MOTOR TRUCK FREIGHT TRANSPORTATION

U. S. DEPARTMENT OF COMMERCE
BUREAU OF FOREIGN AND DOMESTIC COMMERCE

U. S. DEPARTMENT OF COMMERCE
ROY D. CHAPIN, Secretary
BUREAU OF FOREIGN AND DOMESTIC COMMERCE
FREDERICK M. FEIKER, Director

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MOTOR TRUCK FREIGHT TRANSPORTATION

Characteristics and Costs of Motor-Truck Operation by Common Carriers and Contract Haulers in Intercity Service

Report of a Survey Conducted Jointly by
BUREAU OF PUBLIC ROADS
UNITED STATES DEPARTMENT OF AGRICULTURE
and
BUREAU OF FOREIGN AND DOMESTIC COMMERCE
UNITED STATES DEPARTMENT OF COMMERCE

TRANSPORTATION DIVISION

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FOREWORD

This bulletin reports the results of a survey of intercity motor-truck freight transportation for hire, conducted in 1931 jointly by the Bureau of Public Roads of the United States Department of Agriculture and the Bureau of Foreign and Domestic Commerce of the United States Department of Commerce. The principal objects of the investigation were to secure available data on (1) motor equipment in use, particularly as to types and weights of vehicles, (2) radius of haul, and (3) costs of operation.

The survey was made under the general supervision of E. W. James, chief, division of highway transport, Bureau of Public Roads, and A. Lane Cricher, chief, division of transportation and communication, Bureau of Foreign and Domestic Commerce. William G. Eliot, 3d, Robert A. Montgomery, and Frank B. Curran, of the Bureau of Public Roads, and Wellington McNichols, of the Bureau of Foreign and Domestic Commerce, conducted the field investigation and compiled this report.

FREDERICK M. FEIKER, *Director,*
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AUGUST, 1932.

MOTOR TRUCK FREIGHT TRANSPORTATION

INTRODUCTION

The information contained in this report was secured, through personal interviews, from 217 motor-trucking concerns in 41 States and the District of Columbia. Data as to truck and trailer equipment and hauling radius were generally available, especially from operators making regular trips over fixed routes. Comprehensive figures on operating costs, however, were scarce, only 122 firms supplying cost data in sufficient detail to permit statistical analysis. The inadequacy of accounts and records for the industry as a whole may be attributed to numerous circumstances, but its rapid growth, the large proportion of small-scale operations, and unstable competitive conditions are probably the most important. Motor trucking as an industry is still new and unorganized. Equipment and methods have been changing rapidly. There is little accumulated experience for guidance, and each operator must work out almost alone the solution for his own particular problems.

Although there is apparent some tendency toward consolidation and large-scale operation in the motor-freight field, the industry is still predominatingly one of small fleets and individual management. Scientific accounting is the exception rather than the rule, direct personal familiarity with the business taking the place, however inadequately, of elaborate records.

Under such circumstances it is natural that the available statistical data should be limited in scope. Statistical conclusions, therefore, must be accepted only as indicative of general tendencies, not as final evidence on the subject.

While a reasonable effort was made to show a true cross section of commercial truck operations, the final selection of cases was unquestionably influenced by the nature of the data sought. It was usually the better-known operators who were interviewed and reports were made only on those who were able to supply some details as to costs of operation. The reports show a preponderance of common carriers in States where certificates of convenience and necessity are required. This is due at least in part to the fact that the names and addresses of certificated carriers are on public file, and they are usually required to maintain records in a prescribed form and to make periodic reports. In certain other States, however, the data show a disproportionate number of contract carriers. This is usually the case where there is no common-carrier legislation and truck operators are not compelled to assume the legal status of common carriers, even though they cater to the general public.

In proportion to their numbers, the small operators, especially in rural communities, constitute the group least adequately represented.

Typically, they employ one or two trucks, which may be engaged principally in local transfer work or private business. Accounting, if any, is likely to be inextricably mingled with personal transactions, while certain overhead or administrative costs are frequently ignored.

Very few of the truck operators interviewed were able to give as complete reports as were desired for the purposes of this survey. There was a wide variety of accounting and statistical systems in use, and even where full records were kept it was impossible to extract all the details of the operation in a reasonable length of time. It was very difficult to secure comparable records, especially regarding costs of operation. This will explain the fact that almost none of the statistical analyses shows a complete summary of data from all the concerns interviewed. In each case the analysis covers only the trucks or trucking for which the details were reported.

Of the 217 operators included in the survey, 103 reported a common-carrier business only, 41 contract hauling only, while 73 reported both common-carrier and contract hauling. The disproportionate representation of the larger operators is brought out in Tables 1 and 2, showing gross revenues for 1930, and size of fleets, respectively.

TABLE 1.—GROSS REVENUES, 1930, OF TRUCKING CONCERNS

Gross revenue	Number of concerns	Per cent of concerns	Gross revenue	Number of concerns	Per cent of concerns
Under $5,000	5	2	$100,000 and over	60	28
$5,000 to $9,999	14	6	No revenue data given	48	22
$10,000 to $19,999	16	7			
$20,000 to $49,999	40	19	Total	217	100
$50,000 to $99,999	34	16			

TABLE 2.—SIZE OF FLEETS OF TRUCKING CONCERNS

Size of fleet	Power units		All units	
	Number of concerns	Per cent of concerns	Number of concerns	Per cent of concerns
1 or 2 vehicles	16	7.4	15	6.9
3 or 4 vehicles	31	14.3	22	10.1
5 to 9 vehicles	69	31.8	58	26.7
10 to 14 vehicles	30	13.8	35	16.1
15 to 19 vehicles	21	9.6	27	12.4
20 to 49 vehicles	39	18.0	36	16.6
50 to 74 vehicles	7	3.2	14	6.5
75 to 99 vehicles	3	1.4	4	1.9
100 vehicles and over	1	.5	6	2.8
Total	217	100.0	217	100.0

Figure 1 shows on a map of the United States the "regular" routes of the truck operators from whom reports were secured in this survey. It does not include irregular or "anywhere for hire" hauling, since such trucking is practically without limit. The map clearly indicates the wide geographical field of the survey.

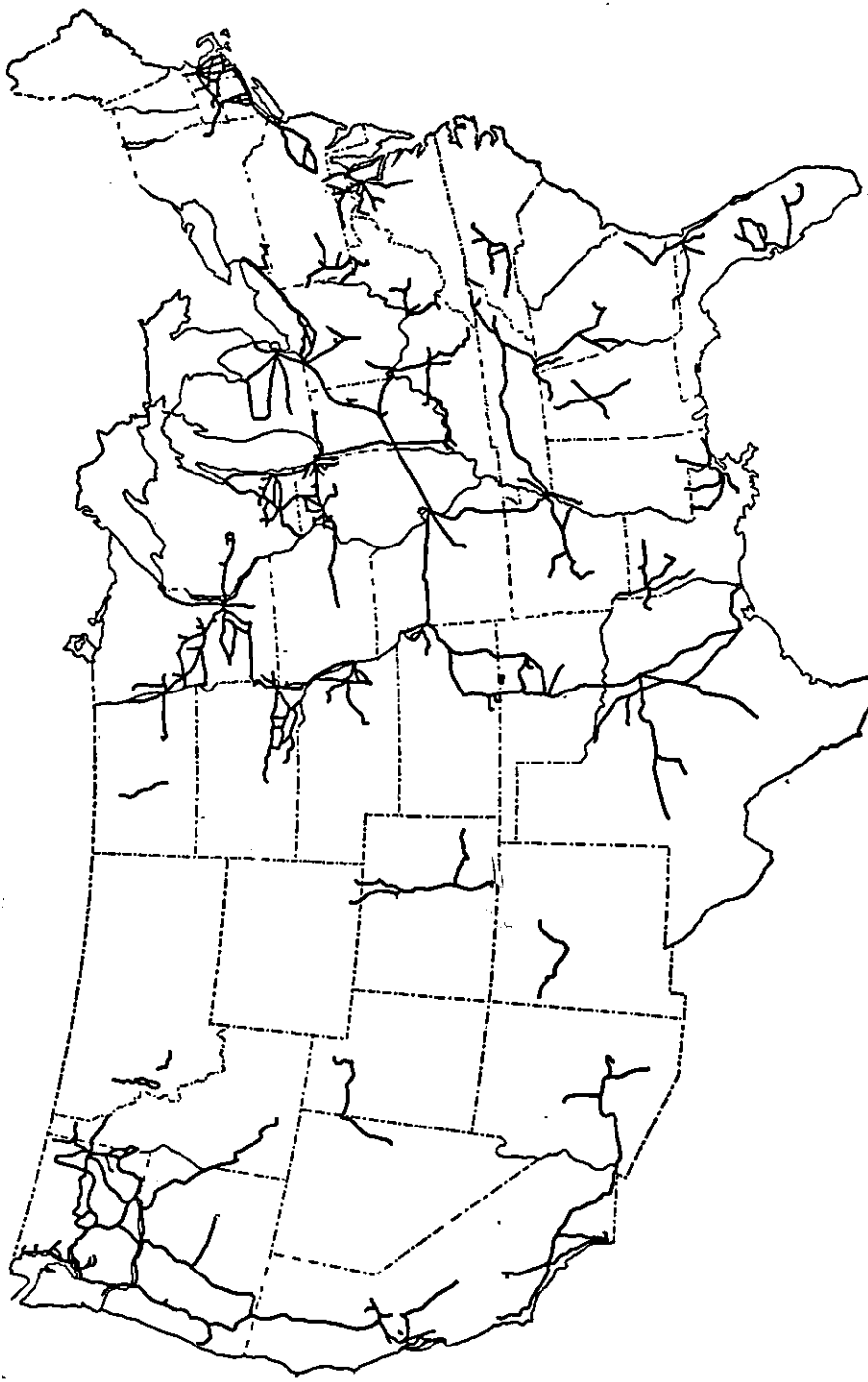

Figure 1.—Fixed motor-truck freight routes studied in this survey

EQUIPMENT

The variety of equipment apparent in a comparison of different operations and different sections of the country is indicative of a marked specialization of motor-truck chassis and body design for particular types of hauling service.

The most obvious differences are those arising directly from the nature of the commodity hauled. Tank trucks and trailers, for example, are designed for the purpose of hauling gasoline, oil, or other liquids in an efficient manner. For the transportation of perishables in hot climates, refrigerator bodies are becoming increasingly common. Household goods are moved in closed, weatherproof vans, frequently equipped with sleeping accommodations for the driver or drivers on long trips. Dump bodies of special types are required in the handling of coal, coke, and certain building materials. Armored vans have been specially designed for the transportation of silk and other commodities of high value in concentrated bulk.

Figure 2.—A 6-wheeled tractor truck, a 4-wheeled semitrailer, and a 6-wheeled full trailer

For loading, unloading, or hoisting safes, machinery, and other heavy freight, trucks are not infrequently equipped with power winches or cranes. Exceptional loads, usually moved over the highways only under special permit, are carried on low, flat trailers, on multiple wheels, with capacities as high as 25 tons and more.

All these special types of equipment were among those listed by the trucking companies interviewed. By far the greater number of trucks and trailers, however, may be described as being in the "general purpose" class; that is, they are all reasonably well adapted to miscellaneous hauling of whatever freight is offered. Their suitability to any given job depends primarily on how well their capacity, speed, and economy of maintenance are adapted to the particular demands made upon them. Even for general hauling there is a wide range of sizes from which to choose, and a considerable variety in body and chassis design. They range from the light express truck, of ½-ton capacity, to outfits like that illustrated in Figure 2, a tractor-truck, semitrailer, and trailer combination capable of carrying 90,000 pounds gross load, on 30 balloon tires. This heavy combination, it should be stated, is no longer in use, not because of excess wheel or axle loads, or because of illegal dimensions, but because the State in which it is

registered now sets a maximum gross load of 68,000 pounds for any combination of vehicles, and this load can be more efficiently handled by an ordinary 6-wheeled truck in combination with a 6-wheeled trailer.

TRUCK CAPACITY

The choice of truck capacity depends primarily on the loads which are to be moved. Since most of the firms contributing statistics in this inquiry were engaged principally in intercity hauling, the proportion of large-capacity trucks is far greater than if all trucking were included. In the questionnaire circulated to the trucking industry by the General Motors Truck Co. in 1929, the percentages of light, medium, and heavy duty trucks were 58 per cent, 32 per cent, and 10 per cent, respectively. The corresponding percentages for the survey here reported were 11 per cent for the light trucks, 60 per cent for medium duty trucks, and 29 per cent for the heavy trucks.

Even these figures may not be fairly representative of the trucks used in highway hauling, inasmuch as the lightest trucks reported were commonly described as "pick-up" trucks, used principally in local pick-up and delivery work in connection with a line haul by heavy trucks. Others of the light trucks were engaged in a local transfer business more or less independent of the intercity work. On the other hand, it is possible that the inclusion of a larger proportion of small trucking concerns in the survey might have reduced somewhat the proportion of heavy trucks reported.

Table 3 shows, by geographic divisions, the rated capacities of vehicles reported. Table 4 shows the per cent of power units (trucks and tractor trucks) in each capacity group.

TABLE 3.—RATED CAPACITY OF VEHICLES REPORTED, BY GEOGRAPHIC DIVISIONS

Geographic division [1]	Light vehicles, ½ to 1¼ tons				Medium capacity vehicles, 1½ to 3 tons				Heavy vehicles, 3½ tons and over				No capacity data			
	Trucks	Tractor trucks	Semitrailers	Trailers	Trucks	Tractor trucks	Semitrailers	Trailers	Trucks	Tractor trucks	Semitrailers	Trailers	Trucks	Tractor trucks	Semitrailers	Trailers
New England	31	----	----	----	134	----	----	----	103	4	11	1	23	8	1	----
Middle Atlantic	14	----	----	----	190	----	----	8	255	86	100	54	3	32	12	----
East North Central	38	1	2	3	265	85	27	18	75	58	151	96	----	4	----	3
West North Central	39	----	----	----	260	22	9	44	32	31	80	13	1	11	5	----
South Atlantic	13	----	----	----	199	9	10	11	35	1	5	1	1	4	----	----
East South Central	19	----	1	----	58	9	3	1	26	7	11	7	----	----	1	----
West South Central	16	----	----	----	86	28	22	18	7	31	38	20	41	15	16	5
Mountain	24	----	----	1	109	5	4	11	38	----	1	3	1	1	3	----
Pacific	128	----	----	5	384	2	8	69	248	16	21	137	13	2	6	74
United States	322	1	3	9	1,685	160	83	180	819	234	418	332	83	77	44	82

[1] According to U. S. Bureau of the Census.

TABLE 4.—PER CENT OF TRUCKS AND TRACTOR TRUCKS, BY CAPACITY GROUPS

Geographic division [1]	Light, ½ to 1¼ tons	Medium, 1½ to 3 tons	Heavy, 3½ tons and over	Total
New England	11.4	49.3	39.3	100
Middle Atlantic	2.6	34.8	62.6	100
East North Central	7.5	67.0	25.5	100
West North Central	10.2	73.4	16.4	100
South Atlantic	5.1	80.9	14.0	100
East South Central	16.0	56.3	27.7	100
West South Central	9.5	67.9	22.6	100
Mountain	13.6	64.8	21.6	100
Pacific	16.5	49.6	33.9	100
United States	10.0	57.3	32.7	100

[1] According to U. S. Bureau of the Census.

Few marked differences appear in the average or predominating rated capacity of trucks in the several sections of the country as above grouped. The factors determining the choice of truck are so many that they tend to cancel out in a large sample. There is some evidence, however, that the larger vehicles are more usual in those sections where the principal cities and towns have been linked with paved highways. This is brought out by regrouping the States according to the progress they have made in paving their State highway systems, as shown in Table 5.

TABLE 5.—RATED CAPACITY OF TRUCKS, ACCORDING TO PROGRESS OF STATE HIGHWAY SYSTEMS

Road mileage improved with high-type surfaces	States	Number of trucks	Average rated capacity
			Tons
50 to 100 per cent	7	739	3.23
25 to 49 per cent	13	1,110	3.10
20 to 24 per cent	5	415	2.55
Up to 19 per cent	23	531	2.21
Total	48	2,795	2.88

Six of the seven States from which no reports were secured fall in the last group above, having a relatively small amount of paved highway, which, in itself, may be regarded as significant.

The gross weight allowable under the law also appears to have an effect on the sizes of trucks used, although the limits have so many qualifications and exceptions (for example, giving higher limits to 6-wheeled vehicles or providing for special limits on certain highways) that statistical evidence is not easily presented.

That license or registration fees assessed against trucks influence the choice of capacity seems to be demonstrated by the fact that in the 30 States in which the license fees (for either common or contract carriers) are based on rated or actual capacity, the average capacity reported is 2.3 tons, where for all other States the average is 3.1 tons.

The 2½-ton truck is the most favored size for intercity commercial hauling, according to the reports in this survey. In a total of 2,826 trucks for which capacity information was supplied, 510 were in this

class, slightly over 18 per cent. Actually, these 2½-ton trucks handle large overloads, as shown elsewhere in this report.

Figure 3 pictures a typical 2½-ton truck.

TRUCK WEIGHTS AND LOADS

One of the more important aims of the survey was to to secure data relative to weights of trucks and loads carried. So far as it was obtainable, information was recorded covering the tare weights of the trucks used, the "usual loads" carried, and the gross weights of the loaded trucks. The "usual load" was taken to mean not an average load, but that load which the operator regarded as a normal or capacity load for a given vehicle, assuming sufficient freight was available. The usual load was not the maximum load, since many operators stated that they hauled loads considerably in excess of normal capacity under emergency conditions. Nor was usual load equivalent to rated capacity, as it is commonly agreed that practical

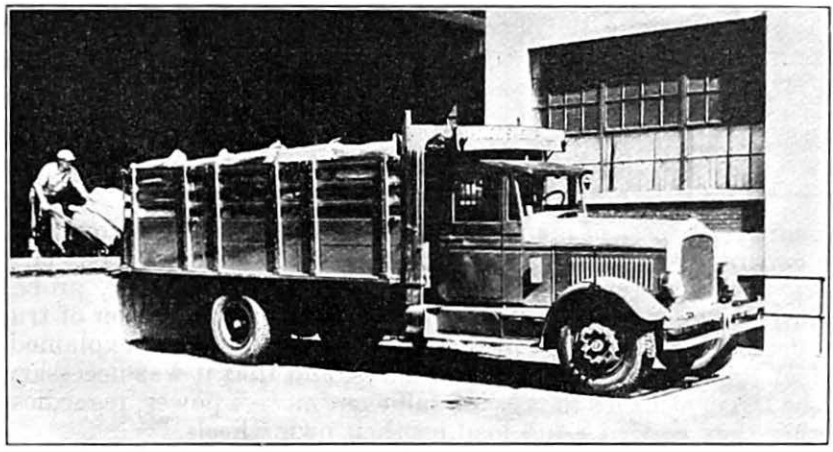

Figure 3.—Typical 2½-ton freight truck

working capacity is in excess of listed rating. Gross weight was computed as the sum of tare weight and usual load as defined above.

Table 6 shows the average tare weight, usual load, and gross weight for trucks in the light, medium, and heavy capacity groups.

TABLE 6.—TARE WEIGHT, USUAL LOAD, AND GROSS WEIGHT OF TRUCKS, BY RATED CAPACITY GROUPS

Rated capacity	Tare weight		Usual load		Gross weight	
	Number of trucks	Average	Number of trucks	Average	Number of trucks	Average
		Pounds		*Pounds*		*Pounds*
½ to 1¼ tons (light)	143	4,043	121	3,129	99	7,220
1½ to 3 tons (medium)	997	7,979	1,037	8,132	869	16,021
3½ tons and over (heavy)	585	13,366	592	13,690	566	27,363
Total [1]	1,760	9,408	1,784	9,585	1,568	19,457

[1] Includes trucks for which rated capacity was not reported.

It is of interest to compare the average usual load of 9,585 pounds with an actual average load of 7,820 pounds as computed from reports of 27 common-carrier freight lines to the State of Washington in 1930.[1] This latter figure is derived by dividing freight ton-mileage by truck mileage, and so takes into account both loaded and empty mileage run. It also includes freight hauled by trailer, however, which to an unknown extent increases the load hauled by, as distinct from the load carried upon, the average truck.

The range and distribution of gross weights of trucks is shown in Table 7. The evident tendency toward concentration between 15,000 and 25,000 pounds does not necessarily indicate that trucks within this range are the most efficient for the work they are doing, since that tendency is probably controlled to a considerable degree by the prevailing legal load limits for 4-wheeled trucks.

TABLE 7.—GROSS WEIGHT OF TRUCKS

Gross weight	Trucks	Gross weight	Trucks
Under 5,000 pounds	32	30,000 to 34,999 pounds	151
5,000 to 9,999 pounds	190	35,000 to 39,999 pounds	9
10,000 to 14,999 pounds	281	40,000 pounds and over	14
15,000 to 19,999 pounds	338		
20,000 to 24,999 pounds	323	Total	1,568
25,000 to 29,999 pounds	230		

Loading in excess of manufacturer's rated capacity was found to be very general, especially on the medium capacity trucks. The largest trucks were apparently loaded somewhat below capacity, probably due in part to legal limitations on gross weight. Operation of trucks with greater capacity than utilized was in some instances explained by the fact that these trucks pulled trailers, and that it was necessary to use the larger vehicles to provide sufficient motive power, regardless of whether they carried a full load on their own wheels.

