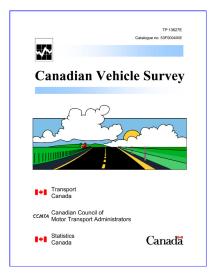


Catalogue no. 53F0004XIE



# **Canadian Vehicle Survey**

Quarter 4, 2002





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Statistics Canada

Transportation Division

# Canadian Vehicle Survey

Quarter 4, 2002

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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 and governments. 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
- p preliminary
- r revised
- x suppressed to meet confidentiality requirements
- A excellent
- B very good
- C good
- D 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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# Canadian Council of Motor Transport Administrators and Provincial and Territorial Registrars of Motor Vehicles

A special note of appreciation goes to Transport Canada whose vision and funding made this survey possible.

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## **HIGHLIGHTS**

- Over 18.0 million vehicles were in-scope for the Canadian Vehicle Survey during this quarter.
- Between October 1 and December 31, 2002, these vehicles travelled an estimated 74.1 billion kilometres.
- During this quarter, vehicles weighing less than 4 500 kilograms were driven an average of 3 900 kilometres while the largest of the trucks (trucks with gross weight 15 000 kilograms or more) were driven an average of 16 400 kilometres.

## 1. INTRODUCTION

Canadian transport activity statistics were inadequate due to the lack of any routine measurement of road vehicle activity. While road vehicles dominate passenger travel and freight traffic, no measures of total vehicle-kilometres or passenger-kilometres were available.

The Canadian Vehicle Survey (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 will be the prime source of road vehicle use information for researchers and interested members of the public.

Transport Canada plans to combine 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 fourth quarter of 2002.

## 2. SURVEY OVERVIEW

The CVS is a voluntary vehicle-based survey that provides 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 stages. The first stage 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 seven-day trip log. The trip log is then mailed out. 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 postcards. 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 postcard asks respondents to record the odometer reading at the beginning of the first day of the quarter. All those returning the first postcards are mailed second postcards 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.

The CVS provides annual and quarterly estimates of road activity for vehicles registered in Canada. The estimates are provided by type of vehicle and other variables, such as driver and vehicle characteristics, time of day and season.

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 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.

<u>Passenger-kilometres</u> is the sum of the distances traveled by individual passengers. Trucks with gross vehicle weight of 4.5 tonnes or more (see the *Vehicle type* definition below) and urban buses were not required to report passengers. Therefore, these passengers are not included in the estimates of passenger-kilometres. Also the number of passengers 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 below) plus the driver.

<u>Fuel purchased</u> is the amount of fuel purchased to operate vehicles. This includes purchases for the off-road operation of the vehicle. However, these purchases are considered negligible.

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

<u>The number of vehicles in scope</u> 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

<u>Vehicle type</u> is the classification created for CVS based on the information available on the vehicle registration lists. There are four vehicle types. <u>Buses</u> are identified first. The remaining vehicles are then divided into three weight types: <u>light vehicles</u> with gross vehicle weights below 4.5 tonnes, <u>trucks</u> with gross vehicle weights of <u>4.5 tonnes or more and less than 15 tonnes</u>, and <u>trucks</u> with gross vehicle weights of <u>15 tonnes or more</u>.

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

<u>Fuel type</u> is derived based on the information available on 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 source.

<u>Vehicle model year</u> is derived based on the information available on the registration lists.

#### 3.4 DEFINITIONS OF VEHICLE USAGE CHARACTERISTICS

The CVS definition of a <u>Trip</u> determines the trip characteristics. The definition of what delimits a trip depends on the <u>vehicle type</u>:

For *buses*, if any of the following events happened:

- a stop of more than 30 minutes
- a change of driver
- a change in the type of bus service
- all the passengers have been dropped off and another passenger trip begins (does not apply to scheduled urban buses)

For *light vehicle*, if any of the following events happened:

- a stop of more than 30 minutes
- a change of driver
- a change in the main trip purpose

For <u>vehicles (trucks) weighing 4.5 tonnes or more</u> if any of the following events happened:

- 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 <u>time of day</u> and <u>day of week</u> the trip takes place.
- Driver age group and driver sex.
- The <u>trip purpose</u> 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. The choice of purpose is specific to the vehicle type.
- If <u>dangerous goods</u> are carried (as defined by the Transportation of Dangerous Goods Act). Does not apply to buses.
- Number of kilometres traveled on roads with posted speed limit of 80 km/h or more
- <u>Age group (0 4, 5 14 and 15 years and over) of passengers and the number of passengers within each group</u>, to calculate passenger-km (urban buses are excluded). Passenger age information is collected only for light vehicles. See 3.2. For all other vehicles we collect only the total number of passengers.
- Truck configuration for vehicles (trucks) weighing 4.5 tonnes or more.
- Cost (for light vehicles and buses) or quantity (for trucks and buses) of *Fuel purchased*.

## 4. METHODS

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 was derived from the 13 jurisdiction vehicle registration lists (ten Provincial and three Territorial Governments) created three months before the reference period. The sample for this quarter was drawn from lists of motor vehicles with valid registrations in any province or territory available in July 2002. 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; e.g., vehicles that were registered after July 2002 are not included.

The incoming lists underwent thorough preparation procedure:

- First, out-of-scope vehicles are removed (trailers, motorcycles, construction equipment, parade vehicles, motor homes, etc.).
- Second, vehicles with expired registration are removed.
- Then, records with duplicate Vehicle Identification Numbers (VIN) within each list are removed leaving the one updated most recently.
- Last, records with irregular data are verified.

The last set of processed lists, before the beginning of the reference period, consisted of the twelve lists provided in July 2002 to Statistics Canada for CVS and the most recent list available for Nunavut, created in April 2002. This set of prepared vehicle lists and the set of days within the fourth quarter of 2002 constitute the survey population.

## 4.1.2 Sample design

All vehicles from the survey population were stratified (grouped) into 104 strata. First, the vehicles were stratified into four vehicle types (buses, light vehicles, and two groups of trucks, see 3.3) and 13 jurisdictions (ten provinces and three territories). Then, for efficiency of estimates, they were further divided into two vehicle-age strata of newer and older vehicles.

