

Fuel Use Relative to Population

- A Provincial Analysis -

Transportation requirements vary regionally across Canada depending largely upon population distribution. Although the total Canadian population is mainly found in urban areas, some provinces have larger urban populations than others. Most of these provinces would have a decreased need for long-range transportation, and would be less affected by climate change mitigation efforts directed towards transportation in the province. In these situations, mitigation efforts would most likely see greater results if they focused on urban transportation. In provinces with larger rural populations, long commutes are more frequent, and these areas have a greater potential for mitigation efforts directed towards transportation at the provincial level.

Population Densitiesⁱ

The Canadian population is mainly urban, with 80 per cent of the population living in census metropolitan areas (CMAs) and census agglomerations (CAs). Furthermore, 19 per cent of the Canadian population live in urban shadow areas (rural subdivisions with commuting flows to urban areas), leaving only 1.2 per cent of the Canadian population in remote rural areas.

Highlights

- *Saskatchewan* has the largest share of its population living in *remote rural areas*ⁱⁱ (9.5%).
- *Newfoundland and Labrador* have the largest share of their population living in *urban shadow areas*ⁱⁱⁱ (48.7%). In fact, a high percentage of the population in all the Atlantic provinces live in the urban shadow areas.
- *Prince Edward Island* has the largest share of its population in *small urban centres*^{iv} (55.1%).
- *Nova Scotia* has the largest share of its population in *medium urban centres*^v (51.6%).
- *Alberta* has the largest share of its population in *large urban centres*^{vi} (63.5%), although *Manitoba* follows closely, with 60 per cent of its population living in Winnipeg.
- Toronto, Montreal and Vancouver are the only cities with populations of 1,500,000 or greater.

These data show that population densities in urban and rural areas vary greatly across Canadian Provinces.

Passenger Vehicle Distribution^{vii}

Vehicle ownership and use, as well as gasoline consumption also vary across the provinces. Figures for Alberta are quite high in these categories.

Highlights

- *Alberta* has the highest percentage of households owning a vehicle (86.6%). *Prince Edward Island* and *Saskatchewan* follow closely with 85.4 per cent of households owning vehicles.

- *Alberta* also has the highest percentage of its households owning two or more vehicles (48.9%) – the remainder having either one or no vehicles. For all other provinces (except Saskatchewan) households owning one vehicle rank higher than households owning multiple vehicles.
- *Saskatchewan* has the highest number of kilometres driven per vehicle (estimated^{viii} to be 18,140 km). However, all Atlantic provinces (excluding P.E.I.) and *Alberta* have averages well above the national average.
 - Canada: 16,616 km
 - New Brunswick: 17,933 km
 - Newfoundland and Labrador: 17,774 km
 - *Alberta*: 17,637 km
 - Nova Scotia: 17,371 km
- *Alberta* had the highest average gas consumption (estimated^{ix} to be 1667 l/person), with Saskatchewan also reaching an average gas consumption at 1606 l/person.

This data shows that the Prairie and Atlantic provinces have the highest vehicle usage. This is especially true for *Alberta*, which ranks highest for most of the above categories.

The Prairie Provinces

The Prairie provinces differ in their population distribution and vehicle use. *Alberta* has the highest population density (Table 1), with most of its population concentrated along the Edmonton-Calgary corridor. This also gives *Alberta* the highest population in large/medium cities in the Prairie provinces. Saskatchewan has the highest population in small cities and rural areas, giving it the lowest population density. A large majority of the population in Manitoba is found in Winnipeg; however there is also a large urban shadow population.

These differing population distributions affect vehicle use in the provinces (Table 1). Vehicle ownership in all Prairie provinces is higher than the national average. In Manitoba, more households own one vehicle over multiple vehicles. This could be because the distances required for travel to other populated areas is shorter than in the other Prairie provinces; as seen by the lower estimated kilometres driven per vehicle. Saskatchewan has the highest estimated kilometres driven per vehicle. This could be due to the low population density, as the population seems to be quite evenly distributed in southern rural areas, thus requiring longer average travel distances to reach urban centres.

