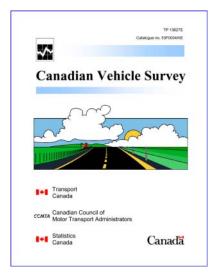




# **Canadian Vehicle Survey**

Second quarter 2005





Statistics Canada

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#### Statistics Canada

Transportation Division

# Canadian vehicle survey

# Second quarter 2005

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#### Note of appreciation

Canada owes the success of its statistical system to a long-standing partnership between Statistics Canada, the citizens of Canada, its businesses, governments and other institutions. Accurate and timely statistical information could not be produced without their continued cooperation and goodwill.

#### **Symbols**

The following symbols are used to indicate the quality of the estimates in this publication:

- . not available for any reference period
- .. not available for a specific reference period
- ... not applicable
- 0 true zero or a value rounded to zero
- $0^{\rm s}$  value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
- p preliminary
- r revised
- x suppressed to meet confidentiality requirements of the Statistics Act
- A excellent
- B very good
- c good
- acceptable
- E use with caution
- F too unreliable to be published

The quality of estimates not accompanied by a quality symbol is "good or better".

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The principal author of this publication was **Wendy Christoff**.

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# Canadian Council of Motor Transport Administrators and Provincial and Territorial Registrars of Motor Vehicles

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# **Highlights**

- Over 18.4 million vehicles were in-scope for the Canadian Vehicle Survey during this quarter.
- Between April 1 and June 30, 2005, these vehicles travelled an estimated 85.9 billion kilometres.
- During this quarter, vehicles weighing less than 4 500 kilograms were driven an average of 4 450 kilometres while the largest of the trucks (trucks with gross weight 15 000 kilograms or more) were driven an average of 19 250 kilometres.

#### 1. Introduction

Road vehicles dominate passenger travel and freight traffic. However, prior to the Canadian Vehicle Survey (CVS), no measures of total vehicle-kilometres or passenger-kilometres were available. The CVS was developed at the request of Transport Canada to fill this data gap. The survey provides quarterly and annual estimates of the amount of road travel, broken down by types of vehicles and characteristics, such as age and sex of driver, time of day and season. The results are the prime source of road vehicle use information for researchers and interested members of the public.

Prior to 2004, the survey was sponsored by Transport Canada. Since then, the survey has been co-sponsored by Transport Canada and Natural Resources Canada. They plan to combine the survey data with other data to improve road safety, monitor fuel consumption and deal with the impact of vehicle usage on the environment.

This document describes concepts, employed methods and discusses data quality. The reference period for all the information presented in this document is the second quarter of 2005.

# 2. Survey overview

The CVS is a voluntary vehicle-based survey that provides quarterly and annual estimates of road vehicle activity (vehicle-kilometres and passenger-kilometres) of vehicles registered in Canada. A quarterly sample of vehicles is drawn from vehicle registration lists provided by the provincial and territorial governments.

The provincial component of the survey consists of two steps. The first step is a computer assisted telephone interview (CATI) with the registered owners of the sampled vehicles. This interview is used to collect some general information on the usage of the vehicle as well as to ask the respondent to complete a trip log specific to his/her vehicle type. The trip log is then mailed out as a second step. If respondents cannot be contacted by phone, the trip log is mailed out with a short questionnaire to collect some of the information normally collected during the CATI.

The territorial component of the survey consists of two short questionnaires. One is mailed to the respondents at the beginning of the quarter and the other is mailed at the end of the quarter. The first questionnaire asks respondents to record the odometer reading at the beginning of the first day of the quarter. All those returning the first questionnaire are mailed a second questionnaire asking them to record the odometer reading at the beginning of the first day of the next quarter. These two odometer readings allow the calculation of the distance the vehicle was driven during the quarter.

Survey collection began on February 1, 1999. Only eight provincial / territorial vehicle registration lists were received in time to be included in the sample at that time, but over the remainder of 1999, the other lists were received. Starting October 1, 1999, vehicles from all provinces and territories were included in the survey.

Users who require additional information from Statistics Canada can obtain it from the Transportation Division upon request by phoning 1 866 500-8400 or e-mailing transportationstatistics@statcan.ca.

## 3. Concepts and definitions

#### 3.1 The population of interest

The **in-scope vehicles** for the CVS include all motor vehicles, except buses (buses were included in the survey prior to 2004), motorcycles, off road vehicles (e.g., snowmobiles, dune buggies, amphibious vehicles) and special equipment (e.g., cranes, street cleaners, snowplows and backhoes), registered in Canada anytime during the survey reference period, that have not been scrapped or salvaged.

The **population of interest** consists of vehicle-days, composed from the in-scope vehicles and the days within the survey reference period.

#### 3.2 Definitions of variables in tables

**Vehicle-kilometres** is the distance traveled by vehicles on roads.

**Passenger-kilometres** is the sum of the distances traveled by individual passengers (the driver being considered as one of the passengers). For example, for a vehicle with three passengers (the driver being one of them) that is driven on a distance of 10 kilometres, the number of passenger-kilometres will be 30. Light vehicles (see the **Vehicle type** definition in section 3.3) report the number of passengers for each trip (see the **Trip** definition in section 3.4). The number of passengers in heavy vehicles with gross vehicle weight of 4.5 tonnes or more is calculated as the average of the number of passengers at the beginning of each trip and the number of passengers at the end of each trip (see the **Trip** definition in section 3.4).

**Fuel consumed** is the amount of fuel used to operate vehicles. This variable is derived for each vehicle using the reported fuel purchases and distance driven.

The number of vehicles on the registration lists is the average number of the registered vehicles in the registration lists at the beginning and at the end of the reference period.

The number of vehicles in scope is an estimate of the average number of vehicles registered during the quarter based on the lists from jurisdictions and the survey responses. This number slightly differs from the previous one because we incorporate into it all our findings from the survey. Note that this number includes vehicles used and not used on the roads during the reference period.

#### 3.3 Definitions of vehicle characteristics

**Vehicle type** is the weight classification created for the CVS, based on the information available on the vehicle registration lists. The vehicles are divided into three weight types: **light vehicles** with gross vehicle weights below 4.5 tonnes, **heavy vehicles** with gross vehicle weights of **4.5 tonnes or more and less than 15 tonnes**, and **heavy vehicles** with gross vehicle weights of **15 tonnes or more**.

The respondent determines **vehicle body type.** The respondent is asked to choose among: car, station wagon, van, sport utility vehicle, pick-up, straight truck, truck-tractor, and other. Missing or unusual responses are verified against registration lists, if possible.

**Fuel type** is based on the information provided by the respondent or from the registration lists. All vehicles are divided into three classes: vehicles powered by gasoline, vehicles powered by diesel fuel and vehicles powered by other energy sources.

Vehicle model year is derived based on the information available on the registration lists.

#### 3.4 Definitions of vehicle usage characteristics

The CVS definition of a **trip** determines the trip characteristics. The definition of what delimits a trip depends on the **vehicle type**:

A new trip is reported for **light vehicles** if any of the following events happen:

- the driver gets in the car
- a passenger gets in or out of the car

A new trip is reported for **heavy vehicles weighing 4.5 tonnes or more** if any of the following events happen:

- a stop of more than 30 minutes
- a change of driver
- a change of purpose or use
- a change in the truck configuration
- a change in the status of the load from loaded to unloaded or the reverse

For each trip, the respondent provides the following information:

- Beginning and end times and dates of the trip that are used to determine the **time of day** and **day of week** the trip takes place.
- Driver age group and driver sex.
- **Trip origin and destination** for light vehicles.
- **Trip purpose** for heavy vehicles, as determined by the respondent. If there were several purposes for the trip, the respondent is asked to indicate the main purpose of the trip. Multiple trip purposes are not allowed.
- If **dangerous goods** (as defined by the Transportation of Dangerous Goods Act) are carried by heavy vehicles.
- Number of kilometres traveled on roads with posted speed limit of 80 km/h or more
- Age group (Under 5 years, 5 to 14, 15 to 19, 20 to 34, 35 to 54, 55 to 64, 65 to 74, 75 to 84, 85 years and over) of passengers and the number of passengers within each group, to calculate passenger-kms. Passenger age information is collected only for light vehicles (see section 3.2). We collect the total number of passengers only for heavy vehicles.
- Truck configuration for heavy vehicles.
- Total cost, unit cost and quantity of fuel purchased.

## 4. Methodology

The CVS has been designed as a quarterly survey. The survey design also allows the calculation of annual estimates based on the data collected during the four quarters.

#### 4.1 Survey design

#### 4.1.1 Survey population

The survey population of vehicles was derived from the 13 jurisdiction vehicle registration lists (ten Provincial and three Territorial Governments) created three months before the reference period. The sample of vehicles for this quarter was drawn from lists of motor vehicles with valid registrations in any province or territory available in January 2005. Buses, motorcycles, off-road vehicles (e.g., snowmobiles, dune buggies, amphibious vehicles) and special equipment (e.g., cranes, street cleaners, snowplows and backhoes) are excluded from the survey. This population differs from the population of interest of vehicles; e.g., vehicles that were registered after January 2005 are not included.

The thirteen incoming lists underwent a thorough preparation procedure:

- First, out-of-scope vehicles are removed (buses, trailers, motorcycles, construction equipment, parade vehicles, motor homes, etc.) from each list.
- Second, vehicles with expired registrations are removed from each list.
- Then, records with duplicate Vehicle Identification Numbers (VIN) within each list are removed leaving only the record that had been updated most recently.
- Last, records in each file with irregular data are verified.

