Estimating shared transport costs on snow trips

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This article, based on members' suggestions (and my own researchinto the *RACV factored* method) presents four methods for estimating shared transport costs on snow trips. The committee takes no view about them, leaving you to use them, or not, as you wish. The *RACV factored* method (referred to on the MNSC website as 'RACV adjusted') involves complexity which I've hidden as much as possible, but my document Rationale for 'RACV factored' method.pdf describes how I developed it.

Note: *energy* refers to whatever powers your vehicle — petrol, diesel, LPG or electricity.

Current method

Table of marginal running costs — now replaced by an online calculator with fresh data.
Visit https://www.melbourne-nordic.org.au/Pages/plain.php?page_id=104

New methods

- Simple MNSC
- Simple YHA
- RACV factored

'Simple' methods

Thanks to one our members for the *Simple MNSC* (my name for it) method, which resembles a formula recommended by the Youth Hostels Association,

https://yhaski.com/costs.html

Table 1: Cost per occupant, 'Simple' methods

Method	Cost per occupant ($)
simple MNSC	$\frac{1.5 \times [\text{your energy purchase (\$)}]}{[\text{no. of occupants}]}$
simple YHA	$\frac{2 \times [\text{your energy purchase (\$)}]}{[\text{no. of occupants}]}$

Advantages:
- simple and easy
- reflects current fuel price

Disadvantages: rationale (how it works) is not evident

Example: A driver's petrol costs after a trip are $240.

Using the *Simple MNSC* formula, driver charges the three passengers
(1.5 × 240)/4 = **$90** each

Or, by the *Simple YHA* method, charge would be
(2 × 240)/4 = **$120** each

'RACV factored' method (developed by M Sinclair)

This method uses data from four years of the RACV's annually published car running-cost survey. It's 'factored' because I've used factors to adjust this data to reflect current energy prices.
If you enjoy gory details, see my document *Rationale for 'RACV factored' method.pdf* which explains how the *RACV factored* method works.

Method

There are two steps in the process. Proceed as follows:

Step 1. From Table 2 (pp 2 and 3), choose a formula based on your type of vehicle.

Table 2: Cost per occupant, 'RACV factored' method

Vehicle category		Cost per occupant ($)
Car	Micro 1.0 - 1.4 L	$\frac{0.001085 \times [\text{retail energy rate}] \times \text{distance}}{[\text{no. of occupants}]}$
	Light 1.2 - 1.5 L	$\frac{0.001179 \times [\text{retail energy rate}] \times \text{distance}}{[\text{no. of occupants}]}$
	Small 1.6 - 2.0 L	$\frac{0.001292 \times [\text{retail energy rate}] \times \text{distance}}{[\text{no. of occupants}]}$
	Medium 1.4 - 2.5 L	$\frac{0.001361 \times [\text{retail energy rate}] \times \text{distance}}{[\text{no. of occupants}]}$
	Large 2.0 - 4.0 L	$\frac{0.001625 \times [\text{retail energy rate}] \times \text{distance}}{[\text{no. of occupants}]}$
	Sports 1.4 - 2.2 L	$\frac{0.001646 \times [\text{retail energy rate}] \times \text{distance}}{[\text{no. of occupants}]}$
People mover 2.4 - 3.3 L		$\frac{0.001680 \times [\text{retail energy rate}] \times \text{distance}}{[\text{no. of occupants}]}$
Electric vehicle 65 - 450 kW		$\frac{0.000990 \times [\text{retail energy rate}] \times \text{distance}}{[\text{no. of occupants}]}$

The *retail energy rate* is the energy retailer's advertised price for:

- petrol/diesel/LPG in cents per litre, or
- electricity in cents per kWh

Table 2: Cost per occupant, 'RACV factored' method (Cont'd)

Vehicle category		Cost per occupant ($)
SUV	2WD, small 1.2 - 2.0 L	$\frac{0.001337 \times [\text{retail energy rate}] \times \text{distance}}{[\text{no. of occupants}]}$
	medium 1.5 - 2.5 L	$\frac{0.001521 \times [\text{retail energy rate}] \times \text{distance}}{[\text{no. of occupants}]}$
	large 2.0 - 3.0 L	$\frac{0.001660 \times [\text{retail energy rate}] \times \text{distance}}{[\text{no. of occupants}]}$
	all-terrain 2.4 - 3.2 L	$\frac{0.001678 \times [\text{retail energy rate}] \times \text{distance}}{[\text{no. of occupants}]}$
Ute	2WD 2.2 - 4.0 L	$\frac{0.001653 \times [\text{retail energy rate}] \times \text{distance}}{[\text{no. of occupants}]}$
	4WD 2.0 - 3.2 L	$\frac{0.001636 \times [\text{retail energy rate}] \times \text{distance}}{[\text{no. of occupants}]}$

The *retail energy rate* is the energy retailer's advertised price for:

- petrol/diesel/LPG in cents per litre, or
- electricity in cents per kWh

The *RACV factored* formula requires you to insert a *retail energy rate* value into the formula. This is a simple matter if you noted the *cost* (cents per litre [petroleum-based] or cents per kWh [electricity]) of your energy at point of sale. If you have not recorded that figure, there are a few websites that can give you (for petroleum-based energy only) a reasonable idea of the value, for example:

