



# Graphical Analysis of Vehicle Portfolio History Data

Prepared for: Sample Insurance Company (SIC)

September 19, 2022

---

## Contents

<b>1</b>	<b>Summary of Data Reviewed</b>	<b>1</b>
1.1	Distribution of Vehicles in Force by Province . . . . .	2
<b>2</b>	<b>Potential Problems and Damage</b>	<b>3</b>
2.1	Severe Problems . . . . .	3
2.2	Potential Damage . . . . .	4
2.3	Potential Fraud . . . . .	5
2.4	Potential Problem . . . . .	6
<b>3</b>	<b>Odometer and Mileage</b>	<b>7</b>
3.1	Average Annual Mileage . . . . .	7
3.2	Calculated Mileage Hit Rate . . . . .	8
3.3	Current Odometer Reading . . . . .	9
3.4	Odometer Problems . . . . .	10
<b>4</b>	<b>Ownership</b>	<b>11</b>
4.1	Number of Owners . . . . .	11
4.2	Length of Ownership . . . . .	12
4.3	Current Ownership Type . . . . .	13
4.4	Ownership Types History . . . . .	14
<b>5</b>	<b>Service History</b>	<b>15</b>
5.1	Out-of-Province Service Records . . . . .	15
<b>6</b>	<b>Vehicle Demographics</b>	<b>17</b>
6.1	Fuel Type . . . . .	17
<b>7</b>	<b>Appendix</b>	<b>18</b>
7.1	Glossary . . . . .	18
7.2	Contact . . . . .	19

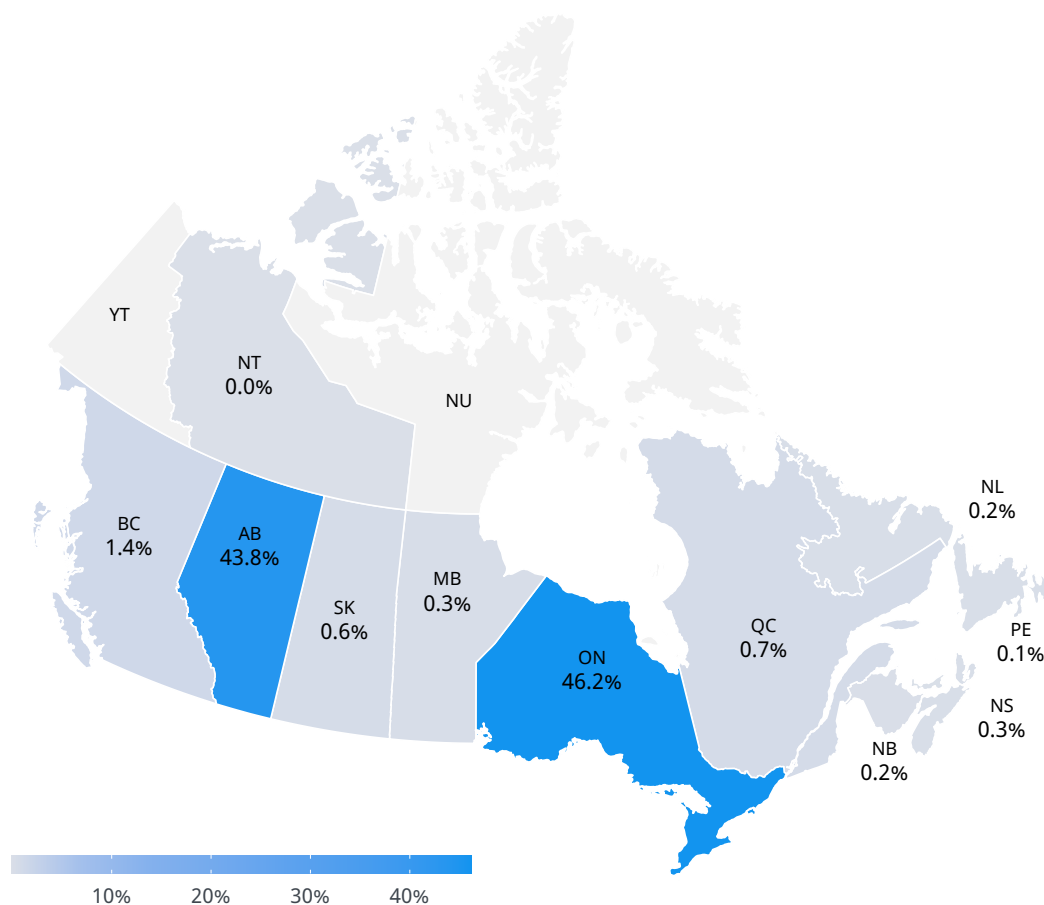
## 1 Summary of Data Reviewed

<b>Data Evaluation Date:</b>	May 24, 2022
<b>Total VINs submitted:</b>	20,153
<b>Model Years Range:</b>	2014 - 2018
<b>Duplicate VINs:</b>	153
<b>Invalid VINs / Unable to Decode:</b>	1
<b>Excluded Heavy Vehicle VINs:</b>	0
<b>VINs designated as USA market:</b>	3
<b>VINs registered in BC<sup>1</sup>:</b>	647
<b>VINs with Insufficient Data<sup>2</sup>:</b>	21
<b>Total Valid VINs:</b>	<b>20,152</b>

**Notes:** <sup>1</sup> VINs registered in BC will not have any Damage or Claims data available, as this data must be purchased separately in a Vehicle History Report (BC).

<sup>2</sup> VINs with Insufficient Data did not return sufficient data from our sources to provide accurate insights for all sections of this report. In most cases, these are Commercial / Heavy / Industrial vehicles.