The last set of processed lists, before the beginning of the reference period, consisted of the thirteen lists provided in January 2005 to Statistics Canada for the CVS. This set of prepared vehicle lists and the set of days within the second quarter of 2005 constitute the survey population of vehicle-days.

#### 4.1.2 Sample design

The CVS uses a two-stage sample design. At the first-stage, a sample of vehicles is selected, while at the second-stage, a sample of consecutive days within the quarter is selected.

To select the first-stage sample, all vehicles from the survey population were first stratified (grouped) into 78 strata. The vehicles were stratified into three vehicle types (see section 3.3) and 13 jurisdictions (ten provinces and three territories). Then, in order to improve the precision of the estimates, the vehicles were further divided into two vehicle-age strata of newer and older vehicles.

Next, the vehicles were sorted within each stratum, using the first three characters of the postal code of the owner's address. Then, a systematic sample of vehicles (first stage sample) was selected from the survey population. Systematic sampling was used to spread the sample over all regions and to avoid heavy burden on owners of multiple vehicles. To minimize respondent burden, no vehicle is selected more than once during any consecutive four quarters for provinces and two consecutive quarters for territories.

In the second stage, a first reporting day within the quarter was randomly assigned to each vehicle selected in the first stage. Within each stratum, the first reporting day was evenly spread over the quarter to ensure a uniform number of responses over time and for each day of the week. This step was not applied to the vehicles registered in the three territories since only odometer readings are collected (see section 2).

#### 4.1.3 Estimation

Since the sample was selected in two stages, the sampling weight (see section 6 for definition) was also calculated in two steps. The first-stage sampling weight was calculated for each vehicle in the first-stage sample. Then the second-stage sampling weight was calculated for each vehicle-day selected from all days within the reference period. Finally, these two weights were multiplied together to obtain the final weight for a vehicle-day. The weighted values are obtained by multiplying the final weights and the collected values. They were aggregated to produce the estimates.

#### 4.1.4 Sample size

A total of 5,375 vehicles out of 18,453,473 from the survey population were drawn for the ten provinces. Another 2,759 vehicles out of 52,214 were included in the sample for the three territories.

#### 4.2 Data collection and processing

#### 4.2.1 Data collection

The data collection for the vehicles sampled in the ten provinces is different from the one for the vehicles sampled in the territories.

#### Provincial collection

The registered owners of the sampled vehicles were telephoned and interviewed (Computer Assisted Telephone Interview, or CATI). During the CATI, the following information is collected about each sampled vehicle: vehicle type, fuel type used, distance driven the previous week, some information about anticipated vehicle usage during the following six weeks, current odometer reading, some vehicle maintenance questions and some questions on the household characteristics. Then the respondent was asked to complete a trip log. If the respondent agreed, personal information, such as name and address, were obtained in order to mail out the trip log for the vehicle.

The log type depended on the type of vehicle. There were two types of logs: a light vehicle log and a heavy vehicle log.

Respondents receiving a light vehicle log were requested to record information for 20 consecutive trips made in the selected vehicle, beginning on the assigned **first reporting day**. Respondents receiving a heavy vehicle log were requested to record information for all the trips made in the selected vehicle over the assigned seven-day period.

The collected data included information about each trip:

- Start and stop dates and times
- Start and stop odometer readings
- origin and destination (light vehicle log) or trip purpose (heavy vehicle log)
- number and age group of passengers (light vehicle log) or number of passengers at the start and end of the trip (heavy vehicle log)
- sex and age group of the driver
- fuel purchases
- distance traveled on roads with posted speed limit of 80km/h or more.
- truck configuration (heavy vehicle log only)
- dangerous goods (heavy vehicle log only)

Starting in 2004, the respondents were also asked to continue to record their fuel purchases until they reported two fill-ups or five fuel purchases or until the 28-day reporting period is over.

If the respondent could not be contacted by phone, a trip log with a short additional questionnaire (to collect some of the information normally collected during the CATI) was mailed out.

To increase the number of responses, respondents were contacted a second time, either by phone or by mail. On the first or second day of the log, an attempt was made to phone each vehicle owner, who agreed during the CATI to fill out the log, to answer any questions the respondent might have. Later, an attempt was made to contact by phone or mail everyone who did not return logs. (Some companies with large vehicle fleets have special arrangements to lower their response burden. There is no follow-up done with these companies.)

#### Territorial collection

The registered owners of the selected vehicles were mailed questionnaires and asked to provide two odometer readings, one at the beginning of the quarter and another at the beginning of the next quarter. Information was also collected on the vehicle status (owned, sold, scrapped), body style (car, SUV, pick-up, etc.) and type of fuel used.

#### 4.2.2 Edit and imputation

Once all necessary information for the survey was collected, a series of verifications took place to ensure that the records were consistent and that collection and capture of the data did not introduce errors. Reported data were examined for completeness and consistency using automated edits coupled with manual review. Outliers, i.e., respondents reporting extremely large values, were processed manually.

Missing values and data found in error were imputed by another automated system. The system imputed the data using different imputation rules depending on the vehicle, available information and the type of data to be imputed. For example, the data can be imputed based on other responses for the same vehicle or by using data from a similar vehicle. The imputed data were then again examined for completeness and consistency.

A complete description of the procedures applied to the survey data is available upon request from the Transportation Division of Statistics Canada.

#### 4.2.3 Estimation

Since the survey population differs from the population of interest, several corrections were done to assure that the estimates correspond (as closely as possible) to the population of interest. The sampling weights derived from the sample design were adjusted and improved using updated registration lists. This was possible because, during the passage of time since the sample was selected, new sets of prepared vehicle lists were obtained for the beginning and for the end of the reference quarter. To improve the estimates for the vehicles registered in the ten provinces, all the days were further stratified into working days and holidays (or non-working days, including weekends). Second stage sampling weights were adjusted so that every day of vehicle activity within the same stratum contributed with equal weight to the total estimate. The final set of weights reflected as closely as possible the characteristics of the vehicle population during the reference period.

The following estimates of totals are available:

- vehicle counts by jurisdiction and vehicle type;
- vehicle-kilometres by jurisdiction and vehicle type;
- passenger-kilometres by province and vehicle type;
- fuel consumed, by vehicle type and fuel type;
- cross tabulations of vehicle-kilometers and passenger-kilometers by a number of variables (described in Concepts and Definitions), such as body type, driver characteristics, time of day, day of week, etc.

## 5. Data quality

This section describes factors that affect the data quality and why they should be considered when using the CVS estimates.

#### 5.1 Sources of errors

While considerable effort is put forth to ensure that a high standard is maintained throughout all survey operations, the resulting estimates are inevitably subject to a certain degree of error. The total survey error is defined as the difference between the survey estimate and the true value for the population, at which the survey estimate aims. The total survey error consists of two types of errors: sampling and non-sampling errors.

#### 5.2 Sampling error

When a sample is selected from a population, estimates based on the sample data may not be exactly the same as what would be obtained from a census of that population. The two results will likely differ since only data for sampled units are used. In the case of a census, there is no sampling error.

The difference between the estimates from a sample survey and a census conducted under the same conditions is referred to as the sampling error of a survey estimate. Factors such as the sample size, the sample design, the variability of the population characteristic under study and the estimation method affect the sampling error. If the population is very heterogeneous like the population of registered motor vehicles, a large sample size is needed to obtain reliable estimates.

The sampling error is measured by a statistical quantity called the standard error. This quantity reflects the expected variability of the survey estimate of a particular population characteristic if repeated sampling is carried out. The true value of the standard error is, of course, not known but can be estimated from the sample. The estimated standard error is used, in this publication, in terms of a relative measure called the coefficient of variation (or CV). This measure is simply the estimated standard error expressed as a percentage of the value of the survey estimate. Therefore, a smaller CV indicates better reliability of the estimate.

#### 5.3 Non-sampling errors

The sampling error is only one component of the total survey error. All other errors arising from all phases of a survey are called non-sampling errors. As the sample size becomes closer to the population size, the sampling error component of the total survey error is expected to decrease. However, this is not necessarily true for the non-sampling error component. For example, this type of error can arise when a respondent provides incorrect information or does not answer certain questions, when a unit in the population of interest is omitted or covered more than once, when a unit that is out-of-scope for the survey is included by mistake or when errors occur in data processing, such as coding and capture errors.

Some non-sampling errors will cancel over a large number of observations, but systematically occurring errors (i.e. those that do not tend to cancel) will contribute to a bias in the estimates. For example, in the case of the CVS, if individuals that use their vehicles more than an average person consistently tend not to respond to the survey, then the resulting estimate of the total vehicle-kilometres will be below the true population total. Any such biases are not reflected in the estimates of standard error.

The non-sampling error as a whole is only one part of the total survey error but its contribution may be important. To minimize the effect of this type of error, a quality assurance program is carried out for each survey. For instance,

follow-ups of nonrespondents can be conducted to obtain information from the total nonrespondents or to complete partially unanswered questionnaires for questions that are deemed essential. Various quality assurance procedures can be exercised at the data capture step. The data editing procedures can identify some inconsistencies in the data structure and the imputation procedures can then correct the identified inconsistencies.

