

The Mileage Wizard What Is It? How Does It Work?

The Mileage Wizard is a formula for determining how much each carpool passenger pays to the driver. The following is a detailed explanation of the Mileage Wizard formula.

The Wizard starts by obtaining some baseline data for the cost per mile to operate a passenger vehicle. This baseline data is obtained from a publication of the AAA, called “Your Driving Costs”. This publication is revised annually, and is available from this web page:

<http://exchange.aaa.com/automobiles-travel/automobiles/gas-pricing/>

The data in “Your Driving Costs” are subdivided into **Ownership (per year) costs** (insurance, licenses & taxes, depreciation), and **Operating (per mile) costs** (gas, tires, maintenance). These data are further subdivided by **vehicle size** (small sedan, medium sedan, large sedan, SUV, minivan).

Since everyone pays their Ownership (per year) costs regardless of whether they are a driver or passenger, these costs are not included in the calculations. The Wizard uses only the Operating (per mile) costs (gas, tires, maintenance); and, for simplicity, takes the average of the 5 vehicle size types.

The information in “Your Driving Costs” is based on data collected in the Fall of the preceding year. For example, the 2010 edition of “Your Driving Costs” is based on data from October 2009. This baseline data must therefore be adjusted for price changes since the date of collection. The Wizard adjusts the gasoline cost separately from the tires and maintenance costs.

The current local average price of gasoline (Regular Unleaded for Oakland, CA) is available from this AAA web page:

<http://fuelgaugereport.aaa.com/states/california/california-metro/>

The change in the CPI-U (Consumer Price Index-Urban) can be calculated from this handy web page:

http://inflationdata.com/inflation/Consumer_Price_Index/CurrentCPI.asp?reloaded=true

Note that the most recent CPI-U is always between 30 and 46 days old.

The Wizard adjusts the baseline gasoline cost per mile by multiplying it by the ratio of the most recent gasoline price to the price used in the AAA “Your Driving Costs”. Similarly, the Wizard adjusts the baseline tire and maintenance costs by multiplying them by the ratio of the most recent CPI-U to the CPI-U of the the month from which the AAA data were taken.

The total operating cost per mile for the vehicle is the sum of the adjusted gasoline cost and the adjusted tire and maintenance costs.

Finally, the rate each passenger pays is determined by dividing the total cost per mile by the Apportionment Factor. The Apportionment Factor is set at 2.0 for all carpool vehicles, according to

club rules. (*see footnote)

A sample calculation follows:

Operating (per mile) costs extracted from the 2010 edition of “Your Driving Costs” :

	Small Sedan	Medium Sedan	Large Sedan	4WD SUV	Minivan
Gas	9.24 cents	11.97 cents	12.88 cents	16.38 cents	13.70 cents
Maintenance	4.21 cents	4.42 cents	5.0 cents	4.95 cents	4.86 cents
Tires	0.65 cents	0.91 cents	0.94 cents	0.98 cents	0.75 cents

Calculate the baseline data:

Gas average = 12.83 cents/mile (assuming gas = \$2.603 / gallon).

Maintenance+Tires average = 5.53 cents/mile (data from around October 2009).

Apply the adjustments (for July 20, 2010):

G (gas) = 12.83 cents * $\$3.172 / \$2.603 = 15.63$ cents

$M+T$ (maintenance+tires) = 5.53 cents * $217.965 / 216.330 = 5.57$ cents

Total = $G + M+T = 21.20$ cents (per mile)

Apply the Apportionment Factor:

Passenger Rate = $21.20 / 2.0 = 10.6$ cents per mile

For simplicity, the rate is rounded to the nearest whole number; so in this case it would be 11 cents per mile.

*The value of the “Apportionment Factor” and its method of application to carpool vehicles has been a controversial issue. It has been debated numerous times at club meetings.

The method in use (a value of 2.0 for all vehicles) has been agreed to, by the following reasoning:

- All carpool passengers pay the same amount, regardless of which vehicle they ride in. Thus it makes no difference from the passenger's point of view as to which car s/he rides in. This helps avoid the “odd person out” problem. In order to equalize the drivers' receipts among the different drivers, as far as is practical and reasonable, passengers should be divided up equally among vehicles. Passengers should be willing to do this since it makes no difference which car they ride in.
- If a vehicle has just 2 people (driver + 1 passenger), then the driver and passenger share equally in the cost of the trip.
- If a vehicle has 3 people (driver + 2 passengers), then the passengers pay the driving expenses and the driver supplies his/her labor.
- If a vehicle has 4 or more people, then the passengers pay the driving expenses and the driver earns a small remuneration.

Last update 5/17/14 has revised URLs