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AUTOMOBILE OPERATING COST AND MILEAGE STUDIES

By

ROBLEY WINFREY



Bulletin 106

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AMES, IOWA**

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THE PURPOSE of the Engineering Experiment Station is to afford a service, through scientific investigation, evolution of new devices and methods, and tests and analyses 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.

BULLETIN 106

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**AUTOMOBILE OPERATING COST AND
MILEAGE STUDIES**

By

ROBLEY WINFREY, Bulletin Editor



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AMES, IOWA

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A part of the data included here were originally reported by the author in his thesis, "Registration and Mortality Studies on Iowa Automobiles," submitted to Iowa State College in July, 1926, for the master of science degree.

TABLE OF CONTENTS

| | Page |
|--|------|
| Acknowledgments | 3 |
| Abstract | 5 |
| I. Introduction | 5 |
| II. Operating Cost Estimates | 7 |
| 1. Collection and Treatment of Cost Records | 7 |
| 2. Reduction of Costs to Common Basis | 10 |
| 3. Operating Cost of a Composite Car | 11 |
| 4. Two-car Ownership | 19 |
| 5. Limitations of Applications of Cost Estimates | 20 |
| 6. Vehicle-mile and Ton-mile Tax Costs | 20 |
| III. Annual Mileage Estimates | 22 |
| 1. Mileage Reports from Iowa Owners | 22 |
| 2. Annual Mileage Estimated from Gasoline Tax Collec- tions | 26 |
| 3. Estimates of Life Mileages | 31 |
| IV. Estimates of Depreciation, Average Life, and Average Age | 31 |
| 1. Iowa Registration and New Car Sales | 31 |
| 2. Average Life Determined from Cars Dismantled | 34 |
| 3. Average Life Determined from the Year Model of the Cars Registered | 37 |
| 4. Determination of the Average Age of Cars Registered | 37 |
| 5. Depreciation Determined from Used Car Sales | 40 |
| 6. Economic Life | 42 |

AUTOMOBILE OPERATING COST AND MILEAGE STUDIES

ABSTRACT

This bulletin presents the operating costs of 1,675 automobiles, the records for which were submitted by individual Iowa owners and by various state highway departments, from which estimates of average costs are determined for 10 classes of cars for annual mileages of 3,000 to 25,000 miles. Similar cost estimates are made for a car representing the composite of the 1930 Iowa registration.

Estimates of mileage, market value depreciation, average life, and average age are given. The Iowa license fee and gasoline tax is shown for each class on a ton-mile basis. Registrations, new car sales, and number of cars operated daily are shown for 1900 to 1930.

I. INTRODUCTION

The automotive and highway industries have grown so rapidly in the last decade that it has been difficult to keep abreast of their developments. Improvements in automotive design have called for a change in highway design, and likewise as the highways have been improved and adapted to higher speeds a change in motor vehicle design has resulted. These changes have made necessary continuous studies in highway economics and motor vehicle transportation, a field which has been under study by the Iowa Engineering Experiment Station for many years and particularly so since 1920.

Bulletin 69 (1924) "Highway Transportation Costs," was the first publication issued by this Station which dealt with mileage costs. Bulletin 91, "Operating Cost Statistics of Automobiles and Trucks," was published in 1928, giving in addition to average vehicle costs, the relative cost of operating over low, intermediate, and high type road surfaces. In bulletin 69 also, stress was placed upon the relative cost of operation on various roadway surfaces. Since the entire supply of each of these bulletins has been distributed and since the cost figures presented therein have been modified by road and vehicle improvements, another publication on this subject is timely.

Other recent bulletins published by this Station on highway economics and highway improvements are listed on the inside of the back cover of this bulletin.¹

Since the total cost of highway transportation is composed of highway costs and vehicle costs, it becomes necessary to study these indi-

¹Particular reference is made to the following additional bulletins: 56, 65, 67, 85, and 88.

vidually in any attempt to arrive at reasonable estimates of the total cost of highway transportation. In the highway field, the road bed (highways) is owned by the public and the rolling stock (motor vehicles) is privately and separately owned. Therefore, the support of these two items of cost comes from separate book accounts, unlike rail transportation in which costs are controlled by one organization.

As private automobile, bus, and highway freight transportation increase the problem of taxation becomes more complex. It cannot be administered with any degree of equality and satisfaction without technical analyses of the highway transportation industry, involving the cost of transportation by the various classes of vehicles.

Reliable estimates of motor vehicle operating costs are of widespread value and interest as there are but few persons in the United States who do not come in direct personal contact with this class of transportation. Owners of fleets and organizations paying automobile expense accounts are vitally interested in cost analyses. Such cost records, however, are not plentiful and as they are seldom reported in the literature a study of this kind becomes one of gathering records from scattered sources, assembling them, and adjusting the results to a common basis in order that comparisons might be made. Reliable records on the privately owned and operated vehicles are hard to find, as few owners compile them and there is no economical means of collecting those that are kept. Owners of fleets usually keep good records, but because of special prices, conditions of service, and bookkeeping methods, accurate comparisons of accounts are difficult to make. An accurate account, or any account of an individual car throughout its life, is almost unknown. Records for the first two or three years are more common, but these do not reflect the true cost picture since the period of heaviest maintenance is not covered.

The final estimates of operating cost are reported here in a form easily reduced to different annual mileages, unit costs, and operating conditions. In general, annual mileage, geographic location, type of service, and cost of vehicle determine the cost per mile, and in any comparison of unit mile costs allowances must be made for differences in these items.

It is recognized that the cost records kept by operators of fleets of cars do not give average costs widely applicable to cars under individual ownership and operation or to other fleets which may be operated under a very different management and character of service. Necessarily, however, such records must be used in any successful attempt to classify costs, as complete records on personal cars are not available. Fleet records give results for high annual mileages and thus one year of operation in such cases is equivalent to two or more under individual operation. The factors of time, unit prices, uniformity and character of service, may vary widely between the

two classes of ownership and thus any comparison must be made with allowances.

The few costs reported herein should not be taken as conclusive evidence establishing the average cost or average mileage of the passenger cars in Iowa nor the United States, but as long as the present dearth of acceptable cost records exists, such figures as are given here, when reasonably interpreted, offer a fairly satisfactory answer to the question, "What does it cost me to operate my car?"

II. OPERATING COST ESTIMATES

To arrive at reasonable average costs of motor vehicle operation would require the composition of a large number of records in each chosen class of cars, and each geographical locality affecting the costs because of conditions of traffic, character of road surfaces, topographical conditions of the country, and other conditions of service. Generally the student of this subject must use the information which is easily available, the result being that some classes may include too few cars to assure the determination of a satisfactory average unit cost, and, as a rule, his information will not cover the country and conditions of service as thoroughly as desired.

1. **Collection and Treatment of Cost Records.** An attempt was made to collect cost reports from the owners of privately operated cars in Iowa, and many hundred letters were sent out asking for such information, but it was found that few individuals kept such records and to secure those would constitute a cost beyond the value of the information received. A few such records were received, however, and there are therefore included 208 records representing the family car.

Since sufficient information on the individually owned cars was not available, records from various state highway departments were secured, and the cost information reported here is based to a large extent on 1,467 vehicles owned by the following state highway departments and operated by state highway officials and employees:

California Department of Public Works, Division of Highways.

State of Idaho Department of Public Works, Bureau of Highways, Equipment Division.

Maine State Highway Commission.

Massachusetts Department of Public Works.

Missouri State Highway Commission, Bureau of Equipment.

North Dakota State Highway Commission.

West Virginia State Highway Commission.

The records of operating cost received were grouped into classes representing the number of engine cylinders and the list weight of the car in accordance with Table 1.

The preliminary grouping of the records received from each operator was made without regard to make of car but with attention to the body style, so that the information reported in Table 14, page 43, represents the information as received except that it has been combined in the case of each owner for all cars of the same class (Table 1) and same body style.

The records in Table 14 were then summarized in two groups, fleet operation and individual operation, the cars in each of these two groups being combined solely on the basis of number of cylinders and list weight, except that the Ford model A was separated. Next these two groups were combined with the results given in Table 2. All combinations and averages were made on a weighted basis so that each car is given its proper weight in the final averages.

TABLE 1. WEIGHT, LIST PRICE, MAKE, AND GROUP CLASSIFICATION OF CARS IN TABLE 14.

| Weight Class | Class Limits | | Cars in Table 14 | | | | | | Approx. Percentage, 1930 Iowa Registration |
|----------------|--|------|-------------------|------|------|------------------------|------|------|--|
| | | | Weight Range, lb. | | | Factory List Price, \$ | | | |
| | Min. | Max. | Min. | Max. | Avg. | Min. | Max. | Avg. | |
| Light 4 | 1500 | 2000 | 1558 | 1065 | 1703 | 355 | 680 | 415 | 31.21 |
| Ford A (M4) | 2000 | 2500 | 2050 | 2372 | 2199 | 395 | 625 | 493 | 12.55 |
| Other Medium 4 | 2000 | 2500 | 2005 | 2500 | 2299 | 495 | 1248 | 728 | 13.44 |
| Heavy 4 | 2500 | 3200 | 2510 | 3209 | 2648 | 495 | 1650 | 922 | 7.10 |
| Light 6 | 2100 | 2700 | 2185 | 2700 | 2535 | 525 | 1950 | 861 | 16.47 |
| Medium 6 | 2700 | 3300 | 2703 | 3280 | 2938 | 875 | 1595 | 1179 | 9.30 |
| Heavy 6 | 3300 | 4500 | 3300 | 4113 | 3506 | 1095 | 2685 | 1426 | 7.97 |
| Light 8 | 2800 | 3500 | 2890 | 3070 | 2934 | 995 | 1465 | 1339 | 0.54 |
| Medium 8 | 3500 | 4200 | 3545 | 4100 | 3798 | 1605 | 3045 | 2320 | 0.72 |
| Heavy 8 | 4200 | 5400 | 4285 | 4632 | 4603 | 3185 | 3406 | 3374 | 0.70 |
| Composite car | — | — | — | — | 2350 | — | — | 767 | 100.00 |
| Weight Class | Makes of Cars Included in Each Class | | | | | | | | |
| Light 4 | Ford T, Chevrolet, Star. | | | | | | | | |
| Ford A (M4) | Ford A. | | | | | | | | |
| Other medium 4 | Chevrolet, Chrysler, Dodge, Maxwell, Whippet. | | | | | | | | |
| Heavy 4 | Hupmobile, Nash, Plymouth, Overland, Reo, Willys-Knight. | | | | | | | | |
| Light 6 | Chandler, Chevrolet, Chrysler, Dodge, Durant, Essex, Falcon-Knight, Franklin, Nash, Oldsmobile, Overland, Oakland, Pontiac, Star, Studebaker, Whippet. | | | | | | | | |
| Medium 6 | Buick, Chrysler, Columbia, Dodge, Falcon-Knight, Graham-Paige, Jewett, Hudson, Hupmobile, Nash, Oakland, Oldsmobile, Reo, Studebaker, Willys-Knight. | | | | | | | | |
| Heavy 6 | Buick, Dodge, Hudson, Nash, Packard, Peerless, Studebaker, Willys-Knight. | | | | | | | | |
| Light 8 | Roosevelt, Marmon, Oldsmobile. | | | | | | | | |
| Medium 8 | Cadillac, Hupmobile, Nash. | | | | | | | | |
| Heavy 8 | Cadillac. | | | | | | | | |

TABLE 2. SUMMARY OF COST DATA AS SUBMITTED BY OWNERS OR OPERATORS'

| Weight Class | Light 4 | | Ford A (M4) | | Other M4 | | Heavy 4 | | Light 6 | |
|------------------------------|-------------------|----------------|-------------------|----------------|-------------------|----------------|-------------------|----------------|-------------------|----------------|
| | No. of Cars Avgd. | Cents Per Mile | No. of Cars Avgd. | Cents Per Mile | No. of Cars Avgd. | Cents Per Mile | No. of Cars Avgd. | Cents Per Mile | No. of Cars Avgd. | Cents Per Mile |
| 1. Gasoline | 692 | 1.09 | 281 | 1.05 | 177 | 1.10 | 112 | 1.27 | 153 | 1.15 |
| 2. Oil | 692 | 0.21 | 281 | 0.17 | 177 | 0.14 | 112 | 0.15 | 153 | 0.16 |
| 3. Tires and tubes | 692 | 0.46 | 281 | 0.37 | 177 | 0.36 | 110 | 0.52 | 152 | 0.33 |
| 4. Maintenance costs | 623 | 1.29 | 279 | 0.60 | 165 | 0.97 | 107 | 1.71 | 151 | 0.96 |
| 4. Misc. costs | 449 | 0.15 | 101 | 0.15 | 63 | 0.07 | 12 | 0.32 | 48 | 0.10 |
| 5. Depreciation | 304 | 1.38 | 218 | 1.20 | 141 | 1.79 | 21 | 2.30 | 90 | 1.76 |
| 6. License | 367 | 0.11 | 120 | 0.15 | 72 | 0.18 | 19 | 0.22 | 95 | 0.14 |
| 7. Garage | 140 | 0.71 | 19 | 0.40 | 85 | 0.45 | 18 | 0.61 | 45 | 0.20 |
| 9. Insurance | 25 | 0.22 | 19 | 0.18 | 49 | 0.33 | 15 | 0.20 | 44 | 0.22 |
| Informational Items | Cars | Amount | Cars | Amount | Cars | Amount | Cars | Amount | Cars | Amount |
| Average list price, \$ | 692 | 415 | 281 | 493 | 177 | 728 | 112 | 922 | 153 | 861 |
| Average weight, lb. | 692 | 1705 | 281 | 2199 | 177 | 2299 | 112 | 2646 | 153 | 2535 |
| Average age at start, yr. | 203 | 0.22 | 281 | 0.00 | 116 | 0.50 | 103 | 0.41 | 108 | 0.27 |
| Dates covered | 692 | 1920-30 | 281 | 1928-30 | 177 | 1924-30 | 112 | 1920-30 | 153 | 1922-30 |
| Average account period, yr. | 692 | 1.39 | 281 | 0.80 | 177 | 1.61 | 112 | 2.61 | 153 | 1.07 |
| Average total miles per car | 692 | 18,114 | 281 | 13,042 | 177 | 23,046 | 112 | 41,654 | 153 | 20,058 |
| Average annual miles per car | 692 | 14,227 | 281 | 17,503 | 177 | 14,404 | 112 | 16,393 | 153 | 24,258 |
| Miles per gallon of gas | 692 | 16.09 | 281 | 17.49 | 177 | 17.30 | 112 | 15.28 | 152 | 15.40 |
| Miles per quart of oil | 552 | 88 | 262 | 104 | 91 | 126 | 93 | 99 | 106 | 95 |
| Weight Class | Medium 6 | | Heavy 6 | | Light 8 | | Medium 8 | | Heavy 8 | |
| Cost Items | Cars | Cents | Cars | Cents | Cars | Cents | Cars | Cents | Cars | Cents |
| 1. Gasoline | 165 | 1.30 | 81 | 1.46 | 5 | 1.71 | 4 | 1.68 | 5 | 1.81 |
| 2. Oil | 165 | 0.16 | 81 | 0.15 | 5 | 0.09 | 4 | 0.39 | 5 | 0.29 |
| 3. Tires and tubes | 164 | 0.48 | 80 | 0.62 | 4 | 0.39 | 3 | 0.52 | 5 | 0.63 |
| 4. Maintenance | 165 | 1.35 | 78 | 1.49 | 5 | 0.81 | 4 | 1.14 | 5 | 1.81 |
| 4. Misc. costs | 63 | 0.20 | 17 | 0.25 | | | 1 | 0.12 | 3 | 3.36 |
| 5. Depreciation | 115 | 1.78 | 54 | 2.71 | 4 | 2.80 | 2 | 4.39 | | |
| 6. License | 62 | 0.25 | 34 | 0.30 | 2 | 0.51 | 3 | 0.52 | 1 | 0.71 |
| 7. Garage | 38 | 0.65 | 22 | 0.81 | 2 | 0.87 | 2 | 1.36 | 1 | 0.79 |
| 9. Insurance | 26 | 0.28 | 19 | 0.49 | 1 | 0.39 | 2 | 0.88 | 1 | 0.96 |
| Informational Items | Cars | Amount | Cars | Amount | Cars | Amount | Cars | Amount | Cars | Amount |
| Average list price, \$ | 165 | 1179 | 81 | 1426 | 5 | 1339 | 4 | 2320 | 5 | 3374 |
| Average weight, lb. | 165 | 2938 | 81 | 3506 | 5 | 2934 | 4 | 3798 | 5 | 4603 |
| Average age at start, yr. | 122 | 0.54 | 60 | 0.17 | 5 | 1.80 | 2 | 0.00 | 3 | 0.00 |
| Dates covered | 165 | 1923-30 | 81 | 1920-30 | 5 | 1928-30 | 4 | 1924-30 | 5 | 1927-30 |
| Average account period, yr. | 165 | 1.36 | 81 | 1.81 | 5 | 1.34 | 4 | 1.57 | 5 | 1.91 |
| Average total miles per car | 165 | 26,793 | 81 | 30,659 | 5 | 9,121 | 4 | 15,626 | 5 | 34,344 |
| Average annual miles per car | 165 | 21,210 | 81 | 18,859 | 5 | 11,525 | 4 | 13,146 | 5 | 17,827 |
| Miles per gallon of gas | 163 | 14.60 | 81 | 13.47 | 5 | 12.65 | 4 | 12.82 | 5 | 10.98 |
| Miles per quart of oil | 124 | 110 | 58 | 117 | 3 | 142 | 2 | 104 | 4 | 75 |

6

Since all items of cost were not reported on some cars, the number of records averaged for each cost item or informational item is shown in Table 2.

2. Reduction of Costs to Common Basis. Any comparison of car operating costs must be made with the costs calculated to a common base as the variation in market prices and grades of fuel, oil, insurance, and other items affect the final average cost. A standard method of estimating depreciation should be used and all comparisons should be made on the same annual mileage. The summarized costs in Table 2 were reduced to a uniform basis by using the cost as reported in cents per mile for tires and maintenance and the gasoline and oil mileage as given, computing all other items of cost on a basis of uniform prices or methods. These final costs, as shown in Table 3 and Fig. 1, were calculated as follows:

1. *Gasoline*: The average mileage per gallon of gasoline was taken from Table 2 for the various classes and reduced to cents per mile on the basis of a uniform price of 20 cents a gallon including the Iowa tax of 3 cents a gallon.

2. *Oil*: The average miles per quart of oil was taken from Table 2 for the weight classes and reduced to cents per mile on the basis of a uniform price of 25 cents a quart.

3. *Tires and tubes*: The average cost per mile as reported in Table 2 was used without modification.

4. *Maintenance*: The average cost per mile as reported in Table 2 was used without modification. Maintenance includes repair parts, labor, washing, greasing, towing, and reported miscellaneous costs.

5. *Depreciation*: Depreciation was figured on a straight line basis for all weight groups, allowing 10 percent of the cost new delivered for salvage value and a total life mileage of 50,000 miles.

The straight line method of figuring depreciation charges was used because it is easy to apply, easy to understand and is suitable to the short term investment. The total depreciation was spread over 50,000 miles as applying to the average car throughout its life regardless of changes in ownership. Thus depreciation includes mechanical wear and tear as well as obsolescence.

6. *License*: The cost of license was figured at the Iowa rate of 40 cents a hundred pounds list weight plus 1 percent of the factory list price, the latter item being reduced for the sixth and subsequent registrations to 0.5 percent of the list price with a minimum total fee of \$10. The costs reported in Table 3 are the averages of five registrations at the full rate and three registrations at the reduced rate, except for annual mileages above 7,000 in which case the average of the whole number of licenses paid during a period of 50,000 miles was taken. Weights and list prices were taken from Table 1.

7. *Garage*: A uniform cost of \$4 a month was used for all classes.

8. *Interest*: Interest charges were figured at 6 percent per annum on the depreciated value of the car at the beginning of the year. Table 3 reports the average interest charges over a 50,000-mile period

for annual mileages above 7,000 and for the corresponding mileage during 7.5 years for annual mileages of 7,000 and less.

9. *Insurance*: The insurance charges were figured at the rates in force at Ames, Iowa, during 1930. The coverage includes, \$5,000 property damage, \$10,000 and \$20,000 public liability (one and two persons killed), fire, theft, and tornado. The insurance was calculated as the average of eight yearly payments, except for annual mileages above 7,000 when the average of the whole number of payments during a life of 50,000 miles was used.

A study of Table 3 and Fig. 1 will show that the annual mileage has a very great effect on the cost per mile for the lower annual mileages and emphasizes that any comparison of costs between different cars or different fleets must be made on a basis of equal annual mileages, particularly for mileages of less than 10,000 a year. This study also indicates that the final cost is dependent to a large extent upon the weight of the vehicle. Since the list price varies somewhat in accordance with the list weight, it follows that the unit mile cost of operation is somewhat proportional to both the weight and purchase price of the car.

The curves (Fig. 1) for the Ford model A and light 8 are probably too low as the data were based upon rather new cars, and the maintenance items are relatively low in comparison with other cars. In contrast, the light 4 and heavy 4 classes indicate costs higher than would normally be expected. Most of the cars in the light 4 and heavy 4 classes have been off the market for some time and these curves are only applicable to old makes of cars. The light 4 class was composed mainly of Ford model T cars, while the heavy 4 class contained a number of miscellaneous old makes comprising about 7 percent of the Iowa registration in 1930. There were sold in 1930 only one make which would fall in the light 4 class, about two or three in the medium 4 class, and none at all in the heavy 4 class. The heavy 6 class is giving way to the light 8 cars. The 1930 sales in Iowa were distributed about as follows: Ford A.(M4), 39.7 percent; medium 4, 3.4 percent; light 6, 37.1 percent; medium 6, 11.6 percent; heavy 6, 1.7 percent; light 8, 2.7 percent; medium 8, 2.4 percent; and heavy 8, 1.4 percent.

The relative cost of the nine items is shown graphically in Fig. 2 for each class of vehicle. This figure illustrates very definitely that the maintenance costs of the Ford A and light 8 are abnormally low, while those for the light 4 and heavy 4 classes are abnormally high. These apparent discrepancies are due to the newness of the group first named and to the oldness of those cars in the latter classes. It will be noticed that the total cost curve follows the general shape of the curves for depreciation and maintenance since these items of cost are large in comparison with the other items and they vary more widely between different weight groups.

3. *Operating Cost of a Composite Car*. For studies in the field of highway economics and highway taxation it is desirable to know

TABLE 3. FINAL ESTIMATED CAR OPERATING COSTS

| Weight Class | Light 4 | | Ford A (M4) | | Other M4 | | Heavy 4 | | Light 6 | |
|---------------------------|------------------|----------------|------------------|----------------|------------------|----------------|------------------|----------------|------------------|----------------|
| | 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 |
| For 5,000 Miles a Year | | | | | | | | | | |
| 1. Gasoline, 20c per gal. | 63.00 | 1.26 | 57.00 | 1.14 | 58.00 | 1.16 | 65.50 | 1.31 | 65.00 | 1.30 |
| 2. Oil, 25c per quart | 14.50 | 0.29 | 12.00 | 0.24 | 10.00 | 0.20 | 12.50 | 0.25 | 13.00 | 0.26 |
| 3. Tires and tubes | 23.00 | 0.46 | 18.50 | 0.37 | 18.00 | 0.36 | 26.00 | 0.52 | 16.50 | 0.33 |
| 4. Maintenance | 70.00 | 1.40 | 33.00 | 0.66 | 49.00 | 0.98 | 87.50 | 1.75 | 49.50 | 0.99 |
| 5. Depreciation | 44.00 | 0.88 | 52.50 | 1.05 | 77.50 | 1.55 | 98.00 | 1.96 | 91.50 | 1.83 |
| 6. License, Iowa rate | 10.18 | 0.20 | 12.80 | 0.26 | 15.12 | 0.30 | 18.07 | 0.36 | 17.13 | 0.34 |
| 7. Garage, \$4 a month | 48.00 | 0.96 | 48.00 | 0.96 | 48.00 | 0.96 | 48.00 | 0.96 | 48.00 | 0.96 |
| 8. Interest, 6 percent | 20.10 | 0.40 | 23.92 | 0.48 | 35.30 | 0.71 | 44.72 | 0.89 | 41.76 | 0.83 |
| 9. Insurance, Ames rate | 19.40 | 0.39 | 19.01 | 0.38 | 20.36 | 0.41 | 22.98 | 0.46 | 24.26 | 0.49 |
| Total cost | 312.18 | 6.24 | 276.73 | 5.54 | 331.28 | 6.63 | 423.27 | 8.46 | 366.65 | 7.33 |
| For 7,000 Miles a Year | | | | | | | | | | |
| 1. Gasoline, 20c per gal. | 88.20 | 1.26 | 79.80 | 1.14 | 81.20 | 1.16 | 91.70 | 1.31 | 91.00 | 1.30 |
| 2. Oil, 25c per quart | 20.30 | 0.29 | 16.80 | 0.24 | 14.00 | 0.20 | 17.50 | 0.25 | 18.20 | 0.26 |
| 3. Tires and tubes | 32.20 | 0.46 | 25.90 | 0.37 | 25.20 | 0.36 | 36.40 | 0.52 | 23.10 | 0.33 |
| 4. Maintenance | 98.00 | 1.40 | 46.20 | 0.66 | 68.00 | 0.98 | 122.50 | 1.75 | 69.30 | 0.99 |
| 5. Depreciation | 61.60 | 0.88 | 73.50 | 1.05 | 108.50 | 1.55 | 137.20 | 1.96 | 128.10 | 1.83 |
| 6. License, Iowa rate | 10.18 | 0.14 | 12.80 | 0.18 | 15.12 | 0.22 | 18.07 | 0.26 | 17.13 | 0.25 |
| 7. Garage, \$4 a month | 48.00 | 0.69 | 48.00 | 0.69 | 48.00 | 0.69 | 48.00 | 0.69 | 48.00 | 0.69 |
| 8. Interest, 6 percent | 17.89 | 0.26 | 21.29 | 0.30 | 31.42 | 0.45 | 39.80 | 0.57 | 37.17 | 0.53 |
| 9. Insurance, Ames rate | 19.40 | 0.28 | 19.01 | 0.27 | 20.36 | 0.29 | 22.98 | 0.33 | 24.26 | 0.35 |
| Total cost | 395.77 | 5.66 | 343.30 | 4.90 | 412.40 | 5.89 | 534.15 | 7.63 | 456.26 | 6.52 |
| For 9,000 Miles a Year | | | | | | | | | | |
| 1. Gasoline, 20c per gal. | 113.40 | 1.26 | 102.60 | 1.14 | 104.40 | 1.16 | 117.90 | 1.31 | 117.00 | 1.30 |
| 2. Oil, 25c per quart | 26.10 | 0.29 | 21.60 | 0.24 | 18.00 | 0.20 | 22.50 | 0.25 | 23.40 | 0.26 |
| 3. Tires and tubes | 41.40 | 0.46 | 33.30 | 0.37 | 32.40 | 0.36 | 46.80 | 0.52 | 29.70 | 0.33 |
| 4. Maintenance | 126.00 | 1.40 | 59.40 | 0.66 | 88.20 | 0.98 | 157.50 | 1.75 | 89.10 | 0.99 |
| 5. Depreciation | 79.20 | 0.88 | 94.50 | 1.05 | 139.50 | 1.55 | 176.40 | 1.96 | 164.70 | 1.83 |
| 6. License, Iowa rate | 11.45 | 0.13 | 13.32 | 0.15 | 15.87 | 0.18 | 19.03 | 0.21 | 18.03 | 0.20 |
| 7. Garage, \$4 a month | 48.00 | 0.53 | 48.00 | 0.53 | 48.00 | 0.53 | 48.00 | 0.53 | 48.00 | 0.53 |
| 8. Interest, 6 percent | 18.51 | 0.20 | 22.03 | 0.25 | 32.52 | 0.36 | 41.19 | 0.46 | 38.47 | 0.43 |
| 9. Insurance, Ames rate | 19.89 | 0.22 | 19.50 | 0.22 | 20.84 | 0.23 | 23.58 | 0.26 | 24.95 | 0.28 |
| Total cost | 483.95 | 5.38 | 414.25 | 4.60 | 499.79 | 5.55 | 652.90 | 7.25 | 553.35 | 6.15 |

For 11,000 Miles a Year

| | | | | | | | | | | |
|---------------------------|---------------|-------------|---------------|-------------|---------------|-------------|---------------|-------------|---------------|-------------|
| 1. Gasoline, 20c per gal. | 138.60 | 1.26 | 125.40 | 1.14 | 127.60 | 1.18 | 144.10 | 1.31 | 143.00 | 1.30 |
| 2. Oil, 25c per quart | 31.90 | 0.29 | 26.40 | 0.24 | 22.00 | 0.20 | 27.50 | 0.25 | 28.60 | 0.26 |
| 3. Tires and tubes | 50.60 | 0.46 | 40.70 | 0.37 | 30.60 | 0.36 | 57.20 | 0.52 | 36.30 | 0.33 |
| 4. Maintenance | 154.00 | 1.40 | 72.60 | 0.66 | 107.80 | 0.98 | 192.50 | 1.75 | 108.90 | 0.99 |
| 5. Depreciation | 96.80 | 0.88 | 115.50 | 1.05 | 170.50 | 1.55 | 215.60 | 1.96 | 201.30 | 1.83 |
| 6. License, Iowa rate | 11.96 | 0.11 | 13.73 | 0.12 | 16.48 | 0.15 | 19.80 | 0.18 | 18.75 | 0.17 |
| 7. Garage, \$4 a month | 48.00 | 0.44 | 48.00 | 0.44 | 48.00 | 0.44 | 48.00 | 0.44 | 48.00 | 0.44 |
| 8. Interest, 6 percent | 19.04 | 0.17 | 22.66 | 0.21 | 33.45 | 0.30 | 42.37 | 0.33 | 39.56 | 0.36 |
| 9. Insurance, Ames rate | 20.28 | 0.18 | 19.84 | 0.18 | 21.22 | 0.19 | 23.99 | 0.22 | 25.50 | 0.23 |
| Total cost | 571.18 | 5.19 | 484.23 | 4.41 | 586.55 | 5.33 | 771.06 | 7.01 | 649.91 | 5.91 |

