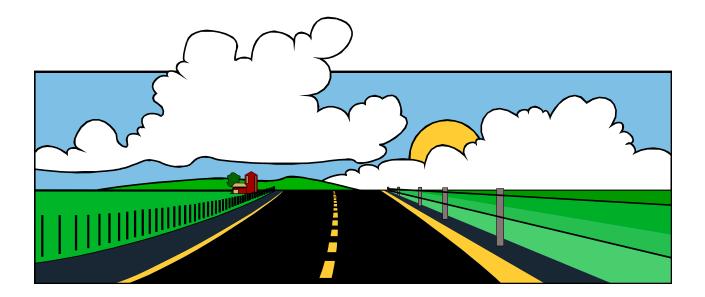


Canadian Vehicle Survey

Quarter 1, 2001



Transport Canada

CCMTA Canadian Council of Motor Transport Administrators





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Transportation Division

Canadian Vehicle Survey

Quarter 1, 2001

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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 confidential to meet secrecy requirements of the Statistics Act
- 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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HIGHLIGHTS

- Over 17.1 million vehicles were in-scope for the Canadian Vehicle Survey during this quarter.
- Between January 1 and March 31, 2001, these vehicles travelled an estimated 70.9 billion kilometres.
- Vehicles weighing less than 4 500 kilograms were driven an average of 3 890 kilometres while the largest of the trucks (trucks with gross weight 15 000 kilograms or more) were driven an average of 19 620 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 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 first quarter of 2001.

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 613-951-2486, e-mailing laroque@statcan.ca, or faxing: 613-951-0579.

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 *vehicle type*:

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 *yehicles (trucks) weighing 4.5 tonnes or more* 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.
- <u>Driver age group</u> and <u>driver sex</u>.
- *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
- Age group (0 4, 5 14 and 15 years and over) of passengers and the number of passengers within each group, 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.
- <u>Truck configuration</u> 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 October 2000. 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 October 2000 are not included.

The incoming lists underwent thorough preparation procedure:

- First, out-of-scope vehicles are removed (trailers, motorcycles, construction equipment, parade vehicles, 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 eleven lists provided in October 2000 to Statistics Canada for CVS and the most recent lists available for Nunavut and the Northwest Territories created in June, 2000. This set of prepared vehicle lists and the set of days within the first quarter of 2001 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 4,160 vehicles out of 17,885,815 from the survey population were drawn for the ten provinces. Another 2,387 vehicles out of 42,875 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.

	Vehicle-	-kilometres	and trip	Only vehic	le-kilometr	Vehicles	Contact	
PROVINCES	charac	cteristics re	ported	(trip cha	racteristics	out of	made but	
	All	0 km	Non 0 km	All	0 km	Non 0 km	scope	no data
Light vehicles	39%	15%	24%	29%	5%	25%	5%	4%
Trucks 4.5t – 15t	35%	25%	9%	18%	6%	12%	8%	10%
Trucks 15t or more	42%	29%	12%	23%	5%	18%	7%	12%
Buses	Buses 38% 23% 15%		4%	0%	4%	6%	31%	

TERRITORIES		-kilometres eteristics 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%	4%	10%
Trucks 4.5t – 15t	N/A	N/A	N/A	9%	2%	8%	7%	11%
Trucks 15t or more	N/A	N/A	N/A	10%	1%	9%	7%	12%
Buses	N/A N/A N/A		10%	1%	9%	3%	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	Vehi	cle days rep	orted	Vehicle days imputed				
PROVINCES	All	0 km	Non 0 km	All	0 km	Non 0 km		
Light vehicles	57%	22%	35%	43%	7%	36%		
Trucks 4.5t – 15t	66%	48%	18%	34%	11%	23%		
Trucks 15t or more	65%	46%	19%	35%	7%	28%		
Buses	91%	55%	36%	9%	0%	9%		

TERRITORIES	Veh	icle km rep	orted	Vehicle km imputed				
TERRITORIES	All	0 km	Non 0 km	All	0 km	Non 0 km		
Light vehicles	100%	4%	96%	N/A	N/A	N/A		
Trucks 4.5t – 15t	100%	17%	83%	N/A	N/A	N/A		
Trucks 15t or more	100%	7%	93%	N/A	N/A	N/A		
Buses	100%	14%	86%	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
С	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 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: 27, 28, 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.

anadian Vehicle Survey – Quarter 1, 2001	

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.