## 1.1 Distribution of Vehicles in Force by Province



Registered Location	Reviewed Vehicles	Distribution
AB	8,829	43.8%
BC	273	1.4%
MB	69	0.3%
NB	35	0.2%
NL	41	0.2%
NS	58	0.3%
NT	2	0.0%
ON	9,306	46.2%
PE	16	0.1%
QC	147	0.7%
SK	130	0.6%
USA	1,216	6.0%
Unknown	31	0.2%

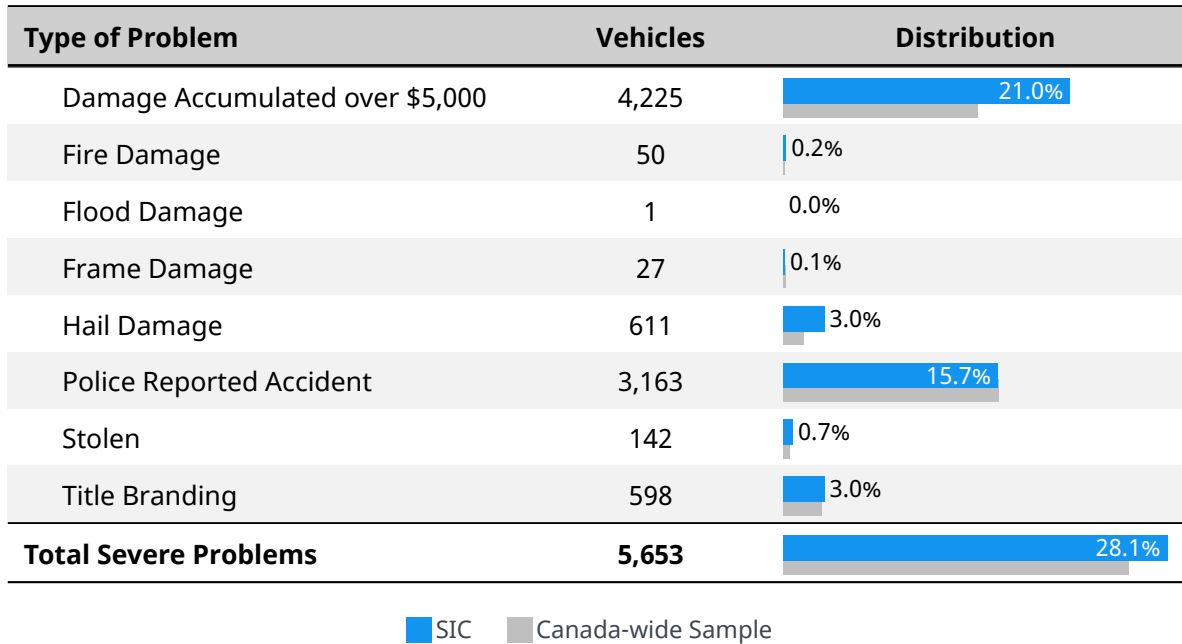
■ SIC ■ Canada-wide Sample

## 2 Potential Problems and Damage

### 2.1 Severe Problems

CARFAX studies show that vehicles with a history of severe problems cost more to insure than vehicles without these problems. Carriers should consider stricter underwriting criteria or surcharges for vehicles with severe problems.

*Note: it is possible for a single vehicle to have multiple Severe Problem events*

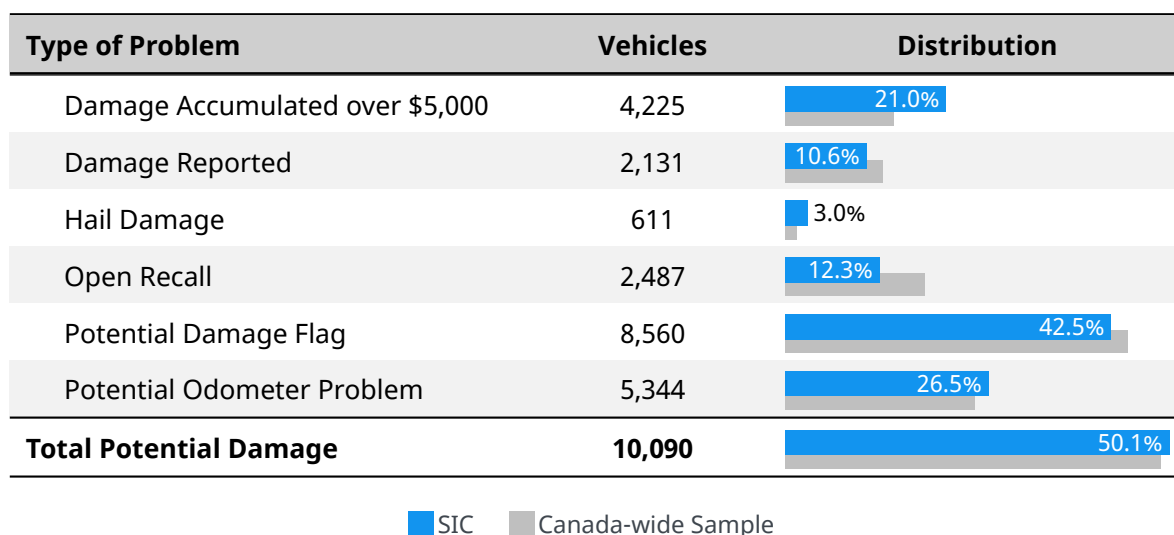


## 2.2 Potential Damage

CARFAX studies have shown that vehicles with minor damage have a higher loss frequency than other vehicles. The more minor damage events a vehicle has, the worse its loss performance. Vehicles with five or more minor damage events have loss costs similar to vehicles with major damage. CARFAX Canada provides insurers with data about potential minor damage events on individual vehicles so that they can better underwrite their books of business.

CARFAX Canada also provides carriers with information about open recalls, so that they can inform their customers about potentially unsafe conditions on the vehicles. This gives the carrier a potential positive customer touch point, allowing it to act proactively to protect its customers.