For 13,000 Miles a Year

| | | | | | | | | | | |
|---------------------------|---------------|-------------|---------------|-------------|---------------|-------------|---------------|-------------|---------------|-------------|
| 1. Gasoline, 20c per gal. | 163.80 | 1.26 | 148.20 | 1.14 | 150.80 | 1.16 | 170.30 | 1.31 | 169.00 | 1.30 |
| 2. Oil, 25c per quart | 37.70 | 0.29 | 31.20 | 0.24 | 26.00 | 0.20 | 32.50 | 0.25 | 33.80 | 0.26 |
| 3. Tires and tubes | 59.80 | 0.46 | 48.10 | 0.37 | 46.80 | 0.36 | 67.60 | 0.52 | 42.00 | 0.33 |
| 4. Maintenance | 182.00 | 1.40 | 85.80 | 0.66 | 127.40 | 0.98 | 227.50 | 1.75 | 128.70 | 0.99 |
| 5. Depreciation | 114.40 | 0.88 | 136.50 | 1.05 | 201.50 | 1.55 | 254.80 | 1.96 | 237.90 | 1.83 |
| 6. License, Iowa rate | 11.96 | 0.09 | 13.73 | 0.11 | 16.48 | 0.13 | 19.80 | 0.15 | 18.75 | 0.14 |
| 7. Garage, \$4 a month | 48.00 | 0.37 | 48.00 | 0.37 | 48.00 | 0.37 | 48.00 | 0.37 | 48.00 | 0.37 |
| 8. Interest, 6 percent | 19.57 | 0.15 | 23.29 | 0.18 | 34.33 | 0.26 | 43.54 | 0.33 | 40.66 | 0.31 |
| 9. Insurance, Ames rate | 20.73 | 0.16 | 20.22 | 0.16 | 21.67 | 0.17 | 24.46 | 0.19 | 26.12 | 0.20 |
| Total cost | 657.96 | 5.06 | 555.04 | 4.27 | 673.03 | 5.18 | 888.50 | 6.83 | 745.83 | 5.73 |

For 18,000 Miles a Year

| | | | | | | | | | | |
|---------------------------|---------------|-------------|---------------|-------------|---------------|-------------|----------------|-------------|---------------|-------------|
| 1. Gasoline, 20c per gal. | 226.80 | 1.26 | 205.20 | 1.14 | 208.80 | 1.16 | 235.80 | 1.31 | 234.00 | 1.30 |
| 2. Oil, 25c per quart | 52.20 | 0.29 | 43.20 | 0.24 | 36.00 | 0.20 | 45.00 | 0.25 | 46.80 | 0.26 |
| 3. Tires and tubes | 82.80 | 0.46 | 66.60 | 0.37 | 61.80 | 0.36 | 93.60 | 0.52 | 59.40 | 0.33 |
| 4. Maintenance | 252.00 | 1.40 | 118.80 | 0.66 | 176.40 | 0.98 | 315.00 | 1.75 | 178.20 | 0.99 |
| 5. Depreciation | 158.40 | 0.88 | 189.00 | 1.05 | 279.00 | 1.55 | 352.80 | 1.96 | 329.40 | 1.83 |
| 6. License, Iowa rate | 11.96 | 0.06 | 13.73 | 0.08 | 16.48 | 0.09 | 19.80 | 0.11 | 18.75 | 0.10 |
| 7. Garage, \$4 a month | 48.00 | 0.27 | 48.00 | 0.27 | 48.00 | 0.27 | 48.00 | 0.27 | 48.00 | 0.27 |
| 8. Interest, 6 percent | 20.89 | 0.12 | 24.86 | 0.14 | 36.70 | 0.21 | 46.98 | 0.26 | 43.40 | 0.24 |
| 9. Insurance, Ames rate | 21.28 | 0.12 | 20.67 | 0.11 | 22.25 | 0.12 | 25.05 | 0.14 | 26.90 | 0.15 |
| Total cost | 874.33 | 4.86 | 730.06 | 4.06 | 888.43 | 4.04 | 1181.53 | 6.57 | 984.85 | 5.47 |

| | | | | | |
|------------------------------|---------|---------|---------|----------|----------|
| 10. Average cost new,* \$ | 415-489 | 403-582 | 728-850 | 922-1088 | 861-1016 |
| 11. Average list weight, lb. | 1703 | 2199 | 2299 | 2646 | 2535 |
| 12. Miles per gallon of gas | 15.82 | 17.49 | 17.30 | 15.28 | 15.40 |
| 13. Miles per quart of oil | 87 | 104 | 126 | 99 | 95 |

*First figure = factory list price; second figure = Iowa delivered retail price = list price times 118%.

TABLE 3. (CONT.) FINAL ESTIMATED CAR OPERATING COSTS

| Weight Class | Medium 6 | | Heavy 6 | | Light 8 | | Medium 8 | | Heavy 8 | |
|---------------------------|------------------|----------------|------------------|----------------|------------------|----------------|------------------|----------------|------------------|----------------|
| | 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 |
| For 5,000 Miles a Year | | | | | | | | | | |
| 1. Gasoline, 20c per gal. | 64.00 | 1.28 | 74.00 | 1.48 | 79.00 | 1.58 | 78.00 | 1.56 | 91.00 | 1.82 |
| 2. Oil, 25c per quart | 11.50 | 0.23 | 10.50 | 0.21 | 9.00 | 0.18 | 12.00 | 0.24 | 16.50 | 0.33 |
| 3. Tires and tubes | 24.00 | 0.48 | 31.50 | 0.63 | 19.50 | 0.39 | 26.00 | 0.52 | 31.50 | 0.63 |
| 4. Maintenance | 71.50 | 1.43 | 77.00 | 1.54 | 40.50 | 0.81 | 53.50 | 1.17 | 90.50 | 1.81 |
| 5. Depreciation | 125.00 | 2.50 | 151.50 | 3.03 | 142.00 | 2.84 | 246.50 | 4.93 | 358.50 | 7.17 |
| 6. License, Iowa rate | 21.31 | 0.43 | 25.61 | 0.51 | 22.62 | 0.45 | 34.04 | 0.68 | 45.82 | 0.92 |
| 7. Garage, \$4 a month | 48.00 | 0.96 | 48.00 | 0.96 | 48.00 | 0.96 | 48.00 | 0.96 | 48.00 | 0.96 |
| 8. Interest, 6 percent | 57.17 | 1.14 | 69.17 | 1.38 | 64.94 | 1.30 | 112.53 | 2.25 | 163.62 | 3.27 |
| 9. Insurance, Ames rate | 28.19 | 0.56 | 31.88 | 0.62 | 32.13 | 0.64 | 38.15 | 0.76 | 40.20 | 0.80 |
| Total cost | 450.67 | 9.01 | 519.16 | 10.38 | 457.69 | 9.15 | 653.72 | 13.07 | 885.64 | 17.71 |
| For 7,000 Miles a Year | | | | | | | | | | |
| 1. Gasoline, 20c per gal. | 89.60 | 1.28 | 103.60 | 1.48 | 110.60 | 1.58 | 109.20 | 1.56 | 127.40 | 1.82 |
| 2. Oil, 25c per quart | 16.10 | 0.23 | 14.70 | 0.21 | 12.60 | 0.18 | 16.80 | 0.24 | 23.10 | 0.33 |
| 3. Tires and tubes | 33.60 | 0.48 | 44.10 | 0.63 | 27.30 | 0.39 | 36.40 | 0.52 | 44.10 | 0.63 |
| 4. Maintenance | 100.10 | 1.43 | 107.80 | 1.54 | 56.70 | 0.81 | 81.90 | 1.17 | 126.70 | 1.81 |
| 5. Depreciation | 175.00 | 2.50 | 212.10 | 3.03 | 198.80 | 2.84 | 345.10 | 4.93 | 501.90 | 7.17 |
| 6. License, Iowa rate | 21.31 | 0.30 | 25.61 | 0.37 | 22.62 | 0.32 | 34.04 | 0.49 | 45.82 | 0.66 |
| 7. Garage, \$4 a month | 48.00 | 0.69 | 48.00 | 0.69 | 48.00 | 0.69 | 48.00 | 0.69 | 48.00 | 0.69 |
| 8. Interest, 6 percent | 50.88 | 0.73 | 61.56 | 0.88 | 57.80 | 0.82 | 100.16 | 1.43 | 145.62 | 2.08 |
| 9. Insurance, Ames rate | 28.19 | 0.40 | 31.88 | 0.46 | 32.13 | 0.46 | 38.15 | 0.54 | 40.20 | 0.57 |
| Total cost | 562.78 | 8.04 | 649.35 | 9.28 | 566.55 | 8.00 | 809.75 | 11.57 | 1102.84 | 15.76 |
| For 9,000 Miles a Year | | | | | | | | | | |
| 1. Gasoline, 20c per gal. | 115.20 | 1.28 | 133.20 | 1.48 | 142.20 | 1.58 | 140.40 | 1.56 | 163.80 | 1.82 |
| 2. Oil, 25c per quart | 20.70 | 0.23 | 18.90 | 0.21 | 16.20 | 0.18 | 21.60 | 0.24 | 29.70 | 0.33 |
| 3. Tires and tubes | 43.20 | 0.48 | 56.70 | 0.63 | 35.10 | 0.39 | 46.80 | 0.52 | 56.70 | 0.63 |
| 4. Maintenance | 128.70 | 1.43 | 138.60 | 1.54 | 72.90 | 0.81 | 105.30 | 1.17 | 162.90 | 1.81 |
| 5. Depreciation | 225.00 | 2.50 | 272.70 | 3.03 | 255.60 | 2.84 | 443.70 | 4.93 | 645.30 | 7.17 |
| 6. License, Iowa rate | 22.56 | 0.25 | 27.09 | 0.30 | 24.01 | 0.27 | 36.46 | 0.41 | 49.34 | 0.55 |
| 7. Garage, \$4 a month | 48.00 | 0.53 | 48.00 | 0.53 | 48.00 | 0.53 | 48.00 | 0.53 | 48.00 | 0.53 |
| 8. Interest, 6 percent | 52.66 | 0.59 | 63.72 | 0.71 | 59.82 | 0.67 | 103.66 | 1.15 | 150.72 | 1.68 |
| 9. Insurance, Ames rate | 28.96 | 0.32 | 32.88 | 0.37 | 33.18 | 0.37 | 39.58 | 0.44 | 42.02 | 0.47 |
| Total cost | 684.98 | 7.61 | 791.79 | 8.80 | 687.01 | 7.63 | 985.50 | 10.95 | 1348.48 | 14.98 |

| For 11,000 Miles a Year | | | | | | | | | | |
|------------------------------|----------------|-------------|----------------|-------------|----------------|-------------|----------------|--------------|----------------|--------------|
| 1. Gasoline, 20c per gal. | 140.80 | 1.28 | 162.80 | 1.48 | 173.80 | 1.58 | 171.60 | 1.56 | 200.20 | 1.82 |
| 2. Oil, 25c per quart | 25.30 | 0.23 | 23.10 | 0.21 | 19.80 | 0.18 | 26.40 | 0.24 | 36.30 | 0.33 |
| 3. Tires and tubes | 52.80 | 0.48 | 69.30 | 0.63 | 42.90 | 0.39 | 57.20 | 0.52 | 69.30 | 0.63 |
| 4. Maintenance | 157.30 | 1.43 | 169.40 | 1.54 | 89.10 | 0.81 | 128.70 | 1.17 | 199.10 | 1.81 |
| 5. Depreciation | 275.00 | 2.50 | 333.30 | 3.03 | 312.40 | 2.84 | 542.30 | 4.93 | 788.70 | 7.17 |
| 6. License, Iowa rate | 23.54 | 0.21 | 28.28 | 0.26 | 25.13 | 0.23 | 38.39 | 0.30 | 52.15 | 0.47 |
| 7. Garage, \$4 a month | 48.00 | 0.44 | 48.00 | 0.44 | 48.00 | 0.44 | 48.00 | 0.44 | 48.00 | 0.44 |
| 8. Interest, 6 percent | 54.17 | 0.49 | 65.54 | 0.59 | 61.53 | 0.56 | 108.62 | 0.97 | 155.02 | 1.41 |
| 9. Insurance, Ames rate | 29.58 | 0.26 | 33.68 | 0.31 | 34.01 | 0.31 | 40.72 | 0.37 | 43.47 | 0.40 |
| Total cost | 806.49 | 7.33 | 933.40 | 8.49 | 806.67 | 7.34 | 1159.93 | 10.55 | 1592.24 | 14.48 |
| For 13,000 Miles a Year | | | | | | | | | | |
| 1. Gasoline, 20c per gal. | 166.40 | 1.28 | 192.40 | 1.48 | 205.40 | 1.58 | 202.80 | 1.56 | 236.60 | 1.82 |
| 2. Oil, 25c per quart | 29.90 | 0.23 | 27.30 | 0.21 | 23.40 | 0.18 | 31.20 | 0.24 | 42.90 | 0.33 |
| 3. Tires and tubes | 62.40 | 0.48 | 81.90 | 0.63 | 50.70 | 0.39 | 67.60 | 0.52 | 81.90 | 0.63 |
| 4. Maintenance | 185.90 | 1.43 | 200.20 | 1.54 | 105.30 | 0.81 | 152.10 | 1.17 | 235.30 | 1.81 |
| 5. Depreciation | 325.00 | 2.50 | 393.90 | 3.03 | 369.20 | 2.84 | 640.90 | 4.93 | 932.10 | 7.17 |
| 6. License, Iowa rate | 23.54 | 0.18 | 28.28 | 0.22 | 25.13 | 0.19 | 38.39 | 0.35 | 52.15 | 0.40 |
| 7. Garage, \$4 a month | 48.00 | 0.37 | 48.00 | 0.37 | 48.00 | 0.37 | 48.00 | 0.37 | 48.00 | 0.37 |
| 8. Interest, 6 percent | 55.67 | 0.43 | 67.35 | 0.52 | 63.23 | 0.49 | 109.57 | 0.84 | 159.32 | 1.22 |
| 9. Insurance, Ames rate | 30.29 | 0.23 | 34.60 | 0.27 | 34.96 | 0.27 | 42.03 | 0.32 | 45.14 | 0.35 |
| Total cost | 927.10 | 7.13 | 1073.93 | 8.26 | 925.32 | 7.12 | 1332.59 | 10.25 | 1833.41 | 14.10 |
| For 18,000 Miles a Year | | | | | | | | | | |
| 1. Gasoline, 20c per gal. | 230.40 | 1.28 | 266.40 | 1.48 | 284.40 | 1.58 | 280.80 | 1.56 | 327.60 | 1.82 |
| 2. Oil, 25c per quart | 41.40 | 0.23 | 37.80 | 0.21 | 32.40 | 0.18 | 43.20 | 0.24 | 59.40 | 0.33 |
| 3. Tires and tubes | 86.40 | 0.48 | 113.40 | 0.63 | 70.20 | 0.39 | 93.60 | 0.52 | 113.40 | 0.63 |
| 4. Maintenance | 267.40 | 1.43 | 277.20 | 1.54 | 145.80 | 0.81 | 210.60 | 1.17 | 325.80 | 1.81 |
| 5. Depreciation | 450.00 | 2.50 | 545.40 | 3.03 | 511.20 | 2.84 | 887.40 | 4.93 | 1290.60 | 7.17 |
| 6. License, Iowa rate | 23.54 | 0.13 | 28.28 | 0.16 | 25.13 | 0.14 | 38.39 | 0.21 | 52.15 | 0.29 |
| 7. Garage, \$4 a month | 48.00 | 0.27 | 48.00 | 0.27 | 48.00 | 0.27 | 48.00 | 0.27 | 48.00 | 0.27 |
| 8. Interest, 6 percent | 59.42 | 0.33 | 71.90 | 0.40 | 67.50 | 0.37 | 116.97 | 0.65 | 170.07 | 0.94 |
| 9. Insurance, Ames rate | 31.17 | 0.17 | 35.74 | 0.20 | 36.15 | 0.20 | 43.67 | 0.24 | 47.23 | 0.26 |
| Total cost | 1227.73 | 6.82 | 1424.12 | 7.91 | 1220.78 | 6.78 | 1762.63 | 9.70 | 2434.25 | 13.52 |
| 10. Average cost new,* \$ | 1179-1391 | | 1426-1683 | | 1339-1580 | | 2320-2738 | | 3374-3981 | |
| 11. Average list weight, lb. | 2938 | | 3506 | | 2934 | | 3798 | | 4603 | |
| 12. Miles per gallon of gas | 14.60 | | 13.47 | | 12.65 | | 12.82 | | 10.98 | |
| 13. Miles per quart of oil | 110 | | 117 | | 142 | | 104 | | 75 | |

*First figure = factory list price; second figure = Iowa delivered retail price = list price times 118%.

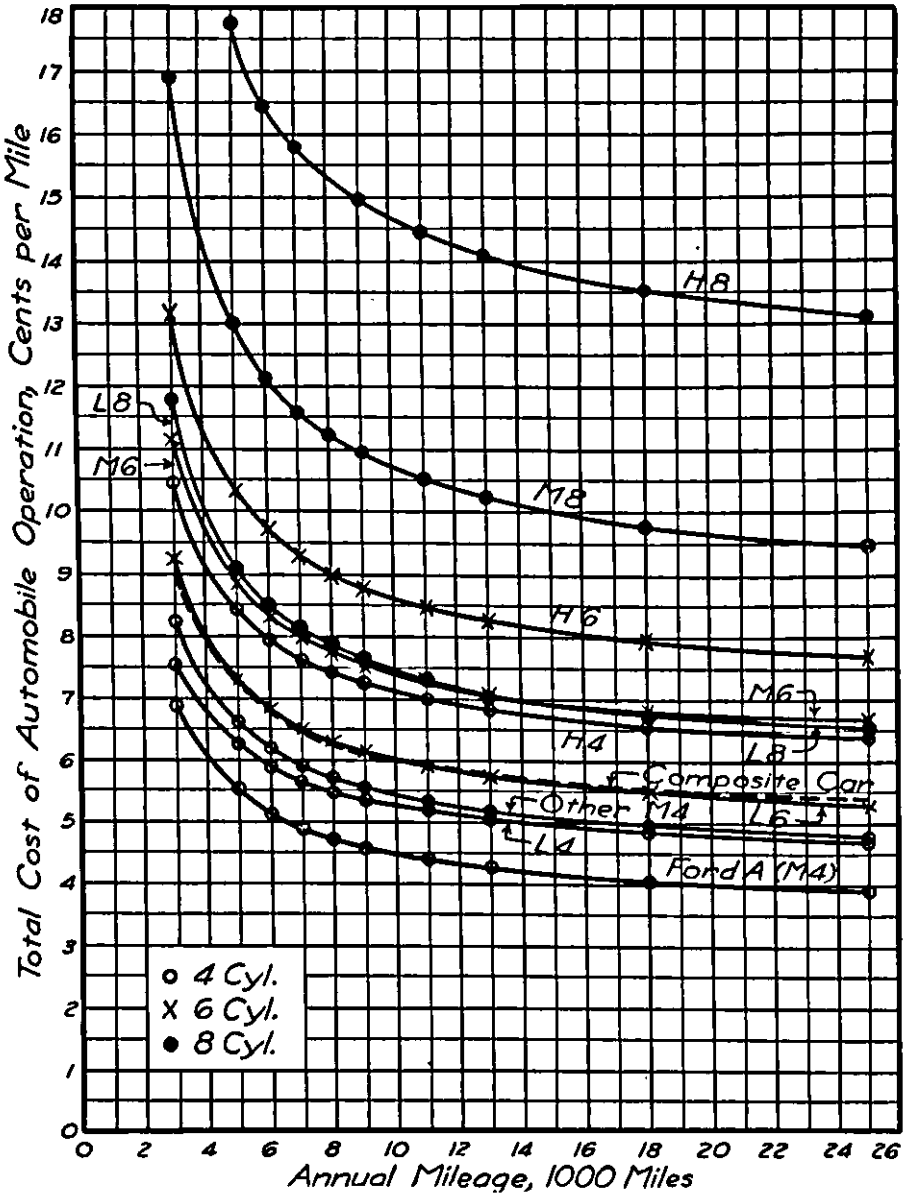


Fig. 1. Operating cost of cars at different annual milengens.

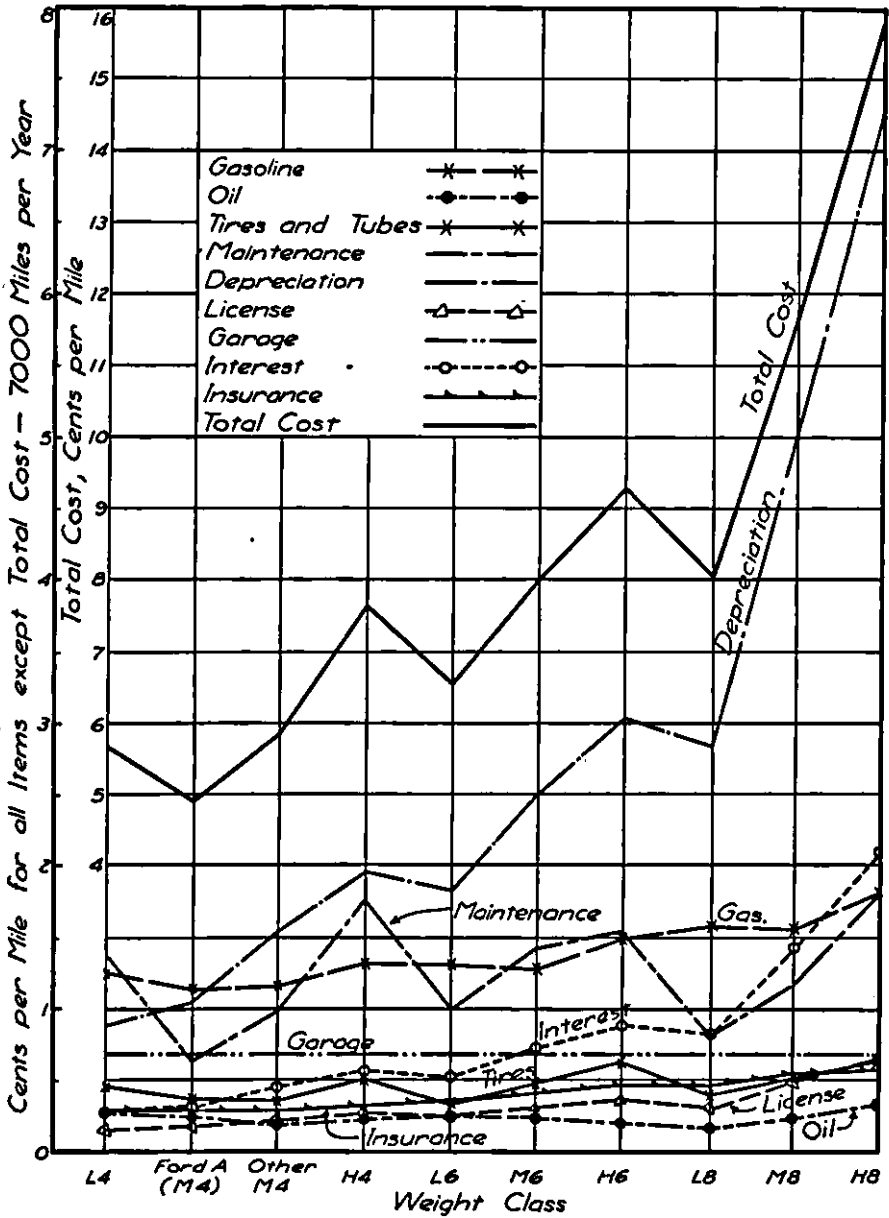


Fig. 2. Comparison of operating cost items for an annual mileage of 7,000

TABLE 4. COST OF OPERATING THE COMPOSITE* IOWA AUTOMOBILE,
BASIS OF 1930 REGISTRATION

| Annual Mileage | 3,000 | | 5,000 | | 7,000 | | 9,000 | |
|---------------------------|-------------------------|----------------|-------------------------|----------------|-------------------------|----------------|-------------------------|----------------|
| | Annual Cost, \$ Per Car | Cents Per Mile | Annual Cost, \$ Per Car | Cents Per Mile | Annual Cost, \$ Per Car | Cents Per Mile | Annual Cost, \$ Per Car | Cents Per Mile |
| 1. Gasoline, 20c per gal. | 38.10 | 1.27 | 63.50 | 1.27 | 88.90 | 1.27 | 114.30 | 1.27 |
| 2. Oil, 25c per quart | 7.50 | 0.25 | 12.50 | 0.25 | 17.50 | 0.25 | 22.50 | 0.25 |
| 3. Tires and tubes | 12.90 | 0.43 | 21.50 | 0.43 | 30.10 | 0.43 | 38.70 | 0.43 |
| 4. Maintenance | 38.60 | 1.22 | 61.00 | 1.22 | 85.40 | 1.22 | 109.80 | 1.22 |
| 5. Depreciation | 48.90 | 1.63 | 81.50 | 1.63 | 114.10 | 1.63 | 146.70 | 1.63 |
| 6. License, Iowa rate | 15.63 | 0.52 | 15.63 | 0.52 | 15.63 | 0.52 | 15.63 | 0.52 |
| 7. Garage, \$4 a month | 48.00 | 1.60 | 48.00 | 1.60 | 48.00 | 1.60 | 48.00 | 1.60 |
| 8. Interest, 6 percent | 44.05 | 1.47 | 37.21 | 1.24 | 33.12 | 1.10 | 34.27 | 1.19 |
| 9. Insurance, Ames rate | 22.70 | 0.76 | 22.70 | 0.76 | 22.70 | 0.76 | 23.31 | 0.79 |
| Total cost | 274.38 | 9.15 | 363.54 | 7.27 | 455.45 | 6.51 | 454.27 | 6.14 |
| Annual Mileage | 11,000 | | 13,000 | | 18,000 | | 25,000 | |
| | Annual Cost, \$ Per Car | Cents Per Mile | Annual Cost, \$ Per Car | Cents Per Mile | Annual Cost, \$ Per Car | Cents Per Mile | Annual Cost, \$ Per Car | Cents Per Mile |
| 1. Gasoline, 20c per gal. | 139.70 | 1.27 | 165.10 | 1.27 | 228.60 | 1.27 | 317.50 | 1.27 |
| 2. Oil, 25c per quart | 27.50 | 0.25 | 32.50 | 0.25 | 45.00 | 0.25 | 62.50 | 0.25 |
| 3. Tires and tubes | 47.30 | 0.43 | 55.00 | 0.43 | 77.40 | 0.43 | 107.50 | 0.43 |
| 4. Maintenance | 134.20 | 1.22 | 158.60 | 1.22 | 219.60 | 1.22 | 305.00 | 1.22 |
| 5. Depreciation | 179.30 | 1.63 | 211.90 | 1.63 | 293.40 | 1.63 | 407.50 | 1.63 |
| 6. License, Iowa rate | 17.38 | 0.16 | 17.38 | 0.16 | 17.38 | 0.16 | 17.38 | 0.16 |
| 7. Garage, \$4 a month | 48.00 | 0.44 | 48.00 | 0.37 | 48.00 | 0.27 | 48.00 | 0.19 |
| 8. Interest, 6 percent | 35.25 | 0.32 | 36.23 | 0.28 | 38.67 | 0.21 | 42.10 | 0.17 |
| 9. Insurance, Ames rate | 23.79 | 0.22 | 24.34 | 0.19 | 25.02 | 0.14 | 25.74 | 0.10 |
| Total cost | 652.42 | 5.94 | 740.95 | 5.77 | 993.07 | 5.52 | 1333.22 | 5.33 |

*Composite car assumed to have the following characteristics: Factory list price, \$767; Iowa retail price, \$905; weight, 2350 pounds; 15.75 miles per gallon of gasoline; and 102 miles per quart of oil.

the average cost of motor vehicle operation, or the cost of operating under normal conditions a car which would be a composite or average of all cars in service. The characteristics of such a car were determined by an analysis of the 1930 Iowa registration made in such a way that the year model of 19 makes and one miscellaneous group were determined. By reference to the manufacturers' description of the cars manufactured under each year model the percentages were arrived at for each weight class as shown in Table 1. These percentages were applied to the itemized and total costs for each class as given in Table 3, the results being shown in Table 4 for various annual mileages. The curve for the composite average car is given in Fig. 1, and it will be seen that it follows very closely the curve for the light 6 class, indicating that the light 6 model car is fairly representative of the cars operated in Iowa during 1930.

Data to be presented on later pages indicate that the average mileage of Iowa cars is about 7,000 miles a year so that the average cost of operation for the cars in Iowa is that for the composite car at about 7,000 miles a year, or 6.51 cents a mile.

The cost for a composite car based on the 1930 sales (page 11) was calculated and found to be 6.36 cents a mile. The estimate does not vary much from that given immediately above, though the classes making up the composite car do differ, because the shift in per-

centage is from the Ford T to the Ford A and from the heavy 4 and heavy 6 to the light 8 and medium 8.

The nine items of cost may be divided into two general groups, designated "mileage costs" and "time costs." In the first group are gasoline, oil, tires and tubes, maintenance and depreciation (mechanical) charges. The second group consists of depreciation (obsolescence) charges, license fees, garage rental (or its equivalent), interest charges, and insurance premiums. Depreciation has been placed in both groups because experience plainly indicates that the value of automobiles decreases materially with age regardless of the mileage driven. No satisfactory method of separating obsolescence from the total depreciation has been determined but the amount would vary from a maximum during the first year to a minimum during the last year the car was operated. The average car, when finally discarded, is still mechanically fit to be economically operated for several thousand miles.

It seems reasonable to charge 25 percent of the total depreciation to obsolescence, and on this basis, Table 5 has been prepared to show the division on a percentage basis between mileage costs and time costs for the composite car. It will be noticed that the annual mileage has a profound effect on the distribution of the costs between mileage and time items. The time costs decrease from 52.00 percent to 17.80 percent as the annual mileage increases from 3,000 to 25,000 miles. For the average owner, the division is about two-thirds mileage costs and one-third time costs.