Table 8 shows the average proportion of loading beyond rated capacity for some of the more common sizes of trucks.

TABLE 8.—USUAL LOADS OF TRUCKS IN EXCESS OF RATED CAPACITY

Manufacturer's rated capacity	Number of trucks reported	Average excess load	Manufacturer's rated capacity	Number of trucks reported	Average excess load
		Per cent			*Per cent*
1 ton	92	62.2	3½ tons	226	70.4
1½ tons	241	71.8	4 tons	25	68.2
2 tons	277	87.7	5 tons	228	42.9
2½ tons	328	93.9	5½ tons and over	111	[1]— 7.6
3 tons	187	68.8			

[1] Average load 7.6 per cent below rated capacity, rather than any excess.

It will be noted that the largest trucks, grouped as 5½ tons and over, show an average load 7.6 per cent below their rated capacities.

Usual loads were reported, in very rare instances, as high as three times the manufacturers' ratings. Normally, however, the excess was less than 125 per cent. Approximately one-fourth of all trucks

[1] 1930 Statistics of Auto Transportation Companies, State of Washington, department of public works.

and more than one-third of the medium capacity trucks were reported as carrying 100 to 125 per cent above capacity—roughly, double their rated capacity. Nearly two-thirds of the heavy trucks carried

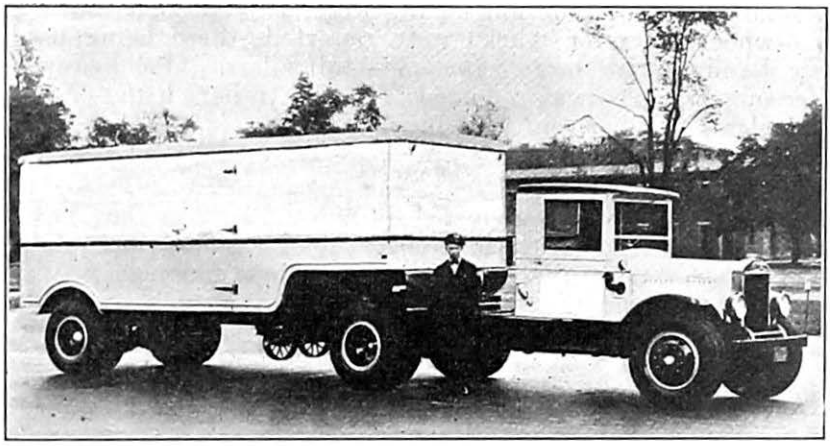

Figure 4.—Typical 4-wheeled tractor and semitrailer unit

less than 50 per cent above capacity. The percentage of trucks in each range of overloading is indicated in Table 9.

TABLE 9.—TRUCK LOADING IN EXCESS OF MANUFACTURERS' RATED CAPACITIES

Rated capacity	Number of trucks	Per cent of trucks						
		Less than 25 per cent overload [1]	25 to 49 per cent overload	50 to 74 per cent overload	75 to 99 per cent overload	100 to 124 per cent overload	Over 124 per cent overload	Total
Under 1½ tons	121	29.7	9.9	21.5	2.5	24.0	12.4	100.0
1½ to 3 tons	1,037	14.1	8.2	20.7	9.2	36.8	11.0	100.0
3½ tons and over	592	26.9	38.7	16.9	8.1	3.5	5.9	100.0
All trucks	1,750	19.5	18.6	19.5	8.3	24.7	9.4	100.0

[1] Includes loads below capacity.

It should be clearly understood that these excess loads are not necessarily or as a rule illegal overloads. Light or medium capacity trucks with adequate tire equipment can carry far above their rated capacity without exceeding the legal limit for either gross weight, axle weight, or load per inch of tire width. The damage, if any, from overloading under such conditions is limited to the vehicle itself.

SIX-WHEELED EQUIPMENT

The liberalizing of gross-weight restrictions in favor of 6-wheeled vehicles (that is, those having three axles) has been a recent development in a number of States. It is the wheel load rather than the gross load which determines stress in the pavement. Larger loads are possible, therefore, with the 6-wheeled trucks and are legalized in an increasing group of the States. Furthermore, for light trucks well within existing gross-weight limitations a third axle may greatly

increase the safe and economical carrying capacity. That this is generally recognized by truck operators is indicated by the fact that 8.7 per cent of the trucks were on six wheels. The number of 6-wheeled tractor trucks was negligible, inasmuch as a tractor truck and semitrailer combination is, in effect, a 6-wheeled unit. Only two 6-wheeled tractor trucks were reported, these being used for heavy hauling with large capacity semitrailers. One heavy semitrailer on two axles was reported. Of the trailers listed (excluding semitrailers) 14.3 per cent were on six wheels.

TRAILERS

Trailer equipment was reported by many operators, and in a variety of types and capacities. The first broad classification to be made is that between the trailer which carries its load independently, upon its own wheels, and the semitrailer, of which the forward end rests upon a tractor truck (sometimes briefly referred to as a tractor, but not to be confused with the industrial or agricultural tractor). Part of the load of the semtrailer is, therefore, carried by the tractor truck.

Figure 5.—Platform truck with auxiliary axle

The first class of trailer referred to may be likened to an ordinary wagon with a single tongue or drawbar. The semitrailer, when uncoupled from its tractor truck, must have some temporary supporting legs under its forward end.

There is apparently no single word or phrase in accepted usage to describe trailers exclusive of semitrailers. It might be desirable to refer to them as 4-wheeled trailers, except that some of them are on six wheels, and some semitrailers have two axles. Figure 2, page 4, shows a 6-wheeled tractor truck, a 4-wheeled semitrailer, and a 6-wheeled full trailer. The term "full trailer" will here be used when semitrailers are not referred to.

The full trailer is used especially by the regular freight lines. It permits economical handling of varying volumes of freight, because the cost of stand-by equipment is relatively low as compared with equivalent freight capacity in trucks. Almost any truck has sufficient reserve power to draw one or more trailers where grades are not excessive, and many operators use truck and trailer combinations regularly. The mechanical expense of operating the truck which draws the trailer is apparently not increased anywhere near in pro-

portion to the increased load handled, though available cost data are insufficient to show this in detail. The driver cost is only slightly greater, if at all, and the capital cost of a trailer is small as compared with that of a truck. The trailer is simply hitched behind the truck, and may quickly be detached when not needed, or while it is being loaded or unloaded.

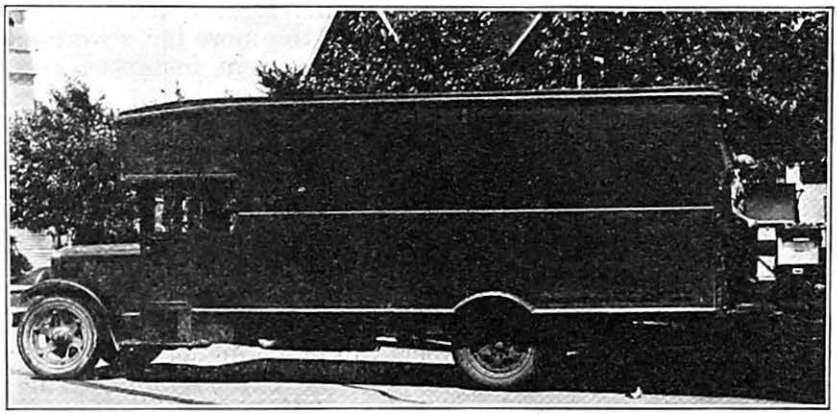

Figure 6.—Furniture-moving van

As stated above, the full trailer, like the motor truck, is sometimes built with six wheels to increase carrying capacity. Dual pneumatic tire equipment is possible on even the front axle of a trailer, since it is steered through the drawbar.

The use of a special type of 2-wheeled trailer seems to be confined almost wholly to the Pacific Northwest States. This differs from the

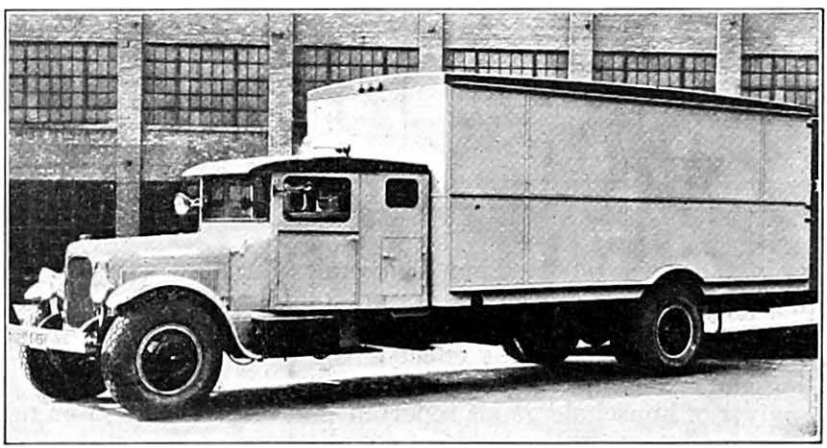

Figure 7.—Closed freight body for long-distance hauling

semitrailer in that it is coupled to a regular freight-body truck instead of to a tractor. The load is carried almost entirely on the single axle, as in the case of the familiar "camp trailer" used with passenger cars. Coupling is made through the same pintle hook or other hitch as is used for full trailers. These 2-wheeled trailers are of relatively low capacity, and it is believed that they are already obsolescent.

The semitrailer is valuable where it can be "spotted" for loading and unloading, while the much more expensive power unit is efficiently used elsewhere. A single tractor truck may provide motive power for an entire group of semitrailers, keeping constantly at work and moving each in turn. An idle power plant is far more expensive than a standing semitrailer.

A second use for the semitrailer is to increase the hauling capacity of a single power unit. This is probably the more important reason for its adoption by intercity haulers. Frequent instances were recorded where the fleet included only one semitrailer to each tractor truck, the two vehicles rarely being uncoupled. The combination becomes, in effect, an articulated 6-wheeled truck, and beside the possible large increase in size of body the carrying capacity of the power unit is practically doubled.

A few cases were reported where semitrailers were equipped with 2-wheeled dollies in front, the result being a unit essentially equivalent to a full trailer.

Because of the absence of power plant, and resultant low chassis weight, the capacity loads of trailers run much higher than for trucks operating under the same legal gross weight restrictions. This will be seen in Table 10, showing rated capacities of trailers and semitrailers reported.

TABLE 10.—TRAILERS AND SEMITRAILERS BY RATED CAPACITIES

Rated capacity	Semitrailers[1]	Trailers			
		2 wheels	4 wheels	6 wheels	Total trailers[2]
½ to 1 ton	3	5	4	----	9
1½ to 3 tons	83	6	143	----	180
3½ to 5 tons	98	3	160	----	167
6 to 10 tons	281	----	66	44	154
Over 10 tons	39	----	----	11	11
Not reported	44	4	46	18	82
Total	548	18	419	73	603

[1] Includes one 8½-ton semitrailer on two axles.
[2] Includes trailers with number of wheels not reported.

One instance was reported in which semitrailer units were exchanged between two freight-line operators on joint hauls. The fifth-wheel coupling mechanism on the respective tractor trucks was identical, and considerable saving was effected through the avoidance of unloading and reloading.

A mover of household goods reported that on shipments to a neighboring city, he was in the habit of coupling one of his full trailers to a freight truck of another concern which was scheduled to make the trip nightly. His power equipment was thus saved for local transfer work.

These two illustrations suggest the possible desirability of standardized equipment, at least with regard to coupling mechanism, to permit a freer exchange of equipment in a manner similar to that of the railroads.

Data covering weights and loads of trailers and semitrailers are shown in Tables 11 and 12. It should be understood that weights

and loads shown for semitrailers are not the weights carried on the single-trailer axle, but include that part of the load supported by the tractor truck.

TABLE 11.—TARE WEIGHT, USUAL LOAD, AND GROSS WEIGHT OF TRAILERS, BY RATED CAPACITY

Rated capacity	Tare weight		Usual load		Gross weight	
	Number of units	Average	Number of units	Average	Number of units	Average
		Pounds		*Pounds*		*Pounds*
Under 1½ tons	6	4,217	6	5,333	6	9,550
1½ to 3 tons	70	4,758	77	7,817	52	13,235
3½ to 5 tons	116	7,261	83	15,648	74	23,356
6 to 10 tons	130	9,133	92	16,433	90	25,402
Over 10 tons	11	12,691	10	20,450	10	33,450

TABLE 12.—TARE WEIGHT, USUAL LOAD, AND GROSS WEIGHT OF SEMITRAILERS, BY RATED CAPACITY

Rated capacity	Tare weight		Usual load		Gross weight	
	Number of units	Average	Number of units	Average	Number of units	Average
		Pounds		*Pounds*		*Pounds*
Under 1½ tons	1	2,300	1	4,000	1	6,300
1½ to 3 tons	35	4,364	42	11,262	24	17,565
3½ to 5 tons	39	5,434	73	14,838	34	24,094
6 to 10 tons	93	7,668	117	18,067	61	26,413
Over 10 tons	32	9,947	12	22,495	8	29,225

TIRE EQUIPMENT

Pneumatic tires are rapidly displacing solid tires on motor trucks. The National Automobile Chamber of Commerce reports that only 3.6 per cent of the total output of motor trucks in 1930 were equipped with solid tires.[2] However, there are still many older trucks on the roads that have not been converted to pneumatic equipment. Analysis revealed that 24 per cent of the trucks and tractor trucks and 32 per cent of the trailers reported were on solid (or "cushion") tires on one or more axles. This is shown in Table 13, together with the use of dual pneumatic tires.

TABLE 13.—TIRE EQUIPMENT OF COMMERCIAL TRUCKS, TRACTOR TRUCKS, AND TRAILERS

Tire equipment	Trucks and tractor trucks		Trailers	
	Number	Per cent	Number	Per cent
Pneumatic tires:				
Single	522	19.1	120	13.9
Dual	1,556	57.0	465	54.0
Total	2,078	76.1	585	67.9
Solid tires	652	23.9	276	32.1
Total	2,730	100.0	861	100.0

[2] Facts and Figures of the Automobile Industry, 1931 edition, National Automobile Chamber of Commerce, p. 38.

This proportion of solid-tired vehicles was unexpectedly high, but an examination of the original data reveals that of the 652 solid-tired trucks and tractor trucks, 167 were operated by a single firm, principally in a metropolitan area. If this firm is excluded from the tabulation, the percentage of solid tires drops to 19. It is likely, too, that some of the solid-tired equipment was so obsolescent as to be used relatively infrequently as compared with the more modern vehicles.

Of the trucks and tractor trucks dating from 1925 or older 53.2 per cent were on solid tires, whereas the 1926 and later models were only 9.0 per cent on solids, and of the 1929 and later models only 2.5 per cent were on solids. This would indicate that the intercity commercial truckers are now buying proportionately fewer solid-tired vehicles than other truck users; which seems reasonable in view of the need for greater speed in the long-haul work.

The prevalence of solid-tire usage was also checked against statewide figures for Maryland, confirming the belief that the proportion

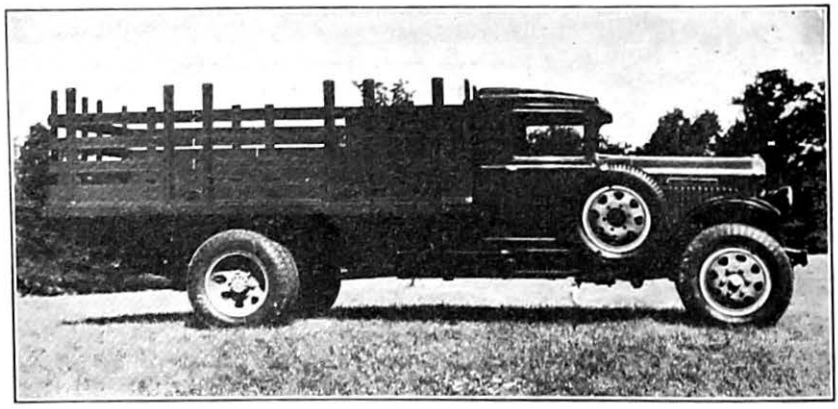

Figure 8.—Stake body for general hauling

shown in the survey was unduly high. Data supplied from the office of the commissioner of motor vehicles in that State show among the common carriers a proportion of 8.6 per cent of solid-tired trucks in 1931. The decline in solid tires for all trucks in Maryland during several recent years is shown in Table 14, and it is probable that the use of solid tires by common carriers and contract haulers has been decreasing at least in the same proportion.

TABLE 14.—SOLID TIRES ON MOTOR TRUCKS REGISTERED IN MARYLAND, 1929 TO 1931

Year	Total truck registration	Solid-tired vehicles [1]	
		Number	Per cent
1929	38,839	8,703	22.4
1930	37,832	6,554	17.3
1931	36,080	4,534	12.6

[1] Includes a negligible number of vehicles other than trucks.

Dual pneumatic tire equipment was found on a large proportion of the trucks, tractor trucks, and trailers, especially in the larger sizes. In all but four States, tire width is a governing factor in limiting loads. Dual pneumatic tire equipment, as shown in Table 13, includes all vehicles having two or more wheels equipped with dual pneumatic tires. Trucks whose capacity has been increased by a supplementary third axle are often fitted with dual tires on the driving axle only. Trailers are frequently equipped with dual tires on the front wheels.

Figure 10 shows graphically the tire equipment of trucks and tractor trucks according to capacity. It is apparent that the use of solid tires is principally confined to the heavier vehicles, and that single pneumatic tire equipment is rare on the larger units.

OPERATIONS

LENGTH OF HAUL

The distances over which trucks are being operated, as reported in this investigation, gave no clear evidence as to the profitable radius of

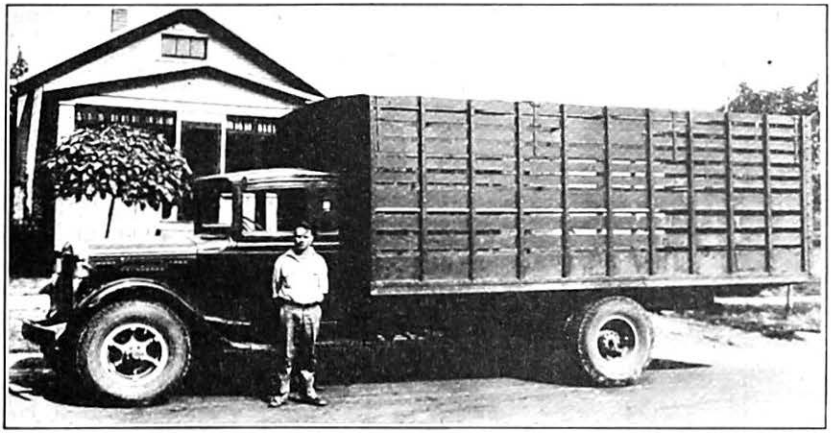

Figure 9.—Rack body for transporting livestock

motor hauling. General statements are apt to be misleading, since there are many factors involved in determining the economic length of haul in any given case. The rates which the traffic will bear, the type of haul (that is, whether between points on fixed routes as in the usual common-carrier operation or to points not on fixed routes), the commodity hauled, the availability and cost of other means of transportation, whether return loads can be obtained, topography and road conditions, all share in setting the limit to motor-truck haul.

Regularly scheduled runs were reported in excess of 500 miles between terminals. Occasional hauls, not on regular schedules, were reported up to 2,500 miles. Indirect information from other sources indicates that a very considerable amount of long-distance hauling is being done. Tires, for example, are being shipped by truck from Ohio factories as far as Omaha, St. Paul, and New York. Fully assembled automobiles are transported on special semitrailers for distances as great as 1,000 miles from the factory. Fish have been trucked from Seattle to San Francisco. Fruits and vegetables move from the Eastern Shore of Maryland to New England. Livestock is hauled 100 miles or more to stockyards in the Middle West. Some of

these long hauls have proved unprofitable, others apparently are continuing successfully, but it is clear that no definite limit can be set for motor hauling.