In general, non-sampling errors are difficult to quantify. Special studies must be conducted to estimate them. However, certain measures such as response and imputation rates are easily obtained and can be used as indicators of the non-sampling errors. Different types of non-sampling errors are discussed below.

#### 5.3.1 Coverage errors

Coverage errors arise when the survey population does not adequately cover the population of interest. As a result, certain units belonging to the population of interest are either excluded (undercoverage), or counted more than once (overcoverage). In addition, out of scope units may be present in the survey population (overcoverage).

The following sources of coverage errors for the CVS were observed:

- Errors in the classification variables of the survey may result in either under- or overcoverage of the registered vehicles.
- The sample is drawn from the list created three months prior to the beginning of the reference period. Thus the vehicles registered after the list was created and before the end of the reference period cannot be drawn into the sample.
- A vehicle list from any jurisdiction that was not created on time or did not arrive at all results in even larger undercoverage since an older list has to be used for sampling.
- A vehicle list created early causes overcoverage.
- A vehicle that has been scrapped or salvaged and remained on the list causes overcoverage.
- The survey population (see section 4.1.1) can contain vehicles with the same Vehicle Identification Number (VIN), for example, when a vehicle is on the registration file of more than one jurisdiction. Since every vehicle has a unique VIN, this is likely to cause some overcoverage and consequently overestimation.
- A vehicle that was registered and subsequently unregistered between two consecutive registration lists causes undercoverage.

Thus the CVS is subject to some degree of under and over coverage. The estimation procedure is designed to compensate for the part of the under- and over coverage that has been determined.

Since we assume that the respondent is right (unless we have hard evidence to the contrary), the corrections at the estimation stage are mostly based on the respondent statements.

#### **5.3.2** Response errors

Response errors occur when a respondent provides incorrect information due to a misinterpretation of the survey questions or due to a lack of correct information, or when a respondent is reluctant to disclose the correct information. Large response errors are likely to be caught during editing. However, others may simply go through undetected.

Few response errors were discovered during editing of the data.

#### **5.3.3** Nonresponse errors

Nonresponse errors can occur when a respondent does not respond at all (total nonresponse) or responds only to some questions (partial nonresponse). These errors can have a serious effect if the nonrespondents are systematically different in survey characteristics from the respondents and/or the nonresponse rate is high. See the response rate tables in section 5.4.1.

#### **5.3.4** Processing errors

Apart from coverage, response and nonresponse errors described above, errors that occur during the processing of the data constitute another component of the non-sampling error. Processing errors can arise in data capture, coding, transcription, editing, imputation, outlier detection and treatment, and other types of data handling.

A coding error occurs when a field is coded erroneously because of a misinterpretation of the coding procedures or a bad judgment. A data capture error occurs when the data are misinterpreted or keyed incorrectly. For example, an odometer reading of 53467 could be keyed as 54367.

Once data are coded and captured, they are subject to editing and imputation of missing or erroneous values. The quality of the data used in the estimation depends on the amount of imputation and the difference between the imputed and the true, but unknown, values. The imputation system could result in bias of the estimates. This can happen due to wrong assumptions or due to inability to impute. For example, in the CVS, it is impossible to detect, for vehicles that travel only a small distance during the reported period, fuel purchases that are missing or entered in error.

#### 5.4 Measuring quality

This section presents some indicators of the data quality of the CVS estimates.

#### 5.4.1 Response rates

The response rate is a function of the number of vehicles that responded to the survey. This rate is defined as the number of vehicles for which respondents gave complete or partial (vehicle-kilometers only) answers to the survey divided by the total number of in-sample vehicles.

#### Vehicle response rates by province and vehicle type

Provinces	Nfld. Lab.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.					
	%														
Light vehicles	65	71	63	62	64	64	70	62	61	64					
Heavy vehicles 4.5t – 14.9t	69	69	68	59	65	60	69	73	61	64					
Heavy vehicles 15t or more	72	51	77	72	75	73	55	81	67	66					

#### Vehicle response rates by territory

Territories	Y.T.	N.W.T.	Nvt.
		%	
All vehicles	20	16	11

The low level of response may lead to biased results if the characteristics of interest of the nonrespondents are different than those of the respondents.

#### **5.4.2** Relative imputation rates

The relative imputation rate is defined as the proportion of the corresponding published estimate that is accounted for by imputed data. For example, if the total published estimate is 25 million, composed of 20 million from non-imputed data and 5 million from imputed data, then the relative imputation rate is .2 (5 million divided by 25 million) or 20%. The lower the relative imputation rates are, the more reliable the published estimates are.

The relative imputation rates were calculated for each of the estimates and used to establish a quality indicator for each estimate. The relative imputation rates for estimates could be obtained from the Transportation Division of Statistics Canada upon request.

#### 5.4.3 Coefficient of variation

As a measure of the sampling error of the estimates, the estimated coefficients of variation (CV) were calculated. CV's for estimates may be obtained from the Transportation Division of Statistics Canada upon request. Note that the calculated CV estimates take into account the variability due to sampling and the variability due to non-response and imputation.

#### 5.4.4 Quality indicator

To assist the user in evaluating the potential effect of nonresponse, imputation and sampling error, an all-embracing quality indicator accompanies every estimate. The quality indicator is a function of the CV, which takes into account the variability due to sampling and the variability due to non-response and imputation.

Quality Symbol	C.V. equivalent	Explanation of estimate quality
A	Less than 5%	Excellent
В	5% to 9.9%	Very good
С	10% to 14.9%	Good
D	15% to 19.9%	Acceptable
E	20% to 34.9%	Use with caution
F	35% or more	Too unreliable to be published

The quality of counts (direct from registration lists) not accompanied by a quality symbol is good or better.

#### 5.5 Notes for historical comparison

Beginning with Quarter 1, 2004, the following changes were made and may affect comparability with previous quarters:

- Buses are excluded from the survey
- Rather than estimates of the quantity of fuel purchased, the survey now produces estimates of the quantity
  of fuel consumed.
- The light vehicle log is based on 20 trips rather than reporting all trips for 7 days. Depending on vehicle usage, some respondents will report more than 7 days worth of trips while others will report less than 7 days.
- The definition of a trip for light vehicles has changed so that a new trip is now reported every time a driver gets in the vehicle or a passenger gets in or out of the vehicle. This change will mean that what was previously reported as one trip could now be reported as two, three or even more trips if there is a change in driver and/or multiple passengers are picked up or dropped off at different locations. This new definition will produce more accurate estimates of passenger-kilometres for light vehicles.

Beginning with Quarter 2, 2003, vehicles that were insured but not registered were removed from the registration lists for Manitoba. As a result, some estimates for Manitoba may be lower than the estimates from previous quarters.

Beginning with Quarter 4, 2001, vehicles that were registered but did not have license plates were removed from the registration lists for Quebec. As a result, some estimates for Quebec may be lower than the estimates from previous quarters.

Beginning with Quarter 1, 2001, the following changes were made and may affect comparability with previous quarters:

- Prior to this quarter, duplicate records found within the same list and duplicate records found in more than one list were removed. Starting in this quarter, duplicate records were removed from within each list only. This change may cause some overcoverage and, consequently, overestimation.
- Type of fuel used and body type are collected for the territories. Consequently, the four tables (pages: 28, 29, 34, 36) now include the territories.
- The heavy vehicle logs were changed in 2001 in order to collect passenger information for heavy vehicles. This change means that passenger-kilometres are now estimated for all vehicles, except urban transit buses, for all the provinces (but not for territories).
- The heavy vehicle logs were also changed in 2001 in order to collect distance traveled on roads with posted speeds of 80 kilometres per hour or more. This change means that this information is now estimated for all vehicle types in all provinces (but not for the territories).

The following change was made in the third quarter of 2000 and may affect comparability with previous quarterly results:

Owners of buses and heavy vehicles registered in the territories are now sent two short questionnaires to
record odometer readings at the start and end of the quarter. This process was always used for light vehicles
in the territories and replaces the previous method of sending only one questionnaire at the end of the
quarter and requesting that bus and heavy vehicle owners rely on maintenance records to provide odometer
readings for the start of the quarter.

The following changes were made in the first quarter of 2000 to improve the quality of the survey by diminishing non-sampling errors.

- The changes that affect comparability with 1999 results:
  - The trip purpose choices (for all vehicle types) were changed. The purpose is now based on the destination of the trip. Thus the results from 2000 and 1999 are not comparable for this item.
  - Passenger-kilometers were not collected for heavy vehicles in 2000.
- The changes that may affect comparability with the 1999 results:
  - A new log was developed for survey year 2000 for all heavy vehicles. In 1999 heavy vehicles with gross vehicle weights of 4.5 tonnes or more and less than 15 tonnes had a different log than heavy vehicles with gross vehicle weights of 15 tonnes or more.
  - The fuel purchased question was attached to each trip for the 2000 survey year for heavy vehicles. Previously it was recorded separately from the trips.

# 6. Glossary

**Population of interest:** the collection of all units (e.g., vehicle-days) for which the information is required.

**Survey Population:** the collection of all units (e.g., vehicle-days) for which the information can be realistically provided to the survey. The survey population may differ from the population of interest due to the operational difficulty of identifying all the units that belong to the population of interest. A list of all units in the survey population with their classification information (e.g., geographical, vehicle characteristics, date) is used for sample design, selection and estimation.

**Stratification:** a non-overlapping partition of the survey population into relatively homogeneous groups with respect to certain characteristics such as geographical classification, size, etc. These groups are called strata and are used for sample allocation and selection.

