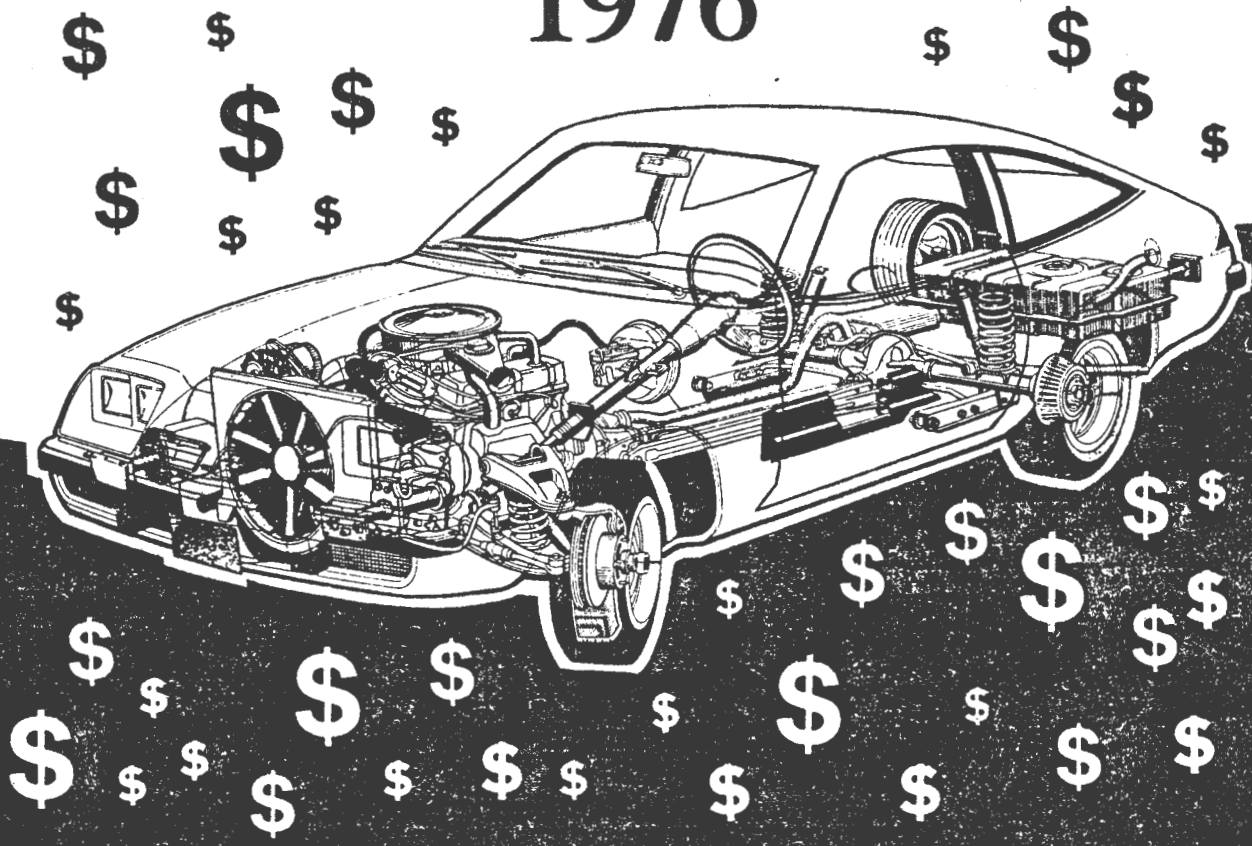


COST OF OWNING AND OPERATING AN AUTOMOBILE 1976

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SUBURBAN-BASED OPERATION

SIZE	TOTAL COSTS: CENTS PER MILE
STANDARD	17.9
COMPACT	14.6
SUBCOMPACT	12.6










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151.5
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1976



J.S. DEPARTMENT OF TRANSPORTATION
Federal Highway Administration

Office of Highway Planning
Highway Statistics Division

COST OF OWNING AND OPERATING AN AUTOMOBILE 1976

SUBURBAN-BASED OPERATION							
TOTAL COSTS: CENTS PER MILE							
SIZE	 ORIGINAL VEHICLE COST DEPRECIATED	 MAINTENANCE, ACCESSORIES, PARTS & TIRES	 GAS & OIL (EXCLUDING TAXES)	 GARAGE, PARKING & TOLLS	 INSURANCE	 STATE & FEDERAL TAXES	TOTAL COST
STANDARD* WITH STANDARD EQUIP- MENT, WEIGH MORE THAN 4,000 LBS. EMPTY. 	4.9	4.2	3.3	2.2	1.7	1.6	17.9
COMPACT WEIGH MORE THAN 2,700 LBS. BUT LESS THAN 3,600 LBS. EMPTY. 	3.8	3.4	2.5	2.1	1.6	1.2	14.6
SUB COMPACT WEIGH LESS THAN 2,700 LBS. EMPTY. 	3.2	3.1	1.8	2.1	1.5	.9	12.6

* NOT SHOWN IN THIS STUDY ARE THE INTERMEDIATE-SIZE CARS THAT WEIGH 3,600 - 4,000 LBS. EMPTY.



U.S. DEPARTMENT OF TRANSPORTATION
Federal Highway Administration

Office of Highway Planning
Highway Statistics Division

COST OF OWNING AND OPERATING AN AUTOMOBILE

L. L. Liston and C. A. Aiken

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(Mr. Liston is Chief of the Vehicles, Drivers, and Fuels Branch, Highway Statistics Division of the Federal Highway Administration. Mr. Aiken is a Community Planner in the Vehicles, Drivers, and Fuels Branch.)

Introduction

With costs of all goods and services rising, Americans are well aware of the increasing demands on their incomes, but it appears that many still have only a vague notion of how much it costs to own and operate the cars they drive. A standard-size American car costs nearly \$5,000 to purchase. Typically, it will be driven 100,000 miles over a 10-year period, and the total cost to its owners will be nearly \$18,000. During that period it will cost about \$3,193 excluding tax for some 6,667 gallons of gasoline, about \$3,664 to keep the vehicle maintained and in repair, \$1,678 to insure it, \$2,209 for garaging, parking, and tolls, and \$1,562 in automotive taxes. This last item goes mainly for the roads on which he drives, and accounts for only 8.7 percent of total costs.

In this study, we shall examine the factors influencing the costs of car ownership and operation, and we shall suggest ways the motorist can get the best value for his money.

This "Cost of Owning and Operating an Automobile" report has been updated and published as changes in costs and vehicle characteristics have warranted additional study. The most recent prior edition was issued in April 1974. The text, method, and coverage of the current report borrows freely from former reports. As with the earlier reports, the costs shown are based on typical operations in the Baltimore, Maryland suburbs.

Several organizations have published analyses of driving costs. Among the better known are those published by the American Automobile Association, Washington, D.C.; the American Legal Association in Wellesley, Massachusetts; the National Automobile Association, Atlanta, Georgia; the Conference Board, New York, New York; and the National Association of Fleet Administrators, New York, New York. In some cases, the studies have been made for the above organizations by commercial advisory services that have access to records of commercial fleets and leasing operations. Copies of the studies may be available in libraries or from the organizations listed.

