Australian Government
Department of Infrastructure and Regional Development
Bureau of Infrastructure, Transport and Regional Economics

# Who's using the roads: variations in usage by drivers

## At a glance

An examination of variations in road usage by drivers has found that:

- Use of the roads is highly unequally distributed among drivers, particularly for motorcycles and 'other' trucks.
- Most vehicles are driven relatively low distances, with a few driven long distances.
- Half of all car kilometres are driven by only a fifth of drivers.

## Variations in usage by drivers

Road usage imposes a cost for maintaining, constructing and reconstructing the Australian road system. Annually, this cost is about $18 billion per year (see BITRE 2013). There is also the cost of congestion in our cities that has been estimated at about $15 billion per year, as a result of travel delays on our roads (see BTRE 2007). The cost of road deaths and injuries has been estimated at $27 billion per year (see BITRE 2009). The costs of city pollution, road noise and other environmental costs are also important.

Current road cost recovery is through registration fees ($7.5 billion), tolls ($1.5 billion), excise on fuel purchases ($9 billion) and the National Heavy Vehicle Charges Determination (which works using registration and road user charges). Only the tolls, excise and road user charges vary with actual use of the roads.

This Information Sheet seeks to analyse the distributional features of the amounts of road usage by drivers.

### *The Data*

The Australian Bureau of Statistics has recently published some data that addresses this question. The data includes for each vehicle type the average distance travelled per year by the 20$^{th}$, 40$^{th}$, 50$^{th}$, 60$^{th}$, 80$^{th}$, 95$^{th}$, and 99$^{th}$ percentile of drivers.

This paper includes an interpolation between the points allowing calculation of three streams of distributional data:

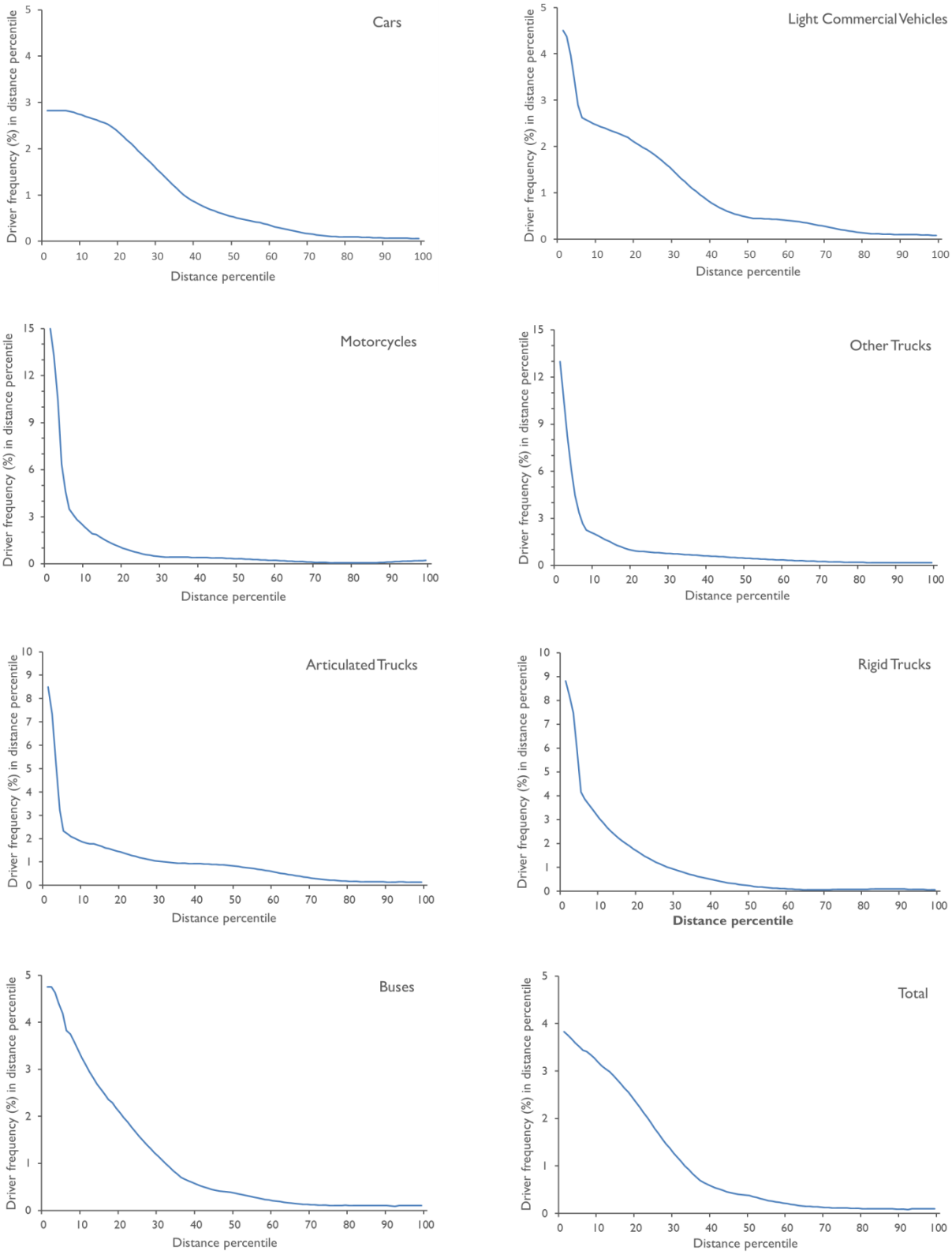
1) Driver frequency by distance driven
2) Cumulative driver frequency by distance driven
3) Share of road use by drivers driving different distances

