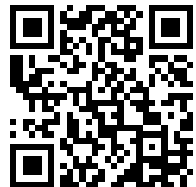


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Vol. XXVII July 25, 1928 No. 13

**OPERATING COST STATISTICS OF AUTOMOBILES  
AND TRUCKS**

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BULLETIN 91

ENGINEERING EXPERIMENT STATION  
IOWA STATE COLLEGE  
AMES, IOWA

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**T**HE PURPOSE of the Engineering Experiment Station is to afford a service, through scientific investigation, evolution of new devices and methods, and tests and analysis of materials;

For the manufacturing and other engineering population and industries of Iowa;

For the industries related to agriculture, in the solution of their engineering problems;

For all people of the state in the solution of the engineering problems of urban and rural life.

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ENGINEERING EXPERIMENT STATION

**OPERATING COST STATISTICS OF  
AUTOMOBILES AND TRUCKS**

By

T. R. AGG

Highway Engineer, Iowa Engineering Experiment Station, and  
HAROLD S. CARTER

Professor of Civil Engineering, South Dakota State College



IOWA STATE COLLEGE  
AMES, IOWA

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### LETTER OF TRANSMITTAL

Anson Marston, Director  
Iowa Engineering Experiment Station  
Ames, Iowa.

Dear Sir:

We take pleasure in transmitting herewith a report on Statistics of Cost of Operation of Automobiles and Trucks, which includes a considerable mass of information on a subject about which there is frequent inquiry. The report summarizes data that have been obtained from many sources and indicates what is probably a fair approximation of the actual cost, to the average owner, of operating a motor vehicle. There is also included an estimate of the variation of cost of operation of automobiles on various types of road surfaces, which estimate is based on a consideration of many investigations of gasoline consumption, tire wear, maintenance, and similar subjects.

It is recommended that this report be published as a Bulletin of the Iowa Engineering Experiment Station.

Respectfully submitted,

Iowa State College  
June 1, 1928

T. R. Agg,  
Highway Engineer.  
Harold S. Carter,  
Research Engineer.

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# OPERATING COST STATISTICS OF AUTOMOBILES AND TRUCKS

## I. INTRODUCTION

**1. Synopsis.** This report deals primarily with the cost of operation of automobiles and trucks as reported by the owners. There is first presented a tabulation of the reported costs of operation of automobiles. The reported costs are then summarized and analyzed with a view to showing the average cost of operation of certain arbitrarily chosen classes of automobiles, which are assumed to be of about the same weight. Finally there is presented an estimate of the average cost of operation of the aforesaid classes of automobiles when all items of cost are placed on a comparable basis.

Statistics of cost of operation of trucks are presented exactly as they were received, but are arranged in convenient form for reference.

On the basis of the automobile operating costs included in this report and the various researches referred to in the bibliography, an estimate has been prepared to show the approximate relative cost of operation of automobiles on high, intermediate, and low type road surfaces.

It appears, from the statistics included herein, that the average cost of operating an automobile throughout the year on all sorts of roads and under the usual weather conditions varies according to the weight of the vehicle, from about 6 cents to about 9.5 cents a mile and that the cost for individual automobiles may be slightly lower than the above average or very much higher. An estimate is included which indicates that it costs 0.99 cents a mile more to operate on intermediate type roads than it does on high type and about 1.07 cent a mile more to operate on low type roads than on intermediate type.

The statistics of truck operating costs give a good deal of information with reference to the cost of gasoline, oil, tires, and maintenance, but are incomplete as regards the other items of cost.

**2. Scope of the Report.** The purpose of this report is to present statistics of automobile and truck operating costs as reported by the owners or operators of the vehicles and from these reports to estimate general average automobile operating costs and the probable variation in cost of three classes of road surface; viz., high type, intermediate type, and low type.

The records of cost were obtained through the courtesy of state highway departments, fleet operators, and individual operators or

owners. Of the vehicles upon which cost reports were received, about 96 per cent were owned by organizations that operate vehicles on a commercial basis, usually in fleets. Records of cost for privately owned and operated automobiles or trucks are not readily obtained, if they exist. The vehicles upon which reports were obtained are operated in various parts of the United States, over all types and conditions of roads, through urban and rural traffic, under diverse climatic conditions, and by drivers of all degrees of skill and efficiency.

## II. AUTOMOBILE OPERATING COSTS

**1. Actual Reported Costs.** The cost reports received were generally in the form of the total cost of certain items for a group of vehicles during an accounting period. The reports on automobile operating costs are given in Table 8, page 22, and the various reported items of cost are arranged as follows:

The "cost per car" for each item is the average obtained by dividing the total cost reported for each of those items for a whole group of automobiles by the number in the group. "Cost per car" is therefore the average cost per car for the accounting period covered by the report.

"Average total mileage per car" and "length of accounting period" are also averages for the group.

Cost in "cents per mile" was obtained by dividing the "cost per car" by the "average total mileage per car."

"Average annual mileage per car" was obtained by dividing the "average total mileage per car" by the "length of accounting period."

"Average gross weight per car in tons" is approximate only, since in but few instances did the owner supply this information. An approximate weight per car for each group seemed necessary for a proper interpretation of the costs and the gross weights given in the tables were obtained by adding to the net weight<sup>1</sup> of the car approximately 200 pounds for roadsters and coupes, and approximately 300 pounds for all other types of cars.

"Miles per gallon" of gasoline was obtained by dividing the "total mileage for accounting period" by the total gallons of "gasoline consumed."

Dashes have been used throughout the table to indicate that the

<sup>1</sup>Rate Book of Weights and List Prices, 1927, used by the Motor Vehicle Department of the State of Iowa.

owner did not report on that item of cost. A glance through the table will show how large a percentage of operators reported only operating or variable costs.

Many operators furnished their records for consecutive accounting periods, which were generally calendar years, though not always. This division of the data has been maintained in the table through the use of letters to indicate successive accounting periods for the respective groups. Some groups, such as 1 and 2, contain a different number of cars in the successive accounting periods, due to additions or eliminations from the fleet.

Gasoline prices vary widely in different parts of the country and even within a single state, and in any locality quantity purchasers usually secure special prices. The amounts recorded in Table 8 are the actual sums reported and nothing is known as to the fluctuation in price during the accounting periods.

Retail oil prices appear to be fairly uniform throughout the country, but wholesale prices are quite variable, which may account in part for some of the low oil costs reported. The oil costs in Table 8 are as reported.

The costs reported for tires and tubes are also the actual reported expenditures during the accounting period, and in many cases it is apparent that tires were purchased at wholesale. The reports included in Table 8 apparently take no account of the difference in condition of tires between the beginning and end of the accounting period covered by the report. It is probable that in many instances there was a marked difference in the condition of tires at the beginning and end of the period. In some instances new tires were purchased during the period covered by the record and in others none were purchased.

Maintenance cost includes repairs, overhauling, greasing, washing, painting, battery replacements, and incidentals such as tire chains, light bulbs, etc. Many operators do their own repairing, greasing, washing, and painting and thereby reduce the actual cash outlay. Probably few of the reports include a money allowance for all of the actual time spent in keeping the car in condition.

Many operators included miscellaneous costs. It is not clear from the reports just what items are included under this heading.

Depreciation, where included in the table, is the difference between the reported purchase price and the reported sale or trade-in price, except in a few instances where the recorded amount is the operator's own estimate of depreciation.

License, garage, interest, and insurance were included as reported and generally there was no explanation of the basis for these items.

Table 8 may be taken as a fairly accurate account of the average sums spent for the various items by the owners who reported their costs. No attempt has been made to show the variations in the expenditures for individual vehicles in a fleet.

TABLE 1. SUMMARY OF PASSENGER AUTOMOBILE COSTS

Group number	1		2		3		4		5		6		7		8	
	Light-4 Roadsters		Light-4 Touring		Light-4 Coupe		Light-4 Sedan		Light-4 Weighted average		Medium-4 Roadster		Medium-4 Touring		Medium-4 Coupe	
Type of car	No. cars av'gd	Cents per mile	No. cars av'gd	Cents per mile	No. cars av'gd	Cents per mile	No. cars av'gd	Cents per mile	No. cars av'gd	Cents per mile	No. cars av'gd	Cents per mile	No. cars av'gd	Cents per mile	No. cars av'gd	Cents per mile
Gross wt., tons (approx.)	0.8	0.9	1.0	1.1	1.1	1.1	1.1	1.1	0.86	1.0	1.0	1.0	1.0	1.07	1.05	1.05
Groups from Table 8.....	2, 7, 9, 10, 11, 26	1, 3, 4, 5, 6, 8, 22, 23, 24, 25, 27	28, 29, 32, 33, 34	35, 36, 37, 38, 39					54, 57					40, 45, 47, 49, 51, 53, 58	42, 46, 56	
Items	No. cars av'gd	Cents per mile	No. cars av'gd	Cents per mile	No. cars av'gd	Cents per mile	No. cars av'gd	Cents per mile	No. cars av'gd	Cents per mile	No. cars av'gd	Cents per mile	No. cars av'gd	Cents per mile	No. cars av'gd	Cents per mile
Gasoline	200	1.24	264	1.34	11	1.37	11	1.42	482	1.32	3	1.04	21	1.14	3	0.94
Oil	200	0.30	264	0.21	11	0.19	7	0.23	482	0.25	3	0.12	21	0.16	3	0.19
Tires and tubes	200	0.78	264	0.53	11	0.44	8	0.60	483	0.63	3	0.30	21	0.51	12	0.35
Maintenance	200	1.12	264	1.89	11	1.12	8	1.82	483	1.55	3	0.72	21	2.43	12	1.12
Depreciation	17	1.16	129	1.47	5	1.47	6	2.01	157	1.48	3	1.72	17	1.75	12	2.03
Totals	200	4.60	264	5.47	11	5.29	8	6.08	483	5.23	3	6.25	21	5.99	12	4.63
Av. annual mi. per car	200	7,115	264	9,075	11	8,997	8	18,156	483	8,412	3	9,796	21	10,926	12	14,797
Av. age per car (yr.)	200	1.548	264	1.83	11	1.953	8	0.85	483	1.70	3	2.83	21	1.71	12	0.95
Av. annual mi. per car	17	14,073	129	9,748	5	7,390	6	15,613	157	9,923	3	9,796	17	11,713	12	14,797
Av. age per car (yr.)	17	1.147	129	2.37	5	1.78	6	1.07	157	2.17	3	2.83	17	1.80	12	0.95
Av. mi. per gal. of gas.	200	14.98	204	14.80	11	15.71	5	18.09	420	14.95	3	17.96	21	17.18	1	19.96
Group number	9		10		11		12		13		14		15		16	
Type of car	Medium-4 Coach-Sedan		Medium-4 Weighted average		Heavy-4 Roadster		Heavy-4 Touring		Heavy-4 Coupe		Heavy-4 Coach		Heavy-4 Sedan		Heavy-4 Weighted average	
Gross wt., tons (approx.)	1.2	1.2	1.29	1.29	1.29	1.29	1.42	1.42	1.4	1.4	1.4	1.4	1.7	1.40	1.40	1.40
Groups from Table 8.....	43, 44, 50, 52, 55		63, 65, 66, 82	60, 61, 62, 64, 68, 71, 76, 77, 78, 81, 83, 89,	73, 74, 75, 79, 93				72	84, 85, 88, 91						
Items	No. cars av'gd	Cents per mile	No. cars av'gd	Cents per mile	No. cars av'gd	Cents per mile	No. cars av'gd	Cents per mile	No. cars av'gd	Cents per mile	No. cars av'gd	Cents per mile	No. cars av'gd	Cents per mile	No. cars av'gd	Cents per mile
Gasoline	8	1.40	35	1.17	34	1.18	146	1.21	2	1.82	7	0.98	4	1.28	193	1.20
Oil	8	0.20	35	0.17	34	0.14	146	0.17	2	0.27	7	0.11	4	0.18	193	0.16
Tires and tubes	8	0.47	44	0.44	34	0.78	146	0.78	23	0.64	7	0.28	4	0.68	214	0.75
Maintenance	8	1.29	44	1.91	34	2.43	146	2.13	15	1.57	7	0.66	4	1.19	206	2.07
Depreciation	3	3.06	35	1.96	11	1.54	74	1.21	22	2.45	.....	.....	2	5.44	109	1.57
Totals	8	6.42	44	5.65	34	6.07	146	5.50	23	6.25	7	2.03	4	8.72	214	6.75
Av. annual mi. per car	8	17,194	44	13,044	34	16,277	146	15,475	23	10,727	7	22,084	4	10,216	214	15,210
Av. age per car (yr.)	8	0.57	44	1.37	34	1.61	146	2.01	23	0.75	7	0.57	4	1.40	214	1.75
Av. annual mi. per car	3	10,511	35	12,503	11	15,287	74	16,219	22	9,934	.....	.....	2	6.541	109	14,679
Av. age per car (yr.)	3	0.77	35	1.51	11	2.45	74	2.50	22	0.76	.....	.....	2	0.91	109	2.11
Av. mi. per gal. of gas.	8	17.97	33	17.53	34	15.92	142	15.59	2	17.66	7	19.13	7	15.22	187	15.29

Group number	17	18	19	20	21	22	23	24
Type of car	Light-6 Touring	Light-6 Coupe	Light-6 Coach	Light-6 Sedan	Light-6 Weighted average	Medium-6 Roadster	Medium-6 Touring	Medium-6 Coach
Gross wt., tons (approx.)	1.98	1.35	1.47	1.55	1.41	1.5	1.68	1.68
Groups from Table 8.....	100, 113, 115	94	95, 98, 119	116, 117		104	102, 108, 109, 114, 127, 128	96, 97, 99, 103, 118
Gasoline .....	11 1.39	4 1.01	5 1.37	2 1.37	22 1.31	2 1.44	9 1.49	6 1.67
Oil .....	11 0.13	4 0.12	5 0.18	2 0.58	22 0.18	2 0.21	9 0.20	6 0.21
Tires and tubes .....	11 0.56	4 0.23	5 0.38	2 0.28	18 0.38	2 0.60	9 0.75	6 0.74
Maintenance .....	11 2.86	4 0.41	5 1.72	2 0.59	22 1.95	2 1.08	9 1.79	6 1.40
Depreciation .....	9 1.56	.....	1 7.38	.....	10 2.14	2 0.78	4 3.31	2 2.85
Totals.....	11 6.50	4 1.53	5 10.70	2 2.77	22 5.96	2 4.11	9 7.54	6 6.87
Av. annual mi. per car	11 22,027	4 18,621	5 8,540	2 7,566	22 17,028	2 14,138	9 8,784	6 25,167
Av. age per car (yr.)	11 2.55	4 0.92	5 0.48	2 1	22 1.64	2 2.0	9 3.33	6 0.78
Av. annual mi. per car	9 22,297	.....	1 5,521	.....	10 20,619	2 14,138	4 6,387	2 28,421
Av. age per car (yr.)	9 2.95	.....	1 1.42	.....	10 2.80	2 2.0	4 5.53	2 0.64
Av. mi. per gal. of gas.	10 13.22	4 18.32	5 15.03	2 13.88	21 14.68	2 13.54	8 12.67	6 13.77
Group number	25	26	27	28	29	30	31	32
Type of car	Medium-6 Weighted average	Heavy-6 Roadster	Heavy-6 Touring	Heavy-6 Coupe	Heavy-6 Coach	Heavy-6 Sedan	Heavy-6 Weighted average	Weighted average of all Pass. auto
Gross wt., tons (approx.)	1.66	1.76	1.81	2.1	1.85	2.12	1.86	1.09
Groups from Table 8.....	126, 129	106, 110, 120, 124, 130	112	122, 123	105, 121, 125			
Gasoline .....	17 1.55	4 1.65	22 1.32	1 1.40	4 1.44	5 1.61	36 1.41	786 1.29
Oil .....	17 0.20	4 0.15	22 0.13	1 0.66	4 0.12	5 0.27	36 0.17	786 0.22
Tires and tubes .....	17 0.73	4 0.58	22 0.76	1 0.31	7 0.63	5 0.77	39 0.71	816 0.67
Maintenance .....	17 1.57	4 2.67	22 2.60	1 0.34	7 3.17	5 1.69	39 2.53	812 1.96
Depreciation .....	8 2.56	4 2.13	21 2.01	1 5.59	3 2.49	1 7.33	30 2.37	349 1.59
Totals.....	17 6.61	4 7.18	22 6.82	1 8.30	7 7.85	5 11.67	39 7.19	820 5.73
Av. annual mi. per car	17 15,196	4 24,278	22 18,232	1 9,546	7 18,113	5 13,781	39 18,037	820 11,335
Av. age per car (yr.)	17 2.28	4 2.11	22 2.93	1 1.1	7 0.69	5 0.81	39 2.33	820 1.71
Av. annual mi. per car	8 13,833	4 24,278	21 18,171	1 9,546	3 12,301	1 8,152	30 18,382	349 12,873
Av. age per car (yr.)	8 3.42	4 2.11	21 2.1	1 1.1	3 1.0	1 1.84	30 2.45	349 2.15
Av. mi. per gal. of gas.	16 13.19	3 12.45	22 14.63	1 14.77	4 13.22	5 12.75	35 14.02	713 15.07