4. **Two-Car Ownership.** It is interesting to review the case of a two-car family from the standpoint of total costs only, no allowance being made here for the saving in time, convenience afforded, and

TABLE 5. ITEM COSTS OF THE COMPOSITE CAR AS A PERCENTAGE OF TOTAL COST

| Cost Items | Percent of Total Operation Cost at Annual Mileages of | | | | | | | |
|----------------------------|---|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | 3,000 | 5,000 | 7,000 | 9,000 | 11,000 | 13,000 | 18,000 | 25,000 |
| Mileage costs | | | | | | | | |
| Gasoline | 13.88 | 17.47 | 19.51 | 20.68 | 21.38 | 22.01 | 23.01 | 23.83 |
| Oil | 2.73 | 3.44 | 3.84 | 4.07 | 4.21 | 4.33 | 4.53 | 4.89 |
| Tires and tubes | 4.70 | 5.91 | 6.60 | 7.00 | 7.24 | 7.45 | 7.79 | 8.07 |
| Maintenance | 13.33 | 16.78 | 18.74 | 19.87 | 20.54 | 21.14 | 22.10 | 22.89 |
| Depreciation* | 13.36 | 16.82 | 18.78 | 19.92 | 20.58 | 21.19 | 22.15 | 22.94 |
| Total mileage costs | 48.00 | 60.42 | 67.47 | 71.54 | 73.95 | 76.12 | 79.58 | 82.42 |
| Time costs | | | | | | | | |
| License | 5.68 | 4.26 | 3.38 | 2.77 | 2.69 | 2.25 | 1.81 | 1.31 |
| Garage | 17.49 | 13.20 | 10.60 | 8.63 | 7.41 | 6.42 | 4.89 | 3.56 |
| Interest | 16.07 | 10.18 | 7.22 | 6.19 | 5.39 | 4.86 | 3.80 | 3.19 |
| Insurance | 8.31 | 6.33 | 5.07 | 4.23 | 3.70 | 3.29 | 2.54 | 1.88 |
| Obsolescence* | 4.45 | 5.61 | 6.26 | 6.64 | 6.86 | 7.06 | 7.38 | 7.64 |
| Total time costs | 52.00 | 39.58 | 32.53 | 28.46 | 26.05 | 23.88 | 20.42 | 17.58 |

*Of the total depreciation charge given in Table 4, 75 percent is assumed to be chargeable to mileage, and 25 percent to obsolescence.

other intangible benefits. Space does not permit the working out of the innumerable two-car combinations resulting from the various classes and annual mileages, but one example is shown which indicates that under certain conditions it is more economical for a family to operate two cars than it is to operate only one. Table 3 gives \$806.49 as the total cost of operating a medium 6 car 11,000 miles a year. Whether an owner would operate two cars more total miles a year than he would operate one car, would, of course, depend entirely upon his individual circumstances. Assume, however, that Ford A and medium 6 cars are operated 7,000 and 5,000 miles a year, respectively, making the costs \$343.30 for the Ford A and \$450.67 for the medium 6, or a total of \$793.97. This sum is \$12.52 less than the costs on the medium 6 car alone when operated 11,000 miles, or 1,000 miles less than the distance traveled by the two cars. Should a heavier car be used in combination with the Ford A, the apparent saving would be even greater. By using Table 3 and Fig. 1 in this way it is easy to determine for any definite case under what conditions two cars can be operated at a total cost of less than the cost of operating one car.

5. Limitations of Applications of Cost Estimates. The foregoing estimates of the cost of operating various classes of automobiles should not be applied directly to all individual cars or even to all fleet operations. It is not assumed that a few fragmentary cost records can be averaged to arrive at the operating cost of all the automobiles in the United States which are operated under widely different climatic, road and service conditions by operators of all degrees of skill. They are presented, however, in the belief that they represent fairly average conditions and therefore are of value in making general comparisons and in determining the general level of costs. While the final estimated costs given in Tables 3 and 4 do not apply to all individual cases they offer a good guide in any attempt to determine local costs. Particularly, one must be careful to determine for his own case his costs for gasoline, oil, depreciation, license, and insurance unless his costs be on the same basis as set forth on page 10. Any calculation or comparison must be for a definite annual mileage.

6. Vehicle-mile and Ton-mile Tax Costs. For purposes of tax legislation and comparison of tax burden with other types of vehicles or transportation it is expedient to reduce the license fee and gasoline tax to a ton-mile basis as shown in Table 6, which also includes the vehicle-mile tax. These tax figures are based upon the data in Tables 3 and 4 and a gasoline tax of 3 cents a gallon. The heavy cars contribute more taxes on a ton-mile basis than the light or average weight cars, more so at 5,000 miles a year than at higher annual mileages. At 7,000 miles a year the composite car pays a total tax of 0.35 cents a ton-mile, which if taken as 100 percent results in the following comparison of the various weight classes:

TABLE 6. IOWA VEHICLE-MILE TAX AND TON-MILE TAX COSTS

| Weight Class | Annual Mileage | | | | | | | | | | | | | | | | | |
|--------------|------------------------|---------|-----------|--------------------|---------|-----------|------------------------|---------|-----------|--------------------|---------|-----------|------------------------|---------|-----------|--------------------|---------|-----------|
| | 5,000 | | | | | | 7,000 | | | | | | 9,000 | | | | | |
| | Cents per Vehicle-Mile | | | Cents per Ton-Mile | | | Cents per Vehicle-Mile | | | Cents per Ton-Mile | | | Cents per Vehicle-Mile | | | Cents per Ton-Mile | | |
| | Lic-ense | Gas Tax | Total Tax | Lic-ense | Gas Tax | Total Tax | Lic-ense | Gas Tax | Total Tax | Lic-ense | Gas Tax | Total Tax | Lic-ense | Gas Tax | Total Tax | Lic-ense | Gas Tax | Total Tax |
| Light 4 | 0.20 | 0.19 | 0.39 | 0.23 | 0.22 | 0.45 | 0.14 | 0.19 | 0.33 | 0.16 | 0.22 | 0.38 | 0.13 | 0.19 | 0.32 | 0.15 | 0.22 | 0.37 |
| Ford A (M4) | 0.26 | 0.17 | 0.43 | 0.24 | 0.15 | 0.39 | 0.18 | 0.17 | 0.35 | 0.16 | 0.15 | 0.31 | 0.15 | 0.17 | 0.32 | 0.14 | 0.15 | 0.29 |
| Other M4 | 0.39 | 0.17 | 0.47 | 0.26 | 0.15 | 0.41 | 0.22 | 0.17 | 0.39 | 0.19 | 0.15 | 0.34 | 0.18 | 0.17 | 0.35 | 0.16 | 0.15 | 0.31 |
| Heavy 4 | 0.36 | 0.20 | 0.56 | 0.27 | 0.15 | 0.42 | 0.26 | 0.20 | 0.46 | 0.20 | 0.15 | 0.35 | 0.21 | 0.20 | 0.41 | 0.16 | 0.15 | 0.31 |
| Light 6 | 0.34 | 0.19 | 0.53 | 0.27 | 0.15 | 0.42 | 0.25 | 0.19 | 0.44 | 0.20 | 0.15 | 0.35 | 0.20 | 0.19 | 0.39 | 0.16 | 0.15 | 0.31 |
| Medium 6 | 0.43 | 0.21 | 0.62 | 0.29 | 0.14 | 0.43 | 0.30 | 0.21 | 0.51 | 0.20 | 0.14 | 0.34 | 0.25 | 0.21 | 0.46 | 0.17 | 0.14 | 0.31 |
| Heavy 6 | 0.51 | 0.22 | 0.73 | 0.29 | 0.13 | 0.42 | 0.37 | 0.22 | 0.59 | 0.21 | 0.13 | 0.34 | 0.30 | 0.22 | 0.52 | 0.17 | 0.13 | 0.30 |
| Light 8 | 0.45 | 0.24 | 0.69 | 0.31 | 0.16 | 0.47 | 0.32 | 0.24 | 0.56 | 0.22 | 0.16 | 0.38 | 0.27 | 0.24 | 0.51 | 0.18 | 0.16 | 0.34 |
| Medium 8 | 0.68 | 0.23 | 0.91 | 0.36 | 0.12 | 0.48 | 0.49 | 0.23 | 0.72 | 0.26 | 0.12 | 0.38 | 0.41 | 0.23 | 0.64 | 0.21 | 0.12 | 0.33 |
| Heavy 8 | 0.92 | 0.27 | 1.19 | 0.40 | 0.12 | 0.52 | 0.66 | 0.27 | 0.93 | 0.29 | 0.12 | 0.41 | 0.55 | 0.27 | 0.82 | 0.24 | 0.12 | 0.36 |
| Composite | 0.31 | 0.19 | 0.50 | 0.26 | 0.16 | 0.42 | 0.22 | 0.19 | 0.41 | 0.19 | 0.16 | 0.35 | 0.18 | 0.19 | 0.37 | 0.15 | 0.16 | 0.31 |
| Class | 11,000 | | | | | | 13,000 | | | | | | 18,000 | | | | | |
| Light 4 | 0.11 | 0.19 | 0.30 | 0.13 | 0.22 | 0.35 | 0.09 | 0.19 | 0.28 | 0.11 | 0.22 | 0.33 | 0.06 | 0.19 | 0.25 | 0.07 | 0.22 | 0.29 |
| Ford A (M4) | 0.12 | 0.17 | 0.29 | 0.11 | 0.15 | 0.26 | 0.11 | 0.17 | 0.28 | 0.10 | 0.15 | 0.25 | 0.08 | 0.17 | 0.25 | 0.07 | 0.15 | 0.22 |
| Other M4 | 0.15 | 0.17 | 0.32 | 0.13 | 0.15 | 0.28 | 0.13 | 0.17 | 0.30 | 0.11 | 0.15 | 0.26 | 0.09 | 0.17 | 0.26 | 0.08 | 0.15 | 0.23 |
| Heavy 4 | 0.18 | 0.20 | 0.38 | 0.14 | 0.15 | 0.29 | 0.15 | 0.20 | 0.35 | 0.11 | 0.15 | 0.26 | 0.11 | 0.20 | 0.31 | 0.08 | 0.15 | 0.23 |
| Light 6 | 0.17 | 0.19 | 0.36 | 0.13 | 0.15 | 0.28 | 0.14 | 0.19 | 0.33 | 0.11 | 0.15 | 0.26 | 0.10 | 0.19 | 0.29 | 0.08 | 0.15 | 0.23 |
| Medium 6 | 0.21 | 0.21 | 0.42 | 0.14 | 0.14 | 0.28 | 0.18 | 0.21 | 0.39 | 0.12 | 0.14 | 0.26 | 0.13 | 0.21 | 0.34 | 0.09 | 0.14 | 0.23 |
| Heavy 6 | 0.26 | 0.22 | 0.48 | 0.15 | 0.12 | 0.27 | 0.22 | 0.22 | 0.44 | 0.13 | 0.13 | 0.25 | 0.16 | 0.22 | 0.38 | 0.09 | 0.13 | 0.22 |
| Light 8 | 0.23 | 0.24 | 0.47 | 0.16 | 0.16 | 0.32 | 0.19 | 0.24 | 0.43 | 0.13 | 0.16 | 0.29 | 0.14 | 0.24 | 0.38 | 0.10 | 0.16 | 0.26 |
| Medium 8 | 0.35 | 0.23 | 0.58 | 0.18 | 0.12 | 0.30 | 0.30 | 0.23 | 0.53 | 0.16 | 0.12 | 0.28 | 0.21 | 0.23 | 0.44 | 0.11 | 0.12 | 0.23 |
| Heavy 8 | 0.47 | 0.27 | 0.74 | 0.20 | 0.12 | 0.32 | 0.40 | 0.27 | 0.67 | 0.17 | 0.12 | 0.29 | 0.29 | 0.27 | 0.56 | 0.13 | 0.12 | 0.25 |
| Composite | 0.16 | 0.19 | 0.35 | 0.14 | 0.16 | 0.30 | 0.13 | 0.19 | 0.32 | 0.11 | 0.16 | 0.27 | 0.10 | 0.19 | 0.29 | 0.09 | 0.16 | 0.25 |

| Weight Class | Ton-mile Tax, percent of amount paid by composite car |
|----------------|---|
| Light 4 | 108.6 |
| Ford A (M4) | 88.6 |
| Other medium 4 | 97.2 |
| Heavy 4 | 100.0 |
| Light 6 | 100.0 |
| Medium 6 | 97.2 |
| Heavy 6 | 97.2 |
| Light 8 | 108.6 |
| Medium 8 | 108.6 |
| Heavy 8 | 112.2 |
| Composite car | 100.0 |

III. ANNUAL MILEAGE ESTIMATES

Because certain items of the total cost of operating a car are proportional to time rather than to the miles driven, any estimate of the cost in cents per mile is practically meaningless unless it is confined to a definite period of time and a definite mileage. The customary unit is miles per year, and any average cost of a group of cars should be calculated for a definite annual mileage. To arrive at the average cost of car operation in Iowa, it is therefore necessary to determine the average mileage per year of the cars registered. Two methods were used in making this calculation and while they are open to certain objections the results check satisfactorily.

1. **Mileage Reports from Iowa Owners.** At the time Iowa owners were registering their cars for 1930 (mainly in December, 1929 and January, 1930) questionnaire cards were given to them in a few representative counties. The information returned on these cards included date of purchase, year model, 1929 mileage, mileage from date of purchase to Dec. 31, 1929, cost new of the car, and allowance on the car traded in as well as the age of the car traded or sold. This information was then available for the estimation of annual mileage and market value.

When the results were summarized it became evident that the annual mileage was greater for new cars than it was for old cars, and that the cars in the counties having large cities were driven a greater distance per year than the cars in the more strictly rural counties. Since only a few returns were available from the counties of small and large populations per square mile, additional questionnaires were mailed out to owners selected at random in counties designated so that the mileage curve could be extended both ways from the more nearly average county. These cards were mailed during August, 1930, and the annual mileage figures received covered about

TABLE 7. SUMMARY OF MILEAGE INFORMATION SUBMITTED BY IOWA OWNERS

| County Registering Cars | Average Annual Mileage to July 1, 1930 | | 1929-30 Annual Mileage | |
|-------------------------|--|------------------------|------------------------|------------------------|
| | No. of Cars Averaged | Average Annual Mileage | No. of Cars Averaged | Average Annual Mileage |
| Adair | 28 | 7,235 | 25 | 6,654 |
| Adams | 16 | 5,831 | 10 | 6,800 |
| Appanoose | 20 | 9,102 | 18 | 7,072 |
| Black Hawk | 152 | 10,014 | 102 | 9,199 |
| Boone | 37 | 7,180 | 32 | 6,597 |
| Buena Vista | 66 | 7,770 | 30 | 5,127 |
| Cass | 50 | 7,015 | 26 | 5,548 |
| Cerro Gordo | 203 | 10,024 | 134 | 7,284 |
| Chickasaw | 12 | 8,852 | 5 | 6,511 |
| Clay | 7 | 16,920 | 4 | 10,951 |
| Clinton | 7 | 10,183 | 3 | 10,833 |
| Dallas | 31 | 8,484 | 23 | 7,902 |
| Davis | 17 | 7,138 | 12 | 8,071 |
| Des Moines | 46 | 9,014 | 33 | 7,981 |
| Dubuque | 53 | 8,545 | 50 | 7,053 |
| Fremont | 23 | 8,136 | 11 | 5,189 |
| Guthrie | 1 | 4,807 | 1 | 6,500 |
| Hamilton | 10 | 8,813 | 10 | 5,978 |
| Hancock | 72 | 7,604 | 41 | 5,638 |
| Henry | 10 | 5,168 | 10 | 4,212 |
| Jaeger | 36 | 7,930 | 32 | 7,112 |
| Jefferson | 32 | 7,020 | 22 | 5,019 |
| Kookuk | 6 | 5,010 | — | — |
| Kossuth | 90 | 8,013 | 53 | 6,436 |
| Lee | 5 | 4,933 | 3 | 3,697 |
| Linn | 104 | 8,932 | 83 | 8,094 |
| Monona | 54 | 8,772 | 35 | 5,888 |
| Montgomery | 80 | 9,240 | 37 | 8,105 |
| Muscatine | 50 | 7,447 | 39 | 7,510 |
| Polk | 605 | 11,820 | 328 | 9,315 |
| Ringgold | 15 | 6,515 | 12 | 5,433 |
| Scott | 105 | 11,036 | 82 | 8,501 |
| Story | 209 | 8,890 | 177 | 6,864 |
| Union | 22 | 7,234 | 17 | 6,893 |
| Wapello | 64 | 7,559 | 39 | 6,097 |
| Webster | 54 | 8,331 | 39 | 8,741 |
| Winnebago | 4 | 7,895 | 1 | 6,100 |
| Woodbury | 128 | 9,080 | 100 | 8,831 |
| Worth | 22 | 9,266 | 18 | 7,138 |
| Year Model | | | | |
| 1912 | 1 | 4,775 | 0 | — |
| 1913 | 2 | 5,920 | 1 | 5,000 |
| 1914 | 1 | 2,065 | 1 | 2,000 |
| 1915 | 4 | 2,843 | 4 | 3,049 |
| 1916 | 6 | 2,304 | 6 | 2,286 |
| 1917 | 8 | 4,224 | 8 | 1,731 |
| 1918 | 6 | 3,470 | 5 | 2,852 |
| 1919 | 12 | 9,383 | 10 | 7,000 |
| 1920 | 17 | 3,260 | 14 | 2,395 |
| 1921 | 14 | 5,481 | 12 | 4,388 |
| 1922 | 45 | 5,775 | 36 | 3,839 |
| 1923 | 75 | 4,909 | 50 | 5,829 |
| 1924 | 98 | 5,714 | 71 | 4,432 |
| 1925 | 174 | 6,590 | 133 | 5,606 |
| 1926 | 336 | 6,870 | 256 | 6,199 |
| 1927 | 335 | 8,105 | 263 | 7,182 |
| 1928 | 625 | 9,593 | 484 | 9,104 |
| 1929 | 912 | 12,464 | 399 | 10,256 |
| 1930 | 64 | 12,397 | 25 | 12,498 |
| Total, Avg. Mileage | 2,735 | 9,455 | 1,697 | 7,758 |

six months of 1929 and about six months of 1930. There was no material difference in the final summaries of the two studies, so they are combined in this report and listed as the annual mileage for the twelve months period of 1929-30.

The significant facts indicated by the mileage information obtained this way are summarized below and indicated in Tables 7 and 8 and Figs. 3 to 7:

1. The 1929-30 yearly mileage of Iowa passenger cars was about 6,731 miles, while the average mileage of these same cars from their

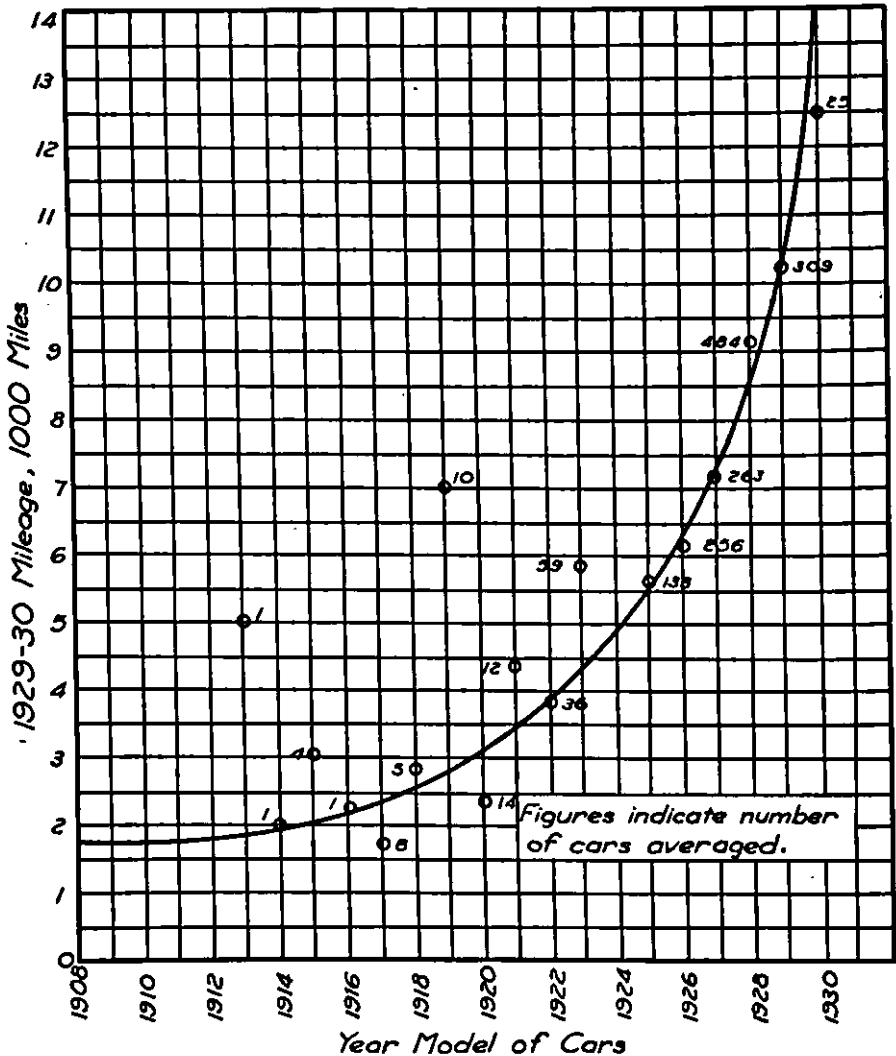


Fig. 3. Relation of the 1929-30 annual mileage to the year model (age) of the cars.

date of purchase to July, 1930 was 7,651 miles, indicating that the cars were driven less as they became older.

2. The mileage of the cars in the more intensely populated counties was greater than that of the cars in the thinly settled or rural counties.

3. The yearly mileage of the average car is greatest during its first or second year of operation.

While Fig. 5 indicates that the annual mileage increases as the population increases and Fig. 7 indicates an increase as the percen-

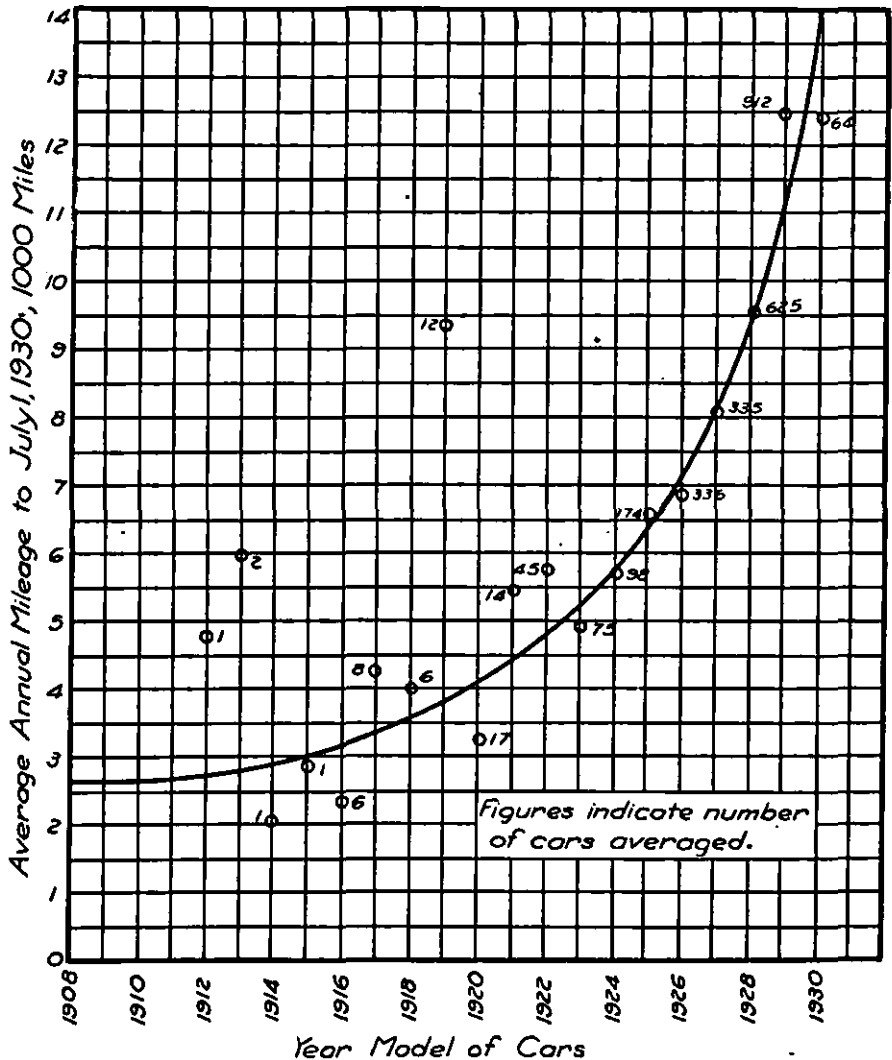


Fig. 4. Average annual mileage from date of purchase to July 1, 1930. This average annual mileage is more than that for the 1920-30 year, showing that the cars are driven less per year as they become older.

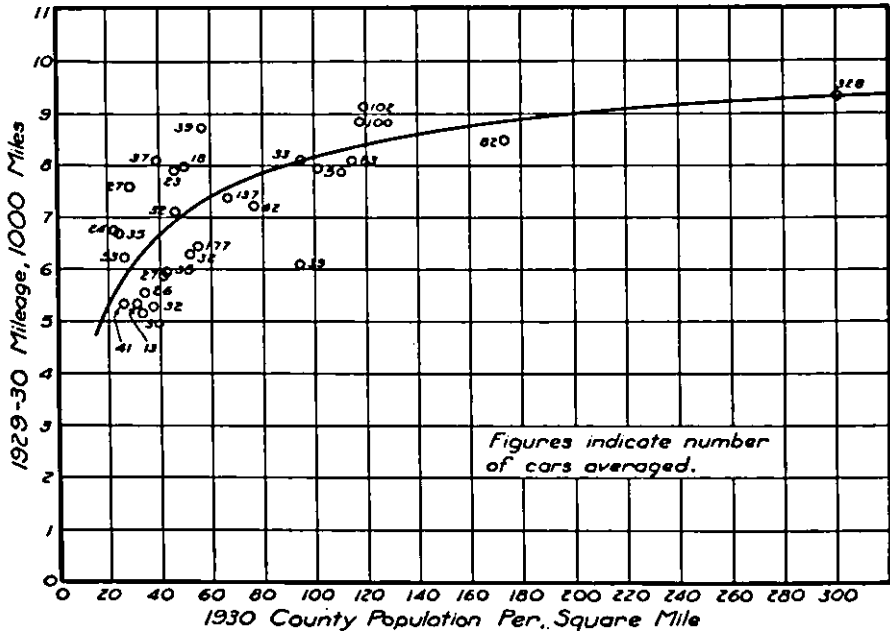


Fig. 5. Relation of the 1929-30 annual mileage to the population per square mile in the county in which the cars were registered.

tage of the primary road system paved increases, it is probable that the increase which is indicated by road improvement is in reality due to the population concentration since the counties having a high percentage of paving also have a large relative population. Similar figures for 1930 and 1931 would probably indicate the effect of paving, as many counties in the rural districts of Iowa were practically 100 percent paved (state primary road system) by September, 1931.

The estimated average yearly mileages of all Iowa cars is illustrated in Table 8, the mileage for the various year models being taken from the curves in Figs. 3 and 4. The analysis of the year model registration, shown in this table and described later, makes it possible to obtain the weighted mileage on an age basis. The figure of 6,731 miles was obtained this way and seems to be representative of the actual conditions in Iowa as all classes of cars are considered, the ages weighted, and there is a proportional division between rural and city owned cars.

2. Annual Mileage Estimated from Gasoline Tax Collections. The second method of estimating mileage was based upon the number of vehicles in daily operation, the average mileage per gallon of gasoline, and the gasoline tax collected by the state. The data are available for this calculation with the exception of the ratio of motor

truck mileage to passenger car mileage, and no reports are known to the author in which average truck mileages are given. However, the three following estimates indicate that it is within reason to assume that the annual mileages are equal.

A traffic survey made by the Iowa State Highway Commission² in 1926-27 at various points over the state indicated that 8.4 percent of the traffic was made up of trucks. Since 7.46 percent of the vehicles registered in 1926 were trucks the indication is that trucks traveled 1.13 ($8.4 \div 7.46$) times the distance traveled by passenger cars. A similar study on the state highway system of Ohio³ for 1925 indicated that 9.5 percent of the traffic was trucks when 14.2 percent of the registration was trucks, indicating that truck mileage was 0.67 as much as that for passenger cars. In a bulletin by the Iowa Engineering Experiment Station⁴ there are published the average annual mileages of 995 trucks used by state highway departments

²Personal communication.

³Report of a Survey of Transportation on the State Highway System of Ohio. Bureau of Public Roads, U. S. D. A., and the Ohio Department of Highways and Public Works. 1927.

⁴Agg. T. R., and Carter, H. S., 1928. Operating Cost Statistics of Automobiles and Trucks. Iowa Engr. Expr. Sta. Bul. 91.