**Sampling weight:** a raising factor is attached to each sampled unit (vehicle-day) to obtain estimates for the population from a sample. The basic concept of the sampling weight can be explained by using the representation rate. For example, if 2 units are selected out of 10 population units at random, then each selected unit represents 5 units in the population including itself, and is given the sampling weight of 5. A survey with a complex sample design like the CVS requires a more complicated way of calculating the sampling weight. However, the sampling weight is still equal to the number of units in the registration lists the sampled unit represents.

**Editing:** the application of checks that identify missing, invalid or inconsistent entries or that point to data records that are potentially in error. Some of these checks involve logical relationships that follow directly from the concepts and definitions. Others are more empirical in nature or are obtained as a result of the application of statistical tests or procedures.

**Imputation:** the process used to resolve problems of missing, invalid or inconsistent responses identified during editing. This is done by changing some of the responses or missing values on the record being edited to ensure that a plausible, internally coherent record is created. Some problems are eliminated earlier through contact with the respondent or through manual study of the questionnaire. It is generally impossible to resolve all problems at these early stages due to concerns of response burden, cost and timeliness. Imputation is then used to handle remaining edit failures, since it is desirable to produce a complete and consistent file containing imputed data. Although, imputation can improve the quality of the final data by correcting for missing, invalid or inconsistent responses, some methods of imputation do not preserve the relationships between variables or can actually distort underlying distributions.

Number of vehicles on the registration lists by type of vehicle and jurisdiction  ${\bf r}$ 

		Vehicle	e type	
	Vehicles up to 4.5t	Trucks 4.5t to 14.9t	Trucks 15t and over	Total
Jurisdiction				
Newfoundland and Labrador	247 482	3 989	3 142	254 613
Prince Edward Island	75 383	1 621	2 649	79 653
Nova Scotia	530 883	9 048	7 835	547 766
New Brunswick	448 012	7 238	4 005	459 255
Quebec	4 185 098	55 955	38 132	4 279 185
Ontario	6 741 705	88 296	109 570	6 939 571
Manitoba	621 275	10 183	15 330	646 788
Saskatchewan	655 806	38 207	25 238	719 251
Alberta	2 204 732	102 251	71 984	2 378 967
British Columbia	2 249 471	83 419	14 201	2 347 091
Yukon Territory	24 585	1 556	1 194	27 335
Northwest territories	20 307	668	1 254	22 229
Nunavut	2 798	186	109	3 093
Total - Canada	18 007 537	402 617	294 643	18 704 797

Number of vehicles on the registration lists by jurisdiction and vehicle model year for

== vehicles up to 4.5t

		Jurisdiction												
	Newfound- land and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatche- wan	Alberta	British Columbia	Yukon Territory	Northwest Territor- ies	Nunavut	TOTAL
Vehicle Model Year														
Earlier then 1988	7 014	4 275	26 571	20 026	143 295	297 387	54 106	100 674	236 509	262 516	4 327	1 985	221	1 158 906
1988	3 577	1 735	8 996	8 359	67 606	103 938	14 398	19 103	54 377	69 895	996	497	80	353 557
1989	4 255	2 132	10 943	10 157	83 203	134 634	16 511	21 112	64 624	84 003	1 083	582	66	433 305
1990	4 748	2 594	13 691	12 484	111 056	174 141	20 664	24 089	76 923	100 912	1 137	622	76	543 137
1991	6 021	2 867	15 854	15 169	140 576	203 275	24 169	26 783	84 571	104 628	1 090	663	109	625 775
1992	7 987	3 949	20 893	19 985	186 069	260 495	28 056	28 947	87 972	111 547	1 081	647	122	757 750
1993	10 489	4 269	23 187	20 505	187 997	278 581	26 837	27 433	84 278	106 278	1 056	624	132	771 666
1994	12 681	4 763	26 742	23 221	195 224	308 456	28 228	30 310	91 713	104 285	1 089	751	151	827 614
1995	13 411	5 130	29 027	25 373	215 856	353 466	31 692	32 811	99 113	109 345	1 162	758	154	917 298
1996	10 807	4 446	25 711	21 797	179 749	308 558	28 849	27 809	85 758	88 617	913	646	122	783 782
1997	14 956	5 475	33 077	27 191	228 396	409 594	38 745	37 259	117 852	115 865	1 251	948	183	1 030 792
1998	17 565	5 715	36 979	30 727	252 276	454 337	41 076	38 180	133 147	116 765	1 166	1 045	168	1 129 146
1999	17 473	5 253	35 142	28 732	250 121	445 529	36 217	31 798	114 640	105 650	1 042	1 104	198	1 072 899
2000	20 514	6 137	42 227	35 307	311 661	546 728	41 790	37 556	132 034	124 216	1 093	1 329	194	1 300 786
2001	18 621	4 163	34 334	28 682	290 165	484 772	38 112	36 267	136 881	121 373	1 207	1 506	218	1 196 301
2002	23 228	4 277	42 374	34 348	364 919	555 456	44 152	39 991	161 645	146 545	1 349	1 733	231	1 420 248
2003	24 634	3 868	42 762	35 385	400 918	595 303	46 498	41 970	175 171	151 104	1 574	2 253	181	1 521 621
2004	20 270	2 773	36 787	30 682	345 606	487 469	39 551	36 963	160 982	133 375	1 236	1 705	135	1 297 534
2005	9 179	1 552	25 213	19 707	227 647	335 015	21 455	16 735	105 320	91 519	721	906	55	855 024
2006	27	10	373	173	2 247	4 571	170	16	1 223	1 032	12	3	2	9 859
Unknown	22	0	0	3	507	0	0	0	0	0	0	0	0	532
TOTAL	247 479	75 383	530 883	448 013	4 185 094	6 741 705	621 276	655 806	2 204 733	2 249 470	24 585	20 307	2 798	18 007 532

Number of vehicles on the registration lists by jurisdiction and vehicle model year for

== trucks 4.5t - 14.9t

		Jurisdiction												
	Newfound- land and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatche- wan	Alberta	British Columbia	Yukon Territory	Northwest Territor- ies	Nunavut	TOTAL
Vehicle Model Year														
Earlier then 1988	870	831	2 207	921	11 955	7 259	2 895	27 404	34 497	13 594	505	131	43	103 112
1988	179	79	329	160	2 799	2 159	317	441	2 381	2 287	57	19	13	11 220
1989	157	92	344	159	2 393	2 227	312	395	2 474	2 548	60	19	7	11 187
1990	167	59	352	182	2 449	2 537	423	524	2 720	2 889	58	35	8	12 403
1991	173	45	270	190	1 624	1 900	392	485	2 108	2 316	36	21	6	9 566
1992	133	40	256	210	1 566	1 995	342	453	2 102	2 372	44	18	7	9 538
1993	148	45	283	256	1 799	2 573	380	509	2 146	2 837	33	14	9	11 032
1994	188	59	306	299	2 293	3 222	400	534	2 644	3 201	51	22	6	13 225
1995	235	65	518	368	3 005	4 312	543	732	3 319	3 725	32	31	18	16 903
1996	133	33	310	286	1 963	3 335	372	470	2 314	2 648	33	18	4	11 919
1997	187	44	403	356	2 050	4 691	469	657	3 769	3 483	63	28	10	16 210
1998	171	25	420	374	2 591	4 874	394	660	3 596	3 043	38	19	7	16 212
1999	224	52	565	521	3 585	7 385	514	660	4 493	3 909	71	39	9	22 027
2000	199	34	474	354	2 982	6 517	386	550	3 940	3 716	51	33	8	19 244
2001	175	26	394	400	2 340	6 439	430	803	5 822	4 461	62	32	5	21 389
2002	207	29	387	399	2 187	6 388	363	657	5 009	4 744	65	35	5	20 475
2003	177	28	485	694	2 841	7 687	432	822	6 133	7 987	112	35	6	27 439
2004	141	20	451	717	2 641	7 195	405	696	5 297	8 367	105	35	12	26 082
2005	119	15	286	369	2 473	5 390	395	756	7 262	5 219	76	82	4	22 446
2006	1	0	8	21	195	213	18	1	228	69	0	1	0	755
Unknown	3	0	0	0	223	0	0	0	0	0	0	0	0	226
TOTAL	3 987	1 621	9 048	7 236	55 954	88 298	10 182	38 209	102 254	83 415	1 552	667	187	402 610

Number of vehicles on the registration lists by jurisdiction and vehicle model year for