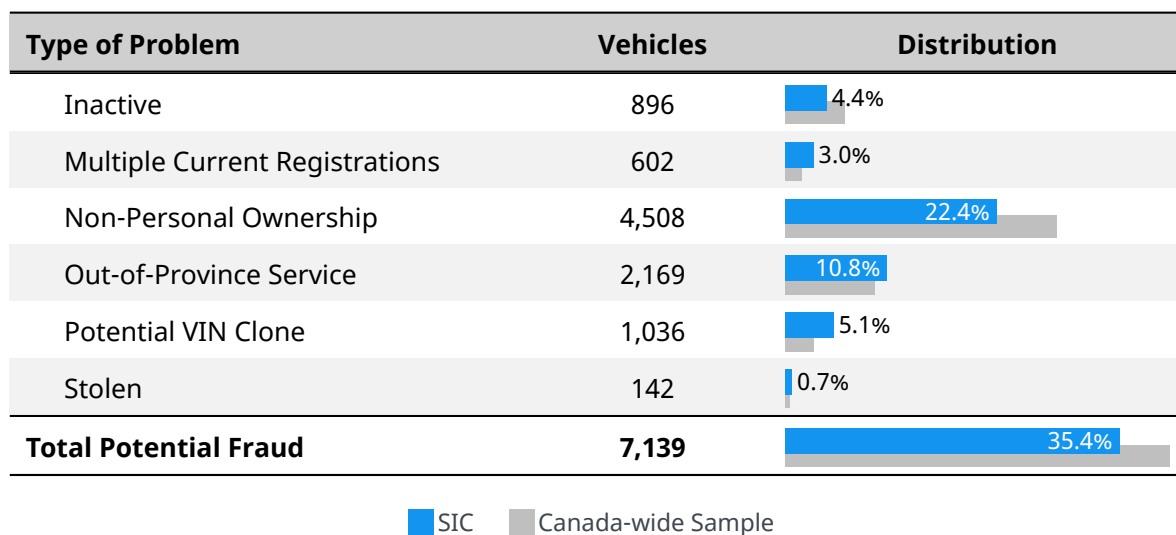
*Note: it is possible for a single vehicle to have multiple Potential Damage events*



## 2.3 Potential Fraud

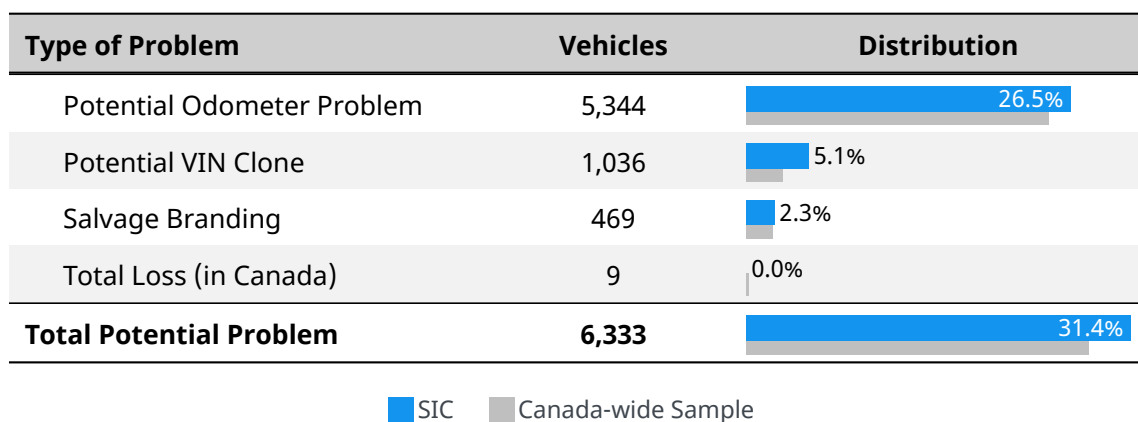
Vehicles with fraud indicators have a higher loss frequency than other vehicles.

*Note: it is possible for a single vehicle to have multiple Potential Fraud events*



## 2.4 Potential Problem

CARFAX studies have shown that vehicles with problem indicators have a higher loss frequency than other vehicles.