**2. Summary of Reported Costs.** The costs reported in Table 8 were assembled in groups according to the type and weight of the automobile and the weighted average of each item of cost was computed for each group. The results are presented in Table 1. A few of the groups that appear in Table 8 were not carried into the average for obvious reasons. For instance, groups 13 to 19 of Table 8 represent automobiles operated in service requiring house to house stops and these groups have been omitted from Table 1.

Cost items for gasoline, oil, tires and tubes, maintenance and depreciation are the ones which were most consistently supplied by the owners. The remaining items such as license, garage, interest and insurance are fixed costs and may be determined very accurately in advance for any given group of cars operating within a given territory.

The arrangement of Table 1 is as follows:

- A. Each of the automobiles upon which reports were received was assigned a classification according to the following schedule:
  1. Light 4's—Fords of all models.
  2. Medium 4's—Chevrolet, Star, Overland.
  3. Heavy 4's—Dodge, Maxwell, Nash, Chrysler 60, Oldsmobile, Hupmobile.
  4. Light 6's—Essex, Chrysler 70, Oldsmobile, Studebaker, Oakland.
  5. Medium 6's—Chrysler, Buick, Jewett, Studebaker, Nash, Chandler.
  6. Heavy 6's—Buick, Studebaker, Hudson, Paige, Reo.
- B. The actual averages of the costs reported in Table 8 were assembled in Table 1, and the tabulation indicates the number of vehicles included in each summary.
- C. Following the tabulation of the reported costs for the several types (roadster, coupe, sedan, etc.) of each group of automobiles there is a summary which is a weighted average of all costs reported for that group.

The average costs for each group in Table 1 are shown graphically in Fig. 1.

**3. Estimated Comparative Costs.** Table 2 is a compilation based on the costs recorded in Table 1 and is an attempt to show the probable average total annual costs in dollars and the total average costs in cents per mile for each group of vehicles for which a summary of operating costs appears in Table 1.

The average annual mileage of operation of the 820 automobiles upon which reports appear in Table 1 was between 11,000 and 13,000 miles. Table 2 was prepared on the basis of an annual mileage of 11,000. A group of cars that is possibly more representative from

TABLE 3. AVERAGE COST OF AUTOMOBILE OPERATION

Based on detailed cost records covering about 800 automobiles operated in various parts of the United States and an average of 11,000 miles per year. The reports were largely from fleet operators who purchase supplies at wholesale and the items of gasoline and tires have been converted to retail price basis.

Type of car	Light 4 <sup>2</sup>		Medium 4 <sup>3</sup>		Heavy 4 <sup>4</sup>		Light 6 <sup>5</sup>		Medium 6 <sup>6</sup>		Heavy 6 <sup>7</sup>	
	Average	per mile	Average	per mile	Average	per mile	Average	per mile	Average	per mile	Average	per mile
GROSS wt., tons (Approx.)	0.86		1.08		1.4		1.41		1.66		1.86	
Items <sup>1</sup>	Dollars per year	Cents per mile	Dollars per year	Cents per mile	Dollars per year	Cents per mile	Dollars per year	Cents per mile	Dollars per year	Cents per mile	Dollars per year	Cents per mile
1. Gasoline at 20 cents per gal.	147.40	1.84	126.40	1.14	144.10	1.31	149.60	1.36	167.20	1.52	157.30	1.42
2. Oil	27.60	.25	18.70	.17	17.60	.16	19.80	.18	22.00	.20	18.70	.17
3. Tires and tubes	66.00	.60	71.50	.65	77.00	.70	82.50	.75	88.00	.80	99.00	.90
4. Maintenance	170.50	1.55	210.10	1.90	227.70	2.06	214.50	1.95	236.50	2.14	273.30	2.53
5. Depreciation	137.60	1.25	154.00	1.40	172.70	1.57	192.50	1.74	229.90	2.09	282.70	2.57
6. License	12.00	.11	15.00	.14	22.00	.20	22.00	.20	26.00	.24	30.00	.27
7. Garage at $\frac{1}{2}$ per month	48.00	.44	48.00	.44	48.00	.44	48.00	.44	48.00	.44	48.00	.44
8. Interest at 6 percent	30.00	.27	42.00	.38	60.00	.55	60.00	.55	78.00	.71	95.70	.87
9. Insurance (fire, theft, tornado, liability)	23.00	.21	22.00	.20	23.00	.21	23.00	.21	23.00	.21	23.00	.21
Total	661.90	6.02	706.70	6.42	792.10	7.20	811.90	7.38	923.60	8.40	1036.70	9.45
Annual mileage	11,000		11,000		11,000		11,000		11,000		11,000	
Average miles per gallon gas	14.95		17.53		15.29		14.68		13.19		14.02	

1. From reported costs reduced to uniform price per gallon.  
 2. Average reported.  
 3. Based on average retail prices of tires.  
 4 and 5. Reported for vehicles that had been operated for a period and then sold.  
 6. At the Iowa rate, i.e., 40 cents per cwt. plus 1 percent of list price.  
 7. Light 4—Fords, all types.  
 8. Medium 4's—Chevrolet, Star, Overland.  
 9. Heavy 4's—Dodge, Nash, Maxwell, Chrysler, Oldsmobile, Hupmobile.  
 10. Light 6's—Esex, Chrysler, Oldsmobile, Studebaker, Oakland.  
 11. Medium 6's—Chrysler, Buick, Jewett, Studebaker, Nash, Chandler.  
 12. Heavy 6's—Buick, Studebaker, Hudson, Falge, Reo.

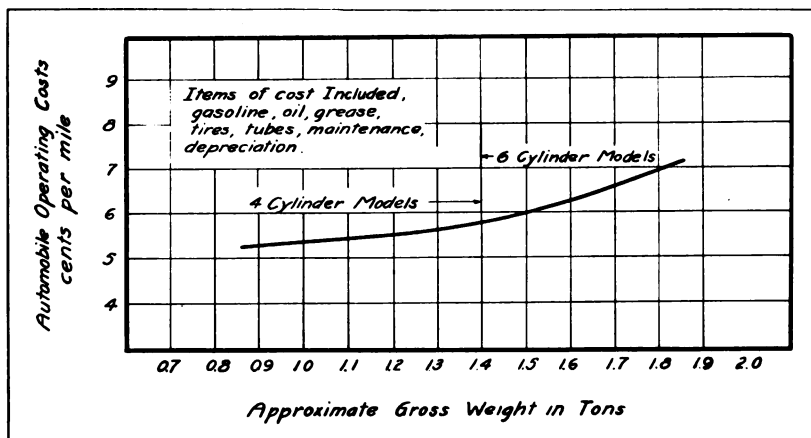


Fig. 1. The relationship between operating costs (exclusive of cost of garage, interest, license, and insurance) and weight of vehicle.

the standpoint of miles operated per year appears in a study<sup>2</sup> by Robley Winfrey. These are mostly privately owned and operated automobiles, and the averages of the reported mileages are as follows:

Make of Car	Number of Cars	Average Annual Mileage
Buick	25	8286
Cadillac	5	6652
Chevrolet	39	8110
Dodge	18	8174
Essex	7	8680
Ford	116	8414
Maxwell	8	7160
Overland	12	5779
Studebaker	10	9964
<b>Weighted Average</b>	<b>240</b>	<b>8195</b>

These averages are based on total mileage on cars operated over the period 1913 to 1926, the ages varying from 13 years to less than one year.

The average annual mileage of the 1923 and later model cars was:

Year Model	Number of Cars	Average Annual Mileage
1923	71	9081
1924	48	10417
1925	40	11892
1926	2	17075

<sup>2</sup>"Registration and Mortality Studies on Iowa Automobiles," by Robley Winfrey, a Master of Science thesis, Iowa State College, 1926 (Table 11 and Table 33 in part).

From these figures by Winfrey it appears that the annual mileage of automobiles is rapidly increasing and in Iowa at this time (1928) is probably over 11,000 miles.

Fig. 2 was prepared on the basis of the costs in Table 2 to show the variation in cost per mile with the miles operated per year.

While the estimates of cost in Table 2 are based on the reports received, certain assumptions were necessary in order to establish a reasonably uniform basis of comparison. The cost of gasoline has been converted to a uniform price basis of 20 cents a gallon. The cost of tires has been estimated on the basis of prices for standard tires. Depreciation has been computed on the basis of the difference between original cost and trade-in allowance reported by various owners. It follows quite closely the curve in Fig. 3, which is taken from the thesis of Winfrey. License fee has been included at the

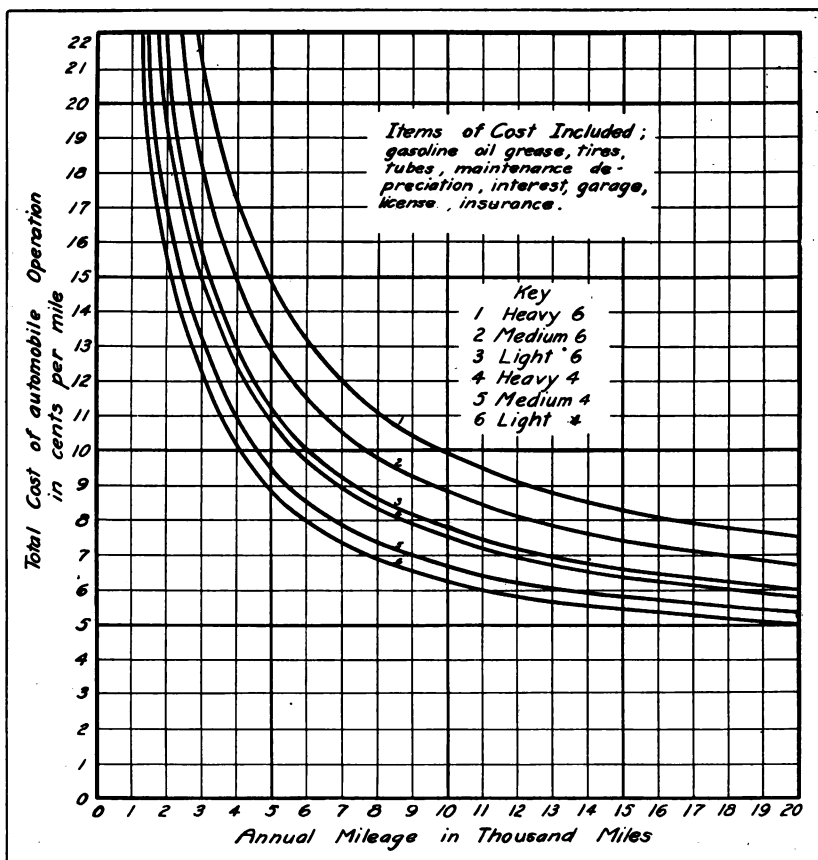


Fig. 2. Relationship of total operating cost per mile to total annual mileage.

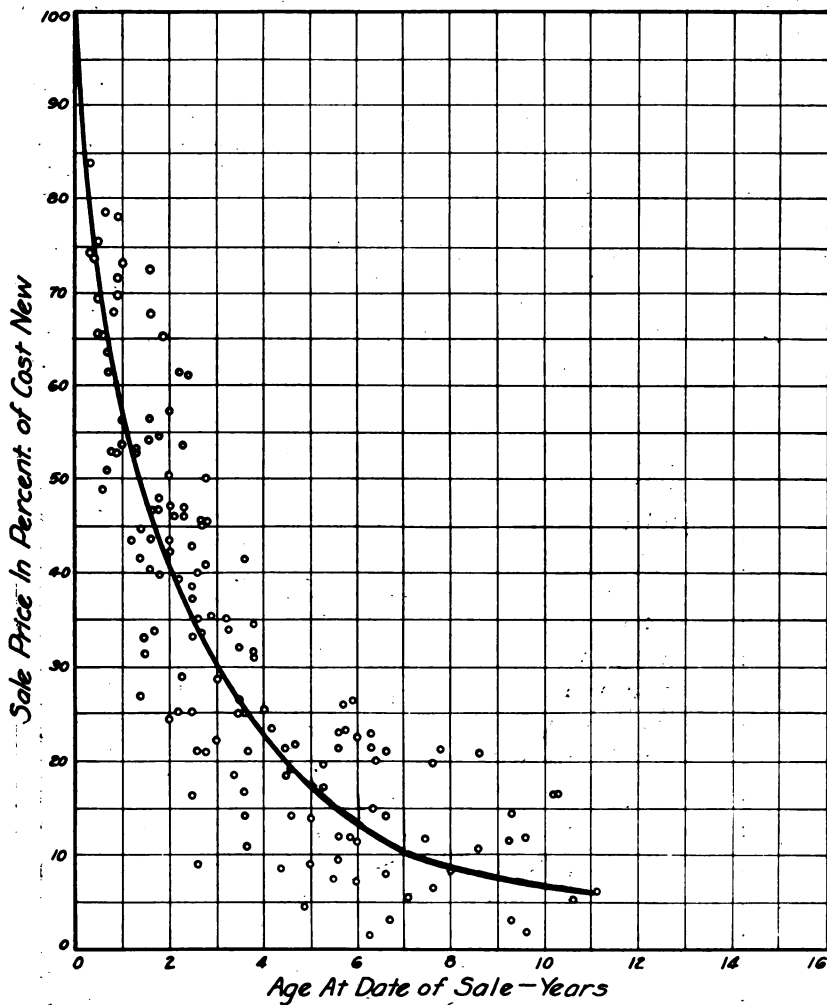


Fig. 8. Relationship of age to sale price of automobiles, exclusive of Fords. From Thesis of Robley Winfrey, Iowa State College, 1926.

rate in effect in Iowa, i. e., 40 cents per cwt., plus 1 per cent of the list price. The basis for the other items is given in the footnote of the table.

