of total rail tonnage, is a very minor component of truck traffic (8 percent), much of it representing the trucking of coal to domestic consumers.

The Federal Coordinator of Transportation accumulated a body of data on trucking activity in 1933 which yields some informative insights into the nature of truck traffic. In a canvass of large shippers, it was found that the commodities moving by truck in significant amounts included such processed goods as paints, autos and parts, rubber articles and tires, dry goods and clothing, textiles,

²³ See *Automobile Facts and Figures*, 1941 ed.

leather goods, and books and stationery; such foodstuffs as beverages and liquors, bakery goods, canned goods, and fruits and vegetables; and, of course, livestock. Other commodities were sand, stone and gravel, cotton in bales and rough lumber.²⁴ The average truck haul was found to be about 100 miles, compared with an average rail haul of 342 miles in that year; truck hauls ranged from 14 miles for sand, stone and gravel to 435 miles for fresh fruits and vegetables. Other commodities for which truck hauls were longer than average were packing house products, groceries, rubber articles, and tires. Hauls by for-hire typically are longer than hauls by private trucks, for the latter usually restrict their range of operations to an area that can be serviced within the limits of a working day. Extremely long truck hauls have been noted for some commodities; automobiles are sometimes trucked as much as 1,500 miles from Michigan, but no regular service is normally maintained for such distances.²⁵

With more advanced equipment and better highways, truck hauls seem to have lengthened considerably during the interwar era. Scattered evidence suggests that hauls were shorter in the early 1920's than today. In traffic surveys during 1922-24 the Bureau of Public Roads found that of loaded trucks on rural roads 86 percent operated within a 40-mile radius in Connecticut, 87 percent in Maine, and 85 percent in Cook County, Illinois. In California traffic 69 percent of all loaded trucks had hauls of less than 40 miles. The average haul of eastbound truck tonnage on the Boston Post Road in October 1921 was found to be 56 miles.²⁶ These and other scattered figures of a like nature do not permit any precise estimate of the total gain in average truck haulage; however, the growth of motor-truck transportation may be gauged by other means.

²⁴ *Freight Traffic Report*, Volume II, pp. 49-50.

²⁵ ICC, *Coordination of Motor Transportation*, 72nd Cong., 1st Sess., Senate Document 43 (1932), p. 42.

²⁶ *Automobile Facts and Figures*, 1922 ed., p. 29; 1926, p. 39.

THE GROWTH OF INTERCITY MOTOR TRUCKING

In a preceding section we described estimates which place the volume of intercity truck transport in 1940 at 59 billion ton-miles. How rapidly did it grow in reaching this volume?

Vehicle Miles (For-Hire and Private Combined)

We begin by estimating the growth of intercity vehicle-miles. As a first step in such measurement, we can resort to indexes of gasoline consumption. Total domestic motor fuel consumption has been analyzed and distributed among highway and city trucks, passenger cars, and busses for the period 1925-40 by Herbert A. Breakey.²⁷ The distribution, admittedly crude, was based on data collected by the Public Roads Administration in road and traffic surveys. The resulting series for truck consumption of gasoline on highways (i.e., rural roads as distinct from city streets) is reproduced in the first column of Table F-4. The highway truck mileage figure of 29.8 billion in 1940 (Table F-2) yields an average of about 14 miles per gallon, somewhat above the figure (11.25) adopted by Breakey. Truck mileage was estimated by the Bureau of Public Roads for 1936, and we have projected these estimates back to 1925 on the basis of gasoline consumption. A constant ratio of motor fuel per vehicle-mile was used, the assumption being that larger loads and higher speeds have offset greater engine efficiency.²⁸ The indications are that intercity truck mileage grew between five- and six-fold from 1925 to 1940.

²⁷ U. S. Bureau of Mines, *Minerals Yearbook, Review of 1940*, p. 982. See also *Petroleum Facts and Figures*, 1939, p. 21.