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

			Vehicle Type		
	Vehicles up to 4.5t	Trucks 4.5t - 15t	Trucks 15t or more	Buses	Total
Jurisdiction					
Newfoundland	242 700	3 915	2 337	1 366	250 318
Prince Edward Island	71 579	1 860	2 382	48	75 869
Nova Scotia	513 985	9 276	6 266	1 812	531 339
New Brunswick	428 025	9 593	3 326	2 660	443 604
Quebec	3 876 409	50 596	24 481	16 373	3 967 859
Ontario	6 381 454	77 283	98 236	27 183	6 584 156
Manitoba	581 991	9 485	11 073	3 530	606 079
Saskatchewan	602 276	42 491	23 196	3 785	671 748
Alberta	1 951 236	110 075	64 800	12 051	2 138 162
British Columbia	2 194 718	59 138	13 130	8 336	2 275 322
Yukon Territory	18 380	1 021	717	174	20 292
Northwest Territories	17 649	553	709	71	18 982
Nunavut	2 291	245	119	16	2 671
Total - Canada	16 882 693	375 531	250 772	77 405	17 586 401

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

Vehicles up to 4.5t

							Jurisdictio	n						
	Newfound- land	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 1984	5 164	2 858	20 500	12 730	73 703	214 678	45 716	79 420	213 672	206 803	2 592	1 703	144	879 683
1984	1 885	1 247	7 135	6 173	36 555	72 792	13 232	18 300	45 857	51 127	528	378	47	255 256
1985	2 931	1 730	9 858	8 640	60 462	111 654	17 762	21 576	59 618	65 172	602	491	73	360 569
1986	4 474	2 275	14 237	12 050	93 764	174 933	24 768	28 558	81 785	94 408	903	600	74	532 829
1987	6 357	3 231	18 604	16 076	135 684	220 592	24 171	24 971	72 860	96 965	914	530	106	621 061
1988	12 333	4 852	27 081	24 158	204 703	329 854	30 413	30 565	95 429	116 157	1 148	797	139	877 629
1989	14 826	5 252	29 874	26 721	221 099	365 509	31 046	31 013	101 788	128 752	1 175	888	137	958 080
1990	14 923	5 606	31 549	27 572	236 792	378 165	34 003	32 462	108 024	140 731	1 209	909	140	1 012 085
1991	15 705	4 965	31 021	27 119	247 031	372 210	35 403	33 693	108 145	137 098	1 065	863	164	1 014 482
1992	16 445	5 508	33 859	29 889	278 800	405 191	36 376	34 022	105 154	138 396	1 063	763	140	1 085 606
1993	17 369	5 211	32 880	26 890	252 493	384 296	32 901	31 163	96 127	127 680	1 043	790	144	1 008 987
1994	17 373	5 135	33 698	27 068	239 958	384 021	32 066	32 973	100 370	121 256	1 022	944	147	996 031
1995	16 152	5 197	34 267	27 633	255 068	411 351	34 686	34 977	106 353	124 141	1 057	977	160	1 052 019
1996	12 312	4 126	28 522	22 405	203 991	341 235	30 086	29 021	89 465	98 140	776	793	120	860 992
1997	16 509	4 479	34 935	27 185	255 604	433 837	39 085	37 616	121 622	125 125	1 100	1 229	154	1 098 480
1998	20 216	3 572	38 225	31 322	296 126	477 629	39 403	36 635	135 031	125 162	957	1 304	149	1 205 731
1999	20 873	2 674	36 563	29 794	306 560	497 939	34 851	27 808	119 139	116 443	895	1 457	135	1 195 131
2000	23 197	2 959	40 516	35 324	361 159	594 871	35 742	28 804	134 383	131 946	328	1 688	99	1 391 016
2001	3 638	702	10 620	9 249	116 670	210 338	10 272	8 692	56 318	49 154	3	543	19	476 218
2002	0	1	40	19	148	359	9	7	99	58	0	1	0	741
Unknown	16	0	0	5	37	0	0	1	0	0	0	0	0	59
TOTAL	242 698	71 580	513 984	428 022	3 876 407	6 381 454	581 991	602 277	1 951 239	2 194 714	18 380	17 648	2 291	16 882 685