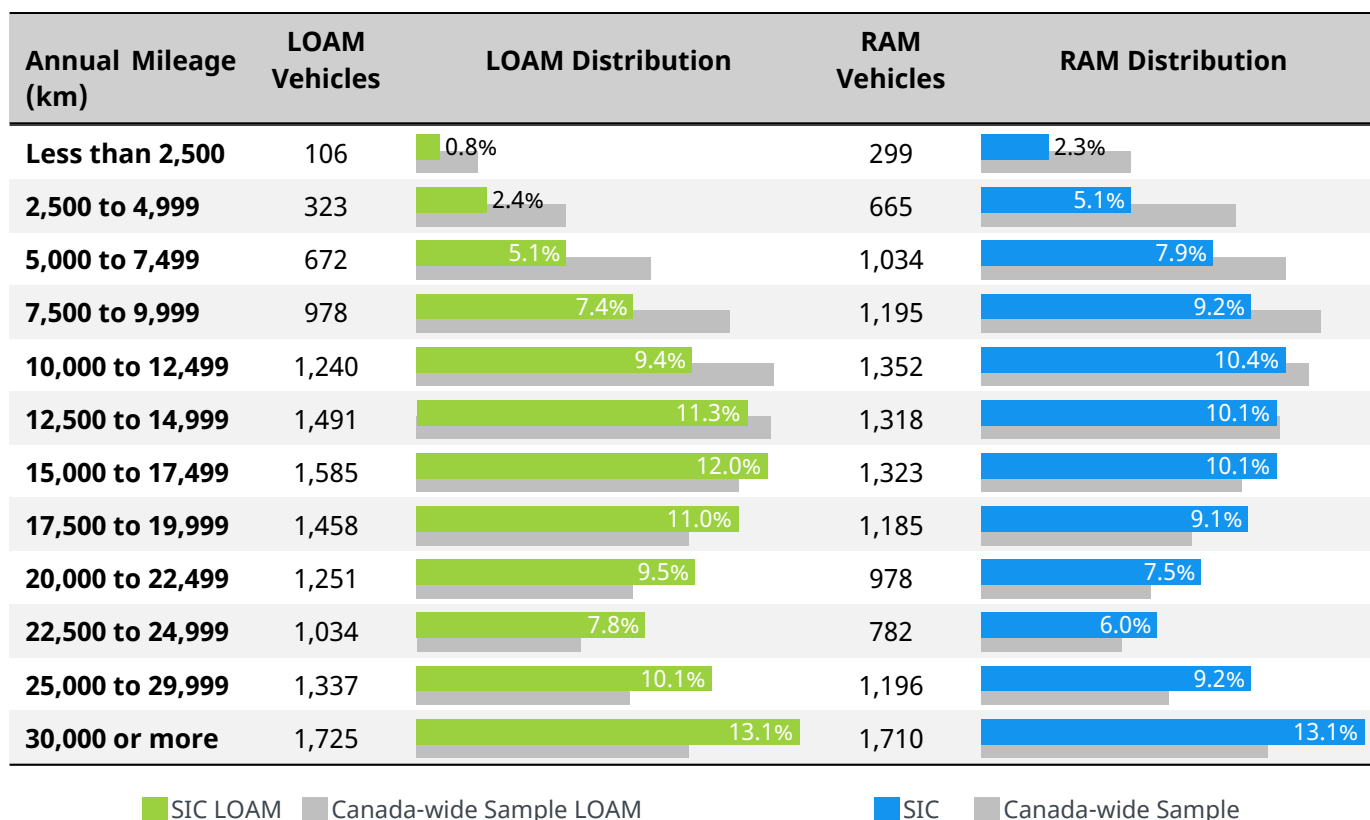
## 3 Odometer and Mileage

### 3.1 Average Annual Mileage

The number of kilometers a vehicle is driven is a direct measure of that vehicle's exposure to loss, particularly for collision and liability coverage. While this statement may seem obvious, many insurers avoid using mileage directly in rating because it is difficult to ascertain or verify. CARFAX Canada's vehicle history data includes calculated annual mileage based on verified odometer readings provided by its data partners. These annual mileage calculations have proven to be powerful variables in personal and commercial auto rating plans. CARFAX Canada offers two primary mileage calculations:

**Last Owner Annual Mileage (LOAM)** is a measure of the average annualized mileage of the vehicle since the current owner took possession of the vehicle. This long-term look at vehicle usage offers stability from year to year because short-term spikes or dips in usage are averaged over the life of the vehicle's ownership period.

**Last Owner Recent Annual Millage (RAM)** is a shorter-term look at the vehicle's usage, favoring a 12-month timeframe. This gives a measure that is much more reactive to changes in life events, such as a customer having a different commute after changing employers or schools.





## 3.2 Calculated Mileage Hit Rate

CARFAX Canada requires at least two valid odometer readings from the current ownership period to calculate an average annual mileage on a vehicle. There are many factors that impact the number of readings available for calculation, including provincial records, the number of private data sources, the accuracy of reported odometer readings, and the amount of time a vehicle has been owned by the current owner.

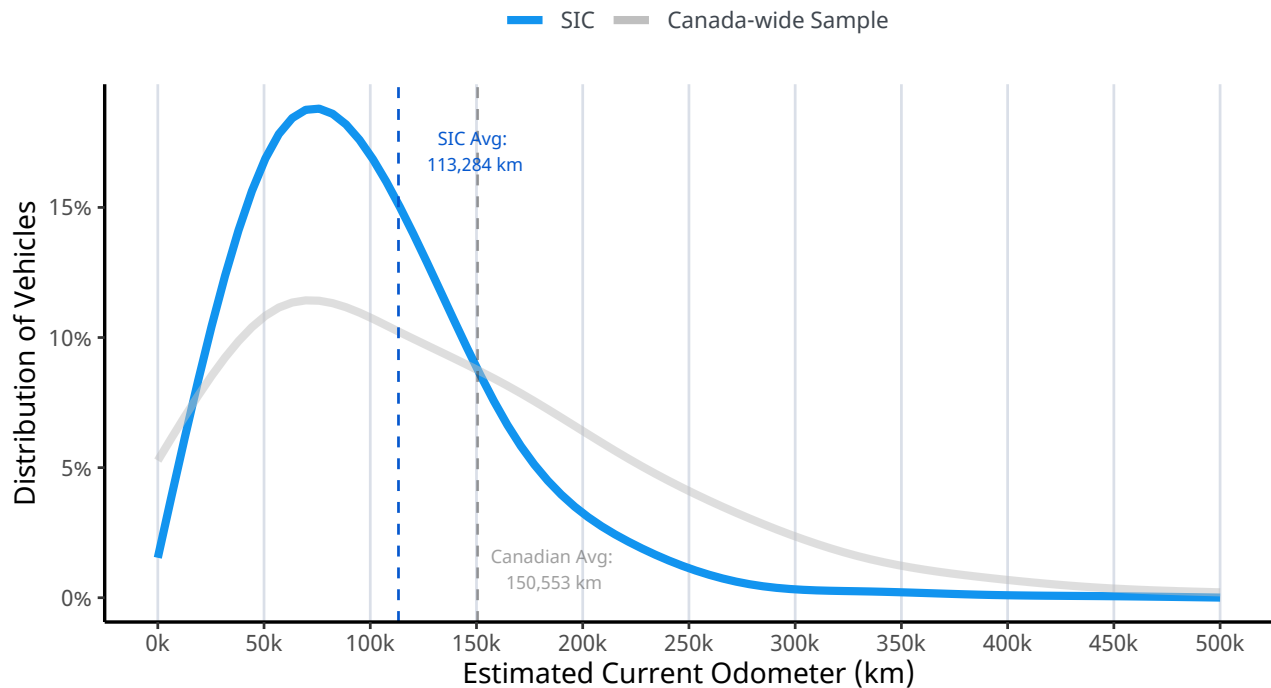
Clients have the option of providing an additional odometer reading to CARFAX Canada, to use that odometer reading in the annual mileage calculation. By doing so, clients may increase the returned Mileage Hit Rate.