It is apparent that the total cost of gasoline, oil, rubber, and maintenance will vary with the miles of operation. Depreciation is partly a function of mileage and partly a function of obsolescence. No attempt has been made to separate the two kinds of depreciation, but on the contrary depreciation is assumed to vary with mileage. The

above group of costs are referred to as "mileage items". The other items of cost are functions of time and are referred to as "time items". In Fig. 4 is shown the variation of the "time items" and "mileage items" for the several classes of automobiles.

In order to determine whether the grouping of the automobiles upon which costs were reported was representative of the mass of automobiles in operation in Iowa, the diagram in Fig. 5 was prepared. It will be noted that the distribution by weight in Table 2 is fairly close to the distribution obtained from registration figures. The cost data table contains reports from slightly more of the heavier vehicles than would be desirable if a true cross-section of total automobile registration were to be obtained.

Fig. 3 shows the depreciation to be expected on automobiles, based on the sale or trade-in price secured on a large number of vehicles.

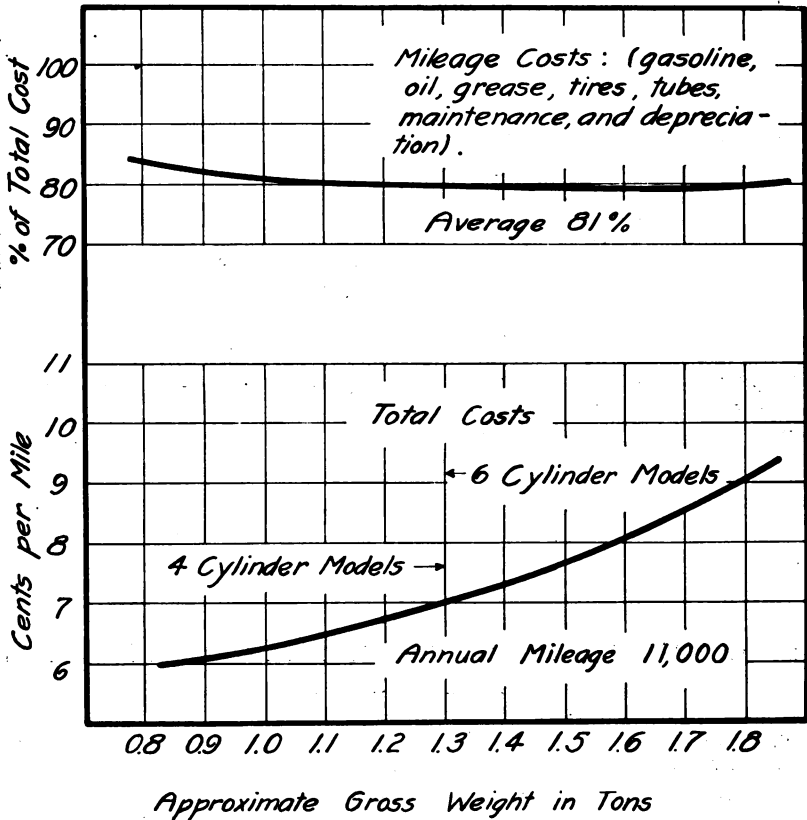


Fig. 4. Fixed costs and mileage costs of automobile operation.

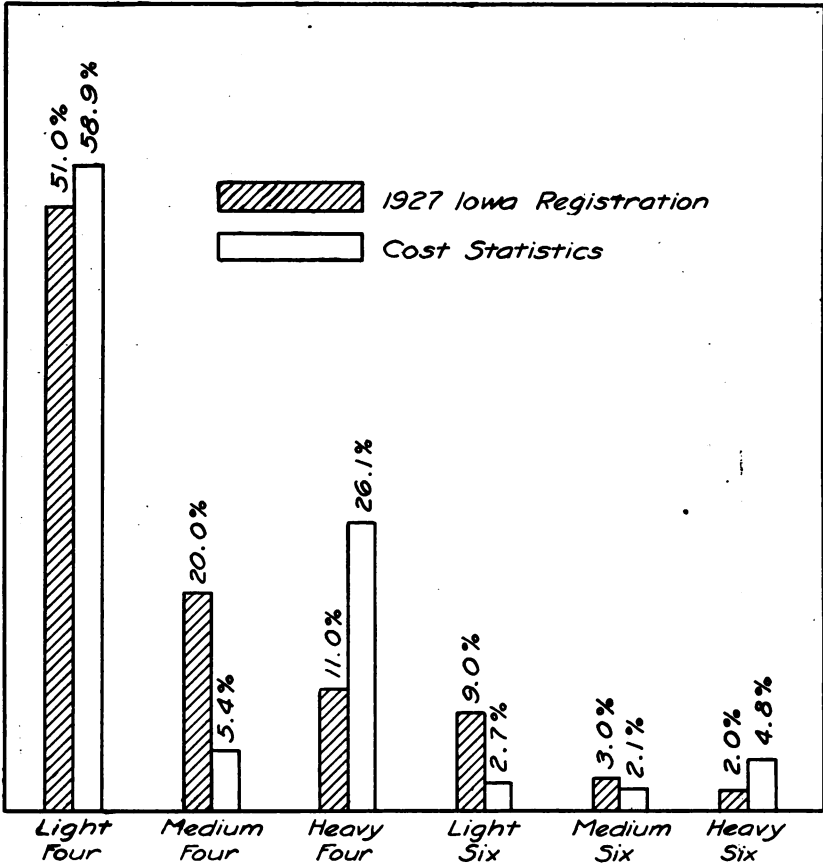


Fig. 5. Comparison of the percentage of each group of automobiles with the percentage of the same group in the cost statistics herein.

This factor in operating cost is exceedingly important because it constitutes the largest item of cost in many instances and is second in magnitude when not first.

### III. RELATIVE COST OF OPERATION ON VARIOUS CLASSES OF HIGHWAYS

The cost reports summarized in the foregoing pages yield no direct information regarding the effect of variations in the type and the condition of the road surface on the cost of vehicle operation thereon. Comparisons of that kind can be made only when the data

are the result of very carefully controlled operation, the speed, tire inflation, and kind of fuel being identical for all runs used in the comparisons. The natural tendency of traffic is to maintain a higher speed on the good surfaces than on the poor, which, although effecting a saving of time, may increase the actual cost of operation over that on the poorer road, due to higher wind resistance.

It is believed that the effect of road condition upon vehicle operating costs may be estimated by the correct interpretation of a mass of research data that has appeared in recent years, the more important of which is described in the publications listed in the Bibliography. The relative cost estimates below were accordingly prepared in that way and the several assumptions in the analysis are as follows:

1. In order that seasonal variation in road condition may be taken into account, it was assumed that an automobile is operated regularly throughout the year, traveling at a speed of 30 to 40 miles an hour, and that the schedule (but not the speed) is maintained regardless of the condition of the roads so long as operation is possible. That is, the vehicle makes regular daily or weekly trips or some other fairly regular trip schedule, and does not avoid the days when the roads are not at their best.

2. The relative rate of tire wear is assumed to be 1.00 for high type roads, 2.12 for intermediate types and 2.90 for low types. This is based on the tire wear researches noted in the Bibliography.

3. The maintenance cost of the vehicle is assumed to vary in accordance with the work done by the motor in various kinds of service, measured by the rate at which the motor delivers power and uses fuel. This presupposes that the maintenance of the vehicle is due entirely to the wearing of parts, which is a conservative view to take, since other factors add to the effect of mechanical deterioration, especially when the vehicle is operated on low type roads.

4. Depreciation in the value of the used vehicle is due in part to mechanical deterioration and in part to obsolescence. It is assumed that one-half of the depreciation is chargeable to mechanical deterioration and one-half to obsolescence. The portion that is due to mechanical deterioration is assumed to vary with the work done by the motor as measured by fuel consumption. This view neglects the effect of road condition on the deterioration of the body of the vehicle.

5. From all of the accessible records of tractive resistance of automobiles, the average tractive resistance for year-around operation at a speed of about 35 miles an hour was estimated for the three classes of roads as follows:

High types (pavements of all kinds in average good condition) .....	70 lb. per ton
Intermediate types (gravel, macadam and bituminous treated surfaces).....	110 lb. per ton
Low types (natural soil roads and light gravel or sand-clay surfaces) .....	160 lb. per ton

6. With these values of tractive resistance the average relative gasoline consumption was determined from reported engine tests and actual measurements on the road. The following results were obtained:

High types .....	1.00 = basic rate
Intermediate types .....	1.20 of basic rate
Low types .....	1.47 of basic rate

The above figures signify that, as the average throughout the year, if a vehicle will travel 15 miles on a high type road per gallon of gasoline, it will take 1.2 gallons of gasoline to travel 15 miles on an intermediate type, and 1.47 gallons to travel 15 miles on a low type. Of course there are times when there is little or no difference in the mileage per gallon on the several types of roads but a comparison of the nature desired must be based on year around conditions.

The effect of these several variables upon cost of operation is most readily presented in the form given in Table 3, in which factors are used to indicate the relative cost of each item of operation on three general classes of road. If the cost of any item is known for one type of road, the cost for either of the other types may be calculated by

TABLE 3. EFFECT OF ROAD CONDITION ON VARIOUS ITEMS OF OPERATING COST

Item of cost	Sum expended for the item when using high type roads	Sum required for equal mileage on intermediate type roads	Sum required for equal mileage on low type roads
Gasoline .....	\$1.00	\$1.20	\$1.47
Oil .....	1.00	1.00	1.00
Tires and tubes .....	1.00	2.22	2.90
Maintenance .....	1.00	1.20	1.47
Depreciation .....	1.00	1.10	1.24
License .....	1.00	1.00	1.00
Garage .....	1.00	1.00	1.00
Interest .....	1.00	1.00	1.00
Insurance .....	1.00	1.00	1.00

the use of the appropriate factor from Table 3. Obviously some items of operating cost are not directly influenced by road conditions. For convenience, the high type is used as the basis of comparison.

In attempting to present a figure representing the "average cost of automobile operation," one is confronted with the fact that no specific automobile is an "average" automobile, although some classes are near the average in cost of operation. What is desired is the figure obtained by dividing the total cost of operating all cars during some period, say one year, by the total mileage operated for the period. No such figure is available, but if the costs tabulated in Table 2 are truly representative of the costs of the respective groups, a general average may be obtained by taking account of the propor-

tion of each group in the total registration of automobiles. This proportion can be obtained quite closely from Fig. 5 and with these percentages as a basis, the cost of operation of an imaginary "average" automobile was computed from the data in Table 2. The result is given in Table 4.

TABLE 4. COST OF OPERATION OF AN IMAGINARY "AVERAGE" AUTOMOBILE\*  
(Annual mileage of 11,000)

Item of cost	Cents per mile
Gasoline .....	1.81
Oil .....	0.22
Tires and tubes.....	0.64
Maintenance .....	1.72
Depreciation .....	1.89
License .....	0.14
Garage at \$4 per month.....	0.44
Interest at 6 per cent.....	0.36
Insurance (fire, theft, tornado).....	0.21
<b>Total cents per mile.....</b>	<b>6.48</b>

Since the automobiles, upon which the cost reports tabulated herein were received, were operated on all sorts of roads, the general average given in Table 4 probably represents the cost of operation on intermediate type roads more nearly than it does the cost on either high type or low type roads, and it is so considered. Whether this is true or not is relatively unimportant in the analysis that follows, as will be apparent from a casual examination of the tables. By applying the factors of Table 3 to the cost figures of Table 4 there is obtained a close approximation to the *relative* cost of operating an imaginary "average" automobile on the three types of roads. These costs are given in Table 5.

From the data of Table 5, it is possible to estimate how the average figures of Table 2 would be affected by road conditions and Table 6 has been prepared to bring out this comparison.

One measure of the value of road improvement is the saving in

TABLE 5. RELATIVE COST OF OPERATING AN IMAGINARY "AVERAGE" AUTOMOBILE ON VARIOUS CLASSES OF ROADS

Item of cost	Approximate relative cost of operation in cents per mile		
	High type roads	Intermediate type roads	Low type roads
Gasoline .....	1.09	1.81	1.61
Oil .....	0.22	0.22	0.22
Tires and tubes.....	0.29	0.64	0.84
Maintenance .....	1.48	1.72	2.11
Depreciation .....	1.26	1.89	1.57
License .....	0.14	0.14	0.14
Garage at \$4 per month.....	0.44	0.44	0.44
Interest at 6 per cent.....	0.36	0.36	0.36
Insurance .....	0.21	0.21	0.21
<b>Total cost.....</b>	<b>5.44</b>	<b>6.48</b>	<b>7.50</b>
<b>Relative cost.....</b>	<b>1.00</b>	<b>1.18</b>	<b>1.38</b>

\*By reference to Table 2 it will be seen that this is about the same as the cost for the "medium four" group.

TABLE 6. ESTIMATED AVERAGE COST OF AUTOMOBILE OPERATION ON  
VARIOUS CLASSES OF ROADS  
(Annual mileage of 11,000)

Class of automobile (see Table 2)	Cost of operation in cents per mile		
	High type roads	Intermediate type roads	Low type roads
"Light four" .....	5.10	6.02	7.08
"Medium four" .....	5.44	6.42	7.50
"Heavy four" .....	6.10	7.20	8.40
"Light six" .....	6.25	7.38	8.62
"Medium six" .....	7.12	8.40	9.80
"Heavy Six" .....	8.00	9.45	11.00

vehicle operating costs effected. This may be determined from Table 6, but for convenience of reference is tabulated in Table 7.

TABLE 7. ESTIMATED AVERAGE SAVING IN AUTOMOBILE OPERATING COSTS DUE  
TO ROAD IMPROVEMENT  
(Annual mileage of 11,000)

Class of automobile (see table 2)	Saving in cents per mile		
	Low type changed to intermediate type	Intermediate type changed to high type	Low type changed to high type
"Light four" .....	1.01	0.92	1.93
"Medium four" .....	1.08	0.98	2.06
"Heavy four" .....	1.20	1.10	2.30
"Light six" .....	1.24	1.13	2.37
"Medium six" .....	1.40	1.28	2.68
"Heavy six" .....	1.55	1.45	3.00
Composite "average" automobile .....	1.07	0.99	2.06

#### IV. TRUCK OPERATING COSTS

Complete records of cost of truck operation were furnished by a few owners and partial cost records were supplied by a large number. These reports included a certain amount of supplementary information with reference to the kind of service in which the truck was employed, its age and the annual mileage. No attempt has been made to convert the reported costs to a basis of cost per ton-mile because the reports did not give sufficient information as to load. These costs are assembled in Table 9, page 44, the vehicles being grouped according to the type and the manufacturer's capacity rating.