Next, a sample of vehicles (first stage sample) was selected from the survey population. A sample from each stratum was selected. To minimize respondent burden, no vehicle is selected more than once during any consecutive four quarters for provinces (two consecutive quarters for territories) and the three characters of the postal code were used to spread the sample over all regions.

Subsequently, seven consecutive days starting within the quarter were randomly assigned (second stage) to each vehicle selected at 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 2.).

Since the sample was selected in two stages, the sampling weight (see 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.

#### 4.1.3 Sample size

A total of 4,999 vehicles out of 18,182,698 from the survey population were drawn for the ten provinces. Another 2,640 vehicles out of 50,929 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 interview the following information is collected about each sampled vehicle: vehicle type, fuel type used, distance driven last week, some information about anticipated vehicle usage during the following six weeks, current odometer reading, and passenger capacity for buses. Then the respondent was asked to complete a seven-day trip log. If the respondent agreed to complete a trip log, personal information such as name and address were obtained in order to mail out a trip log for the vehicle.

The log type depended on the type of vehicle. There were three types of logs: a bus log, a light vehicle log and a log for the two remaining vehicle types (trucks). In all cases, the respondents were requested to record information about all the trips made in the selected vehicle over the assigned seven-day period. The collected data included information about each trip: time and date of the beginning and the end, length, purpose, number and age group of passengers, sex and age group of the driver, fuel purchases, if dangerous goods were carried, number of kilometres traveled on roads with posted speed limit of 80km/h or more, and for trucks, their configuration.

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 of the large fleets of vehicles with several vehicles in the sample had special arrangements to lower their response burden.

### Territorial collection

The registered owners of the selected vehicles were mailed postcards and asked to provide two odometer readings, one at the beginning of the quarter and another at the beginning of the next quarter and information about the vehicle status (owned, sold, scrapped).

## 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. At the end of this process, every vehicle had seven days of trips.

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, a set of prepared vehicle lists was 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 province and territory;
- vehicle-kilometres by province and territory;
- passenger-kilometres by province;
- fuel purchased, Canada level only;
- cross tabulations of vehicle-counts, vehicle-kilometers and passenger-kilometers by a number of variables (described in Concepts and Definitions), such as body type, truck configuration, driver characteristics, time of day, day of week, etc. by province.

## 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 was made to ensure a high standard 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 population value for which the survey estimate aims at. 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 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 are conducted to obtain information from the total nonrespondents or to complete partially unanswered questionnaires for questions that are deemed essential. Various quality assurance procedures are exercised at the data capture step. The data editing procedures identify some inconsistencies in the data structure and the imputation procedures 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 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 4.1.1) can contain vehicles with the same Vehicle Identification Number (VIN) in more than one province. Since every vehicle have 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 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. The rates of out-of-scope vehicles among all units sampled for the reference period is in the table in section 5.4.1.

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 lack of correct information, gives wrong information by mistake, or 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 table 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 (e.g. errors in commodity coding). A data capture error occurs when the data are misinterpreted or keyed incorrectly.

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 CVS, it is impossible to detect, for vehicles that travel only a small distance during the reported week, 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. Several response rates are provided in the table below. This rate is defined as the number of vehicle-days for which respondents gave complete or partial (vehicle-kilometers only) answers to the survey divided by the total number of in-sample and in-scope vehicle-days.

PROVINCES		-kilometres cteristics re	-		cle-kilometaracteristics	Vehicles out of	Contact made but	
	All	0 km	Non - 0 km	All	0 km	Non - 0 km	scope	no data
Light vehicles	35%	16%	18%	33%	6%	27%	4%	4%
Trucks 4.5t – 15t	34%	27%	7%	16%	5%	11%	6%	8%
Trucks 15t or more	38%	26%	13%	17%	5%	12%	5%	12%
Buses	34% 19% 15%		5%	0%	5%	8%	28%	

TERRITORIES		-kilometre cteristics re		Vehicle	-kilometres	Vehicles out of	Contact made but	
	All	0 km	Non - 0 km	All	0 km	Non - 0 km	scope	no data
Light vehicles	N/A	N/A	N/A	15%	1%	15%	6%	8%
Trucks 4.5t – 15t	N/A	N/A	N/A	9%	2%	7%	8%	7%
Trucks 15t or more	N/A	N/A	N/A	16%	1%	15%	12%	7%
Buses	N/A N/A N/A			13%	4%	9%	1%	13%

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 and percentage of vehicle days imputed

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.

With the data collected during the CATI interview (past vehicle usage), the relative imputation rate of the data coming out of the imputation process was lower for vehicle-km, and much higher for other vehicle usage characteristics.

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.

The relative imputation rate is usually directly linked to the response rates and the quality of estimates. A high imputation rate usually leads to the underestimation of sampling error and may also cause a bias.

The percentage of vehicle-days imputed (reported) is defined as the proportion of vehicle-days that are imputed (reported) to total number of vehicle days:

PROVINCES	Vehic	cle days re	ported	Vehicle days imputed				
TROVINCES	All	0 km	Non - 0 km	All	0 km	Non - 0 km		
Light vehicles	51%	24%	27%	49%	9%	40%		
Trucks 4.5t – 15t	68%	54%	14%	32%	10%	22%		
Trucks 15t or more	69%	46%	23%	31%	10%	21%		
Buses	87%	48%	39%	13%	0%	13%		

TERRITORIES	Vehi	cle km rep	oorted	Vehicle km imputed				
TERRITORIES	All 0 km		Non - 0 km	All	0 km	Non - 0 km		
Light vehicles	100%	5%	95%	N/A	N/A	N/A		
Trucks 4.5t – 15t	100%	20%	80%	N/A	N/A	N/A		
Trucks 15t or more	100%	6%	94%	N/A	N/A	N/A		
Buses	100%	31%	69%	N/A	N/A	N/A		

#### 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 compensate partially for the fact that some of the data were imputed.

## 5.4.4 Quality indicator

The CV and the relative imputation rate should be considered simultaneously to make an assessment of the reliability of an estimate. 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 takes into account simultaneously the CV and the relative imputation rate.