²⁸ This assumption is probably too conservative. Estimates of gasoline consumption by rated capacity (Bureau of Public Roads, *The Taxation of Motor Vehicles in 1932*, U. S. Department of Agriculture, 1934, p. 268) suggest an increase in average miles per gallon from about 5 in 1923 to about 9½ in 1932. (This calculation takes account of the rise in average vehicle weight. For 1923 trucks were distributed by rated capacity according to highway surveys in Connecticut, Ohio and Pennsylvania; for 1932 a distribution given in Federal Coordinator of Transportation, *Public Aids to Transportation*, Vol. IV, p. 129 was used.) Consequently Table F-4 may understate the rise both in vehicle mileage and in ton-mileage.

Ton-Miles (For-Hire and Private Combined)

This increase in vehicle mileage serves in turn as a lower limit for the corresponding rise in ton-mileage. To pass from the former to the latter we have to estimate the change in load per truck. There is first of all the question of truck capacity, which has risen significantly in recent years. The rise has occurred not so much because of general increases in rated capacity per truck as because of the introduction and development of tractor and trailer combinations.

The capacity of all single truck units has, if anything, declined owing to the dominant influence of trucks of less than two tons of rated capacity, used mainly in short-haul local service. For the larger trucks in intercity service, the tendency toward increased capacity found its chief expression in the extended use of trailer combinations rather than an increase in the capacity of single trucks. In 1940, 16 percent of total truck vehicle-mileage was accounted for by trailer combinations. The gain in capacity associated with the use of combinations is indicated by their average load, 7.42 tons, as compared with an average load of 2.08 tons for single unit trucks.²⁹ Trailer registrations have not until recently been segregated from those of trucks. Of 1,193 thousand trailers registered in 1939, more than half, or about 674 thousand may have been commercial or property carrying types.³⁰ Although trailer combinations have long been a feature of intercity trucking,³¹ in 1940 single unit trucks made up only 28 percent of all equipment units of Class I intercity property carriers reporting to the ICC.³² The Public Roads Administration found that over the period 1936-40 the percentage of total truck vehicle mileage contributed by combinations increased rather steadily. If the rate of increase which they indicate be projected backward in time, trailer

²⁹ Public Roads Administration release, 'Ton-Mile Estimates, 1940'. Much of the gain in trailer capacity is due to the fact that a trailer subject to the same legal gross-weight restrictions as a single unit truck has a relative advantage because of the absence of a power plant and the resultant low chassis weight. See *Motor Truck Freight Transportation*, Domestic Commerce Series, No. 66 (U. S. Department of Commerce, 1932), p. 12.

³⁰ *Automobile Facts and Figures*, 1941 ed., p. 20.

³¹ *Motor Truck Freight Transportation*.

³² 'Statistics of Class I Motor Carriers, 1940', p. 11.

combinations would have contributed about 10 percent of total truck vehicle mileage in 1929 compared with 16 percent in 1940; this, however, is probably an overestimate of the true proportion in the former year.

When the average capacity of all trucks and combinations in intercity service has been ascertained, it then becomes necessary to enquire into loading practices before one can arrive at an estimate of the average load carried. First, one must determine the proportion of empty mileage, for it is evident that trucks may frequently, especially in private trucking, make return trips without cargo. In the 1940 traffic surveys, it was found that 65 percent of all truck and combination vehicle mileage was made under load.³³ This is in remarkably close agreement with the guess made by the ICC for the years 1925 and 1929, when it was assumed that one-third of all truck mileage is empty mileage.³⁴

Secondly, the rated capacity of a truck is no accurate indication of the actual weight carried when under load. Various factors must be considered in this connection. For trucks of intermediate capacity, loading over rated capacity is very common, although such overloading, most pronounced at the point of origin, tends to diminish along the route of delivery. More important than overloading, however, is the difficulty of obtaining full loads, especially for the larger vehicles, and on return trips. Here again the ICC estimated that in 1925 and 1929 loaded trucks carried about 80 percent of the tonnage they could have carried in terms of rated capacity.

We have no reason to suppose that either the proportion of empty mileage or the ratio of load to capacity are subject to any special trend. Certainly any change since 1925 in average load of all vehicles (loaded and empty) must be attributed in major part to changes in vehicle capacity and type of equipment.