## V. SUMMARY

The foregoing analysis of the effect of road improvement upon automobile operating costs is presented as the best that seems possible with the data now available. Admittedly it is an estimate, but the utmost care has been exercised to obtain corroborative evidence and much fragmentary information has been unearthed to indicate that the figures presented are conservative and may be used for any purpose not requiring a high degree of exactness. Moreover, they emphasize the fact that road improvement of the right kind is in reality an investment that pays good dividends, and that is easily seen to be true even though the relative costs presented herein be discounted heavily.

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TABLE 8. ORIGINAL DATA ON PASSENGER AUTOMOBILE COSTS

Group No.	1a		1b		2a		2b		3		4		5		6					
	No. of cars in group	24	Cost per car	Cents per mile	37	Cost per car	Cents per mile	103	Cost per car	Cents per mile	187	Cost per car	Cents per mile	36	Cost per car	Cents per mile	5	Cost per car	Cents per mile	83
Gas.	117.87	1.33	98.41	1.22	81.29	1.32	85.40	1.19	80.77	1.70	96.19	2.35	419.75	1.65	234.80	1.58				
Oil	25.48	0.29	21.47	0.28	18.16	0.30	21.25	0.30	14.63	0.31	23.22	0.57	87.63	0.34	40.20	0.27				
Tires and tubes	94.68	1.07	66.45	0.97	55.15	0.90	57.44	0.80	20.72	0.44	33.02	0.81	184.50	0.72	86.87	0.58				
Maintenance	106.21	1.20	134.12	1.76	96.49	0.93	95.29	1.33	84.22	1.78	122.96	3.00	555.76	2.18	227.52	1.53				
Misc. costs	26.10	0.30	26.49	0.35	27.82	0.47	23.96	0.33												
Depreciation																				
License																				
Garage																				
Interest																				
Insurance																				
Totals	370.29	4.19	341.94	4.48	283.91	3.92	283.34	3.95	222.21	4.69	306.03	7.48	1553.13	6.09	589.39	3.96				
Type of body	Touring	4	Touring	4	Roadster	4	Roadster	4	Touring	4	Touring	4	Touring	4	Touring	4	Touring	4	Touring	4
Motor, cylinders																				
Av. cost, new, (\$)																				
Total miles for accounting period	212,008		282,442		627,845		1,340,616		170,794		98,246		127,493		491,729					
Av. total miles per car	8,834		7,634		6,096		7,169		4,744		4,094		25,499		14,901					
Av. annual miles per car	8,834		7,634		6,096		7,169		4,744		4,094		8,742		11,176					
Av. length of accounting period (yr.)	1.0		1.0		1.0		1.0		1.0		1.0		2.92		1.33					
Period covered by records	1924		1924		1923		1924		1922		1922		1922-26		1925-26					
Age at beginning (yr.)													New		New					
Av. gross weight per car (tons, approx.)	1.8		1.0		0.3		0.8		0.9		0.9		0.9		0.9					
Gas, consumed (gal.)	13,526		19,683		42,117		90,586						8,351		29,836					
Miles per gal.	13.33		14.85		14.91		14.80						15.27		16.48					
Type of road									Pav., Mac., Grav.		Earth, rocky rds		Earth		Earth					

TABLE 8. ORIGINAL DATA ON PASSENGER AUTOMOBILE COSTS—(Continued)

Group No.	7		8		9a		9b		9c		10a		10b		11	
	4		1		4		4		2		2		2		2	
No. of cars in group	4		1		4		4		2		2		2		2	
Gas. ....	205.03	1.45	177.62	1.78	137.94	1.25	116.64	1.10	85.36	1.19	127.07	1.18	128.04	1.28	176.94	1.28
Oil .....	24.44	0.17	32.75	0.33	40.25	0.36	51.55	0.49	37.93	0.53	37.65	0.35	44.75	0.45	59.00	0.42
Tires and tubes	71.15	0.50	77.05	0.77	41.25	0.37	36.18	0.34	42.78	0.60	25.69	0.24	62.97	0.63	40.00	0.29
Maintenance	141.96	1.01	126.57	1.27	52.18	0.47	81.38	0.76	74.18	1.04	30.18	0.28	72.60	0.73	31.78	0.23
Misc. costs	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Depreciation	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
License	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Garage	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Interest	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Insurance	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals	442.58	3.13	413.99	4.15	477.01	4.31	464.82	4.37	362.13	5.06	512.80	4.77	526.93	5.28	610.91	4.40
Type of body	Roadster	4	Touring	4	Roadster	4	Roadster	4	Roadster	4	Roadster	4	Roadster	4	Roadster	4
Motor, cylinders	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Av. cost new, (\$)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total miles for ac-	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
counting period	56,517	.....	9,877	.....	44,246	.....	42,544	.....	14,306	.....	21,481	.....	19,971	.....	27,772	.....
Av. total miles per car	14,129	.....	9,877	.....	11,061	.....	10,636	.....	7,153	.....	10,740	.....	9,986	.....	13,886	.....
Av. annual miles per car	21,195	.....	14,967	.....	11,061	.....	10,636	.....	7,153	.....	10,740	.....	9,986	.....	13,886	.....
Av. length of accounting period (yr.)	0.67	.....	0.67	.....	1.0	.....	1.0	.....	1.0	.....	1.0	.....	1.0	.....	1.0	.....
Period covered by records	1926	.....	1926	.....	1924	.....	1924	.....	1925	.....	1925	.....	1926	.....	1926	.....
Age at beginning (yr.)	New	.....	New	.....	New	.....	New	.....	2.0	.....	New	.....	1.0	.....	New	.....
Av. gross weight per car (tons, approx.)	0.8	.....	0.8	.....	0.8	.....	0.8	.....	0.8	.....	0.8	.....	0.8	.....	0.8	.....
Gas. consumed (gal.)	3,333	.....	669	.....	2,928	.....	2,791	.....	816	.....	1,233	.....	1,200	.....	1,599	.....
Miles per gal.	16.96	.....	14.9	.....	15.11	.....	15.24	.....	17.53	.....	17.42	.....	16.64	.....	17.87	.....
Type of road	Earth	.....	Earth	.....	Earth	.....	Earth	.....	Earth	.....	Earth	.....	Earth	.....	Earth	.....

TABLE 8. ORIGINAL DATA ON PASSENGER AUTOMOBILE COSTS—(Continued)

Group No.	12		13		14a		14b		15		16		17a		17b	
	No. of cars in group		28		6*		1*		1*		2*		6*		6*	
Item	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile
Gas.....	(164.26	1.98)	881.81	1.91	229.65	2.13	120.77	2.21	89.44	2.46	146.76	2.76	196.54	2.27	144.27	1.79
Oil.....	( 71.47	0.86	73.82	0.97	143.61	0.41	49.15	0.56	14.71	0.41	22.98	0.43	35.50	0.41	26.60	0.33
Tires and tubes.....	101.76	1.22	140.23	0.71	116.50	1.03	43.25	0.79	28.40	0.78	41.00	0.77	58.00	0.67	50.78	0.63
Maintenance.....	56.29	0.63	357.07	1.79	357.18	3.33	83.70	1.84	88.53	2.45	133.73	2.53	183.55	2.12	104.78	1.30
Disc. costs.....	209.68	2.53	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Depreciation.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
License.....	28.17	0.34	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Garage.....	18.55	0.22	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Interest.....	8.37	0.10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Insurance.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals.....	658.55	7.93	1034.40	5.19	746.94	6.95	266.87	4.90	221.08	6.10	344.47	6.49	473.59	5.47	326.43	4.05
Type of body.....	Misc.	.....	Roadster	.....	Roadster	.....	Roadster	.....	Roadster	.....	Roadster	.....	Roadster	.....	Roadster	.....
Motor, cylinders.....	4	.....	4	645.33	4	.....	4	.....	4	.....	4	.....	4	598.00	4	598.00
Average cost, new, (\$ ).....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total miles for accounting period.....	232,458	.....	119,598	.....	10,753	.....	5,450	.....	5,450	.....	5,307	.....	5,307	.....	5,307	.....
Average total miles per car.....	3,302	.....	19,933	.....	10,753	.....	5,450	.....	5,450	.....	5,307	.....	5,307	.....	5,307	.....
Average annual miles per car.....	8,302	.....	8,237	.....	10,753	.....	5,450	.....	5,450	.....	5,307	.....	5,307	.....	5,307	.....
Average length of accounting period (yr.).....	1.0	.....	2.42	.....	1.0	.....	1.0	.....	1.0	.....	1.0	.....	1.0	.....	1.0	.....
Period covered by records.....	1923-24	.....	1922-24	.....	1922	.....	1923	.....	1922	.....	1922	.....	1922	.....	1923	.....
Age at beginning (yr.).....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Average gross weight per car (tons, approx.).....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gas consumed (gal.).....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Miles per gal.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Type of road.....	Earth	.....	Pavement*	.....	Pavement*	.....	Pavement*	.....	Pavement*	.....	Pavement*	.....	Pavement*	.....	Pavement*	.....

\*House to house stops.

TABLE 8. ORIGINAL DATA ON PASSENGER AUTOMOBILE COSTS—(Continued)

Group No.	17c		18a		18b		18c		18d		18e		19a		19b	
	No. of cars in group	2*	1*	1*	1*	1*	1*	1*	1*	1*	1*	1*	1*	1*	1*	1*
Gas.....	82.79	1.28	98.84	2.08	1.66	97.73	1.05	159.52	1.47	58.33	1.20	132.12	1.63	172.65	1.40	
Oil.....	23.28	0.36	11.55	0.24	12.80	23.99	0.26	39.80	0.37	11.43	0.24	11.45	0.14	30.00	0.24	
Tires and tubes.....	62.74	0.97	52.80	1.11	27.10	0.51	1.24	99.20	0.91	25.41	0.55	9.60	0.12	109.80	0.89	
Maintenance.....	170.11	2.63	75.50	1.58	57.26	1.07	191.07	2.07	107.71	0.99	90.99	1.88	23.16	0.28	75.05	0.61
Misc. costs.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Depreciation.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
License.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Garage.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Interest.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Insurance.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals.....	338.92	5.24	238.69	5.01	186.20	3.48	427.74	4.62	406.23	3.74	265.61	5.52	176.33	2.17	387.50	3.14
Type of body.....	Roadster		Roadster		Roadster		Roadster		Roadster		Roadster		Roadster		Roadster	
Motor, cylinders.....	4		4		4		4		4		4		4		4	
Average cost, new, (\$).....	598.00		560.50		560.50		560.50		560.50		560.50		406.10		406.10	
Total miles for accounting period.....	12,937		4,757		5,352		9,269		10,855		4,806		8,125		12,318	
Average total miles per car.....	6,468		4,757		5,352		9,269		10,855		4,806		8,125		12,318	
Average annual miles per car.....	6,468		4,757		5,352		9,269		10,855		4,806		12,897		12,318	
Average length of accounting period (yr.).....	1.0		1.0		1.0		1.0		1.0		1.0		0.63		1.0	
Period covered by records.....	1924		1922		1923		1924		1925		1926		1922		1923	
Age at beginning (yr.).....	4.0		1.0		2.0		3.0		4.0		5.0		New		0.6	
Average gross weight per car (tons, approx.).....	0.8		0.8		0.8		0.8		0.8		0.8		0.8		0.8	
Gas consumed (gal.).....	.....		.....		.....		.....		.....		.....		.....		.....	
Miles per gal.....	.....		.....		.....		.....		.....		.....		.....		.....	
Type of road.....	Pavement*		Pavement*		Pavement*		Pavement*		Pavement*		Pavement*		Pavement*		Pavement*	

\*House to house stops.

TABLE 8. ORIGINAL DATA ON PASSENGER AUTOMOBILE COSTS—(Continued)

Group No.	19c		19d		19e		20		21		22		23		24		
	No. of cars in group	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile		
	Item																
	Gas.....	87.73	1.09	99.21	1.64	113.22	1.17	(305.10	2.31	48.38	1.83)	212.06	1.05	365.73	1.21	334.38	1.85
	Oil.....	22.30	0.28	11.65	0.19	14.22	0.15	72.21	0.54	24.30	0.75	63.57	0.32	52.02	0.17	38.60	0.16
	Tires and tubes.....	41.72	0.51	54.49	0.90	51.38	0.53	114.00	0.86	13.63	0.42	163.00	0.81	275.45	0.91	195.80	0.79
	Maintenance.....	208.76	2.59	162.45	2.69	82.65	0.88	60.90	0.69	67.00	2.06	330.16	1.63	180.52	0.43	248.09	1.00
	Misc. costs.....							360.00	2.72			52.55	0.26	28.40	0.09	8.76	0.03
	Depreciation.....							26.00	0.20								
	License.....							60.00	0.45	14.20	0.44						
	Garage.....							29.10	0.22								
	Interest.....							14.00	0.11								
	Insurance.....																
	Totals.....	360.51	4.47	327.80	5.42	261.47	2.71	1071.31	8.10	162.46	5.00	821.34	4.07	852.12	2.81	825.63	3.33
	Type of body.....	Roadster		Roadster		Roadster		Touring		Touring		Touring		Touring		Touring	
	Motor, cylinders.....	4		4		4		4		4		4		4		4	
	Av. cost, new, (\$).....	406.10		406.10		406.10		485.00		512.00		406.10		406.10		406.10	
	Total miles for ac- counting period.....	8,056		6,046		9,686		13,221		3,246		20,195		20,195		30,286	
	Av. total miles per car	8,056		6,046		9,686		13,221		3,246		20,195		20,195		30,286	
	Av. annual miles per car	8,056		6,046		9,686		13,221		6,492		10,097		12,114		11,016	
	Av. length of account- ing period (yr.).....	1.0		1.0		1.0		1.0		0.5		2.0		2.5		2.25	
	Period covered by records.....	1924		1925		1926		1924-25		1926		1918-15		1915-17		1918-20	
	Age at beginning (yr.)	1.6		2.6		3.6		New		New		New		New		New	
	Av. gross weight per car (tons, approx.)	0.8		0.8		0.8		0.9		0.9		0.9		0.9		0.9	
	Gas consumed (gal.)	.....		.....		818		.....		.....		1,257		1,957		1,408.5	
	Miles per gal.....	.....		.....		11.92		.....		.....		16.07		15.48		17.60	
	Type of road.....	Pavement		Pavement		Pavement		Earth		Gravel		Earth		Earth		Earth	

TABLE 8. ORIGINAL DATA ON PASSENGER AUTOMOBILE COSTS—(Continued)

Group No.	25a	25b	25c	25d	25e	26	27	28
No. of cars in group	1	1	1	1	1	1	124	1
Gas.....	168.21	1.86	191.83	1.39	153.71	1.13	102.71	0.95
Oil.....	23.60	0.26	28.20	0.20	21.25	0.16	18.00	0.17
Tires and tubes.....	60.00	0.66	72.95	0.53	58.60	0.43	44.40	0.41
Maintenance.....	28.70	0.31	106.40	0.64	66.30	0.49	66.80	0.62
Misc. costs.....	29.16	0.32	11.45	0.08	29.81	0.21	3.85	0.04
Depreciation.....	.....	.....	.....	.....	.....	.....	.....	.....
License.....	.....	.....	.....	.....	.....	.....	.....	.....
Garage.....	.....	.....	.....	.....	.....	.....	.....	.....
Interest.....	.....	.....	.....	.....	.....	.....	.....	.....
Insurance.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals.....	309.67	3.41	470.74	3.40	329.67	2.42	235.76	2.19
Type of body.....	Touring	Touring	Touring	Touring	Touring	Touring	Touring	Coupe
Motor, cylinders.....	4	4	4	4	4	4	4	4
Av. cost, new, (\$).....	630.00	630.00	630.00	630.00	630.00	419.60	.....	700.00
Total miles for ac- counting period.....	9,083	16,603	13,846	13,609	13,609	7,600	10,782	7,600
Av. total miles per car	9,083	16,603	13,846	13,609	13,609	7,600	10,782	7,600
Av. annual miles per car	12,111	16,603	13,846	13,609	13,609	9,268	10,782	9,268
Av. length of account- ing period (yr.).....	0.75	1.0	1.0	1.0	1.0	0.82	1.0	0.82
Period covered by records.....	1920	1921	1922	1923	1924	1925	1921-26	1924-27
Age at beginning (yr.).....	New	1.75	2.75	3.75	4.75	New	New	New
Av. gross weight per car (tons, approx.).....	0.9	0.9	0.9	0.9	0.9	0.8	0.9	1.0
Gas, consumed (gal.).....	582	923	803	761	575	415	187,414	436
Miles per gal.....	15.61	17.99	17.24	17.88	18.75	18.30	14.43	21.56
Type of road.....	Earth & Gravel	Gravel & Earth	Gravel & Earth	Gravel	Gravel	.....	.....	Gravel
Totals.....	309.67	3.41	470.74	3.40	329.67	2.42	235.76	2.19
Touring	4	4	4	4	4	4	4	4
1238.90	5.38	757.98	8.06	.....	.....	.....	.....	.....
2,852,755	9,400	23,010	9,400	9,268	9,791	2,385	187,414	436
14.43	21.56	.....	.....	.....	.....	.....	.....	.....