#### == trucks 15t or more

							Jurisdictio	1						
	Newfound- land and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatche- wan	Alberta	British Columbia	Yukon Territory	Northwest Territor- ies	Nunavut	TOTAL
Vehicle Model Year														
Earlier then 1988	447	1 241	1 039	922	1 309	7 594	1 884	9 074	18 130	2 854	228	177	19	44 918
1988	124	185	227	210	551	2 366	324	962	1 925	446	32	23	0	7 375
1989	142	144	278	207	472	2 580	304	820	1 760	455	24	28	3	7 217
1990	100	136	180	221	447	2 544	275	830	1 963	733	33	31	2	7 495
1991	87	88	112	120	288	1 641	204	558	1 450	428	20	30	6	5 032
1992	85	49	130	88	447	1 654	226	548	1 214	555	33	22	4	5 055
1993	80	62	193	161	640	2 280	396	820	1 717	525	33	33	4	6 944
1994	128	85	316	207	1 265	3 389	595	1 110	2 653	649	36	52	4	10 489
1995	205	145	444	264	1 996	5 977	762	1 528	3 417	730	42	62	6	15 578
1996	173	88	361	163	1 471	4 388	682	1 094	2 741	665	54	65	8	11 953
1997	150	45	313	133	1 583	4 832	660	1 062	3 262	697	55	66	2	12 860
1998	229	70	547	227	2 906	8 430	1 087	1 434	4 669	715	67	92	7	20 480
1999	198	77	605	221	3 410	10 218	1 148	1 111	3 757	659	70	85	15	21 574
2000	255	70	779	193	4 458	12 047	1 359	1 040	3 746	562	100	96	4	24 709
2001	128	36	396	119	2 829	7 530	832	786	3 617	591	82	82	5	17 033
2002	105	12	281	91	1 914	5 326	569	434	2 894	515	48	61	2	12 252
2003	145	33	486	129	3 555	7 671	1 013	572	3 234	610	68	64	6	17 586
2004	156	39	565	138	3 188	8 178	1 272	721	4 096	816	79	90	7	19 345
2005	194	36	532	158	4 882	9 958	1 589	725	5 280	917	84	94	2	24 451
2006	11	4	50	32	504	965	147	9	459	78	4	1	0	2 264
Unknown	1	0	0	0	18	0	0	0	0	0	0	0	0	19
TOTAL	3 143	2 645	7 834	4 004	38 133	109 568	15 328	25 238	71 984	14 200	1 192	1 254	106	294 629

Estimates of the

number of vehicles in scope by type of vehicle and jurisdiction

			Ve	hicle	e type			
	Vehicles up to 4.5t		Trucks 4.5t to 14.9t		Trucks 15t and over		Total	
Jurisdiction								
Newfoundland and Labrador	242 189	В	3 461	D	2 752	D	248 402	В
Prince Edward Island	76 006	В	1 496	С	2 289	D	79 791	В
Nova Scotia	528 680	А	7 672	С	7 337	В	543 689	А
New Brunswick	421 115	В	5 153	D	3 865	В	430 132	В
Quebec	4 150 760	А	46 352	С	39 364	В	4 236 476	А
Ontario	6 678 663	А	59 749	С	108 555	В	6 846 968	А
Manitoba	617 144	А	9 004	В	15 463	D	641 611	А
Saskatchewan	649 478	А	34 132	С	25 848	С	709 458	А
Alberta	2 168 231	А	80 858	В	69 739	В	2 318 828	А
British Columbia	2 258 651	А	51 628	В	13 465	В	2 323 744	А
Yukon Territory	23 742	А	1 366	В	1 194	Α	26 302	А
Northwest territories	19 955	А	525	В	1 488	Α	21 967	А
Nunavut	2 924	А	165	С	109	Α	3 199	А
Total - Canada	17 837 538	А	301 561	Α	291 468	Α	18 430 567	А

Estimates for Canada of the

number of vehicles in scope by type of vehicle and vehicle model year

		Vehicle type											
	Vehicles up to 4.5t	Trucks 4.5t to 14.9t	Trucks 15t and over		Total								
Vehicle model year													
Later than 2002	3 151 850	В	44 282	С	76 030	В	3 272 162	A					
2000 - 2002	4 199 488	А	58 083	В	49 181	В	4 306 752	А					
1996 - 1999	4 472 162	А	58 113	С	72 782	С	4 603 057	А					
1992 - 1995	3 308 680	В	51 378	D	46 150	С	3 406 209	В					
Earlier than 1992	2 705 357	В	89 705	С	47 325	С	2 842 387	В					
Total	17 837 538	А	301 561	Α	291 468	Α	18 430 567	А					

Estimates for Canada of the

number of vehicles in scope by type of vehicle and vehicle body type

			Ve	hicle	e type			
	Vehicles up to 4.5t		Trucks 4.5t to 14.9t	Trucks 15t and over	Total			
Vehicle body type								
Car	10 074 546	А					10 074 546	А
Station wagon	366 995	D					366 995	D
Van	2 859 572	В	19 194	Е		F	2 878 899	В
Sport utility vehicle	1 504 425	В		F			1 505 296	В
Pickup	2 974 792	В	68 508	С		F	3 043 391	В
Straight truck		F	204 310	В	107 461	В	368 177	В
Tractor trailer		F		F	181 795	В	187 017	В
Bus		F		F				F
0ther				F		F		F
Total	17 837 538	А	301 561	А	291 468	Α	18 430 567	А

Estimates for Canada of the

number of vehicles in scope by type of vehicle and type of fuel

		Vehicle type									
	Vehicles up to 4.5t		Trucks 4.5t to 14.9t		Trucks 15t and over		Total				
Fuel type											
Gasoline	17 142 774	А	98 850	В		F	17 244 407	А			
Diesel	661 414	С	191 723	В	288 639	Α	1 141 777	В			
Other		F		F	46	Α		F			
Total	17 837 538	Α	301 561	Α	291 468	Α	18 430 567	А			

Estimates of  $\label{eq:condition} % \begin{center} \begin{center$ 

			Ve	hicle	e type				
	Vehicles up to 4.5t		Trucks 4.5t to 14.9t		Trucks 15t and over		Total		
Jurisdiction									
Newfoundland and Labrador	1 070.6	D		F	32.5	E	1 119.4	D	
Prince Edward Island	332.3	D		F		F	339.4	D	
Nova Scotia	2 239.6	С	32.6	Е	169.3	D	2 441.5	С	
New Brunswick	2 120.9	D		F	29.1	Е	2 188.6	С	
Quebec	16 967.9	С	216.2	Е	1 063.2	В	18 247.3	В	
Ontario	33 212.5	С	270.9	Е	2 450.6	С	35 934.0	В	
Manitoba	2 673.2	D		F	471.3	D	3 180.5	С	
Saskatchewan	2 213.6	D		F	233.2	Е	2 504.9	D	
Alberta	9 973.7	D	277.5	Е	958.9	Е	11 210.1	С	
British Columbia	8 191.8	С	187.3	Е	126.0	Е	8 505.0	С	
Yukon Territory	105.7	С	6.6	D	37.6	D	149.9	В	
Northwest territories	58.2	В		F	36.2	D	95.8	В	
Nunavut	7.3	D		F		F	7.8	D	
Total - Canada	79 167.4	В	1 143.7	С	5 613.2	В	85 924.3	В	

Estimates of passenger-km ('000 000) by type of vehicle and jurisdiction

			Vel	hicle	e type			
	Vehicles up to 4.5t		Trucks 4.5t to 14.9t		Trucks 15t and over		Total	
Jurisdiction								
Newfoundland and Labrador	1 792.7	D		F	32.5	E	1 848.3	D
Prince Edward Island	574.0	Е		F		F	581.7	Е
Nova Scotia	3 607.9	С	46.6	Е	182.3	D	3 836.8	С
New Brunswick	3 969.0	D		F	31.0	Е	4 051.4	D
Quebec	29 499.9	С	258.6	Е	1 371.5	С	31 130.0	В
Ontario	58 226.6	С	315.7	Е	2 700.0	D	61 242.3	С
Manitoba	4 742.3	D	58.4	Е	666.2	D	5 466.9	С
Saskatchewan	3 635.7	Е		F	248.5	Е	3 956.9	D
Alberta	19 310.4	D	525.2	Е	1 067.6	Е	20 903.2	D
British Columbia	13 305.0	С	237.3	Е	146.3	Е	13 688.5	С
Total - Provinces	138 663.6	В	1 591.8	С	6 450.8	В	146 706.2	В

Due to rounding, the numbers may not add up and may differ slightly among the tables. All passenger-km estimates exclude the territories.

Estimates for Canada of

vehicle-km ('000 000) by type of vehicle and vehicle model year  $\,$ 

		Vehicle type									
	Vehicles up to 4.5t		Trucks 4.5t to 14.9t		Trucks 15t and over		Total				
Vehicle model year											
Later than 2002	17 174.0	С	280.9	Е	2 332.5	С	19 787.4	В			
2000 - 2002	22 597.6	С	339.3	D	1 349.1	С	24 286.0	С			
1996 - 1999	19 653.9	С	287.8	Е	1 428.0	Е	21 369.7	С			
1992 - 1995	12 664.8	D		F	320.9	Е	13 100.0	С			
Earlier than 1992	7 077.1	D		F		F	7 381.2	D			
Total	79 167.4	В	1 143.7	С	5 613.2	В	85 924.3	В			

Estimates of the provincial total of

passenger-km ('000 000) by type of vehicle and vehicle model year  $\,$ 

		Vehicle type									
	Vehicles up to 4.5t		Trucks 4.5t to 14.9t	Trucks 4.5t to 14.9t			Total				
Vehicle model year											
Later than 2002	34 026.2	С	453.9	Е	2 627.7	С	37 107.7	С			
2000 - 2002	39 631.6	С	488.5	Е	1 573.8	С	41 693.9	С			
1996 - 1999	33 891.0	С	346.3	Е	1 674.7	Е	35 912.0	С			
1992 - 1995	20 080.3	D		F	387.2	Е	20 607.2	С			
Earlier than 1992	11 034.5	Е		F		F	11 385.4	D			
Total	138 663.6	В	1 591.8	С	6 450.8	В	146 706.2	В			

Due to rounding, the numbers may not add up and may differ slightly among the tables. All passenger-km estimates exclude the territories.