A clear distinction should be made between the expressions "length of haul" and "length of route." Where a trucking concern operates

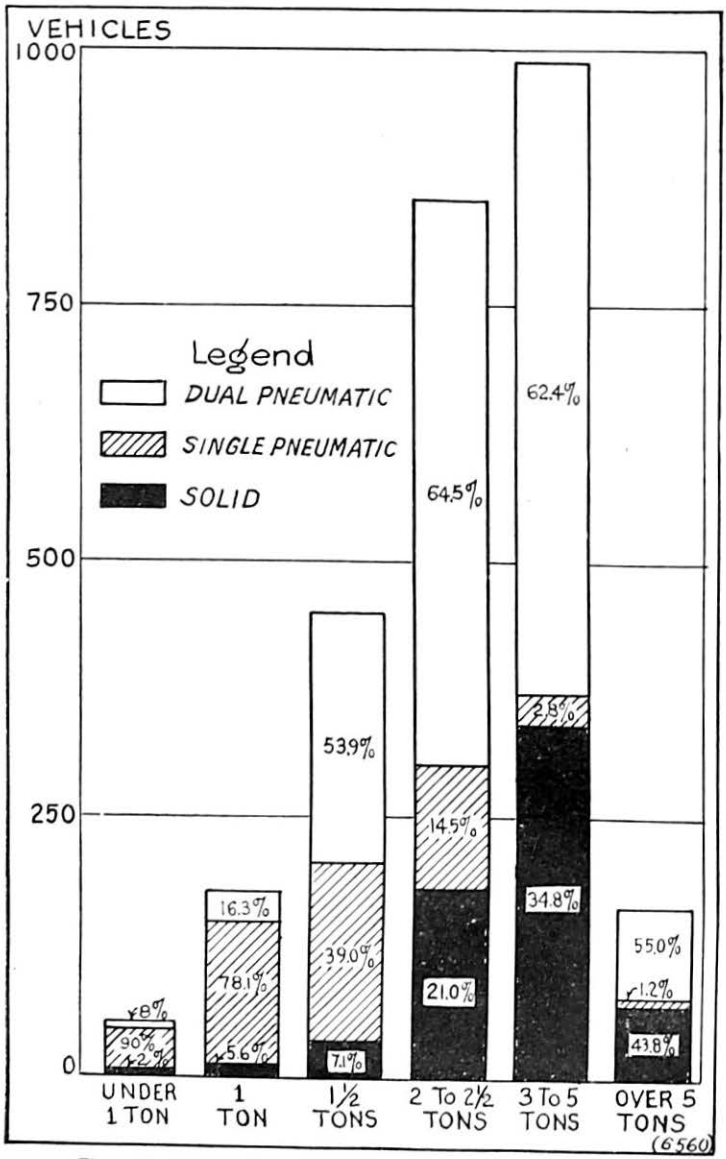

Figure 10.—Tire equipment of trucks and tractor trucks, by capacity

between two large centers of population, the bulk of its freight will move the whole distance, especially if the trucks make an overnight run while business houses are closed. Commodities, however, are not always carried from one terminal of a route to another, but are frequently picked up or delivered en route.

The average haul of certificated motor-freight operators in the State of Washington can be approximated from reports of tonnage and ton-

mileage data made to the department of public works. In 1930 this figure for 11 of the 25 common carriers interviewed in that State [3] was 55 miles, as compared with 71 miles for the average route of these same operators. This comparison is only a rough one, since it does not take into consideration the probable greater number of trucks or more frequent service on the shorter routes, the average route shown being a simple unweighted average of the routes covered by each operator.

FACTORS AFFECTING RATES

In the final analysis, it is the rate that an operator can obtain for hauling that determines the distance to which he will go. Rates, however, depend on many circumstances. For superior service by truck a shipper will pay only as much in excess of competing transportation rates as any added advantages of truck transportation may be worth. Between points served by rail or water transportation the profitable haul by truck ends where the railroad or navigation company can offer a lower rate after due allowance is made for cartage costs at shipping point and at destination and for other possible advantages of truck service such as less rigid packing requirements.

No study of rates and rate making for truck hauling was attempted during this survey. In general, it may be said that truck rates are frequently based on rail tariffs where a competitive condition exists, the truck rates being either slightly higher, to cover pick-up and delivery costs, or approximately the same. However, there are many exceptions to this generalization, as, for example, where the rates are further reduced through competition between rival truck lines or where special commodity rates are made.

TYPE OF HAUL

The effect of the type of haul on the distance commodities are to be carried is easily evident. By legal restrictions or by choice, the common carrier will usually limit his haul and adhere to a definite schedule. He will haul practically any freight offered, but only between points on his regular routes. In certain States he is restricted to fixed routes by regulation and is not permitted to haul beyond the limits imposed by his franchise or certificate. On the other hand, the contract carrier will haul "anywhere for hire," though he may undertake to handle only certain classes of commodities. Regulation does not restrict the distance nor confine his operations to fixed routes. The contract-carrier reports show exceptionally long hauls. One of the questions asked of the anywhere-for-hire operators was: "What was your longest single trip during the past year?" This brought records of trips 1,200, 2,000, and even 2,500 miles, practically all of these extremely long trips being with loads of household goods.

FIXED ROUTES

The number of operators who reported regular hauling over fixed routes was 182, or 84 per cent of the number interviewed during the survey. These were located in 39 States and the District of Columbia, including all the States except Iowa and South Carolina, where only operators between points not on fixed routes were reported, and

[3] The remaining 14 carriers did not report ton-mileage.

the seven States[4] from which no reports were received. Table 15 shows data for length of fixed routes, by geographical areas.

Figure 11 shows the percentage of fixed routes of various lengths. Although routes over 250 miles in length and extending as far as 530 miles were reported, their number was so small that they have been shown only as routes longer than 250 miles. It will be noted that

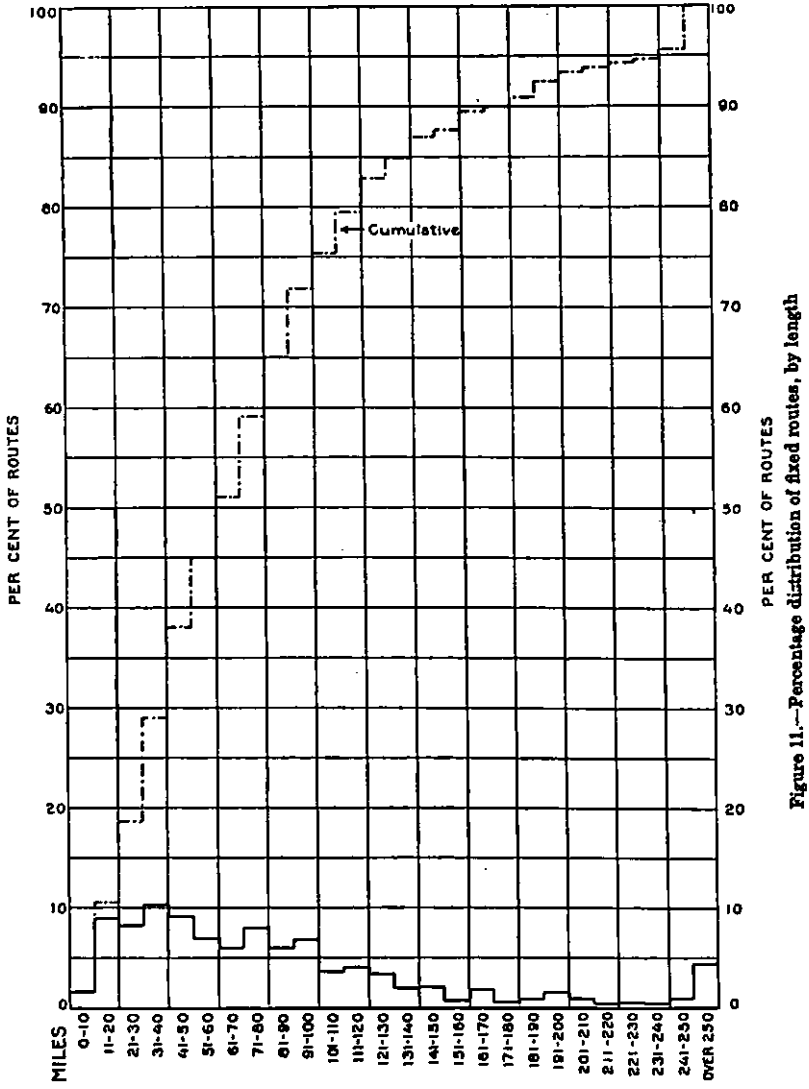

Figure 11.—Percentage distribution of fixed routes, by length

about 95 per cent of the routes reported were less than 250 miles long, 92 per cent were less than 200 miles, 80 per cent were less than 120 miles, and 75 per cent less than 110 miles in length. Over half the routes were shorter than 70 miles. The largest group, those ranging from 31 to 40 miles in length, contained 10.5 per cent of the whole.

[4] Delaware, Maine, Mississippi, Nevada, New Hampshire, Vermont, Wyoming.

TABLE 15.—LENGTH OF FIXED ROUTES REPORTED BY MOTOR-TRUCK OPERATORS

Geographic divisions and States	Number of companies reporting	Number of routes reported	Total route mileage	Average length of route	Median length of route	Longest route reported	Shortest route reported
Grand total, United States	182	562	49,160	88	70	530	5
New England	12	57	3,866	68	50	240	10
Massachusetts	8	41	2,650	65	50	210	10
Rhode Island	1	6	549	92	68	240	30
Connecticut	3	10	667	67	32	165	20
Middle Atlantic	11	30	2,354	78	73	192	20
New York	3	6	270	45	31	70	20
New Jersey	3	8	572	72	64	170	30
Pennsylvania	5	16	1,512	95	92	192	30
East North Central	29	102	7,595	75	60	500	11
Ohio	4	19	1,200	63	60	150	15
Indiana	9	12	1,026	86	55	311	20
Illinois	3	19	761	40	40	75	11
Michigan	4	18	2,586	144	113	500	15
Wisconsin	9	34	2,022	59	58	151	11
West North Central	23	91	7,953	87	80	256	5
Minnesota	8	37	2,784	75	59	250	5
Missouri	3	10	1,132	113	69	256	30
North Dakota	4	7	745	106	92	247	46
South Dakota	1	16	1,266	79	81	134	34
Nebraska	4	11	849	77	65	150	34
Kansas	3	10	1,177	118	94	250	45
South Atlantic	21	80	4,926	62	50	150	5
Maryland	6	36	1,262	35	27	120	5
District of Columbia	1	3	276	92	106	120	50
Virginia	3	10	689	69	65	150	18
West Virginia	2	7	477	68	50	134	40
North Carolina	1	6	434	72	74	120	23
Georgia	1	4	313	78	83	114	34
Florida	7	14	1,475	105	102	198	40
East South Central	8	27	3,058	113	90	350	33
Kentucky	2	9	808	90	90	200	33
Tennessee	5	15	1,997	133	111	350	40
Alabama	1	3	253	84	88	105	60
West South Central	13	45	6,178	137	112	317	34
Arkansas	1	5	334	67	55	117	42
Louisiana	4	17	1,752	103	106	165	54
Oklahoma	2	6	1,095	183	205	265	70
Texas	6	17	2,997	176	175	317	34
Mountain	16	36	3,902	108	70	530	11
Montana	4	5	247	49	50	75	27
Idaho	2	4	269	67	59	69	34
Colorado	4	13	887	68	65	120	11
New Mexico	1	2	230	115	115	165	65
Arizona	3	10	1,976	198	135	530	24
Utah	2	2	293	147	110	256	37
Pacific	49	94	9,328	99	70	412	6
Washington	26	44	4,167	95	65	377	6
Oregon	6	10	1,719	172	140	375	77
California	17	40	3,442	86	60	412	14

NOTE.—No reports received from Delaware, Maine, Mississippi, Nevada, New Hampshire, Vermont, and Wyoming; no fixed routes reported in Iowa and South Carolina.

The total number of routes reported was 562, with an aggregate length of 49,160 miles. The average length of route was 88 miles, ranging from an average of 35 miles in Maryland for six companies operating 36 routes to an average of 198 miles in Arizona for three companies with 10 routes. An ordinary arithmetical average may be greatly and disproportionately affected by a few long routes, especially where the number of operations is relatively small. A truer picture of the typical truck route probably results from the median figure. When the routes are listed in order of length, the median is the middle item in the series. In other words, the median route is exceeded in length by just as many routes as are inferior to it in length. The median length of route for Maryland is 27 miles, as compared with the arithmetical average of 35 miles quoted above, while that for Arizona is 135 miles as compared with 198 miles. In the latter instance the effect of two routes approximating 500 miles each is pronounced. In

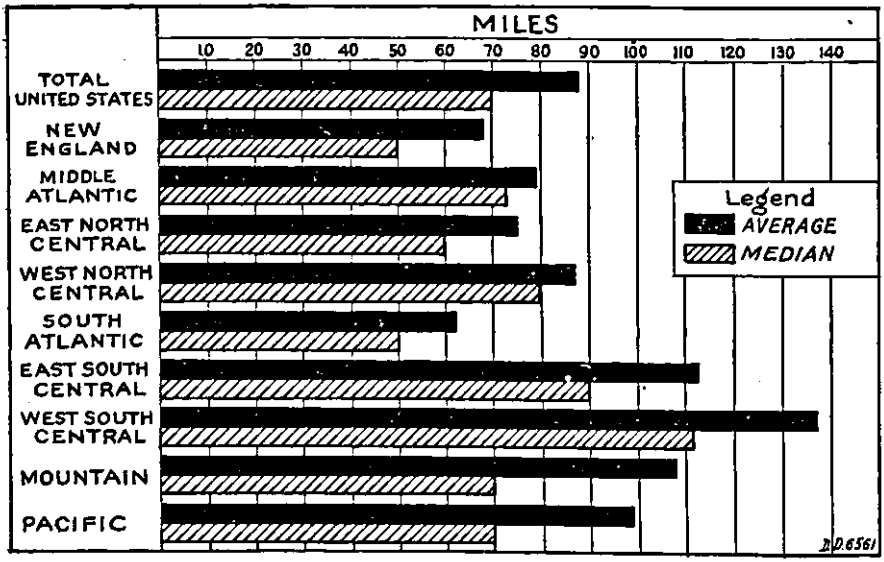

Figure 12.—Average and median length of fixed routes, by geographic divisions

certain other States, as will be seen from the table, medians and averages are nearly identical.

The median length of route is, therefore, shown in Table 15 as well as the arithmetical average, and is to be preferred to the ordinary average.

Figure 12 shows the average length of fixed routes reported in different sections of the country. It will be noted that the average for the West North Central section is practically the same as for the United States as a whole, while those of the East South Central, West South Central, Mountain, and Pacific States exceed the average for the country.

The map shown as Figure 1 on page 3 outlines the extent of the territory reached by the fixed routes reported. No attempt was made to separate the routes, and thus one line on the map may indicate several routes following the same course, and may also be made up of several routes end to end. It is perhaps not necessary to point out that the map is not intended to show all the common-

carrier motor-freight routes now in existence. Doubtless a complete map of such routes would show, except in certain sections, that practically all the cities of importance in the United States are connected by the network of truck lines now in operation.

Of the total of 562 fixed routes reported, 154 were interstate.

The small number of reports from some of the States prevents the drawing of too definite conclusions, but certain general tendencies may be pointed out. For 101 operators in States west of the Mississippi River the median length of 266 routes, covering 27,361 miles, is 80 miles, while for 81 firms east of the Mississippi, with 296 routes totaling 21,799 miles, the median is 60 miles. In 10 States in the southwestern part of the country 40 concerns, operating over a total of 13,006 miles on 112 routes, have a median route length of 95 miles.

IRREGULAR HAULS

Hauling to points not on fixed routes, commonly referred to as "anywhere for hire," was carried on not only by operators who had no fixed routes but also by many carriers in addition to their scheduled trips. Specific data regarding length of haul were naturally difficult to secure for these irregular movements. The operator himself frequently has no detailed record of where his truck or trucks have been working, except perhaps on the exceptionally long trips. Each of the "anywhere for hire" operators was asked his normal or usual hauling radius. For 70 operators, reporting irregular hauls other than "local," the average normal radius was approximately 119 miles, with a median of 100. The latter figure (100 miles) was also the most commonly reported, being named by 17 out of the 70 irregular operators. It is clearly apparent that estimates were made in well-rounded figures. Three operators reported 500 miles; 19, on the other hand, reported 50 miles or less, some of these hardly exceeding local limits. In addition to the 70 irregular haulers mentioned, there were five who reported only a normal "local" range for their work, this usually being a city transfer business. Eleven operators who occasionally made long irregular hauls furnished no information as to the normal range.

COMMODITIES

The distance a commodity can profitably be hauled by truck is, in actual practice, limited by the nature of that commodity. Such freight as wheat, coal, and building and road materials, whose weight or bulk are relatively high compared to their value, require special loading equipment and carriers of large capacity, such as freight cars or barges, if they are to be hauled long distances at economically sound rates. Other products, like household goods, poultry and livestock, perishables which suffer from excessive handling, silk, and similar commodities of relatively low weight or bulk and high value, can be hauled comparatively long distances at higher cost. Over the longer hauls trucks tend to specialize in the less-than-carload business, often equivalent to express service, although this is by no means universally true, as evidenced by bulk hauling of gasoline in tanks from Los Angeles 400 or 500 miles over the mountains to Arizona points.

By far the greater number of operators reported only "miscellaneous" or "general freight" hauling. Some of these also named the particular commodities which made up an important proportion of

their business. Other firms specialized in particular commodities, like milk, automobile parts, household goods, oil and gasoline, etc. These special commodities were not listed often enough to permit of significant statistical tabulation, however, and no attempt is here made to compare the length of haul of different classes of freight.

TRANSPORTATION COSTS

A major object of this survey was the compilation of data relative to the cost of operating motor trucks, either as common carrier or contract carrier vehicles, in interurban freight service. While it was recognized that the wide variety of conditions under which motor-freight services are performed, as well as the numerous factors affecting individual operations, would modify any generalization on the subject of operating costs, it was felt that a presentation of actual cost figures contributed by motor-trucking concerns, noting the accounting practices in use, would be of value to the industry. An endeavor was made to obtain truck operating cost figures for the calendar year 1930, and this was successful in so far as fleet operating costs were concerned. Data on the cost of operating individual vehicles for a yearly period were scarce, and the figures in the unit cost table cover varying shorter periods of time.

Figures on operating costs, vehicle mileage, tonnage hauled, and other pertinent data were obtained directly from the books and records of the concerns interviewed. In some instances, these data were supplemented by extracts from the companies' reports to the State regulatory commissions. Cost information was generally scarce, but much more material was available in those States requiring periodic reports from motor-freight carriers. The necessity of filing a statement of operations with the regulatory body not only compels the truck operator to keep reasonably accurate records of his business, but effects in many respects a more uniform method of accounting in that particular State.

The actual cost of commercial transportation over the highways is difficult to obtain and only comparatively meager knowledge is available from present records. This is perhaps the principal conclusion to be drawn from the cost study here reported, although such figures as were obtained are, it is believed, significant and valuable. Some cost data were received from every concern reported upon, but much of the material collected was not susceptible of the detailed analysis necessary for a study of transportation costs.

The inadequacy of existing information on motor-trucking costs, on the volume of business, as measured by, tonnage transported, and the distance it is moved, is due to a number of circumstances. The most important of these are the large proportion of small-scale operations, the lack or insufficiency of accounting methods and records, and the failure of many operators to accord proper recognition to the importance of an accurate knowledge of costs.

VARIATIONS BY SIZE OF ORGANIZATION

Small-scale organizations.—Thousands of small motor lines form a predominant part of the motor-freight hauling business. The very nature of these small organizations, individualistic in character and operating with a minimum of capital and personnel, makes difficult

the compiling of detailed figures and statistics. The owner-operators of these small firms exercise immediate personal supervision over their business and decide, justifiably or not, that a system of simple accounts is sufficient for their requirements. Even if the need were felt for more records and greater detail, the necessity of keeping overhead expenses to a minimum would be a factor of paramount importance.

The administrative personnel of these small concerns generally consists of the owner, sometimes assisted by an additional office employee. With the innumerable duties incident to the supervision and management of a motor-freight line performed by one or two employees, the importance of comprehensive cost records is likely to be minimized in comparison with other features of the business.

Despite these disadvantages, if the lack of facilities for elaborate record keeping may be termed such, a few of the small trucking companies had excellent figures on their operations. In general, though, these small concerns, constituting a numerical majority of the industry, lacked detailed data, with the result that the burden of furnishing the more comprehensive information fell to the larger truck lines, who were the important contributors of a majority of the material herein.

Large-scale organizations.—The larger trucking companies, especially those doing a common-carrier business, require more elaborate organization. Many of them are splendid examples of efficiently conducted enterprises, utilizing the most modern of business methods. The activities of these large concerns are sometimes divided into separate departments, such as traffic, auditing, and maintenance, each under experienced supervision. In such organizations adequate accounting records are highly essential to the administrative officials.

Medium-size organizations.—In between these two extremes of large and small scale motor-freight operations comes the medium or average-size trucking organization. It operates from 6 or 10 to 20 or 30 trucks. While the varied accounting practices and the adequacy of cost data may not be defined and measured according to the extent of the operations, it may be said that generally this class of operator maintains an ordinary accounting system. Segregation of expense items in more or less detail is made, and comparative figures for revenue and expenditures can be determined. These, however, are not sufficient for a scientific analysis of costs.

VARIATIONS IN ACCOUNTING METHODS

Other factors responsible for the deficiency in cost information are the incompleteness and lack of detail in existing cost systems. It was not unusual to find a combination of one or more standard items of operating or administrative expenses, such as gasoline, oil, and tires; maintenance and repair and tires; drivers' and other wages; taxes and insurance, etc. It is to be presumed that when the account has such a limited segregation of expenses, the owner is not interested in the various itemized costs, but is concerned only with the total expense of his operation and the determination of net revenue. It was practically impossible for the investigator to distribute these combined expenses into their component items, and in the unit-cost table (Table 16) where a per mile cost for individual items of expense is computed, it was necessary to omit these multiple costs.