In 1940 the effects of all the above factors appear in the figure for average tonnage carried per vehicle, obtained by dividing total ton-mileage by total vehicle mileage (loaded and empty). The result, an average load of 1.98 tons per truck for 1940, represents

³³ 'Ton-Mile Estimates, 1940'.

³⁴ 182 ICC 263, see pp. 400-7 (1932).

an advance of nearly 50 percent over the corresponding figure of 1.33 tons estimated by the ICC for the year 1929. The latter figure rests on the following basis: trucks were assumed to be loaded two-thirds of the time at 80 percent of capacity; and the average capacity of trucks in intercity use (including trailers) was estimated at 2.50 tons.³⁵ State traffic surveys in the middle 'twenties suggest a figure of one ton per truck for the initial year of our data, 1925. The average load per vehicle apparently doubled within the space of fifteen years. In Table F-4 the ton-mileage series for intercity trucking (for-hire and private combined) is derived from the truck mileage series with the use of the ratios just outlined.

It appears from these data that while intercity truck mileage grew between five- and six-fold, the corresponding ton-mileage rose more than tenfold between 1925 and 1940. A simple extrapolation places ton-mileage at about 2 billion in 1920, or less than one-half of one percent of the volume of railroad freight transportation in that year. We may therefore say with some confidence that the intercity trucking industry became a factor in the national transportation picture only after 1920. Judged by gasoline consumption, the growth of highway freight transportation was remarkably steady, slackening little even in depression years. Such sustained gains in output are, of course, to be expected in the early stages of an industry's life history.

How may this rapid increase be explained? In our discussion of the nature of truck traffic, we have seen that the type of cargo most suited to truck transport is of a short-haul, high grade nature. The motor truck, filling a definite need for this type of transport service and adding the elements of over-all speed of delivery, and completeness and flexibility of service, enlarged its share of total traffic in proportion as these factors were lacking in the standard rail freight service. Truckers have been quick to capitalize on certain aspects of rail shipping practices. Throughout the 1920's the railroads exercised considerable managerial ingenuity in increasing the efficiency of freight service. Great gains were achieved, as we have seen, in railroad output per unit of input. However, some of this productivity gain may have been achieved at the expense of

³⁵ *Ibid.*

the shipper. For example, the average number of cars in each freight train increased from 36.6 in 1920 to 48.9 in 1930.⁸⁶ While such an increase may reflect in one sense an improvement in the organization of rail freight service, it may also have contributed to increasing the over-all shipping time, a factor that was singled out by the Federal Coordinator of Transportation as a serious flaw in rail freight service in 1932. It has been the contention of some observers (particularly representatives of railway labor) that many of the technological advances instituted by rail management in the 'twenties, such as those making for gains in car capacity and the tractive power of locomotives, have increased the inflexibility of rail service, inasmuch as they hindered the speedy dispatch of small shipments.⁸⁷ It is further asserted that business practice after 1920 favored so-called 'hand-to-mouth buying', whereby small orders are placed at frequent intervals requiring quick delivery.⁸⁸ Hand-to-mouth buying was not always considered in the late 1920's to be a tendency leading to diversion of traffic from rail to highway;⁸⁹ nevertheless, the steady decline of less-than-carload railroad traffic from 53 million tons in 1920 to 36 million tons in 1929 suggests that here was an area of competition in which motor trucking was rapidly gaining at the expense of the railroads.

Various other competitive advantages have been attributed to motor trucking. That of 'completeness of service', involving store-door collection and delivery, it may be noted, is not necessarily limited to the trucking industry as such, as is attested by the increasing degree to which railroads have in recent years added this feature to their regular freight service. Nevertheless, in this respect, intercity truckers no doubt had a considerable initial advantage over rail freight service. In addition, motor trucks could (and still do) offer certain other services to shippers which the railroads cannot duplicate; trucks can penetrate areas often inaccessible to railroads, such as logging and construction camps and oil fields in

⁸⁶ TNEC, *Hearings*, Part 30, p. 17387.