Quality Symbol	C.V. equivalent	Explanation of estimate quality
A	Less than 5%	Excellent
В	5% to 10%	Very good
C	10% to 15%	Good
D	15% to 20%	Acceptable
E	20% to 35%	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 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:

- Duplicate records were previously removed from within and among registration lists. Starting in this quarter, duplicate records were removed from within each list only. This is likely to 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) include the territories.
- The truck logs were changed in 2001 in order to collect passenger information for trucks. 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 truck logs were also changed in 2001 in order to collect distance travelled 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 trucks registered in the territories are now sent two postcards 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 postcard at the end of the quarter and requesting that bus and truck 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 trucks in 2000.
- The changes that may affect comparability with the 1999 results:
  - A new log was developed for survey year 2000 for all trucks. In 1999 trucks with gross vehicle weights of 4.5 tonnes or more and less than 15 tonnes had a different log than trucks with gross vehicle weights of 15 tonnes or more.
  - The fuel purchased question was attached to each trip for the 2000 survey year for trucks. 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 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.

 $\label{thm:lists} \mbox{Number of Vehicles on the Registration Lists by Type of Vehicle and Jurisdiction}$ 

			Vehicle Type		
	Vehicles up to 4.5t	Trucks 4.5t - 15t	Trucks 15t or more	Buses	Total
Jurisdiction					
Newfoundland and Labrador	256 598	4 103	2 965	1 417	265 083
Prince Edward Island	74 282	1 833	2 654	56	78 825
Nova Scotia	517 760	8 427	6 995	1 785	534 967
New Brunswick	445 631	7 393	3 686	2 757	459 467
Quebec	4 089 197	56 379	36 458	16 780	4 198 814
Ontario	6 555 294	80 474	104 528	27 873	6 768 169
Manitoba	601 813	10 017	13 138	3 634	628 602
Saskatchewan	629 150	39 144	23 659	3 824	695 777
Alberta	2 112 063	88 985	68 893	12 789	2 282 730
British Columbia	2 287 629	70 762	14 587	8 559	2 381 537
Yukon Territory	23 981	1 510	1 234	264	26 989
Northwest Territories	19 801	632	850	101	21 384
Nunavut	2 973	304	156	19	3 452
Total - Canada	17 616 172	369 963	279 803	79 858	18 345 796

DUE TO ROUNDING THE NUMBERS MAY NOT ADD UP AND MAY DIFFER SLIGHTLY AMONG THE TABLES.

 $\label{thm:lists} \textbf{Number of Vehicles on Registration Lists by Jurisdiction and Vehicle Model Year for}$ 

Vehicles up to 4.5t

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 $\label{thm:lists} \textbf{Number of Vehicles on Registration Lists by Jurisdiction and Vehicle Model Year for}$ 

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 ${\tt Number\ of\ Vehicles\ on\ Registration\ Lists\ by\ Jurisdiction\ and\ Vehicle\ Model\ Year\ for}$ 

Trucks 15t or more

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 $\label{thm:lists} \textbf{Number of Vehicles on Registration Lists by Jurisdiction and Vehicle Model Year for}$ 

Buses

Buses												
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. Labrador		cotia , Brunswick	, Quebec ,	Ontario ,	, Manitoba ,	wan .	Alberta ,	Columbia,		ies .	Nunavut	TOTAL .
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, 1995 , 34		175, 16		1 798,	178,	11111111111111111111111111111111111111	536,	504,	10,		0	
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Estimates of the

Number of Vehicles in Scope by Type of Vehicle and Jurisdiction

					Vehicle Type					
	Vehicles up to 4.	5t	Trucks 4.5t - 15	t	Trucks 15t or more	9	Buses		Total	
Jurisdiction										
Newfoundland and Labrador	256 598	А	3 705	В	2 844	А	1 417	А	264 563	А
Prince Edward Island	73 622	А	1 709	В	2 654	Α	56	А	78 041	А
Nova Scotia	511 716	А	6 661	В	6 758	Α	1 742	А	526 876	А
New Brunswick	442 541	А	5 070	С	3 843	Α	1 654	С	453 109	А
Quebec	4 050 371	А	50 717	А	35 883	Α	16 442	А	4 153 413	А
Ontario	6 390 969	А	69 116	А	102 844	Α	28 055	Α	6 590 984	А
Manitoba	596 048	А	9 551	А	12 661	Α	3 634	А	621 893	А
Saskatchewan	617 268	А	38 083	А	20 880	В	3 824	А	680 056	А
Alberta	2 080 212	А	77 872	А	69 475	Α	12 197	А	2 239 757	А
British Columbia	2 283 247	А	53 201	В	13 684	Α	8 284	В	2 358 416	А
Yukon Territory	23 836	А	797	С	1 199	Α	254	С	26 085	А
Northwest Territories	19 716	А	540	В	836	Α	101	А	21 193	А
Nunavut	2 932	А	259	Е	257	Е		F	3 448	А
Total - Canada	17 349 077	А	317 281	А	273 817	Α	77 659	А	18 017 834	А

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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 - 15	t	Trucks 15t or more		Buses		Total				
Vehicle Model Year													
Later than 1999	3 677 684	В	51 407	В	62 199	В	16 116	В	3 807 406	В			
1997 - 1999	3 851 033	А	55 215	В	60 242	В	13 820	С	3 980 310	А			
1993 - 1996	3 782 135	В	45 157	С	49 567	С	18 950	С	3 895 809	А			
1989 - 1992	3 478 667	А	39 040	С	33 358	С	14 026	D	3 565 092	А			
Earlier than 1989	2 559 558	А	126 462	В	68 451	В	14 746	С	2 769 218	А			
Total	17 349 077	А	317 281	А	273 817	Α	77 659	А	18 017 834	А			

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Estimates for Canada of the

Number of Vehicles in Scope by Type of Vehicle and Vehicle Body Type

					Vehicle Type					
	Vehicles up to 4.	5t	Trucks 4.5t - 15	t	Trucks 15t or more	Trucks 15t or more			Total	
Vehicle Body Type										
Car	10 393 588	А							10 393 588	А
Station wagon	492 980	D							492 980	D
Van	2 174 462	В	16 628	Е			3 018	Е	2 194 108	В
Sport utility vehicle	1 233 877	С							1 233 877	С
Pickup	2 975 666	В		F		F		F	3 032 580	В
Straight truck		F	228 155	А	112 932	В		F	384 784	В
Tractor trailer			10 341	Е	157 726	Α		F	168 545	А
Bus				F			73 364	А	76 410	В
Other		F		F		F				F
Total	17 349 077	А	317 281	Α	273 817	Α	77 659	А	18 017 834	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 - 15	t	Trucks 15t or more	9	Buses		Total	
Fuel Type										
Gasoline	16 967 629	А	122 088	В	12 723	Е	13 111	С	17 115 552	A
Diesel	347 093	D	188 195	А	261 094	Α	60 573	А	856 954	В
Other		F		F				F		F
Total	17 349 077	Α	317 281	А	273 817	А	77 659	А	18 017 834	А