Some concerns, particularly the smaller ones, fail to include in their accounts items of legitimate expense, with the result that a false or excessive profit may be shown on the operation. This neglect is generally confined to the omission of overhead or administrative costs. The shortcomings appearing most frequently were failure to charge to the business a salary for its owner; not including compensation paid to member of family employed in the business; no allowance for rent, light, telephone, etc., when home and garage are used for office and storage purposes; no charge for maintenance and repair labor performed by owner; and the overlooking of miscellaneous petty-cash expenditures.

Contrary to an impression that has gained wide credence in some quarters, depreciation expense was not a neglected item of trucking cost. Very few of the concerns that furnished unit or fleet costs stated that no depreciation allowance was charged on their books

MILEAGE AND TONNAGE RECORDS

Bases for cost comparisons.—The value of cost data available was sometimes nullified by the absence of an accurate measure as a basis for studying and comparing costs. The cost of hauling, if it is to have significant meaning, can be expressed only in relation to service performed. Statistics as to truck-miles operated, tons of freight transported, and ton-miles hauled are essential—and extremely scarce.

Truck-mileage records.—Many concerns do not keep an accurate record of truck mileage. This was often explained by the statement that odometers could not be kept in proper order under the severe operating conditions imposed by motor-truck service, and the difficulty and expense of maintaining them in working order. In other instances it was apparent that the concern did not consider mileage records essential. In the case of scheduled freight hauls mileage was often estimated on the basis of the number of trips over the known distance between terminal points during a certain period. Where irregular anywhere-for-hire hauling was done, it was often impossible to reach any satisfactory estimate. In determining the cost per mile figures as published in the unit cost table, actual odometer mileage was used when available, but reasonably accurate approximations were accepted in its absence.

Ton-mileage records.—The true measure of the cost of transporting goods over the highway is the cost of hauling a certain tonnage of goods a certain number of miles. The unit of measurement, the ton-mile, represents a load of 1 ton moved a distance of 1 mile. With few exceptions ton-mile figures were not available, despite the fact that the basis for determining such figures is to be had from the bills of lading or daily manifest sheets. The failure of concerns to summarize these bills of lading or manifest sheets prevented the development of these important data. Where the service rendered is a through haul between the point of origin and a limited number of destinations, the summarization of ton-miles is not difficult, but where service is performed over a number of routes, serving a number of points on each route, the computation of ton-miles involves a great deal of detailed tabulation.

Ton-mile cost varies more widely than truck-mile cost. While there are fairly definite physical limitations to the per mile operating costs for trucks in normal use, the ton-mile cost depends almost

wholly upon the average load carried. The ton-mile cost of a given haul will be reduced by almost half if the truck can return loaded instead of empty. In other words, ton-mile cost, which is a most accurate measure of hauling costs, is dependent upon the efficiency of the loading practice. Paradoxically, the less a truck carries, which is equivalent to saying the less efficiently it is used, the more cheaply it will operate, as measured by per mile cost, while under the same condition of partial loadings the per ton-mile cost will be high.

The cost per ton of transporting goods is not usually significant unless consideration is given to the length of haul, when it resolves itself into a ton-mile basis of calculation. For any particular concern or group of concerns, however, it may be helpful in comparing business done during successive periods of operation.

ESSENTIALS OF PROPER COST ACCOUNTING

An accurate conception of costs is essential to the survival of any business enterprise and this applies no less to motor-freight hauling than to any other.

Substantiating evidence for this statement is to be found in a survey made by the Bureau of Foreign and Domestic Commerce, Causes of Business Failures and Bankruptcies of Individuals in New Jersey in 1929–1930. While various reasons were advanced by those who failed regarding the causes of failure, it is significant that of the 487 cases of bankruptcy and other failures of business establishments studied, 23.5 per cent kept no books and 29.4 per cent kept inadequate records, or a total of 52.9 per cent who had no accurate knowledge of their costs.

It is not the purpose of this report to propose or suggest the manner in which costs should be kept nor the accounting methods to be used. However, a statement as to the principal objectives of a cost system for motor freight line operations may be found helpful. To this end, the following items are enumerated as essential to a proper knowledge of costs:

1. Absolute reckoning of every expenditure made on behalf of the business.
2. A proper record of every such expenditure made.
3. Sufficient detail in accounts to permit a scientific analysis of the operating costs, so that it may be determined which vehicles are being operated most economically or efficiently, and which portions of the services are or are not profitable.

The above three points are elementary, but if these primary purposes are kept in mind, they should result in improved services, more efficient utilization of equipment and personnel, elimination of unprofitable practices and services, and increased profit to the operator.

A generalization of the accounting methods of motor-freight companies is not possible but, stated simply, they may be classified as the unit-cost system and the fleet-cost system, with the latter in much more general use.

UNIT-COST ACCOUNTING

Under a unit-cost system, each expenditure is charged to the vehicle for which it is incurred. The majority of concerns using this method of accounting confine the allocation of costs against the individual vehicle to what are considered as direct operating or running expenses.

The expense items embraced in this classification are gasoline, oil and grease, tires and tubes, maintenance and repair, drivers' wages, and depreciation. When the probable life of a vehicle is estimated on a time basis, as for a fixed number of years, depreciation expense is more properly a fixed rather than a variable operating cost. However, while the majority of firms interviewed computed depreciation on a time basis, they considered the account as an operating expense, and it has been so carried in the unit-cost table herein.

A tax accruing only from actual operation of the vehicle, such as a gasoline tax, a mileage, a ton-mileage, or even a gross revenue tax, may be considered as an operating expense and charged to the individual vehicle. The gasoline tax is almost invariably included in the cost of gasoline, and not as a separate operating expense. Theoretically, certain forms of insurance which cover contingencies generally possible only from operation of the vehicle on the highway should also be charged to operating expense. In a few instances the unit-cost system was extended to include taxes and insurance, but no separation was made as between those incurred as operating costs and those more properly chargeable to administrative expense.

The restriction of unit-cost allocation to direct operating or running costs is principally due to the simplicity of tracing expenses, such as gasoline, oil, tires, etc., for an individual unit, while the affixing of its proper share of fixed or overhead expense presents some difficulties. Too, there is less need for assessing a proportionate share of overhead expense to individual vehicles, where the primary purpose of the unit-cost system is to determine the relative efficiency of various makes or types of equipment, either for purchase or for a particular service. In only rare instances was there any attempt by operators to apportion general overhead or administrative expenses on a proportionate basis.

FLEET-COST ACCOUNTING

The fleet-cost system has the advantage of simplicity, which undoubtedly accounts for its more extensive use. Properly set up, it permits the operator to know the most important fact pertaining to his business, namely, whether or not he is making a profit. It permits him to classify and budget his expenditures and to segregate his fixed and his variable charges. It does not reveal, however, which vehicles are operating most economically or efficiently, nor which portion of the business is profitable. Costs per truck-mile are apt to be misleading if averaged over a fleet which includes trucks of widely differing capacities and ages.

Segregation of expense items is usually confined to the principal costs occurring consistently in the firm's operation, and will vary with different concerns. Direct operating expenses and many of the fixed or overhead costs are general to all motor-truck operations, but the number and type of various miscellaneous costs are governed by the ramifications of the firm's service as well as by the accounting practice. The method of computing the different expense items and the extent of segregation of such items will vary with the need or desires of the truck owner.

OPERATING COSTS IN DETAIL

Nearly all of the concerns reporting in this survey furnished some sort of information regarding operating costs, but in only 122 cases was it sufficiently complete for analysis. Unit operating cost figures were obtained for 146 vehicles or combinations of vehicles, operated by 39 firms.

These vehicles were selected in the field after consultation with the operators as typical units engaged in intercity hauling.

Fleet operating costs were supplied by 91 concerns operating a total of 2,380 vehicles of various capacities and types, including trailers. A few of the vehicles for which unit costs are given are also included in the tabulation of fleet costs.

The figures in Table 16 cover 146 typical vehicles from fleets totaling 680 vehicles, of which 579 were trucks and tractor trucks. It is apparent that cost figures for a few of the units show unusual divergence, due to some extreme condition not disclosed in the investigation. Figures for expense items were furnished in a sum total, and abnormal costs which might have been questioned and perhaps accounted for did not become apparent until this total figure was broken down into a per mile or other relative basis.

The varying periods of time affect the comparability of individual unit-cost figures for different trucks. The unit-cost averages, however, are probably equalized over a large number of vehicles; this is evidenced by the consistency of the average figures for the various size ranges. Where unit costs are shown for less than a year, it is either because the unit-cost system had been recently installed or because some firms kept unit costs for only short periods of time for their own experimental purposes.

Utmost consideration should be given to the numerous factors affecting operations of individual concerns and individual vehicles in comparing the costs for vehicles of similar capacity in the table. Operating conditions vary greatly and have a corresponding effect on costs. Some of the physical factors of the vehicle and the road have been set forth in the cost table, but the human elements of control and management, equally or more responsible for variations in operating cost, are not possible of evaluation. Vehicles of similar size and character, engaged in identical services on the same route, may show a wide variation in operating costs, the favorable figure resting with the unit having the most efficient supervision, better maintenance methods, and superior driver ability.

UNIT COSTS

The 146 vehicles for which unit-cost figures are given include 126 trucks, 9 tractor truck-trailer units, 2 truck-trailer units, and 9 trailers.

Trucks have been divided into three ranges, according to rated capacity. The medium-duty range includes trucks of 1½ to 3 tons capacity; the heavy-duty range, 3½ to 5 tons capacity; and the extra-heavy-duty range, over 5 tons. This division is not based on any particular standard, but to permit an equitable comparison within a range, between vehicles not too dissimilar in character. The smaller trucks, from ½ to 1¼ tons capacity, are not included, as they are sel-

dom used for road-haul purposes, usually being restricted to city pick-up and delivery service. Costs for tractor-and-trailer and truck-and-trailer combinations and for trailer units are shown in a separate section of the table.

Because various items of operating expense for some units were not available, complete operating costs are shown for but slightly more than half of the vehicles in the table. Total operating cost per mile is given for 65 trucks, 4 tractor-trailer units, and 9 trailers. Per mile cost is also shown for each individual item of operating expense, where a cost and mileage figure were obtained. The omission of figures for some items does not necessarily indicate that these expenses were not carried in the operator's account; rather, it indicates inability to separate a combination of various expenses of which this omitted item was a part.

As heretofore mentioned, the table on unit costs includes only those expenses commonly considered as variable operating or running costs, overhead or fixed costs necessarily being omitted because so few firms attempted to apportion such costs to the individual vehicles of their fleet. These direct operating expenses have been reduced to a per mile cost for each item of expense, and a total per mile and per ton-mile cost for all items, where a basis for such tabulation was possible. The value of per mile figures as a measure for the cost of operating motor trucks is often questionable, but it is believed that the accompanying descriptive data for each unit, relative to age, tire equipment, maximum loads, average loads, and type of road, sufficiently reflect approximate operating conditions to permit a fair comparison.

Ton-mile figures in some instances were taken direct from station-to-station tonnage data. More often they were derived from an estimated average load (including empty as well as loaded mileage) multiplied by the miles operated. They are an approximation; obtained, however, from the operators themselves.

Cost data for combination units, or for trailers or semitrailers as individual units, were rare, and the few examples shown in the table are given merely as illustrative of what it cost a few firms to operate such vehicles. No comparisons can be made within the several groupings.

A number of trucks shown in the unit-cost table in addition to those listed among the combination units were at times operated with trailers. In some instances this is indicated by footnote. Facts were not available to show any consistent operation of a specified trailer with a particular truck or tractor truck. In many instances it was evident that little attention was devoted to the operating costs of trailers or semitrailers as individual units, or to the relative efficiency and operating costs for combination units as compared with trucks.

The letters following the truck numbers designate the firms operating the trucks. Truck 1–A, for example, was operated by the same firm as Truck 26–A.

TABLE 16.—UNIT OPERATING COSTS

MEDIUM-CAPACITY TRUCKS, 1½ TO 3 TONS

Item	Truck 1-A	Truck 2-A	Truck 3-A	Truck 4-B	Truck 5-C	Truck 6-D	Truck 7-E	Truck 8-F
DESCRIPTIVE DATA[1]								
Rated capacity, tons	1½	1½	1½	1½	1½	1½	1½	1½
Number of wheels	4	4	4	4	4	4	4	4
Tire equipment:								
Front	PN	PN	PN	PN	PN	PN	PN	PN.
Rear	D-PN	D-PN	D-PN	D-PN	CU	D-PN	PN	PN.
Type of body	Open top	Open top	Open top	Stake	Closed	Stake	Stake	Closed.
Age at start of period, months				54	144	New	New	New.
Period covered, months	12	12	12	4	12	2	8	12.
Type of road	Paved & dirt	Paved & dirt	Paved & dirt	Paved	Paved	Paved	Paved & grav.	Paved.
Principal commodity handled	Misc.	Misc.	Misc.	Misc.	Misc.	Misc.	Misc.	Crackers.
Usual maximum load, pounds				6,000	4,000	3,300	5,000	
Average load, pounds	1,587	1,633	2,986		2,800	1,800	1,074	3,000.
Tons hauled	55	299	487		536		338	
Truck-miles operated	5,226	20,550	53,280	5,507	12,224	3,099	25,186	42,241.
DIRECT OPERATING COSTS								
Tires and tubes	$256.60	$275.05	$1,002.97	$11.02	$54.50	$35.33	$87.85	
Per mile	0.0491	0.0133	0.0188	0.0020	0.0045	0.0114	0.0034	
Gasoline, including tax	170.33	532.19	1,263.27	114.04	222.51	44.34	454.24	754.20
Per mile	0.0325	0.0258	0.0237	0.0207	0.0182	0.0143	0.0180	0.0178
Oil and grease	21.73	49.08	181.92	16.20	44.47	2.85	37.55	49.30
Per mile	0.0041	0.0023	0.0034	0.0029	0.0036	0.0009	0.0014	0.0011
Maintenance and repair	499.08	847.64	1,500.05	80.72	111.59	5.12	203.89	261.20
Per mile	0.0954	0.0412	0.0281	0.0146	0.0091	0.0016	0.0080	0.0061
Drivers' wages	177.50	825.20	1,625.50	629.75	604.45	207.75	634.80	1,560.00
Per mile	0.0339	0.0401	0.0305	[1] 0.1143	0.0543	0.0670	0.0252	0.0369
Depreciation	156.78	616.50	1,598.40	100.00	225.00	63.03		
Per mile	0.0300	0.0300	0.0300	0.0181	0.0184	0.0203		
TOTAL DIRECT OPERATING COSTS								
Total direct operating cost	1,282.02	3,145.66	7,172.11	951.73	1,322.52	358.42		
Per truck-mile	0.2453	0.1530	0.1346	[1] 0.1728	0.1081	0.1156		
Per ton-mile	0.3092	0.1874	0.1082		0.0773	0.1285		

[1] Truck used for local drayage half of the day.

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TABLE 16.—UNIT OPERATING COSTS—Continued

MEDIUM-CAPACITY TRUCKS, 1½ TO 3 TONS—Continued

Item	Truck 9-A	Truck 10-A	Truck 11-A	Truck 12-A	Truck 13-A	Truck 14-G	Truck 15-G	Truck 16-H
DESCRIPTIVE DATA								
Rated capacity, tons	2	2	2	2	2	2	2	2.
Number of wheels	4	4	4	4	4	4	4	4.
Tire equipment:								
Front	PN	PN	PN	PN	PN	PN	PN	PN.
Rear	D-PN	D-PN	D-PN	D-PN	D-PN	D-PN	D-PN	D-PN.
Type of body	Open top	Open top	Open top	Open top	Open top	Refrigerator	Van	Flat.
Age at start of period, months						24	9	144.
Period covered, months	12	12	12	12	12	6	6	5.
Type of road	Paved & dirt	Paved & dirt	Paved & dirt	Paved & dirt	Paved & dirt	Paved	Paved	Paved.
Principal commodity handled						Misc. & milk	Horses	Misc.
Usual maximum load, pounds						8,000	6,500	10,000.
Average load, pounds	3,528	3,187	3,467	3,248	3,619	6,000	6,000	4,470.
Tons hauled	737	602	676	1,007	290			290.
Truck-miles operated	48,700	36,520	43,814	61,930	18,770	28,548	20,000	14,401.
DIRECT OPERATING COSTS								
Tires and tubes	$380.84	$683.73	$419.66	$617.05	$439.95	$360.00	$155.00	$371.14
Per mile	0.0180	0.0187	0.0095	0.0099	0.0234	0.0126	0.0077	0.0257
Gasoline, including tax	1,595.14	1,291.80	1,135.11	1,708.03	546.58	520.00	581.76	348.81
Per mile	0.0327	0.0353	0.0259	0.0275	0.0291	0.0182	0.0290	0.0242
Oil and grease	204.89	135.25	272.07	224.14	105.12	65.00	57.53	148.19
Per mile	0.0042	0.0037	0.0062	0.0036	0.0056	0.0022	0.0028	0.0102
Maintenance and repair	2,258.11	987.35	1,992.38	1,343.81	570.16	183.00	100.00	382.10
Per mile	0.0463	0.0270	0.0454	0.216	0.0303	0.0064	0.0050	0.0265
Drivers' wages	1,649.50	1,345.00	1,574.65	2,477.50	642.50	366.00	366.00	552.50
Per mile	0.0338	0.0368	0.0359	0.0400	0.0342	0.0128	0.0183	0.0383
Depreciation	1,461.00	1,095.60	1,314.42	1,857.90	563.10	400.00	1,000.00	458.85
Per mile	0.0300	0.0300	0.0300	0.0300	0.0300	0.0140	0.0500	0.0318
TOTAL DIRECT OPERATING COSTS								
Total direct operating cost	8,049.48	5,538.73	6,709.29	8,228.43	2,867.41	1,894.00	2,260.29	2,261.59
Per truck-mile	0.1652	0.1516	0.1531	0.1328	0.1527	0.0663	0.1130	[1] 0.1570
Per ton-mile	0.0936	0.0950	0.0882	0.0818	0.0844	0.0221	0.0376	0.0702

Item	Truck 17-J	Truck 18-K	Truck 19-L	Truck 20-M	Truck 21-N	Truck 22-P	Truck 23-P	Truck 24-E
DESCRIPTIVE DATA								
Rated capacity, tons	2	2	2	2	2	2	2	2.
Number of wheels	4	4	4	4	4	4	4	4.
Tire equipment:								
Front	PN	PN	PN	PN	PN	S	PN	PN.
Rear	D-PN	D-PN	D-PN	D-PN	D-PN	S	D-PN	D-PN.
Type of body	Closed	Stake	Van	Stake	Van	Open top	Open top	Closed.
Age at start of period, months	48		6	18	18	60	3	40.
Period covered, months	1	12	12	12	12	12	12	4.
Type of road	Paved & grav.	Paved	Paved	Paved	Gravel	Paved	Paved	Paved & grav.
Principal commodity handled	Misc.	Misc.	Misc.	Misc.	Misc.	Furn. & Misc.	Furn. & Misc.	Misc.
Usual maximum load, pounds	8,000	8,000	8,000	6,000	6,000	6,000	6,000	9,000.
Average load, pounds	6,000	5,240	8,000	4,700	1,632			2,580.
Tons hauled								179.
Truck-miles operated	1,139	14,706	52,000	23,300	17,893	15,473	22,800	7,257.
DIRECT OPERATING COSTS								
Tires and tubes				$456.68	$103.50	$154.73	$228.00	$14.25
Per mile				0.0196	0.0057	0.0100	0.0100	0.0019
Gasoline, including tax	$26.40	$360.61	$1,114.00	618.31		626.40	616.30	183.76
Per mile	0.0231	0.0245	0.0214	0.0265		0.0404	0.0270	0.0253
Oil and grease	3.66	22.20				35.19	30.43	37.75
Per mile	0.0032	0.0015				0.0022	0.0013	0.0052
Maintenance and repair	37.64	29.80	600.00		[3] 132.35	373.37	147.80	192.64
Per mile	0.0330	0.0020	0.0115		0.0073	0.0241	0.0064	0.0265
Drivers' wages	39.29	1,531.80	1,440.00	1,175.00	1,200.00	1,300.00	1,430.00	202.25
Per mile	0.0344	[4] 0.1041	0.0276	0.0504	0.0670	0.0840	0.0627	0.0278
Depreciation	51.25	400.00	805.00	786.33	420.00			
Per mile	0.0449	0.0271	0.0154	0.0337	0.0234			
TOTAL DIRECT OPERATING COSTS								
Total direct operating cost								
Per truck-mile								
Per ton-mile								

[3] Pulling 3½-ton trailer part time.
[4] Not including labor.
[4] Contract service, short-trip haul.