The nature of these three distributions for each vehicle type will be examined, before implications are drawn from these.

## *Road Use Distributions*

The most basic distributions have to do with the percentage of drivers doing each distance percentile (from zero kilometres to the kilometres driven by those who travel the largest distance - the 99th percentile of drivers). Figure 1 shows these distributions by vehicle type for all vehicles registered for use on the road in Australia.

Figure 1: Percentage of drivers by distance driven



The distributions can be roughly divided into three groups:

1) L-SHAPED distributions, having extremely large numbers of drivers with low levels of usage, and correspondingly few drivers travelling larger distances (motorcycles, articulated trucks and other trucks)
2) More STRAIGHT-LINE DECLINING distributions showing a somewhat more even number of drivers across the distance range (cars, buses and all vehicles)
3) INTERMEDIATE distributions (rigid trucks and light commercial vehicles).

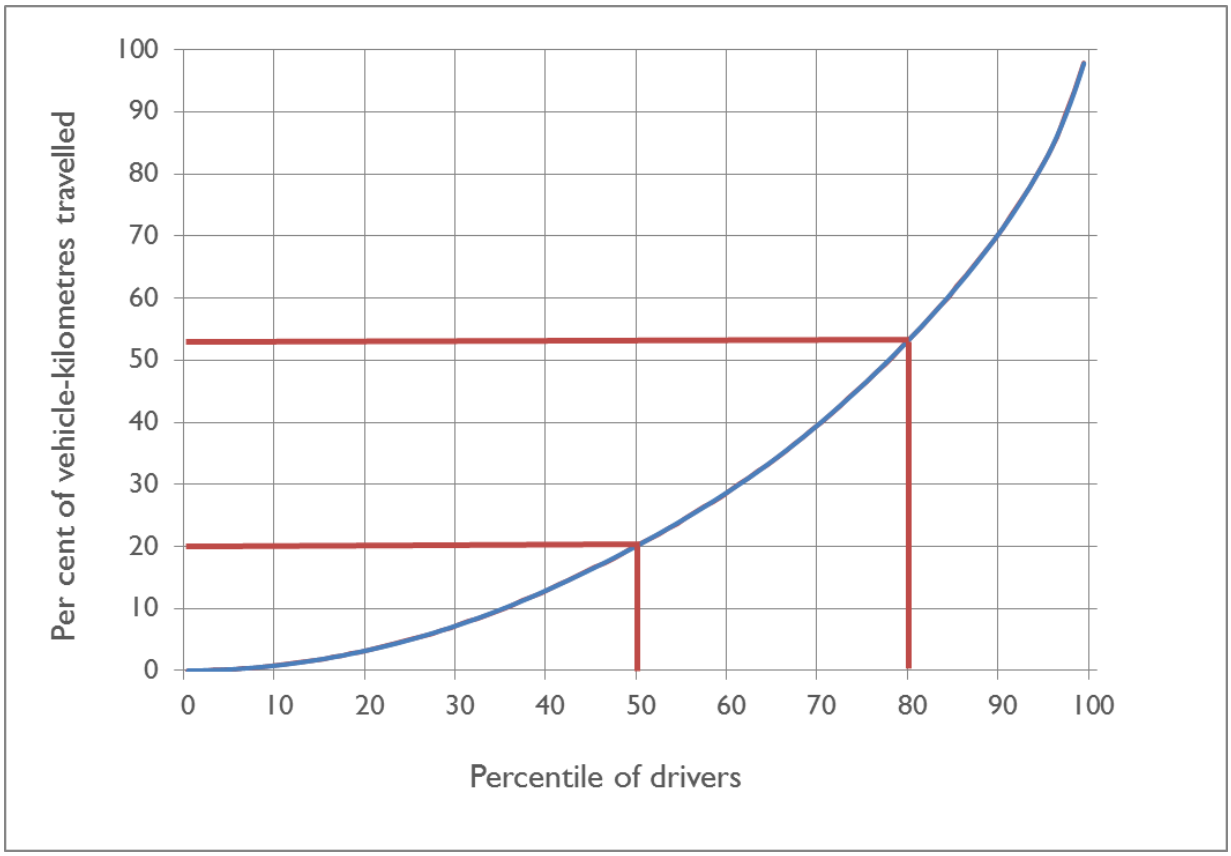
But all three types of distributions share a weighting of drivers toward low distances driven.

Figure 2 shows the share of road use accounted for by car drivers at or below increasing distance percentiles.

From Figure 2 it can be seen that drivers at or below the 50th percentile are responsible for only 20 per cent of car road use. The 20 per cent of drivers, at or above the 80th percentile by distance driven, are responsible for almost 50 per cent of road use.

So for cars, the *most evenly* distributed road use group, there appears to be something like a 50:20 / 20:50 rule applying – i.e. the bottom half of the drivers are responsible for a fifth of road use, while the top fifth of the drivers are responsible for almost half of road use.

Figure 2 Share of road use by percentile of car drivers (by distance driven)



The comparisons are even more skewed for the other vehicle types, as can be seen in Figure 3.

Figure 3 Shares of road use by percentile of drivers (by distance driven)