Province	Vehicles	LOAM Hit Rate	RAM Hit Rate
ON	7,791	66.1%	65.5%
AB	7,574	75.5%	74.3%
BC	234	57.7%	56.8%
QC	123	21.1%	20.3%
SK	114	89.5%	85.1%
MB	59	33.9%	33.9%
NS	52	53.8%	53.8%
NL	32	50.0%	50.0%
NB	31	64.5%	64.5%
PE	13	15.4%	15.4%
NT	2	100.0%	100.0%
<b>Total</b>	<b>16,025</b>	<b>70.0%</b>	<b>69.1%</b>

### 3.3 Current Odometer Reading

The more vehicles are driven, the more they wear out, which impacts how a vehicle performs. Vehicles with more wear and tear are more likely to be involved in a collision, but also have a lower value. Because total kilometers driven is related to vehicle age, this effect is often buried in a carrier's vehicle age or model year rating variable.

Using CARFAX Canada's data, carriers can separate the effects of age and total mileage on a vehicle to segment their books. This gives carriers a competitive edge on older vehicles.



### 3.4 Odometer Problems

Not all odometer readings are usable in the calculation of annual mileage: In some cases, odometer readings reported to CARFAX Canada are inaccurate due to entry errors or “plug” values (e.g. 999,999 km). In other cases, the odometer reading has exceeded the mechanical limitation of the odometer (“rolled over”) or the odometer unit has been replaced with one salvaged from another vehicle. A third possibility is that the odometer is fraudulently tampered (“rolled back”) to understate the actual mileage on the vehicle.

CARFAX Canada uses a sophisticated set of business rules to determine if a vehicle has a potential problem with an odometer. We combine this information with databases of known odometer problems to determine if an individual reading is likely to be an error and should be ignored, or if it more likely represents an inaccurate mileage for the vehicle.

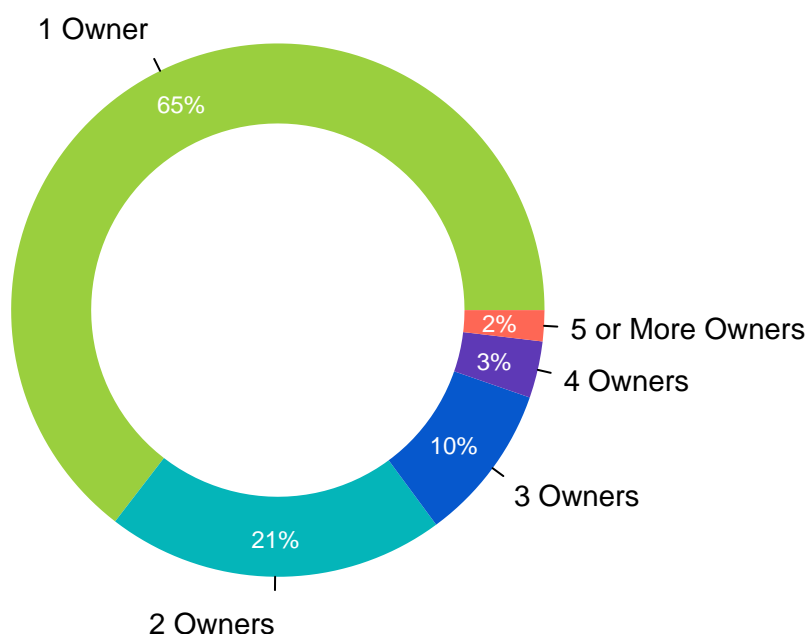
Vehicles with inaccurate odometers are much more likely to be off their maintenance schedules, and therefore presents a different risk to the Insurer. Vehicles with known rollbacks in the current ownership period are more likely to be involved in insurance fraud.

Type of Problem	Vehicles	Distribution
Potential Odometer Problem	5,344	26.5%
Odometer Problem Reported	0	0.0%
Potential Rollback	0	0.0%
<b>Total Odometer Problems</b>	<b>5,344</b>	<b>26.5%</b>

## 4 Ownership

### 4.1 Number of Owners

Used car buyers have a strong preference for one-owner vehicles. This is because it is more likely that vehicles with multiple owners are problematic, or that they were not properly maintained at some point. As a result, multiple owner vehicles have a lower value in the marketplace. For insurance carriers, the number of owners a vehicle has had is just as significant as it is for used car buyers.



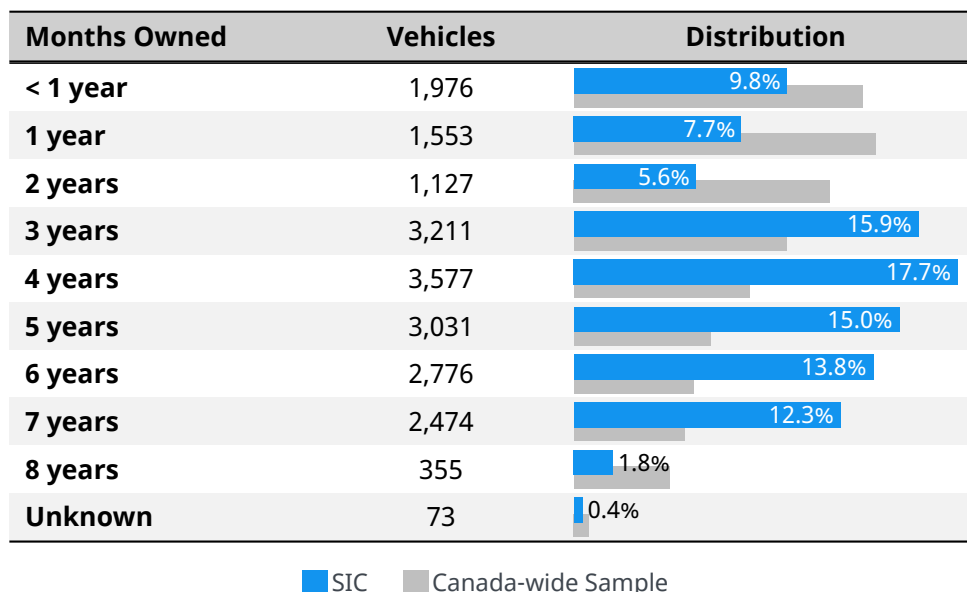
Detailed breakdown of Number of Registered Owners:

Number of Owners	Vehicles	Distribution
1	12,963	64.3%
2	4,129	20.5%
3	1,921	9.5%
4	690	3.4%
5 or More	377	1.9%
Unknown	73	0.4%

■ SIC    ■ Canada-wide Sample

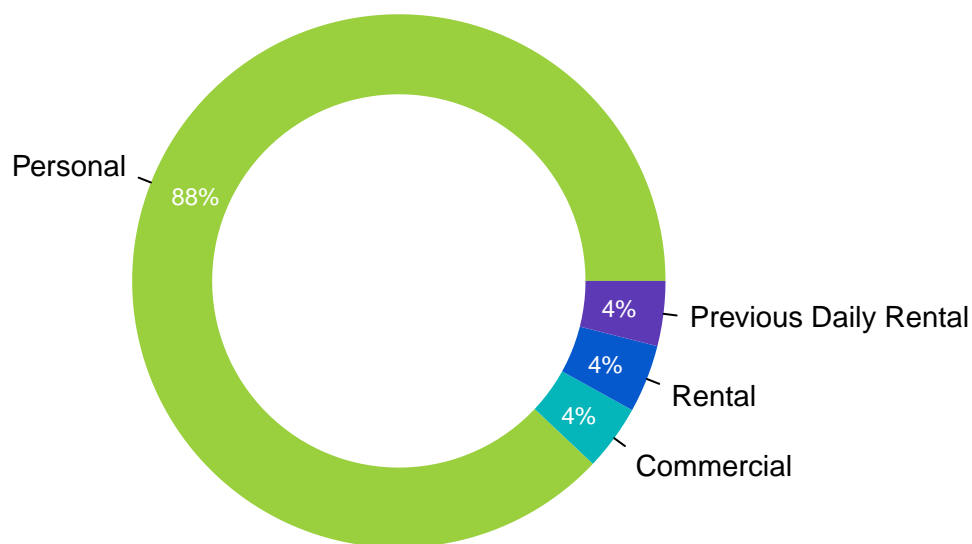
## 4.2 Length of Ownership

CARFAX studies have shown that the longer a vehicle is owned by a single owner, the lower the cost to provide coverage for that vehicle. This is true for third-party liability coverage as well as for first-party physical damage coverage. Insurers have found that this variable is one of the most powerful vehicle history rating variables, often outperforming other variables in a standard rating plan. Carriers using length of ownership in rating enjoy a significant competitive advantage over those who do not.



### 4.3 Current Ownership Type

Summary of known Ownership Types currently registered to vehicles:



Detailed breakdown of all Ownership Types (including Unknown current Ownership type):

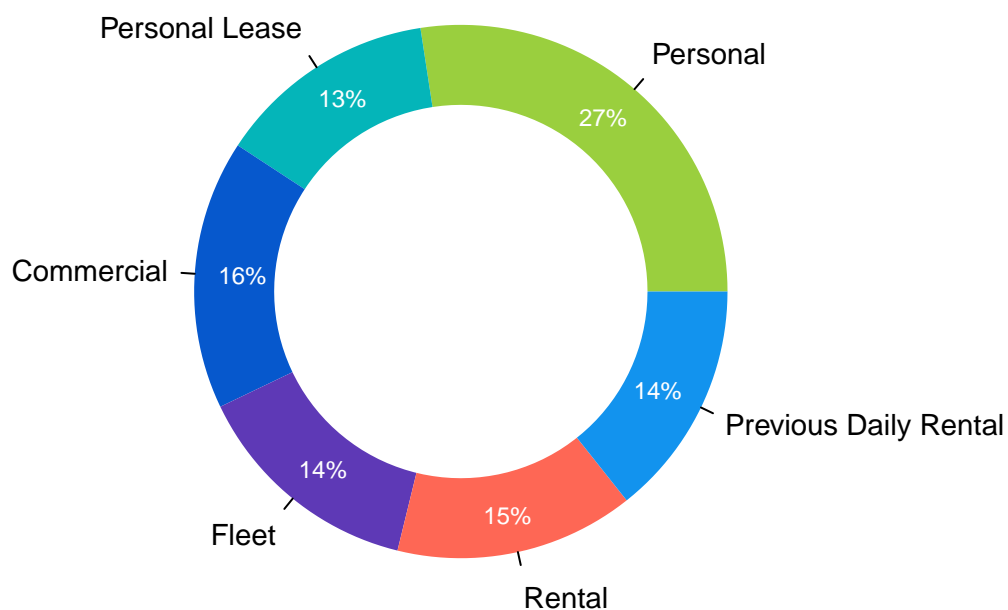
Ownership Type	Vehicles	Distribution
Personal	7,401	36.7%
Personal Lease	87	0.4%
Commercial	335	1.7%
Fleet	27	0.1%
Rental	346	1.7%
Previous Daily Rental	331	1.6%
Unknown	10,465	51.9%

■ SIC 
 ■ Canada-wide Sample

## 4.4 Ownership Types History

Summary of the Ownership Types historically registered to vehicles.