TABLE 16.—UNIT OPERATING COSTS—Continued

MEDIUM-CAPACITY TRUCKS, 1½ TO 3 TONS—Continued

Item	Truck 25–E	Truck 26–A	Truck 27–A	Truck 28–A	Truck 29–Q	Truck 30–R	Truck 31–H	Truck 32–H
DESCRIPTIVE DATA								
Rated capacity, tons	2	2½	2½	2½	2½	2½	2½	2½
Number of wheels	4	4	4	4	4	4	4	4
Tire equipment:								
Front	PN	PN	PN	PN	PN	PN	PN	PN.
Rear	D–PN	D–PN	D–PN	D–PN	D–PN	D–PN	D–PN	D–PN.
Type of body	Stake	Open top	Open top	Open top	Flat	Stake	Closed	Closed.
Age at start of period, months					48	24	48	48.
Period covered, months	12	12	12	12	12	3	5	5.
Type of road	Paved & grav.	Paved & dirt.	Paved & dirt.	Paved & dirt.	Paved	Paved	Paved	Paved.
Principal commodity handled	Misc.				Misc.	Misc.	Misc.	Misc.
Usual maximum load, pounds	9,000				10,000	5,000	10,000	10,000.
Average load, pounds		4,636	3,502	5,910		4,000	3,676	3,078.
Tons hauled	529	723	949	952			334	283.
Truck miles operated	8,071	30,790	39,240	31,830	18,000	2,550	19,086	19,591.
DIRECT OPERATING COSTS								
Tires and tubes		$590.49	$560.61	$618.45	$594.00	$63.00	$269.29	$213.94
Per mile		0.0191	0.0142	0.0194	0.0330	0.0241	0.0141	0.0109
Gasoline, including tax	$205.38	1,153.41	1,128.01	1,215.66	910.00	83.95	419.55	414.81
Per mile	0.0254	0.0374	0.0312	0.0381	0.0505	0.0329	0.0219	0.0211
Oil and grease	48.42	195.29	97.43	134.43	75.00	6.96	186.12	186.12
Per mile	0.0059	0.0063	0.0024	0.0042	0.0041	0.0024	0.0097	0.0095
Maintenance and repair	202.70	2,151.57	1,154.06	954.45	500.00	87.50	416.63	400.39
Per mile	0.0251	0.0698	0.0294	0.0299	0.0277	0.0343	0.0218	0.0204
Drivers' wages	201.34	1,329.75	1,963.00	1,310.50	2,500.00	390.00	773.50	782.00
Per mile	0.0249	0.0431	0.0500	0.0411	0.1388	[1] 0.1429	0.0405	0.0399
Depreciation		923.70	1,177.20	954.90	864.00	108.00	713.20	713.20
Per mile		0.0300	0.0300	0.0300	0.0300	0.0423	0.0373	0.0364
TOTAL DIRECT OPERATING COSTS								
Total direct operating cost		6,344.21	6,180.31	5,188.39	5,443.00	739.41	2,778.29	2,710.46
Per truck-mile		0.2060	0.1575	0.1630	0.3023	[1] 0.2899	[1] 0.1455	[1] 0.1383
Per ton-mile		0.0888	0.0898	0.0550		0.1449	0.0791	0.0698

Item	Truck 33–S	Truck 34–T	Truck 35–A	Truck 36–U	Truck 37–V	Truck 38–J	Truck 39–J	Truck 40–W
DESCRIPTIVE DATA								
Rated capacity, tons	2½	2½	2½	2½	2½	2½	2½	2½.
Number of wheels	4	4	6	4	4	4	4	4.
Tire equipment:								
Front	PN	PN	PN	PN	PN	PN	PN	PN.
Rear	CU	D-PN	PN-PN	D-PN	D-PN	D-PN	D-PN	D-PN.
Type of body		Van	Open top	Stake	Stake	Closed	Open top	Van.
Age at start of period, months	84	New		New	48	36	36	30.
Period covered, months	12	12	12	12	6	1	1	6.
Type of road	Paved	Paved & grav.	Paved & dirt	Paved	Paved	Paved	Paved & grav.	Paved.
Principal commodity handled	Misc.	Household goods.		Milk & misc.	Misc.	Misc. & milk	Misc.	Misc.
Usual maximum load, pounds	10,000	9,000		12,000		13,500	12,000	10,000.
Average load, pounds	5,439	6,000	5,277	8,907	4,800	10,000	12,000	
Tons hauled	1,670		818	526	744			
Truck miles operated	18,420	22,000	30,270	9,346	12,400	3,721	2,561	14,522.
DIRECT OPERATING COSTS								
Tires and tubes	$156.00	$318.12	$1,163.41					
Per mile	0.0084	0.0144	0.0384					
Gasoline, including tax	570.00	682.06	986.21	316.14	454.55	89.32	45.76	643.00
Per mile	0.0309	0.0310	0.0325	0.0391	0.0366	0.0240	0.0178	0.0441
Oil and grease	29.75	131.04	138.99	13.35	41.07	6.56	3.92	31.00
Per mile	0.0016	0.0059	0.0045	0.0014	0.0033	0.0017	0.0015	0.0021
Maintenance and repair	72.75	[2] 390.00	1,676.48	[2] 191.57	143.23	21.24	24.39	
Per mile	0.0039	0.0177	0.0553	0.0205	0.0115	0.0057	0.0095	
Drivers' wages	1,326.00	1,800.00	1,240.65	412.60	620.00	274.36	150.36	545.00
Per mile	0.0719	0.0818	0.0409	0.0441	0.0500	0.0737	0.0587	0.0374
Depreciation	500.00	770.00	908.10	765.00	251.19	93.54	79.48	436.56
Per mile	0.0271	0.0350	0.0300	0.0818	0.0202	0.0251	0.0310	0.0300
TOTAL DIRECT OPERATING COSTS								
Total direct operating cost	2,654.50	4,091.22	6,113.84					
Per truck mile	0.1441	0.1859	0.2019					
Per ton-mile	0.0529	0.0819	0.0764					

[1] Pulling 3½-ton trailer, part time.
[2] Not including labor.
[3] 70 per cent local hauling.

TABLE 16.—UNIT OPERATING COSTS—Continued

MEDIUM-CAPACITY TRUCKS, 1½ TO 3 TONS—Continued

Item	Truck 41-W	Truck 42-L	Truck 43-X	Truck 44-X	Truck 45-Y	Truck 46-Z	Truck 47-U	Truck 48-F
DESCRIPTIVE DATA								
Rated capacity, tons	2½	2½	2½	2½	2½	2½	2½	2½.
Number of wheels	4	4	4	4	4	4	4	4.
Tire equipment:								
Front	PN	PN	PN	PN	PN	PN	PN	PN.
Rear	D-PN	D-PN	D-PN	D-PN	D-PN	D-PN	D-PN	D-PN.
Type of body	Van	Van	Van	Van	Closed	Stake	Stake	Stake.
Age at start of period, months	30	New	40	40	38	7	New	36.
Period covered, months	6	12	12	3	12	3	6	12.
Type of road	Paved	Paved	Paved	Paved	Paved & grav.	Paved & grav.	Paved	Paved.
Principal commodity handled	Misc.	Misc.	Misc.	Misc.	Cream & misc.	Misc.	Milk & misc.	Misc.
Usual maximum load, pounds	10,900	12,000	10,000	10,000	11,000	12,000	12,000	
Average load, pounds			5,800	5,420	3,134		7,827	6,000.
Tons hauled			163	62	170		1,307	
Truck miles operated	26,898	41,600	4,200	1,730	21,500	6,110	26,890	24,480.
DIRECT OPERATING COSTS								
Tires and tubes		$936.00	$96.60	$39.79	$265.36	$32.12	$27.79	
Per mile		0.0225	0.0230	0.0230	0.0123	0.0525	0.0010	
Gasoline, including tax	$812.42	1,200.00					585.51	$603.90
Per mile	0.0302	0.0288					0.0217	0.0246
Oil and grease	45.00						33.00	63.06
Per mile	0.0016						0.0012	0.0025
Maintenance and repair		1,400.00	162.61	27.55	600.23	387.60	[3] 1.35	239.40
Per mile		0.0336	0.0387	0.0159	0.0279	0.0634		0.0097
Drivers' wages	779.22	1,440.00	349.45	143.00	1,563.00	177.50	886.20	1,560.00
Per mile	0.0289	0.0346	0.0832	0.0826	0.0726	0.0290	0.0329	0.0637
Depreciation	806.94	1,038.00	475.00	43.25	919.00		444.10	
Per mile	0.0300	0.0249	0.1130	0.0250	0.0427		0.0165	
TOTAL DIRECT OPERATING COSTS								
Total direct operating cost								
Per truck mile								
Per ton-mile								

Item	Truck 49-AA	Truck 50-M	Truck 51-B	Truck 52-U	Truck 53-U	Truck 54-AB	Truck 55-AB	Truck 56-AC
DESCRIPTIVE DATA								
Rated capacity, tons	2½	2½	3	3	3	3	3	3.
Number of wheels	4	4	4	4	4	4	4	4.
Tire equipment:								
Front	PN	PN	PN	PN	PN	PN	PN	PN.
Rear	D-PN	D-PN	D-PN	D-PN	D-PN	D-PN	D-PN	D-PN.
Type of body	Van	Stake	Van	Stake	Stake	Stake	Stake	Refrigerator.
Age at start of period, months	12	New	New	36	24	12	12	New.
Period covered, months	12	12	3	11	12	1	1	10.
Type of road		Paved		Paved	Paved	Paved	Paved	Paved.
Principal commodity handled	Misc.	Misc.		Milk & misc.	Milk & misc.	Milk & misc.	Milk & misc.	Milk.
Usual maximum load, pounds	9,480	8,000	10,000	12,000	12,000	12,000	11,000	9,500.
Average load, pounds	6,000	3,940		7,730	7,579	8,420	7,720	
Tons hauled				819	1,288	67	69	
Truck miles operated	40,934	25,000	3,371	18,920	27,120	3,734	2,550	33,020.
DIRECT OPERATING COSTS								
Tires and tubes		$550.00	$18.00	$170.39	$105.52	$74.68	$44.98	$742.95
Per mile		0.0220	0.0053	0.0090	0.0038	0.0200	0.0176	0.0225
Gasoline, including tax	$1,041.76	798.84	74.57	505.93	556.14	78.12	56.80	785.90
Per mile	0.0254	0.0319	0.0221	0.0267	0.0205	0.0209	0.0222	0.0239
Oil and grease	292.62		7.70	45.45	36.75	9.95	10.40	83.00
Per mile	0.0071		0.0022	0.0024	0.0013	0.0026	0.0040	0.0025
Maintenance and repair	1,088.06		15.32	[1] 9.10	[1] 182.47	13.68	38.08	275.00
Per mile	0.0265		0.0045	0.0005	0.0067	0.0036	0.0149	0.0083
Drivers' wages	1,535.40	1,175.00	387.50	1,235.50	980.00	245.05	160.00	1,000.00
Per mile	0.0375	0.0470	0.1149	0.0653	0.0361	0.0656	0.0627	0.0302
Depreciation		585.50	160.00	881.25	753.30	94.00	55.20	1,000.00
Per mile		0.0234	0.0474	0.0465	0.0277	0.0251	0.0216	0.0302
TOTAL DIRECT OPERATING COSTS								
Total direct operating cost			663.09	2,847.62	2,614.18	515.48	365.46	3,886.85
Per truck mile			0.1967	0.1505	0.0963	0.1380	0.1433	0.1177
Per ton-mile				0.0389	0.0254	0.0327	0.0371	

[1] Not including labor.

TABLE 16.—UNIT OPERATING COSTS—Continued

MEDIUM-CAPACITY TRUCKS, 1½ TO 3 TONS—Continued

Item	Truck 57-B	Truck 58-V	Truck 59-G	Truck 60-K	Truck 61-J	Truck 62-X	Truck 63-X	Truck 64-Z
DESCRIPTIVE DATA								
Rated capacity, tons	3	3	3	3	3	3	3	3.
Number of wheels	4	4	4	4	4	4	4	6.
Tire equipment:								
Front	PN	PN	PN	PN	PN	PN	PN	PN.
Rear	D-PN	D-PN	D-PN	D-PN	D-PN	D-PN	D-PN	D-PN.[6]
Type of body	Stake	Stake	Closed	Stake	Open top	Stake	Stake	Stake.
Age at start of period, months	62	24	New	3	24	20	13	6.
Period covered, months	4	4	6	12	1	12	12	4.
Type of road	Paved	Paved	Paved	Paved	Paved	Paved	Paved	Paved & grav.
Principal commodity handled	Misc.	Misc.	Misc.	Misc.	Misc.	Misc.	Misc.	Misc.
Usual maximum load, pounds	10,000		9,000	12,000	12,000	14,000	16,000	17,000.
Average load, pounds		6,000	9,000	6,520	12,000	4,320	6,540	
Tons hauled		624				485	1,066	
Truck miles operated	8,314	17,680	22,500	14,748	1,616	16,807	24,479	21,070.
DIRECT OPERATING COSTS								
Tires and tubes	$3. 50					$386. 58	$563. 01	$104. 17
Per mile	0. 0004					0. 0230	0. 0229	0. 0049
Gasoline, including tax	220. 96	$214. 09	$877. 50	$301. 40	$55. 44			
Per mile	0. 0265	0. 0121	0. 0390	0. 0204	0. 0343			
Oil and grease	23. 00	30. 48	168. 75	15. 75	3. 47			
Per mile	0. 0027	0. 0017	0. 0075	0. 0010	0. 0021			
Maintenance and repair	79. 42	62. 53	150. 00	72. 37	19. 00	103. 28	1. 637. 60	155. 63
Per mile	0. 0095	0. 0035	0. 0066	0. 0049	0. 0117	0. 0061	0. 0668	0. 0073
Drivers' wages	483. 75	416. 00	366. 00	1, 460. 05	126. 00	1, 010. 73	2, 010. 73	561. 00
Per mile	0. 0581	0. 0235	0. 0162	0. 0989	0. 0779	0. 0600	0. 0821	0. 0266
Depreciation	120. 00	342. 45	500. 00	1, 008. 40	76. 57	719. 26	869. 29	
Per mile	0. 0144	0. 0193	0. 0222	0. 0683	0. 0473	0. 0427	0. 0355	
TOTAL DIRECT OPERATING COSTS								
Total direct operating cost	930. 63							
Per truck mile	0. 1119							
Per ton-mile								

Item	Truck 65-E	Truck 66-AD	Truck 67-AE	Truck 68-AF	Truck 69-AF	Average for medium-capacity trucks
DESCRIPTIVE DATA						
Rated capacity, tons	3	3	3	3 [†]	3 [†]	
Number of wheels	4	4	4	4	4	
Tire equipment:						
Front	PN	PN	PN	PN	PN	
Rear	D-PN	D-PN	D-PN	D-PN	D-PN	
Type of body	Stake	Closed	Stake	Stake	Stake	
Age at start of period, months	24	2	27	24	36	
Period covered, months	12	1	12	12	12	
Type of road	Paved & grav.	Paved	Gravel	Paved	Paved	
Principal commodity handled	Misc.	Misc.	Misc.	Misc.	Misc.	
Usual maximum load, pounds	7,500	6,000	7,000			
Average load, pounds						
Tons hauled	411					
Truck miles operated	14,712	2,016	12,000	50,574	31,503	
DIRECT OPERATING COSTS						
Tires and tubes	$75.23	$21.17	$267.00	$383.03	$473.42	
Per mile	0.0051	0.0010	0.0222	0.0165	0.0150	$0.0149
Gasoline, including tax	377.58	41.75	283.50	1,244.53	772.87	
Per mile	0.0256	0.0207	0.0236	0.0246	0.0245	0.0273
Oil and grease	52.15	11.20	47.10	188.47	64.24	
Per mile	0.0035	0.0055	0.0039	0.0037	0.0020	0.0036
Maintenance and repair	278.83			1,184.02	929.27	
Per mile	0.0189			0.0234	0.0294	0.0235
Drivers' wages	376.75	137.85				
Per mile	0.0256	0.0683				0.0450
Depreciation		47.85	613.75	1,285.80	1,352.40	
Per mile		0.0237	0.0511	0.0254	0.0429	0.0308
TOTAL DIRECT OPERATING COSTS						
Total direct operating cost						
Per truck mile						0.1513
Per ton-mile						0.0695

[†] On both rear axles.
[‡] Pulling 3-8 ton capacity trailer.

TABLE 16.—UNIT OPERATING COSTS—Continued

HEAVY-DUTY TRUCKS, 3½ TO 5 TONS CAPACITY

Item	Truck 70-A	Truck 71-A	Truck 72-A	Truck 73-A	Truck 74-A	Truck 75-A	Truck 76-A	Truck 77-R
DESCRIPTIVE DATA								
Rated capacity, tons	3½	3½	3½	3½	3½	3½	3½	3½.
Number of wheels	4	4	4	4	4	4	4	4.
Tire equipment:								
Front	PN	PN	PN	PN	PN	PN	PN	PN.
Rear	S	S	D-PN	S	D-PN	D-PN	D-PN	D-PN.
Type of body	Open top	Open top	Open top	Open top	Open top	Open top	Open top	Stake.
Age at start of period, months								30.
Period covered, months	12	12	12	12	12	12	12	3.
Type of road	Paved & dirt	Paved & dirt	Paved & dirt	Paved & dirt	Paved & dirt	Paved & dirt	Paved & dirt	Paved.
Principal commodity handled	Misc.	Misc.	Misc.	Misc.	Misc.	Misc.	Misc.	Misc.
Usual maximum load, pounds								7,000.
Average load, pounds	5,516	6,370	6,429	9,104	5,321	5,030	5,033	7,000.
Tons hauled	264	707	804	410	788	1,464	946	
Truck miles operated	8,910	22,310	25,330	8,970	32,940	71,260	44,320	2,800.
DIRECT OPERATING COSTS								
Tires and tubes	$406.88	$161.64	$553.17	$195.14	$897.31	$1,324.25	$1,372.64	$112.00
Per mile	0.0456	0.0206	0.0218	0.0217	0.0272	0.0185	0.0309	0.0400
Gasoline, including tax	370.14	926.21	1,060.70	414.37	1,074.86	2,108.70	1,435.14	98.20
Per mile	0.0415	0.0415	0.0418	0.0461	0.0326	0.0295	0.0323	0.0350
Oil and grease	41.20	100.33	115.14	53.30	268.11	206.41	217.52	9.68
Per mile	0.0046	0.0044	0.0045	0.0059	0.0081	0.0028	0.0049	0.0034
Maintenance and repair	752.93	1,201.39	2,037.41	824.24	1,723.06	1,520.61	1,670.85	141.00
Per mile	0.0845	0.0538	0.0800	0.0918	0.0523	0.0213	0.0376	0.0503
Drivers' wages	484.00	750.13	1,285.25	499.50	1,379.00	2,002.50	1,802.60	390.00
Per mile	0.0543	0.0336	0.0507	0.0556	0.0418	0.0107	0.0406	[1] 0.1392
Depreciation	267.30	669.30	759.90	269.10	988.20	2,137.80	1,329.60	196.00
Per mile	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0700
TOTAL DIRECT OPERATING COSTS								
Total direct operating cost	2,322.45	4,109.00	5,811.57	2,255.65	6,330.54	10,200.27	7,828.35	946.88
Per truck mile	0.2606	0.1841	0.2294	0.2515	0.1921	0.1431	0.1766	[1] 0.3381
Per ton-mile	0.0944	0.0578	0.0712	0.0552	0.0722	0.0508	0.0700	0.0966

Item	Truck 78-H	Truck 79-H	Truck 80-H	Truck 81-H	Truck 82-D	Truck 83-K	Truck 84-H	Truck 85-AA
DESCRIPTIVE DATA								
Rated capacity, tons	3½	3½	3½	3½	3½	3½	3½	3½.
Number of wheels	4	4	4	4	4	4	4	4.
Tire equipment:								
Front	PN	PN	PN	PN	PN	PN	PN	PN.
Rear	D-PN	D-PN	D-PN	D-PN	D-PN	D-PN	D-PN	D-PN.
Type of body	Closed	Closed	Closed	Closed	Stake	Stake	Closed	Van.
Age at start of period, months	16	36	36	24	New		New	24.
Period covered, months	5	5	5	5	8	12	5	12.
Type of road	Paved	Paved	Paved	Paved	Paved	Paved	Paved	
Principal commodity handled	Misc.	Misc.	Misc.	Misc.	Misc.	Misc.	Misc.	Misc.
Usual maximum load, pounds	10,000	10,000	10,000	10,000	4,400	14,320	10,000	8,670.
Average load, pounds	5,487	5,613	5,650	5,564	4,200	8,280	5,323	6,000.
Tons hauled	669	702	684	707			138	
Truck miles operated	25,083	24,762	23,227	25,186	23,280	14,701	5,427	44,072.
DIRECT OPERATING COSTS								
Tires and tubes	$619.70	$175.36	$540.68	$406.88	$1,042.26			
Per mile	0.0247	0.0070	0.0232	0.0161	0.0447			
Gasoline, including tax	903.54	1,060.05	941.89	926.05	722.34	$386.07	$225.11	$1,390.56
Per mile	0.0360	0.0428	0.0405	0.0367	0.0310	0.0261	0.0414	0.0315
Oil and grease	186.12	186.12	186.12	186.12	118.89	22.20	59.97	307.25
Per mile	0.0074	0.0075	0.0080	0.0073	0.0051	0.0015	0.0110	0.0069
Maintenance and repair	576.57	857.75	752.96	429.76	120.15	46.90	174.76	1,482.24
Per mile	0.0229	0.0346	0.0324	0.0170	0.0051	0.0317	0.0322	0.0336
Drivers' wages	1,047.00	1,089.50	1,038.50	1,080.50	1,335.69	1,573.70	221.00	1,656.00
Per mile	0.0417	0.0439	0.0447	0.0432	0.0573	0.1066	0.0407	0.0375
Depreciation	674.90	901.05	1,033.95	749.20	1,741.00	540.00	132.32	
Per mile	0.0269	0.0363	0.0445	0.0297	0.0747	0.0365	0.0243	
TOTAL DIRECT OPERATING COSTS								
Total direct operating cost	4,007.83	4,269.83	4,494.10	3,787.51	5,080.33			
Per truck mile	[2] 0.1597	[2] 0.1724	[2] 0.1934	[2] 0.1503	0.2182			
Per ton-mile	0.0582	0.0614	0.0684	0.0540	0.1038			

[1] Pulling trailer, 3½-ton capacity, part-time.
[2] 70 per cent local hauling.