Estimates of

 $\label{thm:condition} \mbox{Vehicle-km ('000 000) by Type of Vehicle and Jurisdiction}$ 

					Vehicle Type					
	Vehicles up to 4.	5t	Trucks 4.5t - 15	t	Trucks 15t or mor	е	Buses		Total	
Jurisdiction										
Newfoundland and Labrador	780.5	С		F	25.1	E		F	819.7	В
Prince Edward Island	251.8	В		F		F		F	261.5	В
Nova Scotia	2 263.0	В	24.9	Е	121.5	С		F	2 415.4	В
New Brunswick	1 387.2	В	13.6	Е	19.8	Е		F	1 432.5	В
Quebec	15 842.1	С	321.4	С	1 058.2	В	113.8	С	17 335.4	В
Ontario	25 688.7	В	424.5	С	1 896.7	С	163.1	С	28 172.9	В
Manitoba	1 858.9	В	24.5	Е	221.7	С	20.2	С	2 125.2	В
Saskatchewan	2 084.5	В	46.8	Е	187.2	Е	16.6	С	2 335.0	В
Alberta	7 784.2	В	327.7	Е	841.3	С	111.3	С	9 064.5	В
British Columbia	9 492.2	С	275.8	D	84.2	D	89.4	D	9 941.5	С
Yukon Territory	86.5	С	2.6	Е	18.1	Е		F	109.1	В
Northwest Territories	69.7	С		F	20.6	С	3.7	Е	94.9	С
Nunavut	4.6	В		F		F		F	5.0	С
Total - Canada	67 593.6	А	1 473.5	В	4 501.8	В	543.7	В	74 112.7	А

Estimates of

Passenger-km ('000 000) by Type of Vehicle and Jurisdiction

					Vehicle Type					
	Vehicles up to 4.	5t	Trucks 4.5t - 15	t	Trucks 15t or more	9	Buses		Total	
Jurisdiction										
Newfoundland and Labrador	1 249.5	С	15.1	Е		F	68.4	E	1 367.2	С
Prince Edward Island	459.1	D		F		F		F	484.4	D
Nova Scotia	3 307.5	С	34.7	Е	165.4	Е		F	3 634.2	С
New Brunswick	2 058.5	С		F		F	226.7	Е	2 330.2	С
Quebec	23 707.6	С		F	1 219.6	D	1 772.7	Е	27 089.2	С
Ontario	40 124.5	В	568.9	D	2 182.2	Е	2 597.2	D	45 472.9	В
Manitoba	3 323.5	С		F	268.3	D	289.5	Е	3 935.0	С
Saskatchewan	3 668.9	D		F		F	203.3	Е	4 173.1	D
Alberta	12 653.2	С	379.3	Е	1 004.3	Е		F	14 588.8	С
British Columbia		F		F	88.6	Е		F		F
Total - Provinces	106 492.7	В	2 017.2	С	5 208.1	С	7 192.0	С	120 909.9	В

THE SYMBOL BESIDE EACH ESTIMATE CLASSIFIES ITS QUALITY: A - EXCELLENT, B - VERY GOOD, C - GOOD, D - ACCEPTABLE, E - USE WITH CAUTION,

F - TOO UNRELIABLE TO BE PUBLISHED, ... - NOT APPLICABLE, . - NOT AVAILABLE FOR ANY REFERENCE PERIOD.

DUE TO ROUNDING THE NUMBERS MAY NOT ADD UP AND MAY DIFFER SLIGHTLY AMONG THE TABLES.

ALL PASSENGER-KM ESTIMATES EXCLUDE URBAN TRANSIT BUSES AND 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 - 15	t	Trucks 15t or more		Buses		Total	
Vehicle Model Year										
Later than 1999	18 566.6	В	422.1	С	1 896.1	С	158.2	С	21 043.1	В
1997 - 1999	18 125.6	В	503.4	D	1 372.1	С	81.9	С	20 083.1	В
1993 - 1996	14 542.9	С	274.1	Е	835.7	D	144.9	D	15 797.6	С
1989 - 1992	11 365.5	В	164.8	Е	236.4	Е	92.8	Е	11 859.4	В
Earlier than 1989	4 993.0	С	109.1	Е	161.5	Е	65.9	Е	5 329.5	В
Total	67 593.6	Α	1 473.5	В	4 501.8	В	543.7	В	74 112.7	А

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 - 15	t	Trucks 15t or more		Buses		Total	
Vehicle model year										
Later than 1999	28 336.1	С		F	2 425.6	D	1 844.8	Е	33 183.8	С
1997 - 1999	28 814.6	С	692.3	Е	1 470.2	Е	1 580.0	Е	32 557.1	С
1993 - 1996	23 154.6	С		F	886.0	Е	1 937.7	Е	26 319.8	С
1989 - 1992		F	254.8	E		F		F		F
Earlier than 1989		F	151.2	Е		F		F	7 928.3	С
Total	106 492.7	В	2 017.2	С	5 208.1	С	7 192.0	С	120 909.9	В

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THE SYMBOL BESIDE EACH ESTIMATE CLASSIFIES ITS QUALITY: A - EXCELLENT, B - VERY GOOD, C - GOOD, D - ACCEPTABLE, E - USE WITH CAUTION,

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DUE TO ROUNDING THE NUMBERS MAY NOT ADD UP AND MAY DIFFER SLIGHTLY AMONG THE TABLES.

ALL PASSENGER-KM ESTIMATES EXCLUDE URBAN TRANSIT BUSES AND THE TERRITORIES.