Trucks 4.5t - 15t

							Jurisdictio	n						
	Newfound- land	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 1984	654	929	2 249	725	9 384	5 988	2 357	27 284	37 618	11 255	378	90	43	98 954
1984	112	62	239	103	1 317	1 021	222	575	1 889	995	32	23	3	6 593
1985	151	76	314	172	1 967	1 712	315	634	2 549	1 317	40	22	11	9 280
1986	175	84	355	209	2 172	2 335	410	746	3 066	1 860	33	21	12	11 478
1987	182	76	425	214	2 717	2 846	355	586	1 992	1 724	28	12	17	11 174
1988	300	89	510	289	3 480	4 061	412	673	3 700	2 470	47	22	17	16 070
1989	228	91	504	277	2 746	3 777	413	581	3 586	2 749	50	28	15	15 045
1990	236	68	494	287	2 863	4 147	511	702	3 931	3 102	52	36	17	16 446
1991	209	45	349	285	1 970	2 766	427	620	3 783	2 366	37	24	9	12 890
1992	169	36	321	352	1 683	2 818	372	615	3 430	2 393	37	23	8	12 257
1993	188	43	350	519	1 812	3 449	386	899	3 770	2 806	24	18	8	14 272
1994	207	47	346	578	2 231	4 250	391	880	4 659	3 113	44	23	10	16 779
1995	251	53	530	666	2 956	5 308	565	1 063	5 102	3 700	41	38	26	20 299
1996	139	24	325	578	1 848	3 858	417	691	3 873	2 651	30	20	9	14 463
1997	168	32	390	690	1 951	5 260	490	996	6 075	3 600	44	37	14	19 747
1998	128	17	466	953	2 495	5 526	419	1 042	5 702	3 107	32	23	10	19 920
1999	198	43	546	1 271	3 393	8 339	504	1 580	5 886	4 332	56	43	10	26 201
2000	173	33	439	963	2 520	7 125	354	1 627	5 826	3 799	14	35	5	22 913
2001	40	11	126	460	1 074	2 696	166	698	3 628	1 795	1	16	1	10 712
2002	0	0	0	1	14	3	0	0	9	2	0	0	0	29
Unknown	5	0	0	0	3	0	0	0	0	0	0	0	0	8
TOTAL	3 913	1 859	9 278	9 592	50 596	77 285	9 486	42 492	110 074	59 136	1 020	554	245	375 530

