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Daubert, John Thoma/Cost of owning a self-

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Quick Facts

Recreational vehicles have become attractive alternatives to conventional modes of vacation lodging and transportation.

A self-contained recreational vehicle includes kitchen, bedroom and bathroom facilities.

The expense of ownership and operation of a self-contained recreational vehicle can be separated into fixed and variable costs.

Fixed costs include depreciation, interest, license taxes and insurance.

Variable costs include fuel, tires, repair and maintenance.

Of the four types of recreational vehicles, motor homes require the greatest investment.

Recreational vehicles, such as motor homes, trailers and pickup campers, provide features that make them increasingly attractive alternatives to conventional modes of vacation lodging and transportation. Improvements in materials and methods of construction permit extended use of the vehicles with relatively little maintenance and repair.

The combined characteristics of mobility and self-containment provide, for many recreationists, a desirable middle ground between tent-camping and commercial lodging. Recreational units can be equipped with most of the conveniences found in the home, such as cooking, sleeping and sanitary facilities, and yet the vehicle can be taken to sites accessible by almost any semi-improved road.

Recreational vehicles are classed as self-contained if they include kitchen, bedroom and bathroom facilities.

The expense of ownership and operation of a self-contained recreational vehicle can be separated into fixed and variable costs. Fixed cost items are those that accrue to the owner regardless of amount of use, including depreciation, interest, license, taxes and insurance. Variable costs are those which increase directly with use, including fuel, tires, repair and maintenance.

Of the four types of recreational vehicles, motor homes require the greatest investment. Motor homes combine living quarters and the power source into one specially constructed vehicle. The driver and front passenger seats rotate to become part of the living space.

Mini homes are similar to motor homes except for the smaller size and the partitioning of the camping unit from the driving compartment. Trailers are self-contained, towed camping units. The towing vehicle is usually a larger automobile or a pickup truck. The self-contained camping units that are designed to be mounted on a $\frac{3}{4}$ -ton (680.4 kilogram) pickup truck are categorized as campers.

Prices of the representative models reflect the 1976 new purchase price. The prices were computed by finding the average price of at least three different brands of models with similar lengths. Most purchasers of motor mini homes select air conditioning, maximum size refrigerator and furnace, generator and dual gas tanks, so these options are included in the price of each vehicle. The price of trailers and campers contain the necessary equipment to make the unit self-

Cost of owning a self-contained recreational vehicle

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contained. It is assumed that the towing vehicle or pickup truck is fitted with requirements for towing or carrying the camping unit which include heavy-duty suspension and towing hitch.

Fixed Costs

Fixed costs are summarized in Table 1.

Depreciation represents an estimate of the value used up each year of the life of the equipment. Depreciation can arise from physical deterioration, obsolescence due to design and technological improvements, and other intangible factors of inadequacy, such as the inability of the vehicle to fulfill the needs of the individual. Depreciation is computed by using the straight-line method:

$$\text{annual depreciation} = \frac{\text{new price} - \text{salvage value}}{\text{years life}}$$

Salvage value is defined as the estimated value of the recreational vehicle at the end of the specified life. Salvage value is found by multiplying the new price times a "salvage ratio." The salvage ratio is expressed as a percentage of new price and is based upon Blue Book resale values of the various models at the end of the estimated average life.

The **interest charge** represents the foregone financial returns of the investment. The annual interest cost is calculated by multiplying the average investment times the interest rate, where average investment equals the new price plus the salvage value divided by 2. The interest rate was estimated as the average market interest rate, or 8 per cent.

Personal property taxes on each vehicle are based upon age and original purchase price. As each vehicle ages, the value is assumed to decrease which lowers the tax. Taxes on motor and mini homes included a license fee based on the weight of the vehicle.

Insurance coverage for motor and mini homes was calculated on the basis of a no-fault policy, including liability (\$100,000/\$300,000/\$10,000), comprehensive and collision (\$100 deductible). Only comprehensive and collision are necessary insurance coverage for trailers and campers. Insurance premiums were estimated for the life of the recreational vehicle and divided by the average life to find an average annual insurance cost.

Variable Costs

Variable costs are summarized in Table 2. (Note: In this section, metric equivalents have been omitted to allow clarity; they can be determined by using the following conversions - 1 mile = 1.6 kilometers; 1 gallon = 3.8 liters.)

Fuel cost per mile is calculated by dividing the cost of fuel per gallon by the miles per gallon achieved by the respective recreational vehicles. Miles per gallon were derived from the consensus estimate of the interviewed salesmen to the effect that mileage is 9 mpg for motor homes and 10 mpg for mini homes.

These figures were used for the shortest length in each category and adjusted 1 mpg downward for each increase in length. The downward adjustment was made to reflect the fact

1/ John Daubert, CSU graduate student, and R. A. Young, CSU professor, both department of economics (7/15/76)

that with each increase in length there is a subsequent increase in weight which would cause identical engines to achieve less fuel economy.

Motor homes are available with either 440 or 454 cid V-8 engines. Mini homes are equipped with either a 350 or 360 cid V-8 engine. All engines consume nonleaded gas obtainable at an estimated 60 cents per gallon.

Fuel cost for trailers reflects the extra cost (decrease in miles per gallon) from towing a trailer. Fuel cost for the longest trailer was estimated, assuming a mid-sized V-8 Oldsmobile was the towing vehicle. Fuel consumption declined from 17 without the trailer to 9 when towing. Since all trailers weigh less, it is assumed that the decrease in miles per gallon is less. The make of the towing vehicle plays an important role in determining fuel consumption.

Fuel cost for campers was calculated in a fashion similar to that for trailers. The decrease in miles per gallon was assumed to be 4 for the 9.5' (and 6 for the 11') camper. Calculations are based on the assumption that as the weight increases fuel consumption will increase.