Estimates for Canada of

 $\label{thm:condition} \mbox{Vehicle-km ('000 000) by Type of Vehicle and Vehicle Body Type}$ 

			Vehicle Type												
	Vehicles up to 4.	nicles up to 4.5t Tru			Trucks 15t or mor	е	Buses		Total						
Vehicle Body Type															
Car	37 587.2	В							37 587.2	В					
Station wagon	1 930.0	D							1 930.0	D					
Van	8 864.6	В		F			50.6	Е	9 016.2	В					
Sport utility vehicle	6 222.3	Е							6 222.3	Е					
Pickup	12 456.8	С	305.6	Е		F			12 770.3	С					
Straight truck		F	1 005.3	С	811.4	С		F	2 143.0	С					
Tractor trailer				F	3 682.4	В		F	3 697.9	В					
Bus				F			489.2	В	524.4	D					
Other		F		F						F					
Total	67 593.6	А	1 473.5	В	4 501.8	В	543.7	В	74 112.7	А					

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Estimates of the Provincial Total of

Passenger-km ('000 000) by Type of Vehicle and Vehicle Body Type

					Vehicle Type					
	Vehicles up to 4.	5t	Trucks 4.5t - 15	t	Trucks 15t or more	е	Buses		Total	
Vehicle Body Type										
Car	57 232.0	В							57 232.0	В
Station wagon		F								F
Van	18 060.8	С		F			415.1	Е	18 614.2	С
Sport utility vehicle		F								F
Pickup		F		F		F				F
Straight truck		F		F	878.8	Е		F	2 704.1	Е
Tractor trailer				F	4 321.4	С		F	4 367.0	С
Bus				F			6 735.2	С	6 784.1	С
0ther		F		F						F
Total	106 492.7	В	2 017.2	С	5 208.1	С	7 192.0	С	120 909.9	В

35

THE SYMBOL BESIDE EACH ESTIMATE CLASSIFIES ITS QUALITY: A - EXCELLENT, B - VERY GOOD, C - GOOD, D - ACCEPTABLE, E - USE WITH CAUTION,

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DUE TO ROUNDING THE NUMBERS MAY NOT ADD UP AND MAY DIFFER SLIGHTLY AMONG THE TABLES.

ALL PASSENGER-KM ESTIMATES EXCLUDE URBAN TRANSIT BUSES AND 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 - 15	t	Trucks 15t or more	9	Buses		Total					
Fuel Type														
Gasoline	65 544.5	А	218.7	D		F	95.4	D	65 896.5	A				
Diesel	1 994.2	Е	1 218.5	В	4 463.8	В	441.5	В	8 118.0	В				
Other		F		F				F		F				
Total	67 593.6	А	1 473.5	В	4 501.8	В	543.7	В	74 112.7	А				

Passenger-km ('000 000) by Type of Vehicle and Type of Fuel

					Vehicle Type					
	Vehicles up to 4.	5t	Trucks 4.5t - 15	t	Trucks 15t or more	9	Buses		Total	
Fuel Type										
Gasoline	103 396.9	В		F		F	919.1	Е	104 671.4	В
Diesel		F	1 658.7	С	5 169.7	С	6 247.9	D	16 092.6	С
Other		F		F				F		F
Total	106 492.7	В	2 017.2	С	5 208.1	С	7 192.0	С	120 909.9	В

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Vehicle-km ('000 000) by Type of Vehicle and Day of Week

					Vehicle Type					
	Vehicles up to 4.	5t	Trucks 4.5t - 15	t	Trucks 15t or more	е	Buses		Total	
Day of the Week										
Sunday	7 141.4	В	55.5	Е	267.6	Е	25.8	D	7 490.4	В
Monday	9 836.8	В	251.1	С	697.4	С	75.5	С	10 860.7	В
Tuesday	10 121.7	В	251.3	D	764.0	D	91.0	В	11 228.0	В
Wednesday	10 530.1	В	303.6	D	790.3	С	115.1	В	11 739.2	В
Thursday	10 883.4	В	290.8	D	866.5	С	94.9	В	12 135.5	В
Friday	11 003.9	В	257.1	С	737.5	С	92.7	В	12 091.3	В
Saturday	7 915.5	В	60.3	Е	339.5	D	43.1	D	8 358.5	В
Total	67 432.8	А	1 469.8	В	4 462.8	В	538.2	В	73 903.7	А

Passenger-km ('000 000) by Type of Vehicle and Day of Week

					Vehicle Type					
	Vehicles up to 4.	5t	Trucks 4.5t - 15	t	Trucks 15t or more	9	Buses		Total	
Day of the Week										
Sunday	12 962.0	В		F	330.9	Е		F	13 712.3	В
Monday	14 629.9	В	338.1	С	788.2	С	1 034.1	D	16 790.3	В
Tuesday	15 696.9	С		F	853.8	D	1 277.5	D	18 163.7	С
Wednesday	16 349.5	В	380.9	D	923.2	С	1 304.5	С	18 958.1	В
Thursday	15 720.9	В	382.7	С	1 018.2	D	1 235.0	С	18 356.7	В
Friday	17 698.7	С	365.6	С	870.1	С	1 375.5	D	20 309.9	В
Saturday	13 434.8	В		F	423.7	Е		F	14 618.9	В
Total	106 492.7	В	2 017.2	С	5 208.1	С	7 192.0	С	120 909.9	В

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Vehicle-km ('000 000) by Type of Vehicle and Driver Age Group

					Vehicle Type					
	Vehicles up to 4.	5t	Trucks 4.5t - 15	t	Trucks 15t or more	e	Buses		Total	
Age of Driver										
Under 20 years		F		F		F		F		F
20 - 24 years		F		F		F		F		F
25 - 34 years	8 396.3	С	433.8	Е	1 092.9	Е	36.4	Е	9 959.5	С
35 - 44 years	18 198.8	С	493.7	D	1 292.0	D	133.6	С	20 118.1	В
45 - 54 years	16 661.8	С	344.5	D	1 211.7	D	217.5	С	18 435.6	В
55 - 64 years	12 127.1	С		F	750.8	Е	119.5	D	13 136.5	С
65 years and over	6 649.3	С		F		F		F	6 758.7	С
Total	67 432.8	А	1 469.8	В	4 462.8	В	538.2	В	73 903.7	А