⁸⁷ Cf. testimony of George Harrison of the Brotherhood of Railway Clerks, TNEC, *Hearings*, Part 30, pp. 16615-8.

⁸⁸ *Freight Traffic Report*, Vol. II, pp. 68-83.

⁸⁹ L. S. Lyon, *Hand to Mouth Buying* (Brookings, 1929), pp. 467-71.

Table F-4

INTERCITY MOTOR TRUCKING: TON-MILE
ESTIMATES, 1925-1946^a

	<i>Motor Fuel Consumed by Trucks Outside Cities (mil. barrels)</i>	FOR-HIRE AND PRIVATE		FOR-HIRE ONLY Ton-miles (bil.)
		<i>Vehicle- miles^b (bil.)</i>	<i>Ton- miles (bil.)</i>	
1925	8.7	4	4	2
1926	10.3	4	5	2
1927	12.3	5	6	3
1928	14.6	6	8	3
1929	17.8	8	10	4
1930	19.9	9	12	5
1931	22.4	10	14	6
1932	22.5	10	15	6
1933	24.1	10	17	7
1934	27.5	12	20	9
1935	30.8	13	23	10
1936	35.5	15.4	28	12
1937	39.7	19	35	15
1938	40.8	21	40	18
1939	45.2	25	49	22
1940	49.4	29.8	59	27
1941	....	24.2	59	28
1942	....	n.a.	n.a.	n.a.
1943	....	17.4	44	23
1944	....	17.2	45	25
1945	....	18.9	50	28
1946	....	24.3	61	34

n.a.: not available.

^a Figures for combined for-hire and private vehicle-miles and ton-miles in 1936 and in 1940 and later years are based directly on traffic surveys by the Public Roads Administration made during the years in question. The ratio of for-hire to total traffic was surveyed only in 1936, 1940, and 1944, and estimates of for-hire ton-miles in these three years are also due to PRA. The above data were published in various issues of *Public Roads* or in special releases by PRA.

Estimates for other years were made as follows. Combined for-hire and private vehicle-miles for 1925-35 and 1937-39 were based upon the series for motor fuel consumed by trucks outside cities, published in U. S. Bureau of Mines, *Minerals Yearbook* (annual). It was assumed that vehicle-miles per gallon of fuel did not change between 1925 and 1935, fuel economy being offset by growth in vehicle weight (an assumption supported by scattered state surveys during the period). Combined for-hire and private ton-miles were derived for 1937-39 by straight line interpolation of the ratio of tons per truck (loaded and empty); for 1935 and earlier years by similar interpolation assuming average load was 1 ton in 1925 and 1-1/3 ton in 1929 (figures from scattered state surveys). For-hire ton-miles were obtained for 1937-39, 1941, and

1943 by straight line interpolation of the ratio of for-hire to total ton-miles; for 1945 and 1946 by using the corresponding ratio for 1944; and for 1935 and prior years by using the ratio for 1936. So far as estimates of for-hire ton-miles in early years are concerned, this last step is probably the weakest. Unfortunately there appears to be no way of checking the assumption that for-hire and private traffic grew at the same rate prior to 1936, for the ratio between them was not canvassed in any of the early surveys that have come to our notice.

Our estimate of 49 billion ton-miles for private and for-hire trucking in 1939 compares with a figure released by the ICC of 43 billion (*55th Annual Report*, p. 9). The Board of Investigation and Research, appointed under the Transportation Act of 1940, offers an even lower figure (40 billion) in *The National Traffic Pattern* (79th Cong., 1st Sess., Senate Document 83, p. 22). Neither the ICC nor the Board gives the derivation of its estimate, but the latter states that its figure excludes "local highway traffic where the trip is under 15 miles."

