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Letter
Circular
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AUTOMOBILE COSTS

Many inquiries are received concerning the cost of owning and operating an automobile, and this letter circular is issued to outline the various factors which enter into the problem of estimating the cost of operation of a car, more particularly in the lower price classes.

Selection of a Car

The National Bureau of Standards can not answer the question often asked as to which model gives "most value for the money". The cost in dollars of a given automobile may be the same to two different purchasers, but the value of that automobile to the two individuals is, in general, not at all the same. The value depends much on the use which is to be made of it.

Other items than initial price affect the cost and value of an automobile. The cost of spare parts is often less, and salability of the used car better, for those makes in any price class which are produced in quantity. A small increase in price for cars in a higher price class may permit a substantial improvement in quality of the product. Both first cost and trade-in allowance depend on the style of body. Some cars are more economical, some more powerful, some excel in riding comfort or appointments, others in their ability to withstand rough usage. It is better in general to choose a car within any price class which has the particular characteristics that one desires for his own use. Consequently, information on the relative value per dollar of cost of automobiles in different price classes can not be given.

Costs of Operation

The total cost of owning and operating a car involves two distinct classes of expenditures, (A) fixed expenses, or those which do not depend on the mileage, and (B) running expenses, or those which depend directly on the miles driven. For instance, if a car is bought for \$750 and not used for a year the cost of owning the car would be largely the depreciation (the difference between the purchase price of, say, \$750, and the resale value at the end of the year). If on the other hand the car is driven 10,000 miles during the year, it will depreciate in sales value by about the same amount or perhaps somewhat more, but additional expenses will be incurred for each mile of travel, such as gasoline, oil, upkeep, minor repairs, etc.

A. Fixed Expenses

Charges which are substantially independent of the miles of travel but are incurred whenever a man owns and operates a car may include such items as, (1) depreciation, (2) insurance, (3) licenses, taxes, etc., (4) interest, and (5) housing.

1. Depreciation

If a passenger car is turned in each year in exchange for a new car, the difference which has to be paid represents the total annual cost of the item of depreciation, including tires and equipment. If the car is turned in at the end of 2 or 3 years, the depreciation per year is less but the added cost of replacement of tires and equipment together with the increased maintenance charges offset a part of this cost differential.

The first year trade-in cost of the low-priced models throughout the United States for several years has ranged between \$200 and \$300, with a figure \$50 to \$75 higher for cars in the next higher price class. For the low-priced group of cars, assuming that they are turned in during the first three years of use, an average annual turn-in cost of \$200 per year is suggested, including cost of replacing tires and batteries which may be necessary if the car is kept over two years or is driven very extensively.

The wear and tear on the various parts of automobiles is to a very large extent controlled by the conditions of operation and the care with which the vehicle is maintained. They are commonly less for a given mileage when cars are in continuous use than when used intermittently. So large are these differences that one vehicle may last much longer or give a much greater useful mileage than another of exactly the same construction.

The National Bureau of Standards does not have statistical information available on the average wear and tear or length of life of different types of automobiles and such information, if available at all, would have to be obtained from the records of users of large fleets of vehicles.

2. Insurance

The costs of insurance vary greatly with the class of car, the locality, and the total amount of coverage carried. Only a very general average figure can be estimated. If we include liability and property damage as well as fire and theft the annual charge is estimated at \$50.

3. License fees, taxes, etc.

License fees, taxes, etc. (exclusive of gasoline and oil taxes) average throughout the country about \$7.62 per year. Personal taxes on the car, drivers' license fees and similar items vary in amounts in different parts of the United States and are estimated to be about \$12.50. A total charge for these various items is estimated at \$20 per year.

The two items which follow depend on so many factors that their inclusion in the cost of owning a car must be largely a matter of personal judgment.

4. Interest

If a car is bought with borrowed money, either directly by borrowing from a bank or indirectly through deferred payments, interest is a part of the car.

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In considering the annual cost, therefore, a fair basis would seem to be interest calculated on the estimated \$200 annual replacement cost of the car or, say, \$10 per year.

5. Housing

The cost of housing an automobile varies greatly in different parts of the country, and between different car owners. If a car is housed in a rented garage or on the premises of the owner in a garage or other space which he has built for that special purpose, the cost of renting or of owning the housing space is naturally a part of the cost of owning the car. On the other hand, if the car is housed in a barn or shed or in space which otherwise would be idle, or if it is not housed at all, there seems to be no excuse for including a charge for housing. For cars which are not housed the depreciation will be greater at least after the third year, so that this partly offsets any saving in the cost of housing.