Trucks 15t or more

	Newfound Prince Reward Island Scotia Brunswick Quebec Ontario Manitoba Saskatche Wan Alberta Columbia Territory Territor													
		Edward		1	Quebec	Ontario	Manitoba	!	Alberta			Territor-	Nunavut	TOTAL
Vehicle Model Year														
Earlier then 1984	194	838	769	303	640	3 847	1 148	5 968	16 460	2 276	153	122	16	32 734
1984	57	125	114	91	227	1 043	202	459	954	245	7	18	2	3 544
1985	76	130	191	111	371	1 738	288	635	1 610	314	24	20	0	5 508
1986	79	172	191	124	459	2 395	340	739	1 856	419	19	12	0	6 805
1987	101	191	270	189	736	3 320	385	732	1 648	500	16	9	4	8 101
1988	136	167	304	181	951	3 599	401	824	2 259	574	27	20	1	9 444
1989	146	118	288	163	748	3 889	392	676	2 108	528	28	30	2	9 116
1990	94	99	205	192	728	3 677	344	675	2 336	901	30	29	3	9 313
1991	104	57	131	123	424	2 394	209	469	1 807	497	18	23	8	6 264
1992	83	31	156	86	587	2 453	269	440	1 493	675	36	22	6	6 337
1993	79	43	212	154	914	3 618	441	657	2 034	620	22	20	1	8 815
1994	132	57	324	173	1 610	5 243	671	838	3 135	753	28	39	5	13 008
1995	175	86	477	266	2 263	8 697	798	999	3 791	819	31	62	13	18 477
1996	139	54	371	175	1 557	6 216	726	767	2 992	742	49	51	9	13 848
1997	127	24	279	169	1 579	6 198	686	786	3 542	811	48	49	5	14 303
1998	186	46	515	198	2 841	10 317	1 048	1 606	5 123	742	71	58	12	22 763
1999	163	60	583	273	3 096	11 753	1 126	2 438	4 464	710	55	54	24	24 799
2000	196	59	655	242	3 322	12 667	1 158	2 662	4 479	620	48	51	6	26 165
2001	65	21	229	109	1 417	5 160	438	824	2 697	381	2	21	2	11 366
2002	1	0	1	2	4	11	1	0	12	2	0	0	0	34
Unknown	4	0	0	0	7	0	0	0	0	0	0	0	0	11
TOTAL	2 337	2 378	6 265	3 324	24 481	98 235	11 071	23 194	64 800	13 129	712	710	119	250 755

Buses

	40 11 101 713 533 1 315 308 482 2 419 933 43 8 6 3 3 1 24 140 179 171 72 149 230 129 7 4 0 6 2 34 109 204 367 239 207 317 132 2 1 4 64 124 217 416 168 214 368 195 4 1 0 202 3 73 130 214 747 178 364 445 233 3 4 0													
	!	Edward		!	Quebec	Ontario	Manitoba	!	Alberta		!	Territor-	Nunavut	TOTAL
Vehicle Model Year														
Earlier then 1984	40	11	101	713	533	1 315	308	482	2 419	933	43	8	6	6 912
1984	3	1	24	140	179	171	72	149	230	129	7	4	0	1 109
1985	6	2	34	109	204	367	239	207	317	132	2	1	4	1 624
1986	21	4	64	124	217	416	168	214	368	195	4	1	0	1 796
1987	202	3	73	130	214	747	178	364	445	233	3	4	0	2 596
1988	220	2	114	160	455	1 209	257	232	559	336	12	2	1	3 559
1989	184	1	96	118	910	1 623	183	250	656	460	7	1	0	4 489
1990	143	1	133	187	1 091	2 099	140	278	679	467	12	2	0	5 232
1991	120	0	130	77	1 161	1 877	201	217	581	564	7	1	2	4 938
1992	115	2	75	82	1 145	1 838	188	172	595	450	4	0	0	4 666
1993	49	0	100	96	967	1 526	178	180	557	383	2	1	0	4 039
1994	23	0	52	39	1 471	1 302	256	112	403	422	10	1	0	4 091
1995	28	0	185	158	973	1 862	177	120	525	557	13	0	1	4 599
1996	22	2	70	20	1 213	1 933	174	148	433	596	14	0	0	4 625
1997	46	0	103	125	1 183	1 588	157	148	688	404	16	2	1	4 461
1998	35	0	188	185	1 101	1 985	198	169	715	708	6	3	0	5 293
1999	57	0	99	91	1 441	2 409	231	207	787	578	4	23	0	5 927
2000	52	18	171	94	1 277	2 257	194	115	788	605	7	7	1	5 586
2001	0	1	2	9	634	658	30	21	308	184	0	8	0	1 855
2002	0	0	0	0	2	1	0	0	0	0	0	0	0	3
Unknown	0	0	0	2	0	0	0	0	0	0	0	0	0	2
TOTAL	1 366	48	1 814	2 659	16 371	27 183	3 529	3 785	12 053	8 336	173	69	16	77 402