Maintenance cost of the chassis was estimated by adding the basic maintenance items of 1) oil, lubrication and filter every 3,000 miles at a cost of \$13.40, 2) a tune-up every 10,000 miles at a cost of \$55, and 3) wheel bearing repacking every 20,000 miles costing \$20. This total amount then was divided by the estimated average annual miles.

Repair cost to the chassis is an estimate of the repair per year required to the engine. The estimate of \$75 is divided by the annual miles to arrive at a repair cost per mile.

Maintenance of the camping unit consists of winterizing the unit. The cost of winterizing includes \$15 for service and \$12 for antifreeze. Annual repair of the camping unit is calculated by multiplying an estimated fixed percentage (0.5 per cent) times the new price. The two costs are added together and divided by the average annual miles.

Cost of tire replacement is computed by finding the average cost of recommended 8-ply bias belted tires for use on motor and mini homes, and 4-ply bias belted tires for trailers. This amount, which includes the cost of balancing and alignment, is divided by the average miles of expected tire life. The tire sizes are 7.00 x 15 for trailers over 23 feet (7.0 m) in length and motor and mini homes, and 7.15 x 15 for trailers 23 feet (7.0 m) or less in length.

It is assumed that tire wear will increase with each length and corresponding increase in weight. (A 10-per-cent increase for each increase in length of motor and mini home and every two increases in length for trailers was used.)

The process of towing a trailer or carrying a camper will cause increased wear and tear to the towing vehicle. This cost is estimated by multiplying an annual repair multiplier of 0.5 per cent times the new price, then converting to a per-mile figure.

Table 1: Fixed costs of owning and operating recreational vehicles.

Length (feet [meters])	1976 new price (\$)	Assumed average life (years)	Assumed salvage ratio (%)	Salvage value (\$)	Annual depreciation (\$)	Interest on investment 1/ (\$)	Taxes (\$)	Insurance (\$)	Total Annual fixed costs (\$)
Motor homes									
20 ft (6.1 m)	14,100	10	25	3,525	1,058		5705		132
23 ft (7.0 m)	15,400	10	25	3,850	1,155	770	139		
25 ft (7.6 m)	20,500	12	25	5,125	1,281	1,025	150	184	2,640
28 ft (8.5 m)	22,800	12	25	5,700	1,425	1,140	161	198	2,924
Mini homes									
19 ft (5.8 m)	13,600	10	25	3,400	1,020	688	128	161	1,997
22 ft (6.7 m)	15,400	10	25	3,850	1,155	770	139	170	2,234
Automobile	5,000	10	15	750	425	230	38	110	803
Trailers									
19 ft (5.8 m)	4,600	10	15	690	391	212	38	25	666
20 ft (6.1 m)	5,000	10	15	750	425	230	40	33	728
23 ft (7.0 m)	5,800	10	15	870	522	267	46	33	868
25 ft (7.6 m)	8,400	12	15	1,260	595	386	58	49	1,088
27 ft (8.2 m)	10,500	12	15	1,575	744	483	70	60	1,357
30 ft (9.1 m)	11,300	12	15	1,695	800	520	75	60	1,455
Pickup truck	4,100	10	15	615	348	189	31	100	668
Campers									
9.5 ft (2.9 m)	3,400	10	10	340	306	150	21	25	502
11 ft (3.4 m)	4,000	10	10	400	360	176	26	25	587

1/ See text for assumptions and method of calculation.

(Interest rate used in computing interest on investment was estimated to be 8 per cent.)

Table 2: Variable costs per mile of operating recreational vehicles.

Lengths (feet [meters])	1976 new price (\$)	Assumed average life (miles)	Fuel consumption 1/ (mpg)	Fuel cost 2/ (per mile)	Chassis maintenance cost (per mile)	Chassis repair cost (per mile)	Camper repair and maintenance (per mile)	Tire cost (per mile)	Total Variable cost (per mile)
Motor homes									
20 ft (6.1 m)	14,100	75,000	9	.067	.011	.01	.012	.014	.114
23 ft (7.0 m)	15,400	75,000	8	.076	.011	.01	.013	.015	.124
25 ft (7.6 m)	20,500	100,000	7	.086	.011	.009	.015	.016	.137
28 ft (8.5 m)	22,800	100,000	6	.10	.011	.009	.016	.017	.153
Mini homes									
19 ft (5.8 m)	13,600	75,000	10	.06	.011	.01	.012	.013	.107
22 ft (6.7 m)	15,400	75,000	9	.067	.011	.01	.013	.015	.116
Automobile	5,000	100,000	17	.035	.011	.01	—	.014	.07
Trailers			decrease in mpg	Extra fuel cost		Extra repair cost to towing vehicle			
19 ft (5.8 m)	4,600	75,000	4	.011	—	.003	.006	.006	.016
20 ft (6.1 m)	5,000	75,000	4	.011	—	.003	.006	.006	.027
23 ft (7.0 m)	5,800	75,000	6	.019	—	.004	.007	.007	.037
25 ft (8.2 m)	10,500	100,000	6	.019	—	.005	.008	.014	.046
27 ft (8.2 m)	10,500	100,000	8	.032	—	.005	.009	.015	.061
30 ft (9.1 m)	11,300	100,000	8	.032	—	.006	.009	.015	.062
Pickup truck	4,100	100,000	12	.05	.011	.01	—	.014	.085
Campers									
9.5 ft (2.9 m)	3,400	75,000	3	.016	—	.002	.005	—	.023
11 ft (3.4 m)	4,000	75,000	4	.025	—	.003	.006	—	.034

*1/ Motor and mini homes are available with either 440 or 360 cid engines; automobile and pickup trucks were equipped with 350 V-8 engines.

2/ Full price, 60 cents per gallon.

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