Vehicles Used in the Study

Description—A description of the vehicles included in the study, the repairs, the repetitive maintenance operations, replacement items, insurance, and other costs that were included in the study and the values of factors used to compute these costs are listed in table 1 which is titled, "Automobile Operating Costs—Bases for Estimates." As in the 1974 study, three cars have been chosen to compare the costs incurred, and to show the various costs in relation to the highway-user taxes paid. Earlier editions of this report¹ considered costs for only one vehicle, a standard size "big 3" four-door sedan operated from a home in the Baltimore, Maryland area. The current study is also based in the Baltimore, Maryland area in order to retain comparison with data from prior reports. The study data are for that location only, and are *not national averages*. As discussed later, an analysis for other cars in other locations can follow these procedures.

The vehicles chosen for study are a standard size "big 3" four-door sedan (table 2), an American-made compact (table 3), and an American subcompact (table 4). The modern American subcompact cars are now entering their sixth year of production and usage. The problems experienced with new designs and power plants have, for the most part, been solved, and we are somewhat better able to predict the repairs and maintenance that will be necessary.

The current purchase price of the car was considered to be the "sticker" price of the vehicle less an assumed dealer discount allowed on that car. The discounts are affected by many factors—the size of dealership, the dealer's inventory situation, the time of year, and the ability of the buyer to negotiate a good deal. The intent is to trace each vehicle and its costs through a 10-year lifetime of 100,000 miles, which the odometer records of vehicles of these kinds

¹Studies were published in 1950, 1967, 1970, 1972, and 1974. Copies of the 1972 and 1974 studies are available, but supplies of the earlier editions have been exhausted.

have shown to be a reasonable life expectancy. Usually an automobile passes through two, three, or more owners during its life, but the costs of these changes of ownership are not included in this report. An individual's need for transportation tends to be relatively stable from year to year, so it would be unlikely that he would drive his *only* car successively fewer miles each year. However, we know that, as a general rule, cars are operated fewer miles each year as they grow older; the older car usually becomes the second or third car in a family, or for some other reason it is driven less.

Vehicle Life—Many things such as individual driving habits, climate, garage facilities, type of road used, purpose for which the car is used, and sometimes luck can affect the service life and costs of operating a car. As previously stated, the standard-size car has an average life of about 10 years, and the compacts appear to be surviving at about the same rate. The current American subcompacts have been on the market nearly six years, so their survival history is only now beginning to develop. Odometer checks of some of these subcompacts show that their annual travel accumulation is consistent with the mileage of the larger vehicles. For ease of comparison among vehicle sizes and uses, all of the study vehicles have been assumed to have a 10-year, 100,000-mile life. A normal travel pattern has been set at 14,500 miles in the first year and a decreasing number of miles each year thereafter until the vehicle is driven only 5,700 miles in its 10th year. These assumptions are reasonably consistent with available travel data.

The average automobile is sold or traded three or more times during its life, usually through new or used car dealers. The need for repairs or anticipation of them usually prompts owners to trade-in their cars, and the dealers serve as the quality control judges of the used vehicle trade. They wholesale those which require very expensive or time-consuming work, and make the repairs on the remainder prior to resale. But whether the automobile needing repairs is owned by an individual or by a dealer, the money spent on repairs and upkeep becomes a part of the cost of owning and operating the car. Battery and tire replacements, brake linings, radiator repairs, body work, and numerous other replacements and repairs are included in the used car reconditioning programs of many dealers. The additional work that is done under dealer warranties does not impose direct out-of-pocket expenditures on the car owner. These costs are submerged in each automobile's purchase price, and for the purposes of this report, no effort has been made to separate them.

Types of Costs

Although many owners think of their costs in terms

of the outlays for gasoline, oil, tires, and tolls, a careful examination shows that there are costs that occur whether or not the car is driven, and there are other costs which are directly related to the amount of travel. The first group of costs is generally called *fixed* or *ownership* costs, and the latter group is *variable* or *operating* costs.

Ownership Costs—These include depreciation, insurance, finance charges, registration and titling fees, and accessory costs. As time passes, during car ownership a portion of each of these costs occurs, even if the car is permanently garaged.

1. **Depreciation**—Includes the loss in value of the car during the time it is owned due to (1) passage of time, and (2) its mechanical and physical condition and the amount that it is used (miles driven). National vehicle dealer groups issue car value books for different sections of the country, usually on a quarterly basis. Car values are determined by a canvass of selling prices of vehicles by make and year model in each geographic area. These values are based on normal travel, so odometer readings higher or lower than the normal range will be reflected in lower or higher remaining car values. Of course, the car's appearance is very important in determining the remaining value.

Depreciation is the greatest single cost of owning and operating an automobile. In the great majority of cases, the age of a car is more important than its mileage in determining its resale or trade-in value. Such factors as brand popularity, body style, size, and to some degree, color, are also considered in determining value. For the standard-size car, by far the greatest dollar depreciation in its value occurs in its first few years, while for the smaller cars the depreciation is more evenly distributed over all their years of use. Since newer cars are driven more miles than older cars, the depreciation on a per-mile basis is held down the first few years. For example, consider depreciation for the standard-size car in this report. (See table 2.) If the car were bought new for \$4,914 and sold or traded at the end of the first year, when it had been driven 14,500 miles, depreciation would be \$1,215. This depreciation cost divided by the 14,500 miles driven the first year amounts to 8.4 cents per mile. By the end of the second year, when the car had been driven 27,500 miles, depreciation would total \$1,963, which divided by the 27,500 miles would compute to 7.1 cents per mile. As the car gets older depreciation decreases, but the outlay for maintenance and repairs rises. As time passes it becomes increasingly difficult and expensive to keep a car in satisfactory operating condition.

2. **Insurance Costs**—These costs depend on the amount of coverage and the purpose for which the car is used and the location in which it is operated.

Automobiles are continuously exposed to the possibility of damage, whether on the highway or parked. The large numbers of vehicles on the roads and streets and in parking lots make cars highly susceptible to accident involvement. Controlled crash tests on cars produced through 1973 showed that they were not able to escape unmarked from any sort of collision. Beginning with 1974 models most cars were manufactured with energy absorbing bumpers that were designed to protect against impacts up to five miles per hour without damage to the vehicles. Even so, there has been considerable damage reported, particularly for the very small cars. The insurance industry reports that "the lightweight subcompact does save money on gas consumption, but at the same time costs more to repair than its compact or standard-size big brothers." They report that repair costs for subcompacts are not only higher than those reported for other classes of automobiles, but they also are rising at a much faster rate.

The uninsured portion of accident costs is included in the maintenance and repair costs. The insurance industry statistics show that the annual collision frequency rate now is about 10.7 per 100 cars. A spokesman for the industry ventured the opinion that the average motorist will be involved in an accident twice during an eight-year period, and one of these probably will be his fault. If the owner carries collision insurance for the first five years of the car's life, his out-of-pocket cost during this period will be the deductible amount (usually \$100). That amount can be considered the minimum he will pay for accidents during the life of the car. After his collision insurance is discontinued he will have to pay the entire cost of any accidents for which he is responsible.