- RACV's *Find your local fuel prices* web page (see Fig 1)
  https://www.racv.com.au/on-the-road/driving-maintenance/fuel-prices.html, or
- *FuelPrice Australia* (see Fig 2)
  https://fuelprice.io/vic/

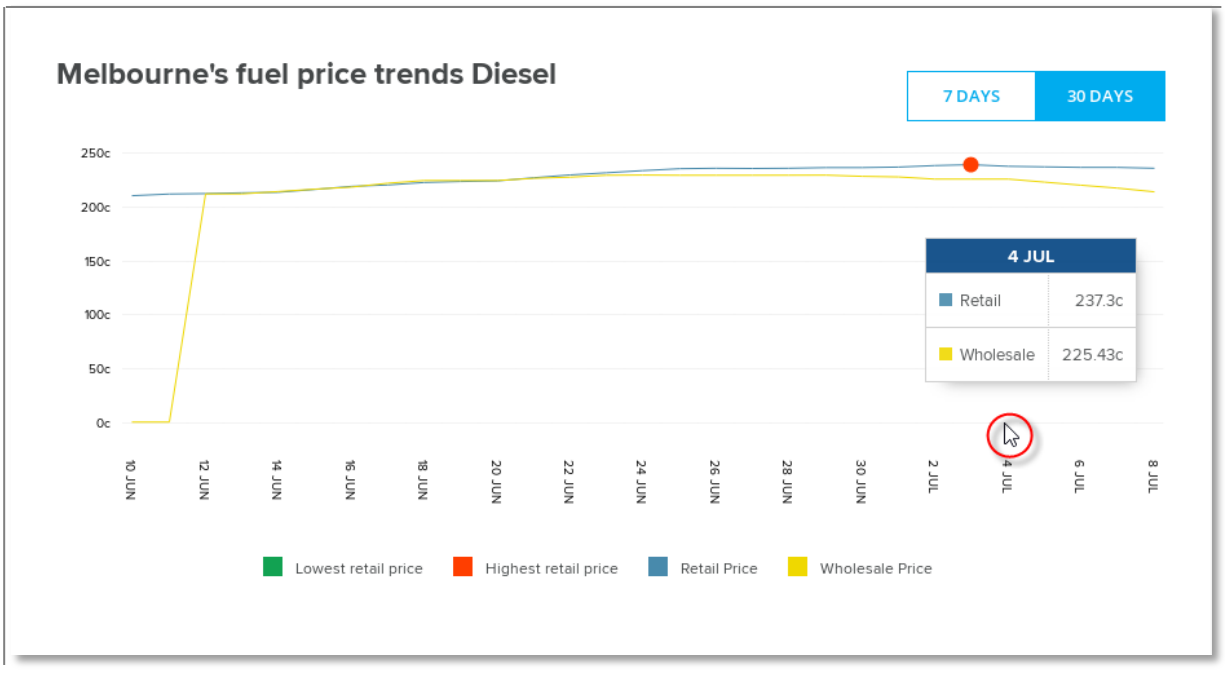

Fig 1 RACV *Find your local fuel prices* web page showing 30-day history of fuel prices

Fig 2 *FuelPrice Australia* web panel showing historic petrol pricing

Note: At present, neither current nor retrospective data on retail electricity rates appear to be available for electric vehicle charging stations. Visit https://www.evchargingmap.com.au/

Having obtained your *retail energy rate*, proceed to step 2.

Step 2. Insert

- the *retail energy rate*,
- your trip distance, and
- number of occupants of your vehicle

into the formula you chose in step 1 to obtain the amount you'll charge your passengers.

Advantages:
- takes account of energy prices
- maps RACV vehicle statistics to current energy prices by reference to data published by energy research bodies (Australian Energy Market Commission, *Australian Competition and Consumer Commission* and *Australian Institute of Petroleum*)

Disadvantages:
- unless you recorded your *retail energy rate* at point of sale, the formula requires an internet look-up

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Examples

Petroleum vehicle	Mary drives 3 passengers to Howman Gap (380 km) in her large diesel SUV on Jul 4. **Note**: to keep things simple, we're looking at a *one-way trip only*. She chooses the *SUV, large* formula $$\frac{0.001660 \times [\text{retail energy rate}] \times \text{distance}}{[\text{number of occupants}]}$$ to calculate her costs. As Mary didn't note the petrol station's prices, she checks the RACV *Find your local fuel prices* web page to find that the average diesel price on Jul 4 was 237.3 ¢/L. So her calculation is: $(0.001660 \times 237.3 \times 380)/4$ making a per-passenger charge of about **$37**
Electric vehicle	Joe returns with one passenger from Cann River (370 km) in his electric hatchback. He chooses the *Electric vehicle* formula $$\frac{0.000990 \times [\text{retail energy rate}] \times \text{distance}}{[\text{number of occupants}]}$$ to calculate his costs. On doing a level 2 recharge in Melbourne, he notes the charging station's rate of 32¢/kWh. So his calculation is: $(0.000990 \times 32 \times 370)/2$ so, his passenger pays him **$6**

MNSC *Table of marginal running costs*

One of our past members, Ian Cochrane, devised a handy *Table of marginal running costs* some years ago. The only method presented in the *Crosswords* newsletter in recent times, some members were concerned about the reliability of the data and methodology of the tool. Thanks to John Banks for aligning the data with current energy prices, and presenting it on our website in the form of an online calculator. This 'Old car sharing table' is still available on our *Car sharing guidelines* web page.