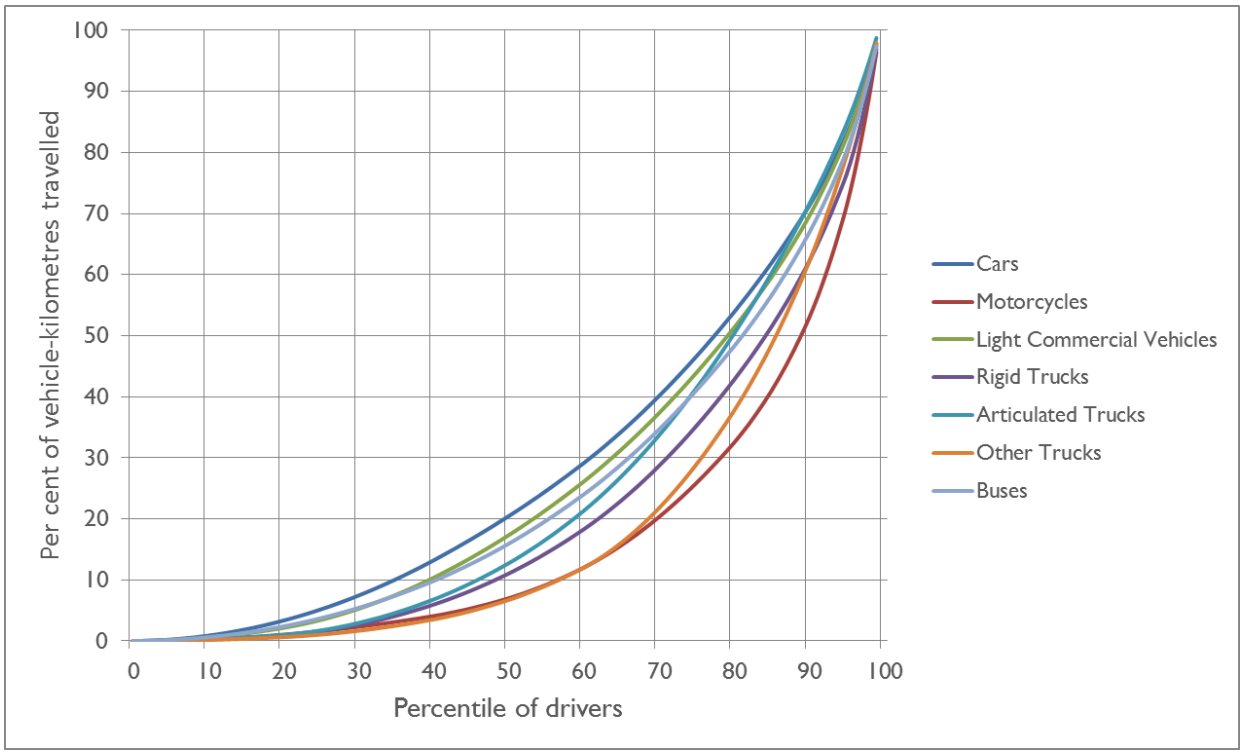



Table 1 shows the comparisons of distance driven by the lowest 50 per cent of drivers versus the highest 20 per cent for the other vehicle types.

Table 1: Shares of distance driven

| Vehicle Type | Lowest 50 per cent of drivers | Highest 20 per cent of drivers |
|---|---|---|
| Car | 20% | 48% |
| Motorcycle | 7% | 69% |
| Light Commercial Vehicle | 17% | 50% |
| Rigid Truck | 11% | 59% |
| Articulated Truck | 13% | 52% |
| Other Truck | 7% | 64% |
| Bus | 16% | 53% |
| Total | 18% | 50% |

Table 2 shows the average distances driven by the 20th, 50th, 80th and 99th percentiles of drivers.

Table 2: Kilometres driven by driver percentile

| Vehicle Type | 20th Percentile | 50th Percentile | 80th Percentile | 99th Percentile |
|---|---|---|---|---|
| Car | 4,190 | 10,320 | 19,810 | 57,840 |
| Motorcycle | 390 | 1,430 | 5,440 | 29,470 |
| Light Commercial Vehicle | 3,600 | 13,720 | 27,010 | 75,700 |
| Rigid Truck | 1,860 | 12,570 | 33,210 | 133,020 |
| Articulated Truck | 7,930 | 58,920 | 157,680 | 336,200 |
| Other Truck | 600 | 4,050 | 19,040 | 51,770 |
| Bus | 6,230 | 19,120 | 41,000 | 139,600 |
| All Vehicles | 3,800 | 10,510 | 20,620 | 68,920 |

## Conclusions

Use of the roads is highly unequally distributed among drivers/vehicles. This is especially so for motorcycles and 'other trucks' that have high numbers of very low use vehicles. But even with cars, the most equally distributed, road use is highly skewed, with most people driving relatively low distances and a few driving long distances every year.

The cost of road use is determined by four principle factors: distance driven, the weight of the vehicle, vehicle externalities (emissions, noise) and (in cities) the time of day. The implications of the distance driven distributions shown above is that road use charges that vary with distance driven will much more closely match the distribution of the first of these cost factors, rather than fixed costs.

## References

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### *Use of the Coat of Arms*



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