Passenger-km ('000 000) by Type of Vehicle and Driver Age Group

					Vehicle Type					
	Vehicles up to 4.	5t	Trucks 4.5t - 15	t	Trucks 15t or more	е	Buses		Total	
Age of Driver										
Under 20 years		F		F		F		F		F
20 - 24 years		F		F		F		F		F
25 - 34 years	13 900.2	D	581.7	Е		F		F	16 202.3	С
35 - 44 years	31 449.1	С		F	1 554.5	D	1 387.6	Е	35 154.1	С
45 - 54 years	24 202.2	В	428.8	D	1 374.7	Е	2 604.4	Е	28 610.0	В
55 - 64 years	17 531.4	С		F	838.0	Е	2 279.6	Е	20 813.3	С
65 years and over	11 851.9	D		F		F		F	12 256.0	D
Total	106 492.7	В	2 017.2	С	5 208.1	С	7 192.0	С	120 909.9	В

Vehicle-km ('000 000) by Type of Vehicle and Sex of Driver

					Vehicle Type					
	Vehicles up to 4.	5t	Trucks 4.5t - 15	t	Trucks 15t or more	9	Buses		Total	
Sex of Driver										
Male	47 735.9	В	1 453.1	С	4 269.4	С	378.0	С	53 836.3	В
Female	19 696.9	В		F		F	160.3	С	20 067.4	В
Total	67 432.8	А	1 469.8	В	4 462.8	В	538.2	В	73 903.7	А

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Passenger-km ('000 000) by Type of Vehicle and Sex of Driver

					Vehicle Type					
	Vehicles up to 4.	5t	Trucks 4.5t - 15	t	Trucks 15t or more	9	Buses		Total	
Sex of Driver										
Male	76 659.0	В	1 971.7	С	4 870.3	С	5 005.8	D	88 506.7	В
Female		F		F		F	2 186.3	Е	32 403.3	В
Total	106 492.7	В	2 017.2	С	5 208.1	С	7 192.0	С	120 909.9	В

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Vehicle-km ('000 000) by Type of Vehicle and Time of Day

					Vehicle Type					
	Vehicles up to 4.	5t	Trucks 4.5t - 15	t	Trucks 15t or more	9	Buses		Total	
Time of Day										
00:00 - 05:59	1 973.5	D		F	539.9	D	9.6	Е	2 606.4	D
06:00 - 11:59	22 419.4	В	655.3	С	1 597.2	В	242.8	В	24 914.6	В
12:00 - 17:59	29 852.0	В	590.7	С	1 597.8	С	245.7	В	32 286.2	В
18:00 - 23:59	13 187.9	В		F	727.9	С	40.2	D	14 096.4	В
Total	67 432.8	А	1 469.8	В	4 462.8	В	538.2	В	73 903.7	А

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Passenger-km ('000 000) by Type of Vehicle and Time of Day

					Vehicle Type					
	Vehicles up to 4.	5t	Trucks 4.5t - 15	t	Trucks 15t or more	9	Buses		Total	
Time of Day										
00:00 - 05:59	2 383.6	D		F	693.6	Е		F	3 264.8	D
06:00 - 11:59	32 600.9	В	899.1	С	1 806.7	С	3 321.9	С	38 628.6	В
12:00 - 17:59	47 937.7	В	842.8	С	1 843.8	С	3 482.6	С	54 107.0	В
18:00 - 23:59	23 570.5	В		F	863.9	D		F	24 909.6	В
Total	106 492.7	В	2 017.2	С	5 208.1	С	7 192.0	С	120 909.9	В

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Vehicle-km ('000 000) by Type of Vehicle and Carrying Dangerous Goods

					Vehicle Type					
	Vehicles up to 4.5	5t	Trucks 4.5t - 15	t	Trucks 15t or more	9	Buses		Total	
Carrying Dangerous Goods										
Declared - yes		F		F	438.9	Е			585.0	E
Declared - no	67 427.5	В	1 329.0	С	4 024.0	С	538.2	В	73 318.7	В
Total	67 432.8	А	1 469.8	В	4 462.8	В	538.2	В	73 903.7	А

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Passenger-km ('000 000) by Type of Vehicle and Carrying Dangerous Goods

					Vehicle Type					
	Vehicles up to 4.5	5t	Trucks 4.5t - 15	t	Trucks 15t or more	9	Buses		Total	
Carrying Dangerous Goods										
Declared - yes		F		F		F			673.3	E
Declared - no	106 484.6	В	1 868.1	С	4 691.9	С	7 192.0	С	120 236.6	В
Total	106 492.7	В	2 017.2	С	5 208.1	С	7 192.0	С	120 909.9	В

Vehicle-km ('000 000) by Type of Vehicle and Type of Day

					Vehicle Type					
	Vehicles up to 4.	Vehicles up to 4.5t Trucks 4.5t - 15t T		Trucks 15t or more	9	Buses		Total		
Type of Day										
Weekends and Holidays	16 747.6	В	164.1	E	716.5	D	68.4	С	17 696.6	В
Weekdays	50 685.3	В	1 305.6	С	3 746.3	В	469.8	В	56 207.0	А
Total	67 432.8	А	1 469.8	В	4 462.8	В	538.2	В	73 903.7	А

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Passenger-km ('000 000) by Type of Vehicle and Type of Day

					Vehicle Type					
	Vehicles up to 4.	5t	Trucks 4.5t - 15	t	Trucks 15t or more	9	Buses		Total	
Type of Day										
Weekends and Holidays	29 427.8	В		F	870.2	Е		F	31 562.4	В
Weekdays	77 064.8	В	1 745.4	С	4 337.9	С	6 199.5	С	89 347.6	В
Total	106 492.7	В	2 017.2	С	5 208.1	С	7 192.0	С	120 909.9	В

Vehicle-km ('000 000) by Type of Vehicle and Road Type

		Vehicle Type												
	Vehicles up to 4.	5t	Trucks 4.5t - 15	t	Trucks 15t or more	9	Buses		Total					
Road Type														
Road with posted maximum speed of 80km/h or more	38 094.7	В	811.3	С	2 635.5	С	188.2	С	41 729.6	В				
Other roads	29 338.1	А	658.5	D	1 827.4	С	350.0	В	32 174.1	А				
Total	67 432.8	А	1 469.8	В	4 462.8	В	538.2	В	73 903.7	А				