Information regarding commutes in CMAs in the Prairies shows that jobs are more concentrated in the smaller CMAs, such as Regina (Table 2.) Also, the majority of commutes for all CMAs in the Prairies were less than 10 kilometres, with commutes of over 25 kilometres accounting for less than 10 per cent of commutes in all Prairie CMAs. Despite these relatively short commutes, a large majority of the population in all CMAs across Canada drive to work. Edmonton and Calgary have the highest average commute distances, thus partly explaining the higher vehicle use in *Alberta*. Based on commute patterns, climate change mitigation efforts directed towards transportation have great potential in both urban and suburban communities in the Prairies.

Table 1. Population distribution and vehicle use in the Prairies

		Alberta	Saskatchewan	Manitoba	<i>Canada (including territories)</i>
Population density (people/km ²)		4.6	1.7	2.0	3.3
Provincial population in large/medium cities		63.5%	42.8%	60%	67.1%
Provincial population in small cities		11.9%	15%	6.7%	12.3%
Provincial population in rural areas (urban shadow and remote rural)		24.5%	42.3%	33.3%	20.6%
Vehicles per household	Households owning vehicles	86.6%	85.4%	82.6%	78.2%
	1 vehicle	37.7%	42.3%	46.4%	42.2%
	2 or more vehicles	48.9%	43.1%	36.1%	36%
Estimated kilometres per vehicle		17,637 km	18,140 km	16,327 km	16,616 km

Table 2. Commuting in Prairie CMAs

	Average commute distance	Share of commuters driving to work	Share of commuters with >25km trip
Winnipeg	7.1 km	70.0 %	4.3 %
Regina	5.3 km	80.3 %	4.8 %
Saskatchewan	6.3 km	79.7 %	7.6 %
Calgary	8.8 km	71.8 %	4.9 %
Edmonton	9.8 km	77.7 %	9.1 %
All Canadian CMAs	9.6 km	70.8 %	/

Conclusion

Saskatchewan and the Atlantic provinces have the highest percentages of their populations living in rural areas. This is partly reflected in vehicle use, since vehicle ownership and kilometres driven are both high for these regions, especially in the Prairie provinces (not including Manitoba). Most of the provinces with high percentages of their populations in major urban centres (Quebec, Ontario, British Columbia and Manitoba) have lower vehicle use.

Alberta's population is concentrated in large urban centres, and based on this data it seems that climate change mitigation efforts related to transportation in Alberta should focus on these areas. However, Alberta also ranks highest for vehicle ownership and gas consumption, while other provinces with large urban populations have lower ranks for these categories. This difference could be attributed to the large amount of commuting between the large urban centres (Edmonton and Calgary) and the robust economic activity in rural areas that includes agriculture, but also oil and gas activity and forestry.

Key Findings

In Canada, provinces with higher populations in rural (remote rural and urban shadow) areas tend to have increased vehicle usage. In these provinces (Saskatchewan and Atlantic provinces), climate change mitigation efforts would have the greater effect at the provincial level than in other provinces in Canada. However, in Alberta, climate change mitigation efforts for transportation would have an impact in both rural areas and urban centres, due to the population being concentrated in urban areas and also high vehicle use and gas consumption in rural areas.

ⁱ All data are from Statistics Canada's 2001 Census (a special tabulation done for catalogue 11-624-MIE2005012)

ⁱⁱ Remote rural areas: rural census subdivision with no commuting flows to a CMA or CA

ⁱⁱⁱ Urban shadow areas: rural census subdivisions that have commuting flows with a CMA or CA

^{iv} Small urban areas: CAs with a population between 10,000 and 99,999

^v Medium urban areas: CMAs and CAs with a population between 100,000 and 499,999

^{vi} CMAs with a population between 500,000 and 1,499,999

^{vii} All data are from 2001. Vehicle ownership and gas consumption are from Statistics Canada's "Market Research Handbook", and vehicle kilometres are from Statistics Canada's "Canadian Vehicle Survey".

^{viii} Average vehicle kilometres were estimated by taking the total vehicle kilometres for the province and dividing it by the total number of vehicles registered in the same province.

^{ix} Average gas consumption was estimated by taking the total gasoline sales in the province and dividing it by the population for the same province. Note that while the discussion focuses on passenger vehicles, the total gasoline sales will also include non-passenger vehicles.