TABLE 8. ORIGINAL DATA ON PASSENGER AUTOMOBILE COSTS—(Continued)

Group No.	32		33		34		35		36		37		38		39	
	No. of cars in group		1		1		4		1		2		1		1	
Gas.	180.79	0.98	219.29	1.19	327.66	1.44	(266.06	1.84)	302.03	1.37	172.26	1.48	158.00	1.58	198.00	1.36
Oil	26.64	0.15	28.59	0.15	33.39	0.24	33.39	0.24	60.33	0.27	30.02	0.26	48.00	0.48	25.00	0.23
Tires and tubes.	137.26	0.75	99.32	0.54	100.72	0.44	73.90	0.51	161.60	0.73	30.78	0.27	103.00	1.05	75.00	0.75
Maintenance	288.38	1.57	231.88	1.25	340.88	1.51	156.10	1.08	412.59	1.84	239.47	2.06	248.00	2.48	128.00	1.28
Misc. costs	.....	.....	.....	.....	.....	.....	25.00	0.17	.....	.....	.....	.....	.....	.....	.....	.....
Depreciation	.....	.....	.....	.....	.....	.....	441.15	3.05	364.27	1.64	.....	.....	333.00	3.33	253.00	2.53
Licence	.....	.....	.....	.....	.....	.....	19.50	0.13	.....	.....	.....	.....	48.00	0.48	39.00	0.39
Garage	.....	.....	.....	.....	.....	.....	73.75	0.51	.....	.....	.....	.....	98.00	0.98	47.00	0.47
Interest	.....	.....	.....	.....	.....	.....	44.46	0.31	.....	.....	.....	.....	104.00	1.04	36.00	0.36
Insurance	.....	.....	.....	.....	.....	.....	24.38	0.16	.....	.....	.....	.....	40.00	0.40	5.00	0.50
Totals	633.07	3.45	579.08	3.13	822.65	3.63	1124.27	7.76	1300.81	5.85	472.53	4.07	1182.00	11.82	742.00	7.42
Type of body	Coupe	4	Coupe	4	Coupe	4	Coach	4	Sedan	4	Sedan	4	Sedan	4	Sedan	4
Motor, cylinders	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Av. cost, new, (\$)	.....	.....	.....	.....	.....	.....	741.15	.....	650.00	.....	665.00	.....	1,128.00	.....	858.00	.....
Total miles for ac-	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
counting period	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Av. total miles per car	18,330	.....	18,491	.....	90,704	.....	14,479	.....	66,754	.....	23,232	.....	10,000	.....	9,000	.....
Av. annual miles per car	5,431	.....	6,474	.....	14,351	.....	14,479	.....	22,251	.....	11,616	.....	10,000	.....	9,000	.....
Av. length of accounting period (yr.)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Period covered by records	1923-26	.....	1924-26	.....	1924-26	.....	1925-26	.....	1924-26	.....	1925-26	.....	1920-22	.....	1922-23	.....
Age at beginning (yr.)	New	.....	New	.....	New	.....	.....	.....	New	.....	New	.....	New	.....	New	.....
Av. gross weight per car (tons, approx.)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gas consumed (gal.)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Miles per gal.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Type of road.	Pavement*	.....	Pavement*	.....	Earth	.....	Earth	.....	Earth	.....	Earth	.....	.....	.....	.....	.....

\*City operation.

TABLE 8. ORIGINAL DATA ON PASSENGER AUTOMOBILE COSTS—(Continued)

Group No.	40		41		42		43		44		45a		45b		46	
	No. of cars in group		Cents per mile		Cents per car		Cents per mile		Cents per car		Cents per mile		Cents per car		Cents per mile	
Item	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile
Gas.....	288.17	1.08	(63.53)	1.05	114.46	0.90	153.75	1.42	158.39	1.45	73.70	1.05	50.78	1.01	(201.89)	1.40
Oil.....	23.87	0.09			21.22	0.17	17.84	0.16	29.00	0.27	17.69	0.25	8.75	0.17		
Tires and tubes.....	128.01	0.48	9.20	0.15	48.43	0.38	57.89	0.53	49.60	0.45	58.60	0.54	37.83	0.75	52.09	0.36
Maintenance.....	684.44	2.58	37.36	0.62	92.20	0.73	158.79	1.47	160.89	1.47	93.93	1.34	90.06	1.79	184.59	1.28
Misc. costs.....			27.78	0.42	17.15	0.14					10.38	0.15	3.39	0.07		
Depreciation.....	356.32	1.34	300.00	4.92	132.48	1.05									308.67	2.14
License.....			33.20	0.55	15.00	0.12										
Garage.....			28.56	0.47	30.88	0.24									42.68	0.30
Interest.....			18.00	0.30	17.00	0.14										
Insurance.....																
Totals.....	1480.81	5.57	517.63	8.56	507.82	4.02	388.27	3.58	397.88	3.64	254.30	3.63	190.81	3.79	789.92	5.48
Type of body.....	Touring				Coupe				Coach		Touring		Touring		Coupe	
Motor, cylinders.....	4		4		4		4		4		4		4		4	
Average cost, new, (\$). ..	.....		.....		675.00		.....		.....		.....		.....		749.21	
Total miles for accounting period (yr.).....	159,545		6,048		25,293		43,355		10,942		14,009		20,158		129,648	
Average total miles per car.....	26,591		6,048		12,646		10,839		10,942		7,004		5,039		14,405	
Average annual miles per car.....	13,099		8,064		16,861		25,807		18,865		10,505		5,039		15,658	
Average length of accounting period (yr.).....	2.03		0.75		0.75		0.42		0.58		0.67		1.0		0.92	
Periods covered by records.....	1924-26		1923-24		1926		1926		1926		1923		1924		1926	
Age at beginning (yr.).....	New		New		1.0		New		New		.....		.....		New	
Average gross weight per car (tons, approx.).....	1.05		1.05		1.05		1.2		1.2		1.05		1.05		1.05	
Gas consumed (gal.).....	9,248		.....		.....		2,957		630		804		1,297		.....	
Miles per gal.....	17.27		.....		.....		18.39		17.37		17.40		.....		.....	
Type of road.....	.....		Earth		Earth		Earth		Earth		.....		.....		.....	

TABLE 8. ORIGINAL DATA ON PASSENGER AUTOMOBILE COSTS—(Continued)

Group No.	47	48	49	50	51	52	53	54
No. of cars in group	4	1	2	1	1	1	2	1
Gas.....	223.91	1.38	317.11	133.09	2.30	1.17	48.50	1.17
Oil.....	55.64	0.34	36.22	38.68	0.67	0.44	9.50	0.23
Tires and tubes.....	100.00	0.61	152.16	44.00	0.76	21.60	21.37	0.52
Maintenance.....	284.01	1.75	846.64	98.75	1.71	8.80	48.77	1.06
Misc. costs.....	.....	.....	.....	.....	.....	.....	.....	.....
Depreciation.....	411.20	2.53	468.53	160.00	2.77	270.00	92.00	2.23
License.....	.....	.....	.....	8.50	0.15	15.00	10.50	0.25
Garage.....	.....	.....	.....	(21.00	0.36)	36.00	36.00	0.87
Interest.....	.....	.....	.....	(	.....	52.20	18.45	0.45
Insurance.....	.....	.....	.....	5.00	0.09	9.80	12.73	0.31
Totals.....	1074.76	6.61	1820.66	580.02	9.17	573.05	292.82	7.09
Type of body.....	Touring	.....	Touring	Sedan	Touring	Sedan	Touring	Roadster
Motor, cylinders.....	4	.....	4	4	4	4	4	4
Av. cost, new (\$)	.....	.....	.....	720.00	.....	870.00	.....	610.00
Total miles for ac-	65,011	8,219	58,203	5,733	8,028	12,197	8,264	30,000
counting period.....	16,253	8,219	29,101	5,733	8,028	12,197	4,132	30,000
Av. total miles per car	.....	.....	.....	.....	.....	.....	.....	.....
Av. annual miles per	12,220	8,219	10,899	9,971	7,042	12,197	4,132	10,000
car.....	.....	.....	.....	.....	.....	.....	.....	.....
Av. length of account-	1.33	1.0	2.67	0.58	1.14	1.09	1.0	3.0
ing period (yr.).....	.....	.....	.....	.....	.....	.....	.....	.....
Period covered by	1923-26	1923-24	1923-26	1926	1925	1925	.....	1922-25
record.....	New	New	New	.....	.....	New	.....	New
Age at beginning (yr.)	.....	.....	.....	.....	.....	.....	.....	.....
Av. gross weight per	1.1	1.1	1.1	1.95	1.1	1.25	1.1	1.1
car (tons, approx.)	3.99	.....	3.387	4.77	4.64	6.10	4.13	1.488
Gas, consumed (gal.)	18.52	.....	17.18	12.14	17.30	20.00	20.00	20.15
Miles per gal.	.....	.....	.....	Earth	.....	.....	.....	.....
Type of road.....	Earth	Earth	.....	.....	.....	.....	.....	.....

TABLE 8. ORIGINAL DATA ON PASSENGER AUTOMOBILE COSTS—(Continued)

Group No.	55	56	57	58	59	60	61	62
No. of cars in group	1	1	2	2	1	1	8	1
Item	Cost per car	Cost per car	Cost per car	Cost per car	Cost per car	Cost per car	Cost per car	Cost per car
	Cents per mile	Cents per mile	Cents per mile	Cents per mile	Cents per mile	Cents per mile	Cents per mile	Cents per mile
Gas.....	65.47	139.00	291.03	329.85	225.98	574.16	132.44	656.00
Oil.....	17.80	32.00	24.00	39.40	9.84	57.02	19.79	176.00
Tires and tubes.....	24.00	26.00	86.93	114.35	63.92	255.21	156.71	109.50
Maintenance.....	112.05	1.78	39.50	952.20	1687.79	1599.12	223.48	3.60
Misc. costs.....	7.50	27.50	0.20	.....	.....	34.03	51.75	0.91
Depreciation.....	314.00	4.98	377.00	580.00	435.00	1337.68	.....	1100.00
License.....	11.00	0.18	.....	.....	.....	.....	.....	2.97
Garage.....	27.00	0.43	.....	.....	.....	.....	.....	32.00
Interest.....	35.80	0.57	.....	.....	.....	.....	.....	108.00
Insurance.....	7.50	0.12	.....	.....	.....	.....	.....	147.90
Totals.....	622.12	9.88	2054.16	2015.80	2422.53	3823.19	566.45	2384.75
Type of body.....	Coach	Coupe	Roadster	Touring	Touring	Touring	Touring	Touring
Motor, cylinders.....	4	4	4	4	4	4	4	4
Av. cost, new, (\$).....	840.00	822.00	.....	.....	.....	.....	.....	1,375.00
Total miles for accounting period.....	6,300	13,897	53,170	59,235	19,250	55,361	43,801	37,000
Av. total miles per car.....	6,300	13,897	26,585	29,618	19,250	55,361	14,600	37,000
Av. annual miles per car.....	8,630	8,526	9,667	12,877	13,368	25,552	14,600	12,833
Av. length of accounting period covered by records.....	1925	1.63	2.75	2.3	1.44	2.17	1.0	3.0
Age at beginning (yr.).....	New	New	1924-26	1924-26	1923-24	1924-26	1924	1920-23
Av. gross weight per car (tons, approx.).....	1.2	1.05	0.95	1.05	1.45	1.4	1.4	1.2
Gas. consumed (gal.).....	299	686	3,142	3,728	1,102	8,273	2,565	2,466.6
Miles per gal.....	21.05	19.96	16.92	15.89	17.46	16.91	17.08	15.0
Type of road.....	.....	.....	.....	.....	.....	.....	.....	Earth

TABLE 8. ORIGINAL DATA ON PASSENGER AUTOMOBILE COSTS—(Continued)

Group No.	63	64	65	66	67	68	69	70	
No. of cars in group	3	8	10	10	2	6	1	3	
Gas.....	496.27	1.04	276.65	1.33	134.82	1.70	136.77	1.01	131.40
Oil.....	64.09	0.13	39.62	0.19	15.81	0.42	21.21	0.16	5.53
Tires and tubes.....	179.79	0.38	254.86	1.23	139.79	1.48	189.01	1.40	105.22
Maintenance.....	4515.12	3.17	371.27	1.79	197.44	1.54	245.30	1.81	405.08
Misc. costs.....	.....	.....	58.34	0.28	24.30	0.19	17.80	0.13	3.33
Depreciation.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
License.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Garage.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Interest.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Insurance.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals.....	2255.27	4.72	1001.24	4.82	562.16	4.38	610.09	4.51	1054.48
Type of body.....	Roadster	Touring	Roadster	Roadster	Touring	Touring	Touring	Touring	Touring
Motor, cylinders.....	4	4	4	4	4	4	4	4	4
Av. cost, new, (\$).....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total miles for ac- counting period.....	143,369	307,794	207,835	128,471	18,654	81,194	15,020	15,020	23,430
Av. total miles per car	47,790	38,474	20,783	12,847	9,327	13,532	15,020	15,020	7,810
Av. annual miles per car.....	18,303	20,357	14,636	22,150	9,327	18,042	15,020	15,020	7,810
Av. length of account- ing period (yr.).....	2.61	1.89	1.42	0.58	1.0	0.75	1.0	1.0	1.0
Period covered by records.....	1924-26	1923-26	1923-24	1924	1924	1924	1923-24	1924	1924
Age at beginning (yr.)	New	New	Old	New	Old	New	0.5	.....	.....
Av. gross weight per car (tons, approx.)	1.15	1.25	1.4	1.2	1.45	1.25	1.45	1.45	1.45
Gas consumed (gal.)	8,034	18,010	13,705	8,152	1,875	4,868	.....	.....	2,466
Miles per gal.....	17.85	17.09	15.07	15.75	9.96	16.7	.....	.....	9.52
Type of road.....	.....	.....	.....	.....	.....	.....	Earth	.....	.....