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Passenger-km ('000 000) by Type of Vehicle and Road Type

		Vehicle Type												
	Vehicles up to 4.	5t	Trucks 4.5t - 15	ŧ	Trucks 15t or more	9	Buses		Total					
Road Type														
Road with posted maximum speed of 80km/h or more	61 769.4	В	1 119.4	С	2 891.7	С	3 599.9	Е	69 380.3	В				
Other roads	44 723.3	А	897.8	С	2 316.4	Е	3 592.1	С	51 529.6	А				
Total	106 492.7	В	2 017.2	С	5 208.1	С	7 192.0	С	120 909.9	В				

Estimates of Provincial Total for

Vehicles up to 4.5t: Passenger-km ('000 000) by Passenger Age Group

	Estimates for	
	Vehicles up to 4.	5t
Passenger Age		
Under 5 years	3 209.0	Е
5-14 years	8 135.1	С
15 years and over	95 148.6	В
Total	106 492.7	В

Passenger-km and Vehicle-km for Buses by Trip Purpose

	Est	tima	tes of	
	Passenger-km ('000 (	000)	Vehicle-km ('000 00	00)
Trip Purpose				
Scheduled urban			163.0	D
Scheduled intercity		F		F
School	4 945.4	С	254.7	В
Charter	2 105.0	Е	102.6	D
Other		F		F
Total	7 192.0	С	538.2	В

Estimates of Provincial Total for

Vehicles up to 4.5t: Vehicle-km ('000 000) by Vehicle Group and Trip Purpose

			Vehicle Group			
	Car and Station was	gon	Other below 4.5t		Total	
Trip Purpose						
To go home	12 508.4	В	7 951.5	D	20 460.0	В
To go to work or school	6 822.6	В	4 428.9	С	11 251.6	В
To do shopping or errands	8 090.1	В	5 057.6	В	13 147.7	В
To go to a recreational or social activity	4 491.8	D	2 553.0	D	7 044.8	С
To go somewhere else		F	3 053.0	Е	8 435.0	D
(Job) picking up or delivering goods		F		F		F
(Job) to or from service call		F		F		F
(Job) other work purpose	1 161.6	Е		F	2 775.5	D
Total	39 476.4	В	27 956.4	В	67 432.8	А

Estimates of Provincial Total for

Vehicles up to 4.5t: Passenger-km ('000 000) by Vehicle Group and Trip Purpose

			Vehicle Group					
	Car and Station wa	gon	Other below 4.5t	Other below 4.5t				
Trip Purpose								
To go home	20 025.9	В	12 482.8	С	32 508.8	В		
To go to work or school	8 150.3	В	5 529.1	С	13 679.4	В		
To do shopping or errands	12 382.7	В	9 096.4	С	21 479.1	В		
To go to a recreational or social activity	8 608.1	D		F	14 561.6	С		
To go somewhere else		F	6 847.5	Е	16 253.6	D		
(Job) picking up or delivering goods		F		F		F		
(Job) to or from service call		F		F		F		
(Job) other work purpose	1 309.3	Е		F	3 353.9	Е		
Total	60 937.0	В	45 555.7	С	106 492.7	В		

Estimates of Provincial Total for

Trucks 4.5t or more: Vehicle-km ('000 000) by Vehicle Group and Trip Purpose

		Ve	hicle	е Туре	
		Trucks 4.5t - 15	t	Trucks 15t or mor	`e
Vehicle Group	Trip Purpose				
Straight truck	Driving to or from service call		F		F
	Carrying goods or equipment	926.4	D	624.7	Е
	Empty	94.2	Е		F
	Other work purpose		F		F
	Non work purpose	236.3	Е		F
	Total	1 456.9	В	819.3	С
ther over 4.5t	Driving to or from service call		F		F
	Carrying goods or equipment		F	3 093.8	С
	Empty		F	399.5	Е
	Other work purpose		F		F
	Non work purpose		F		F
	Total		F	3 643.5	В
Total	Driving to or from service call	173.8	Е	120.4	Е
	Carrying goods or equipment	934.2	D	3 718.6	С
	Empty	95.4	Е	477.9	Е
	Other work purpose		F		F
	Non work purpose	239.8	Е	110.6	E
	Total	1 469.8	В	4 462.8	В

Estimates of Provincial Total for

Trucks 4.5t or more: Passenger-km ('000 000) by Vehicle Group and Trip Purpose

		Vel	hicle	е Туре	
		Trucks 4.5t - 15	t	Trucks 15t or mor	`e
Vehicle Group	Trip Purpose				
Straight truck	Driving to or from service call		F		F
	Carrying goods or equipment		F	670.6	Е
	Empty	119.2	Е		F
	Other work purpose		F		F
	Non work purpose	485.9	Е		F
	Total		F	886.7	Е
ther over 4.5t	Driving to or from service call		F		F
	Carrying goods or equipment		F	3 752.7	D
	Empty		F	415.0	Е
	Other work purpose		F		F
	Non work purpose		F		F
	Total		F	4 321.4	С
Total	Driving to or from service call	260.2	D	138.2	Е
	Carrying goods or equipment	1 097.9	С	4 423.3	С
	Empty	120.4	Е	498.9	Е
	Other work purpose		F		F
	Non work purpose	493.8	Е	111.9	Е
	Total	2 017.2	С	5 208.1	С

Estimates of Provincial Total for

 $\label{thm:condition} \mbox{Vehicle-km ('000 000) by Type of Vehicle, Type of Day and Time of Day}$ 