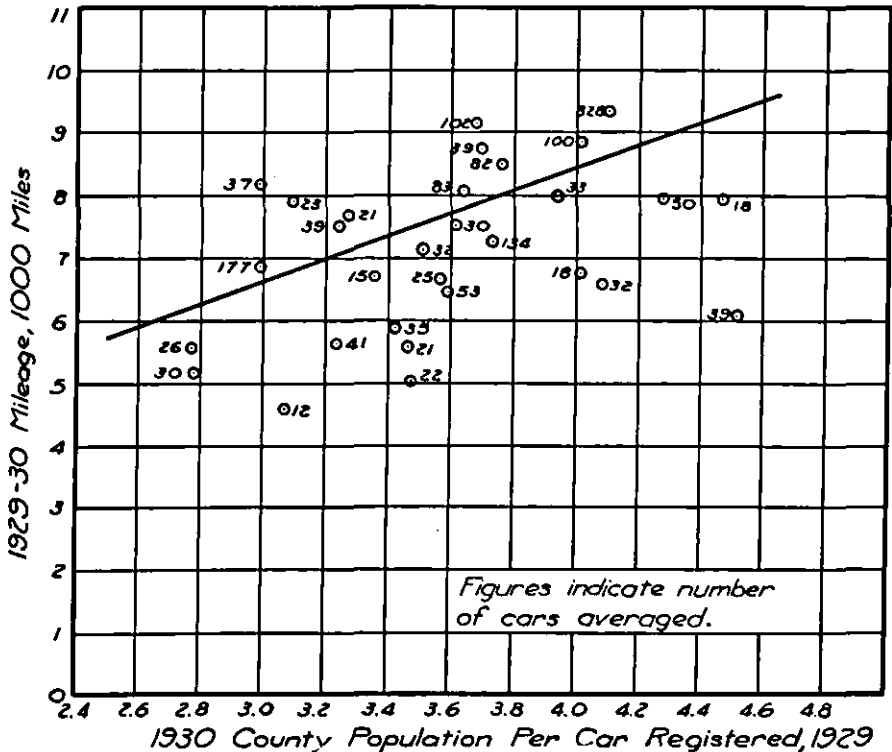


Fig. 6. Relation of annual mileage to the number of persons per car in the county registering the cars.

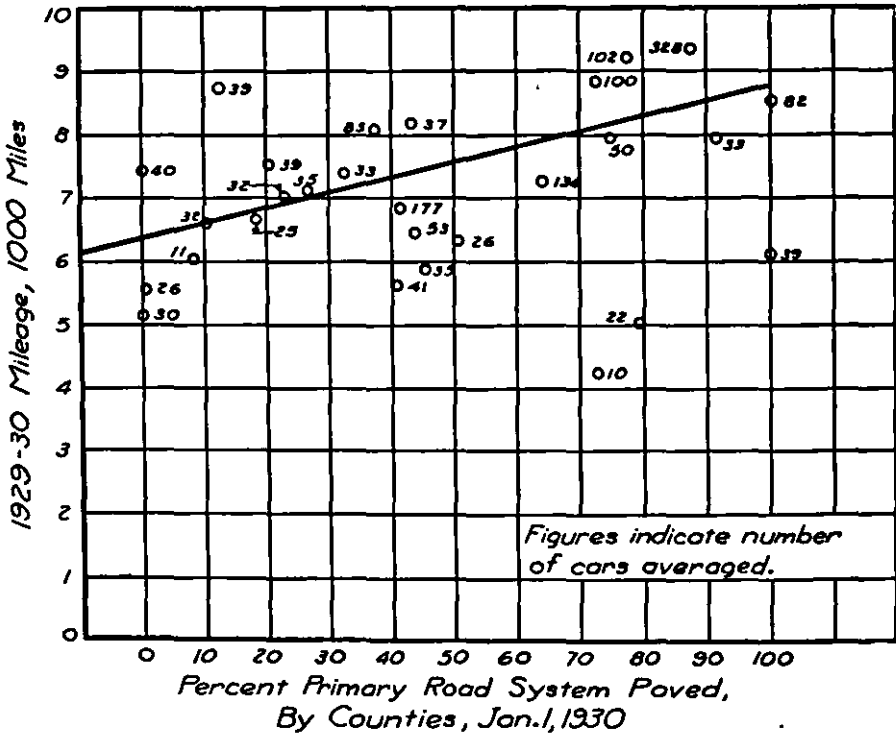


Fig. 7. Relation of the annual mileage to the percentage of primary road mileage paved in the counties registering the cars.

and fleet operators. The final average of the total 995 trucks was calculated to be 6,600 miles. Since these three estimates indicate that truck annual mileage is about the same as that for passenger cars a ratio of 1 to 1 will be used here in estimating the mileage of passenger cars from the gasoline tax receipts in Iowa.

Table 4 shows that the average gasoline consumption of the composite Iowa car is at the rate of 15.75 miles to the gallon. The General Motors Truck Company⁵ has published information resulting from a nation wide survey giving the figure of 11 miles (actually 5.7 to 13.0) a gallon for all trucks. By using these rates of gasoline consumption, the gasoline tax receipts and assuming that the trucks and passenger cars travel the same annual mileage, it is possible to estimate the average annual mileage of passenger cars.

Table 9 shows the results of the calculations as based upon the gasoline tax receipts in Iowa, 1925 to 1930. The annual mileages of 7,416 for 1930 and 6,804 for 1929 constitute a very good and independent check on the previous estimate of 6,731 obtained by sum-

⁵National Motor Truck Analysis, April, 1930.

TABLE 8. AVERAGE ANNUAL MILEAGE OF IOWA CARS AS DETERMINED FROM DATA IN TABLE 7

| Year Model | 1930 Registration | 1929-30 Mileage | | Average Annual Mileage to Jan. 1, 1930 | |
|-----------------|----------------------|-----------------|---------------|---|---------------|
| | | From Fig. 3 | Car-Miles | From Fig. 4 | Car-Miles |
| 1909 | — | 1,890 | — | 2,650 | — |
| 1910 | 10 | 1,700 | 17,000 | 2,660 | 26,600 |
| 1911 | 52 | 1,720 | 89,440 | 2,700 | 88,400 |
| 1912 | 209 | 1,760 | 367,840 | 2,770 | 369,930 |
| 1913 | 553 | 1,830 | 1,011,990 | 2,840 | 1,570,520 |
| 1914 | 1,117 | 1,920 | 2,144,640 | 2,930 | 3,272,810 |
| 1915 | 1,577 | 2,010 | 3,169,770 | 3,030 | 4,778,310 |
| 1916 | 2,955 | 2,170 | 6,412,350 | 3,200 | 9,456,000 |
| 1917 | 7,111 | 2,310 | 16,426,410 | 3,360 | 23,892,960 |
| 1918 | 4,889 | 2,520 | 11,816,280 | 3,560 | 16,692,840 |
| 1919 | 9,012 | 2,790 | 25,143,480 | 3,790 | 34,155,480 |
| 1920 | 14,515 | 3,090 | 44,851,350 | 4,050 | 58,785,750 |
| 1921 | 12,990 | 3,460 | 44,945,400 | 4,380 | 56,896,200 |
| 1922 | 27,056 | 3,900 | 105,518,400 | 4,770 | 129,057,120 |
| 1923 | 48,212 | 4,380 | 211,168,560 | 5,200 | 250,702,400 |
| 1924 | 58,905 | 4,950 | 291,579,750 | 5,780 | 340,470,900 |
| 1925 | 62,403 | 5,520 | 344,464,560 | 6,400 | 399,379,200 |
| 1926 | 93,552 | 6,270 | 586,571,040 | 7,210 | 674,509,920 |
| 1927 | 74,558 | 7,200 | 536,817,600 | 8,190 | 610,630,020 |
| 1928 | 90,054 | 8,550 | 769,961,700 | 9,470 | 852,811,380 |
| 1929 | 121,025 | 10,260 | 1,241,716,500 | 11,210 | 1,356,690,250 |
| 1930* | 78,849* | — | — | 14,300* | — |
| 1931* | 2,088* | — | — | — | — |
| Totals | 711,492 | — | 4,244,194,060 | — | 4,824,236,990 |
| Average mileage | — | 6,731 | — | 7,651 | — |

*1930 and 1931 year model cars registered in 1930 not counted in average.

TABLE 9. AVERAGE ANNUAL MILEAGE OF IOWA CARS ESTIMATED FROM GAS-TAX RECEIPTS

| Year | Gas-Tax Collected, \$ | Refunds, \$ | Net Tax, \$ | Tax, Cents per Gal. | Gasoline, Gallons Used |
|-------|--|--|---------------------------------------|---------------------------|---------------------------|
| 1925* | 4,640,605.00* | 84,074.91* | 4,556,530.09* | 2 | 227,826,504 |
| 1926 | 5,033,892.97 | 175,420.17 | 4,858,472.80 | 2 | 242,923,640 |
| 1927 | 7,362,138.21 | 303,891.95 | 6,998,246.26 | 2&3 | 276,004,951 |
| 1928 | 9,138,707.68 | 622,059.58 | 8,516,648.10 | 3 | 283,888,270 |
| 1929 | 9,987,186.06 | 896,396.17 | 9,090,789.89 | 3 | 303,026,330 |
| 1930 | 11,724,784.38 | 1,201,267.32 | 10,523,517.06 | 3 | 350,783,902 |
| Year | Avg. No. of Passenger Cars Operated During Year | Avg. No. of Trucks Operated During Year | Avg. Annual Passenger Car Mileage† | | |
| 1925 | 543,523 | 41,836 | 5,947 | | |
| 1926 | 562,636 | 46,239 | 6,034 | | |
| 1927 | 581,539 | 53,335 | 6,607 | | |
| 1928 | 591,331 | 55,715 | 6,663 | | |
| 1929 | 614,436 | 60,743 | 6,804 | | |
| 1930 | 646,787 | 68,600 | 7,416 | | |

*These calculations are for the full year of 1925 based upon the tax collections for the last 6 months (\$2,067,505.89). The tax was effective April 16, 1925, and the collections totaled \$3,215,404.88 for 1925, with \$63,068.73 refunded.

†Based upon 15.75 miles to the gallon of gasoline for passenger cars and 11 miles for trucks. Annual truck mileage was assumed to be the same as that for passenger cars.

marizing the replies from owners and averaging them according to ages of the cars.

This table also indicates an increase in average annual mileage from 5,947 in 1925 to 7,416 in 1930. It is fairly certain that this increase is real, for if anything, the gasoline consumption in 1925 was more per mile than it was in 1930 as road and vehicle improvements have increased the miles per gallon more than higher speeds and other factors have decreased it.

The estimates of annual mileage calculated on the basis of gasoline tax collections are based on the assumption that the number of cars transferring registration from another state to Iowa is equal to the number transferring out of Iowa, and also that the gasoline tax collections indicate the gallons of gasoline used by Iowa cars on the basis that the Iowa cars purchase as much gasoline outside of the state as foreign cars purchase gasoline within the state. There is no information available by which to check the correctness of either of these assumptions and they may both be questionable, but for the results desired they are reasonably exact. In any case they cannot vary far from the actual case.

The number of vehicles operated daily was obtained for any year by subtracting one-half of the new car sales for that year and one-half of the cars not re-registered (dismantled) the following year from the total registration for the year. The number of cars not re-registered was assumed to be equal to the new car sales minus the gain in registration over the preceding year.

A sample calculation is given below to show the method of estimating the number of cars dismantled each year and the average number operated daily.

Calculation of number of cars dismantled in 1928

| | | |
|---|---------|--------|
| Car registration for 1929..... | 718,380 | |
| Car registration for 1928 | 677,782 | |
| | <hr/> | |
| Gain in registration | | 40,598 |
| Estimated new car sales during 1929..... | 122,000 | |
| Less gain in registration | 40,598 | |
| | <hr/> | |
| Cars dismantled (not re-registered in 1928) | | 81,402 |

Calculation of cars in daily operation in 1928

| | | |
|---|---------|---------|
| Total car registration, 1928 | 677,782 | |
| Less one-half of 1928 sales (91,500) | 45,750 | } |
| Less one-half of 1928 dismantled (81,402) | 40,701 | |
| | <hr/> | |
| Number of cars in daily operation, 1928.... | | 591,331 |

The results of similar calculations for other years, 1900 to 1930, are given in Table 10.

3. Estimates of Life Mileages. From the number of cars dismantled during 1929, their ages, and the average mileage from Fig. 4 it is possible to estimate the mileage operated from date of purchase to the date they were dismantled or the total life mileage. This was done for the 19,243 cars shown in Table 11 as being dismantled during 1929 and found to be 33,444 miles, a figure considerably less than 50,000 miles because in the group of the vehicles on which this calculation was based there was a high percentage of comparatively old cars which had a low average annual mileage throughout their life.

A similar calculation was made to determine the average age in miles of the cars registered for 1930, using the year model registration data given in Table 12 and the mileage averages of Fig. 4. This calculation gave 25,141 miles as the average total miles driven to July 1, 1930 of the cars registered for 1930. No correction was made for the cars not operated for the full year except for the 1930 and 1931 models. If this correction is made, the mileage is reduced to 24,572. Since the average age (Table 12) of the cars in service Jan. 1, 1930 was about 4 years, it is probable that these cars will have reached a total life mileage of 40,000 to 50,000 miles by the time they are scrapped at an average age of 7.5 years.

IV. ESTIMATES OF DEPRECIATION, AVERAGE LIFE, AND AVERAGE AGE

The depreciation cost item in the cost of operating motor vehicles is relatively large, and since there is no standard method of calculating these charges any two sets of costs may differ greatly. Many reports of costs have extended over the time during which the vehicle was thought to have served its useful economic life, or until the original owner became convinced that a new car was better suited to his needs, and in these cases the item of depreciation was the cost new minus the trade-in or sale value. This system works well for calculating the average costs during the entire period of one ownership, but cannot be applied to shorter accounting periods. Neither is it suitable to the cases involving fleet operation. Some other unit seems necessary, and such a unit is conveniently expressed in cents per mile, based upon the expected total life mileage of the car, the cost new, and the salvage value.

1. Iowa Registration and New Car Sales. Since the methods used to determine the average life and average age were based upon registrations and new car sales for various years, it is first necessary to determine sales and car registrations.

The Iowa registration of cars and trucks is given in Table 10 for 1900 to 1930, and these figures are thought to be as accurate as they can be in the light of missing information, the changing of the Iowa

motor vehicle license laws, and conflicting reports. Through the courtesy of the State Motor Vehicle Department and the Archives Division, Historical, Memorial, and Art Department of Iowa, access was had to the registrations from 1904 to 1911. Later records were furnished by the Motor Vehicle Department and for the years 1920 to 1930 the total registrations for each type of vehicle and classification are known accurately.

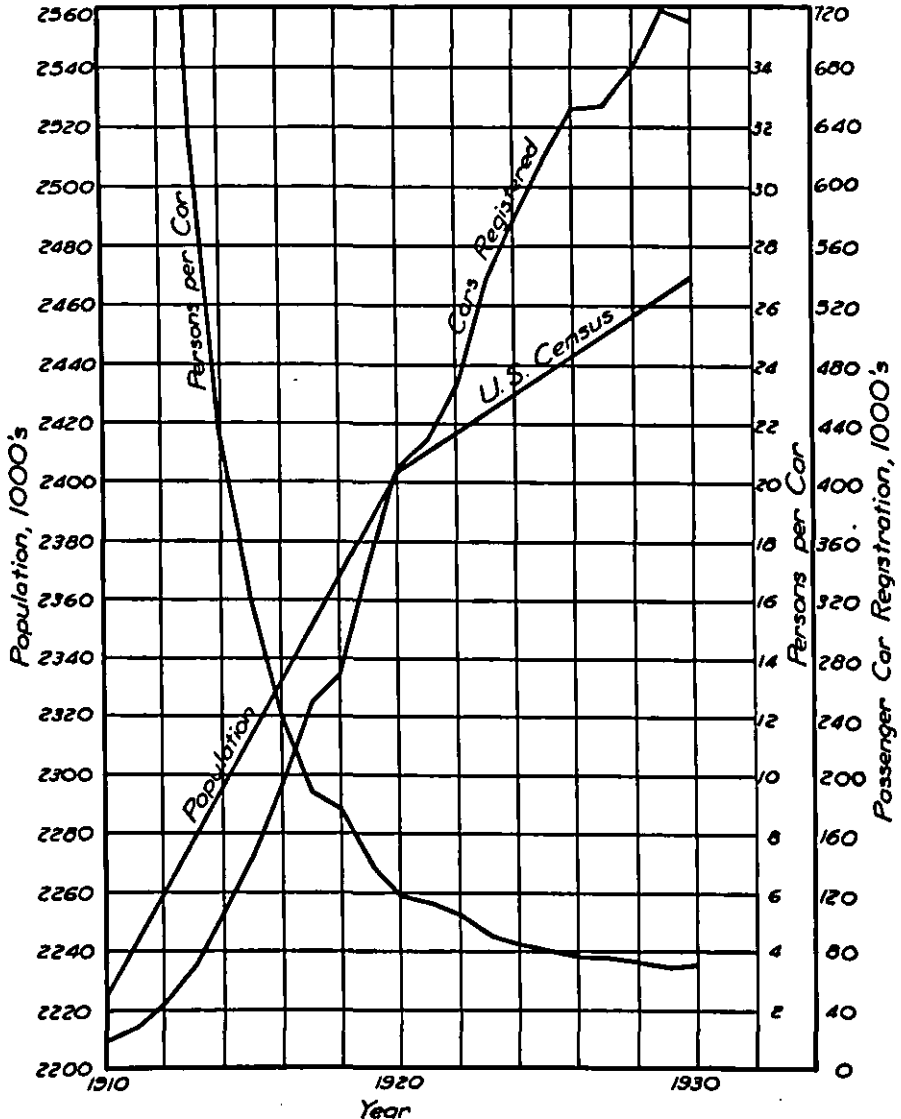


Fig. 8. Iowa population and passenger car registration, 1910 to 1930.

TABLE 10. IOWA CAR REGISTRATIONS, SALES, AND OTHER DATA, 1000 TO 1930

| Year | Iowa Automobile Registrations | | | | | Iowa New Car Sales* | Number of Cars Dismantled During Year† | Avg. No. of Cars Operated Daily |
|------|-------------------------------|-------------|------------|---------|---------------------|---------------------|--|---------------------------------|
| | Ford | Other Makes | Total Cars | Trucks | Total Cars & Trucks | | | |
| 1900 | | | 75† | | 75† | 50 | — | |
| 1901 | | | 130† | | 130† | 100 | — | |
| 1902 | | | 250† | | 250† | 180 | — | |
| 1903 | | | 500† | | 500† | 280 | — | |
| 1904 | | | 931 | | 931 | 580 | 80 | 601 |
| 1905 | | | 1,650† | | 1,650† | 799 | 172 | 1,164 |
| 1906 | | | 2,500† | | 2,500† | 1,022 | 247 | 1,865 |
| 1907 | | | 4,200† | | 4,200† | 1,947 | 436 | 3,008 |
| 1908 | | | 6,930† | | 6,930† | 3,166 | 841 | 4,920 |
| 1909 | | | 11,600† | | 11,600† | 5,511 | 3,142 | 7,273 |
| 1910 | | | 18,870 | | 18,870† | 10,412 | 2,063 | 12,632 |
| 1911 | 4,167 | 23,940 | 28,107 | 50† | 28,157 | 11,300 | 1,065 | 21,924 |
| 1912 | 8,493 | 36,049 | 44,542 | 100† | 44,642 | 17,500 | 2,106 | 34,739 |
| 1913 | 21,279 | 50,157 | 71,436 | 400† | 71,836 | 29,000 | 9,132 | 52,370 |
| 1914 | 37,240† | 89,464† | 106,704 | 800† | 107,504 | 44,400 | 3,362 | 82,823 |
| 1915 | 52,904† | 92,438† | 145,342 | 1,500† | 146,842 | 42,000 | 8,740 | 119,972 |
| 1916 | 74,133† | 121,469† | 195,602 | 3,000† | 198,602 | 59,000 | 37,285 | 147,459 |
| 1917 | 98,480† | 150,837† | 249,317 | 5,000† | 254,317 | 91,000 | 24,804 | 191,415 |
| 1918 | 110,008 | 158,305 | 268,313 | 10,000† | 278,313 | 43,800 | —17,267 | 255,046 |
| 1919 | 146,617 | 198,363 | 344,980 | 18,100† | 363,080 | 58,600 | 1,786 | 314,787 |
| 1920 | 190,815 | 219,279 | 410,094 | 29,406 | 439,500 | 66,900 | 19,547 | 366,870 |
| 1921 | 204,560 | 225,187 | 429,747 | 32,865 | 462,612 | 39,200 | 26,803 | 396,745 |
| 1922 | 242,176 | 222,768 | 464,944 | 35,102 | 500,046 | 62,000 | 17,907 | 424,990 |
| 1923 | 292,692 | 245,345 | 538,037 | 37,443 | 575,480 | 91,000 | 44,692 | 470,191 |
| 1924 | 330,458 | 249,387 | 579,845 | 41,039 | 620,524 | 86,500 | 40,914 | 515,778 |
| 1925 | 350,528 | 267,143 | 617,671 | 46,618 | 664,289 | 79,100 | 69,196 | 543,523 |
| 1926 | 357,523 | 294,952 | 652,475 | 51,290 | 703,765 | 104,000 | 75,679 | 562,636 |
| 1927 | 329,765 | 324,531 | 654,296 | 55,698 | 709,994 | 77,500 | 68,014 | 581,539 |
| 1928 | 309,596 | 368,186 | 677,782 | 61,933 | 739,715 | 91,500 | 81,402 | 591,331 |
| 1929 | 313,214 | 405,166 | 718,380 | 69,531 | 787,911 | 122,000 | 85,888 | 614,436 |
| 1930 | 293,677 | 417,815 | 711,492 | 73,417 | 784,909 | 79,000 | | |

CC

*Estimated from registration analyses and new car registration reports. Figures refer to year model rather than to calendar years.
 †Estimated.
 ‡Calculated by assuming that the number of cars dismantled any year is equal to the registration for that year minus the difference between the following year's registration and sales.
 ||Calculated by assuming that the average number of cars operated daily is equal to the year's registration minus one-half of the new car sales and minus one-half of the number of cars dismantled during the year.

The number of new car sales of year models corresponding to those found in the registration analysis was somewhat difficult to determine as there were no authoritative data available. Those sales as reported in Table 10 were determined by a careful study of the registrations, the year model analyses (Table 12) and the new car registrations reported by R. L. Polk Company, Detroit. As a rule the year model analysis indicated that more cars were registered the year following the appearance of a new model than were indicated by the new car registrations compiled during the year. However, the final results shown in Table 10 are estimates giving consideration to each set of evidence.

By the method outlined on page 30 the number of vehicles not re-registered was calculated for each year, 1900 to 1930 (Table 10). It is interesting to note that during the years of numerous sales the number of cars discarded was also heavy. When the sales were light the number of cars retired was also light. This economic law is strikingly illustrated for 1918 when the method indicates that 17,267 cars, discarded in 1917 and previous years were brought back into service.

2. Average Life Determined from Cars Dismantled. An attempt was made to discover the mileage of cars up to the time they were scrapped or permanently removed from service, but since only a few scattered figures were found the plan was given up in favor of one involving a determination of the average life in years, and the average annual mileage. In the State of Iowa, owners are required to report to the state department of motor vehicles the disposition of each car not re-registered the following year. The reports usually state that the vehicle was wrecked, burned up, scrapped, or removed from the state. Through the courtesy of the treasurers in several Iowa counties a tabulation was made showing the year model of the cars that were permanently removed from service (dismantled) during several consecutive years, 1920 to 1929. These tabulations have been summarized as shown in Table 11.

The average life was calculated for the cars whose dismantled dates were known, on the basis that on the average the cars were placed in service July 1 of their year model year and that on the average they were retired from service July 1 of the last year for which they were registered. The mean date of the new car sales by months is very near to July 1, but some year models are sold as early as the preceding July. This error in the assumption is balanced somewhat by the over-issue cars and dealers' cars which in some cases do not reach private ownership until late the following year. The cars which are removed from service because of accidents would have an average date of removal very close to July 1, but those cars which are retired because of their general condition may not be taken from service until late in the year, since the new license fees have to be paid before January 1. But in any case the assumption

that the average age of the cars retired can be determined on the basis of July to July is perhaps reasonable and accurate enough for the purpose of this study.

The average lives shown at the bottom of Table 11 are plotted in Fig. 10, the curve showing a gradual increase in life up to 7.81 years for 1927.

TABLE 11. PARTIAL COUNT OF IOWA CARS RETIRED FROM SERVICE, 1920 TO 1929

| Year Model | Cars Registered Last Time for Year Indicated* | | | | | | | | | Average Age in Years of Cars Dismantled in 1929** |
|----------------|---|------|------|------|------|------|------|--------|--------|---|
| | 1920 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 | |
| 1908 | 3 | 0 | 0 | 0 | | 1 | | 0 | 0 | 21 |
| 1909 | 4 | 0 | 4 | 2 | 0 | 25 | 0 | 2 | 1 | 20 |
| 1910 | 17 | 31 | 12 | 7 | 5 | 24 | 2 | 21 | 14 | 19 |
| 1911 | 36 | 55 | 29 | 13 | 24 | 24 | 7 | 11 | 9 | 18 |
| 1912 | 86 | 112 | 101 | 41 | 37 | 70 | 14 | 35 | 25 | 17 |
| 1913 | 132 | 282 | 254 | 114 | 112 | 198 | 36 | 85 | 74 | 16 |
| 1914 | 144 | 515 | 477 | 325 | 270 | 467 | 101 | 175 | 192 | 15 |
| 1915 | 77 | 457 | 540 | 394 | 346 | 564 | 138 | 294 | 278 | 14 |
| 1916 | 56 | 600 | 879 | 650 | 611 | 1096 | 236 | 584 | 548 | 13 |
| 1917 | 66 | 533 | 1043 | 905 | 946 | 2026 | 488 | 1412 | 1255 | 12 |
| 1918 | 17 | 182 | 411 | 452 | 400 | 1116 | 329 | 872 | 961 | 11 |
| 1919 | 17 | 151 | 296 | 426 | 580 | 1300 | 485 | 1338 | 1481 | 10 |
| 1920 | 8 | 99 | 219 | 305 | 414 | 1185 | 505 | 1682 | 2022 | 9 |
| 1921 | | 50 | 93 | 125 | 227 | 514 | 271 | 999 | 1492 | 8 |
| 1922 | | 51 | 77 | 96 | 149 | 440 | 255 | 1304 | 2357 | 7 |
| 1923 | | | 50 | 85 | 184 | 392 | 228 | 1555 | 3576 | 6 |
| 1924 | | | | 25 | 110 | 224 | 137 | 1007 | 2622 | 5 |
| 1925 | | | | | 60 | 134 | 58 | 433 | 1431 | 4 |
| 1926 | | | | | | 78 | 31 | 194 | 545 | 3 |
| 1927 | | | | | | | 14 | 126 | 170 | 2 |
| 1928 | | | | | | | | 91 | 137 | 1 |
| 1929 | | | | | | | | | 53 | 0.33 |
| Total Cars | 663 | 3124 | 4485 | 3065 | 4574 | 9878 | 3335 | 12,220 | 19,243 | — |
| Avg. Lifes, yr | 5.90 | 6.32 | 6.56 | 6.83 | 7.14 | 7.79 | 7.81 | 7.69 | 7.56 | — |

*Data were taken from files in the offices of the treasurer for the following counties. The totals do not include all cars reported to the county treasurer. Cars of unknown year model were omitted.

1920—Benton, Buena Vista, Butler, Cedar, Cerro Gordo, Davis, Delaware, Dickinson, Fremont, Guthrie, Keokuk, Kossuth, Mitchell, Poweshiek, Ringgold, Sioux, Story, Tama, Wapello, and Webster Counties.

1922, 1923, 1924, and 1925—Blackhawk, Clinton, Fremont, Guthrie, Humboldt, Keokuk, Kossuth, Lee, Monona, Polk, Story, and Webster Counties.

1926—Buena Vista, Butler, Cerro Gordo, Cherokee, Cass, Fayette, Guthrie, Hamilton, Hancock, Jackson, Jefferson, Keokuk, Lee, Montgomery, Poweshiek, Union, Washington, Woodbury, and Worth Counties.

1927—Adair, Buena Vista, Cherokee, Decatur, Delaware, Kossuth, Montgomery, Sioux, and Webster Counties.

1928—Adair, Butler, Cass, Cerro Gordo, Cherokee, Decatur, Delaware, Fayette, Guthrie, Hamilton, Hancock, Henry, Jackson, Jefferson, Keokuk, Kossuth, Lee, Montgomery, Poweshiek, Sioux, Union, Webster, Washington, Woodbury, and Worth Counties.

1929—Adair, Buena Vista, Butler, Cass, Cerro Gordo, Cherokee, Davis, Decatur, Delaware, Fayette, Guthrie, Hamilton, Hancock, Henry, Jackson, Jasper, Jefferson, Keokuk, Kossuth, Lee, Montgomery, Polk, Poweshiek, Ringgold, Sioux, Story, Union, Washington, Webster, Woodbury, and Worth Counties.

**Assuming that cars entered service July 1 of their year model year, and were retired July 1 of the last year registered. Average ages for other years determined accordingly.

†Calculated by determining the service in car-years and dividing by the number of cars.