TABLE 16.—UNIT OPERATING COSTS—Continued

HEAVY-DUTY TRUCKS, 3½ TO 5 TONS CAPACITY—Continued

Item	Truck 86–AG	Truck 87–AH	Truck 88–M	Truck 89–AF	Truck 90–AF	Truck 91–AF	Truck 92–Q	Truck 93–AJ
DESCRIPTIVE DATA								
Rated capacity, tons	3½	3½	3½	4	4	4	5	5.
Number of wheels	4	4	4	4	4	6	4	4.
Tire equipment:								
Front	S.[8]	PN	PN	PN	PN	PN	S	S.
Rear	S	D-S	PN	D-PN	D-PN	D-PN [6]	S	S.
Type of body	Stake	Van	Stake	Stake	Stake	Stake	Stake	Flat.
Age at start of period, months	48	24	2	12	12	12	108	48.
Period covered	9	12	12	12	12	12	12	8.
Type of road	Paved	Paved	Paved	Paved	Paved	Paved	Paved	
Principal commodity handled	Misc.	Household gds.	Misc.	Misc.	Misc.	Misc.	Misc.	Lumber.
Usual maximum load, pounds	7,000	8,000	11,000	22,000 [7]	22,000 [7]	34,000 [7]	15,500	14,000.
Average load, pounds	3,900	5,460	8,360					
Tons hauled								
Truck miles operated	7,475	28,680	24,000	56,102	28,090	48,727	18,000	11,606.
DIRECT OPERATING COSTS								
Tires and tubes	$97.17	$453.14	$542.40	$879.83	$456.16	$890.24	$900.00	$269.07
Per mile	0.0129	0.0157	0.0226	0.0156	0.0162	0.0182	0.0500	0.0231
Gasoline, including tax	334.03		821.82	1,055.88	692.86	1,340.82	1,090.00	361.42
Per mile	0.0446		0.0342	0.0188	0.0246	0.0275	0.0605	0.0311
Oil and grease	30.7600			83.41	100.20	161.90	75.00	68.21
Per mile	0.0041			0.0014	0.0035	0.0033	0.0041	0.0058
Maintenance and repair	679.33	2,271.46		268.28	909.85	536.97	500.00	409.70
Per mile	0.0908	0.0792		0.0047	0.0323	0.0110	0.0277	0.0353
Drivers' wages	1,025.00	1,915.82	1,175.00				2,500.00	1,252.45
Per mile	0.1371	0.0667	0.0489				0.1388	0.1079
Depreciation		500.00	550.00	1,575.85	842.72	1,903.09	900.00	617.76
Per mile		0.0174	0.0229	0.0280	0.0300	0.0390	0.0500	0.0532
TOTAL DIRECT OPERATING COSTS								
Total direct operating cost							5,965.00	2,978.61
Per truck mile							[9] 0.3313	0.2566
Per ton-mile								

Item	Truck 94-AJ	Truck 95-AK	Truck 96-AG	Truck 97-D	Truck 98-V	Truck 99-V	Truck 100-K	Truck 101-K
DESCRIPTIVE DATA								
Rated capacity, tons	5	5	5	5	5	5	5	5.
Number of wheels	4	4	4	4	6	6	4	4.
Tire equipment:								
Front	S	PN	S	PN	PN	PN	S	PN.
Rear	S	D-PN	S	S	D-PN [6]	D-PN [6]	D-S	D-PN.
Type of body	Open top		Van	Stake	Van	Van	Stake	Stake.
Age at start of period, months	42	84	24		New	New	42	48.
Period covered, months	8	6	9	12	6	5	12	12.
Type of road		Paved	Paved	Paved	Paved	Paved	Paved	Paved.
Principal commodity handled	Coke	Misc.	Silk hose	Misc.	Misc.	Misc.	Misc.	Misc.
Usual maximum load, pounds	11,000		10,000	11,000			14,000	16,000.
Average load, pounds			4,080	6,000	7,640	7,640	7,820	8,600.
Tons hauled					1,240	1,024		
Truck-miles operated	11,839	15,000	21,620	6,654	16,200	13,376	8,057	14,052.
DIRECT OPERATING COSTS								
Tires and tubes	$281.21	$185.00	$864.80	$124.70				
Per mile	0.0237	0.0123	0.0400	0.0187				
Gasoline, including tax	441.15	326.46	1,586.74	224.24	$660.14 [7]	$437.06	$276.94	$530.98
Per mile	0.0372	0.0217	0.0733	0.0337	0.0407	0.0326	0.0343	0.0377
Oil and grease	74.72	70.22	128.04	39.75	76.75	59.53	16.95	19.65
Per mile	0.0063	0.0046	0.0059	0.0059	0.0047	0.0044	0.0021	0.0013
Maintenance and repair	955.49	83.54	843.89	175.52	83.49	56.49	21.00	188.44
Per mile	0.0807	0.0055	0.0390	0.0263	0.0051	0.0042	0.0026	0.0134
Drivers' wages	1,318.30	1,171.50	1,710.00	860.67	775.00	640.00	712.75	1,641.25
Per mile	0.1113	0.0781	0.0790	0.1293	0.0478	0.0478	0.0884	0.1167
Depreciation	1,040.64	100.00	1,725.00	151.68	542.03	442.41	1,143.00	1,200.00
Per mile	0.0878	0.0066	0.0797	0.0227	0.0334	0.0330	0.1418	0.0853
TOTAL DIRECT OPERATING COSTS								
Total direct operating cost	4,111.51	1,936.72	6,858.47	1,576.56				
Per truck-mile	[8] 0.3472	0.1291	0.3172	0.2369				
Per ton-mile			0.1554	0.0789				

[6] On both rear axles.
[7] Pulling 3-8 ton capacity trailer.
[8] Hauling in congested metropolitan area.
[9] 60 per cent local hauling.

TABLE 16.—UNIT OPERATING COSTS—Continued

HEAVY-DUTY TRUCKS, 3½ TO 5 TONS CAPACITY—Continued

Item	Truck 102–K	Truck 103–D	Truck 104–AK	Truck 105–AL	Truck 106–X	Average for heavy-duty trucks
DESCRIPTIVE DATA						
Rated capacity, tons	5	5	5	5	5	
Number of wheels	4	6	4	4	6	
Tire equipment:						
Front	PN	PN	PN	PN	PN	
Rear	D-PN	PN-PN	D-PN	D-PN	D-PN	
Type of body	Stake	Stake			Stake	
Age at start of period, months	82	10	22	36	New	
Period covered, months	12	1	6	6	10	
Type of road	Paved	Paved	Paved	Paved	Paved	
Principal commodity handled	Misc.	Misc.	Misc.	Misc.	Misc.	
Usual maximum load, pounds	16,500	20,000			24,000	
Average load, pounds	8,880	14,940			7,060	
Tons hauled		135			1,089	
Truck miles operated	11,844	2,600	15,000	12,000	23,146	
DIRECT OPERATING COSTS						
Tires and tubes				$148.00	$925.32	
Per mile				0.0123	0.0399	$0.0232
Gasoline, including tax	$320.98	$96.48	$387.36	265.34		
Per mile	0.0271	0.0371	0.0258	0.0221		0.0339
Oil and grease	48.75	11.40	41.30	39.24		
Per mile	0.0041	0.0043	0.0027	0.0032		0.0047
Maintenance and repair	118.95	28.03	71.04	158.42	925.32	
Per mile	0.0100	0.0107	0.0047	0.0132	0.0399	0.0305
Drivers' wages	1,542.50	160.00			1,637.60	
Per mile	0.1302	0.0615			0.0707	0.0606
Depreciation	970.00	145.83	420.00	260.00	1,387.76	
Per mile	0.0818	0.0560	0.0280	0.0216	0.0599	0.0386
TOTAL DIRECT OPERATING COSTS						
Total direct operating cost						
Per truck-mile						0.2005
Per ton-mile						0.0704

EXTRA-HEAVY-DUTY TRUCKS, OVER 5 TONS CAPACITY

Item	Truck 107-AM	Truck 108-AM	Truck 109-AM	Truck 110-AM	Truck 111-AN	Truck 112-AN	Truck 113-AN	Truck 114-AN
DESCRIPTIVE DATA								
Rated capacity, tons	7	8	8	8	10	10	10	10.
Number of wheels	6	4	4	4	6	6	6	6.
Tire equipment:								
Front	PN	S	S	S	PN	PN	S	S.
Rear	D-PN [6]	D-S	D-S	D-S	D-PN [6]	D-PN [6]	S-S	S-S.
Type of body	Stake	Stake	Stake	Stake	Van	Van	Van	Van.
Age at start of period, months	30	36	48	42	48	36	48	36.
Period covered, months	12	12	12	12	6	6	6	6.
Type of road	Paved	Paved	Paved	Paved	Paved	Paved	Paved	Paved.
Principal commodity handled	Misc.	Misc.	Misc.	Misc.	Misc. & meats.	Misc. & meats.	Misc. & meats.	Misc. & meats.
Usual maximum load, pounds	14,000	14,000	15,000	15,000	16,520	15,720	16,470	16,320.
Average load, pounds	10,250	10,500	9,000	9,000				
Tons hauled			1,548	1,782				
Truck-miles operated	25,065	24,200	17,200	19,806	25,937	28,904	13,256	16,315.
DIRECT OPERATING COSTS								
Tires and tubes	$408.00	$373.50	$333.00	$386.50	$516.66	$568.29	$268.47	$331.20
Per mile	0.0162	0.0154	0.0193	0.0195	0.0199	0.0196	0.0202	0.0203
Gasoline, including tax	816.48	908.34	723.35	784.96	1,164.51	1,238.50	819.80	905.45
Per mile	0.0325	0.0375	0.0420	0.0396	0.0448	0.0428	0.0618	0.0554
Oil and grease	111.86	104.80	102.75	97.65	114.67	118.23	81.19	90.80
Per mile	0.0044	0.0043	0.0059	0.0049	0.0044	0.0040	0.0061	0.0055
Maintenance and repair	526.13	411.83	510.60	499.75	1,882.86	1,242.42	573.96	985.70
Per mile	0.0209	0.0170	0.0296	0.0252	0.0725	0.0429	0.0432	0.0604
Drivers' wages	1,820.00	1,820.00	1,820.00	1,820.00	1,687.71	1,878.76	861.64	1,060.48
Per mile	0.0726	0.0752	0.1058	0.0918	0.0650	0.0650	0.0650	0.0650
Depreciation	1,000.00	1,000.00	1,200.00	1,200.00	674.64	603.42	589.06	171.22
Per mile	0.0398	0.0413	0.0697	0.0605	0.0260	0.0208	0.0444	0.0104
TOTAL DIRECT OPERATING COSTS								
Total direct operating cost	4,682.47	4,618.47	4,689.70	4,788.86	6,041.05	5,649.62	3,194.12	3,544.85
Per truck-mile	0.1868	0.1908	0.2726	0.2417	0.2329	0.1954	0.2409	0.2172
Per ton-mile	0.0364	0.0363	0.0605	0.0537				

[6] On both rear axles.

TABLE 16.—UNIT OPERATING COSTS—Continued

EXTRA-HEAVY-DUTY TRUCKS, OVER 5 TONS CAPACITY—Continued

Item	Truck 115-AN	Truck 116-AN	Truck 117-AN	Truck 118-AN	Truck 119-AN	Truck 120-AN	Truck 121-AN	Truck 122-AN
DESCRIPTIVE DATA								
Rated capacity, tons	10	10	10	10	10	10	10	10.
Number of wheels	6	6	6	6	6	6	6	6.
Tire equipment:								
Front	PN	PN	S	PN	PN	PN	PN	PN.
Rear	D-PN [6]	D-PN [6]	S-S	D-PN [6]	D-PN [6]	D-PN [6]	D-PN [6]	D-PN [6].
Type of body	Van	Van	Van	Van	Van	Van	Van	Stake.
Age at start of period, months	96	84	48	96	12	12	12	12.
Period covered, months	6	6	6	3	6	3	6	12.
Type of road	Paved	Paved	Paved	Paved	Paved	Paved	Paved	Paved.
Principal commodity handled	Misc. & meats.	Misc. & meats.	Misc. & meats.	Misc. & meats.	Misc. & meats.	Misc. & meats.	Misc. & meats.	Misc.
Usual maximum load, pounds					16,780		16,800	19,190.[10]
Average load, pounds								
Tons hauled								
Truck-miles operated	8,331	10,466	10,242	6,540	29,328	15,384	28,299	43,156.
DIRECT OPERATING COSTS								
Tires and tubes	$171.20	$204.14	$238.49	$150.60	$576.20	$388.80	$573.76	$824.27
Per mile	0.0205	0.0195	0.0232	0.0230	0.0196	0.0252	0.0202	0.0191
Gasoline, including tax	302.19	371.92	649.69	257.76	1,285.01	825.62	1,188.56	1,688.88
Per mile	0.0362	0.0355	0.0634	0.0394	0.0438	0.0536	0.0420	0.0391
Oil and grease	56.69	62.13	71.25	10.76	128.71	54.01	136.97	272.11
Per mile	0.0068	0.0059	0.0069	0.0016	0.0043	0.0035	0.0048	0.0063
Maintenance and repair	670.66	434.70	1,144.79	252.56	1,874.77	691.28	1,212.91	1,141.09
Per mile	0.0805	0.0415	0.1117	0.0386	0.0639	0.0449	0.0428	0.0264
Drivers' wages	541.52	680.29	665.73	425.10	1,906.32	999.96	1,839.44	
Per mile	0.0650	0.0650	0.0650	0.0650	0.0650	0.0650	0.0650	0.0650
Depreciation	340.86	340.86	280.20	217.14	608.88	304.44	608.88	1,740.08
Per mile	0.0409	0.0325	0.0273	0.0332	0.0207	0.0197	0.0215	0.0403
TOTAL DIRECT OPERATING COSTS								
Total direct operating cost	2,083.12	2,094.04	3,050.15	1,313.92	6,379.89	3,264.11	5,560.52	
Per truck mile	0.2500	0.2000	0.2978	0.2009	0.2175	0.2121	0.1964	
Per ton-mile								

Item	Truck 123-AF	Truck 124-AF	Truck 125-AF	Truck 126-AA	Average extra heavy-duty trucks
DESCRIPTIVE DATA					
Rated capacity, tons	10	10	10	10	
Number of wheels	6	6	6	6	
Tire equipment:					
Front	PN	PN	PN	PN	
Rear	D-PN [9]	D-PN [9]	D-PN [9]	D-PN [9]	
Type of body	Stake	Stake	Stake	Van	
Age at start of period, months	12	12	12	12	
Period covered, months	12	12	12	7	
Type of road	Paved	Paved	Paved	Paved	
Principal commodity handled	Misc.	Misc.	Misc.	Misc.	
Usual maximum load, pounds	19,190 [10]	19,190 [10]	19,190 [10]	22,500	
Average load, pounds				10,000	
Tons hauled					
Truck miles operated	42,724	44,810	43,418	35,891	
DIRECT OPERATING COSTS					
Tires and tubes	$816.81	$857.27	$831.82		
Per mile	0.0191	0.0191	0.0191		$0.0194
Gasoline, including tax	1,634.83	1,675.16	1,083.40	$1,430.88	
Per mile	0.0382	0.0373	0.0387	0.0398	0.0416
Oil and grease	231.73	248.32	228.45	240.00	
Per mile	0.0054	0.0055	0.0052	0.0066	0.0052
Maintenance and repair	1,060.74	984.55	868.42	1,872.00	
Per mile	0.0248	0.0219	0.0200	0.0521	0.0385
Drivers' wages				1,092.15	
Per mile				0.0304	0.0664
Depreciation	1,738.43	1,940.45	1,897.85		
Per mile	0.0406	0.0433	0.0437		0.0363
TOTAL DIRECT OPERATING COSTS					
Total direct operating cost					
Per truck mile					0.2183
Per ton-mile					

[9] On both rear axles.
[10] Pulling 10-ton trailer.

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TABLE 16.—UNIT OPERATING COSTS—Continued

COMBINATION AND NONMOTIVE UNITS

Item	Unit 1-AP		Unit 2-D		Unit 3-AP		Unit 4-AB		Unit 5-AG		Unit 6-AJ		Unit 7-AJ	
	Tractor	Semi-trailer	Tractor	Semi-trailer	Tractor	Semi-trailer	Tractor	Semi-trailer	Tractor	Semi-trailer	Tractor	Semi-trailer	Tractor	Semi-trailer
DESCRIPTIVE DATA														
Rated capacity, tons	1½	3	2	7	3	3	3	5	3½	8	7½	15	7½	15
Number of wheels	4	2	4	2	4	2	4	2	4	2	4	2	4	2
Tire equipment:														
Front	PN		PN		PN		PN		PN		S		S	
Rear	D-PN	D-PN	D-PN	D-PN	D-PN	D-PN	D-PN	D-PN	D-PN	D-PN	S	S	S	S.
Type of body		{Closed. Stake [11]		Stake		{Closed. Van [11]		Stake		Van		{Flat. Flat [11]		{Flat. Flat.[11]
Age at start of period, months			New		9		24		New		21		18	
Period covered, months	5		10		5		1		9		8		8.	
Type of road	Paved & gravel				Paved & gravel		Paved		Paved					
Principal commodity handled	Misc				Misc		Misc		Silk hose		Lumber		Lumber.	
Usual maximum load, pounds	8,000		15,400		12,000		20,000		13,000					
Average load, pounds	3,820		10,000		4,000		13,240		6,051					
Tons hauled							119							
Vehicle miles operated	6,380		20,664		9,650		3,040		31,341		8,275		15,010.	
DIRECT OPERATING COSTS														
Tires and tubes		$93.40		$721.74		$248.60		$91.20		$1,567.20		$337.83		$607.17
Per mile		0.0146		0.0349		0.0257		0.0300		0.0500		0.0108		0.0404
Gasoline, including tax		99.53		526.80		193.47		58.92		1,447.75		378.06		700.66
Per mile		0.0156		0.0255		0.0200		0.0193		0.0461		0.0456		0.0466
Oil and grease		19.80		35.58		42.30		11.40		60.94		60.85		93.90
Per mile		0.0031		0.0017		0.0043		0.0037		0.0019		0.0073		0.0062
Maintenance and repair		83.10		105.84		167.45		56.92		865.51		647.35		890.40
Per mile		0.0130		0.0051		0.0173		0.0187		0.0276		0.0782		0.0593
Drivers' wages		164.00		1,166.83		625.00		171.70		1,800.00		783.42		1,378.78
Per mile		0.0257		0.0564		0.0647		0.0564		0.0574		0.0946		0.0918
Depreciation				746.74						1,483.14		1,476.80		1,572.56
Per mile				0.0361						0.0473		0.1784		0.1047
TOTAL DIRECT OPERATING COSTS														
Total direct operating cost				3,303.53						7,224.54		3,684.31		5,243.47
Per vehicle-mile				0.1598						0.2305		0.4452		0.3493
Per ton-mile				0.0319						0.0761				

Item	Unit 8-W			Unit 9-W			Unit 10-AQ		Unit 11-AQ		Unit 12-H; trailer	Unit 13-H; trailer	Unit 14-H; trailer
	Tractor	Semi-trailer	Trailer	Tractor	Semi-trailer	Trailer	Truck	Trailer	Truck	Trailer			
DESCRIPTIVE DATA													
Rated capacity, tons	2½	3 to 5	2 to 4	3½	5 to 10	2 to 4	3½	5	5	5	3½	3½	3½.
Number of wheels	4	2	4	4	2	4	4	4	4	4	4	4	4.
Tire equipment:													
Front	PN		PN	PN		PN	S	PN	S	PN	PN	PN	PN.
Rear	D-PN	D-PN	PN	D-PN	D-PN	PN	D-S	PN	D-S	PN	D-PN	D-PN	D-PN.
Type of body		Stake / Stake [11]	Stake		Van / Van [11]	Van	Flat	Flat	Flat	Flat	Closed	Closed	Closed.
Age at start of period, months	6	30	18	6	18	18	60		120			18	7.
Period covered, months	6			6			12		12		5	5	5.
Type of road	Paved			Paved			Paved		Paved		Paved	Paved	Paved.
Principal commodity handled	Misc.			Misc.			Bldg. materials		Bldg. materials		Misc.	Misc.	Misc.
Usual maximum load, pounds	21,500			31,500							10,000	10,000	10,000.
Average load											4,616	4,677	5,073.
Tons hauled							1,092		364		544	552	619.
Vehicle miles operated	32,458			29,842			7,946		4,766		21,669	22,010	23,647.
DIRECT OPERATING COSTS													
Tires and tubes								$40.00		$131.40	$385.98	$3.00	$248.20
Per mile								0.0050		0.0275	0.0178	0.0001	0.0104
Gasoline, including tax			$1,014.65			$1,027.90		297.22		176.06			
Per mile			0.0312			0.0344		0.0374		0.0369			
Oil and grease			75.00			57.50		18.48		6.17	110.67	110.68	110.68
Per mile			0.0023			0.0019		0.0023		0.0012	0.0051	0.0050	0.0046
Maintenance and repair								297.41		139.95	119.44	166.91	118.22
Per mile								0.0374		0.0293	0.0055	0.0075	0.0049
Drivers' wages			1,039.10			1,039.10		720.99		59.75	[12] 177.00	[12]177.00	[12] 183.00
Per mile			0.0320			0.0348		0.0907		0.0125	0.0081	0.0080	0.0077
Depreciation			895.84			895.26					412.80	246.10	275.15
Per mile			0.0272			0.0300					0.0190	0.0111	0.0116
TOTAL DIRECT OPERATING COSTS													
Total direct operating cost											1,205.89	703.69	935.25
Per vehicle mile											0.0556	0.0319	0.0395
Per ton mile											0.0241	0.0136	0.0155

[11] Two different semitrailers interchanged with same tractor.
[12] Drivers paid $1.50 per day extra when trailer attached to truck.