Estimates for Canada of

vehicle-km ('000 000) by type of vehicle and vehicle body type  $\,$ 

			Ve	hicle	e type			
	Vehicles up to 4.5t		Trucks 4.5t to 14.9t		Trucks 15t and over		Total	
Vehicle body type								
Car	43 995.2	В					43 995.2	В
Station wagon		F						F
Van	14 137.5	С		F		F	14 203.6	С
Sport utility vehicle	6 586.6	Е					6 586.6	Е
Pickup	12 349.5	D		F		F	12 585.6	С
Straight truck		F	809.7	D	892.9	Е	1 942.7	D
Tractor trailer		F		F	4 710.6	В	4 738.9	В
Bus		F		F				F
Other				F		F		F
Total	79 167.4	В	1 143.7	С	5 613.2	В	85 924.3	В

Estimates of the provincial total of

passenger-km ('000 000) by type of vehicle and vehicle body type  $% \left( 1\right) =\left( 1\right) \left( 1\right) \left($ 

			Ve	hicle	e type			
	Vehicles up to 4.5t		Trucks 4.5t to 14.9t		Trucks 15t and over		Total	
Vehicle body type								
Car	71 994.9	В					71 994.9	В
Station wagon		F						F
Van	30 462.1	D		F		F	30 541.6	D
Sport utility vehicle	13 125.4	Е					13 125.4	Е
Pickup	19 849.6	D	462.4	Е		F	20 312.1	D
Straight truck		F	1 009.0	D	1 057.4	Е	2 365.0	D
Tractor trailer				F	5 382.8	В	5 417.8	В
Bus		F						F
Other				F		F		F
Total	138 663.6	В	1 591.8	С	6 450.8	В	146 706.2	В

Due to rounding, the numbers may not add up and may differ slightly among the tables. All passenger-km estimates exclude the territories.

Estimates for Canada of

vehicle-km ('000 000) by type of vehicle and type of fuel

		Vehicle type									
	Vehicles up to 4.5t		Trucks 4.5t to 14.9t		Trucks 15t and over		Total				
Fuel type											
Gasoline	75 055.8	В	222.1	Е		F	75 280.8	В			
Diesel	3 883.4	Е	892.3	С	5 608.6	В	10 384.4	С			
Other		F		F		F		F			
Total	79 167.4	В	1 143.7	С	5 613.2	В	85 924.3	В			

Estimates of the provincial total of

passenger-km ('000 000) by type of vehicle and type of fuel

		Vehicle type									
	Vehicles up to 4.5t		Trucks 4.5t to 14.9t		Trucks 15t and over		Total				
Fuel type											
Gasoline	132 882.9	В	354.0	Е		F	133 239.8	В			
Diesel	5 336.1	Е	1 203.0	С	6 447.9	В	12 987.0	С			
Other		F		F				F			
Total	138 663.6	В	1 591.8	С	6 450.8	В	146 706.2	В			

Due to rounding, the numbers may not add up and may differ slightly among the tables. All passenger-km estimates exclude the territories.

vehicle-km ('000 000) by type of vehicle and day of week

			Vel	hicle	e type			
	Vehicles up to 4.5t Tr		Trucks 4.5t to 14.9t		Trucks 15t and over		Total	
Day of the week								
Sunday	9 559.4	С		F	238.3	Е	9 834.5	С
Monday	10 894.6	С	186.0	Е	1 095.8	В	12 176.4	С
Tuesday	10 382.9	С	234.1	D	1 074.4	В	11 691.4	С
Wednesday	12 227.4	С	231.4	D	1 204.9	В	13 663.8	С
Thursday	14 280.4	С	240.7	Е	992.7	С	15 513.7	С
Friday	12 501.6	С	164.6	Е	759.2	С	13 425.4	С
Saturday	9 149.9	С		F	173.7	Е	9 365.6	С
Total	78 996.1	В	1 135.7	С	5 539.1	В	85 670.8	В

passenger-km ('000 000) by type of vehicle and day of week

			Vel	hicle	e type			
	Vehicles up to 4.5t		Trucks 4.5t to 14.9t		Trucks 15t and over	Total		
Day of the week								
Sunday	20 648.2	С		F	260.0	Е	20 955.7	С
Monday	17 317.7	С	274.0	Е	1 188.5	В	18 780.3	В
Tuesday	16 187.9	С	323.4	D	1 244.7	С	17 755.9	С
Wednesday	17 191.8	С	308.3	Е	1 505.3	С	19 005.4	С
Thursday	22 776.4	D	342.4	Е	1 159.5	С	24 278.3	D
Friday	26 181.7	D	239.5	Е	901.0	С	27 322.2	С
Saturday	18 360.0	С		F	191.8	Е	18 608.3	С
Total	138 663.6	В	1 591.8	С	6 450.8	В	146 706.2	В

vehicle-km ('000 000) by type of vehicle and driver age group  $% \left( 1\right) =\left( 1\right) \left( 1\right$ 

			Ve	hicle	e type			
	Vehicles up to 4.5t T		Trucks 4.5t to 14.9t		Trucks 15t and over		Total	
Age of driver								
Under 20 years		F		F		F		F
20 - 24 years		F		F	185.1	Е		F
25 - 34 years	7 248.4	Е	236.6	Е	1 126.8	D	8 611.8	Е
35 - 44 years	12 742.3	Е	401.4	D	1 952.7	С	15 096.4	D
45 - 54 years	31 506.1	С	298.0	Е	1 565.1	С	33 369.2	С
55 - 64 years	14 198.5	D	117.3	Е	565.0	D	14 880.8	D
65 years and over	9 984.6	D		F		F	10 165.0	D
Total	78 996.1	В	1 135.7	С	5 539.1	В	85 670.8	В

			Ve	hicle	e type			
	Vehicles up to 4.5t		Trucks 4.5t to 14.9t		Trucks 15t and over		Total	
Age of driver								
Under 20 years		F		F		F		F
20 - 24 years		F		F	224.1	Е	2 769.0	E
25 - 34 years	12 581.8	Е	348.3	Е	1 322.2	D	14 252.3	D
35 - 44 years	27 661.8	Е	537.7	D	2 292.8	С	30 492.3	D
45 - 54 years	51 680.4	С	395.2	Е	1 716.4	С	53 792.0	С
55 - 64 years	22 569.2	D	157.7	Е	747.8	D	23 474.7	D
65 years and over	18 623.2	D		F		F	18 843.2	D
Total	138 663.6	В	1 591.8	С	6 450.8	В	146 706.2	В

vehicle-km ('000 000) by type of vehicle and sex of driver

	Vehicle type										
	Vehicles up to 4.5t	/ehicles up to 4.5t Truc		Trucks 4.5t to 14.9t			Total				
Sex of driver											
Male	55 299.1	В	1 107.6	С	5 523.0	В	61 929.8	В			
Female	23 697.0	D		F		F	23 741.0	D			
Total	78 996.1	В	1 135.7	С	5 539.1	В	85 670.8	В			

passenger-km ('000 000) by type of vehicle and sex of driver  $% \left( 1\right) =\left( 1\right) \left( 1\right)$ 

	Vehicle type										
	Vehicles up to 4.5t		Trucks 4.5t to 14.9t		Trucks 15t and over		Total				
Sex of driver											
Male	98 565.6	В	1 545.1	С	6 427.0	В	106 537.8	В			
Female	40 097.9	С		F		F	40 168.4	С			
Total	138 663.6	В	1 591.8	С	6 450.8	В	146 706.2	В			

vehicle-km ('000 000) by type of vehicle and time of day

			Vel	hicle	e type			
	Vehicles up to 4.5t		Trucks 4.5t to 14.9t	Trucks 4.5t to 14.9t			Total	
Time of day								
00:00 - 05:59	2 071.2	E	57.1	Е	498.5	С	2 626.8	D
06:00 - 11:59	24 160.9	В	492.4	С	1 952.4	В	26 605.7	В
12:00 - 17:59	34 226.1	В	500.1	С	2 080.3	В	36 806.5	В
18:00 - 23:59	18 537.9	С	86.1	Е	1 007.8	С	19 631.8	С
Total	78 996.1	В	1 135.7	С	5 539.1	В	85 670.8	В

passenger-km ('000 000) by type of vehicle and time of day

			Ve	hicle	e type			
	Vehicles up to 4.5t T		Trucks 4.5t to 14.9t	Trucks 4.5t to 14.9t			Total	
Time of day								
00:00 - 05:59	3 056.4	Е	99.6	Е	654.4	С	3 810.4	D
06:00 - 11:59	40 512.9	В	656.7	С	2 223.7	В	43 393.4	В
12:00 - 17:59	64 715.2	В	688.3	С	2 358.0	В	67 761.5	В
18:00 - 23:59	30 379.1	С	147.2	Е	1 214.6	С	31 740.9	В
Total	138 663.6	В	1 591.8	С	6 450.8	В	146 706.2	В

vehicle-km ('000 000) by type of vehicle and carrying dangerous goods  $% \left( 1\right) =\left( 1\right) \left( 1$ 

			Vehicle type			
	Trucks 4.5t to 14.9t		Trucks 15t and over	Total		
Carrying dangerous goods						
Declared - yes		F	442.3	D	455.0	D
Declared - no	1 123.0	D	5 096.7	В	6 219.7	В
Total	1 135.7	D	5 539.1	В	6 674.7	В

passenger-km ('000 000) by type of vehicle and carrying dangerous goods  $% \left( 1\right) =\left( 1\right) \left( 1\right) \left($ 