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	239 722	А	3 860	А	1 741	С	1 238	В	246 562	А				
Prince Edward Island	69 612	А	1 609	В	2 225	Α	48	А	73 494	А				
Nova Scotia	493 203	Α	8 962	А	6 162	А	1 812	А	510 139	А				
New Brunswick	418 435	Α	6 817	В	3 001	В	1 731	D	429 985	А				
Quebec	3 756 876	Α	44 810	В	23 996	Α	15 140	Α	3 840 822	А				
Ontario	6 266 221	Α	71 944	А	97 346	Α	24 490	В	6 460 001	А				
Manitoba	566 643	А	8 180	В	10 840	Α	3 559	А	589 222	А				
Saskatchewan	599 182	А	39 111	В	20 758	Α	3 429	С	662 481	А				
Alberta	1 918 364	Α	83 251	В	62 894	Α	11 484	В	2 075 992	А				
British Columbia	2 187 187	Α	48 639	В	12 214	В	8 336	Α	2 256 376	А				
Yukon Territory	18 167	Α	720	С	701	В	174	А	19 761	А				
Northwest Territories	17 845	Α	440	С	669	С	72	Α	19 026	А				
Nunavut	2 350	Α	4	С		F		F	2 354	А				
Total - Canada	16 553 807	Α	318 346	А	242 548	Α	71 512	Α	17 186 213	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 - 15	t	Trucks 15t or more		Buses		Total					
Vehicle Model Year														
Later than 1998	2 548 453	В	37 288	С	50 560	В	10 906	D	2 647 206	В				
1996 - 1998	3 193 240	А	38 955	С	56 060	В	16 055	С	3 304 310	А				
1992 - 1995	4 332 307	А	63 633	С	43 222	С	10 391	D	4 449 552	А				
1988 - 1991	4 104 570	В	50 571	С	41 315	D	18 753	В	4 215 209	А				
Earlier than 1988	2 375 238	В	127 899	В	51 391	С	15 407	В	2 569 936	В				
Total	16 553 807	А	318 346	Α	242 548	Α	71 512	Α	17 186 213	А				

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	9	Buses		Total					
Vehicle Body Type														
Car	9 575 567	А		F					9 577 937	А				
Station wagon	500 357	D							500 357	D				
Van	2 492 842	В	19 033	Е			8 575	Е	2 520 450	В				
Sport utility vehicle	1 254 178	С							1 254 178	С				
Pickup	2 668 200	В	70 553	С		F			2 741 520	В				
Straight truck		F	211 922	В	76 717	В			323 108	В				
Tractor trailer				F	163 064	Α			172 612	В				
Bus		F					62 937	А	63 376	А				
Other		F		F						F				
Total	16 553 807	А	318 346	А	242 548	Α	71 512	Α	17 186 213	А				

Estimates for Canada of the

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

	Vehicles up to 4.	Vehicles up to 4.5t True		t	Trucks 15t or more		Buses		Total	
Fuel Type										
Gasoline	16 141 994	А	141 405	В	12 263	Е	11 918	С	16 307 580	А
Diesel	392 904	D	170 001	В	230 285	Α	54 619	А	847 808	В
Other		F		F			4 976	Е		F
Total	16 553 807	А	318 346	Α	242 548	А	71 512	А	17 186 213	А