It should be noted that our estimates for early years fall considerably below some other estimates made in the past. Thus the ICC quotes an estimate by the Bureau of Public Roads of 8 billion for intercity (for-hire and private) ton-mileage in 1925, and offers alternative estimates of 26 and 20 billion for 1929 (182 ICC 263, see pp. 400-7, 1932). The Federal Coordinator of Transportation estimated total intercity ton-mileage at 30 billion in 1932, and the for-hire component at 5.5 billion (*Regulation of Transportation Agencies*, 73d Cong., 2d Sess., Senate Document 152, 1934, pp. 261-2). An early estimate of total ton-mileage, including farm-to-market and city trucking, of 6.5 billion was made by the Bureau of Public Roads at the beginning of the 1920's (*Report of the Joint Commission of Agricultural Inquiry*, 67th Cong., 1st Sess., House Report 408, Part 3, 'Transportation', 1922, p. 351). On the whole these estimates are higher than our own. They were made before the extensive new surveys of 1936 and 1940; all of them rest on figures for truck mileage derived by taking the product of an assumed number of trucks and an assumed average annual mileage per truck, a procedure we do not believe preferable to that used here, i.e., the projection of the vehicle-mileage data backward using gasoline consumption. Nevertheless, if the earlier estimates quoted are correct, then intercity trucking must have developed much more rapidly before about 1929, and much less rapidly during the 'thirties, than is suggested by our figures.

^b Both loaded and empty. A trailer is counted as a separate vehicle; a tractor truck plus semitrailer as a single vehicle.

the early stages of development. Some shippers find the relative simplicity of the packing requirements, flexibility of schedules, and adaptability of equipment of truckers as reasons for preferring the latter to other agencies.⁴⁰

For-Hire Ton-Miles

The preceding discussion was concerned with all intercity trucking, for-hire and private. Certainly a truck, whether owned by a commercial trucking company or by the firm whose property it carries,

⁴⁰ See *Freight Traffic Report*, as above.

competes with other means of transportation. The rise of both kinds of intercity trucking was stimulated by the same sorts of advantage. Yet our main interest in this study is in for-hire rather than in all intercity trucking. If only as one constituent of our index of freight traffic for all transportation agencies, we need a series for ton-miles carried in for-hire (contract and common carrier) operations. The calculation is a simple one, although we cannot claim accuracy for it on that account. The Public Roads Administration surveyed the proportion of for-hire to total ton-miles in intercity trucking for the years 1936, 1940, and 1944. For other years we must assume that for-hire ton-miles moved in the same fashion as total ton-miles. The figures will be found in the last column of Table F-4.

RELATION OF OUTPUT TO EMPLOYMENT

The relation of the output of intercity motor trucking to employment must remain largely a matter of conjecture, in the absence of truck employment statistics as such. The latter, however, may be estimated, albeit roughly, from the number of trucks in use, i.e., from truck registration statistics. That there is a functional relationship between truck employment and truck registrations cannot be doubted, for the use of every truck or truck combination must of necessity involve one or more employees; yet the nature of the function and the precise level of the 'employment per truck' ratio, may be difficult to ascertain.

The volume of employment required to furnish 59 billion ton-miles of intercity transportation in 1940 cannot be determined unless some adequate disposition first be made of the employment required to transport the unknown proportion made up by those agricultural (and other) products which were transported by the million or so farm trucks in use in 1940. It would be clearly unwarranted to assign one full-time driver to every farm truck in intercity use and we have no data which permit estimates of the actual full time employment associated with such intercity transport. For the remaining million or so trucks engaged in intercity trucking, in private and for-hire service, we may at least assert that to the extent that such trucks were in continuous use, a minimum of one

million drivers were employed in 1940. The actual employment associated with the operation of these trucks, including those employees concerned with terminal, maintenance, and administrative functions, must have been considerably larger.⁴¹

Of the 283 thousand trucks in intercity for-hire service in 1940, 14,869 were operated by common carriers of general freight reporting operating revenues over \$500,000 to the ICC, and for these companies the employment per truck ratio was 3.1 to 1. For 643 Class I intercity carriers operating owned equipment only, the corresponding ratio was 2.4 to 1.⁴² The number of trucks engaged in such relatively large scale operations, in which the proportion of total employment engaged in terminal and administrative functions exceeds that engaged in actual transportation service, is relatively small. All intercity Class I motor carriers in predominantly intercity service reporting to the ICC operated fewer than 40,000 trucks and tractors in 1940. The bulk of the remaining for-hire carriers in intercity service probably operated single truck units, and for these carriers the employment per truck ratio was probably much closer to unity. The Federal Coordinator of Transportation estimated that the ratio for all intercity for-hire truckers was 1.58 to 1 in 1934.⁴³ Applying this ratio to the 283 thousand or so for-hire trucks estimated by us to be in intercity service in 1940, we may take 450 thousand as a tentative estimate of total employment in intercity for-hire motor transport in that year. Even more tentative would be any estimate of the employment associated with privately operated trucks; a reasonable guess may be that as many as one million were so engaged. The 58 billion ton-miles of inter-