			Vehicle type				
	Trucks 4.5t to 14.9t Trucks 15t and over				Total		
Carrying dangerous goods							
Declared - yes		F	442.7	Е	458.4	Е	
Declared - no	1 576.1	С	6 008.1	В	7 584.2	В	
Total	1 591.8	С	6 450.8	В	8 042.6	В	

vehicle-km ('000 000) by type of vehicle and type of day

		Vehicle type										
	Vehicles up to 4.5t	Vehicles up to 4.5t		Trucks 4.5t to 14.9t			Total					
Type of day												
Weekends and holidays	19 720.6	С		F	456.6	D	20 278.3	В				
Weekdays	59 275.5	В	1 034.7	С	5 082.4	В	65 392.6	В				
Total	78 996.1	В	1 135.7	С	5 539.1	В	85 670.8	В				

passenger-km ('000 000) by type of vehicle and type of day

			Vel	nicle	e type			
	Vehicles up to 4.5t	Vehicles up to 4.5t		Trucks 4.5t to 14.9t			Total	
Type of day								
Weekends and holidays	40 543.2	С		F	499.5	D	41 168.5	С
Weekdays	98 120.3	В	1 466.0	С	5 951.3	В	105 537.7	В
Total	138 663.6	В	1 591.8	С	6 450.8	В	146 706.2	В

vehicle-km ('000 000) by type of vehicle and road type

			Vel	hicle	e type			
	Vehicles up to 4.5t		Trucks 4.5t to 14.9t		Trucks 15t and over		Total	
Road type								
Road with posted maximum speed of 80km/h or more	43 141.1	В	554.5	D	4 077.4	В	47 772.9	В
Other roads	35 855.0	С	581.2	С	1 461.7	С	37 897.9	С
Total	78 996.1	В	1 135.7	С	5 539.1	В	85 670.8	В

passenger-km ('000 000) by type of vehicle and road type

	Vehicle type										
	Vehicles up to 4.5t		Trucks 4.5t to 14.9t		Trucks 15t and over		Total				
Road type											
Road with posted maximum speed of 80km/h or more	80 068.1	В	779.7	D	4 658.2	С	85 505.9	В			
Other roads	58 595.5	С	812.0	С	1 792.7	С	61 200.2	С			
Total	138 663.6	В	1 591.8	С	6 450.8	В	146 706.2	В			

vehicles up to 4.5t: passenger-km ('000 000) by passenger age group

	Estimates	s for	
	Vehicles up	to 4.5t	
Passenger age			
Under 5 years	5	762.7	Е
5 - 14 years	12	308.4	Е
15 - 19 years	6	249.8	Е
20 - 24 years	3	803.8	Е
25 - 34 years	10	014.0	D
35 - 54 years	60	439.5	В
55 - 64 years	22	805.0	С
65 - 74 years	11	868.6	С
75 - 84 years	5	108.2	D
85 years and over			F
Total	138	663.6	В

vehicles up to 4.5t: vehicle-km and passenger-km by part of the driver's job

	Estimates of									
	vehicle-km ('000 000)	passenger-km ('000 000)								
Part of job										
Yes	10 307.1	С	13 158.6	С						
No	68 689.0	В	125 504.9	В						
Total	78 996.1	В	138 663.6	В						

vehicles up to 4.5t: vehicle-km ('000 000) by origin and destination of trip

					Destination					
	Driver's home		Driver's regular workplace		Shopping centre / ba / other place of personal business		Leisure / entertain / recreational faci / restaurant			
Origin										
Driver's home	15 004.8	С	5 742.7	E		F		F	12 213.9	D
Driver's regular workplace	5 325.5	Е	2 047.1	Е		F		F		F
Shopping centre / bank / other place of personal business		F		F		F		F		F
Leisure / entertainment / recreational facility / restaurant		F		F		F		F		F
Other	8 518.8	Е		F		F		F	6 883.6	Е

vehicles up to 4.5t: passenger-km ('000 000) by origin and destination of trip

					Destination					
	Driver's home		Driver's regular workplace		Shopping centre / ba / other place of personal busines		Leisure / entertain / recreational faci / restaurant			
Origin										
Driver's home	25 642.9	С	6 954.6	E	5 641.8	Е	5 311.3	Е	21 131.1	D
Driver's regular workplace	6 384.8	Е	2 550.7	Е		F		F		F
Shopping centre / bank / other place of personal business	6 042.9	Е		F		F		F		F
Leisure / entertainment / recreational facility / restaurant	5 415.5	Е		F		F		F		F
Other	14 596.6	D		F		F	3 308.1	Е	15 582.2	D

trucks 4.5t or more: vehicle-km ('000 000) by vehicle group and trip purpose

		Ve	hicle	e type	
		Trucks 4.5t to 14.9t		Trucks 15t and over	
Vehicle group	Trip purpose				
Straight truck	Driving to or from service call		F		F
	Carrying goods or equipment	550.0	Е	598.1	Е
	Empty		F		F
	Other work purpose		F		F
	Non work purpose		F		F
	Total	1 108.1	D	880.8	Е
Other over 4.5t	Driving to or from service call		F		F
	Carrying goods or equipment		F	3 690.4	С
	Empty		F	516.9	E
	Other work purpose				F
	Non work purpose		F	190.1	Е
	Total		F	4 658.3	В
Total	Driving to or from service call		F	299.7	Е
	Carrying goods or equipment	562.0	Е	4 288.4	В
	Empty		F	673.4	Е
	Other work purpose		F		F
	Non work purpose		F	233.9	Е
	Total	1 135.7	D	5 539.1	В

trucks 4.5t or more: passenger-km ('000 000) by vehicle group and trip purpose

		Ve	hicle	type	
		Trucks 4.5t to 14.9t		Trucks 15t and over	
Vehicle group	Trip purpose				
Straight truck	Driving to or from service call	325.3	Е		F
	Carrying goods or equipment	630.2	Е	676.3	Е
	Empty		F		F
	Other work purpose		F		F
	Non work purpose	450.9	Е		F
	Total	1 556.8	D	1 058.7	E
Other over 4.5t	Driving to or from service call		F	366.2	Е
	Carrying goods or equipment		F	4 269.1	С
	Empty		F	546.7	Е
	Other work purpose				F
	Non work purpose		F	204.4	E
	Total		F	5 392.1	С
Total	Driving to or from service call	329.4	Е	423.7	E
	Carrying goods or equipment	644.1	Е	4 945.4	С
	Empty		F	746.5	Е
	Other work purpose		F		F
	Non work purpose	466.5	Е	271.6	E
	Total	1 591.8	D	6 450.8	В

vehicle-km ('000 000) by type of vehicle, type of day and time of day  $% \left( 1\right) =\left( 1\right) \left( 1$ 

				Ve	hicl	e type			
		Vehicles up to 4.5t		Trucks 4.5t to 14.9t		Trucks 15t and over		Total	
Type of day	Time of day								
Weekends and holidays	00:00 - 05:59		F		F	33.8	E		F
nolidays	06:00 - 11:59	5 551.7	С		F	140.9	D	5 735.6	С
	12:00 - 17:59	9 127.4	С	37.0	Е	172.7	D	9 337.1	С
	18:00 - 23:59	4 056.2	D		F	95.5	Е	4 157.9	D
	Total	19 720.6	В	101.0	Е	456.6	С	20 278.3	В
Weekdays	00:00 - 05:59	1 493.2	Е	50.3	Е	464.7	С	2 008.1	D
	06:00 - 11:59	18 609.2	В	449.4	С	1 811.5	В	20 870.1	В
	12:00 - 17:59	25 098.7	В	463.1	С	1 907.6	В	27 469.4	В
	18:00 - 23:59	14 481.7	D	80.0	Е	912.3	С	15 474.0	С
	Total	59 275.5	В	1 034.7	С	5 082.4	В	65 392.6	В
Total	00:00 - 05:59	2 071.2	Е	57.1	Е	498.5	С	2 626.8	D
	06:00 - 11:59	24 160.9	В	492.4	С	1 952.4	В	26 605.7	В
	12:00 - 17:59	34 226.1	В	500.1	С	2 080.3	В	36 806.5	В
	18:00 - 23:59	18 537.9	С	86.1	E	1 007.8	С	19 631.8	С
	Total	78 996.1	В	1 135.7	С	5 539.1	В	85 670.8	В

passenger-km ('000 000) by type of vehicle, type of day and time of day  $% \left( 1\right) =\left( 1\right) \left( 1\right) \left($ 