TABLE 16.—UNIT OPERATING COSTS—Continued

COMBINATION AND NONMOTIVE UNITS—Continued

Item	Unit 15-H; trailer	Unit 16-AN; trailer	Unit 17-AN; trailer	Unit 18-AN; trailer	Unit 19-AN; trailer	Unit 20-AN; trailer
DESCRIPTIVE DATA						
Rated capacity, tons	3½	5	5	5	10	10.
Number of wheels	4	4	4	4	6	6.
Tire equipment						
Front	PN	D-PN	D-PN	S	S	S.
Rear	D-PN	D-PN	D-PN	S	S-S	S-S.
Type of body	Closed	Van	Van	Van	Van	Van.
Age at start of period, months	2	72	60	84	60	72.
Period covered, months	5	6	3	6	6	6.
Type of road	Paved	Paved	Paved	Paved	Paved	Paved.
Principal commodity handled	Misc.	Misc. & meats	Mis. & meats	Misc. & meats	Misc. & meats.	Misc. & meats.
Usual maximum load, pounds	10,000				34,000	34,000.
Average load, pounds	5,061					
Tons hauled	592					
Vehicle miles operated	22,292	15,306	11,578	8,137	12,739	15,232.
DIRECT OPERATING COSTS						
Tires and tubes	$271.87	$329.73	$311.96	$158.62	$261.65	$305.30
Per mile	0.0121	0.0215	0.0269	0.0194	0.0205	0.0200
Gasoline, including tax						
Per mile						
Oil and grease	110.70	5.74	5.74	5.74	5.74	5.74
Per mile	0.0049	0.0003	0.0004	0.0007	0.0004	0.0003
Maintenance and repair	64.91	345.27	161.05	182.15	424.72	639.69
Per mile	0.0029	0.0025	0.0139	0.0223	0.0333	0.0419
Drivers' wages	[12] 175.50					
Per mile	0.0078					
Depreciation	246.30	193.74	95.04	8.82	9.18	10.86
Per mile	0.0110	0.0126	0.0082	0.0010	0.0007	0.0007
TOTAL DIRECT OPERATING COST						
Total direct operating cost	869.28	874.48	573.79	355.33	701.29	961.59
Per vehicle mile	0.0389	0.0571	0.0495	0.0436	0.0550	0.0631
Per ton mile	0.0154					

[12] Driver paid $1.50 per day extra when trailer attached to truck.

TIRES AND TUBES

Very few concerns endeavored to set up an estimated tire life in miles and compute tire costs accordingly. The majority simply took the total amount expended, for both new tire purchases and repairs, and divided this sum by the mileage traveled to obtain a per mile cost for a particular period of operation. This latter method may produce an abnormal per mile tire cost unless it covers an extended period of time, sufficient to take into consideration the irregular exhaustion and replacement of tires and tubes for the vehicle.

Tire cost during a brief period of operation depends to a large degree upon the expenditures for new tire equipment. If no replacements are made during such period, assuming normal mileage traveled, the per mile cost will cover only the negligible amount spent for tire and tube repairs. Inversely, if it is necessary to equip the vehicle with all new rubber during the period, a high per mile tire cost results, and the succeeding period of operation will reap the benefit of the tire life still remaining. The length of period analyzed, therefore, becomes of particular importance in comparing per mile tire cost for the different units tabulated.

Other conditions affecting tire cost are road surfaces and grades, loads carried, maintenance (tire repair, inflation, wheel alignment, brake adjustment, etc.), driver ability, traffic conditions, and frequency of stops. Many of these factors affect other operating expenses.

The majority of the vehicles for which tire costs are given are equipped with pneumatic tires, with dual pneumatics on the rear wheels. The extremely small number of typical vehicles otherwise equipped does not allow a comparison of tire costs as between various types of tire equipment. Only a few of the vehicles listed are equipped with solid tires, but it may be significant that the other operating expenses per mile for these trucks tend to be high.

GASOLINE

Gasoline costs tabulated include the gasoline tax. Few operators made any attempt to keep the tax as a separate item of expense, since it was not considered essential to their accounting records. Nevertheless, the gasoline tax is often one of the largest single items of tax cost. The average gasoline tax in 50 representative cities in the United States in June, 1930, was 23 per cent of the average service-station gasoline price, not including tax, according to figures compiled by the American Petroleum Institute.[5] In many localities the tax will be a much larger proportion of the gasoline cost, especially if the operator purchases at wholesale prices. In comparing fuel costs, the differences in gasoline price (including tax) in different parts of the country must be taken into consideration. The number of gallons consumed was rarely reported, however; hence the price per gallon can not be computed from the total cost of the gasoline as set forth in the table.

LUBRICANTS

While the cost of oil and grease is relatively small as compared with other items of expense, it is by no means insignificant. Vehicles vary in their lubrication needs according to age and design and

[5] Petroleum Facts and Figures, third edition (1930), American Petroleum Institute, p. 49.

according to the conditions under which they are operated. The policy followed by a truck operator with respect to lubrication will not only affect this one item of cost, but may have a much more important effect upon maintenance and repair expense.

MAINTENANCE AND REPAIR

Maintenance and repair costs as tabulated show extreme variations. Efforts were made in compiling these figures to combine repair labor with repair materials and other expenditures for maintenance. In many instances it was difficult to reach an accurate total for all of these items, or to determine whether the figure given included all three classes of expense. The situation is complicated by the fact that in some of the smaller organizations the owners or the drivers do a considerable share of maintenance and repair work and the repair labor is not charged to that account. During a short period consideration must be given to variation in the per mile cost due to possible inclusion (or exclusion) of periodic overhauls, or of possible expensive repairs following an accident or mechanical failure.

DRIVERS' WAGES

As indicated by the per mile cost figures, few of the concerns interviewed paid drivers' wages on a mileage basis. A conspicuous exception appears in the group of 10-ton trucks, where 11 vehicles belonging to a single operator show a uniform rate of 6½ cents per mile. Only where route schedules can be so arranged that the drivers are assured of adequate compensation with but slight fluctuation in earnings does the mileage method of payment prove equitable to both employer and employee. When wages are paid on a time basis, a wide variation per mile naturally results from differences in daily mileage. In each group, those units showing a high cost per mile show also a low average daily mileage. Such low mileage may be due to a large proportion of time-consuming pick-up and delivery service as compared with line haul, to a predominantly urban route with many traffic delays, or to a short daily round trip and much actual idle time.

Whether the vehicle makes delivery to consignees or performs only the road haul has an important effect upon the per mile driver cost. Where a division of facilities exists, with the larger vehicles restricted to line-haul work and pick-ups and deliveries made by light trucks used solely for that purpose, the per mile driver cost for road trucks will generally be low. Wages for drivers of local trucks are often carried as part of the terminal expense rather than as a wage expense. A number of truck lines operate through truck terminals at destination points, and the pick-up and delivery expense is absorbed in the terminal charge. Other firms confine their operations and equipment strictly to line-haul service, contracting with local drayage concerns for pick-ups and deliveries. The restriction of the driver's duties to line-haul operation reduces his nondriving time to a minimum and results in a proportionately lower per mile driver cost.

DEPRECIATION

Depreciation is calculated by most motor truck operators on the basis of an estimated life in years—usually three to six for trucks, though four years is so common as to be almost the standard figure.

The fact that the United States Bureau of Internal Revenue has accepted four years as prima facie reasonable for income-tax purposes is probably responsible for the general adoption of the 25 per cent per annum rate. Trailers and semitrailers are generally estimated at a life of 50 to 100 per cent longer than that of trucks and tractor trucks. Some concerns also depreciate the truck chassis and body separately, on the assumption that the latter will have a longer life. In most instances the truck operator merely divides the actual cost of the vehicle when acquired by the estimated life in years, making no allowance for salvage value or for additions to capital account through subsequent replacements of major parts or installation of special equipment. A few firms depreciate their vehicles on a per mile basis.

Many truck owners apparently write off the value of their equipment faster than the vehicles actually depreciate, owing either to a natural inclination to provide a safe margin for replacement before the vehicle is worn out or obsolete or to an incorrect method of estimating its probable life. On the other hand, it will be noted that a depreciation figure is shown for some units which even under extraordinary circumstances should have been written off before they reached their present age. If an owner has recently purchased a truck secondhand he is, of course, entitled to allow for depreciation regardless of the age of the vehicle, but hardly in an amount as high as that shown for some units. The omission of a depreciation figure for some units in Table 16 is due either to this rapid depreciation or to the inability of the firm to furnish an accurate figure for this account.

In nearly every capacity class the table shows a maximum per mile depreciation cost for vehicles with a low annual mileage, and vice versa. This is only to be expected in computing any fixed cost on a per mile basis. It is of interest to note, however, that the units with maximum depreciation figures in the 1½-ton and 2-ton groups are depreciated at an arbitrary rate per mile. It would seem that this excessively high rate would be justified only if the vehicles were engaged in a particularly severe type of service.

AVERAGE COSTS

The most conspicuous characteristic of the per mile cost data for the various items is the tendency toward a wide and irregular distribution rather than a symmetrical concentration around an average figure, even within like capacity groups. This may be attributed principally to the limited number of data available. The only marked uniformity that appears anywhere is in the depreciation for both medium-capacity and heavy-duty trucks, where the frequency of the 3-cent rate is easily explained by the fact that these trucks were depreciated on an arbitrary 3 cents per mile basis, 12 of them in the medium-capacity class and 7 in the heavy-duty class belonging to a single operator.

With such irregularities an average cost lacks the significance it would have if there were a clearly typical figure in each group. An ordinary arithmetical average of per mile costs for the different units would be seriously affected by the abnormally extreme variations. There is no clear evidence, moreover, as to which items should properly be rejected before calculating an average on the remaining, presumably sound, items. The average for each class (medium-capa-

city, heavy-duty, and extra-heavy duty trucks) shown in Table 16, therefore, includes all the trucks in that class, but is weighted according to the mileage run by each truck. This minimizes the effect of those costs which are erratic owing to short periods of operation.

While there are several capacities of truck in each class, the groups are reasonably homogeneous, and the very small number of trucks of some sizes does not permit an analysis by single capacity classes.

The generally higher costs for the heavier trucks indicate that the figures for unit costs are at least consistent within themselves. As an additional check on these costs, however, they were compared with estimated costs per mile for direct operating costs as supplied by two leading truck manufacturers. These are shown in Table 17.

TABLE 17.—TRUCK OPERATING COSTS PER MILE AS SHOWN BY SURVEY, COMPARED WITH MANUFACTURERS' ESTIMATES

Rated capacity	Tires and tubes	Gasoline (including tax)	Oil and grease	Maintenance and repair	Drivers' wages	Depreciation
Field survey average:						
1½ to 3 tons	$0.0149	$0.0273	$0.0036	$0.0235	$0.0450	$0.0308
3½ to 5 tons	.0232	.0339	.0047	.0305	.0606	.0386
Estimated by manufacturer A:						
3 tons	.0264	.0208	.0024	.0185	.0400	.0195
5 tons	.0530	.0300	.0039	.0273	.0400	.0241
Estimated by manufacturer B:						
1½ tons	.0081	.0167		.0200		.0126
2 tons	.0100	.0200		.0225		.0161
2½ tons	.0100	.0222		.0250		.0158
3 tons	.0112	.0250		.0250		.0191
3½ tons	.0173	.0286		.0275		.0227
4 tons	.0224	.0286		.0275		.0230
5 tons	.0281	.0333		.0300		.0274

GROSS UNIT COSTS

No attempt is made in the unit-cost table to reach total costs of transportation, including overhead or administrative costs in addition to the direct operating costs tabulated. As previously stated, the principal object of keeping records of unit costs is to show the relative costs of different pieces of equipment, and for this purpose the overhead costs are of secondary importance. As a basis for rate making, however, it is desirable to know the total cost of a certain haul, and this requires some apportionment of overhead expenses.

The choosing of a satisfactory basis for such apportionment of overhead is not easy. Where all the vehicles in the fleet are alike and engaged in similar service, it makes little, if any, difference whether the allocation is made merely according to the number of vehicles in the fleet or whether it is made according to earnings, mileage, tonnage, capacity, direct operating costs, or other individual characteristic of each vehicle. Each unit will get an equal share, exactly or approximately. Where there are important differences between the vehicles, in either potential or actual performance, inconsistencies may arise to upset almost any system.

None of the bases mentioned above can exactly measure the proportionate overhead cost of any one unit. License, taxes, and garage storage will depend primarily upon size of vehicle; clerical overhead will probably bear a close relation to tonnage handled or, in less degree, to earnings or mileage run; fleet insurance is frequently based on gross revenue, and so on. It would seem to be impossible to set

forth any one general rule for the apportionment of overhead cost among the different units of a fleet under different forms of company organization.

An approximation of gross expenses per mile for the several truck-capacity groups may be reached by adding to each figure for total direct operating costs a proportionate addition to cover the overhead costs. This, of course, is equivalent to allocating the overhead costs in proportion to direct operating costs. The analysis of fleet costs in the following section of this report shows that direct operating cost averaged 57 per cent and overhead cost 43 per cent of the total. On this basis Table 18 gives an approximate gross expense per truck-mile for medium, heavy, and extra heavy trucks.

TABLE 18.—GROSS EXPENSE PER TRUCK-MILE, BY RATED CAPACITY GROUPS

Rated capacity	Direct operating costs (57 per cent)	Overhead costs (43 per cent)	Gross expense (100 per cent)
1½ to 3 tons	$0.1513	$0.1141	$0.2654
3½ to 5 tons	.2005	.1513	.3518
Over 5 tons	.2183	.1647	.3830

FLEET COSTS

Gross operating expenses for 91 motor truck fleets in the year 1930 were selected for clarity and completeness and are presented in Table 19. The firms listed show gross expenses ranging from approximately $15,000 to slightly over $800,000. They have been grouped according to size to facilitate a comparision between large and small operations as to the relationship of separate items of expense to gross expenses.

Because emphasis in the survey was given to unit costs rather than fleet costs, the latter were not obtained in every case where they were available. The number of firms represented in the table, therefore, is not an accurate indication of the percentage of firms interviewed that were able to furnish such data.

Although a more detailed classification of expenses than that given in the table is desirable, it was generally difficult to obtain from the operators details as to some expenses, and the subdivisions in the table were found to be the most adaptable to the majority of reports.

Records of mileage and tonnage and ton-mileage figures for fleet operations were meager. This deficiency is not of serious importance, however, as an attempt to measure fleet costs on one of these bases would mean very little. Per mile or other measure of costs averaged over a fleet is of value only when the fleet is composed of vehicles similar in every respect, and operating in identical service; even then only an approximation would be possible. The analysis of fleet cost figures, therefore, has been confined to showing the relation of each of the standard items of trucking cost bears to the gross expense for fleets in the different groups.

Where an expense column contains a figure for more than one expense or the expense item is not complete, the combined figure or the incomplete item is not included in the computation of the ratio of that particular cost item to gross expenses. This elimination of combination and incomplete expenses tends slightly to unbalance the percentages for a group, so that they do not total exactly 100 per cent, but the error is very small.

TABLE 19.—FLEET OPERATING COSTS

GROSS EXPENSES OF $10,000 to $24,999

Firm number	Direct operating expenses							Overhead expenses						Total gross expenses
	Tires and tubes	Gasoline (including tax)	Oil and grease	Maintenance and repair	Depreciation	Drivers' wages	Total	Taxes and licenses (not including gasoline)	Insurance	Rent	Wages and salaries	Miscellaneous	Total	
1	$1,427.12	[1] $1,876.20	(2)	$897.17	$2,482.25	(2)	[1] $6,682.74	$908.73	$924.67	$420.00	[1] $5,297.30	$583.11	[1] $8,133.81	$14,816.55
2	306.25	1,493.32	(2)	[4] 1,064.54	1,200.00	(2)	[1] 4,064.11	[4] 890.04	704.82	1,349.78	[1] 8,150.07	320.43	[1] 11,415.14	15,479.25
3	542.94	1,481.59	$161.12	1,656.54	[6] 2,373.53	$3,951.80	[1] 10,167.52	567.18	563.00	457.92	2,376.35	1,461.06	[1] 5,425.51	15,593.03
4	1,055.98	2,732.04	303.55	2,599.82	[6] 3,975.60	3,875.50	[1] 14,542.49	1,324.75	857.38	645.00	4,485.00	1,011.63	[1] 8,323.76	22,866.25
5	1,473.57	4,365.63	388.65	1,437.70	3,007.84	4,343.20	15,016.59	2,126.65	771.68	442.50	1,971.57	2,098.23	7,409.63	22,426.22
6	1,114.43	[1] 3,738.06	(2)	2,372.54	3,866.19	6,166.82	17,258.04	792.33	897.42	1,980.00	2,041.00	1,867.79	7,578.54	24,836.58
7	2,011.30	[1] 2,317.21	(2)	2,856.36	3,494.56	5,149.51	15,828.94	414.08	904.85	1,384.00	3,631.92	2,758.64	9,093.49	24,922.43
8	(2)	[1] 2,498.33	(2)	[12] 383.95	2,024.25	4,944.57	11,851.10	164.17	943.12	570.00	1,980.00	1,780.13	5,437.42	17,288.52
9	(2)	[1] 3,566.75	(2)	1,628.16	906.46	2,068.00	8,169.37	341.10	671.41	347.28	5,539.39	1,920.49	8,819.67	16,989.04
10	(2)	[1] 1,376.23	(2)	621.06	2,786.96	5,825.85	10,610.10	1,191.93	1,283.15	900.00	6,000.00	1,166.16	10,541.24	21,151.34
11	1,157.80	3,055.01	209.34	1,526.00	2,373.14	4,579.30	12,900.59	581.92	237.01	3,098.45	3,885.32	859.80	8,662.50	21,563.09
12	530.55	1,167.36	66.15	658.69	656.41	5,037.30	8,116.46	680.54	823.18	2,297.58	1,785.00	546.92	6,133.22	14,249.68
13	779.94	2,200.38	135.08	1,762.07	2,449.37	3,551.27	10,878.11	709.47	635.81	1,419.24	2,700.30	895.92	6,360.44	17,238.55
14	375.55	2,283.03	366.58	1,323.61	3,527.35	6,195.65	14,071.77	1,647.05	1,508.57	3,403.82	2,318.92	2,127.07	10,905.43	24,977.20
15	926.68	2,061.44	226.45	1,324.97	1,871.61	5,349.81	11,760.96	589.49	889.07	2,276.38	720.00	702.49	5,177.43	16,938.39
16	888.37	2,464.82	384.63	1,738.85	2,069.22	8,447.25	15,993.14	847.51	374.90	1,320.50	1,976.90	898.78	5,418.59	21,411.73
Per cent of total expenses	4.89	12.30	1.26	8.00	11.93	24.60	62.48	4.30	4.15	7.13	14.66	6.71	37.52	100.00

GROSS EXPENSES OF $25,000 TO $49,999

17	$2,071.63	$3,435.88	$464.52	$4,389.34	$3,349.39	$8,369.68	$22,080.44	$1,701.58	$1,590.51	$1,130.70	$6,511.50	$664.50	$11,598.79	$33,679.23
18	2,002.02	4,067.42	267.94	5,554.45	6,456.40	10,522.32	28,870.55	2,729.65	1,955.91	1,200.00	9,932.36	1,667.93	17,485.85	46,356.40
19	1,004.77	3,229.67	219.88	5,064.62	----------	10,237.44	19,756.38	2,778.84	5,343.37	2,269.04	7,227.40	400.97	18,019.62	37,776.00
20	817.39	4,633.12	659.22	4,893.63	[6] 3,207.90	[8] 18,703.20	[1] 32,914.46	1,449.30	2,256.42	3,267.60	5,215.11	1,892.48	[1] 14,080.91	46,995.37
21	(7)	6,882.00	472.00	[17] 7,163.00	4,251.75	11,700.00	30,468.75	607.38	1,749.00	900.00	10,945.00	3,444.00	17,645.38	48,114.13
22	1,781.76	3,619.76	352.44	3,905.91	3,650.04	8,782.71	22,092.62	681.02	851.60	866.74	4,552.40	1,174.15	8,125.91	30,218.53
23	(7)	4,807.41	350.00	[13] 3,084.90	2,600.00	(2)	[1] 10,842.31	297.00	1,917.45	1,200.00	[1] 9,932.67	1,062.00	[1] 14,409.12	25,251.43
24	1,723.55	4,730.00	660.00	4,664.49	6,250.00	9,630.00	27,658.04	191.90	1,206.67	336.00	3,750.00	196.00	5,680.57	33,338.61