TABLE 2. AVERAGE COST OF AUTOMOBILE OPERATION

Group No.	71	72	73	74	75	76a	76b	77								
No. of cars in group	11	7	8	5	8	28	28	9								
Item	Cents per car mile	Cents per car mile	Cents per car mile	Cost per car mile	Cost per car mile	Cost per car mile	Cost per car mile	Cents per car mile								
Gas.....	208.89	123.20	0.98	(121.70	1.58	1.70	42.20	1.73)	1.46	179.70	1.46	66.86	1.87	218.42	1.22	
Oil.....	23.23	0.11	13.38	0.11	13.38	0.11	42.00	0.33	14.15	0.29	46.39	0.26	14.15	0.29	46.39	
Tires and tubes.....	87.05	0.43	34.78	0.23	59.15	0.75	32.38	0.27	19.90	0.82	168.46	1.33	73.59	1.51	208.97	1.14
Maintenance.....	245.71	1.20	83.86	0.66	463.70	5.85	175.57	1.46	37.91	1.55	286.09	2.32	152.36	3.16	302.55	1.69
Misc. costs.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Depreciation.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
License.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Garage.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Interest.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Insurance.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals.....	564.88	2.76	255.22	2.03	875.65	11.04	722.76	6.01	161.23	6.62	736.82	5.97	327.59	6.78	883.43	4.66
Type of body.....	Touring 4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Motor, cylinders.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Av. cost, new, (\$ ).....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total miles for ac- counting period.....	224,959	.....	88,115	.....	63,390	.....	60,114	.....	19,510	.....	345,008	.....	135,771	.....	160,981	.....
Av. total miles per car.....	20,451	.....	12,588	.....	7,924	.....	12,023	.....	2,438	.....	12,322	.....	4,849	.....	17,876	.....
Av. annual miles per car.....	24,060	.....	22,804	.....	7,924	.....	12,023	.....	7,314	.....	12,322	.....	4,849	.....	17,876	.....
Av. length of accounting period (yr.).....	0.85	.....	0.57	.....	1.0	.....	1.0	.....	0.33	.....	1.0	.....	1.0	.....	1.0	.....
Period covered by records.....	1925-26 New	.....	1926 New	.....	1926 New	.....	1926 New	.....	1926 New	.....	1923 Old	.....	1924 Old	.....	1924 New	.....
Age at beginning (yr.).....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Av. gross weight per car (tons, approx.).....	1.3	.....	1.4	.....	1.85	.....	1.45	.....	1.4	.....	1.35	.....	1.35	.....	1.45	.....
Gas consumed (gal.).....	12,826	.....	4,606	.....	.....	.....	.....	.....	.....	.....	24,706	.....	10,624	.....	11,414	.....
Miles per gal.....	17.54	.....	19.13	.....	.....	.....	.....	.....	.....	.....	13.96	.....	12.74	.....	14.12	.....
Type of road.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

TABLE 8. ORIGINAL DATA ON PASSENGER AUTOMOBILE COSTS--(Continued)

Group No.	78	79	80	81	82	83	84	85
No. of cars in group	7	1	2	1	11	62	1	1
Gas.	399.22	1.66	(198.67	906.28	442.99	1.18	124.54	1.08
Oil	62.63	0.26	)	120.64	47.97	0.13	9.67	0.08
Tires and tubes.	273.76	1.14	(	762.46	176.26	0.47	9.67	0.08
Maintenance	622.11	2.59	45.55	1,144.58	1,048.06	2.79	122.30	1.05
Misc. costs			79.70					
Depreciation			47.12	1,200.00	576.76	1.54		
License	634.08	2.64	422.50	34.00				
Garage				217.50				
Interest				(322.57				
Insurance				0.55)				
Totals	1991.81	8.29	858.62	4708.03	2287.04	6.11	266.18	2.31
Type of body	5 Tour. 2 Rdst.	Coupe		Touring	Roadster	Touring	Sedan	Sedan
Motor, cylinders	4	4	4	4	4	4	4	4
Av. cost, new, (\$)				1,200.00				1,350.00
Total miles for ac-	168,125	30,924	20,935	59,428	411,972	2,634,935	11,525	6,390
counting period.	24,018	30,924	10,468	59,428	37,452	42,499	11,525	6,390
Av. total miles per car								
Av. annual miles per car	10,675	30,924	10,468	29,714	15,287	16,666	21,343	6,390
Av. length of account-	2.25	1.0	1.0	2.0	2.45	2.55	0.54	1.0
ing period (yr.)								
Period covered by records	1923-26	1926	1923-24	1925-27	1923-26	1923-26	1926	1926-27
Age at beginning (yr)	5 New, 2-2 yrs.	1.5		New	New	New	New	1.25
Av. gross weight per car (tons, approx.)	1.3	1.4	1.4	1.45	1.3	1.5	1.65	1.7
Gas, consumed (gal.)	10,767	1,616.5			26,010	169,491	605	
Miles per gal.	15.61	19.13			15.84	15.55	19.05	
Type of road	Earth	Earth	Earth	½ Grav. ½ Earth				Gravel

TABLE 8. ORIGINAL DATA ON PASSENGER AUTOMOBILE COSTS—(Continued)

Group No.	86a		86b		86c		86d		86e		87a		87b		87c	
	No. of cars in group	1	Cost per car	Cents per mile	1	Cost per car	Cents per mile	1	Cost per car	Cents per mile	1	Cost per car	Cents per mile	1	Cost per car	Cents per mile
Gas.	72.02	1.62	164.74	1.35	137.84	1.08	182.46	1.57	145.44	1.36	95.67	0.98	150.58	1.35	123.24	1.28
Oil	7.80	0.18	10.65	0.09	14.50	0.11	18.20	0.16	10.88	0.10	8.95	0.09	10.30	0.09	5.84	0.06
Tires and tubes.	10.71	0.24	131.46	1.25	154.48	1.21	199.15	1.72	52.43	0.49	173.20	1.78	16.50	0.15	108.09	1.12
Maintenance	28.32	0.64	34.29	0.28	131.77	1.43	380.58	3.28	333.60	3.12	49.50	0.50	111.87	1.00	233.08	2.68
Misc. costs																
Depreciation																
Licenses																
Garage																
Interest																
Insurance																
Totals.	118.85	2.68	365.79	3.01	554.80	4.35	848.24	7.31	611.31	5.71	373.62	3.80	322.17	2.88	656.04	6.79
Type of body.....	Coupe		Coupe		Coupe		Coupe		Coupe		Coupe		Coupe		Coupe	
Motor, cylinders.....	4		4		4		4		4		4		4		4	
Av. cost, new, (\$)	1,085.00		1,085.00		1,085.00		1,085.00		1,085.00		1,050.00		1,050.00		1,050.00	
Total miles for accounting period	4,440		12,095		12,709		11,603		10,711		9,820		11,190		9,666	
Av. total miles per car	4,440		12,095		12,709		11,603		10,711		9,820		11,190		9,666	
Av. annual miles per car	10,571		12,095		12,709		11,603		10,711		9,820		11,190		9,666	
Av. length of accounting period (yr.)	0.42		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
Period covered by records	1922		1923		1924		1925		1926		1924		1925		1926	
Age at beginning (yr.)	New		0.42		1.42		2.42		3.42		New		1.0		2.0	
Av. gross weight per car (tons, approx.)	1.4		1.4		1.4		1.4		1.4		1.4		1.4		1.4	
Gas. consumed (gal.)	.....		.....		.....		.....		.....		.....		.....		.....	
Miles per gal.	.....		.....		.....		.....		.....		.....		.....		.....	
Type of road	Pavement*		Pavement*		Pavement*		Pavement*		Pavement*		Pavement*		Pavement*		Pavement*	

\*City operation exclusively.

TABLE 8. ORIGINAL DATA ON PASSENGER AUTOMOBILE COSTS—(Continued)

Group No.	88a		88b		88c		89		90		91		92		93	
	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
No. of cars in group	1	1	1	1	1	1	6	1	1	1	1	1	1	2	1	1
Gas.....	120.48	0.92	156.92	1.37	103.78	1.15	430.67	1.07	105.74	1.70	92.63	1.66	354.10	1.54	210.95	1.38
Oil.....	16.90	0.13	13.60	0.12	13.04	0.14	50.57	0.13	27.99	0.45	21.20	0.38	57.59	0.25	38.75	0.25
Tires and Tubes.....	77.46	0.59	117.25	1.02	126.89	1.40	238.50	0.60	.....	.....	.....	.....	238.28	1.03	126.28	0.83
Maintenance.....	47.42	0.36	72.89	0.63	264.52	2.92	903.80	2.25	44.78	0.72	80.35	1.44	288.21	1.25	173.78	1.14
Misc. costs.....	81.60	0.63	78.39	0.68	149.69	1.65	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Depreciation.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
License.....	.....	.....	.....	.....	.....	.....	.....	.....	73.39	1.18	251.10	4.50	525.00	2.28	400.00	2.62
Garage.....	.....	.....	.....	.....	.....	.....	.....	.....	111.96	1.80	22.88	0.41	38.00	0.17	20.00	0.13
Interest.....	.....	.....	.....	.....	.....	.....	.....	.....	132.49	2.13	58.03	1.04	96.00	0.42	48.00	0.31
Insurance.....	.....	.....	.....	.....	.....	.....	.....	.....	10.57	0.17	49.10	0.88	144.00	0.63	64.66	0.42
Totals.....	343.86	2.63	439.05	3.82	657.92	7.26	1622.54	4.05	506.92	8.15	580.87	10.41	1861.18	8.09	1157.42	7.57
Type of body.....	Sedan		Sedan		Sedan		Touring		Touring		Sedan		Touring		Coupe	
Motor, cylinders.....	4		4		4		4		4		4		4		4	
Av. cost, new (\$)	.....	.....	.....	.....	.....	.....	.....	.....	1,335.00	.....	1,690.00	.....	1,200.00	.....	1,050.00	.....
Total miles for accounting period.....	13,078	11,479	11,479	9,055	240,699	40,116	6,220	6,220	6,220	6,220	5,580	5,580	46,070	23,935	15,280	15,280
Av. total miles per car.....	13,078	11,479	11,479	9,055	240,699	40,116	6,220	6,220	6,220	6,220	5,580	5,580	46,070	23,935	15,280	15,280
Av. annual miles per car.....	10,720	11,479	11,479	9,055	27,685	1,962	1,962	1,962	1,962	1,962	6,723	6,723	11,518	11,518	15,280	15,280
Av. length of accounting period (yr.).....	1.22	1.0	1.0	1.0	1.45	3.17	3.17	3.17	3.17	3.17	0.83	0.83	2.0	2.0	1.0	1.0
Period covered by records.....	1923-24	1925	1925	1926	1924-25	1921-24	1924-25	1921-24	1921-24	1921-24	1923-24	1923-24	1921-23	1921-23	1925	1925
Age at beginning (yr.).....	New	New	New	2.22	New	New	New	New	New	New	New	New	New	New	New	New
Av. gross weight per car (tons, approx.).....	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.45	1.45	1.70	1.70	1.4	1.4	1.4	1.4
Gas, consumed (gal.).....	.....	.....	.....	.....	13,474	17.86	12.12	17.86	.....	.....	.....	.....	.....	.....	.....	.....
Miles per gal.....	.....	.....	.....	.....	12.12	17.86	17.86	17.86	.....	.....	.....	.....	.....	.....	.....	.....
Type of road.....	Pavement*	Pavement*	Pavement*	Pavement*	Pavement*	Pavement*	Pavement*	Pavement*	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel

\*City operation exclusively.

TABLE 8. ORIGINAL DATA ON PASSENGER AUTOMOBILE COSTS—(Continued)

Group No.	94		95		96		97		98		99		100		101		
	4		1		1		2		1		1		2		1		
No. of cars in group	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile	
Gas.....	43.23	1.01	34.48	0.87	308.78	1.43	128.17	1.21	163.25	2.09	488.04	1.60	148.07	1.14	(223.53	1.86)	
Oil.....	5.15	0.12	1.00	0.03	9.08	0.04	5.19	0.05	27.90	0.36	106.75	0.39	38.19	0.30	(	0.30)	
Tires and tubes.....	.....	.....	.....	.....	182.60	0.84	40.92	0.39	4.10	0.05	206.64	0.75	110.01	0.85	114.30	0.95)	
Maintenance.....	17.37	0.41	27.23	0.68	211.81	0.98	63.02	0.59	269.68	3.44	276.60	1.01	420.11	3.25	191.55	1.59	
Misc. costs.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	103.34	0.38	67.80	0.52	64.33	0.53	
Depreciation.....	.....	.....	.....	.....	.....	.....	.....	.....	578.73	7.88	805.31	2.95	.....	.....	400.00	3.43	
License.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	20.00	0.07	.....	.....	.....	.....	
Garage.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	91.90	0.33	.....	.....	24.00	0.20	
Interest.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	136.00	0.50	.....	.....	36.00	0.30	
Insurance.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	19.00	0.07	.....	.....	11.65	0.10	
Totals.....	65.75	1.53	62.71	1.58	712.27	3.29	237.30	2.24	1043.66	13.32	2203.58	8.05	784.18	6.06	1065.36	8.85	
Type of body.....	Coupe	6	Coach	6	Coach	6	Coach	6	Coach	6	Coach	6	Coach	6	Touring	6	.....
Motor, cylinders.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Av. cost, new, (\$)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total miles for ac-	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
counting period	17,131	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Av. total miles per car	4,253	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Av. annual miles per car	18,621	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Av. length of accounting period (yr.)	0.23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Period covered by records	1926	New	1926	New	1926	New	1926	New	1925-26	New	1926	New	1926	New	1924	New	1923-24
Age at beginning (yr.)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Av. gross weight per car (tons, approx.)	1.35	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gas. consumed (gal.)	216	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Miles per gal.....	18.32	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Type of road.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Earth

TABLE 8. ORIGINAL DATA ON PASSENGER AUTOMOBILE COSTS—(Continued)

Group No.	102	103	104	105	106	107	108	109
No. of cars in group	1	1	2	1	3	2	2	1
Gas.....	592.83	1.50	407.16	1.44	440.88	(180.79	107.80	1.63
Oil.....	69.95	0.18	58.42	0.21	75.03	0.29	8.43	0.13
Tires and tubes.....	252.20	0.64	169.69	0.60	341.37	1.35	199.87	8.02
Maintenance.....	258.05	0.65	306.08	1.08	773.68	3.06	385.72	5.84
Misc. costs.....	12.10	0.03	44.84	0.16	715.88	2.84	2.94	0.04
Depreciation.....	1050.00	2.66	221.50	0.78	1100.00	7.33	573.00	6.75
License.....	73.20	0.19	55.20	0.20	58.00	0.37	.....	.....
Garage.....	105.00	0.27	223.17	0.79	66.00	0.44	12.00	0.14
Interest.....	235.20	0.59	66.60	0.24	203.30	1.39	47.94	0.57
Insurance.....	139.67	0.48	67.20	0.24	114.00	0.76	14.95	0.18
<b>Totals.....</b>	<b>2838.23</b>	<b>7.18</b>	<b>1619.86</b>	<b>5.74</b>	<b>2023.90</b>	<b>13.49</b>	<b>1055.02</b>	<b>12.41</b>
Type of body.....	Touring	Coach	Roadster	Sedan	Touring	Touring	Touring	Touring
Motor, cylinders.....	6	6	6	6	6	6	6	6
Av. cost, new (\$).....	1,350.00	1,430.00	.....	1,890.00	.....	.....	.....	2,150.00
Total miles for ac- counting period.....	39,521	9,000	56,551	15,000	56,551	16,997	13,216	25,650
Av. total miles per car.....	39,521	9,000	28,276	15,000	28,276	8,499	6,608	25,650
Av. annual miles per car.....	13,628	25,000	14,138	8,152	11,203	8,499	6,608	4,597
Av. length of account- ing period (yr.).....	2.9	0.36	2.0	1.84	2.25	1.0	1.0	5.58
Period covered by records.....	1923-25	1925-26	1923-24	1924-25	1924-26	1923-24	1924	1920-25
Age at beginning (yr.).....	New	New	3.0	New	New	0.75	.....	New
Av. gross weight per car (tons, approx.).....	1.7	1.7	1.5	2.05	1.88	1.8	1.7	1.65
Gas. consumed (gal.).....	2,823	584	4,176	1,360	5,149	.....	1,338	2,325
Miles per gal.....	14.00	15.40	13.54	11.00	14.68	.....	9.89	11.04
Type of road.....	.....	.....	.....	.....	.....	Earth	.....	.....