The insurance coverage in this study includes \$50,000 combined public liability, full comprehensive fire and theft, uninsured motorist, and personal injury protection with first-party medical and wage benefits of \$2,500, the latter being required by Maryland's no-fault insurance law. Also included is \$100 deductible collision insurance, which is usually dropped after the car is about five years old. Accidents during the sixth through tenth years could, therefore, increase

the cost of owning and operating a vehicle more than the amounts shown in the accompanying tables.

3. *Finance Charges*—These ownership costs are included in payments to lending institutions which have advanced money to the motorist to buy a car, or they can be considered as the interest lost on savings withdrawn for that purpose.

Automobile financing charges are not included in the costs shown in the tables in this report since a number of options are available, but they may be approximated with relative ease. Most car buyers either pay interest on money they borrow to buy their cars, or they forego interest they would have earned if they had elected to use savings or other investments to pay for the cars outright. On a conventional 36-month loan covering two-thirds of the purchase price, the interest cost at a 10-percent annual rate for the 3-year period, would be 1.4 cents per mile for the standard-size car, it would be 1.1 cents per mile for the compact, and 0.9 cents per mile for the subcompact. On the other hand, if the purchase were financed by a savings withdrawal rather than by borrowing, and the amount withdrawn were paid back in 36 equal monthly installments, the net interest lost (at 5½ percent) in the account would be 0.8 cents per mile for the standard-size car, 0.6 cents per mile for the compact, and 0.5 cents per mile for the subcompact.

Recent information shows that there may be a move toward financing new automobiles for a four- to five-year period with 10 percent or less down payment. This extended financing on a larger loan, at 11 percent interest, reduces each monthly payment, but the overall cost to the owner is higher. For the standard-size car, five-year interest would cost 2.3 cents per mile for the compact, 1.8 cents per mile; and for the subcompact, 1.5 cents per mile. Savings withdrawals at 5½ percent for the same period would cost 1.19 cents per mile for the standard-size car, 0.94 cents per mile for the compact, and 0.78 cents per mile for the subcompact. The following tabulation gives the details of automobile financing for the conventional term (36 months) and for the extended term (60 months).

36 Month Financing

Type of Car	Loan Financing			Savings Withdrawal	
	Loan Amount	Finance Charge	Cost Per Mile	Lost Interest	Cost Per Mile
Standard-Size -----	\$3,266	\$ 533	1.4 cents	\$296	0.8 cents
Compact -----	2,577	420	1.1 cents	233	0.6 cents
Subcompact -----	2,163	339	0.9 cents	188	0.5 cents

60 Month Financing

Standard-Size -----	\$4,409	\$1,343	2.3 cents	\$701	1.19 cents
Compact -----	3,478	1,059	1.8 cents	553	0.94 cents
Subcompact -----	2,902	884	1.5 cents	461	0.78 cents

There can be important cost differences in alternative methods of financing a new car purchase, and the merits of different plans should be weighed carefully before a particular one is selected.

4. Registration and Titling or Sales Taxes—These are payments to the government of the State in which the car is registered. The registration fee customarily is due each year, and the titling or sales tax is due only once—when the vehicle is purchased. However, in some States, like Maryland, which is the base State for this study, a titling tax applied as a percentage of the car's value is invoked each time the car changes hands. Also, some States or their local subdivisions (but not Maryland) levy an annual tangible or personal property tax which is figured as a percentage of the value of certain personal possessions, including automobiles. In the study presented here the cost of the registration fee is applied to the year in which it is charged, and the titling tax is applied in equal amounts to all years of ownership of the car.

5. Accessory Costs—These cover the value of any add-on features for a car and have no effect on its mechanical operation. These items customarily include cover mats for the floors, radio, extra side mirrors, seat covers, etc. The costs of these items are usually assigned in equal amounts to the year purchased and any following years in which the items are still serviceable. Accessories, as defined in this analysis, do not include optional equipment such as power steering, automatic transmission, or air conditioning, which are included in the purchase price.

6. Garage Costs—These costs are computed to include the value of any arrangements made by the car owner for off-street storage of the car at his residence. It may be an attached or detached garage, a carport, or it may be a paved parking apron or gravel surfaced space beside his house.

Operating Costs—These include gasoline, oil, tires, repairs and maintenance, garaging, parking and tolls, and taxes on gasoline and oil. The more a car is used the higher these costs become.

1. Gasoline and Oil—Gasoline is a major cost item for cars of all sizes.

The difference between gasoline costs alone for the 1976 model standard-size car and the subcompact over 100,000 miles of travel can amount to as much as \$1,600—nearly half the new car cost for another subcompact. As shown in Tables 2 and 4 respectively, over the first three years, gasoline will cost \$600 more for the standard-size car than for the subcompact. The difference in gasoline costs between the standard-size (table 2) and the compact (table 3) is not quite as great, but is still noteworthy when one considers that compacts feature most of the advantages of both the larger cars and the smaller subcompacts. Until

gasoline shortages occurred in 1973, the price of gasoline, including taxes, had changed little for more than 20 years. However, the price of gasoline rose more than 14 cents per gallon in the study area in late 1973 and early 1974. There was a 2-cent State gasoline tax increase in mid-1972, so the remaining 12 cents of increase was all in the price, and was a 32 percent rise. During the past two years, the price has risen another 8.8 cents per gallon, and the tax has remained constant.

For a new or relatively new car the cost of oil is mainly dependent on the car manufacturers' instructions for oil changes, because little, if any, oil is burned by these cars. Currently, most manufacturers recommend a change every 6,000 miles, and the capacities listed for the study cars are 4 quarts for the subcompact, 5 quarts for the compact, and 6 quarts for the standard-size car.

2. Tires—When an automobile is driven 100,000 miles there are 400,000 miles of tire wear. For the standard-size and subcompact cars it was assumed that radial tires would be used. If the automobiles are driven with reasonable care, and the wheels are kept properly aligned, they would each wear out the original 5 tires and require 7 additional replacements, which would include 3 regular tires and 4 snow tires. Typically, for the 1976 models, the compact would not be delivered with radial tires, so it is assumed that fiberglass bias-belted tires would be used. The compact would wear out the original 5 tires and require 11 additional replacements, which would include 7 regular tires and 4 snow tires. At the end of 100,000 miles the compact should have some usable tread left on the tires.

Radial tires generally cost about one-third more than bias-belted tires, and the expected mileage is at least 33 percent higher, if a substantial amount of the annual travel is over-the-road. Also, tests show that in this kind of use radial tires roll more freely, and there can be a fuel saving of up to five percent. If most of the travel is in restricted speed areas, the possibility of saving is substantially reduced.

Bias-ply tires (not belted) cost about one-fourth less than bias-belted tires, and they will customarily not last as many miles as the other two types of tires. However, they are safe, and their low cost makes them attractive for mainly urban and suburban uses.

