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NATIONAL BUREAU OF STANDARDS  
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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 in the lower price classes, including perhaps a few above the minimum price.

#### Selection of a Car

The National Bureau of Standards has no information on the relative money values of different automobiles but in general it may be said that competitive conditions are so severe that all automobiles in any given price class have substantially the same real value per dollar of cost. Different makes of automobiles differ in various respects. Some may be slightly more economical in one class of service, others in another. It is better in general to choose a car which has the particular characteristics which one desires than to attempt a selection on the basis of any assumed difference in money value within any particular class.

When it comes to choosing between cars in different price classes, there is probably little doubt that one secures the most value for his money in the lowest priced cars because the greater quantity production of these models makes it possible to give more automobile for the money. Whether the lower priced car is the more desirable purchase for any individual depends upon the demands and tastes of the user.

#### 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 first year, the amount of depreciation is about the same but additional expenses have been incurred for each mile of travel, such as gasoline, oil, 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 include such items as (1) depreciation, (2) interest, (3) insurance, (4) license fees, taxes, etc., 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 this item of the car, including tires and equipment. If the car is turned in at the end of 2, 3 or 4 years, the cost differential per year is less but the added cost of replacement of tires and equipment together with the increased maintenance charges may bring the annual cost up to the former figure.

The annual trade-in cost of the low-priced models throughout the United States for several years has ranged between \$200 and \$300 per year with a figure about \$75 per year higher for cars in the next higher price class. For the low price group of cars the figure of \$250 per year is suggested as an average.

The cars which show the highest depreciation are almost always those which are driven around the city for short distances with frequent stops. Cars which in general show the least depreciation are those driven mainly for long trips on the open highway at speeds from 40 to 60 miles per hour. It is only when cars are driven considerable distances at speeds above this that depreciation greatly exceeds that of cars which are not much used.

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. So large are these differences that one vehicle may last several times as long as another vehicle 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. Certain estimates have been made as to the average life of passenger cars before they are finally scrapped. We are not informed as to the reliability of the basis for such estimates but the average life in recent years has been said to be eight or nine years.

## 2. Interest

Interest on the initial cost is included in the finance charges if the car is bought on that basis, but if the car is bought for cash, interest should be included for comparative purposes. If the initial cost of the car is \$750, the item of interest at six percent would amount to \$45 per year.

## 3. 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 the minimum insurance which every man should carry, the annual charge is estimated at \$50 per year.

## 4. 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.

## 5. Housing

If a car is housed in a rented garage a charge of about \$100 per year should be included. While proper housing adds to the ultimate useful life of a car, the present cars when new do not depreciate much more rapidly than is assumed under (1) if left outside. Comparatively few of them are housed, therefore in these cases the housing charge is not justified. It is included here only as an optional charge and estimated at \$100 per year.

## 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 1/3 to 2 cents per mile. Therefore we estimate \$.0175 per mile. In the case of an old car the additional cost of tires, replacements and repairs is partly accounted for in the amount estimated above for depreciation.

Total Cost Per Year

10,000 Miles Travel

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

<u>Fixed Expenses</u>		
Depreciation	\$250 per annum	
Interest	45 "	
Insurance	50 "	
Licenses, etc.	20 "	
Housing	100 "	
Total fixed expenses		\$465
<u>Running Expenses</u>		
10,000 miles at \$.0175		175
Total Cost Per Year		<u>\$640</u>
Total Cost Per Mile		6.40 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	\$250 per annum	
Interest	45 "	
Insurance	50 "	
Licenses, etc.	20 "	
Total fixed expenses		\$365
<u>Running Expenses</u>		
25,000 miles at \$.0175		437.50
Total Cost Per Year		<u>\$802.50</u>
Total Cost Per Mile		3.21 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 1.75 cents per mile for a new car and a little higher, perhaps 2 cents per mile, for an older car, as explained under (B).

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.