TABLE 12. YEAR MODEL SUMMARY OF IOWA AUTOMOBILE REGISTRATIONS FOR VARIOUS YEARS, 1911 TO 1930*

| Year Model | Number of Cars of Each Year Model Registered for Following Years of Registration | | | | | | | | |
|------------------|--|--------|--------|-----------|-----------|-----------|-----------|-----------|-----------|
| | 1911 | 1912 | 1913 | 1920 | 1922 | 1924 | 1926 | 1928 | 1930 |
| 1900 | 8 | 12 | | | | | | | |
| 1901 | 4 | 12 | | | | | | | |
| 1902 | 29 | 40 | | | | | | | |
| 1903 | 67 | 60 | 20 | | | | | | |
| 1904 | 132 | 202 | 76 | | | | | | |
| 1905 | 237 | 379 | 206 | | | | | | |
| 1906 | 562 | 689 | 305 | | | | | | |
| 1907 | 1,035 | 1,359 | 951 | 10 | | | 11 | | |
| 1908 | 2,253 | 2,721 | 2,010 | 89 | | | 22 | | |
| 1909 | 3,719 | 4,821 | 3,225 | 362 | 208 | 62 | 43 | 32 | |
| 1910 | 8,583 | 8,231 | 8,251 | 1,400 | 826 | 380 | 202 | 74 | 10 |
| 1911 | 11,478 | 10,614 | 9,623 | 2,805 | 1,861 | 1,022 | 532 | 106 | 52 |
| 1912 | | 15,265 | 17,112 | 7,975 | 4,779 | 2,734 | 1,074 | 613 | 209 |
| 1913 | | 137 | 28,996 | 17,978 | 12,005 | 6,884 | 3,190 | 1,384 | 553 |
| 1914 | | | 659 | 33,707 | 26,304 | 17,432 | 7,348 | 2,768 | 1,117 |
| 1915 | | | | 36,795 | 29,986 | 22,125 | 10,347 | 4,311 | 1,577 |
| 1916 | | | | 54,459 | 49,326 | 38,572 | 20,104 | 8,052 | 2,955 |
| 1917 | | | | 85,892 | 79,113 | 68,240 | 40,760 | 17,921 | 7,111 |
| 1918 | | | | 44,556 | 40,123 | 35,917 | 24,532 | 11,591 | 4,689 |
| 1919 | | | | 60,956 | 57,031 | 51,660 | 37,049 | 20,816 | 9,012 |
| 1920 | | | | 62,193 | 66,497 | 62,145 | 51,394 | 31,985 | 14,515 |
| 1921 | | | | 917 | 37,267 | 37,574 | 34,422 | 24,577 | 12,990 |
| 1922 | | | | | 55,511 | 59,481 | 57,285 | 45,648 | 27,056 |
| 1923 | | | | | 4,107 | 89,721 | 86,623 | 76,400 | 48,212 |
| 1924 | | | | | | 82,249 | 85,411 | 70,003 | 58,905 |
| 1925 | | | | | | 3,647 | 79,732 | 75,095 | 62,403 |
| 1926 | | | | | | | 112,304 | 102,061 | 93,552 |
| 1927 | | | | | | | | 76,596 | 74,558 |
| 1928 | | | | | | | | 97,739 | 90,054 |
| 1929 | | | | | | | | | 121,025 |
| 1930 | | | | | | | | | 78,849 |
| 1931 | | | | | | | | | 2,088 |
| Total | 28,107 | 44,542 | 71,436 | 410,094 | 464,944 | 579,845 | 652,475 | 677,782 | 711,492 |
| Car-Years | 24,687 | 54,267 | 73,562 | 1,072,376 | 1,599,960 | 2,084,582 | 2,245,378 | 2,346,085 | 2,410,266 |
| No. of Cars† | 16,629 | 29,140 | 41,781 | 346,984 | 405,326 | 493,949 | 540,171 | 580,043 | 630,555 |
| Avg. Age, Year** | 1.485 | 1.862 | 1.761 | 3.091 | 3.947 | 4.220 | 4.157 | 4.045 | 3.822 |

See next page for footnote.

3. Average Life Determined from the Year Model of the Cars Registered. A second method of determining the average life was based upon the registration by year models, and new car sales. Sample analyses were made of the registrations for 1911, 1912, 1913, and every even year, 1920 to 1930, showing the year model of the cars registered. These samples, when converted to equal the total state registration, are shown in Table 12. With the possible exceptions of 1922 and 1924, the samples are quite representative of the entire state. The 1922 and 1924 samples, taken in only 11 counties, probably had too high a percentage of urban counties to render the sample characteristic of the state.

The percentage of the cars surviving or registered for the years following their placement in service is indicated in Table 13 and Fig. 9. Normally the average life would be determined directly by the percentage surviving at any given age, but since the methods used resulted in more than 100 percent in service for certain ages and year models, the average life was determined from the smooth curves of Fig. 9. As in the previous method the cars were assumed to have entered service July 1 of their model year, but since the registration was always as of January 1, the age could be determined more exactly.

It will be seen from Fig. 10 that these two methods of determining the average life of the cars do not check for the years prior to 1926. There is no explanation for this apparent discrepancy, but both methods indicate an increase in the average life up to recent years, and the results agree for 1927, 1928, and 1929. An average life of 7.5 years seems to be reasonable and this has been used in these calculations. Since the average mileage was shown to be about 6,731 miles a year, the life mileage for a life of 7.5 years would be 50,482 or 482 more than was used in calculating depreciation charges in the previous average operating cost estimates.

4. Determination of the Average Age of Cars Registered. It is possible also to determine the approximate age of the cars registered for any year for which the year model analysis is available. These

*EXPLANATION OF SAMPLES: 1911, 1912, and 1913 Registrations— Obtained by tabulating 500 cars out of each 2,000 in state registration.

1920 Registration—Obtained by tabulating all cars in registrations of Benton, Buena Vista, Butler, Cedar, Cerro Gordo, Davis, Delaware, Dickinson, Fremont, Guthrie, Keokuk, Kossuth, Mitchell, Poweshiek, Ringgold, Sioux, Story, Tama, Wapello, and Webster Counties.

1922 and 1924 Registrations—Obtained by tabulating all cars in registrations of Blackhawk, Clinton, Fremont, Guthrie, Humboldt, Keokuk, Kossuth, Lee, Monona, Story, and Webster Counties.

1926 and 1928 Registrations—Data obtained by tabulating every approximate fourth car in registrations of Adair, Adams, Blackhawk, Buena Vista, Cass, Cerro Gordo, Cherokee, Chickasaw, Clay, Clinton, Crawford, Fayette, Fremont, Guthrie, Hancock, Henry, Humboldt, Jefferson, Keokuk, Kossuth, Lee, Linn, Monona, Montgomery, O'Brien, Polk, Story, Union, Wapello, Washington, Webster, Winnebago, and Worth Counties.

1930 Registration—Same as 1926 and 1928, except minus Winnebago County, and plus Winnecheik County.

**Cars whose year model is the same or later than year of registration analysis are not included in figuring the average age.

Age determined by assuming that cars entered service July 1 of their year-model year. Thus, in the 1930 registration, the 1929 year-model cars were 0.5 year old.

†Not including those whose year-model is the same or later than year of registration analysis.

TABLE 13. PERCENT OF NEW CAR SALES RE-REGISTERED FOR YEARS SUBSEQUENT TO THEIR YEAR MODEL YEAR*

| Year Model | Percent of New Car Sales Re-registered for Year Indicated | | | | | | | | | | | | | | | | | |
|--------------------|---|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| | 1911 | | 1912 | | 1913 | | 1920 | | 1922 | | 1924 | | 1926 | | 1928 | | 1930 | |
| | From Data | From Curve | From Data | From Curve | From Data | From Curve | From Data | From Curve | From Data | From Curve | From Data | From Curve | From Data | From Curve | From Data | From Curve | From Data | From Curve |
| 1899 | 0.00 | 0.00 | 0.00 | 0.00 | | | | | | | | | | | | | | |
| 1900 | 16.00 | 2.77 | 24.00 | 5.76 | | | | | | | | | | | | | | |
| 1901 | 4.00 | 6.82 | 12.00 | 12.61 | | | | | | | | | | | | | | |
| 1902 | 16.11 | 12.41 | 22.22 | 20.90 | 0.00 | 0.00 | | | | | | | | | | | | |
| 1903 | 25.77 | 19.40 | 23.08 | 29.89 | 7.69 | 6.10 | | | | | | | | | | | | |
| 1904 | 22.76 | 28.00 | 34.83 | 39.21 | 13.45 | 15.00 | | | | | | | | | | | | |
| 1905 | 29.66 | 37.71 | 47.43 | 50.27 | 25.78 | 25.01 | | | | | | | 0.00 | 0.00 | | | | |
| 1906 | 54.99 | 47.73 | 67.42 | 62.00 | 29.84 | 35.50 | 0.00 | 0.00 | | | | | 0.56 | 0.20 | | | | |
| 1907 | 53.16 | 58.00 | 69.80 | 72.79 | 48.84 | 46.12 | 0.51 | 0.70 | | | | | 0.69 | 0.50 | 0.00 | 0.00 | | |
| 1908 | 71.16 | 68.78 | 85.94 | 82.12 | 63.49 | 56.98 | 2.81 | 2.71 | 0.00 | 0.80 | 0.00 | 0.00 | | | | | | |
| 1909 | 67.48 | 80.02 | 87.48 | 89.15 | 58.52 | 67.76 | 6.57 | 6.70 | 3.77 | 3.28 | 1.13 | 0.68 | 0.78 | 1.00 | 0.58 | 0.18 | 0.00 | 0.00 |
| 1910 | 82.43 | 90.95 | 79.05 | 94.31 | 79.25 | 78.80 | 13.45 | 13.50 | 7.93 | 8.06 | 3.65 | 3.41 | 1.94 | 2.10 | 0.71 | 0.52 | 0.10 | 0.17 |
| 1911 | 101.58 | 100.00 | 93.93 | 97.77 | 85.16 | 89.25 | 24.82 | 25.00 | 16.47 | 15.75 | 9.04 | 7.88 | 4.71 | 3.90 | 0.94 | 1.23 | 0.48 | 0.42 |
| 1912 | | | 87.23 | 100.00 | 97.78 | 96.57 | 45.57 | 44.95 | 27.31 | 26.91 | 15.62 | 14.69 | 6.14 | 6.71 | 3.50 | 2.27 | 1.19 | 0.80 |
| 1913 | | | | | 99.99 | 100.00 | 61.99 | 64.70 | 41.40 | 40.90 | 23.74 | 23.77 | 11.00 | 10.90 | 4.77 | 3.81 | 1.91 | 1.51 |
| 1914 | | | | | | | 75.92 | 77.81 | 59.24 | 56.32 | 39.26 | 36.50 | 16.55 | 16.72 | 6.23 | 6.10 | 2.52 | 2.48 |
| 1915 | | | | | | | 87.61 | 86.72 | 71.40 | 71.12 | 52.68 | 51.72 | 24.64 | 24.30 | 10.26 | 9.22 | 3.75 | 3.75 |
| 1916 | | | | | | | 92.30 | 93.21 | 83.60 | 81.29 | 65.38 | 65.02 | 34.23 | 33.41 | 13.65 | 13.61 | 5.01 | 5.50 |
| 1917 | | | | | | | 94.38 | 97.20 | 86.94 | 88.81 | 75.00 | 75.10 | 44.79 | 44.00 | 19.69 | 19.62 | 7.81 | 7.72 |
| 1918 | | | | | | | 101.73 | 99.25 | 91.61 | 94.18 | 82.00 | 82.08 | 56.01 | 55.80 | 26.46 | 27.18 | 10.71 | 10.79 |
| 1919 | | | | | | | 104.02 | 99.87 | 97.32 | 97.42 | 88.16 | 87.81 | 63.22 | 67.49 | 35.52 | 37.50 | 15.38 | 15.16 |
| 1920 | | | | | | | 92.96 | 100.00 | 99.11 | 92.89 | 92.50 | 92.50 | 76.82 | 78.12 | 47.81 | 50.52 | 21.70 | 21.76 |
| 1921 | | | | | | | | | 95.07 | 99.79 | 95.85 | 96.06 | 87.81 | 86.34 | 62.70 | 63.80 | 33.14 | 31.10 |
| 1922 | | | | | | | | | 89.53 | 100.00 | 95.94 | 98.50 | 92.40 | 92.61 | 73.66 | 74.22 | 43.64 | 43.25 |
| 1923 | | | | | | | | | | | 98.27 | 99.73 | 94.88 | 96.60 | 83.78 | 83.61 | 52.81 | 53.26 |
| 1924 | | | | | | | | | | | 95.09 | 100.00 | 98.74 | 99.07 | 92.37 | 90.75 | 68.10 | 67.40 |
| 1925 | | | | | | | | | | | | | 100.80 | 99.95 | 94.94 | 95.50 | 78.89 | 78.91 |
| 1926 | | | | | | | | | | | | | 107.98 | 100.00 | 98.14 | 98.58 | 89.95 | 89.50 |
| 1927 | | | | | | | | | | | | | | | 98.83 | 99.78 | 96.20 | 96.20 |
| 1928 | | | | | | | | | | | | | | | 106.82 | 100.00 | 98.42 | 98.71 |
| 1929 | | | | | | | | | | | | | | | | | 99.20 | 99.72 |
| 1930 | | | | | | | | | | | | | | | | | 99.81 | 100.00 |
| Ave. Life, (Years) | | 4.55 | | 6.57 | | 5.18 | | 7.12 | | 7.84 | | 8.36 | | 8.20 | | 7.77 | | 7.30 |

*Percentages calculated from the registrations shown in Table 12 and the new car sales shown in Table 10. "From data" indicates the actual percentage as calculated. "From curve" indicates the percentage from the smooth curves of F. g. 9.

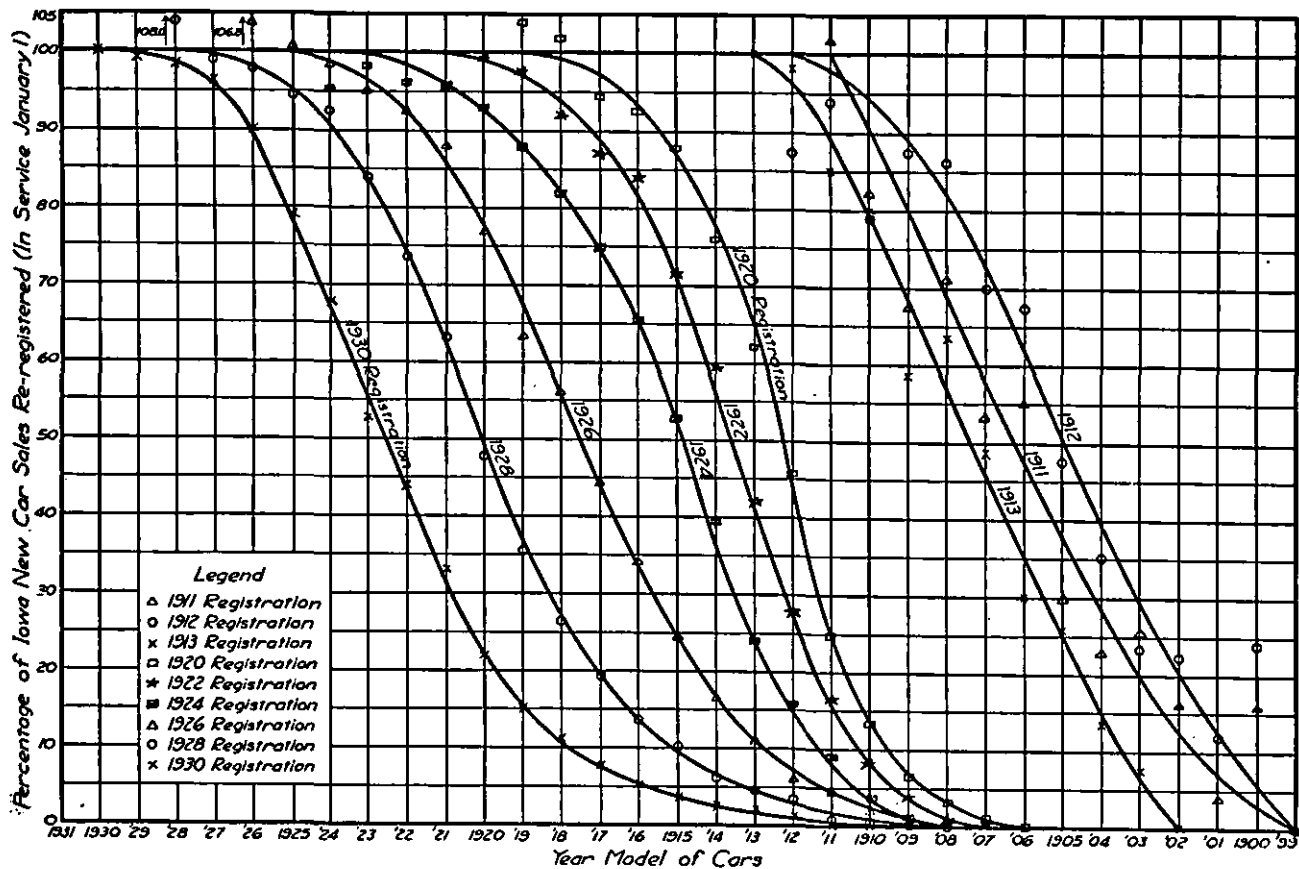


Fig. 9. Percentage of Iowa new car sales re-registered for various years, 1911 to 1930.

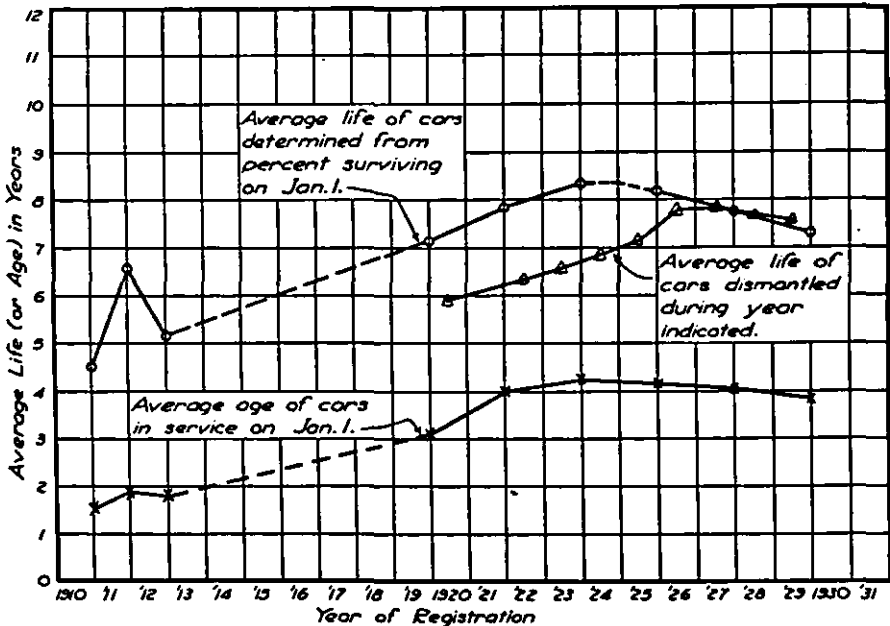


Fig. 10. Results of two methods of determining the average life of cars. The lower curve shows the average age of Iowa cars as of January 1 for the years indicated.

determinations were made and are shown in Table 12 and Fig. 10, the results indicating a reduction in average age since about 1925. This downward trend of the age curve is unusual, since the average age is considerably less than the average service life, but it is no doubt caused by the purchase of unusually large numbers of new cars from 1925 to 1930. The reduction of new car purchases in 1930 and 1931, and the accompanying tendency of owners to prolong the life of their cars will no doubt increase the average age of the cars registered and also the average life of the cars retired from service.

5. **Depreciation Determined from Used Car Sales.** When the information on mileage was submitted by Iowa owners they sent in cost new prices and amounts received in trade or sale for their used cars. Since they also listed the length of time they had owned the cars, data are available from which the market value of the cars can be calculated for various ages and mileages. These data (Figs. 11 to 12) indicate that the market value of used cars is determined primarily by the age, and least by the mileage. The depreciation during the first year is about 40 percent, the second year 13 percent, the third year, 11 percent, the fourth year, 9 percent, reaching approximate salvage value of 10 percent at the age of 8.5 years. The data were first studied from the standpoint of make of car and price, but since these indicated no particular difference in the depreciation rates, the points are plotted in price groups, the market value

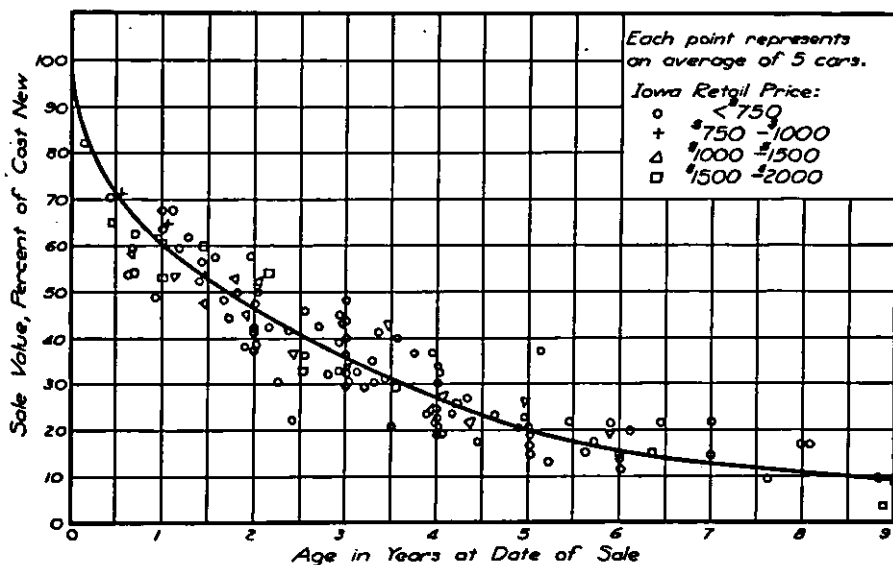


Fig. 11. Market value of cars based upon their retail cost new and their age in years.

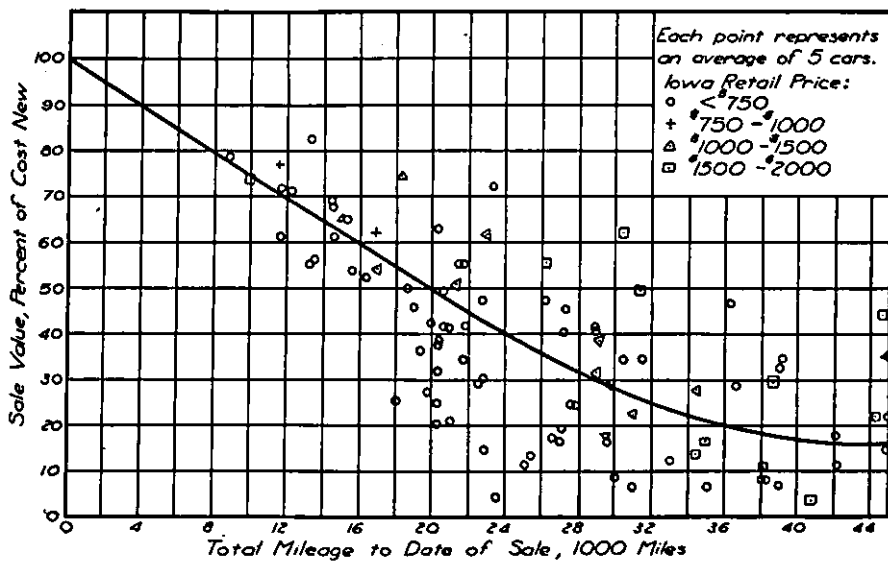


Fig. 12. Effect of mileage upon the market value of cars.

being calculated as a percentage of the Iowa retail delivered price of new cars.

The depreciation of 40 percent for the first year is quite large and includes, of course, delayed maintenance and tire renewal as well as a large amount for obsolescence. But in any event, the average car one year old is worth for transportation purposes more than 60 percent of its cost new. At an average life of 7.5 years, the depreciation on a straight line basis would be about 13.3 percent a year, and if 12 percent is allowed for tire and delayed mechanical maintenance, the first year's depreciation equivalent would be about 25 percent, leaving 15 percent for obsolescence.

6. **Economic Life.** Many owners have given considerable thought to the problem of determining just when it is economical for them to dispose of their cars and buy new ones. They wish to know when the economic life of the car has been reached. Such information could be easily calculated from cost records on operation throughout a long period of time, but such records are seldom kept and complete sets of data are difficult to locate. The steady improvement in car design and construction coupled with the human desire to possess things new and modern sends cars to the scrap pile with 10 to 50 percent of their economic mileage unused.

An attempt was made to calculate the average cost for each year over a period of years but it was given up because there were no records available on any one car over a sufficiently long period of time. The items that increase in cost per mile as the car becomes older are gasoline, lubrication, and maintenance; garage and tire costs remain constant; depreciation (market value basis), interest, insurance, and license (Iowa laws) decrease. For the first period of years the total cost would decrease, following which the increasing items would increase more than the amount of the decrease, thus causing the total costs to increase over the preceding period. For any given car the economic life (neglecting the time element and the operating cost of a replacement car) would be reached when the average accumulative unit cost per mile reached the lowest point. But in practice these calculations must be considered in the light of time saved, safety, convenience, and the probable operating cost of a new car. However, it seems evident that it is now not only safe but economical to drive any car purchased new 50,000 to 60,000 miles before disposing of it.

TABLE 14. AUTOMOBILE OPERATING COST DATA SUMMARIZED

| Group No. | 6-8 | | 3-16 | | 3-2 | | 3-1 | | 2-13 | | 4-7 | | 2-10 | | 1-3 | |
|---------------------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|
| Class & No. Cars Avgd. | L4-Tour.-9 | | L4-Tour.-52 | | L4-Road.-188 | | L4-Road.-13 | | L4-Road.-12 | | L4-Road.-41 | | L4-Tour.-8 | | L4-Road.-3 | |
| Account Item | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile |
| Gasoline | 251.09 | 1.31 | 388.75 | 1.52 | 89.93 | 1.09 | | | 101.63 | 1.05 | 141.91 | 1.02 | 95.19 | 1.30 | 297.42 | 1.27 |
| Oil | | | 73.59 | 0.28 | 23.09 | 0.28 | | | 9.95 | 0.10 | 22.30 | 0.16 | 11.78 | 0.16 | | |
| Tires and tubes | 84.05 | 0.44 | 124.19 | 0.49 | 46.25 | 0.56 | | | 35.96 | 0.37 | 58.68 | 0.42 | 42.39 | 0.64 | 79.22 | 0.32 |
| Maintenance | 102.44 | 0.53 | | | 101.06 | 1.23 | | | 135.39 | 1.40 | 110.87 | 0.80 | 185.30 | 2.78 | 93.21 | 0.40 |
| Misc. costs | | | | | 17.40 | 0.21 | | | | | 6.80 | 0.05 | | | | |
| Depreciation | | | 451.73 | 1.78 | | | | | 157.60 | 1.63 | 116.50 | 0.84 | | | | |
| License | 34.78 | 0.18 | | | 10.00 | 0.12 | | | | | | | | | 17.67 | 0.08 |
| Garage | 62.85 | 0.33 | | | | | | | | | 57.40 | 0.41 | | | 56.00 | 0.24 |
| Insurance | 48.63 | 0.25 | | | | | | | | | | | | | 19.37 | 0.08 |
| Avg. list price, \$ | 373 | | 377 | | 360 | | | | 360 | | 380 | | 364 | | 355 | |
| Avg. weight, lb. | 1558 | | 1642 | | 1645 | | | | 1645 | | 1650 | | 1655 | | 1655 | |
| Avg. age at start, yr. | 1.22 | | 0.00 | | | | | | | | | | | | 0.33 | |
| Dates covered | 1920-1930 | | 5/23-1/30 | | 1928 | | | | 1928 | | 12/27-12/28 | | 1928 | | 1926-1929 | |
| Avg. account period, yr. | 3.59 | | 2.74 | | 0.75 | | | | 1.00 | | 1.00 | | 1.00 | | 1.63 | |
| Avg. total miles per car | 19,185 | | 25,344 | | 8,243 | | | | 9,681 | | 13,869 | | 7,314 | | 23,506 | |
| Avg. annual miles per car | 5,344 | | 9,250 | | 11,020 | | | | 9,681 | | 13,869 | | 7,314 | | 15,386 | |
| Miles per gallon gas | 14.28 | | 15.57 | | 14.46 | | | | 16.32 | | 14.21 | | 14.60 | | 19.24 | |
| Miles per quart oil | | | 93 | | 64 | | | | 138 | | | | 81 | | | |

| Group No. | 5-9 | | 3-5 | | 6-1 | | 3-4 | | 2-12 | | 4-6 | | 3-8 | | 4-3 | |
|---------------------------|-------------|------|-------------|------|------------|------|------------|------|------------|------|-------------|------|-------------|------|------------|------|
| Class & No. Cars Avgd. | L4-Tour.-86 | | L4-Tour.-3 | | L4-Tour.-1 | | L4-Tour.-4 | | L4-Tour.-7 | | L4-Tour.-54 | | L4-Road.-98 | | L4-Road.-2 | |
| Gasoline | 354.76 | 1.21 | 68.01 | 1.03 | 68.00 | 1.31 | 80.71 | 1.57 | 71.96 | 1.24 | 124.59 | 1.02 | 126.34 | 0.79 | 297.99 | 1.10 |
| Oil | 44.22 | 0.15 | 17.18 | 0.26 | 11.20 | 0.21 | 9.50 | 0.19 | 9.10 | 0.16 | 25.23 | 0.21 | 23.48 | 0.15 | 24.18 | 0.09 |
| Tires and tubes | 96.31 | 0.33 | 43.59 | 0.66 | 14.50 | 0.28 | 40.63 | 0.40 | 22.99 | 0.40 | 57.27 | 0.47 | 70.27 | 0.44 | 86.93 | 0.32 |
| Maintenance | 501.82 | 1.71 | 81.05 | 1.22 | 127.62 | 2.45 | 326.39 | 6.35 | 156.94 | 2.70 | 144.10 | 1.18 | 120.29 | 0.75 | 1176.15 | 4.33 |
| Misc. costs | | | 23.54 | 0.36 | 1.22 | 0.02 | 14.41 | 0.28 | | | 4.74 | 0.04 | 19.37 | 0.12 | | |
| Depreciation | 473.94 | 1.61 | | | 19.32 | 0.37 | | | | | 109.97 | 0.90 | | | 491.80 | 1.81 |
| License | | | 10.00 | 0.15 | | | 10.00 | 0.20 | | | | | 13.00 | 0.08 | | |
| Garage | | | | | | | | | | | 121.35 | 0.99 | | | | |
| Insurance | | | | | | | | | | | | | | | | |
| Avg. list price, \$ | 378 | | 380 | | 380 | | 380 | | 380 | | 380 | | 510 | | 540 | |
| Avg. weight, lb. | 1675 | | 1728 | | 1728 | | 1728 | | 1728 | | 1728 | | 1700 | | 1720 | |
| Avg. age at start, yr. | 0.00 | | | | 1.75 | | | | | | | | | | 0.00 | |
| Dates covered | 6/24-1/30 | | 12/27-12/28 | | 1928 | | 1928 | | 1928 | | 12/27-12/28 | | 12/27-12/28 | | 2/24-3/27 | |
| Avg. account period, yr. | 2.87 | | 0.86 | | 1.00 | | 0.27 | | 1.00 | | 1.00 | | 0.69 | | 2.87 | |
| Avg. total miles per car | 29,348 | | 6,821 | | 5,210 | | 5,138 | | 5,812 | | 12,200 | | 15,957 | | 27,189 | |
| Avg. annual miles per car | 10,226 | | 7,690 | | 5,210 | | 19,029 | | 5,812 | | 12,200 | | 23,145 | | 9,467 | |
| Miles per gallon gas | 14.99 | | 16.43 | | 16.08 | | 11.62 | | 14.66 | | 15.06 | | 19.30 | | 16.85 | |
| Miles per quart oil | 100 | | 87 | | 93 | | 78 | | 104 | | | | 87 | | 106 | |