3. Repairs and Maintenance—The costs shown in this report are not taken from records of specific vehicles nor are the amounts of usage, fuel consumption rates, or any other factors presented as "averages." However, the vehicle and operation cost factors are considered to be typical for cars of these sizes in the study area. The factors used here were selected on the basis of available statistics, discussions with automobile industry personnel, and assistance

from service managers of major automobile dealers.

To estimate car operating costs, it was necessary to make a series of assumptions concerning tire and battery replacements, wheel alignments, light bulbs, fan belts, brake linings and parts, lubrications, and other repair and maintenance items. The need for repairs was estimated from data gathered during discussions of repair experience with car service personnel, and from the authors' knowledge. They include such items as starter repair, carburetor overhaul, replacement of fuel pump, radiator hoses, muffler, tail pipes, and shock absorbers, and what must seem to the owner to be a pretty long list of other repairs. Several of these repairs and replacements must be made more than once during the life of the car. No costs were included for repairs or replacements that would have been covered by warranties.

The mechanical features on the vehicles in this study are similar to those in the prior study, so changes in costs result primarily from increases in charges for parts and labor. Maintenance and repair costs reflect a 2-year increase in parts prices over those used in the 1974 study. In the current study, the costs for all repairs are based on 1976 prices. A charge of \$13.50 an hour or more for shop labor is not unusual, and this is a major factor in the 3.7 cents-per-mile cost for repairs and maintenance for the standard-size automobile. The relative simplicity of compact and subcompact cars offers an opportunity for cost savings to those who might like to do some of their own minor repairs and maintenance. Replacement of spark plugs, windshield wiper blades, fan belts, radiator hoses, etc., on many cars of all sizes are simple and there are indeed savings to be realized. When trained mechanics do these jobs, vehicle owners must pay professional wages. Although there are increasing numbers of "at home" mechanics, repair garage experience shows that the public generally is not ready to assume this responsibility.

4. *Garaging, Parking and Tolls*—The operating cost portion of garage costs is for temporary storage or parking a car in a commercial garage. Parking costs include metered curb parking, and fees charged in parking lots. Tolls include charges for using private or public highways and bridges.

5. *Taxes on Gasoline and Oil*—These are payments to the government on a per gallon basis for motor fuel and oil used. For the study area the State gasoline tax is 9 cents per gallon, the Federal gasoline tax is 4 cents per gallon, and the Federal oil tax is 6 cents per gallon.

Adjustment of Costs to Other Localities

The worksheet provided at the end of this report can be used as a guide to adjusting the study costs to

any other locality for which cost factors can be obtained.

The costs and rates for suburban Baltimore, shown in tables 2, 3, and 4, can be compared with costs and rates for other localities; and automobile operating costs in those other localities can be estimated using this study as a guide. For example, the price of gasoline used in this study, as shown in the "Bases for Estimates" table, was 60.9 cents per gallon. If the price of gasoline in another locality were 55.9 cents per gallon, persons living there, and wishing to estimate their own automobile operating costs, could adjust the gasoline cost figure in this study to reflect the 5 cents per gallon lower price. Similar adjustments can also be made for other cost items. This is particularly important with respect to repair labor rates, and for insurance.

Not all cost items are listed in detail in the tables, but sufficient information is included to assist those who wish to make recomputations to fit other geographic areas, or other types of operation. If the suburban costs had been computed for Boston, New York, or San Francisco, they probably would have been higher, and if they had been computed for Jacksonville, Montgomery, or Fort Worth, they would have been lower. Running costs in most rural areas of the United States probably would not differ greatly, but there are substantial differences in vehicle registration fees and gasoline tax rates among States. The running costs (gasoline, tires, oil, repairs, maintenance, etc.) for the vehicles in rural operation tend to be lower than for comparable cars in suburban use, because there are fewer traffic control devices, less congestion, and because of the lower accident rates in rural areas, insurance costs are usually much less than in urban areas.

The costs that are most likely to change in the short range, and to need adjustments from one geographic location to another are gasoline price and tax, registration fee, repair labor rate, insurance premium, and toll and parking charges. Furthermore, the market value of cars can differ substantially from region to region, and any estimates of interim costs should allow for differences in rates of depreciation.

In some areas of the United States tolls and garaging would cost less than in the study area, but an automobile owner traveling south, or west, or north from Baltimore customarily would encounter major toll routes. Also, he would spend more for garaging and parking than residents of small towns or rural areas. To go to New York City, 185 miles to the north and return, he would pay \$8.10 in tolls, not counting the \$1.50 Baltimore Tunnel fee. This is substantially more than persons living in Atlanta, New Orleans, or St. Louis would have to pay in making similar length trips from their localities.

The worksheet at the end of this report has been prepared to produce costs for the first year of a vehicle's life. If annual and per mile costs for an older car are desired, the odometer mileage for that vehicle should be compared with a cumulation of the annual mileages shown at the top of the "year" columns on tables 2, 3, or 4. When sufficient mileages are added together to match the car's odometer mileage, the proper column of table 2, 3, or 4 will be identified from which cost factors can be used for everything except depreciation. Since depreciation is dependent on both car age and mileage, local used car prices and "blue book" values (if available) should be used.

Other Applications for Study Data

Choosing a Car—A person's choice of an automobile—standard size, compact, or subcompact—is dependent on several considerations. For the motorist who needs the space provided in the standard-size car because of a large family, carpool needs, or equipment that must be carried, the economies and size advantages of the compact and subcompact must be forgone. If he finds that those needs are not compelling, the smaller cars offer several advantages. Parking in curb space is easier, some parking lots have lower rates for small cars, repair costs may be less, registration fees in some States are lower, tires cost less, and saving in gasoline cost over the life of the car will be enough to pay a substantial amount toward the cost of a new car. As was previously mentioned under "Gasoline and Oil" as operating costs, the gasoline cost savings between a standard-size car and a subcompact over 100,000 miles can amount to nearly half the cost of another subcompact.

When to Trade In—Another question that motorists frequently ask is, "When should I trade in my car?" There is no answer that fits everyone, because monetary consideration is only a part of the problem. Vehicle style, size, interior decor, mechanical features, availability of money, and many other things may be important to the car owner in making his decision of which vehicle to buy, and when to buy again.

However, most people probably are concerned mainly with the money difference when they ask the question. The "annual trader" drives a current model car all of the time, but depreciation for his standard-size automobile over a 10-year period costs him about \$12,150 (10 times the first year depreciation). The "two-year trader" pays about \$9,815 in depreciation (5 times the depreciation for the first 2 years). This is a saving of \$2,335 from the "annual trader's" costs, and he can save even more by becoming a "three-year trader." However, after the first year he faces a series of outlays for tire replacement, repairs, and incidentals that begin to offset his savings in depreciation.