*Note: it is possible for a single vehicle to have multiple Ownership Type over its history*



Detailed breakdown of History of Ownership Types:

Ownership Type	Vehicles	Distribution
Personal	16,979	84.3%
Personal Lease	8,263	41.0%
Commercial	10,119	50.2%
Fleet	8,713	43.2%
Rental	8,978	44.6%
Previous Daily Rental	8,865	44.0%
Unknown	8,263	41.0%

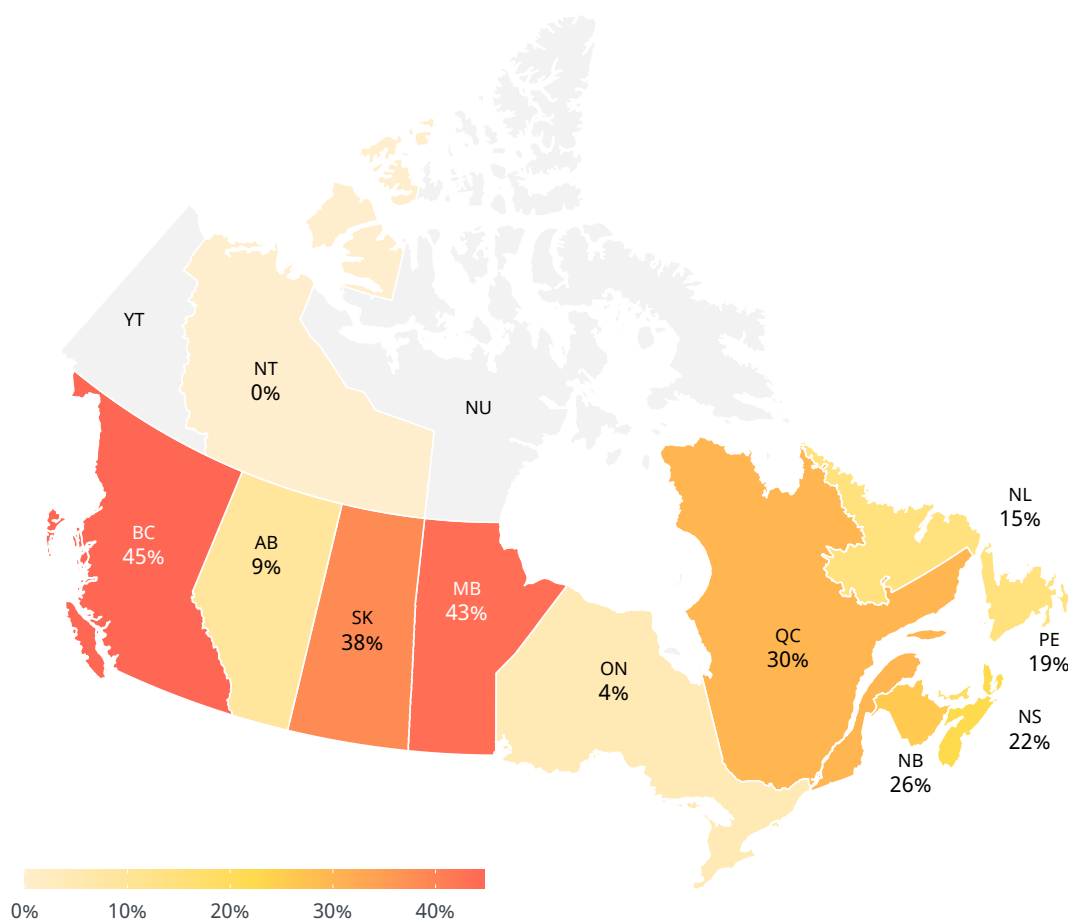
■ SIC ■ Canada-wide Sample

## 5 Service History

### 5.1 Out-of-Province Service Records

Vehicles that are routinely serviced far from their insured garaging locations are more likely to be improperly classified than other vehicles. CARFAX Canada's extensive database allows us to identify which vehicles have had service performed in a province or country outside the vehicle's registration jurisdiction ("OoP-Serviced Vehicles").



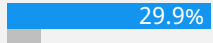

Carriers can use this information to identify improperly rated vehicles and adjust their rates or overages to better match their exposure to loss.





Current Province of Registration	Total Vehicles	OoP-Serviced Vehicles	Percentage
Alberta	8,829	800	9.1%
British Columbia	273	122	44.7%
Manitoba	69	30	43.5%
New Brunswick	35	9	25.7%
Newfoundland and Labrador	41	6	14.6%
Nova Scotia	58	13	22.4%

Table continues on next page...



Current Province of Registration	Total Vehicles	OoP-Serviced Vehicles	Percentage
Northwest Territories	2	0	0.0%
Ontario	9,306	406	 4.4%
Prince Edward Island	16	3	 18.8%
Quebec	147	44	 29.9%
Saskatchewan	130	50	 38.5%