TABLE 14. (CONT.) AUTOMOBILE OPERATING COST DATA SUMMARIZED

| Group No. | 2-16 | | 4-4 | | 4-13 | | 3-9 | | 4-12 | | 6-3 | | 2-8 | | 2-15 | |
|---------------------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|
| Class & No. Cars Avgd. | L4-Road-4 | | L4-Tour-2 | | L4-Road-4 | | L4-Tour-28 | | L4-Tour-1 | | L4-Tour-1 | | L4-Tour-6 | | L4-Tour-7 | |
| Account Item | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile |
| Gasoline | 349.19 | 0.93 | 344.35 | 1.04 | 164.68 | 1.52 | 123.18 | 0.93 | 113.71 | 1.32 | | | 122.17 | 0.94 | 309.82 | 1.06 |
| Oil | 30.95 | 0.08 | 44.62 | 0.13 | 18.58 | 0.17 | 22.57 | 0.17 | 14.25 | 0.16 | | | 7.00 | 0.05 | 27.93 | 0.10 |
| Tires and tubes | 163.04 | 0.44 | 114.35 | 0.34 | 61.67 | 0.47 | 70.26 | 0.53 | 44.32 | 0.51 | | | 59.71 | 0.46 | 97.97 | 0.34 |
| Maintenance | 211.78 | 0.57 | 961.49 | 2.90 | 131.11 | 1.21 | 158.50 | 1.19 | 169.87 | 1.06 | | | 340.56 | 2.62 | 608.00 | 2.09 |
| Misc. costs | | | | | 40.49 | 0.37 | 21.29 | 0.16 | 72.20 | 0.83 | | | 26.04 | 0.20 | | |
| Depreciation | 644.83 | 1.73 | 574.78 | 1.73 | 59.68 | 0.55 | | | 79.91 | 0.92 | | | 258.67 | 1.09 | 418.02 | 1.44 |
| License | | | | | | | 13.00 | 0.10 | | | | | | | | |
| Garage | | | | | | | | | | | | | | | | |
| Insurance | | | | | | | | | | | | | | | | |
| Avg. list price, \$ | 503 | | 540 | | 514 | | 510 | | 510 | | | | 510 | | 404 | |
| Avg. weight, lb. | 1740 | | 1805 | | 1808 | | 1870 | | 1875 | | | | 1900 | | 1901 | |
| Avg. age at start, yr. | 0.00 | | 0.00 | | 1.28 | | | | 1.54 | | | | | | 0.00 | |
| Dates covered | 5/24-12/29 | | 4/24-7/27 | | 2/26-1/29 | | 12/27-12/28 | | 1028 | | | | 1928 | | 5/24-12/29 | |
| Avg. account period, yr. | 3.08 | | 2.54 | | 0.87 | | 0.77 | | 1.00 | | | | 1.00 | | 2.00 | |
| Avg. total miles per car | 37,350 | | 33,131 | | 10,823 | | 13,310 | | 8,667 | | | | 12,985 | | 20,111 | |
| Avg. annual miles per car | 12,126 | | 13,052 | | 12,440 | | 17,335 | | 8,667 | | | | 12,985 | | 13,929 | |
| Miles per gallon gas | 16.66 | | 16.95 | | 17.04 | | 18.02 | | 20.11 | | | | 20.10 | | 17.35 | |
| Miles per quart oil | 128 | | 74 | | 177 | | 93 | | 188 | | | | 251 | | 124 | |

| Group No. | 2-5 | | 1-2 | | 2-1 | | 1-1 | | 3-7 | | 3-15 | | 4-8 | | 3-3 | |
|---------------------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|
| Class & No. Cars Avgd. | L4-Tour-7 | | L4-Coupe-6 | | L4-Coupe-4 | | L4-Sedan-7 | | L4-Sedan-1 | | L4-Sedan-8 | | L4-Sedan-20 | | M4-Road-70 | |
| Account Item | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile |
| Gasoline | 360.07 | 1.28 | 224.94 | 1.37 | 428.42 | 1.47 | 201.95 | 1.62 | 233.70 | 1.22 | 320.38 | 1.38 | 120.27 | 1.02 | 68.47 | 0.86 |
| Oil | 144.37 | 0.48 | | | 69.90 | 0.21 | | | 47.70 | 0.25 | 65.15 | 0.28 | 25.74 | 0.22 | 15.81 | 0.20 |
| Tires and tubes | 86.70 | 0.29 | 34.40 | 0.21 | 132.87 | 0.41 | 81.87 | 0.45 | 120.85 | 0.63 | 116.84 | 0.51 | 50.40 | 0.48 | 36.10 | 0.45 |
| Maintenance | | | 102.57 | 0.62 | | | 277.16 | 1.54 | 171.46 | 0.90 | | | 161.71 | 1.37 | 21.15 | 0.27 |
| Misc. costs | | | | | | | | | 18.10 | 0.09 | | | 4.91 | 0.04 | 10.22 | 0.13 |
| Depreciation | | | | | 376.44 | 1.62 | | | | | 482.63 | 2.09 | 124.67 | 1.05 | | |
| License | | | 22.50 | 0.14 | | | 46.59 | 0.28 | 13.00 | 0.07 | | | | | 12.00 | 0.15 |
| Garage | | | 51.38 | 0.31 | | | 121.25 | 0.67 | | | | | 114.38 | 0.97 | | |
| Insurance | | | 16.92 | 0.10 | | | 60.26 | 0.33 | | | | | | | | |
| Avg. list price, \$ | 527 | | 523 | | 521 | | 605 | | 680 | | 509 | | 545 | | 305 | |
| Avg. weight, lb. | 1965 | | 1784 | | 1827 | | 1943 | | 1050 | | 1953 | | 1900 | | 2050 | |
| Avg. age at start, yr. | 0.00 | | 3.17 | | 0.00 | | 0.57 | | | | 0.00 | | | | 0.00 | |
| Dates covered | 4/27-1/30 | | 1925-1930 | | 9/24-4/28 | | 1920-1930 | | 12/27-12/28 | | 7/24-1/30 | | 12/27-12/28 | | 6/28-12/28 | |
| Avg. account period, yr. | 2.68 | | 1.68 | | 2.33 | | 2.98 | | 1.00 | | 2.60 | | 1.00 | | 0.36 | |
| Avg. total miles per car | 29,897 | | 16,441 | | 32,242 | | 17,998 | | 19,140 | | 23,056 | | 11,820 | | 7,040 | |
| Avg. annual miles per car | 11,081 | | 9,786 | | 13,838 | | 6,040 | | 19,140 | | 9,222 | | 11,820 | | 22,368 | |
| Miles per gallon gas | 17.42 | | 16.57 | | 17.51 | | 15.58 | | 14.32 | | 17.12 | | 15.10 | | 15.92 | |
| Miles per quart oil | 135 | | | | 109 | | | | 64 | | 96 | | | | 73 | |

TABLE 14. (CONT.) AUTOMOBILE OPERATING COST DATA SUMMARIZED

| Group No. | 5-13 | | 5-10 | | 3-6 | | 5-12 | | 1-5 | | 2-3 | | 2-2 | | 5-11 | |
|---------------------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|
| Class & No. Cars Avgd. | M4-Road-19 | | M4-Coupe-1 | | M4-Tour-22 | | M4-Tour-43 | | M4-Coupe-3 | | M4-Coupe-1 | | M4-Sedan-1 | | M4-Coupe-1 | |
| Account Item | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile |
| Gasoline | 100.71 | 1.05 | 224.61 | 0.91 | 74.94 | 0.96 | 154.17 | 1.04 | 282.21 | 1.59 | 332.17 | 1.42 | 438.71 | 1.26 | 180.59 | 1.01 |
| Oil | 15.34 | 0.16 | 21.26 | 0.09 | 23.50 | 0.30 | 21.32 | 0.14 | 98.80 | 0.42 | 98.80 | 0.42 | 63.55 | 0.18 | 25.38 | 0.14 |
| Tires and tubes | 35.96 | 0.39 | 57.82 | 0.23 | 44.23 | 0.57 | 48.91 | 0.33 | 46.00 | 0.15 | 38.06 | 0.16 | 143.10 | 0.41 | 51.72 | 0.29 |
| Maintenance | 52.92 | 0.55 | 232.48 | 0.94 | 22.99 | 0.30 | 105.12 | 0.71 | 93.67 | 0.58 | — | — | — | — | 164.81 | 0.92 |
| Misc. costs | — | — | — | — | 15.53 | 0.20 | — | — | — | — | — | — | — | — | — | — |
| Depreciation | 123.95 | 1.29 | 346.68 | 1.41 | — | — | 161.57 | 1.09 | 190.04 | 1.20 | — | — | — | — | 222.41 | 1.25 |
| License | — | — | — | — | 12.00 | 0.15 | — | — | 14.50 | 0.09 | — | — | — | — | — | — |
| Garage | — | — | — | — | — | — | — | — | 94.50 | 0.57 | — | — | — | — | — | — |
| Insurance | — | — | — | — | — | — | — | — | 32.70 | 0.20 | — | — | — | — | — | — |
| Avg. list price, \$ | 417 | — | 495 | — | 395 | — | 412 | — | 513 | — | 550 | — | 495 | — | 625 | — |
| Avg. weight, lb. | 2050 | — | 2128 | — | 2140 | — | 2140 | — | 2197 | — | 2200 | — | 2340 | — | 2360 | — |
| Avg. age at start, yr. | 0.00 | — | 0.00 | — | 0.00 | — | 0.00 | — | 0.28 | — | 0.00 | — | 0.00 | — | 0.00 | — |
| Dates covered | 11/28-12/29 | — | 4/28-12/29 | — | 6/28-12/28 | — | 6/28-12/29 | — | 10/28-4/30 | — | 10/28-1/30 | — | 5/28-1/30 | — | 4/28-12/29 | — |
| Avg. account period, yr. | 0.70 | — | 1.71 | — | 0.46 | — | 0.97 | — | 1.00 | — | 1.25 | — | 1.66 | — | 1.08 | — |
| Avg. total miles per car | 9,600 | — | 24,660 | — | 7,795 | — | 14,879 | — | 16,510 | — | 23,300 | — | 34,617 | — | 17,859 | — |
| Avg. annual miles per car | 13,714 | — | 14,421 | — | 16,871 | — | 15,339 | — | 16,510 | — | 18,640 | — | 20,854 | — | 16,536 | — |
| Miles per gallon gas | 17.40 | — | 19.30 | — | 18.33 | — | 18.18 | — | 17.26 | — | 15.08 | — | 17.27 | — | 17.97 | — |
| Miles per quart oil | 125 | — | 183 | — | 78 | — | 104 | — | — | — | 70 | — | 180 | — | 113 | — |

| Group No. | 1-4 | | 3-10 | | 6-4 | | 3-11 | | 2-4 | | 4-1 | | 1-11 | | 6-2 | |
|---------------------------|-------------|------|-------------|------|------------|------|-------------|------|-------------|------|-----------|------|------------|------|------------|------|
| Class & No. Cars Avgd. | M4-Sedan-16 | | M4-Coupe-8 | | M4-Coupe-8 | | M4-Coach-9 | | M4-Coach-10 | | M4-Road-3 | | M4-Coupe-2 | | M4-Coach-1 | |
| Gasoline | 160.79 | 1.36 | 98.27 | 0.93 | 152.56 | 1.25 | 94.80 | 1.01 | 408.13 | 1.21 | 582.50 | 1.06 | 284.46 | 1.27 | 285.11 | 1.55 |
| Oil | 18.33 | 0.16 | 22.79 | 0.22 | 21.20 | 0.17 | 17.78 | 0.19 | 75.20 | 0.18 | 76.04 | 0.14 | 76.04 | 0.14 | 52.45 | 0.28 |
| Tires and tubes | 54.85 | 0.46 | 38.75 | 0.37 | 60.36 | 0.49 | 55.18 | 0.59 | 126.12 | 0.30 | 194.87 | 0.35 | 65.08 | 0.29 | 106.78 | 0.55 |
| Maintenance | — | — | 51.07 | 0.49 | — | — | 143.64 | 1.53 | — | — | 1872.58 | 3.39 | 99.75 | 0.44 | 322.76 | 1.76 |
| Misc. costs | — | — | 14.60 | 0.14 | — | — | 11.16 | 0.12 | — | — | — | — | — | — | 80.37 | 0.44 |
| Depreciation | 138.80 | 1.18 | — | — | 252.03 | 1.03 | — | — | — | — | 907.67 | 1.64 | 430.00 | 1.72 | 126.31 | 0.69 |
| License | 18.69 | 0.16 | 15.00 | 0.14 | 21.38 | 0.17 | 14.00 | 0.15 | — | — | — | — | 33.50 | 0.15 | — | — |
| Garage | 43.58 | 0.37 | — | — | 60.67 | 0.50 | — | — | — | — | — | — | 70.00 | 0.31 | — | — |
| Insurance | 21.50 | 0.18 | — | — | 32.01 | 0.26 | — | — | — | — | — | — | 35.55 | 0.16 | — | — |
| Avg. list price, \$ | 548 | — | 645 | — | 648 | — | 645 | — | 645 | — | 885 | — | 580 | — | 625 | — |
| Avg. weight, lb. | 2372 | — | 2005 | — | 2064 | — | 2110 | — | 2121 | — | 2130 | — | 2135 | — | 2160 | — |
| Avg. age at start, yr. | 0.38 | — | — | — | 1.50 | — | — | — | 0.00 | — | 0.00 | — | 1.00 | — | 0.71 | — |
| Dates covered | 1928-1929 | — | 12/27-12/28 | — | 2/27-2/30 | — | 12/27-12/28 | — | 4/26-1/30 | — | 3/24-4/28 | — | 9/26-5/29 | — | 1928 | — |
| Avg. account period, yr. | 1.10 | — | 0.40 | — | 1.36 | — | 0.64 | — | 2.97 | — | 3.37 | — | 1.42 | — | 1.00 | — |
| Avg. total miles per car | 11,811 | — | 10,528 | — | 12,252 | — | 9,370 | — | 40,072 | — | 55,212 | — | 22,444 | — | 18,367 | — |
| Avg. annual miles per car | 10,698 | — | 26,320 | — | 9,009 | — | 17,352 | — | 13,705 | — | 16,383 | — | 15,806 | — | 18,367 | — |
| Miles per gallon gas | 19.53 | — | 19.35 | — | 18.18 | — | 15.45 | — | 18.53 | — | 17.30 | — | 21.46 | — | 14.87 | — |
| Miles per quart oil | — | — | 101 | — | — | — | 80 | — | 152 | — | 76 | — | — | — | 104 | — |

TABLE 14 (CONT.) AUTOMOBILE OPERATING COST DATA SUMMARIZED

| Group No. | 1-13 | | 1-7 | | 3-12 | | 5-16 | | 2-9 | | 6-6 | | 5-3 | | 6-5 | |
|---------------------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|
| Class & No. Cars Avgd. | M4 Coach 3 | | M4 Sedan 1 | | M4 Sedan 6 | | M4 Tour. 7 | | M4 Coupe 1 | | M4-Coach-14 | | M4-Road.-1 | | M4-Sedan-12 | |
| Account Item | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile |
| Gasoline | 234.63 | 1.19 | 207.88 | 1.38 | 90.62 | 0.94 | 614.07 | 1.15 | 112.58 | 1.15 | 179.81 | 1.20 | 668.08 | 1.09 | 167.01 | 1.38 |
| Oil | | | | | 18.18 | 0.19 | 70.03 | 0.13 | 4.94 | 0.05 | | | 66.34 | 0.11 | | |
| Tires and tubes | 46.93 | 0.24 | 90.40 | 0.60 | 78.86 | 0.82 | 277.27 | 0.52 | 44.15 | 0.45 | 27.78 | 0.18 | 704.85 | 1.15 | 24.51 | 0.20 |
| Maintenance | 81.97 | 0.41 | 220.72 | 1.47 | 136.13 | 1.42 | 1070.99 | 2.01 | 117.68 | 1.20 | 80.26 | 0.50 | 120.67 | 0.20 | 72.00 | 0.59 |
| Misc. costs | | | | | 9.03 | 0.09 | | | | | | | | | | |
| Depreciation | 219.50 | 0.81 | | | | | 868.69 | 1.63 | 2500.00 | 2.55 | 261.60 | 1.37 | 805.83 | 1.32 | 280.87 | 2.10 |
| License | 17.67 | 0.09 | 33.00 | 0.22 | 16.00 | 0.17 | | | | | 25.79 | 0.17 | | | 24.46 | 0.20 |
| Garage | 21.17 | 0.11 | 37.75 | 0.25 | | | | | | | 60.54 | 0.40 | | | 62.67 | 0.52 |
| Insurance | 16.05 | 0.08 | 54.80 | 0.36 | | | | | | | 33.59 | 0.22 | | | 55.22 | 0.46 |
| Avg. list price, \$ | 565 | | 850 | | 735 | | 895 | | 595 | | 607 | | 890 | | 733 | |
| Avg. weight, lb. | 2160 | | 2200 | | 2200 | | 2220 | | 2235 | | 2256 | | 2265 | | 2203 | |
| Avg. age at start, yr. | 1.33 | | 3.00 | | | | 0.00 | | | | 0.00 | | 0.00 | | 1.64 | |
| Dates covered | 6/28-2/30 | | 1927-1928 | | 12/27-12/28 | | 5/24-6/29 | | 1928 | | 3/26-3/30 | | 8/26-12/28 | | 3/26-2/30 | |
| Avg. account period, yr. | 1.17 | | 2.00 | | 0.31 | | 2.56 | | 1.00 | | 1.62 | | 2.29 | | 1.61 | |
| Avg. total miles per car | 19,778 | | 15,060 | | 9,622 | | 53,194 | | 9,807 | | 14,049 | | 61,158 | | 12,114 | |
| Avg. annual miles per car | 16,904 | | 7,030 | | 30,968 | | 20,779 | | 9,807 | | 9,228 | | 26,707 | | 7,524 | |
| Miles per gallon gas | 20.93 | | 19.87 | | 17.16 | | 17.02 | | 16.57 | | 18.76 | | 17.72 | | 18.66 | |
| Miles per quart oil | | | | | 76 | | 104 | | 258 | | | | 158 | | | |

| Group No. | 1-12 | | 5-1 | | 5-4 | | 2-14 | | 4-14 | | 7-1 | | 2-7 | | 5-6 | |
|---------------------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|
| Class & No. Cars Avgd. | M4-Sedan-5 | | M4-Tour.-13 | | M4-Coupe-1 | | M4-Coach-20 | | M4-Coach-2 | | M4-Tour.-1 | | M4-Road.-2 | | M4-Road.-7 | |
| Account Item | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile |
| Gasoline | 112.94 | 1.25 | 577.34 | 1.04 | 196.69 | 0.85 | 299.46 | 1.13 | 178.81 | 1.27 | 1158.92 | 1.53 | 579.87 | 1.41 | 560.52 | 1.09 |
| Oil | | | 72.22 | 0.13 | 9.92 | 0.04 | 21.98 | 0.08 | 22.90 | 0.16 | | | 79.89 | 0.19 | 52.53 | 0.10 |
| Tires and tubes | 34.03 | 0.38 | 256.45 | 0.46 | 54.11 | 0.23 | 61.10 | 0.23 | 20.18 | 0.14 | 658.43 | 0.87 | 523.36 | 1.27 | 204.12 | 0.30 |
| Maintenance | 77.92 | 0.86 | 939.32 | 1.69 | 532.78 | 2.30 | 282.24 | 1.07 | 55.30 | 0.39 | 940.61 | 1.24 | | | 1071.35 | 2.06 |
| Misc. costs | | | | | | | | | 13.41 | 0.10 | | | | | | |
| Depreciation | 219.50 | 3.04 | 907.35 | 1.63 | 725.00 | 3.13 | 349.53 | 1.32 | 90.02 | 0.64 | 2060.00 | 2.72 | | | 817.23 | 1.57 |
| License | 18.75 | 0.21 | | | | | | | | | 128.80 | 0.17 | | | | |
| Garage | 32.94 | 0.36 | | | | | | | | | 307.00 | 0.40 | | | | |
| Insurance | 33.17 | 0.37 | | | | | | | | | 404.52 | 0.53 | | | | |
| Avg. list price, \$ | 686 | | 850 | | 750 | | 585 | | 585 | | 795 | | 1015 | | 815 | |
| Avg. weight, lb. | 2310 | | 2313 | | 2330 | | 2360 | | 2360 | | 2365 | | 2380 | | 2479 | |
| Avg. age at start, yr. | 1.00 | | 0.00 | | 0.00 | | 0.00 | | 0.00 | | 1.00 | | 0.00 | | 0.00 | |
| Dates covered | 1/28-4/30 | | 8/25-12/29 | | 5/27-12/29 | | 4/28-12/29 | | 3/28-1/29 | | 1920-1926 | | 5/26-1/30 | | 3/24-12/29 | |
| Avg. account period, yr. | 1.15 | | 2.32 | | 2.61 | | 1.58 | | 0.70 | | 6.00 | | 4.25 | | 2.98 | |
| Avg. total miles per car | 9,067 | | 55,564 | | 23,164 | | 26,399 | | 14,047 | | 75,810 | | 41,061 | | 52,106 | |
| Avg. annual miles per car | 7,884 | | 23,950 | | 8,875 | | 16,709 | | 20,067 | | 12,635 | | 9,661 | | 17,485 | |
| Miles per gallon gas | 19.27 | | 16.05 | | 18.88 | | 17.92 | | 19.71 | | 16.03 | | 17.75 | | 15.43 | |
| Miles per quart oil | | | 88 | | 203 | | 188 | | 205 | | | | 130 | | 107 | |

TABLE 14 (CONT.) AUTOMOBILE OPERATING COST DATA SUMMARIZED

| Group No. | 1-14 | | 4-11 | | 5-2 | | 1-8 | | 2-6 | | 4-15 | | 3-13 | | 6-7 | |
|---------------------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|
| Class & No. Cars Avgd. | M4 Sedan 3 | | M4-Road.-37 | | H4-Coach-7 | | H4-Sedan-1 | | H4-Tour.-5 | | H4-Tour.-5 | | H4-Coupe-2 | | H4-Coach-1 | |
| Account Item | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile |
| Gasoline | 255.00 | 1.55 | 91.07 | 1.04 | 543.53 | 1.03 | 172.15 | 1.56 | 521.95 | 1.82 | 189.29 | 1.54 | 75.58 | 1.57 | 635.41 | 1.38 |
| Oil | 10.22 | 0.12 | 10.22 | 0.12 | 75.79 | 0.14 | — | — | 91.37 | 0.32 | 20.89 | 0.17 | 3.87 | 0.08 | — | — |
| Tires and tubes | 70.91 | 0.56 | 28.85 | 0.33 | 186.82 | 0.35 | — | — | 255.79 | 0.89 | 68.43 | 0.56 | 17.93 | 0.37 | 90.00 | 0.20 |
| Maintenance | 136.24 | 0.83 | 41.03 | 0.47 | 849.84 | 1.60 | 24.00 | 0.22 | — | — | 234.56 | 1.91 | 241.14 | 5.00 | 467.60 | 1.02 |
| Misc. costs | — | — | 2.94 | 0.03 | — | — | — | — | — | — | 46.90 | 0.38 | 18.50 | 0.39 | — | — |
| Depreciation | 300.00 | 2.18 | 201.58 | 2.30 | 1092.57 | 2.06 | — | — | — | — | 118.08 | 0.96 | — | — | — | — |
| License | 68.47 | 0.42 | — | — | — | — | 15.00 | 0.14 | — | — | — | — | 20.00 | 0.42 | 106.50 | 0.23 |
| Garage | 128.00 | 0.78 | 40.09 | 0.46 | — | — | 30.00 | 0.27 | — | — | — | — | — | — | 208.00 | 0.45 |
| Insurance | 126.27 | 0.77 | — | — | — | — | 10.00 | 0.09 | — | — | — | — | — | — | 118.75 | 0.26 |
| Avg. list price, \$ | 1248 | — | 795 | — | 935 | — | 695 | — | 908 | — | 886 | — | 985 | — | 825 | — |
| Avg. weight, lb. | 2500 | — | 2500 | — | 2510 | — | 2535 | — | 2556 | — | 2571 | — | 2590 | — | 2590 | — |
| Avg. age at start, yr. | 3.33 | — | — | — | 0.00 | — | — | — | 0.00 | — | 3.40 | — | — | — | 1.75 | — |
| Dates covered | 4/26-2/30 | — | 12/27-12/28 | — | 5/29-12/29 | — | 6/29-1/30 | — | 6/20-1/30 | — | 1928 | — | 1928 | — | 9/25-12/29 | — |
| Avg. account period, yr. | 3.17 | — | 1.00 | — | 2.81 | — | 0.58 | — | 4.15 | — | 1.00 | — | 0.25 | — | 4.33 | — |
| Avg. total miles per car | 16,479 | — | 8,779 | — | 52,983 | — | 11,025 | — | 28,642 | — | 12,277 | — | 4,823 | — | 45,970 | — |
| Avg. annual miles per car | 5,198 | — | 8,779 | — | 18,855 | — | 18,900 | — | 6,902 | — | 12,277 | — | 19,292 | — | 10,608 | — |
| Miles per gallon gas | 15.58 | — | 15.51 | — | 18.01 | — | 18.22 | — | 13.69 | — | 15.78 | — | 11.85 | — | 17.43 | — |
| Miles per quart oil | — | — | — | — | 110 | — | — | — | 86 | — | 116 | — | 121 | — | — | — |

| Group No. | 5-15 | | 5-5 | | 5-7 | | 4-9 | | 2-11 | | 7-2 | | 4-2 | | 5-14 | |
|---------------------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|
| Class & No. Cars Avgd. | H4-Road.-1 | | H4-Tour.-57 | | H4-Coupe-3 | | H4-Coupe-2 | | H4-Coupe-2 | | H4-Coupe-5 | | H4-Tour.-1 | | H4-Tour.-5 | |
| Account Item | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile |
| Gasoline | 781.16 | 1.20 | 639.21 | 1.20 | 487.85 | 1.06 | 77.32 | 0.93 | 174.13 | 1.09 | 314.06 | 1.83 | 574.16 | 1.04 | 591.95 | 1.06 |
| Oil | 101.44 | 0.16 | 68.44 | 0.13 | 44.38 | 0.10 | 17.42 | 0.21 | 36.80 | 0.23 | — | — | 57.02 | 0.10 | 74.15 | 0.13 |
| Tires and tubes | 357.37 | 0.56 | 271.19 | 0.51 | 110.02 | 0.24 | — | — | 21.60 | 0.14 | 120.06 | 0.70 | 255.21 | 0.46 | 347.23 | 0.62 |
| Maintenance | 1840.38 | 2.90 | 929.03 | 1.74 | 627.75 | 1.36 | 37.14 | 0.45 | 143.01 | 0.89 | 167.92 | 0.98 | 1599.12 | 2.89 | 1147.09 | 2.05 |
| Misc. costs | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Depreciation | 1267.30 | 2.00 | 859.92 | 1.61 | 771.46 | 1.68 | 235.80 | 2.84 | 20.00 | 0.13 | — | — | 1337.68 | 2.49 | 1066.68 | 1.90 |
| License | — | — | — | — | — | — | — | — | — | — | 20.00 | 0.12 | — | — | — | — |
| Garage | — | — | — | — | — | — | 58.63 | 0.71 | — | — | 47.93 | 0.28 | — | — | — | — |
| Insurance | — | — | — | — | — | — | — | — | — | — | 14.33 | 0.08 | — | — | — | — |
| Avg. list price, \$ | 1225 | — | 843 | — | 845 | — | 845 | — | 845 | — | 1061 | — | 935 | — | 1225 | — |
| Avg. weight, lb. | 2505 | — | 2603 | — | 2613 | — | 2613 | — | 2613 | — | 2677 | — | 2720 | — | 2737 | — |
| Avg. age at start, yr. | 0.00 | — | 0.00 | — | 0.00 | — | — | — | — | — | 2.6 | — | 0.00 | — | 0.00 | — |
| Dates covered | 8/25-3/29 | — | 2/24-12/29 | — | 6/27-12/29 | — | 12/27-12/28 | — | 1928 | — | 7/24-1/30 | — | 8/24-11/26 | — | 12/24-1/29 | — |
| Avg. account period, yr. | 3.56 | — | 3.01 | — | 2.20 | — | 1.00 | — | 1.00 | — | 1.02 | — | 2.19 | — | 2.44 | — |
| Avg. total miles per car | 63,365 | — | 53,370 | — | 46,031 | — | 8,300 | — | 15,983 | — | 17,120 | — | 55,361 | — | 56,084 | — |
| Avg. annual miles per car | 17,799 | — | 17,731 | — | 20,923 | — | 8,300 | — | 15,983 | — | 16,839 | — | 25,279 | — | 22,985 | — |
| Miles per gallon gas | 15.67 | — | 14.75 | — | 15.51 | — | 19.95 | — | 17.44 | — | 15.65 | — | 16.91 | — | 17.95 | — |
| Miles per quart oil | 87 | — | 94 | — | 97 | — | — | — | 101 | — | — | — | 108 | — | 89 | — |