25	1,346.65	2,716.98	468.24	2,308.98	3,821.60	8,194.24	18,856.69	1,053.22	1,856.28	893.62	5,234.11	3,578.79	12,616.02	31,472.71
26	1,637.29	4,416.62	642.25	2,198.23	1,806.92	8,665.47	19,366.78	950.56	926.92	1,994.50	5,480.00	1,611.33	10,963.31	30,330.09
27	1,269.00	[1] 8,000.00	[2]	1,735.86	[6] 5,435.00	6,600.00	[1] 23,039.86	548.80	1,645.00	7,461.67	7,762.00	3,047.00	[1] 20,464.47	43,504.33
28	1,491.59	4,017.72	451.85	1,291.05	3,991.50	4,013.00	15,256.71	480.00	1,811.78	1,620.00	5,040.00	1,452.80	10,404.58	25,661.29
29	1,512.39	7,276.51	660.07	5,896.00	6,475.94	12,068.15	33,889.06	1,689.87	716.63	3,615.82	4,200.00	3,489.71	13,712.03	47,601.09
30	842.06	3,528.79	286.83	2,555.41	3,483.66	5,431.46	16,127.21	892.06	539.52	2,699.36	2,915.00	[8] 7,175.30	14,221.24	30,348.45
Per cent of total expenses	3.99	12.24	1.27	10.14	10.95	23.70	64.43	3.13	4.76	5.75	16.18	6.03	35.57	100.00

GROSS EXPENSES OF $50,000 TO $99,999

31	$5,775.35	$9,048.48	$868.46	$4,162.40	$12,705.11	$20,649.95	$53,209.75	$3,378.45	$846.91	$2,418.33	$9,034.63	$7,996.23	$23,674.55	$76,884.30
32	511.44	3,864.80	304.44	4,342.21	5,866.32	16,133.63	31,022.84	3,051.77	3,118.93	864.50	14,345.30	2,836.13	24,216.63	55,239.47
33	[7]	[1] 8,433.63	[3]	[1] 8,974.53	10,314.90	14,486.73	42,209.79	2,320.69	3,867.85	3,979.77	20,244.93	12,267.86	42,681.10	84,890.89
34	4,633.23	10,992.88	700.00	5,853.31	8,408.72	18,739.18	49,327.32	1,637.65	3,972.78	1,861.40	10,242.84	7,565.38	25,280.05	74,607.37
35	1,683.34	4,793.69	1,026.46	881.84	----------	25,967.83	34,353.16	2,723.30	748.15	----------	9,575.27	6,136.38	19,183.10	53,536.26
36	3,652.96	[1] 5,522.63	[3]	4,166.22	8,370.96	11,810.14	33,522.91	190.21	2,692.66	----------	7,220.00	8,496.09	18,598.96	52,121.87
37	1,030.08	3,391.65	675.00	9,581.55	2,877.32	5,384.48	22,940.08	629.74	5,213.84	1,397.50	15,690.00	[10] 43,091.56	66,022.64	88,962.72
38	3,496.58	6,825.06	644.41	8,747.47	5,109.44	33,236.15	58,059.11	1,496.11	7,741.17	4,669.50	14,249.80	5,301.05	33,457.63	91,516.74
39	2,366.66	[11] 5,380.41	174.81	8,242.11	----------	26,345.33	[1] 42,509.32	2,255.87	4,547.87	2,340.00	7,140.00	5,210.73	[1] 21,494.47	64,003.79
40	1,198.07	5,677.04	748.80	2,562.71	6,102.71	16,172.25	32,461.07	2,034.99	2,304.34	5,461.10	7,332.11	4,135.88	21,268.42	53,729.49
41	9,593.58	[1] 14,236.93	[3]	8,263.21	8,010.22	12,950.57	53,054.51	3,303.83	3,356.10	7,373.12	10,516.03	5,262.12	29,811.20	82,865.71
42	[7]	7,870.40	[3]	[1] 7,532.27	----------	[3]	[1] 15,402.67	631.28	3,101.48	352.80	[12] 8,737.71	4,611.04	[1] 37,434.31	52,836.98
43	1,059.81	7,305.18	1,886.69	3,621.20	6,410.04	9,478.29	29,761.21	2,199.45	780.37	8,134.20	13,842.35	9,361.43	34,317.80	64,079.01
44	[7]	7,207.25	200.37	[1] 9,349.91	8,210.82	23,141.19	48,109.54	3,637.50	1,677.73	4,086.68	9,004.60	4,102.06	22,508.59	70,618.13
45	[7]	[1] 8,932.71	[3]	[11] 11,376.59	[6] 6,631.47	20,957.36	[1] 47,898.13	3,603.85	2,973.29	2,722.08	13,702.40	4,738.78	[1] 27,740.40	75,638.53
46	2,844.45	9,352.14	600.00	5,073.78	6,031.35	10,342.45	34,244.17	1,398.85	1,946.71	1,244.57	5,080.00	6,710.28	16,380.41	50,624.58
47	3,871.43	[1] 8,531.34	[3]	4,728.13	9,675.46	9,756.31	36,562.67	1,067.23	2,330.32	515.25	7,739.18	[13] 7,794.11	19,446.09	56,008.76
48	3,616.06	8,586.88	1,316.80	8,010.16	8,291.96	7,691.61	37,513.47	2,521.60	562.86	5,254.44	15,840.00	2,237.46	26,506.36	64,019.83
49	2,506.92	8,650.95	961.10	8,405.49	8,162.66	16,684.09	45,371.21	1,062.43	1,257.65	738.75	4,264.98	5,273.55	12,597.36	57,968.57
50	1,601.87	5,212.22	577.80	8,040.21	5,698.35	17,484.63	38,615.08	2,799.83	1,373.32	2,874.56	8,344.55	6,360.64	21,752.90	60,367.98
51	1,145.39	3,772.78	315.38	5,031.60	5,027.00	15,121.46	30,413.61	2,119.93	1,301.86	3,578.00	8,286.17	[13] 7,416.08	22,702.04	53,115.65
Per cent of total expenses	4.60	10.34	1.12	9.07	11.01	24.99	59.67	3.18	4.03	4.33	15.91	12.06	40.33	100.00

[1] Combination expenses and incomplete items not included in percentage computation.
[2] Included in gasoline cost.
[3] Included in wages and salaries.
[4] Repair labor included in wages and salaries.
[5] Incomplete.
[6] Includes depreciation on other property.
[7] Included in maintenance and repair.
[8] Includes drayage charges.
[9] Includes $4,663.48 for pick-up and delivery charges.
[10] Includes $32,242.67 for truck hire.
[11] Includes heat, light, and power expense.
[12] Includes $2,920.21 for pick-up and delivery charges.
[13] Includes $2,832.18 for truck hire.

TABLE 19.—FLEET OPERATING COSTS—Continued

GROSS EXPENSES OF $100,000 TO $249,999

Firm number	Direct operating expenses							Overhead expenses						Total gross expenses
	Tires and tubes	Gasoline (including tax)	Oil and grease	Maintenance and repair	Depreciation	Drivers' wages	Total	Taxes and licenses (not including gasoline)	Insurance	Rent	Wages and salaries	Miscellaneous	Total	
52	$7,335.57	[1] $14,994.44	(2)	$8,484.00	$20,744.35	$39,337.44	$90,895.80	$7,961.08	$7,005.96	$10,395.90	$35,140.93	$16,936.52	$77,440.39	$168,336.19
53	1,993.64	21,093.44	$2,195.73	24,666.25	18,290.83	66,354.04	134,593.93	9,132.43	8,773.20	5,725.00	50,774.13	10,125.45	84,530.21	219,124.14
54	2,058.59	11,172.75	1,539.23	9,422.76	9,896.47	39,475.12	73,564.92	9,404.12	6,424.27	9,405.34	35,052.62	12,179.23	72,465.58	146,030.50
55	10,139.00	23,624.32	1,500.00	7,472.00	8,400.00	27,039.00	78,174.32	8,512.00	7,900.00	20,759.00	52,298.00	22,596.00	111,885.00	190,239.32
56	2,873.45	15,272.05	1,417.00	10,105.77	8,695.84	36,424.49	74,788.60	4,545.21	2,854.40	7,062.75	9,252.34	8,459.30	32,174.00	106,962.60
57	12,842.80	18,987.26	2,123.67	28,339.17	15,835.09	22,937.48	101,065.47	5,066.03	3,442.84	7,007.32	47,247.27	48,464.14	111,227.60	212,293.07
58	(1)	17,552.07	4,400.00	[1] 21,238.50	9,600.00	19,188.71	71,979.28	2,647.97	2,510.00	2,037.00	30,715.82	9,294.77	47,205.56	119,184.84
59	14,584.55	[1] 32,133.69	(2)	21,709.76	31,578.24	39,760.84	139,757.08	4,334.67	18,076.13	2,442.40	57,054.28	24,504.47	106,411.95	246,169.03
60	7,206.38	[1] 23,558.11	(2)	[14] 9,557.93	21,509.35	(2)	[1] 61,831.77	4,075.26	11,367.42	3,893.00	[1] 101,069.55	26,623.07	[1] 147,028.30	208,860.07
61	(1)	[1] 26,220.74	(2)	[1] 18,292.79	29,063.52	101,760.32	175,337.37	9,740.19	10,133.17	4,523.00	14,774.19	4,894.23	44,064.78	219,402.15
62	9,626.43	[1] 32,008.20	(2)	13,162.72	----------	31,243.20	86,040.55	2,003.36	8,794.89	4,577.70	48,762.80	[15] 30,662.62	94,801.37	180,841.92
63	7,301.34	[1] 23,690.67	(2)	7,650.85	17,945.43	54,587.58	111,175.87	9,322.65	6,128.78	3,389.97	17,367.65	14,678.63	50,887.68	162,063.55
64	4,046.20	[1] 15,237.97	(2)	5,750.61	11,389.19	23,403.00	59,826.97	1,977.80	2,419.41	7,480.68	34,849.55	8,947.56	55,675.00	115,501.97
65	6,000.00	13,800.00	900.00	8,500.00	----------	30,000.00	59,200.00	3,810.00	4,200.00	4,800.00	20,000.00	20,600.00	53,410.00	112,610.00
66	4,971.90	13,730.89	1,160.51	13,860.51	7,530.50	37,514.62	78,768.93	3,719.54	5,168.15	4,931.50	31,347.00	10,813.01	55,979.20	134,748.13
67	7,275.98	11,023.41	1,482.76	6,130.20	13,422.42	52,364.65	91,699.42	4,046.31	1,968.33	4,835.07	15,249.74	[16] 27,592.29	54,291.74	145,991.16
68	10,027.45	[1] 21,766.46	(2)	13,594.55	[6] 9,073.02	22,673.39	[1] 77,134.87	3,539.48	1,645.37	4,433.53	10,800.00	5,484.19	[1] 15,210.57	103,037.44
69	8,193.07	15,053.17	1,816.02	10,487.40	10,894.34	15,845.81	62,289.81	3,685.69	1,573.70	8,807.73	25,644.13	5,293.92	45,005.17	107,294.98
70	9,828.27	14,114.44	960.00	4,488.67	10,222.49	10,364.86	49,978.73	3,249.53	5,511.57	2,601.75	39,932.21	7,132.46	58,427.52	108,406.25
71	5,455.95	[1] 20,992.35	(2)	5,538.43	23,927.56	26,192.68	82,106.59	1,495.14	5,248.11	4,071.97	16,169.75	25,370.78	52,355.75	134,462.72
72	8,920.68	12,304.20	3,850.83	17,658.36	8,420.04	14,913.48	66,067.97	783.83	2,179.51	487.95	7,549.14	[17] 39,746.28	50,746.71	116,814.30
73	11,002.96	21,639.65	2,795.49	11,234.98	24,641.69	31,305.60	102,620.37	8,365.76	7,140.26	4,002.50	72,279.31	22,150.84	113,938.67	216,559.04
74	17,322.49	30,003.50	4,936.49	24,253.20	22,661.36	51,117.73	150,294.77	----------	5,213.72	12,815.21	28,975.05	8,254.31	55,258.29	205,553.06
75	2,225.58	14,654.05	1,817.86	17,916.81	23,599.28	62,284.57	122,498.15	11,934.36	8,819.23	10,844.06	53,466.93	20,575.90	105,640.48	228,138.63
76	4,826.89	14,707.30	1,841.17	10,450.86	17,851.63	32,693.66	82,371.51	4,265.79	4,476.85	5,591.89	32,176.66	6,528.59	53,039.78	135,411.29
77	13,980.72	16,686.96	3,133.55	12,937.57	31,694.31	21,567.83	99,970.94	6,235.70	2,492.76	880.00	15,120.00	7,460.91	32,195.37	132,166.31
78	2,231.55	5,201.06	446.25	6,726.16	3,964.70	23,206.38	41,776.10	5,312.74	920.75	8,023.38	28,157.46	[18] 23,608.74	66,023.07	107,799.17
Per cent of total expenses	4.87	10.59	1.39	8.04	10.33	22.91	57.58	3.43	3.56	3.87	20.37	10.95	42.42	100.00

GROSS EXPENSES OF $250,000 AND OVER

79	$15,781.17	$61,941.57	$8,076.03	$70,231.32	[5] $55,436.80	$105,444.01	[1] $316,910.90	$36,048.49	$21,563.12	$12,153.80	$87,734.73	[19] $53,888.08	[1] $211,988.22	$528,899.12
80	4,388.43	[1] 20,954.46	(2)	11,007.06	25,922.95	18,328.36	80,601.26	15,409.38	6,375.68	14,062.56	96,459.05	[20] 54,080.01	186,393.28	266,994.54
81	19,403.70	31,630.75	3,742.11	37,852.10	[6] 36,156.08	66,052.65	[1] 194,837.39	11,543.66	10,333.99	7,594.50	31,214.95	61,092.17	[1] 121,779.27	316,616.66
82	0,015.11	[1] 24,868.75	(3)	11,294.27	87,854.66	39,092.67	169,125.46	2,353.70	8,150.85	4,200.00	56,077.59	11,364.86	82,747.00	251,872.46
83	7,350.00	37,350.00	3,350.00	36,675.00	16,850.00	73,000.00	174,575.00	3,440.00	10,035.00	6,700.00	69,000.00	63,250.00	152,425.00	327,000.00
84	18,073.66	[1] 46,209.01	(3)	24,029.59	28,302.46	(3)	[1] 116,614.72	3,289.45	17,127.68	11,522.14	[1] 227,168.49	56,369.35	[1] 315,477.11	432,091.83
85	20,755.37	42,010.83	6,273.72	46,220.36	20,602.85	61,344.76	203,207.89	12,817.89	19,369.63	21,513.48	42,309.80	28,716.54	124,727.34	327,935.23
86	15,170.07	30,337.54	(3)	21,561.17	20,702.48	26,965.77	114,737.03	12,296.13	5,809.50	10,036.01	39,219.42	[21] 101,782.67	169,143.73	283,880.76
87	9,673.74	34,741.44	3,496.83	26,518.35	45,544.17	68,506.84	188,481.37	8,907.47	14,410.00	13,117.53	50,376.87	39,227.43	126,099.30	314,580.67
88	58,425.41	90,536.65	10,982.92	64,889.12	[6] 71,514.51	118,591.96	[1] 414,940.57	60,945.02	26,026.34	12,417.26	157,096.16	138,295.76	[1] 394,780.54	809,721.11
89	31,939.33	90,881.62	9,382.75	39,312.24	[6] 69,029.32	(3)	[1] 240,545.26	33,046.18	75,701.48	13,424.36	[1] 314,095.50	78,321.52	[1] 514,589.04	755,134.30
90	26,002.00	40,054.00	4,014.00	57,275.00	36,604.00	126,544.00	290,493.00	3,741.00	21,152.00	(22)	(22)	[1] 81,006.00	105,899.00	396,392.00
91	16,942.87	35,386.47	4,586.78	33,096.65	40,355.90	28,214.63	158,583.30	9,462.44	15,666.07	(22)	[1] 53,200.53	[1] 117,436.84	195,765.88	354,349.18
Per cent of total expenses	4.58	11.25	1.30	8.80	10.80	17.16	54.69	3.92	4.61	2.69	17.66	16.49	45.31	100.00

RECAPITULATION

(Per cent of total gross expenses)

Expense group	Tires and tubes	Gasoline (including tax)	Oil and grease	Maintenance and repair	Depreciation	Drivers' wages	Total operating expense	Taxes and licenses (not including gas)	Insurance	Rent	Wages and salaries	Miscellaneous	Total overhead expense	Total gross expenses
$10,000–$25,000	4.89	12.30	1.26	8.00	11.93	24.60	62.48	4.30	4.15	7.13	14.66	6.71	37.52	100
$25,000–$50,000	3.99	12.24	1.27	10.14	10.95	23.70	64.43	3.13	4.76	5.75	16.18	6.03	35.57	100
$50,000–$100,000	4.60	10.34	1.12	9.07	11.01	24.99	59.67	3.18	4.03	4.33	15.91	12.06	40.33	100
$100,000–$250,000	4.87	10.59	1.39	8.04	10.33	22.91	57.58	3.43	3.56	3.87	20.37	10.95	42.42	100
$250,000 and over	4.58	11.25	1.30	8.80	10.80	17.16	54.69	3.92	4.61	2.69	17.66	16.49	45.31	100
Average	3.96	11.01	1.31	8.60	10.71	20.89	57.47	3.64	4.16	3.64	18.38	13.26	42.53	100

[1] Combination expenses and incomplete items not included in percentage computation.
[2] Included in gasoline cost.
[3] Included in wages and salaries.
[5] Includes depreciation on other property.
[6] Included in maintenance and repairs.
[19] Not including repair labor cost.
[20] Including $20,196.07 charged as local drayage.
[21] Includes $11,105.75 for repairs to buildings and plant.
[22] Includes $24,745.80 for pick-up and delivery charges.
[23] Includes $8,796.88 for truck hire and $5,474.77 for warehouse expense.
[19] Includes $18,328.36 for truck hire.
[20] Includes $37,754.31 for truck hire.
[21] Includes $64,549.22 for pick-up and delivery charges and $17,823.96 for truck hire.
[22] Included in miscellaneous expenses.

The percentage relationship of the individual items of direct operating or running costs to gross expenses shows no great variation among the different groups except for the wide spread in drivers' wages. In the $50,000 to $100,000 group, the ratio of drivers' wages to gross expenses is approximately 25 per cent, the highest of all groups, while the $250,000 and over group shows a ratio of 17 per cent, the minimum. The average for all groups is 21 per cent. The low figure for the $250,000 and over group is not necessarily indicative of a less proportionate expense per driver or a lower wage scale for this group, but rather to the tendency toward a higher percentage ratio of other expenses.

The percentage figure for total operating costs shows an almost consistent decrease in successive groups of higher gross expenses, this being offset by the increase in the ratio of fixed or overhead expenses to gross expenses for these groups.

Wages and salaries assume a proportionately larger part of the gross expenses for firms in the higher groups, owing to the greater number of persons other than drivers and mechanics employed by firms engaged in extensive operations. The ratio of this expense to gross expense fluctuates and shows no consistent trend among the various groups. A coincidence occurs in the $250,000 and over group in that the ratio of wages and salaries to gross expenses is approximately the same as that of drivers' wages to gross expenses. The matching of each dollar paid for drivers' wages by a dollar outlay for administrative salaries in this group appears indicative of the supervision and clerical detail necessary to the proper functioning of a large motor-freight operation.

As mechanics' wages are included in maintenance and repair expense, an exact ratio of total labor cost to gross expenses is not determinable. Drivers' wages and all other wages and salaries except mechanics', however, constitute 41 per cent of gross expenses for all groups.

It should be clearly understood that the item "Taxes and licenses" does not represent the total amount paid in taxes, since it excludes the important sum paid as gasoline tax as well as Federal and State income taxes. The gasoline tax information was not reported separately but included with expenditures for gasoline. The determination of the different types and the amounts of taxes paid by common and contract carriers was not feasible in this survey because the majority of operators made no segregation as between the various kinds of taxes paid, nor was it possible to ascertain the amount of taxes levied on the concern for the operation of motor vehicles as distinct from those assessed against the business in general.

Greater ownership of facilities by firms engaged in large-scale operations is evidenced by the decreasing ratio of rental expense to gross expenses in successive groups. The maximum ratio figure for this expense, 7 per cent, occurs in the lowest classification of $10,000 to $25,000, and the minimum of 2.7 per cent in the highest classification of $250,000 and over, with a consistent decrease for the intervening groups.

Miscellaneous expenses comprise a multitude of unclassified costs. Many of them constitute quite a large proportion of the total gross

penses for some concerns, but vary greatly both [redacted] character, with no one type occuring in a sufficient number of [redacted] tions to merit a separate classification. Where any of these unclassified costs amounts to 5 per cent or more of the gross expenses, a footnote has been appended, explaining the expenditure and giving the amount.

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