The obvious flaw in trying to use these tables to determine when to trade in a car is that a family's annual auto usage tends to be relatively constant from year to year, and does not follow the pattern shown for the life of a car in this study. If the family customarily drives 14,500 miles per year, it is unlikely that they will drive fewer miles the second year and still fewer the third year. Therefore, by the end of the third year they will have driven 43,500 miles (3 x 14,500 miles) instead of the 39,000 miles obtained by accumulating the mileage shown for the first 3 years on table 2. By the end of the fourth year they will have traveled 58,000 miles while table 2 shows this to be the mileage on a 5-year old car. Therefore, it appears that the mileage traveled can be as important to a car's condition and remaining value as the car's chronological age. But, using total miles traveled as the only determinant of a car's condition can be misleading. Some long trips can put a lot of "easy" mileage on a car, while many short trips to the store and around the neighborhood, with a lot of stop-and-go driving, can put fewer, but "very wearing" miles on a car.

The total vehicle cost per mile is lower for the high-mileage drivers, because depreciation in the early years of a car's life is determined more by age than by miles, and because some of the annual or nonrecurring charges, such as garaging and insurance, do not increase in proportion to mileage. A low-mileage driver sustains about the same depreciation, insurance, and garaging costs, but they are distributed over fewer miles and result in a higher cost per mile. Most insurance companies charge lower rates for private and recreational uses of vehicles, and higher rates for vehicles used directly for work or in relation to business. In addition, many companies apply a surcharge for high-mileage drivers in both categories.

To some degree, the purpose for which a car is used, and the circumstances of its use will dictate the vehicle-cost pattern. Once an owner determines his vehicle-use pattern, he may be able to relate his costs to those shown in this report, and decide when it will be most advantageous to him to trade his car. The high-mileage driver may find some repairs and tire replacements moved to earlier years than those shown in this study. Of course, comfort, dependability, and appearance are important to most car owners, and weigh heavily in the automobile purchasing decision.

Business Use of Car—Employers commonly reimburse the costs for an employee's use of his personal car for business purposes. The question uppermost in the mind of each of the parties is, "How much should the reimbursement be?" If an employee uses his automobile only occasionally and incidentally for business purposes, an amount necessary to cover out-of-pocket costs, tire wear, and general wear on the

vehicle should be sufficient. At today's prices 8 to 10 cents per mile should be enough. If the extent or type of use affects his insurance rate, or if it subjects the automobile to unusual loads or operating conditions, the reimbursement should be adjusted upward accordingly. Tolls and parking or storage costs incurred in the course of such use should be paid separately and in full, regardless of per-mile reimbursement. If an employee's job is dependent on his obtaining and using his car in his employer's behalf, reimbursement on the basis of the employee's overall costs per mile seems fair. If, in addition, the employee's frequency of car purchases, the type of automobile bought, or other factors of ownership or upkeep are substantially affected by the employer's requirements, the reimbursement should be sufficient to cover all outlays that exceed what the employee would normally spend for his own nonbusiness automobile transportation. Information concerning reimbursement for private automobile use, can be obtained from business travel advisory services that have made studies of costs for specific vehicles and groups of vehicles under various conditions of use.

Carpooling—Nearly 75 percent of the automobiles used for commuting in the United States carry only one person—the driver. While circumstances can justify some driver-only cars, there are many that could be removed from the rush hour traffic crunch, and their drivers would enjoy advantages and savings available through carpooling.

Out-of-pocket cost is the major saving, as was demonstrated in the Federal Highway Administration publication, "Carpool Savings Analysis," dated December 8, 1975. For a 30-mile round trip to work each day, and by adding only one person to a car (making a 2-person carpool) there was a demonstrated saving of \$366–\$581 annually depending on the size of the car being used. Expanding the carpool to 4 members would result in an annual saving per person of \$847 when a standard-size car is used, \$635 per person when a compact car is used, \$528 per person when a subcompact car is used.

In addition to the direct monetary advantages of this arrangement, there are added benefits in the form of less air pollution, fewer cars on the streets during rush hours so traffic would flow more freely, a lower incidence of accident exposure, substantial energy saving, a guaranteed comfortable seat (usually with pickup and delivery to your door), and less driving for each vehicle owner.

The potential fuel savings are enormous: Increasing the average automobile occupancy for commuting trips to only two persons per car would save the nation 500,000 barrels of gasoline a day.

While the above stated monetary savings are typical

for the Baltimore area, carpool savings can be estimated for other areas with the help of the guidelines in the section titled, "Adjustment of Costs to Other Localities." For additional assistance the "Carpool Savings Analysis" publication can be obtained from the Office of Public Affairs, Federal Highway Administration, Washington, D.C. 20590.

Cost of the Road to the Automobile Owner

America's transportation system today is dominated by more than 100 million automobiles (roughly one car for every two persons in the country) and 20 million trucks. Highways carry about 98 percent of all trips people make and practically all of the goods we use in our daily lives. Our roads and streets literally are the lifelines of the nation.

Most of the costs of building, maintaining and operating the nation's 3.7 million miles of roads and streets are paid by motor vehicle owners through highway-use taxes, such as the gasoline tax. Studies have shown that the benefits highway users receive from improvements to the road system often far outweigh the costs of those improvements. These benefits result from lower operating and accident costs, and reductions in travel time and driving strain.

At the same time, insufficient or inadequate roads can cause car running costs to rise. When traffic is not moving freely, slower speeds and stop-and-go driving increase a car's per-mile fuel consumption. There are more accidents, and the per-mile wear on engine parts, brakes, tires, and so on is much higher. Poorly maintained roads may develop pot holes, broken slabs, obliterated pavement markings, damaged or missing signs, etc. Any of these can contribute to stress or damage to a motor vehicle and to higher repair costs or shorter vehicle life. In this sense, the user taxes which support an adequate highway system save the car owner money he otherwise might have to spend because of driving on poor quality roads or in congested traffic.

In paying the gasoline tax, vehicle registration fees, and other user taxes, the motorist is in a very real sense paying for the roads he is using. It may come as a surprise to some motorists that only 8.7 percent of the owning and operating cost of a standard-size car goes to pay for the roads. For smaller cars roads cost even less.

The cost of the road, as reflected in taxes paid, has been declining in recent years in relation to the overall cost of owning and operating an automobile. In times of rising construction costs, reductions in the per-vehicle contribution for highways are a serious problem for those responsible for administering the highways.

Financing highway construction and maintenance

has become increasingly difficult over the years, because automotive taxes are generally applied as unit charges. The gasoline tax at a certain number of cents per gallon, and the registration fees at a flat rate per vehicle, are not sensitive to price changes. As the cost of labor and products used for highway construction and maintenance rise, the gasoline tax and registration fees do not yield comparably higher revenues. Therefore, except for the possibility of added revenues caused by greater use of gasoline and more vehicles being registered, highway construction and maintenance must be accomplished with tax money that is continuously losing value. Relief occurs only when States raise their tax rates to try to offset inflated costs. Sensitivity to changes in costs would be possible if these taxes were applied on the value of the product, like sales taxes.

