

9.5: Operating and Maintaining a Vehicle

Objective: SWBAT compute the total cost per mile of operating and maintaining a vehicle.

Many costs are involved in operating and maintaining a vehicle. You'll need to take these costs into consideration.

- **Variable costs** (such as gasoline and tires) increase the more you drive.
- **Fixed Costs** (such as vehicle insurance, registration fees, and depreciation) remain about the same regardless of how many miles you drive.
- **Depreciation** is a decrease in the value of your vehicle because of its age and condition.

$$\text{Cost per mile} = \frac{\text{Annual Variable Cost} + \text{Annual Fixed Cost}}{\text{Number of Miles Driven}}$$

Warm Up:

It looks like there might be a very good chance that you will be driving a Hummer. Before buying the vehicle, or any vehicle for that matter, what are some costs that you should take into account? List as many as you can think of.

Example 1:

Ann Jones purchased a used vehicle for \$4,000 one year ago. She drove 9,000 miles during the year and kept a record of all her expenses. She estimates the vehicle's present value at \$3,200. Her fixed and variable costs are shown in the figure below. What was the cost per mile for Jones to operate her vehicle last year?

Variable Costs		Fixed Costs	
Gasoline	\$591.24	Insurance	\$385.40
Oil changes	71.85	License/registration	76.25
Maintenance	114.36	Depreciation	800.00
New Tire	41.75	(\$4000 - \$3,200)	
Total	\$819.20	Total	\$1,261.65

Step 1: Find the cost per mile.

(Annual Variable Cost + Annual Fixed Cost) ÷ Number of Miles Driven

$$\left(\$819.20 + \$1,261.65 \right) \div 9,000 =$$

$$\$2,080.85 \div 9,000 = \mathbf{\$0.231 \text{ or } \$0.23} \leftarrow \text{Cost per mile}$$

Example 2:

Lucas Perry purchased a new four-door car 2 years ago at a price of \$21,750. *Kiplinger* estimates it is worth \$13,920 today. The *Complete Car Cost Guide* computes the annual variable cost to be \$595.20 per year with insurance costing \$1,461 per year. Perry paid \$112.60 for license and registration fees and drove 16,500 miles during the year. After computing the depreciation and the total annual cost, find the cost per mile.

Step 1: Find the depreciation.

(Purchase Price – Today's Worth) / Number of Years Owned

$$\left(\$21,750.00 - \$13,920.00 \right) / 2 = \mathbf{\$3,915.00} \leftarrow \text{Depreciation}$$

Step 2: Find the total annual cost.

$$\$595.20 + (1,461.00 + \$3,915.00 + \$112.60) = \mathbf{\$6,083.80} \leftarrow \text{Total Annual Cost}$$

Step 3: Find the cost per mile.

(Annual Variable Cost + Annual Fixed Cost) / Number of Miles Driven

$$\frac{\$6,083.80}{16,500}$$

$$= \mathbf{\$0.3687 \text{ or } \$0.37} \leftarrow \text{Cost per mile}$$

Self Check Answers:

1. \$3,600
2. \$0.36
5. \$1,600
6. \$6,158.10
7. \$0.45