				Ve	hicle	e type			
		Vehicles up to 4.5t		Trucks 4.5t to 14.9t		Trucks 15t and over		Total	
Type of day	Time of day								
Weekends and	00:00 - 05:59		F		F	45.3	Е		F
holidays	06:00 - 11:59	10 734.2	С		F	158.1	D	10 949.0	С
	12:00 - 17:59	20 685.1	С		F	190.2	D	20 927.2	С
	18:00 - 23:59	8 191.3	D		F	105.9	Е	8 305.9	С
	Total	40 543.2	В	125.7	Е	499.5	D	41 168.5	В
Weekdays	00:00 - 05:59	2 123.7	Е	91.3	Е	609.1	D	2 824.0	Е
	06:00 - 11:59	29 778.8	С	600.1	С	2 065.6	В	32 444.4	В
	12:00 - 17:59	44 030.1	В	636.3	С	2 167.9	В	46 834.3	В
	18:00 - 23:59	22 187.8	С	138.4	Е	1 108.8	С	23 434.9	С
	Total	98 120.3	В	1 466.0	С	5 951.3	В	105 537.7	В
Total	00:00 - 05:59	3 056.4	Е	99.6	Е	654.4	С	3 810.4	D
	06:00 - 11:59	40 512.9	В	656.7	С	2 223.7	В	43 393.4	В
	12:00 - 17:59	64 715.2	В	688.3	С	2 358.0	В	67 761.5	В
	18:00 - 23:59	30 379.1	С	147.2	Е	1 214.6	С	31 740.9	В
	Total	138 663.6	В	1 591.8	С	6 450.8	В	146 706.2	В

vehicle-km ('000 000) by type of vehicle, driver age group and sex of driver

				Vel	hicle	e type			
		Vehicles up to 4.5t		Trucks 4.5t to 14.9t		Trucks 15t and over		Total	
Age of driver	Sex of driver								
Under 25 years	Male		F		F	182.6	E		F
	Female		F		F		F		F
	Total		F		F	185.1	Е		F
25 - 54 years	Male	35 647.5	С	918.3	С	4 631.1	В	41 196.9	В
	Female	15 849.3	Е		F		F	15 880.6	Е
	Total	51 496.8	С	936.0	С	4 644.6	В	57 077.4	В
55 years and over	Male	18 172.3	С	143.2	Е	709.3	D	19 024.8	С
	Female	6 010.8	Е		F		F	6 020.9	E
	Total	24 183.1	С	153.3	Е	709.3	D	25 045.7	С
Total	Male	55 299.1	В	1 107.6	С	5 523.0	В	61 929.8	В
	Female	23 697.0	D		F		F	23 741.0	D
	Total	78 996.1	В	1 135.7	С	5 539.1	В	85 670.8	В

passenger-km ('000 000) by type of vehicle, driver age group and sex of driver

				Vel	hicle	e type			
		Vehicles up to 4.5t		Trucks 4.5t to 14.9t		Trucks 15t and over		Total	
Age of driver	Sex of driver								
Under 25 years	Male		F		F	218.6	E		F
	Female		F		F		F		F
	Total		F		F	224.1	Е		F
25 - 54 years	Male	63 922.1	С	1 262.0	С	5 313.1	В	70 497.2	С
	Female	28 002.0	D		F		F	28 039.4	D
	Total	91 924.0	В	1 281.2	С	5 331.4	В	98 536.6	В
55 years and over	Male	31 747.0	С	203.0	Е	895.3	D	32 845.4	С
	Female	9 445.3	Е		F		F	9 472.5	E
	Total	41 192.3	С	230.2	Е	895.3	D	42 317.9	С
Total	Male	98 565.6	В	1 545.1	С	6 427.0	В	106 537.8	В
	Female	40 097.9	С		F		F	40 168.4	С
	Total	138 663.6	В	1 591.8	С	6 450.8	В	146 706.2	В

vehicle-km ('000 000) by type of vehicle, type of fuel and vehicle body type

		Vehicle type							
		Vehicles up to 4.5t Trucks 4.5t to 14.9t Trucks 15t and over				Total			
Vehicle body type	Fuel type								Ī
Car	Gasoline	42 309.9	В					42 309.9	В
	Diesel		F						F
Station wagon	Gasoline		F						F
	Diesel								
Van	Gasoline	13 890.2	С		F			13 914.3	С
	Diesel		F		F		F		F
Sport utility vehicle	Gasoline	6 543.5	Е					6 543.5	Е
venicie	Diesel		F						F
Pickup	Gasoline	10 062.0	D		F		F	10 129.8	D
	Diesel	2 167.1	Е	161.0	E			2 328.1	Е
Straight truck	Gasoline		F		F		F		F
	Diesel		F	655.9	С	876.8	D	1 534.7	С
Tractor trailer	Gasoline								
	Diesel				F	4 649.9	В	4 677.5	В
Bus	Gasoline		F						F
	Diesel								
Other	Gasoline				F				F
	Diesel				F		F		F
Total	Gasoline	74 900.5	В	218.1	Е		F	75 121.5	В
	Diesel	3 868.9	Е	888.4	С	5 536.2	В	10 293.6	С

Due to rounding, the numbers may not add up and may differ slightly among the tables. This table does not include other fuel types (natural gas, propane, ethanol, etc.).

fuel consumed ('000 000 litres) by type of vehicle, type of fuel and vehicle body type

		Vehicle type							
		Vehicles up to 4.5t		Trucks 4.5t to 14.9t		Trucks 15t and over		Total	
Vehicle body type	Fuel type								
Car	Gasoline		F						F
	Diesel		F						F
Station wagon	Gasoline		F						F
	Diesel								
Van	Gasoline		F		F				F
	Diesel		F		F		F		F
Sport utility vehicle	Gasoline		F						F
venicie	Diesel		F						F
Pickup	Gasoline		F		F		F		F
	Diesel		F		F				F
Straight truck	Gasoline		F		F		F		F
	Diesel		F	192.7	D	305.8	D	498.7	С
Tractor trailer	Gasoline								Ī
	Diesel				F	1 650.4	В	1 661.5	В
Bus	Gasoline		F						F
	Diesel								
Other	Gasoline				F				F
	Diesel				F		F		F
Total	Gasoline	7 820.3	Е		F		F	7 880.0	Е
	Diesel		F	252.7	D	1 959.7	В	2 577.3	С

Due to rounding, the numbers may not add up and may differ slightly among the tables. This table does not include other fuel types (natural gas, propane, ethanol, etc.).

number of vehicles in scope by type of vehicle and activity type

	Vehicle type					
	Trucks 4.5t to	14.9t		Trucks 15t and over		
Activity type						
For-hire trucking	32	003	D	133 328	В	
Owner operator trucking	37	113	D	65 918	С	
Private trucking	161	379	В	59 314	С	
Other	69	010	С	30 117	D	
Total	299	505	Α	288 677	Α	

trucks 4.5t - 14.9t: vehicle-km and passenger-km by activity type

	Estimates of				
	vehicle-km ('000 000	)	passenger-km ('000 000	0)	
Activity type					
For-hire trucking		F		F	
Owner operator trucking		F		F	
Private trucking	521.1	Е	797.5	Е	
Other	286.3	Е	337.9	Е	
Total	1 135.7	D	1 591.8	D	

trucks 15t and over: vehicle-km and passenger-km by activity type

	Estimates of				
	vehicle-km ('000 000)	)	passenger-km ('000 000	0)	
activity type					
For-hire trucking	3 251.7	С	3 834.6	С	
Owner operator trucking	1 442.5	D	1 689.0	Е	
Private trucking	508.2	Е	537.8	Е	
Other	336.7	Е	389.5	Е	
Total	5 539.1	В	6 450.8	В	

trucks 4.5t - 14.9t: vehicle-km and passenger-km by trip type

	Estimates of					
	vehicle-km ('000 000)	)	passenger-km ('000 000	0)		
Trip type						
Within province	1 096.9	D	1 541.9	D		
Between provinces		F		F		
Across CAN-US border		F		F		
Outside Canada		F		F		
Total	1 135.7	D	1 591.8	С		

trucks 15t and over: vehicle-km and passenger-km by trip type

	Estimates of				
	vehicle-km ('000 000)	)	passenger-km ('000 000	0)	
Trip type					
Within province	3 311.0	В	3 647.7	В	
Between provinces	1 308.8	D	1 533.7	D	
Across CAN-US border	841.7	D	1 182.4	D	
Outside Canada	77.6	Е		F	
Total	5 539.1	В	6 450.8	В	

## For further reading

Selected publications from Statistics Canada

	F
Catalogue	
53-223-XIE	Canadian Vehicle Survey – Annual. English.
53-223-XIF	Canadian Vehicle Survey – Annual. French.
50-002-XIB	Surface and Marine Transport - Service Bulletin. Bilingual.
51-004-XIB	Aviation - Service Bulletin - Bilingual.
51-203-XIB	Air Carrier Traffic at Canadian Airports - Annual. Bilingual.
51-204-XIE	Air Passenger Origin and Destination: Domestic Report - Annual. English.
51-204-XIF	Air Passenger Origin and Destination: Domestic Report - Annual. French.
51-206-XIB	Canadian Civil Aviation - Annual. Bilingual.
51-207-XIB	Air Charter Statistics - Annual. Bilingual.
52-001-XIE	Railway Carloadings – Monthly. English.
52-001-XIF	Railway Carloadings - Monthly. French.
52-216-XIB	Rail in Canada - Annual. Bilingual.
53-215-XIB	Passenger Bus and Urban Transit Statistics - Annual. Bilingual.
53-222-XIB	Trucking in Canada - Annual. Bilingual.
54-205-XIB	Shipping in Canada - Annual. Bilingual.
66-001-PIE	International Travel, Advance Information (Touriscope) - Monthly. English.
66-001-PIF	International Travel, Advance Information (Touriscope) - Monthly. French.
66-201-XIB	International Travel - Annual. Bilingual.
87-003-XIE	Travel Log - Quarterly. English.
87-003-XIF	Travel Log - Quarterly. French.

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