TABLE 14. (CONT.) AUTOMOBILE OPERATING COST DATA SUMMARIZED

| Group No. | 4-10 | | 7-3 | | 7-4 | | 4-16 | | 1-6 | | 5-8 | | 3-14 | | 1-9 | |
|---------------------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|
| Class & No. Cars Avgd. | H4-Coach-2 | | H4-Coach-1 | | H4-Sedan-3 | | H4-Sedan-1 | | H4-Tour-1 | | H4-Sedan-2 | | H4-Sedan-2 | | H4-Tour-1 | |
| Account Item | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile |
| Gasoline | 116.12 | 0.97 | 570.55 | 1.88 | 312.69 | 1.71 | 40.54 | 1.42 | 260.00 | 1.70 | 357.31 | 1.15 | 258.23 | 1.79 | 880.61 | 1.97 |
| Oil | 15.16 | 0.13 | | | | | 4.95 | 0.17 | | | 23.45 | 0.08 | 17.55 | 0.12 | | |
| Tires and tubes | 28.56 | 0.24 | 125.40 | 0.41 | 230.27 | 1.26 | 29.84 | 1.04 | 30.10 | 0.20 | 110.78 | 0.38 | 19.63 | 0.14 | 428.00 | 0.06 |
| Maintenance | 109.19 | 0.92 | 311.23 | 1.02 | 74.32 | 0.41 | 74.95 | 2.61 | 132.08 | 0.86 | 434.62 | 1.40 | 740.48 | 5.13 | 602.32 | 1.35 |
| Misc. costs | 15.29 | 0.13 | | | | | 18.30 | 0.64 | | | | | 15.78 | 0.11 | | |
| Depreciation | 241.86 | 2.03 | | | 945.00 | 5.18 | | 1.11 | 400.00 | 2.61 | 882.42 | 2.83 | | | | |
| License | | | 84.00 | 0.28 | 33.50 | 0.18 | | | 28.00 | 0.18 | | | 22.00 | 0.15 | 90.00 | 0.20 |
| Garage | 115.38 | 0.97 | 240.00 | 0.79 | 117.00 | 0.64 | | | 64.00 | 0.42 | | | | | | |
| Insurance | | | 90.00 | 0.30 | 43.30 | 0.24 | | | 8.00 | 0.03 | | | | | 22.00 | 0.05 |
| Avg. list price, \$ | 1035 | | 1095 | | 895 | | 895 | | 405 | | 895 | | 1105 | | 1650 | |
| Avg. weight, lb. | 2780 | | 2800 | | 2828 | | 2828 | | 2835 | | 2912 | | 2965 | | 3050 | |
| Avg. age at start, yr. | | | 0.00 | | 1.33 | | 0.00 | | 5.00 | | 0.00 | | | | 0.00 | |
| Dates covered | 12/27-12/28 | | 5/25-5/29 | | 1927-1929 | | 1928 | | 6/21-10/22 | | 6/26-12/29 | | 1928 | | 4/21-1/30 | |
| Avg. account period, yr. | 1.00 | | 4.00 | | 2.33 | | 1.00 | | 1.33 | | 2.31 | | 0.40 | | 8.75 | |
| Avg. total miles per car | 11,914 | | 30,400 | | 18,233 | | 2,874 | | 15,300 | | 31,126 | | 14,436 | | 44,757 | |
| Avg. annual miles per car | 11,914 | | 7,600 | | 7,825 | | 2,874 | | 11,475 | | 13,474 | | 20,461 | | 5,115 | |
| Miles per gallon gas | 17.46 | | 14.32 | | 13.94 | | 18.91 | | 15.00 | | 14.63 | | 10.42 | | 12.67 | |
| Miles per quart oil | | | | | | | 169 | | | | 142 | | 122 | | | |

| Group No. | 1-10 | | 13-13 | | 10-15 | | 13-3 | | 10-15 | | 14-1 | | 9-16 | | 14-7 | |
|---------------------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|
| Class & No. Cars Avgd. | H4-Sedan-2 | | L6-Tour-1 | | L6-Coupe-1 | | L6-Coupe-2 | | L6-Coach-4 | | L6-Tour-10 | | L6-Coach-1 | | L6-Coupe-1 | |
| Account Item | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile |
| Gasoline | 388.82 | 1.67 | 154.80 | 1.11 | 260.00 | 1.30 | 185.26 | 1.19 | 223.34 | 1.32 | 98.74 | 1.28 | 194.06 | 1.23 | 199.95 | 0.97 |
| Oil | | | 12.43 | 0.09 | | | 25.05 | 0.15 | | | 7.38 | 0.10 | | | 32.55 | 0.16 |
| Tires and tubes | 168.47 | 0.72 | 32.12 | 0.23 | 40.00 | 0.20 | 14.04 | 0.08 | 15.03 | 0.08 | 6.90 | 0.09 | 60.75 | 0.30 | 67.04 | 0.33 |
| Maintenance | 205.12 | 0.88 | 141.50 | 1.02 | 41.59 | 0.21 | | | 23.59 | 0.09 | 117.29 | 1.52 | 82.20 | 0.53 | 280.31 | 1.36 |
| Misc. costs | | | | | | | | | | | 0.60 | 0.01 | | | 8.95 | 0.04 |
| Depreciation | | | 340.85 | 2.45 | 165.00 | 0.83 | | | | | | | | | | |
| License | 94.05 | 0.40 | | | 15.00 | 0.08 | | | 18.83 | 0.16 | 17.00 | 0.22 | 72.00 | 0.46 | 17.00 | 0.08 |
| Garage | 288.00 | 1.24 | | | | | | | 54.00 | 0.45 | | | | | | |
| Insurance | 122.76 | 0.53 | | | 14.65 | 0.07 | | | 21.33 | 0.18 | | | | | | |
| Avg. list price, \$ | 1795 | | 525 | | 505 | | 505 | | 645 | | 705 | | 880 | | 825 | |
| Avg. weight, lb. | 3209 | | 2240 | | 2425 | | 2425 | | 2500 | | 2185 | | 2245 | | 2270 | |
| Avg. age at start, yr. | 0.50 | | 0.00 | | 0.00 | | 0.00 | | 0.00 | | | | 0.00 | | | |
| Dates covered | 5/25-12/29 | | 5/29-12/29 | | 2/29-9/26 | | 4/29-1/30 | | 1/29-4/30 | | 1928 | | 3/26-2/30 | | 12/27-12/28 | |
| Avg. account period, yr. | 3.00 | | 0.59 | | 0.58 | | 0.71 | | 1.10 | | 0.40 | | 3.92 | | 1.00 | |
| Avg. total miles per car | 23,297 | | 13,036 | | 20,000 | | 15,678 | | 11,932 | | 7,703 | | 15,464 | | 20,501 | |
| Avg. annual miles per car | 7,766 | | 23,620 | | 34,483 | | 22,082 | | 10,847 | | 19,258 | | 3,949 | | 20,501 | |
| Miles per gallon gas | 14.55 | | 16.32 | | | | 19.22 | | 17.47 | | 14.45 | | 17.77 | | 15.81 | |
| Miles per quart oil | | | 129 | | | | 189 | | | | 159 | | | | 70 | |

TABLE 14 (CONT.) AUTOMOBILE OPERATING COST DATA SUMMARIZED

| Group No. | 14-2 | | 9-4 | | 8-4 | | 11-8 | | 14-6 | | 6-14 | | 8-3 | | 11-4 | |
|---------------------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|
| Class & No. Cars Avgd. | L6-Coach-3 | | L6-Coupe-1 | | L6-Coupe-2 | | L6-Coupe-4 | | L6-Coach-17 | | L6-Coach-9 | | L6-Sedan-10 | | L6-Coupe-2 | |
| Account Item | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile |
| Gasoline | 165.05 | 1.00 | 187.91 | 1.28 | 228.46 | 0.71 | 469.89 | 0.89 | 168.95 | 1.08 | 256.69 | 1.63 | 242.45 | 1.52 | 449.26 | 1.25 |
| Oil | 42.89 | 0.26 | | | 40.45 | 0.08 | 40.45 | 0.08 | 33.05 | 0.20 | | | | | 47.25 | 0.13 |
| Tires and tubes | 110.64 | 0.67 | | | 20.55 | 0.06 | 173.12 | 0.33 | 98.90 | 0.62 | 36.12 | 0.23 | 25.77 | 0.16 | 68.10 | 0.19 |
| Maintenance | 335.52 | 2.04 | 29.73 | 0.20 | 94.09 | 0.29 | 773.73 | 1.47 | 127.68 | 0.80 | 144.70 | 0.92 | 106.63 | 0.67 | 259.95 | 0.72 |
| Misc. costs | 33.22 | 0.20 | | | | | | | 20.99 | 0.13 | | | | | | |
| Depreciation | | | | | 229.98 | 0.71 | 528.01 | 1.00 | | | 363.75 | 2.21 | 458.04 | 2.87 | 421.82 | 1.17 |
| License | 17.00 | 0.10 | 31.50 | 0.22 | 22.50 | 0.07 | | | 20.00 | 0.13 | 35.94 | 0.23 | 16.00 | 0.10 | | |
| Garage | | | 17.00 | 0.12 | | | | | | | 73.00 | 0.46 | 35.70 | 0.22 | | |
| Insurance | | | | | 35.29 | 0.11 | | | | | 45.05 | 0.29 | 27.32 | 0.17 | | |
| Avg. list price, \$ | 795 | | 755 | | 745 | | 745 | | 875 | | 767 | | 857 | | 885 | |
| Avg. weight, lb. | 2395 | | 2425 | | 2435 | | 2435 | | 2450 | | 2483 | | 2494 | | 2500 | |
| Avg. age at start, yr. | | | 0.00 | | 0.00 | | 0.00 | | | | 0.67 | | 0.90 | | 0.00 | |
| Dates covered | 12/27-12/28 | | 3/29-1/30 | | 11/28-1/30 | | 3/28-12/29 | | 12/27-12/28 | | 9/28-2/30 | | 9/27-2/30 | | 7/28-12/29 | |
| Avg. account period, yr. | 0.71 | | 0.75 | | 1.00 | | 1.75 | | 0.52 | | 2.13 | | 1.18 | | 1.30 | |
| Avg. total miles per car | 16,467 | | 14,640 | | 32,200 | | 52,696 | | 15,806 | | 15,744 | | 15,962 | | 38,047 | |
| Avg. annual miles per car | 23,193 | | 19,520 | | 32,200 | | 30,112 | | 30,569 | | 7,392 | | 13,489 | | 27,728 | |
| Miles per gallon gas | 15.14 | | 19.44 | | 15.70 | | 17.31 | | 15.14 | | 15.53 | | 16.84 | | 14.63 | |
| Miles per quart oil | 57 | | | | | | 106 | | 74 | | | | | | 84 | |
| Group No. | 6-16 | | 8-8 | | 8-2 | | 8-1 | | 11-7 | | 14-8 | | 8-5 | | 8-15 | |
| Class & No. Cars Avgd. | L6-Tour-1 | | L6-Road-1 | | L6-Sedan-3 | | L6-Sedan-2 | | L6-Coach-2 | | L6-Coach-2 | | L6-Sedan-1 | | L6-Sedan-4 | |
| Account Item | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile |
| Gasoline | 767.75 | 1.64 | 437.00 | 1.46 | 293.95 | 1.77 | 141.09 | 1.36 | 315.59 | 0.98 | 302.95 | 1.30 | 454.17 | 1.35 | 199.57 | 1.24 |
| Oil | | | | | | | | | 40.41 | 0.13 | 79.30 | 0.34 | | | | |
| Tires and tubes | 270.46 | 0.54 | 104.50 | 0.35 | 34.00 | 0.21 | 58.20 | 0.56 | 43.41 | 0.13 | 220.43 | 0.95 | 252.70 | 0.75 | 23.75 | 0.15 |
| Maintenance | 539.71 | 1.08 | 29.75 | 0.10 | 85.98 | 0.42 | 83.09 | 0.80 | 246.46 | 0.77 | 342.46 | 1.47 | 57.60 | 0.17 | 80.66 | 0.50 |
| Misc. costs | | | | | | | | | | | 11.53 | 0.05 | | | | |
| Depreciation | 1569.52 | 3.15 | | | 976.67 | 2.27 | 208.00 | 2.00 | 400.43 | 1.25 | | | | | 366.40 | 1.82 |
| License | 141.00 | 0.28 | 95.00 | 0.32 | 30.83 | 0.19 | 22.50 | 0.22 | | | 17.00 | 0.08 | | | 21.43 | 0.13 |
| Garage | | | 200.00 | 0.67 | 29.75 | 0.18 | 30.50 | 0.20 | | | | | | | 55.00 | 0.34 |
| Insurance | 137.85 | 0.28 | 120.00 | 0.40 | 27.12 | 0.16 | 22.75 | 0.22 | | | | | 280.66 | 0.83 | 41.30 | 0.26 |
| Avg. list price, \$ | 1950 | | 1025 | | 815 | | 995 | | 745 | | 745 | | 1550 | | 715 | |
| Avg. weight, lb. | 2510 | | 2510 | | 2515 | | 2519 | | 2520 | | 2520 | | 2545 | | 2575 | |
| Avg. age at start, yr. | 2.00 | | 0.00 | | 0.33 | | 4.00 | | 0.00 | | 0.00 | | 1.00 | | 0.00 | |
| Dates covered | 1/25-1/30 | | 6/24-4/29 | | 1/27-2/30 | | 4/28-1/30 | | 6/28-12/29 | | 12/27-12/28 | | 1922-1929 | | 7/28-2/30 | |
| Avg. account period, yr. | 5.00 | | 4.88 | | 1.73 | | 1.21 | | 1.40 | | 0.78 | | 7.00 | | 1.04 | |
| Avg. total miles per car | 49,838 | | 29,987 | | 16,571 | | 10,393 | | 32,147 | | 23,355 | | 33,667 | | 16,151 | |
| Avg. annual miles per car | 9,968 | | 6,170 | | 9,579 | | 5,589 | | 22,962 | | 29,942 | | 4,810 | | 15,530 | |
| Miles per gallon gas | 17.57 | | 16.50 | | 14.33 | | 9.82 | | 17.74 | | 14.83 | | 12.32 | | 15.71 | |
| Miles per quart oil | | | | | | | | | 97 | | 61 | | | | | |

TABLE 14 (CONT.) AUTOMOBILE OPERATING COST DATA SUMMARIZED

| Group No. | 11-9 | | 14-9 | | 12-2 | | 12-4 | | 14-5 | | 9-11 | | 6-13 | | 10 13 | |
|---------------------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|
| Class & No. Cars Avgd. | L6-Sedan-26 | | L6-Sedan-1 | | L6-Coupe-1 | | L6-Sedan-10 | | L6-Coupe-14 | | L6-Coupe-2 | | L6-Coupe-2 | | L6-Sedan-1 | |
| Account Item | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile |
| Gasoline | 147.83 | 1.02 | 173.79 | 0.96 | 574.81 | 0.95 | 95.86 | 1.05 | 176.47 | 1.15 | 518.40 | 1.31 | 436.75 | 1.51 | 221.01 | 1.57 |
| Oil | 14.19 | 0.10 | 47.33 | 0.26 | 136.84 | 0.23 | 8.00 | 0.09 | 36.97 | 0.24 | | | | | | |
| Tires and tubes | 23.33 | 0.16 | 115.54 | 0.64 | 189.62 | 0.31 | 25.31 | 0.28 | 104.84 | 0.68 | 140.00 | 0.36 | 90.67 | 0.31 | 80.00 | 0.57 |
| Maintenance | 108.42 | 0.74 | 290.56 | 1.61 | 824.24 | 1.36 | 64.36 | 0.70 | 224.94 | 1.46 | 295.80 | 0.75 | 152.29 | 0.53 | 276.18 | 1.96 |
| Misc. costs | | | 2.00 | 0.01 | | | | | 21.91 | 0.14 | | | | | | |
| Depreciation | 186.30 | 1.28 | | | 843.12 | 1.39 | 112.18 | 1.23 | | | | | 840.00 | 2.90 | | |
| License | | | 19.00 | 0.11 | | | | | 19.00 | 0.12 | 72.00 | 0.18 | 41.25 | 0.14 | 40.00 | 0.28 |
| Garage | | | | | | | | | | | 222.00 | 0.56 | | | | |
| Insurance | | | | | | | | | | | 91.75 | 0.23 | 16.25 | 0.00 | | |
| Avg. list price, \$ | 825 | | 825 | | 845 | | 795 | | 925 | | 1125 | | 995 | | 905 | |
| Avg. weight, lb. | 2595 | | 2595 | | 2613 | | 2660 | | 2660 | | 2663 | | 2683 | | 2685 | |
| Avg. age at start, yr. | 0.00 | | 0.00 | | 0.00 | | 0.00 | | 0.00 | | 0.00 | | 0.00 | | 0.00 | |
| Dates covered | 6/29-12/29 | | 12/27-12/28 | | 5/28-12/29 | | 2/29-12/29 | | 12/27-12/28 | | 6/26-8/28 | | 5/27-8/29 | | 1/28-1/30 | |
| Avg. account period, yr. | 0.55 | | 0.58 | | 1.53 | | 0.40 | | 0.30 | | 1.08 | | 1.13 | | 2.00 | |
| Avg. total miles per car | 14,547 | | 18,070 | | 60,459 | | 9,133 | | 15,360 | | 39,429 | | 28,965 | | 14,090 | |
| Avg. annual miles per car | 26,449 | | 31,155 | | 29,516 | | 22,833 | | 50,526 | | 36,306 | | 25,033 | | 7,045 | |
| Miles per gallon gas | 15.31 | | 17.53 | | 17.30 | | 14.29 | | 13.63 | | 17.19 | | 14.30 | | 14.16 | |
| Miles per quart oil | 99 | | 58 | | 58 | | 111 | | 59 | | | | | | | |

| Group No. | 13-14 | | 6-9 | | 6-11 | | 12-1 | | 11-3 | | 8-7 | | 12-6 | | 10-9 | |
|---------------------------|-------------|------|------------|------|-----------|------|------------|------|-------------|------|------------|------|------------|------|------------|------|
| Class & No. Cars Avgd. | L6-Coupe-10 | | L6-Coupe-1 | | L6-Road-1 | | M6-Tour-1 | | M6-Sedan-2 | | M6-Coupe-1 | | M6-Sedan-4 | | M6-Sedan-1 | |
| Gasoline | 628.70 | 1.16 | 334.66 | 1.34 | 427.16 | 2.12 | 238.16 | 0.81 | 274.92 | 0.85 | 589.70 | 1.23 | 195.84 | 1.14 | 45.04 | 1.54 |
| Oil | 79.16 | 0.15 | | | | | 28.50 | 0.10 | 20.92 | 0.08 | | | 14.82 | 0.09 | 4.60 | 0.16 |
| Tires and tubes | 204.25 | 0.38 | 24.00 | 0.10 | 148.50 | 0.74 | 64.70 | 0.22 | 41.91 | 0.08 | 112.30 | 0.23 | 37.74 | 0.22 | | |
| Maintenance | 9604.53 | 1.78 | 20.00 | 0.08 | 179.60 | 0.89 | 65.95 | 0.22 | 163.40 | 0.50 | 88.03 | 0.18 | 181.17 | 1.06 | 5.10 | 0.18 |
| Misc. costs | | | | | | | | | | | | | | | 5.50 | 0.19 |
| Depreciation | 1157.00 | 2.14 | | | 290.00 | 1.44 | 312.78 | 1.06 | 266.55 | 0.82 | | | 306.37 | 1.79 | 27.18 | 0.93 |
| License | | | 59.00 | 0.24 | 29.00 | 0.14 | | | | | 34.00 | 0.07 | | | | |
| Garage | | | 90.00 | 0.38 | 120.00 | 0.60 | | | | | 100.00 | 0.21 | | | | |
| Insurance | | | 52.50 | 0.21 | 58.90 | 0.29 | | | | | 70.00 | 0.15 | | | | |
| Avg. list price | 1119 | | 1125 | | 1075 | | 995 | | 955 | | 1225 | | 875 | | 1095 | |
| Avg. weight, lb. | 2699 | | 2700 | | 2700 | | 2703 | | 2725 | | 2730 | | 2755 | | 2767 | |
| Avg. age at start, yr. | 0.00 | | 0.00 | | 0.00 | | 0.00 | | 0.00 | | 1.00 | | 0.00 | | 0.68 | |
| Dates covered | 10/28-12/29 | | 7/27-1/30 | | 1929 | | 2/29-12/29 | | 11/28-12/29 | | 1928-1929 | | 6/28-12/29 | | 5/28-1/29 | |
| Avg. account period, yr. | 2.63 | | 2.50 | | 1.00 | | 0.88 | | 0.83 | | 2.00 | | 0.90 | | 0.90 | |
| Avg. total miles per car | 53,941 | | 25,000 | | 20,105 | | 29,536 | | 32,437 | | 46,074 | | 17,111 | | 2,916 | |
| Avg. annual miles per car | 20,510 | | 10,000 | | 20,105 | | 33,564 | | 39,081 | | 24,037 | | 19,012 | | 4,860 | |
| Miles per gallon gas | 16.58 | | 19.92 | | 11.98 | | 16.13 | | 18.01 | | 17.21 | | 15.05 | | 10.62 | |
| Miles per quart oil | 93 | | | | | | 87 | | 207 | | | | 116 | | | |

TABLE 14 (CONT.) AUTOMOBILE OPERATING COST DATA SUMMARIZED

| Group No. | 14-4 | | 13-6 | | 11-5 | | 12-10 | | 14-18 | | 9-3 | | 12-3 | | 9-13 | |
|---------------------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|
| Class & No. Cars Avgd. | M6-Sedan-19 | | M6-Tour.-1 | | M6-Coach-8 | | M6-Sedan-1 | | L6-Sedan-2 | | M6-Sedan-2 | | M6-Sedan-20 | | M6-Sedan-2 | |
| Account Item | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile |
| Gasoline | 185.09 | 1.03 | 38.10 | 1.27 | 534.18 | 1.06 | 458.73 | 1.20 | 134.19 | 1.08 | 208.92 | 1.48 | 2545.13 | 1.17 | 349.90 | 1.44 |
| Oil | 37.55 | 0.21 | 4.16 | 0.15 | 64.31 | 0.13 | 30.40 | 0.09 | 29.42 | 0.24 | | | 219.67 | 0.10 | | |
| Tires and tubes | 114.15 | 0.64 | 23.80 | 0.84 | 127.80 | 0.25 | 29.15 | 0.08 | 104.86 | 0.84 | 36.08 | 0.10 | 757.69 | 0.35 | 9.78 | 0.04 |
| Maintenance | 201.75 | 1.12 | 101.23 | 3.55 | 801.97 | 1.60 | 234.23 | 0.66 | 200.28 | 1.61 | 58.00 | 0.19 | 3171.00 | 1.45 | 171.69 | 0.70 |
| Misc. costs | 32.22 | 0.18 | 31.90 | 1.12 | | | | | 20.10 | 0.16 | | | | | | |
| Depreciation | | | 100.00 | 3.51 | 972.20 | 1.93 | 388.51 | 1.10 | | | | | 4087.41 | 1.87 | | |
| License | 30.00 | 0.17 | | | | | | | 25.00 | 0.20 | 33.50 | 0.18 | | | 52.25 | 0.21 |
| Garage | | | | | | | | | | | 54.00 | 0.30 | | | 64.13 | 0.26 |
| Insurance | | | | | | | | | | | 33.90 | 0.19 | | | 32.15 | 0.13 |
| Avg. list price | 1095 | | 1030 | | 1220 | | 925 | | 1385 | | 1105 | | 1015 | | 1070 | |
| Avg. weight, lb. | 2767 | | 2785 | | 2793 | | 2795 | | 2800 | | 2801 | | 2802 | | 2803 | |
| Avg. age at start, yr. | | | | | 0.00 | | 0.00 | | | | 0.50 | | 0.00 | | 0.00 | |
| Dates covered | 12/27-12/28 | | 1928 | | 9/26-12/29 | | 11/28-12/29 | | 12/27-12/28 | | 12/28-2/30 | | 5/28-12/29 | | 7/26-1/30 | |
| Avg. account period, yr. | 0.73 | | 1.00 | | 2.25 | | 1.10 | | 0.45 | | 1.04 | | 1.13 | | 2.17 | |
| Avg. total miles per car | 17,955 | | 2,850 | | 50,254 | | 35,473 | | 12,481 | | 18,156 | | 21,831 | | 24,357 | |
| Avg. annual miles per car | 24,595 | | 2,850 | | 22,335 | | 32,248 | | 27,609 | | 17,458 | | 19,319 | | 11,242 | |
| Miles per gallon gas | 15.86 | | 15.00 | | 16.01 | | 13.25 | | 15.61 | | 16.97 | | 15.09 | | 9.42 | |
| Miles per quart oil | 69 | | 89 | | 105 | | 174 | | 84 | | | | 114 | | | |

| Group No. | 13-15 | | 10-14 | | 6-10 | | 10-1 | | 12-5 | | 14-10 | | 9-7 | | 10-6 | |
|---------------------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|
| Class & No. Cars Avgd. | M6-Coach-5 | | M6-Sedan-1 | | M6-Coach-2 | | M6-Coach-2 | | M6-Sedan-1 | | M6-Coach-7 | | M6-Sedan-2 | | M6-Road.-5 | |
| Account Item | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile |
| Gasoline | 882.59 | 1.13 | 997.70 | 2.03 | 429.79 | 1.69 | 152.83 | 1.29 | 358.10 | 1.21 | 234.66 | 1.21 | 227.31 | 2.04 | 300.21 | 1.68 |
| Oil | 75.17 | 0.12 | | | | | 24.11 | 0.20 | 39.94 | 0.14 | 30.34 | 0.16 | | | 36.02 | 0.20 |
| Tires and tubes | 303.67 | 0.50 | 138.50 | 0.28 | 177.50 | 0.39 | 51.34 | 0.43 | 53.84 | 0.18 | 151.11 | 0.79 | 29.80 | 0.27 | 88.50 | 0.47 |
| Maintenance | 1026.83 | 1.71 | 498.80 | 1.01 | 142.69 | 0.56 | 181.56 | 1.54 | 241.51 | 0.82 | 410.81 | 2.16 | 146.30 | 0.66 | 339.31 | 1.90 |
| Misc. costs | | | | | | | 21.78 | 0.18 | | | 36.61 | 0.19 | | | 35.28 | 0.20 |
| Depreciation | 1105.66 | 1.84 | 950.00 | 1.93 | 657.78 | 2.59 | 281.00 | 2.37 | 1197.75 | 4.06 | | | 543.37 | 2.44 | 151.42 | 0.85 |
| License | | | 130.00 | 0.26 | 89.90 | 0.35 | | | | | 24.00 | 0.12 | | | 74.00 | 0.33 |
| Garage | | | 300.00 | 0.61 | 126.00 | 0.50 | 142.87 | 1.21 | | | | | | | 64.00 | 0.29 |
| Insurance | | | 160.00 | 0.33 | 96.40 | 0.38 | | | | | | | | | 164.00 | 0.68 |
| Avg. list price, \$ | 1195 | | 1395 | | 1033 | | 1395 | | 1095 | | 1305 | | 1388 | | 1170 | |
| Avg. weight, lb. | 2803 | | 2810 | | 2840 | | 2853 | | 2875 | | 2875 | | 2888 | | 2910 | |
| Avg. age at start, yr. | 0.00 | | 0.00 | | 0.00 | | 0.00 | | 0.00 | | 0.00 | | 0.00 | | 3.98 | |
| Dates covered | 12/25-12/29 | | 9/23-9/28 | | 1/26-11/29 | | 12/27-12/28 | | 5/28-12/29 | | 12/27-12/28 | | 4/26-1/30 | | 1928 | |
| Avg. account period, yr. | 2.63 | | 5.00 | | 2.71 | | 1.00 | | 0.84 | | 0.90 | | 3.00 | | 1.00 | |
| Avg. total miles per car | 60,216 | | 49,200 | | 25,398 | | 11,839 | | 29,518 | | 19,466 | | 22,253 | | 17,818 | |
| Avg. annual miles per car | 22,896 | | 9,850 | | 9,379 | | 17,839 | | 35,140 | | 21,029 | | 7,418 | | 17,818 | |
| Miles per gallon gas | 17.08 | | 16.45 | | 10.91 | | 12.27 | | 15.88 | | 12.59 | | 13.93 | | 15.25 | |
| Miles per quart oil | 99 | | | | | | | | 125 | | 76 | | | | 121 | |