Summary of Costs—Saving Opportunities

During the first year of operation the three study cars would have daily owning and operating costs of \$7.44 (standard-size), \$4.83 (compact), and \$3.95 (subcompact). In the second year daily costs would drop by \$1.94 for the standard-size to \$5.50; by 45 cents to \$4.38 for the compact; and by 41 cents to \$3.54 for the subcompact. The daily costs continue to drop, and differences in these costs between car sizes narrow as the years pass. By the time each of the cars has accumulated nearly 60,000 miles, the daily costs are relatively close. They remain close during the next 25,000 miles of travel, so the economic advantage of having a small car during that period would not be great.

Opportunities to Save on Costs—For car owners who wish to reduce their owning and operating costs, a number of possibilities might be suggested. They include: (1) Using radial tires instead of bias ply

tires. The original cost of radials is higher but they last longer, and particularly in over-the-road driving they contribute 5 to 7 percent better gasoline mileage. Tires should be properly inflated for regular use, and a pound or two of pressure may be added for long over-the-road trips with luggage. (2) Joining a car-pool provides adequate transportation in most cases, and cuts car costs by reducing annual vehicle travel. (3) Shopping for money to finance the car purchase is worthwhile, and even more can be saved by using savings and replacing them. (4) A properly tuned car efficiently uses the gasoline purchased. (5) Insurance suited to particular use patterns, and reduced rates for a good safety record are economical. Additional vehicles insured by a family frequently result in a reduced rate, and there may be savings on vehicles used in carpools. (6) Shopping among car dealers may produce a better offer when buying a car, but this saving may be offset by excessive travel to obtain warranty service. (7) Small cars with their smaller engines will save fuel, but the efficiency is dampened substantially as power-robbing features are added. These include automatic transmission, air conditioning, and power steering. (8) Careful reading of the new car warranty and full utilization of every promised service can save substantial costs. If warranty-covered repairs needed are put in writing, and a copy is retained by the owner, this record may be useful in determining responsibility for any repairs requested but not completed once the car goes out of warranty. (9) Minor repairs and replacements by the owner save paying mechanic's wages to have them done.

The bases for estimating the operating costs for each of the study automobiles follow, in modified tabular form in order to emphasize the factors that differ and those that are the same for the three vehicles. The annual costs and per-mile costs shown in tables 2, 3, and 4 are self explanatory.

WORKSHEET TO CONVERT COSTS TO ANY LOCALITY

S.C.R.T.D. LIBRARY

Costs in Your Locality

- 1. Amount paid for your car ----- \$ _____
- 2. Cost of accessory items ----- \$ _____
- 3. Cost of a tire to fit your car ----- \$ _____
- 4. Price of gasoline per gallon (including tax) ----- \$ _____
- 5. Price of oil per quart (including tax) ----- \$ _____
- 6. Annual cost of your insurance ----- \$ _____
- 7. Estimated cost of your daily parking ----- \$ _____
- 8. State registration fee for your car ----- \$ _____
- 9. Sales/titling, and/or personal property tax ----- \$ _____
- 10. Mechanics labor charge per hour ----- \$ _____
- 11. Monthly interest cost (Monthly payment x Number of months for loan less
Amount of loan ÷ Number of months for loan) ----- \$ _____
- 12. Term of your auto loan ----- _____ Months
- 13. Your mileage for the year ----- _____ Miles

Estimated First Year Cost¹

	<i>Total</i>	<i>Cost per mile (Total column ÷ line 13)</i>	
Ownership Costs (First Year)			
14. Depreciation (30% of line 1) -----	\$ _____	_____	cents
15. Accessories (Line 2 ÷ 10) -----	\$ _____	_____	cents
16. Insurance (Line 6) -----	\$ _____	_____	cents
17. Registration fee (Line 8) -----	\$ _____	_____	cents
18. Finance (12 x monthly interest cost) -----	\$ _____	_____	cents
19. Sales/titling, and/or property tax (Line 9) -----	\$ _____	_____	cents
Operating Costs (First Year)			
20. Gasoline (Annual gallons used x line 4) -----	\$ _____	_____	cents
21. Oil (line 13 ÷ owners manual oil change requirement x line 5) -----	\$ _____	_____	cents
22. Tires (2 x line 3 x .25) -----	\$ _____	_____	cents
23. Maintenance and Repair (Line 10 ÷ \$13.50 x First Year Repairs and Maintenance from table 2, 3, or 4) -----	\$ _____	_____	cents
24. Parking (250 x line 7) or actual days parked x daily cost -----	\$ _____	_____	cents
25. Total Cost (Add lines 14-24) -----	\$ _____	_____	cents

¹If you wish to compute your costs for other than the first year, note additional instructions in section titled "Adjustment of Costs to Other Localities".

TABLE 1 - AUTOMOBILE OPERATING COSTS - BASES FOR ESTIMATES

ITEM	STANDARD SIZE AUTOMOBILE	COMPACT SIZE AUTOMOBILE	SUBCOMPACT SIZE AUTOMOBILE
Automobile Description	1976 model 4-door sedan Equipped with: V-8 engine, automatic transmission, power steering and brakes, air conditioning, tinted glass, radio, clock, white stripe radial tires, wheel covers, remote control left-hand mirror, and body protective moulding. Purchase price - \$4,899.	1976 model 2-door sedan Equipped with: 6 cylinder engine, automatic transmission, power steering and brakes, radio, vinyl top, wheel covers, tinted glass, remote control left-hand mirror and body protective moulding. Purchase price - \$3,865.	1976 model 2-door sedan Equipped with: standard equipment plus radio, wheel covers, and body protective moulding. Purchase price - \$3,224.
Repairs and Maintenance	Includes routine maintenance such as lubrications, repacking wheel bearings, flushing cooling system, and aiming headlamps; replacement of minor parts such as spark plugs, fan belts, radiator hoses, distributor cap, fuel filter, and pollution control equipment; minor repairs such as brake jobs, water pump, carburetor overhaul, and universal joints; and major repairs such as a complete "valve job." Costs were calculated using 1976 parts prices and a \$13.50 per hour labor rate.		
Replacement Tires	It was assumed that 3 new regular tires and 4 new snow tires would be purchased during the lives of the standard and subcompact size cars, and 7 new regular tires and 4 new snow tires would be purchased during the life of the compact car.		
Accessories	It was assumed that extra wheels and floor mats would be purchased the first year, seat covers the the sixth year, and miscellaneous items totalling \$2.65 each year.		
Gasoline	Consumption rate of 15 miles per gallon and a gasoline price of 60.9 cents per gallon including taxes were used.	Consumption rate of 21 miles per gallon and a gasoline price of 60.9 cents per gallon including taxes were used.	Consumption rate of 29 miles per gallon and a gasoline price of 60.9 cents per gallon including taxes were used.
Oil	Consumption was associated with gasoline consumption at a rate of 1 gallon of oil for every 167 gallons of gasoline. A price of \$1.06 per quart was used.	Consumption was associated with gasoline consumption at a rate of 1 gallon of oil for every 119 gallons of gasoline. A price of \$1.06 per quart was used.	Consumption was associated with gasoline consumption at a rate of 1 gallon of oil for every 95 gallons of gasoline. A price of \$1.06 per quart was used.
Insurance	Coverage includes \$50,000 combined public liability (\$15,000/\$30,000 bodily injury, and \$5,000 property damage), \$2,500 personal injury protection, uninsured motorist coverage, and full comprehensive coverage for the 10-year period. Deductible collision insurance was assumed for the first 5 years (\$100 deductible).		
Garaging, Parking, and Tolls	Includes monthly charges of \$12.00 for garage rental or indirect cost of the owner's garaging facility, and a toll average of \$6.88 per year; plus parking fee averages of \$70.00 per year for standard size cars, and \$60.00 per year for compact and subcompact size cars. Parking fee and toll fee averages were assigned in proportion to annual travel.		
Taxes	Includes Federal excise taxes on tires (10 cents per pound), lubricating oil (6 cents per gallon), and gasoline (4 cents per gallon); plus the Maryland Tax on gasoline (9 cents per gallon), titling tax (4 percent of retail price), sales tax (4 percent of retail items), and registration fee (\$20.00 for 3,700 pounds or less shipping weight, or \$30.00 for vehicles over 3,700 pounds).		