TABLE 8. ORIGINAL DATA ON PASSENGER AUTOMOBILE COSTS—(Continued)

Group No.	110		111		112		113		114		115		116		117	
	No. of cars in group		1		2		1		8		1		1		1	
Item	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile
Gas.....	1446.42	1.43	36.52	1.00	147.31	1.40	885.65	1.43	415.00	1.15	1227.14	1.29	67.07	1.07	140.00	1.58
Oil.....	80.08	0.08	2.40	0.07	69.45	0.66	64.70	0.10	155.00	0.48	224.00	0.24	35.45	0.56	52.20	0.59
Tires and tubes.....	788.88	0.78	4.90	0.13	32.55	0.31	373.50	0.60	184.00	0.51	228.50	0.24	12.51	0.20	22.85	0.26
Maintenance.....	4000.55	3.96	15.31	0.43	35.88	0.34	2098.72	3.38	80.00	0.22	51.00	0.05	38.63	0.62	51.99	0.58
Misc. costs.....	.....	.....	.....	.....	16.38	0.16	.....	.....	40.00	0.11	16.50	0.02	.....	.....	.....	.....
Depreciation.....	.....	.....	.....	.....	587.00	5.59	1054.14	1.70	915.00	2.53	765.00	0.80	.....	.....	.....	.....
License.....	.....	.....	.....	.....	28.92	0.28	.....	.....	217.50	0.69	102.00	0.11	24.00	0.38	24.00	0.27
Garage.....	.....	.....	.....	.....	66.25	0.63	.....	.....	360.00	1.00	329.35	0.85	.....	.....	.....	.....
Interest.....	.....	.....	.....	.....	104.00	0.99	.....	.....	750.00	2.08	252.00	0.27	.....	.....	.....	.....
Insurance.....	.....	.....	.....	.....	62.08	0.59	.....	.....	350.00	0.90	127.00	0.13	57.38	0.91	57.38	0.64
Totals.....	6315.88	6.25	59.73	1.63	1149.74	10.95	4476.71	7.21	3441.50	9.53	3322.49	3.49	235.04	3.74	347.80	3.92
Type of body.....	Touring	6	Sedan	6	Coupe	6	Touring	6	Touring	6	Touring	6	Touring	6	Sedan	6
Motor, cylinders.....	.....	.....	.....	.....	1,567.00	.....	.....	.....	1,250.00	.....	.....	.....	1,600.00	.....	1,484.00	.....
Av. cost, new (\$)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total miles for accounting period.....	101,140	7,833	.....	.....	10,500	496,060	.....	.....	36,113	.....	95,250	.....	.....	6,268	8,863	.....
Av. total miles per car.....	101,140	3,667	.....	.....	10,500	62,008	.....	.....	36,113	.....	95,250	.....	.....	6,268	8,863	.....
Av. annual miles per car.....	18,905	24,447	.....	.....	9,546	22,966	.....	.....	3,611	.....	19,360	.....	.....	6,268	8,863	.....
Av. length of accounting period (yr.).....	.....	.....	.....	.....	1.1	2.7	.....	.....	10	.....	4.92	.....	.....	1.0	1.0	.....
Period covered by records.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Age at beginning (yr.).....	1921-26	.....	1926	.....	1925-26	.....	1921-26	.....	1916-26	.....	1920-25	.....	1923-24	.....	1925-26	.....
Av. gross weight per car (tons, approx.).....	New	.....	New	.....	New	.....	New	.....	New	.....	New	.....	New	.....	New	.....
Gas, consumed (gal.).....	1.75	1.7	.....	.....	2.1	1.4	.....	.....	1.65	.....	1.25	.....	.....	1.55	1.55	.....
Miles per gal.....	8,038	426	.....	.....	711	37,716	.....	.....	.....	.....	.....	.....	.....	398	692	.....
Type of road.....	.....	.....	.....	.....	.....	14.77	.....	.....	.....	.....	.....	.....	.....	15.75	12.80	.....
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Pavement	Pavement	.....



TABLE 8. ORIGINAL DATA ON PASSENGER AUTOMOBILE COSTS—(Continued)

Group No.	126		127a		127b		127c		127d		128		129		130	
	No. of cars in group		Cost per car		Cents per mile		Cost per car		Cents per mile		Cost per car		Cents per mile		Cost per car	
Item	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile	Cost per car	Cents per mile
Gas.....	329.73	1.74	136.48	1.37	117.84	1.18	126.27	1.26	148.19	1.46	544.71	1.51	1018.72	1.64	691.20	1.37
Oil.....	64.43	0.34	10.80	0.11	20.40	0.20	24.19	0.24	37.45	0.37	93.75	0.09	82.38	0.13	100.55	0.20
Tires and tubes.....	233.08	1.23	30.07	0.30	41.50	0.42	173.65	1.74	173.60	1.74	207.20	0.58	319.84	0.52	406.64	0.80
Maintenance.....	181.92	0.96	33.45	0.33	32.78	0.33	116.12	1.16	173.60	1.74	900.41	2.50	1762.64	2.34	1272.46	2.51
Misc. costs.....	.....	.....	.....	.....	1.50	0.01	2.50	0.03	.....	.....	.....	.....	.....	.....	.....	.....
Depreciation.....	581.76	3.07	408.00	4.08	272.00	2.72	204.00	2.04	176.00	1.76	.....	.....	.....	.....	905.52	1.79
License.....	49.27	0.26	29.75	0.30	25.80	0.26	25.80	0.26	25.80	0.26	.....	.....	.....	.....	.....	.....
Garage.....	60.64	0.32	52.00	0.52	44.00	0.44	48.00	0.48	40.00	0.40	.....	.....	.....	.....	.....	.....
Interest.....	98.54	0.52	88.40	0.88	70.00	0.70	80.30	0.80	20.00	0.20	.....	.....	.....	.....	.....	.....
Insurance.....	9.48	0.05	11.50	0.11	13.50	0.14	8.95	0.09	.....	.....	.....	.....	.....	.....	.....	.....
Totals.....	1608.85	8.49	800.45	8.00	639.32	6.39	809.69	8.10	619.04	6.19	1686.07	4.68	4449.77	7.17	3376.37	6.67
Type of body.....	Roadster	.....	Touring	.....	Touring	.....	Touring	.....	Touring	.....	Touring	.....	Touring	.....	Touring	.....
Motor, cylinders.....	6	.....	6	.....	6	.....	6	.....	6	.....	6	.....	6	.....	6	.....
Av. cost, new, (\$)	1,525.00	.....	1,360.00	.....	1,360.00	.....	1,360.00	.....	1,360.00	.....	1,360.00	.....	1,360.00	.....	1,360.00	.....
Total miles for accounting period.....	18,950	.....	10,000	.....	10,000	.....	10,000	.....	10,000	.....	10,000	.....	10,000	.....	10,000	.....
Av. total miles per car.....	18,950	.....	10,000	.....	10,000	.....	10,000	.....	10,000	.....	10,000	.....	10,000	.....	10,000	.....
Av. annual miles per car.....	11,994	.....	9,259	.....	11,765	.....	11,364	.....	11,905	.....	18,359	.....	27,104	.....	17,266	.....
Av. length of accounting period (yr.).....	1.58	.....	1.08	.....	0.85	.....	0.88	.....	0.84	.....	1.96	.....	2.29	.....	2.93	.....
Period covered by records.....	1921-22	.....	1922-23	.....	1923-24	.....	1924-25	.....	1925-26	.....	1926-27	.....	1927-28	.....	1928-29	.....
Age at beginning (yr.).....	New	.....	New	.....	1.08	.....	1.93	.....	2.81	.....	New	.....	New	.....	New	.....
Av. gross weight per car (tons, approx.).....	1.8	.....	1.6	.....	1.6	.....	1.6	.....	1.6	.....	1.7	.....	1.75	.....	1.75	.....
Gas. consumed (gal.).....	.....	.....	660	.....	655	.....	657	.....	679	.....	8,722	.....	14,961	.....	7,611	.....
Miles per gal.....	.....	.....	15.15	.....	15.26	.....	15.22	.....	14.78	.....	12.38	.....	12.45	.....	13.30	.....
Type of road.....	Earth	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

TABLE 8. ORIGINAL DATA ON PASSENGER AUTOMOBILE COSTS—(Concluded)

Group No.	131		132		133		134	
	1		1		1		1	
Item	Cents		Cents		Cents		Cents	
	Cost per car	per mile	Cost per car	per mile	Cost per car	per mile	Cost per car	per mile
Gas.....	161.64	1.12	180.69	1.49	401.68	1.67	186.34	1.66
Oil.....	19.03	0.13	55.70	0.46	43.03	0.18	23.59	0.21
Tires and tubes.....	4.42	0.03	65.75	0.55	137.45	0.57	.....	.....
Maintenance.....	338.49	2.33	130.63	1.08	555.38	2.31	.....	.....
Misc. costs.....	.....	.....	.....	.....	.....	.....	.....	.....
Depreciation.....	.....	.....	250.00	2.06	.....	.....	.....	.....
License.....	.....	.....	27.00	0.22	.....	.....	.....	.....
Garage.....	.....	.....	41.10	0.34	.....	.....	.....	.....
Interest.....	.....	.....	52.56	0.43	.....	.....	.....	.....
Insurance.....	.....	.....	36.85	0.30	.....	.....	.....	.....
Totals.....	523.58	3.61	840.28	6.93	1,137.54	4.73	209.93	1.87
Type of body.....	Sedan	.....	Touring	.....	Sedan	.....	Sedan	.....
Motor, cylinders.....	6	.....	6	.....	8	.....	6	.....
Av. cost, new, (\$)	3,700.00	.....	.....	.....	4,300.00	.....	.....	.....
Total miles for accounting period	14,498	.....	12,125	.....	24,033	.....	11,247	.....
Av. total miles per car	14,498	.....	12,125	.....	24,033	.....	11,247	.....
Av. annual miles per car.....	21,639	.....	12,763	.....	22,253	.....	11,247	.....
Av. length of accounting period (yr.).....	0.67	.....	0.95	.....	1.08	.....	1.0	.....
Period covered by records.....	1926	.....	1926-27	.....	1925-26	.....	1926	.....
Age at beginning (yr.).....	New	.....	4.0	.....	New	.....	.....	.....
Av. gross weight per car (tons, approx.).....	2.85	.....	1.85	.....	2.4	.....	2.4	.....
Gas. consumed (gal.).....	849	.....	900	.....	2,078	.....	847	.....
Miles per gal.....	17.07	.....	13.47	.....	11.56	.....	13.29	.....
Type of road.....	.....	.....	Gravel	.....	.....	.....	.....	.....

TABLE 9. MOTOR TRUCK OPERATING COSTS

Group.....	1		2		3		4a		4b		5		6		7	
	Light express		Delivery		Delivery		1 ton		1 ton		1 ton		1 ton		1 ton	
No. trucks in group.....	131		7		1		90		102		1		32		1	
Item	Dollars per truck	Cents per mile	Dollars per truck	Cents per mile	Dollars per truck	Cents per mile	Dollars per truck	Cents per mile	Dollars per truck	Cents per mile	Dollars per truck	Cents per mile	Dollars per truck	Cents per mile	Dollars per truck	Cents per mile
Driver.....	251.45	1.31	240.31	1.21	217.25	1.63	64.70	1.94	138.07	2.14	78.48	8.02	233.69	1.79	102.89	2.07
Gas.....	23.40	0.12	23.92	0.12	20.11	0.15	12.28	0.37	18.71	0.29	21.50	2.20	27.63	0.21	18.90	0.39
Tires.....	101.31	0.53	125.39	0.63	70.95	0.53	32.85	0.99	64.52	1.00	1.90	0.19	59.54	0.46	78.00	1.47
Maintenance.....	311.70	1.62	529.96	2.68	1262.87	9.50	21.40	0.64	109.68	1.70	4.25	0.43	264.34	2.03	79.28	1.59
Depreciation.....	425.87	2.21	310.00	1.57	603.00	4.54							427.60	3.28		
License.....																
Garage.....																
Insurance.....																
Supervision.....																
Misc. costs.....							10.62	0.32	18.71	0.29	5.19	0.53				
Totals.....	1118.73	5.79	1229.58	6.21	2174.18	16.35	141.85	4.26	349.69	5.42	111.82	11.37	1012.80	7.77	274.07	5.51
Total miles for accounting period.....	2,518,672		138,487		13,292		298,619		658,116							
Av. total miles per truck.....	19,227		19,784		13,292		3,318		6,452							
Av. annual miles per truck.....	11,114		9,794		4,314		7,900		5,041							
Av. length of accounting period (yr.).....	1.73		2.02		3.06		0.42		1.28							
Period covered by record.....	1921-26		1924-26		1923-26		1923		1924		1923		1922-26		1926	
Age at start (yr.).....	New		New		New		New		New		New		New		New	
Gas consumed (gal.).....	180,449		9,813		1,184		32,197		87,314						43,750	
Miles per gal.....	13.96		14.11		11.23		9.2		7.5						9.53	
Type of road.....	Pneumatic		Pneumatic		Earth		Pneumatic		Pneumatic		Pneumatic		Pneumatic		Pneumatic	
Tire equipment.....																