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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	e	Buses		Total					
Jurisdiction														
Newfoundland	1 042.5	С	20.7	Е	29.8	Е	9.0	Е	1 102.0	С				
Prince Edward Island	242.7	С		F	7.9	Е		F	252.9	С				
Nova Scotia	1 943.2	D		F	112.1	С		F	2 115.5	D				
New Brunswick	1 524.7	С	26.1	Е	21.6	Е		F	1 580.4	С				
Quebec	14 190.8	В	143.5	D	701.7	С	111.9	D	15 147.9	В				
Ontario	24 320.3	В	413.4	Е	2 188.3	С	175.8	D	27 097.9	В				
Manitoba	1 950.1	В	45.9	D	283.2	С	14.5	Е	2 293.6	В				
Saskatchewan	2 786.9	Е	120.8	Е	228.3	Е	21.9	D	3 157.9	D				
Alberta	8 097.3	В	271.2	Е	1 033.4	С	49.9	D	9 451.8	В				
British Columbia	8 217.0	В	191.3	Е	120.3	D	59.3	D	8 587.9	В				
Yukon Territory	54.7	В	3.0	Е	17.7	Е		F	75.7	В				
Northwest Territories	30.9	В		F		F		F	45.9	С				
Nunavut	2.6	D		F		F		F	2.6	D				
Total - Canada	64 403.9	А	1 288.1	В	4 758.1	В	462.0	В	70 912.0	А				

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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	1 830.5	Е		F		F	51.9	D	1 949.0	E			
Prince Edward Island	384.5	Е		F		F		F		F			
Nova Scotia	3 035.4	Е		F		F	383.8	Е	3 635.8	E			
New Brunswick	2 591.5	Е		F		F	153.6	Е	2 807.7	Е			
Quebec	19 875.3	В	195.8	D	750.6	Е	1 911.1	Е	22 732.8	С			
Ontario	39 303.8	С		F		F	1 681.8	Е	44 044.9	D			
Manitoba	3 114.0	С	59.4	Е	299.3	Е		F	3 722.1	D			
Saskatchewan		F		F	269.6	Е	171.7	Е		F			
Alberta	14 420.3	D	407.8	Е	1 232.1	Е	334.9	Е	16 395.1	D			
British Columbia	13 103.9	D		F	131.8	Е	665.7	Е	14 237.6	D			
Total - Provinces	102 619.3	В	2 133.3	D	5 131.5	D	5 606.4	С	115 490.5	С			

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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 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 1998	14 268.7	В	342.5	Е	1 693.0	С	55.1	Е	16 359.3	В				
1996 - 1998	13 642.4	В	269.5	D	1 926.7	С	156.0	Е	15 994.8	В				
1992 - 1995	18 472.6	В	381.8	D	555.2	D	59.9	Е	19 469.4	В				
1988 - 1991	12 680.2	В	209.3	D	496.6	Е	96.6	D	13 482.7	В				
Earlier than 1988	5 340.0	С	84.9	Е		F	94.4	D	5 605.8	С				
Total	64 403.9	А	1 288.1	В	4 758.1	В	462.0	В	70 912.0	А				

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Estimates of the Provincial Total of

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

					Vehicle Type					
	Vehicles up to 4.	Vehicles up to 4.5t		t	Trucks 15t or more		Buses		Total	
Vehicle model year										
Later than 1998	22 698.6	D		F	1 791.7	Е	1 390.5	Е	26 513.2	E
1996 - 1998	23 623.9	С	515.2	Е	2 122.2	Е	1 322.7	Е	27 584.0	D
1992 - 1995	29 667.6	С	566.0	Е	603.3	Е	938.3	Е	31 775.1	D
1988 - 1991	19 154.9	D		F		F	1 463.2	Е	21 470.0	D
Earlier than 1988	7 474.2	D	93.4	Е		F	491.8	E	8 148.2	Е
Total	102 619.3	В	2 133.3	D	5 131.5	D	5 606.4	С	115 490.5	С