TABLE 2 - ESTIMATED COST OF OPERATING A STANDARD-SIZE 1976 MODEL AUTOMOBILE ¹

(Total costs in dollars, costs per mile in cents)

Office of Highway Planning
Highway Statistics Division

ITEM	FIRST YEAR (14,500 miles)		SECOND YEAR (13,000 miles)		THIRD YEAR (11,500 miles)		FOURTH YEAR (10,000 miles)		FIFTH YEAR (9,900 miles)			
	TOTAL COST	COST PER MILE	TOTAL COST	COST PER MILE	TOTAL COST	COST PER MILE	TOTAL COST	COST PER MILE	TOTAL COST	COST PER MILE		
Costs Excluding Taxes:												
Depreciation	1,215.00	8.38	748.00	5.75	637.00	5.54	466.00	4.66	340.00	3.43		
Repairs and Maintenance	157.05	1.08	199.95	1.54	414.67	3.61	548.03	5.48	406.52	4.11		
Replacement Tires	30.94	.22	27.74	.21	24.52	.21	24.54	.24	58.09	.59		
Accessories	8.38	.06	7.79	.06	7.19	.06	6.60	.07	6.56	.07		
Gasoline	463.03	3.19	415.13	3.19	367.23	3.19	319.33	3.19	316.14	3.19		
Oil	14.84	.10	13.73	.11	14.84	.13	13.78	.14	19.08	.19		
Insurance	214.00	1.48	200.00	1.54	200.00	1.74	182.00	1.82	182.00	1.84		
Garaging, Parking, Tolls, etc.	250.98	1.73	240.94	1.86	230.21	2.01	220.88	2.21	220.21	2.22		
Total	2,354.22	16.24	1,853.33	14.26	1,896.36	16.49	1,781.16	17.81	1,548.60	15.64		
Taxes and Fees:												
State:												
Gasoline	37.00	.60	78.00	.60	69.00	.60	60.00	.60	59.40	.60		
Registration	30.00	.20	30.00	.23	30.00	.26	30.00	.30	30.00	.30		
Titling	195.76	1.35	-	-	-	-	-	-	-	-		
Sales	8.45	.06	9.97	.07	18.45	.16	23.72	.24	19.61	.20		
Subtotal	321.21	2.21	117.97	.90	117.45	1.02	113.72	1.14	109.01	1.10		
Federal:												
Gasoline	38.67	.27	34.67	.27	30.67	.27	26.67	.27	26.40	.27		
Oil 2/	.21	-	.20	-	.21	-	.19	-	.27	-		
Tires	1.51	.01	1.35	.01	1.20	.01	1.19	.01	2.33	.03		
Subtotal	40.39	.28	36.22	.28	32.08	.28	28.05	.28	29.50	.30		
Total Taxes	361.60	2.49	154.19	1.18	149.53	1.30	141.77	1.42	138.51	1.40		
Total of All Costs	2,715.82	18.73	2,007.52	15.44	2,045.89	17.79	1,922.93	19.23	1,687.11	17.04		
ITEM	SIXTH YEAR (9,900 miles)		SEVENTH YEAR (9,500 miles)		EIGHTH YEAR (8,500 miles)		NINTH YEAR (7,500 miles)		TENTH YEAR (5,700 miles)		TOTALS AND AVERAGE FOR TEN YEARS (100,000 Miles)	
	TOTAL COST	COST PER MILE	TOTAL COST	COST PER MILE	TOTAL COST	COST PER MILE	TOTAL COST	COST PER MILE	TOTAL COST	COST PER MILE	TOTAL COST	COST PER MILE
Costs Excluding Taxes:												
Depreciation	305.00	3.09	292.00	3.08	292.00	3.44	291.00	3.88	277.00	4.66	4,864.00	4.86
Repairs and Maintenance	471.46	4.76	704.82	7.42	280.80	3.30	431.20	5.75	49.63	.87	3,664.13	3.67
Replacement Tires	63.36	.64	55.73	.59	54.38	.64	53.98	.72	54.72	.96	448.00	.45
Accessories	12.70	.13	12.30	.13	11.28	.13	10.26	.14	8.44	.15	91.50	.09
Gasoline	316.14	3.19	303.37	3.19	271.43	3.19	239.50	3.19	182.02	3.19	3,193.32	3.19
Oil	19.08	.19	21.20	.22	19.08	.23	20.14	.27	13.78	.24	169.60	.17
Insurance	140.00	1.42	140.00	1.47	140.00	1.65	140.00	1.87	140.00	2.46	1,678.00	1.68
Garaging, Parking, Tolls, etc.	220.21	2.23	217.54	2.29	210.85	2.48	204.16	2.72	192.12	3.37	2,209.80	2.21
Total	1,548.95	15.65	1,746.96	18.39	1,279.82	15.06	1,390.24	18.54	917.71	16.10	16,317.35	16.32
Taxes and Fees:												
State:												
Gasoline	59.40	.60	57.00	.60	51.00	.60	45.00	.60	34.20	.60	600.00	.60
Registration	30.00	.30	30.00	.32	30.00	.35	30.00	.40	30.00	.52	300.00	.30
Titling	-	-	-	-	-	-	-	-	-	-	195.76	.20
Sales	22.66	.23	31.76	.33	14.62	.17	20.63	.27	5.06	.09	174.93	.17
Subtotal	112.06	1.13	118.76	1.25	95.62	1.12	95.63	1.27	69.26	1.21	1,270.69	1.27
Federal:												
Gasoline	26.40	.27	25.33	.27	22.67	.27	20.00	.27	15.20	.27	266.68	.27
Oil 2/	.27	-	.30	-	.27	-	.29	-	.19	-	2.40	-
Tires	3.09	.03	2.72	.03	2.65	.03	2.63	.04	2.67	.05	21.84	.02
Subtotal	29.76	.30	28.35	.30	25.59	.30	22.92	.31	18.06	.32	290.92	.29
Total Taxes	141.82	1.43	147.11	1.55	121.21	1.42	118.55	1.58	87.32	1.53	1,561.61	1.56
Total of All Costs	1,690.77	17.08	1,894.07	19.94	1,401.03	16.48	1,508.79	20.12	1,005.03	17.63	17,878.96	17.88
^{1/} This estimate covers the total costs of a fully equipped, medium priced, standard size, 4-door sedan, purchased for \$4,899, operated 100,000 miles over a 10-year period, then scrapped for \$35. Baltimore area prices, considered to be in the middle range, were used.												
^{2/} Where costs per mile are less than 1/20 cent, a dash (-) appears in the column.												