TABLE 9. MOTOR TRUCK OPERATING COSTS—(Continued)

Group	8		9		10		11		12		13		14		15a	
	Commercial	5	Commercial	28	Commercial	1	Commercial	57	1/4 ton	1 ton	1 ton	1 ton	1 ton	1 ton	1 ton	7
No. trucks in group.....																
Driver .....	121.53	1.08	329.74	1.41	84.12	1.55	216.06	1.73	844.51	3.07	164.45	1.78	68.52	2.82	81.93	2.09
Gas .....	7.26	0.06	31.88	0.14	4.44	0.08	16.02	0.13	82.46	0.30	13.80	0.15	9.33	0.37	9.41	0.24
Oil .....	48.25	0.43	131.12	0.56	28.88	0.53	65.68	0.53	140.69	0.51	70.94	0.77	167.78	6.88	7.84	0.20
Tires .....	145.01	1.29	510.29	2.13	104.18	1.92	397.96	3.18	1424.92	5.18	192.56	2.09	224.74	9.24	39.20	1.00
Maintenance .....			524.88	2.24			670.81	5.37	1125.00	4.09					12.15	0.31
Depreciation .....																
License .....																
Garage .....																
Interest .....																
Insurance .....																
Supervision .....																
Misc. costs .....													10.00	0.41		
Totals.....	322.05	2.86	1527.91	6.52	221.62	4.08	1366.53	10.94	3617.58	13.15	441.75	4.79	480.27	19.71	150.53	3.84
Total miles for ac- counting period.....	56,340		655,855		5,432		712,530		27,506		188,124		2,437		27,448	
Av. total miles per truck .....	11,268		23,423		5,432		12,500		27,506		9,208		2,437		3,920	
Av. annual miles per truck .....	11,987		11,154		4,643		9,680		6,628		12,116		4,062		8,340	
Av. length of account- ing period (yr.).....	0.94		2.10		1.17		1.29		4.15		0.76		0.6		0.47	
Period covered by record .....	1924-26		1922-26		1925-26		1923-26		1922-26		1924-26		1923		1923	
Age at start (yr.).....	New		New		.....		New		New		New		New		New	
Gas consumed (gal.).....	3,647		51,314		549		70,974		4,697		14,377		318		2,980	
Miles per gal. ....	15.45		12.72		Pavement*		10.03		5.86		9.61		12.9		9.3	
Type of road .....	Pneumatic		Pneumatic		Pneumatic		Pneumatic		Pneumatic		Pneumatic		Pneumatic		Pneumatic	
Tire equipment.....																

\*City operation.

TABLE 9. MOTOR TRUCK OPERATING COSTS—(Continued)

Group	15b 1 ton	16 1 ton	17 1 ton	18 1 ton	19 1 ton	20 1 ton	21 1 ton	22* 1½ ton
No. trucks in group	8	1	1	1	1	3	3	11
Item	Dollars per truck mile	Cents per truck mile	Dollars per truck mile	Cents per truck mile	Dollars per truck mile	Cents per truck mile	Dollars per truck mile	Cents per truck mile
Driver	146.12	1.86	84.70	10.24	1282.50	10.66	104.30	2.87
Gas	16.50	0.21	25.60	3.10	448.32	3.73	2.20	157.70
Oil	143.70	1.83	2.65	0.32	28.50	0.24	23.70	0.17
Tires	212.11	2.70	0.88	0.05	396.77	8.30	55.89	0.35
Maintenance			0.38	0.05	1086.90	9.03	296.77	1.21
Depreciation					540.00	4.48		
License					25.00	0.21		
Garage					493.05	4.10		
Interest								
Insurance			6.38	0.77	194.40	1.62		
Supervision								
Misc. costs	30.72	0.39					20.72	0.75
Totals	549.15	6.99	119.71	14.48	4465.44	37.37	480.66	13.21
Total miles for ac- counting period								
Av. total miles per truck	62,847	7,847	827	12,035	46,766	8,277	10,892	95,904
Av. annual miles per truck	7,856	7,847	827	12,035	46,766	2,759	3,631	8,719
Av. length of account- ing period (yr.)	7,856	10,191	10,338	12,035	9,242	7,664	1,500	11,625
Period covered by record	1.00	0.77	0.08	1.00	5.06	0.36	2.42	0.75
Age at start (yr.)	1924	1926	1923	1922	1921-26	1923	1923-26	1924-26
Gas, consumed (gal.)	0.47	New			New	New	New	New
Miles per gal.	7,445	793	128	1,868	6,635	999	1,152	11,517
Type of road	8.7	9.9	6.5	6.44	7.05	8.2	9.46	8.33
Tire equipment	Pneumatic	Solid	Pneumatic	Pavement Pneumatic	Solid	Solid	Solid	Solid

\*Groups 23 to 29 not compiled.

TABLE 9. MOTOR TRUCK OPERATING COSTS—(Continued)

Group.....	30a		30b		31		32		33		34		35		36		
	1½ ton	7	1½ ton	5	1½ ton	1	1½ ton	27	1½ ton	2	1½ ton	2	1½ ton	1	1½ ton	2 ton	
No. trucks in group.....																	
Driver.....	60.01	8.61	43.75	3.74	79.27	2.82	74.49	2.49	101.12	13.99	42.89	4.42	809.38	3.18	809.38	3.18	1344.34
Gas.....	11.74	1.68	5.67	0.48	20.10	0.71	11.96	0.40	28.27	3.91	4.28	0.67	75.50	0.30	75.50	0.30	269.85
Oil.....			7.20	0.61			41.05	1.37		1.80	6.51		340.30	1.33	340.30	1.33	15.00
Tires.....			84.80	7.25	148.69	5.30	127.05	4.25	37.57	5.20	192.79	19.88	564.86	2.21	564.86	2.21	293.86
Maintenance.....									73.10	10.11							796.67
Depreciation.....									1.38	0.19							20.14
License.....																	0.22
Garage.....																	
Interest.....																	
Insurance.....									15.42	2.13							89.60
Supervision.....																	0.99
Misc. costs.....	2.46	0.85	8.60	0.73			10.03	0.34									
Totals.....	102.78	14.72	150.02	12.81	248.06	8.83	264.58	8.85	258.66	35.78	242.19	24.97	1790.04	7.02	2829.46	31.44	
Total miles for ac- counting period.....	4,888		5,837		2,805		80,707		1,445		1,939		25,501		8,998		
Av. total miles per truck.....	698		1,167		2,805		2,989		723		969		25,501		8,998		
Av. annual miles per truck.....	2,376		3,071		11,220		6,793		9,037		1,938		12,143		9,998		
Av. length of account- ing period (yr.).....	0.29		0.38		0.25		0.44		0.08		0.5		2.10		0.9		
Period covered by record.....	1923		1924		1923		1924		1923		1924		1924-26		1922		
Age at start (yr.).....													New				
Gas. consumed (gal.).....	1,938		1,354		409		13,060		268		582		4,676		1,285		
Miles per gal.....	2.5		4.3		6.8		5.1		5.4		3.3		5.45		7.00		
Type of road.....									Pavement						Misc.		
Tire equipment.....	Solid		Pneumatic		Solid		Pneumatic		Pneumatic		Solid		Solid		Solid		

TABLE 9. MOTOR TRUCK OPERATING COSTS—(Concluded)

Group.....	37 2 ton		38a 2 ton		38b 2 ton		39a 2 ton		39b 2 ton		40 2 ton		41a 2 ton		41b 2 ton	
	Dollars per truck	Cents per mile	Dollars per truck	Cents per mile	Dollars per truck	Cents per mile	Dollars per truck	Cents per mile	Dollars per truck	Cents per mile	Dollars per truck	Cents per mile	Dollars per truck	Cents per mile	Dollars per truck	Cents per mile
No. trucks in group.....	1	6	6	16	3	6	6	6	1	6	6	15	6	6	15	15
Item	Dollars	Cents	Dollars	Cents	Dollars	Cents	Dollars	Cents	Dollars	Cents	Dollars	Cents	Dollars	Cents	Dollars	Cents
Driver.....	125.60	5.14	88.35	7.18	149.81	8.63	58.70	10.00	80.38	8.73	130.81	12.59	172.82	11.20	172.82	11.20
Gas.....	13.22	0.54	20.67	1.68	24.00	1.33	3.33	0.62	13.77	0.63	21.61	2.08	25.77	1.67	25.77	1.67
Tires.....	147.62	6.05	0.16	0.01	31.75	1.33	8.65	1.61	9.94	0.09	9.94	0.09	1.23	0.08	1.23	0.08
Maintenance.....	125.37	5.13	50.86	4.15	124.20	7.16	58.07	5.61	196.11	9.10	31.69	3.05	62.65	4.02	62.65	4.02
Depreciation.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Licenses.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Garage.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Interest.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Insurance.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Supervision.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Misc. costs.....	.....	.....	7.95	0.64	6.88	0.39	3.33	0.62	30.60	1.42	2.91	0.28	2.01	0.13	2.01	0.13
Totals.....	411.81	16.86	167.99	13.66	336.64	19.39	132.56	12.70	231.88	14.88	187.96	18.09	263.88	17.10	263.88	17.10
Total miles for ac- counting period.....	2,440		7,378		27,766		3,105		3,223		2,155		6,233		23,149	
Av. total miles per truck.....	2,440		1,229		1,735		1,035		537		2,155		1,039		1,543	
Av. annual miles per truck.....	2,940		2,858		3,402		6,088		1,249		2,873		2,664		2,530	
Av. length of account- ing period (yr.).....	0.83		0.43		0.51		0.17		0.43		0.75		0.35		0.61	
Period covered by records.....	1924		1923		1924		1923		1924		1924		1923		1924	
Age at start (yr.).....	.....		.....		.....		.....		.....		.....		.....		.....	
Gas consumed (gal.).....	730		2,521		13,875		888		1,964		470		3,562		15,631	
Miles per gal.....	3.3		2.8		2.0		3.5		1.6		4.6		1.7		1.5	
Type of road.....	.....		.....		.....		.....		.....		.....		.....		.....	
Tire equipment.....	Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid	

TABLE 9. MOTOR TRUCK OPERATING COSTS—(Continued)

Group.....	42 2 ton	43 2½ ton	44 2½ tons	45 2½ ton	46 2½ tons	47 2½ ton	48a 3 ton	48b 3 ton
No. trucks in group.....	1	1	1	1	1	1	148	185
Driver .....	42.51	1814.88	11.91	2426.58	138.50	1278.73	153.20	364.59
Gas .....	11.60	6.78	615.21	855.52	22.15	556.80	5.65	10.13
Oil .....	0.80	0.47	26.12	59.98	0.96	53.28	1.21	30.92
Tires .....			228.53	622.98	2.00	202.20	4.22	106.36
Maintenance .....	35.75	20.90	761.70	862.85	43.01	1042.44	21.05	201.62
Depreciation .....			533.21	724.18	38.67	353.04		5.60
License .....				65.78	1.90			
Garage .....				174.00				
Interest .....			84.30	408.00				
Insurance .....	7.04	4.12	37.62	1.77		1.94		
Supervision .....				140.60	20.12	191.50		
Misc. costs .....			169.01				3.68	0.38
Totals.....	97.70	57.13	4270.58	6340.47	316.35	3677.98	200.69	717.20
Total miles for ac- counting period.....	171	15,234	13,230	23,009	236	9,861	225,767	665,598
Av. total miles per truck .....	171	15,234	13,230	23,009	236	9,861	1,526	3,598
Av. annual miles per truck .....	2,137	15,234	8,269	11,062	2,650	9,861	3,912	4,089
Av. length of account- ing period (yr.).....	0.08	1.00	1.60	2.08	0.08	1.00	0.39	0.88
Period covered by records .....	1922	1921-22	1925-26	1921-23	1923	1921-22	1923	1924
Age at start (yr.).....			New	New				
Gas consumed (gal.).....	.58	3,001	2,876	3,082	105	2,504	129,466	417,434
Miles per gal. ....	2.9	5.1	4.6	7.5	2.2	3.9	1.7	1.6
Type of road .....	Pavement	Misc.	Pavement	Pavement	Pavement	Pavement		
Tire equipment .....	Solid	Solid	Solid	Solid	Pneumatic	Solid	Solid	Solid

TABLE 9. MOTOR TRUCK OPERATING COSTS—(Continued)

Group.....	49a 3 ton		49b 3 ton		50a 3 ton		50b 3 ton		51 3 ton		52 3½ ton		53 3½ ton		54 5 ton	
	Dollars per truck	Cents per mile	Dollars per truck	Cents per mile	Dollars per truck	Cents per mile	Dollars per truck	Cents per mile	Dollars per truck	Cents per mile	Dollars per truck	Cents per mile	Dollars per truck	Cents per mile	Dollars per truck	Cents per mile
No. trucks in group.....	3		3		3		18		1		2		1		1	
Driver .....	133.25	7.82	200.24	11.89	142.74	10.41	170.16	10.48	1793.03	28.28	114.11	9.32	1208.84	11.59	223.54	9.48
Gas.....	26.08	1.53	27.95	1.66	10.78	0.78	22.46	1.38	722.55	11.39	114.11	9.32	527.83	5.06	223.54	9.48
Oil.....	1.67	0.10	5.00	0.29	.....	.....	14.68	0.90	66.24	1.04	8.49	0.73	34.50	0.33	81.75	3.46
Tires.....	36.90	2.15	334.63	19.88	35.27	2.57	168.99	10.41	97.12	1.53	138.45	11.90	250.27	2.40	.....	.....
Maintenance.....	.....	.....	.....	.....	.....	.....	.....	.....	69.09	1.09	.....	.....	454.96	4.36	.....	.....
Depreciation.....	.....	.....	.....	.....	.....	.....	.....	.....	25.00	0.39	.....	.....	.....	.....	1.25	0.02
License.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	878.63	8.43	.....	.....
Garage.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	52.50	0.50	.....	.....
Interest.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Insurance.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Supervision.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Misc. costs.....	.....	.....	1.33	0.07	.....	.....	3.59	0.22	.....	.....	.....	.....	.....	.....	.....	.....
Totals.....	197.90	11.60	569.15	33.79	188.79	13.76	379.88	23.39	2773.03	43.72	261.05	22.45	3407.53	32.67	306.54	12.96
Total miles for ac- counting period.....	5,108	.....	5,048	.....	4,110	.....	29,237	.....	6,341	.....	2,324	.....	10,428	.....	2,856	.....
Average total miles per truck.....	1,703	.....	1,683	.....	1,370	.....	1,624	.....	6,341	.....	1,162	.....	10,428	.....	2,856	.....
Average annual miles per truck.....	3,406	.....	2,274	.....	4,152	.....	3,248	.....	7,640	.....	1,549	.....	13,904	.....	5,610	.....
Average length of account- ing period (yr.).....	0.50	.....	0.74	.....	0.33	.....	0.50	.....	0.83	.....	0.75	.....	0.75	.....	0.42	.....
Period covered by records.....	1923	.....	1924	.....	1923	.....	1924	.....	1922	.....	1924	.....	1922	.....	1923	.....
Age at start (yr.).....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gas consumed (gal.).....	2,118	.....	3,807	.....	2,378	.....	18,259	.....	3,142	.....	1,539	.....	2,607	.....	1,268	.....
Miles per gal.....	2.4	.....	1.3	.....	1.7	.....	1.6	.....	2.0	.....	1.5	.....	4.0	.....	1.8	.....
Type of road.....	.....	.....	.....	.....	.....	.....	.....	.....	Loose gravel	.....	.....	.....	Misc. Solid	.....	.....	.....
Tire equipment.....	Solid	.....	Solid	.....	Solid	.....	Solid	.....	Solid	.....	Solid	.....	Solid	.....	Solid	.....





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