A charge of \$100 for housing is included only as optional as noted in the following examples.

B. Running Expenses

Charges which are substantially proportional to the number of miles of travel and can be expressed in cents per mile include such items as gasoline and oil (including gasoline and oil taxes), greasing, washing, minor repairs, parking charges, etc. Figures for the cost of operation vary in different parts of the country and with the driver and the type of service. Records available for this charge range from 1 1/2 to 2 cents per mile. These items might be estimated at \$.0175 per mile, but they do not take into account the actual wear on the car. Most automobiles do not cover enough miles per year to greatly affect their resale value. Obviously, however, if a car covers very large mileages, its resale value will be decreased as a result of the normal wear of the mechanism. This loss of value due to mileage of operation may be estimated at about \$.0025 per mile, which should be added to the above figure, resulting in an estimated cost per mile of an even two cents.

Examples

Total Cost Per Year

10,000 Miles Travel

From the above estimates it will be seen that a car driven 10,000 miles per year and housed in a rented garage will show about the following average cost of operation per year:

Fixed Expenses

Depreciation	\$200 per annum	
Insurance	50 "	
License fees, taxes, etc.	20 "	
Interest	10 "	
Housing	100 "	
Total fixed expenses		\$380

Total fixed expenses (Carried forward)	\$380 .
<u>Running Expenses</u>	
10,000 miles at \$.02	<u>200</u>
Total Cost Per Year	\$580
Total Cost Per Mile	5.80 cents

25,000 Miles Travel

Assuming a car which travels an estimated 25,000 miles per year and is not housed in a garage --

<u>Fixed Expenses</u>		
Depreciation	\$200 per annum	
Insurance	50 "	
Licenses, etc.	20 "	
Interest	<u>10 "</u>	
Total Fixed Expenses		\$280
<u>Running Expenses</u>		
25,000 miles at \$.02		<u>500</u>
Total Cost Per Year		\$780
Total Cost Per Mile		3.12 cents

While these figures are all more or less estimated, they are probably fair approximations to average costs.

Motor Car Costs vs Other Transportation

In applying these figures one often must decide whether it is cheaper to drive one's own car or use other means of transportation for any given trip. Many letters have been received asking information on this point.

If one owns and operates a car he must of necessity meet the "total fixed expenses" whether the car is driven or left idle. The difference in cost to the owner between a car standing idle and the same car in use therefore is only the cost of running expenses. This is, as noted above, about 2 cents per mile for a new car, and perhaps a little higher for an older car.

One may safely estimate, therefore, the cost of driving his own car as compared with leaving the car at home, at 2 cents per mile. Even with cars in the next higher price class the added cost is nearly all included in the "fixed expenses" so that the cost of driving, even here, should not much exceed the estimated 2 cents per mile.

This figure must be divided by the number of passengers to arrive at the cost per passenger mile for comparison with other types of transportation on the same basis. For two passengers, for instance, the cost would be one cent per passenger mile, and for four persons one-half cent per passenger mile.

Used Cars

The foregoing figures apply for relatively new cars, up to perhaps four years old. It is obvious, however, that car operation for a large part of the population costs much less than this. The reason is that the cost of depreciation decreases for cars as they grow older.

Many cars are bought after four or more years of service and used either as long as they will run or turned in on other purchases, at prices which represent costs of depreciation that may run even as low as \$25 per year. Often on such cars no insurance is carried; the owner does most of his own repair work, uses no shelter and makes most of his purchases at the lowest possible price.

The running expenses, of, say, 2 cents per mile, therefore, may represent a large part of his total cost.

A typical budget of this sort for an owner who drives a car worth about \$150 for 5,000 miles per year might be:

<u>Fixed Expenses</u>		
Depreciation	\$50 per annum	
Licenses, etc.	<u>15</u> "	
Total fixed expenses		\$65
<u>Running Expenses</u>		
5,000 miles at 2 cents per mile		<u>100</u>
Total Cost Per Year		\$165
Total Cost Per Mile		3.30 cents

Even this is by no means the lowest cost of operation. Cars which no longer have a market value are being used in some places at a total cost well below 2 cents per mile.

These figures do not take into account the work done by the owner in repairs and upkeep, which, if paid for at current prices, might equal the depreciation charge on a new car.