TABLE 14 (CONT.) AUTOMOBILE OPERATING COST DATA SUMMARIZED

| Group No. | 10-5 | | 9-2 | | 10-7 | | 9-12 | | 9-10 | | 11-16 | | 9-8 | | 12-7 | |
|---------------------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|
| Class & No. Cars Avgd. | M6-Tour.-10 | | M6-Tour.-1 | | M6-Coupe-1 | | M6 Sedan 2 | | M6-Tour.-1 | | M6-Coach-4 | | M6 Sedan-2 | | M6-Road.-1 | |
| Account Item | Per Car Cost, \$ | o per mile | Per Car Cost, \$ | o per mile | Per Car Cost, \$ | o per mile | Per Car Cost, \$ | o per mile | Per Car Cost, \$ | o per mile | Per Car Cost, \$ | o per mile | Per Car Cost, \$ | o per mile | Per Car Cost, \$ | o per mile |
| Gasoline | 293.50 | 1.85 | | | 490.89 | 1.82 | 389.82 | 1.93 | 619.53 | 1.55 | 235.93 | 1.77 | 253.08 | 1.68 | 1184.76 | 1.67 |
| Oil | 25.48 | 0.16 | | | 58.67 | 0.22 | | | 41.17 | 0.31 | 41.17 | 0.31 | | | 86.41 | 0.12 |
| Tires and tubes | 97.98 | 0.62 | | | 111.17 | 0.41 | 23.66 | 0.12 | 245.22 | 0.61 | 147.32 | 1.10 | 82.25 | 0.61 | 369.20 | 0.52 |
| Maintenance | 264.18 | 1.66 | | | 308.08 | 1.15 | 233.74 | 1.16 | 355.95 | 0.89 | 307.68 | 2.30 | 166.16 | 1.04 | 2080.75 | 2.93 |
| Misc. costs | 37.57 | 0.24 | | | 45.50 | 0.17 | | | | | 8.31 | 0.06 | | | | |
| Depreciation | 148.24 | 0.93 | | | 381.10 | 1.42 | | | 1060.00 | 2.65 | 157.00 | 1.17 | | | 1400.00 | 1.97 |
| License | | | | | | | | | 107.15 | 0.27 | | | 57.50 | 0.36 | | |
| Garage | | | | | | | | | 184.00 | 0.46 | | | 72.00 | 0.45 | | |
| Insurance | | | | | | | | | 33.95 | 0.08 | | | 32.75 | 0.20 | | |
| Avg. list price | 1182 | | | | 1375 | | | | 1195 | | 1195 | | 1320 | | 1400 | |
| Avg. weight, lb. | 2942 | | | | 2960 | | | | 2975 | | 2980 | | 2989 | | 3000 | |
| Avg. age at start, yr. | 3.27 | | | | 2.14 | | | 0.00 | 0.00 | | | | 2.50 | | 0.00 | |
| Dates covered | 1928 | | | | 1928 | | | 1926-1929 | 4/23-1/27 | | 12/27-12/28 | | 1/26-1/30 | | 4/24-3/27 | |
| Avg. account period, yr. | 1.00 | | | | 1.00 | | | 2.00 | 3.75 | | 1.00 | | 2.00 | | 2.93 | |
| Avg. total miles per car | 15,868 | | | | 26,907 | | | 20,104 | 40,000 | | 13,363 | | 16,000 | | 71,039 | |
| Avg. annual miles per car | 15,868 | | | | 26,907 | | | 10,052 | 10,667 | | 13,363 | | 8,000 | | 24,245 | |
| Miles per gallon gas | 13.17 | | | | 13.04 | | | 13.00 | 15.09 | | 9.48 | | | | 12.78 | |
| Miles per quart oil | 170 | | | | 121 | | | | | | | | | | 88 | |

| Group No. | 10-3 | | 13-16 | | 11-1 | | 11-6 | | 11-10 | | 9-9 | | 10-2 | | 11-2 | |
|---------------------------|-------------|------|-------------|------|------------|------|------------|------|------------|------|------------|------|-------------|------|------------|------|
| Class & No. Cars Avgd. | M6-Coupe-1 | | M6-Sedan-10 | | M6-Coupe-2 | | M6-Sedan-5 | | M6-Coupe-2 | | M6-Sedan-5 | | M6-Coach-4 | | M6-Sedan-1 | |
| Gasoline | 106.63 | 1.12 | 320.13 | 1.23 | 557.25 | 1.20 | 348.97 | 1.24 | 744.76 | 1.34 | 248.44 | 1.86 | 189.23 | 1.24 | 559.91 | 1.25 |
| Oil | 12.70 | 0.13 | 32.12 | 0.12 | 73.24 | 0.16 | 23.34 | 0.08 | 106.82 | 0.19 | | | 15.82 | 0.10 | 46.75 | 0.10 |
| Tires and tubes | 101.14 | 1.06 | 89.10 | 0.34 | 178.37 | 0.38 | 70.66 | 0.18 | 168.83 | 0.30 | 34.47 | 0.25 | 146.44 | 0.96 | 103.22 | 0.23 |
| Maintenance | 121.94 | 1.28 | 226.69 | 0.87 | 1469.24 | 3.17 | 188.52 | 0.67 | 1035.71 | 1.89 | 156.33 | 1.17 | 165.43 | 1.09 | 1230.82 | 2.75 |
| Misc. costs | | | | | | | | | | | | | 9.24 | 0.06 | | |
| Depreciation | 140.00 | 1.47 | 489.91 | 1.88 | 1056.83 | 2.28 | 447.51 | 1.59 | 1097.37 | 1.98 | 383.65 | 2.87 | 275.25 | 1.81 | 1210.80 | 2.70 |
| License | | | | | | | | | | | 39.80 | 0.30 | | | | |
| Garage | 171.75 | 1.81 | | | | | | | | | 119.52 | 0.89 | 100.46 | 0.66 | | |
| Insurance | | | | | | | | | | | 66.06 | 0.49 | | | | |
| Avg. list price | 1195 | | 1221 | | 1165 | | 1141 | | 1195 | | 1211 | | 1195 | | 1265 | |
| Avg. weight, lb. | 3020 | | 3021 | | 3030 | | 3089 | | 3095 | | 3140 | | 3150 | | 3150 | |
| Avg. age at start, yr. | | | 0.00 | | 0.00 | | 0.00 | | 0.00 | | 0.40 | | 0.00 | | 0.00 | |
| Dates covered | 12/27-12/28 | | 5/27-12/29 | | 3/27-12/29 | | 4/27-12/29 | | 2/28-12/29 | | 5/26-1/30 | | 12/27-12/28 | | 6/27-12/29 | |
| Avg. account period, yr. | 1.00 | | 1.04 | | 2.42 | | 0.99 | | 1.64 | | 1.60 | | 1.00 | | 2.56 | |
| Avg. total miles per car | 9,502 | | 26,044 | | 46,351 | | 28,075 | | 55,480 | | 13,352 | | 15,233 | | 44,789 | |
| Avg. annual miles per car | 9,502 | | 25,042 | | 19,153 | | 28,359 | | 33,850 | | 8,345 | | 15,233 | | 17,496 | |
| Miles per gallon gas | 13.18 | | 15.17 | | 14.74 | | 14.78 | | 14.68 | | 14.61 | | 11.39 | | 13.74 | |
| Miles per quart oil | | | 116 | | 96 | | 145 | | 79 | | | | | | 104 | |

TABLE 14 (CONT.) AUTOMOBILE OPERATING COST DATA SUMMARIZED

| Group No. | 14-12 | | 10-11 | | 8-9 | | 13-2 | | 12-13 | | 10-12 | | 10-8 | | 6-12 | |
|---------------------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|
| Class & No. Cars Avgd. | M6-Coach-1 | | M6-Coach-3 | | M6-Sedan-1 | | M6-Sedan-1 | | M6-Tour.-1 | | M6-Coach-3 | | M6-Coach-1 | | M6-Sedan-1 | |
| Account Item | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile |
| Gasoline | 26.32 | 1.20 | 484.65 | 1.61 | 363.93 | 1.72 | 174.52 | 1.20 | 902.00 | 1.38 | 469.36 | 1.71 | 237.82 | 1.46 | 171.35 | 1.43 |
| Oil | 3.70 | 0.17 | | | | | 73.68 | 0.51 | 38.81 | 0.06 | | | 43.90 | 0.27 | | |
| Tires and tubes | 18.61 | 0.85 | 140.88 | 0.47 | 30.00 | 0.14 | 76.24 | 0.52 | 179.12 | 0.27 | 158.08 | 0.30 | 300.39 | 1.84 | 10.00 | 0.08 |
| Maintenance | 13.83 | 0.63 | 209.65 | 0.70 | 283.51 | 1.34 | 123.43 | 0.85 | 1524.01 | 2.23 | 188.83 | 0.69 | 421.88 | 2.59 | 60.00 | 0.50 |
| Misc. costs | | | | | | | 37.68 | 0.28 | | | | | 182.39 | 1.11 | | |
| Depreciation | | | 610.83 | 2.03 | | | | | 1145.00 | 1.75 | | | 203.75 | 1.25 | | |
| License | 25.00 | 1.14 | 62.53 | 0.21 | 79.00 | 0.37 | 27.00 | 0.18 | | | 43.33 | 0.16 | | | 62.00 | 0.52 |
| Garage | | | 108.40 | 0.36 | 98.00 | 0.46 | | | | | 61.08 | 0.22 | | | 54.00 | 0.45 |
| Insurance | | | 74.90 | 0.25 | 37.00 | 0.17 | | | | | 57.60 | 0.21 | | | 100.00 | 0.83 |
| Avg. list price, \$ | 1215 | | 1195 | | 1495 | | 1495 | | 1275 | | 1195 | | 1195 | | 1595 | |
| Avg. weight, lb. | 3150 | | 3172 | | 3187 | | 3187 | | 3200 | | 3201 | | 3215 | | 3235 | |
| Avg. age at start, yr. | 0.00 | | 0.00 | | 0.00 | | 0.00 | | 0.00 | | 0.00 | | 0.70 | | 0.00 | |
| Dates covered | 12/27-12/28 | | 4/26-1/30 | | 4/27-1/30 | | 12/27-12/28 | | 2/24-6/28 | | 9/26-1/30 | | 1928 | | 5/28-1/30 | |
| Avg. account period, yr. | 0.08 | | 2.83 | | 2.67 | | 0.50 | | 2.35 | | 1.44 | | 1.00 | | 1.58 | |
| Avg. total miles per car | 2,200 | | 30,137 | | 21,200 | | 14,623 | | 65,443 | | 27,441 | | 16,305 | | 12,000 | |
| Avg. annual miles per car | 27,500 | | 10,637 | | 7,940 | | 29,246 | | 27,860 | | 19,090 | | 16,305 | | 7,579 | |
| Miles per gallon gas | 13.75 | | 14.61 | | 15.05 | | 16.89 | | 14.62 | | 13.69 | | 17.19 | | 17.90 | |
| Miles per quart oil | 59 | | | | | | 34 | | 246 | | | | 112 | | | |

| Group No. | 14-3 | | 14-13 | | 12-12 | | 11-15 | | 13-9 | | 11-11 | | 13-10 | | 13-5 | |
|---------------------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|
| Class & No. Cars Avgd. | M6-Sedan-1 | | M6-Sedan-5 | | M6-Tour.-1 | | M6-Sedan-1 | | M6-Tour.-3 | | M6-Sedan-2 | | H6-Coupe-3 | | H6-Sedan-3 | |
| Account Item | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile |
| Gasoline | 176.93 | 1.15 | 62.63 | 1.07 | 741.54 | 1.37 | 250.66 | 1.34 | 702.03 | 1.17 | 523.13 | 1.37 | 517.97 | 1.27 | 140.63 | 1.17 |
| Oil | 33.48 | 0.22 | 8.71 | 0.15 | 88.92 | 0.16 | 35.30 | 0.19 | 46.72 | 0.08 | 40.40 | 0.11 | 36.82 | 0.09 | 10.40 | 0.10 |
| Tires and tubes | 128.07 | 0.83 | 38.76 | 0.66 | 366.10 | 0.68 | 56.10 | 0.30 | 500.79 | 0.83 | 164.44 | 0.43 | 138.03 | 0.34 | 92.54 | 0.74 |
| Maintenance | 294.59 | 1.91 | 27.70 | 0.47 | 1030.97 | 1.90 | 150.10 | 0.80 | 1705.64 | 2.84 | 798.76 | 2.09 | 600.64 | 1.62 | 370.70 | 3.10 |
| Misc. costs | 11.65 | 0.08 | 6.04 | 0.10 | | | | | | | | | | | 75.87 | 0.65 |
| Depreciation | | | | | 957.02 | 1.77 | 240.00 | 1.28 | 1137.69 | 1.89 | 650.12 | 1.70 | 655.13 | 1.61 | | |
| License | 29.00 | 0.19 | 27.00 | 0.46 | | | 10.80 | 0.06 | | | | | | | | |
| Garage | | | | | | | | | | | | | | | | |
| Insurance | | | | | | | | | | | | | | | | |
| Avg. list price, \$ | 1495 | | 1295 | | 1575 | | 1495 | | 1255 | | 1265 | | 1195 | | 1295 | |
| Avg. weight, lb. | 3236 | | 3250 | | 3250 | | 3260 | | 3277 | | 3280 | | 3300 | | 3300 | |
| Avg. age at start, yr. | | | 0.00 | | 0.00 | | | | 0.00 | | 0.00 | | 0.00 | | | |
| Dates covered | 12/27-12/28 | | 12/27-12/28 | | 2/24-11/26 | | 12/27-12/28 | | 3/24-8/29 | | 5/28-12/20 | | 5/29-12/29 | | 1928 | |
| Avg. account period, yr. | 0.58 | | 0.18 | | 2.74 | | 1.00 | | 3.31 | | 1.44 | | 1.33 | | 1.00 | |
| Avg. total miles per car | 15,441 | | 5,851 | | 54,176 | | 18,688 | | 60,108 | | 38,235 | | 40,735 | | 11,980 | |
| Avg. annual miles per car | 26,622 | | 32,506 | | 19,794 | | 18,688 | | 18,160 | | 26,552 | | 30,628 | | 11,980 | |
| Miles per gallon gas | 14.47 | | 16.81 | | 12.44 | | 9.98 | | 15.53 | | 13.60 | | 15.00 | | 16.19 | |
| Miles per quart oil | 70 | | 103 | | 148 | | | | 144 | | 96 | | 140 | | 125 | |

TABLE 14 (CONT.) AUTOMOBILE OPERATING COST DATA SUMMARIZED

| Group No. | 14-11 | | 13-8 | | 13-7 | | 12-9 | | 14-14 | | 12-14 | | 12-8 | | 9-16 | |
|---------------------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|
| Class & No. Cars Avgd. | H6-Sedan-10 | | H6-Coach-1 | | H6-Sedan-1 | | H6-Coach-4 | | H6-Coach-2 | | H6-Tour.-2 | | H6-Sedan-1 | | H6-Sedan-1 | |
| Account Item | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile |
| Gasoline | 143.11 | 1.23 | 179.00 | 1.79 | 137.06 | 1.60 | 764.56 | 1.43 | 120.54 | 1.11 | 552.25 | 1.02 | 630.19 | 1.21 | 1395.00 | 1.75 |
| Oil | 17.59 | 0.15 | 12.10 | 0.12 | 7.45 | 0.09 | 68.09 | 0.13 | 27.39 | 0.25 | 88.42 | 0.16 | 38.50 | 0.07 | 433.00 | 0.54 |
| Tires and tubes | 110.26 | 0.95 | | | 2.50 | 0.03 | 322.37 | 0.60 | 76.66 | 0.71 | 243.08 | 0.45 | 325.08 | 0.63 | 2214.00 | 2.78 |
| Maintenance | 130.34 | 1.12 | 239.00 | 2.39 | 53.85 | 0.63 | 1032.70 | 1.94 | 177.53 | 1.63 | 1226.60 | 2.26 | 1255.88 | 2.41 | | |
| Misc. costs | 16.13 | 0.14 | | | | | | | 35.35 | 0.33 | | | | | | |
| Depreciation | | | 169.54 | 1.69 | 218.00 | 2.55 | 1253.08 | 2.35 | | | 1225.24 | 2.25 | 1285.08 | 2.47 | | |
| License | 26.00 | 0.22 | | | | | | | 24.00 | 0.22 | | | | | 203.00 | 0.26 |
| Garage | | | | | | | | | | | | | | | 364.00 | 0.46 |
| Insurance | | | | | | | | | | | | | | | 450.00 | 0.57 |
| Avg. list price, \$ | 1295 | | 1195 | | 1295 | | 1095 | | 1165 | | 1375 | | 1395 | | 2585 | |
| Avg. weight, lb. | 3300 | | 3310 | | 3370 | | 3385 | | 3385 | | 3400 | | 3425 | | 3438 | |
| Avg. age at start, yr. | | | | | | | 0.00 | | | | 0.00 | | 0.00 | | 0.00 | |
| Dates covered | 12/27-12/28 | | 1928 | | 1928 | | 10/25-7/29 | | 12/27-12/28 | | 5/25-4/28 | | 11/20-10/28 | | 5/25-10/29 | |
| Avg. account period, yr. | 0.55 | | 1.00 | | 1.00 | | 2.70 | | 0.58 | | 2.59 | | 1.95 | | 4.42 | |
| Avg. total miles per car | 11,662 | | 10,014 | | 8,555 | | 53,359 | | 10,883 | | 54,368 | | 51,099 | | 79,517 | |
| Avg. annual miles per car | 21,204 | | 10,014 | | 8,555 | | 19,763 | | 18,764 | | 20,992 | | 26,666 | | 18,004 | |
| Miles per gallon gas | 13.83 | | 12.69 | | 12.54 | | 13.53 | | 11.90 | | 12.42 | | 13.28 | | 13.57 | |
| Miles per quart oil | 91 | | 244 | | 295 | | 102 | | 52 | | 170 | | 169 | | | |

| Group No. | 9-14 | | 13-4 | | 9-1 | | 9-6 | | 10-10 | | 13-11 | | 12-15 | | 11-12 | |
|---------------------------|------------|------|------------|------|-------------|------|------------|------|------------|------|-------------|------|------------|------|------------|------|
| Class & No. Cars Avgd. | H6-Tour.-1 | | H6-Tour.-3 | | H6-Coupe-1 | | H6-Tour.-1 | | H6-Sedan-1 | | H6-Sedan-11 | | H6-Coupe-1 | | H6-Sedan-3 | |
| Gasoline | 696.94 | 1.83 | 699.38 | 1.73 | 200.00 | 2.11 | 1200.00 | 3.00 | 287.60 | 2.00 | 329.65 | 1.32 | 243.34 | 1.39 | 675.82 | 1.38 |
| Oil | 123.47 | 0.31 | | | | | | | 22.11 | 0.09 | 22.11 | 0.09 | 18.30 | 0.10 | 51.93 | 0.11 |
| Tires and tubes | 208.98 | 0.55 | 470.19 | 1.00 | | | 555.00 | 1.39 | 93.14 | 0.54 | 177.24 | 0.71 | 36.77 | 0.21 | 222.63 | 0.46 |
| Maintenance | 629.37 | 1.65 | | | 35.00 | 0.37 | 835.88 | 2.09 | 111.34 | 0.77 | 401.45 | 1.60 | 195.59 | 1.12 | 1032.24 | 2.11 |
| Misc. costs | | | | | | | | | | | | | | | | |
| Depreciation | | | | | | | 2000.00 | 5.00 | 549.14 | 3.78 | 571.51 | 2.28 | 742.24 | 4.28 | 1385.20 | 2.73 |
| License | 108.00 | 0.28 | | | 30.00 | 0.32 | 225.00 | 0.56 | 54.48 | 0.38 | | | | | | |
| Garage | 168.00 | 0.44 | | | 60.00 | 0.63 | 850.00 | 2.13 | 138.19 | 0.96 | | | | | | |
| Insurance | 75.25 | 0.20 | | | | | 780.00 | 1.95 | 68.98 | 0.48 | | | | | | |
| Avg. list price, \$ | 2685 | | 1295 | | 1570 | | 2000 | | 1519 | | 1320 | | 1775 | | 1495 | |
| Avg. weight, lb. | 3450 | | 3455 | | 3475 | | 3475 | | 3531 | | 3538 | | 3580 | | 3583 | |
| Avg. age at start, yr. | 4.00 | | 0.00 | | 0.00 | | 0.00 | | 0.00 | | 0.00 | | 0.00 | | 0.00 | |
| Dates covered | 8/26-3/30 | | 8/24-1/30 | | 11/28-11/29 | | 10/19-9/29 | | 5/25-1/30 | | 4/26-12/29 | | 8/28-12/29 | | 3/27-12/29 | |
| Avg. account period, yr. | 3.50 | | 4.03 | | 1.00 | | 9.92 | | 1.95 | | 0.91 | | 1.34 | | 2.37 | |
| Avg. total miles per car | 38,100 | | 40,348 | | 9,500 | | 40,000 | | 14,368 | | 25,041 | | 17,539 | | 48,908 | |
| Avg. annual miles per car | 10,886 | | 10,012 | | 9,500 | | 4,034 | | 7,383 | | 27,518 | | 13,089 | | 20,645 | |
| Miles per gallon gas | 14.85 | | 14.13 | | 12.01 | | 10.00 | | 13.73 | | 13.03 | | 14.39 | | 13.20 | |
| Miles per quart oil | | | 109 | | | | | | | | 124 | | | | 112 | |

TABLE 14 (CONT.) AUTOMOBILE OPERATING COST DATA SUMMARIZED

| Group No. | 8-6 | | 9-5 | | 14-15 | | 11-13 | | 12-16 | | 10-4 | | 12-11 | | 13-12 | |
|---------------------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|
| Class & No. Cars Avgd. | H6-Sedan-1 | | H6-Sedan-3 | | H6-Sedan-1 | | H6-Tour.-1 | | H6-Sedan-5 | | H6-Coupe-2 | | H6-Sedan-1 | | H6-Coach-4 | |
| Account Item | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile |
| Gasoline | 881.39 | 2.06 | 590.64 | 1.84 | 298.85 | 1.24 | 1358.66 | 2.03 | 478.75 | 1.43 | 154.89 | 1.19 | 674.67 | 1.23 | 1105.57 | 1.32 |
| Oil | — | — | — | — | 62.57 | 0.26 | 94.45 | 0.14 | 43.27 | 0.13 | 25.34 | 0.19 | 73.94 | 0.13 | 93.92 | 0.11 |
| Tires and tubes | 173.20 | 0.40 | 213.11 | 0.56 | 198.82 | 0.82 | 613.02 | 0.91 | 118.81 | 0.36 | 35.18 | 0.27 | 203.03 | 0.37 | 403.88 | 0.48 |
| Maintenance | 243.63 | 0.56 | 177.95 | 0.59 | 482.00 | 2.00 | 1014.91 | 1.51 | 393.44 | 1.18 | 50.49 | 0.39 | 1878.45 | 3.42 | 1180.77 | 1.40 |
| Misc. costs | — | — | — | — | 42.20 | 0.17 | — | — | — | — | — | — | — | — | — | — |
| Depreciation | — | — | 854.93 | 2.66 | — | — | 1835.29 | 2.74 | 752.48 | 2.25 | 422.00 | 3.24 | 1872.05 | 3.41 | 1359.24 | 1.63 |
| License | 62.85 | 0.15 | 90.67 | 0.30 | 28.00 | 0.12 | — | — | — | — | — | — | — | — | — | — |
| Garage | 50.15 | 0.12 | 117.50 | 0.39 | — | — | — | — | — | — | — | — | — | — | — | — |
| Insurance | 64.33 | 0.15 | 62.26 | 0.21 | — | — | — | — | — | — | 89.25 | 0.69 | — | — | — | — |
| Avg. list price, \$ | 1495 | — | 1658 | — | 1745 | — | 1775 | — | 1447 | — | 1790 | — | 2305 | — | 1395 | — |
| Avg. weight, lb. | 3590 | — | 3598 | — | 3605 | — | 3630 | — | 3634 | — | 3640 | — | 3675 | — | 3710 | — |
| Avg. age at start, yr. | 0.00 | — | 2.00 | — | — | — | 0.00 | — | 0.00 | — | 0.00 | — | 0.00 | — | 0.00 | — |
| Dates covered | 11/27-2/30 | — | 2/25-1/30 | — | 12/27-12/28 | — | 4/26-12/29 | — | 11/26-12/29 | — | 12/27-12/28 | — | 4/26-6/29 | — | 6/26-12/29 | — |
| Avg. account period, yr. | 2.17 | — | 2.67 | — | 1.00 | — | 3.69 | — | 1.59 | — | 1.00 | — | 3.10 | — | 2.22 | — |
| Avg. total miles per car | 42,796 | — | 30,006 | — | 24,166 | — | 67,085 | — | 33,394 | — | 13,018 | — | 54,850 | — | 84,004 | — |
| Avg. annual miles per car | 19,722 | — | 11,252 | — | 24,166 | — | 18,180 | — | 21,003 | — | 13,018 | — | 17,694 | — | 37,867 | — |
| Miles per gallon gas | 12.87 | — | 12.30 | — | 13.71 | — | 10.75 | — | 12.79 | — | 13.51 | — | 15.32 | — | 14.67 | — |
| Miles per quart oil | — | — | — | — | 51 | — | 104 | — | 123 | — | — | — | 86 | — | — | — |

| Group No. | 13-1 | | 11-14 | | 8-10 | | 15-5 | | 15-3 | | 15-10 | | 15-11 | | 15-9 | |
|---------------------------|-------------|------|------------|------|------------|------|------------|------|------------|------|------------|------|------------|------|------------|------|
| Class & No. Cars Avgd. | H6-Sedan-1 | | H6-Coupe-1 | | H6-Sedan-1 | | L8-Sedan-1 | | L8-Sedan-2 | | L8-Sedan-1 | | L8-Tour.-1 | | M8-Sedan-1 | |
| Gasoline | 323.26 | 1.28 | 910.67 | 1.56 | 437.63 | 2.68 | 123.39 | 1.56 | 128.72 | 1.51 | 218.00 | 2.12 | 208.48 | 2.02 | 315.38 | 2.10 |
| Oil | 58.63 | 0.23 | 97.66 | 0.17 | — | — | 4.89 | 0.08 | 7.64 | 0.09 | — | — | — | — | — | — |
| Tires and tubes | 56.89 | 0.23 | 328.70 | 0.56 | 40.00 | 0.24 | — | — | 17.37 | 0.20 | 79.50 | 0.78 | 38.56 | 0.37 | — | — |
| Maintenance | 626.46 | 2.48 | 1812.15 | 3.11 | 342.73 | 2.10 | 24.48 | 0.31 | 53.75 | 0.63 | 84.00 | 0.82 | 173.33 | 1.68 | 184.34 | 1.23 |
| Misc. costs | 13.25 | 0.05 | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Depreciation | — | — | 1701.44 | 2.92 | — | — | 957.02 | 1.77 | 246.47 | 2.89 | — | — | 120.00 | 1.62 | 724.00 | 4.83 |
| License | 37.00 | 0.15 | — | — | 114.50 | 0.70 | — | — | — | — | 25.50 | 0.25 | 80.00 | 0.77 | 96.00 | 0.64 |
| Garage | — | — | — | — | 130.00 | 0.80 | — | — | — | — | 60.00 | 0.68 | 120.00 | 1.16 | 264.00 | 1.76 |
| Insurance | — | — | — | — | 80.00 | 0.49 | — | — | — | — | 40.00 | 0.39 | — | — | 122.78 | 0.82 |
| Avg. list price, \$ | 2585 | — | 2045 | — | 1995 | — | 995 | — | 1465 | — | 1395 | — | 1375 | — | 2195 | — |
| Avg. weight, lb. | 3937 | — | 4030 | — | 4113 | — | 2890 | — | 2896 | — | 2897 | — | 3070 | — | 3545 | — |
| Avg. age at start, yr. | — | — | 0.00 | — | 0.00 | — | 0.00 | — | 0.00 | — | 1.00 | — | 8.00 | — | 0.00 | — |
| Dates covered | 12/27-12/28 | — | 12/26-5/29 | — | 5/25-5/27 | — | 5/29-12/29 | — | 5/29-12/29 | — | 1/29-1/30 | — | 1926-1929 | — | 1928-1929 | — |
| Avg. account period, yr. | 1.00 | — | 2.49 | — | 2.00 | — | 0.59 | — | 0.55 | — | 1.00 | — | 4.00 | — | 2.00 | — |
| Avg. total miles per car | 25,273 | — | 58,349 | — | 16,340 | — | 7,929 | — | 8,541 | — | 10,271 | — | 10,323 | — | 15,000 | — |
| Avg. annual miles per car | 25,273 | — | 23,433 | — | 8,170 | — | 13,439 | — | 16,666 | — | 10,271 | — | 2,581 | — | 7,500 | — |
| Miles per gallon gas | 12.76 | — | 12.03 | — | 11.82 | — | 11.29 | — | 13.15 | — | 13.00 | — | 12.67 | — | 14.29 | — |
| Miles per quart oil | 53 | — | 67 | — | — | — | 203 | — | 112 | — | — | — | — | — | — | — |

TABLE 14 (CONT.) AUTOMOBILE OPERATING COST DATA SUMMARIZED

| Group No. | 15-1 | | 15-4 | | 15-7 | | 15-6 | | 15-8 | | 15-2 | |
|---------------------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|
| Class & No. Cars Avgd. | M8-Sedan-1 | | M4-Sedan-1 | | M8-Coupe-1 | | H8-Tour.-1 | | H8-Sedan-1 | | H8-Sedan-3 | |
| Account Item | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile | Per Car Cost, \$ | c per mile |
| Gasoline | 321.61 | 1.26 | 44.74 | 1.78 | 382.90 | 1.97 | 353.19 | 2.35 | 312.02 | 1.80 | 815.76 | 1.75 |
| Oil | 150.37 | 0.59 | 3.50 | 0.14 | — | — | 57.57 | 0.38 | — | — | 129.45 | 0.27 |
| Tires and tubes | 134.07 | 0.52 | — | — | 200.85 | 1.03 | 85.54 | 0.57 | 04.06 | 0.57 | 309.65 | 0.66 |
| Maintenance | 578.53 | 2.26 | 2.80 | 0.11 | 180.20 | 0.93 | 229.34 | 1.53 | 136.63 | 0.83 | 1035.71 | 2.22 |
| Misc. costs | 31.50 | 0.12 | — | — | — | — | 4.03 | 0.03 | — | — | — | — |
| Depreciation | — | — | 99.32 | 3.95 | — | — | 363.01 | 2.41 | — | — | 1570.57 | 3.36 |
| License | 38.00 | 0.15 | — | — | 144.80 | 0.76 | — | — | 117.00 | 0.71 | — | — |
| Garage | — | — | — | — | 185.00 | 0.95 | — | — | 130.00 | 0.79 | — | — |
| Insurance | — | — | — | — | 181.28 | 0.93 | — | — | 158.40 | 0.96 | — | — |
| Avg. list price | 2345 | — | 1695 | — | 3045 | — | 3185 | — | 3195 | — | 3496 | — |
| Avg. weight, lb. | 3545 | — | 4000 | — | 4100 | — | 4285 | — | 4560 | — | 4632 | — |
| Avg. age at start, yr. | — | — | 0.00 | — | — | — | — | — | — | — | 0.00 | — |
| Dates covered | 12/27-12/28 | — | 10/29-12/29 | — | 9/24-1/30 | — | 1928 | — | 10/27-1/30 | — | 12/25-12/29 | — |
| Avg. account period, yr. | 1.00 | — | 0.19 | — | 3.08 | — | 1.00 | — | 2.25 | — | 2.10 | — |
| Avg. total miles per car | 25,561 | — | 2,512 | — | 19,430 | — | 15,049 | — | 16,500 | — | 46,723 | — |
| Avg. annual miles per car | 25,561 | — | 13,221 | — | 6,302 | — | 15,049 | — | 7,333 | — | 22,249 | — |
| Miles per gallon gas | 13.29 | — | 10.64 | — | 13.02 | — | 9.33 | — | 12.66 | — | 11.01 | — |
| Miles per quart oil | 28 | — | 179 | — | — | — | 56 | — | — | — | 81 | — |

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