⁴¹ The 1940 Census reported 1.7 million persons engaged in the occupation 'trucking service'; this figure of course includes private as well as for-hire employment.

⁴² Ratios computed from 'Statistics of Class I Motor Carriers, 1940'.

⁴³ *Hours, Wages and Working Conditions in the Intercity Motor Transport Industries* (1936), Part II, p. 173. The total intercity trucking laboring force was estimated at 395,000 in 1934 and the total number of trucks in use at 250,000. The latter figure is not much below our estimate for the year 1940, and may be an overestimate, although it is possible that in the depression year 1934 many trucks normally in local service entered into intercity transport service where competitive opportunities were more favorable. In any case, however, the employment per truck ratios, obtained from sample data, represent the only attempt to cover the entire range of intercity for-hire operations.

city trucking traffic in 1940 may thus be seen to have required the full-time efforts of anywhere from 1,000,000 to 1,500,000 persons, and for motor trucking as a whole it would be difficult to state the case with any greater precision.

The 450 thousand employees tentatively estimated as engaged in commercial operations accounted for 27 billion ton-miles in 1940 yielding a productivity ratio of 59 thousand ton-miles per man-year. The ratio is much higher, of course, for those commercial carriers whose operations are organized on a relatively large scale. Thus intercity common carriers of general freight, reporting revenues of more than \$500,000 to the ICC in 1940, employed 46,536 persons and reported 788 million intercity vehicle-miles. Since other large common carriers reported an average load per vehicle-mile of 6.8 tons in that year it is reasonable to assume that for such carriers the output per man ratio was well over 100 thousand ton-miles per employee.⁴⁴

A significant question to be raised with regard to the relation between the output of intercity motor trucking and employment concerns their movement in time. We have already determined that the increase in output over the period 1925-40, in ton-mileage terms, was from seven to tenfold, an expansion to be ascribed to the extreme youth of the industry. How has employment moved in this period? For an answer to this question we must again resort to truck registration statistics. We know, for example, that total for-hire and privately owned trucks in local and intercity service grew from 2,442 thousand in 1925 to 4,590 thousand in 1940, or by 88 percent. An estimate of the corresponding increase in the number of intercity trucks would probably be of similar magnitude.⁴⁵ The

⁴⁴ 'Statistics of Class I Motor Carriers, 1940'.

⁴⁵ The present proportion of intercity trucks to the total may be somewhat higher than in 1925, for estimates of gasoline consumed by local trucks indicate advances of about 100 percent during 1925-40 compared with gains of 500 percent in gasoline consumed by highway trucks; it seems difficult to attribute all of this difference to greater increases in average annual mileage of highway trucks (see *Petroleum Facts and Figures*, 1939, p. 21). On the other hand, it has been estimated (or perhaps merely guessed) that in 1925 50 percent of all trucks were in intercity service, which is a higher proportion than that estimated by us for 1940 (182 ICC 263 at pp. 400-7).

employment per truck ratio may perhaps have risen with longer trips and more intensive utilization of equipment.

No precise estimates of the increase in employment in intercity trucking can be inferred from the above, but it seems clear that the size of the increase — probably of the order of 100 percent from 1925 to 1940 — lies well below that of the increase in ton-mileage, which expanded more than sevenfold in the same period (Table F-4). Ton-miles per employee would appear to have increased rather rapidly — how rapidly it is impossible to say. Productivity in intercity trucking seems to have risen at least as rapidly as in other transportation industries.