TABLE 3 - ESTIMATED COST OF OPERATING A COMPACT-SIZE 1976 MODEL AUTOMOBILE ¹

Office of Highway Planning
Highway Statistics Division

(Total costs in dollars, costs per mile in cents)

ITEM	FIRST YEAR (14,500 miles)		SECOND YEAR (13,000 miles)		THIRD YEAR (11,500 miles)		FOURTH YEAR (10,000 miles)		FIFTH YEAR (9,900 miles)			
	TOTAL COST	COST PER MILE	TOTAL COST	COST PER MILE	TOTAL COST	COST PER MILE	TOTAL COST	COST PER MILE	TOTAL COST	COST PER MILE		
Costs Excluding Taxes:												
Depreciation	536.00	3.70	498.00	3.83	441.00	3.83	402.00	4.02	383.00	3.87		
Repairs and Maintenance	139.33	.96	234.68	1.81	296.88	2.58	386.04	3.86	397.98	4.02		
Replacement Tires	20.23	.14	18.14	.14	30.55	.27	48.05	.48	43.34	.44		
Accessories	7.59	.05	7.07	.05	6.55	.06	6.05	.06	6.02	.06		
Gasoline	330.74	2.28	296.52	2.28	262.31	2.28	228.10	2.28	225.81	2.28		
Oil	14.84	.10	13.78	.10	14.84	.13	13.78	.14	19.08	.19		
Insurance	199.00	1.38	187.00	1.44	187.00	1.63	173.00	1.73	173.00	1.75		
Garaging, Parking, Tolls, etc.	240.98	1.66	230.94	1.78	220.91	1.92	210.88	2.11	210.21	2.12		
Total	1,488.71	10.27	1,486.13	11.43	1,460.04	12.70	1,467.90	14.68	1,458.44	14.73		
Taxes and Fees												
State:												
Gasoline	62.10	.43	55.71	.43	49.32	.43	42.84	.43	42.39	.43		
Registration	20.00	.14	20.00	.15	20.00	.17	20.00	.20	20.00	.20		
Titling	154.60	1.06	-	-	-	-	-	-	-	-		
Sales	7.28	.05	10.95	.09	13.95	.12	18.16	.18	18.66	.19		
Subtotal	243.98	1.68	86.66	.67	83.27	.72	81.00	.81	81.05	.82		
Federal:												
Gasoline	27.60	.19	24.76	.19	21.92	.19	19.04	.19	18.84	.19		
Oil 2/	.21	-	.20	-	.21	-	.19	-	.27	-		
Tires	1.25	.01	1.12	.01	1.89	.02	2.97	.03	2.68	.03		
Subtotal	29.06	.20	26.08	.20	24.02	.21	22.20	.22	21.79	.22		
Total Taxes	273.04	1.88	112.74	.87	107.29	.93	103.20	1.03	102.84	1.04		
Total of All Costs	1,761.75	12.15	1,598.87	12.30	1,567.33	13.63	1,571.10	15.71	1,561.28	15.77		
ITEM	SIXTH YEAR (9,900 miles)		SEVENTH YEAR (9,500 miles)		EIGHTH YEAR (8,500 miles)		NINTH YEAR (7,500 miles)		TENTH YEAR (5,700 miles)		TOTALS AND AVERAGES FOR TEN YEARS (100,000 miles)	
	TOTAL COST	COST PER MILE	TOTAL COST	COST PER MILE	TOTAL COST	COST PER MILE	TOTAL COST	COST PER MILE	TOTAL COST	COST PER MILE	TOTAL COST	COST PER MILE
Costs Excluding Taxes:												
Depreciation	377.00	3.81	354.00	3.73	307.00	3.61	283.00	3.77	249.00	4.37	3,830.00	3.83
Repairs and Maintenance	405.32	4.10	618.16	6.51	293.95	3.46	132.41	1.77	56.25	.99	2,961.00	2.96
Replacement Tires	49.90	.51	53.74	.56	48.08	.57	42.42	.57	32.75	.57	387.20	.39
Accessories	12.16	.12	11.77	.12	10.82	.13	9.84	.13	8.13	.14	86.00	.09
Gasoline	225.81	2.28	216.69	2.28	193.88	2.28	171.07	2.28	130.01	2.28	2,280.94	2.28
Oil	19.08	.19	21.20	.22	19.08	.22	20.14	.27	13.78	.24	169.60	.17
Insurance	135.00	1.36	135.00	1.42	135.00	1.59	135.00	1.80	135.00	2.37	1,594.00	1.59
Garaging, Parking, Tolls, etc.	210.21	2.12	207.54	2.19	200.85	2.36	194.16	2.59	182.12	3.20	2,108.80	2.11
Total	1,434.48	14.49	1,618.10	17.03	1,208.66	14.22	988.04	13.18	867.04	14.16	13,417.54	13.42
Taxes and Fees:												
State:												
Gasoline	42.39	.43	40.68	.43	36.45	.43	32.13	.43	24.39	.43	428.40	.43
Registration	20.00	.20	20.00	.21	20.00	.24	20.00	.26	20.00	.35	200.00	.20
Titling	-	-	-	-	-	-	-	-	-	-	154.60	.16
Sales	19.46	.20	28.19	.30	14.88	.17	8.19	.11	4.43	.07	144.15	.14
Subtotal	81.85	.83	88.87	.94	71.33	.84	60.32	.80	48.82	.85	927.15	.93
Federal:												
Gasoline	18.84	.19	18.08	.19	16.20	.19	14.28	.19	10.84	.19	190.40	.19
Oil 2/	.27	-	.30	-	.27	-	.29	-	.19	-	2.40	-
Tires	3.11	.03	3.32	.04	2.98	.04	2.63	.04	2.02	.04	23.97	.02
Subtotal	22.22	.22	21.70	.23	19.45	.23	17.20	.23	13.05	.23	216.77	.21
Total Taxes	104.07	1.05	110.57	1.17	90.78	1.07	77.52	1.03	61.87	1.08	1,143.92	1.14
Total of All Costs	1,538.55	15.54	1,728.67	18.20	1,299.44	15.29	1,065.56	14.21	868.91	15.24	14,561.46	14.56
^{1/} This estimate covers the total costs of a medium priced, compact size, 2-door sedan, purchased for \$3,865, operated 100,000 miles over a 10-year period, then scrapped for \$35. Baltimore area prices, considered to be in the middle range, were used. ^{2/} Where costs per mile are less than 1/20 cent, a dash (-) appears in the column.												