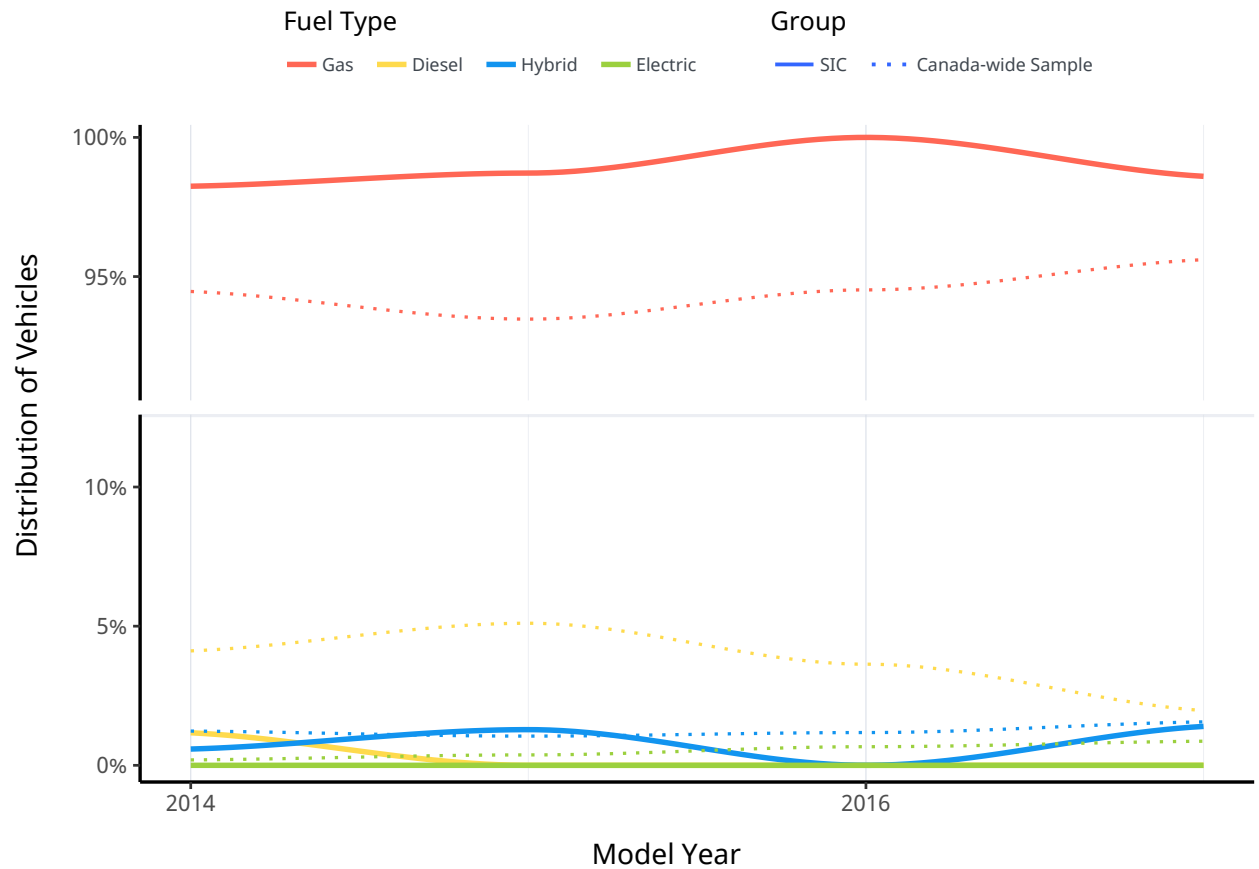
 SIC  Canada-wide Sample

## 6 Vehicle Demographics

### 6.1 Fuel Type

#### 6.1.1 Vehicle Fuel Type by Model Year

*Note: Current Model Year may be excluded if insufficient data.*



## 7 Appendix

### 7.1 Glossary

**Canada-Wide Sample:** A large, randomized, representative sample from the entire Canadian population of nearly 28 Million Vehicles registered with their provincial transportation agencies, combined with unique data elements for each vehicle from CARFAX Canada. The sample size chosen provides a Confidence Level of 99.9% and is within a statistical Margin of Error of  $\pm 0.5\%$ .

**Damage Reported:** A vehicle with Damage Records on record, of any type.

**Frame Damage:** Announcements and Registrations/Brandings are checked for any the following criteria: Frame or Structural

**Heavy Vehicles:** Heavy Trucks or Commercial-/Industrial-grade vehicles. Identified by the following Vehicle Makes: Blue Bird, Caterpillar, Mitsubishi Fuso Truck Of America Inc, Freightliner, Western Star/auto Car, Ic Corporation, International, Kenworth, Mack, Peterbilt, Spartan Motors, Sterling Truck, Sprinter, Hino, Isuzu. There may be less data available for these types of vehicles.

**Last Owner Annual Mileage (LOAM):** a measure of the average annualized mileage of the vehicle since the current owner took possession of the vehicle. This long-term look at vehicle usage offers stability from year to year because short-term spikes or dips in usage are averaged over the life of the vehicle's ownership period.

**Last Owner Recent Annual Millage (RAM):** a shorter-term look at the vehicle's usage, favoring a 12-month timeframe. This gives a measure that is much more reactive to changes in life events, such as a customer having a different commute after changing employers or schools.

**Non-Branded Hail Damage:** Damage Records on a vehicle involving Hail, but missing the corresponding Branding record for Hail Damage.

**Out-of-Province Service (OoP-Serviced Vehicles):** Service records which occurred in a province that is not the currently registered jurisdiction at the time of the service event.

**Potential Damage Flag:** Any of the following criteria: Failed Emissions Test, Failed Safety Inspection, Non-Branded Hail Damage, Odometer Problem, or Open Recalls.

**Potential Fraud Flag:** Any of the following criteria: Non Personal Ownership, Out of Province Service, Stolen, Inactive Vehicle, Multiple Current Registrations, or Potential VIN Clone.

**Potential Odometer Problem:** All odometer records (with any below 3k removed) are compared by date to see any are lower (by a certain threshold) than a previous record.

**Potential VIN Clone:** VIN cloning is a practice of using a vehicle identification number from a legally registered car to hide the identity of a stolen or salvaged vehicle. This vehicle has history that could indicate the VIN has been cloned.

**Severe Problem Flag:** Any of the following criteria: Title Brand, Police Reported Accident, Frame Damage, Hail Damage, Fire Damage, Flood Damage, Is Stolen, Damage Over Threshold Total

**Title Brand:** Announcements and Registrations/Brandings are checked for any the following criteria: Salvage, Hail, Rebuilt, Non-Repairable, Total Loss, Lemon, Manufacturer Buyback, Fire, Flood, Scrapped, Destroyed, Disposed, Failed Safety Inspection, or Odometer Problem

## 7.2 Contact

If you are interested in learning more about CARFAX Canada vehicle history data, or how the information in this report can help you improve auto insurance underwriting or rating, please contact:

**Mike Foster**

*Director - Banking, Insurance & Government*

CARFAX Canada

**Phone:** 416-219-4026

**Email:** [mfoster@carfax.ca](mailto:mfoster@carfax.ca)