						Vehicle Type					
		Vehicles up to 4.	5t	Trucks 4.5t - 15	t	Trucks 15t or mor	е	Buses		Total	
Type of Day	Time of Day										
Weekends and	00:00 - 05:59	422.5	D		F	128.2	Е		F	565.1	С
Holidays	06:00 - 11:59	5 176.5	В	64.1	Е	216.1	D	26.5	D	5 483.2	В
	12:00 - 17:59	7 778.3	В		F	233.9	D	32.4	С	8 110.9	В
	18:00 - 23:59	3 370.3	В	21.4	Е	138.3	D	7.5	Е	3 537.4	В
	Total	16 747.6	В	164.1	Е	716.5	D	68.4	С	17 696.6	В
Weekdays	00:00 - 05:59	1 551.0	Е	70.9	Е	411.7	D	7.6	D	2 041.3	D
	06:00 - 11:59	17 242.9	В	591.3	С	1 381.1	В	216.3	В	19 431.5	В
	12:00 - 17:59	22 073.7	В	524.4	С	1 363.9	С	213.2	В	24 175.3	В
	18:00 - 23:59	9 817.6	В		F	589.6	D	32.7	D	10 559.0	В
	Total	50 685.3	В	1 305.6	С	3 746.3	В	469.8	В	56 207.0	А
Total	00:00 - 05:59	1 973.5	D		F	539.9	D	9.6	Е	2 606.4	D
	06:00 - 11:59	22 419.4	В	655.3	С	1 597.2	В	242.8	В	24 914.6	В
	12:00 - 17:59	29 852.0	В	590.7	С	1 597.8	С	245.7	В	32 286.2	В
	18:00 - 23:59	13 187.9	В		F	727.9	С	40.2	D	14 096.4	В
	Total	67 432.8	А	1 469.8	В	4 462.8	В	538.2	В	73 903.7	А

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Passenger-km ('000 000) by Type of Vehicle, Type of Day and Time of Day  $\,$ 

						Vehicle Type					
		Vehicles up to 4.	5t	Trucks 4.5t - 15	t	Trucks 15t or more	e	Buses		Total	
Type of Day	Time of Day										Ī
Weekends and	00:00 - 05:59	596.8	D		F		F		F	797.2	D
Holidays	06:00 - 11:59	8 306.5	В		F	252.6	Е		F	9 020.3	В
	12:00 - 17:59	13 699.9	В		F	289.0	Е		F	14 652.7	В
	18:00 - 23:59	6 824.6	С		F	170.6	Е		F	7 092.2	С
	Total	29 427.8	В		F	870.2	Е		F	31 562.4	В
Weekdays	00:00 - 05:59		F		F	535.8	Е		F		F
	06:00 - 11:59	24 294.4	В	801.7	С	1 554.0	С	2 958.1	С	29 608.2	В
	12:00 - 17:59	34 237.8	В	721.1	С	1 554.8	С	2 940.6	С	39 454.4	В
	18:00 - 23:59	16 745.9	С		F	693.3	D		F	17 817.4	В
	Total	77 064.8	В	1 745.4	С	4 337.9	С	6 199.5	С	89 347.6	В
Total	00:00 - 05:59	2 383.6	D		F	693.6	Е		F	3 264.8	D
	06:00 - 11:59	32 600.9	В	899.1	С	1 806.7	С	3 321.9	С	38 628.6	В
	12:00 - 17:59	47 937.7	В	842.8	С	1 843.8	С	3 482.6	С	54 107.0	В
	18:00 - 23:59	23 570.5	В		F	863.9	D		F	24 909.6	В
	Total	106 492.7	В	2 017.2	С	5 208.1	С	7 192.0	С	120 909.9	В

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						Vehicle Type					
		Vehicles up to 4.	5t	Trucks 4.5t - 15	t	Trucks 15t or more	9	Buses		Total	
Age of Driver	Sex of Driver										
Under 25 years	Male		F		F		F		F		F
	Female		F		F		F		F		F
	Total		F		F		F		F		F
25 - 55 years	Male	30 730.5	В	1 255.9	С	3 403.2	С	237.9	С	35 627.5	В
	Female	12 526.5	В		F		F	149.6	С	12 885.8	В
	Total	43 257.0	В	1 272.1	С	3 596.6	С	387.6	В	48 513.3	В
55 years and over	Male	14 871.6	С		F	832.2	Е	122.3	D	15 979.2	В
	Female	3 904.8	D		F		F	10.6	Е	3 916.0	D
	Total	18 776.4	В		F	832.2	Е	133.0	D	19 895.2	В
Total	Male	47 735.9	В	1 453.1	С	4 269.4	С	378.0	С	53 836.3	В
	Female	19 696.9	В		F		F	160.3	С	20 067.4	В
	Total	67 432.8	А	1 469.8	В	4 462.8	В	538.2	В	73 903.7	А

Passenger-km ('000 000) by Type of Vehicle, Driver Age Group and Sex of Driver

		Vehicle Type											
		Vehicles up to 4.	5t	Trucks 4.5t - 15	t	Trucks 15t or mor	е	Buses		Total			
Age of Driver	Sex of Driver												
Under 25 years	Male		F		F		F		F		F		
	Female		F		F		F		F		F		
	Total		F		F		F		F		F		
25 - 55 years	Male	49 260.5	В	1 729.4	С	3 908.4	С	2 404.4	D	57 302.7	В		
ı	Female		F		F		F	1 991.0	Е	22 663.8	В		
	Total	69 551.4	В	1 773.5	С	4 246.1	С	4 395.4	С	79 966.5	В		
55 years and over	Male	24 167.9	С		F	919.4	Е	2 392.0	Е	27 657.1	С		
	Female		F		F		F		F		F		
	Total	29 383.3	В		F	919.4	Е	2 587.2	Е	33 069.2	В		
Total	Male	76 659.0	В	1 971.7	С	4 870.3	С	5 005.8	D	88 506.7	В		
	Female		F		F		F	2 186.3	Е	32 403.3	В		
	Total	106 492.7	В	2 017.2	С	5 208.1	С	7 192.0	С	120 909.9	В		

Estimates of the Provincial Total of

Fuel ('000 000 litres) Purchased by Type of Vehicle and Type of Fuel

	Vehicle Type									
	Vehicles up to 4.	5t	Trucks 4.5t - 15	t	Trucks 15t or more	9	Buses		Total	
Fuel Type										
Gasoline	7 281.5	В	61.2	E		F	29.7	Е	7 379.2	В
Diesel	284.0	Е	285.8	D	1 779.5	С	139.1	В	2 488.4	С

## FOR FURTHER READING

## Selected Publications from Statistics Canada

	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-PPB	International Travel, Advance Information (Touriscope) - Monthly. Bilingual.
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