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

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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.	5t	Trucks 4.5t - 15	t	Trucks 15t or more	е	Buses		Total					
Vehicle Body Type														
Car	33 439.5	А		F					33 439.9	А				
Station wagon	1 508.2	Е							1 508.2	Е				
Van	11 667.2	С		F			36.3	Е	11 829.1	С				
Sport utility vehicle	5 857.7	D							5 857.7	D				
Pickup	11 366.9	С	313.7	Е		F			11 715.5	С				
Straight truck		F	791.4	С	366.1	D			1 459.1	D				
Tractor trailer				F	4 357.1	В			4 397.0	В				
Bus		F					425.7	В	427.2	В				
Other		F		F						F				
Total	64 403.9	А	1 288.1	В	4 758.1	В	462.0	В	70 912.0	А				

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 - 15t Trucks 15t or more Buses Total											
	Vehicles up to 4.	hicles up to 4.5t Tru			Trucks 15t or more	е	Buses		Total				
Vehicle Body Type													
Car	50 767.4	В		F					50 767.8	С			
Station wagon		F								F			
Van	20 187.2	D		F				F	20 685.9	E			
Sport utility vehicle		F								F			
Pickup	16 289.7	D	584.6	Е		F			16 939.2	E			
Straight truck		F		F		F				F			
Tractor trailer				F	4 629.4	D			4 706.2	D			
Bus		F					5 395.9	С	5 400.6	С			
0ther		F		F						F			
Total	102 619.3	В	2 133.3	D	5 131.5	D	5 606.4	С	115 490.5	С			

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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

	Vehicles up to 4.5t		Trucks 4.5t - 15t		Trucks 15t or more		Buses		Total	
Fuel Type										
Gasoline	62 445.8	А	265.5	D		F	36.3	E	62 778.9	А
Diesel	1 890.1	Е	1 004.9	С	4 726.8	В	391.5	В	8 013.2	В
Other		F		F			34.2	E		F
Total	64 403.9	А	1 288.1	В	4 758.1	В	462.0	В	70 912.0	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	е	Buses		Total	
Fuel Type										
Gasoline	99 251.4	В	395.4	Е		F		F	100 107.4	С
Diesel		F	1 715.3	Е	5 080.4	D	4 749.2	С	14 824.9	D
Other		F		F			447.8	Е	558.3	Е
Total	102 619.3	В	2 133.3	D	5 131.5	D	5 606.4	С	115 490.5	С

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

					Vehicle Type					
	Vehicles up to 4.	5t	Trucks 4.5t - 15	t	Trucks 15t or more	9	Buses		Total	
Day of the Week										
Sunday	6 914.4	В	55.4	Е	319.8	Е	20.1	Е	7 309.7	С
Monday	9 758.8	В	224.2	С	759.8	D	80.0	В	10 822.7	В
Tuesday	9 966.1	В	214.9	D	739.9	С	81.7	В	11 002.6	В
Wednesday	9 659.1	В	218.1	D	903.0	D	81.4	В	10 861.6	В
Thursday	8 834.8	В	263.3	D	797.9	С	93.3	В	9 989.4	В
Friday	10 247.1	В	249.4	D	808.1	D	87.5	С	11 392.1	С
Saturday	8 935.4	В	58.6	Е	398.1	Е	17.5	Е	9 409.7	В
Total	64 315.6	А	1 284.0	В	4 726.7	В	461.5	В	70 787.7	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	11 847.2	С	99.6	Е	349.2	Е		F	12 578.6	С
Monday	14 944.5	В	361.3	D	823.8	D	1 089.1	D	17 218.8	С
Tuesday	16 187.5	С		F	789.3	D	787.1	D	18 127.7	D
Wednesday	14 962.5	С	396.7	Е	985.4	D	942.8	D	17 287.3	С
Thursday	13 471.5	В		F	889.6	С	1 189.6	D	15 984.7	С
Friday	15 330.7	В	394.3	D	851.6	D	1 143.3	С	17 719.9	С
Saturday	15 875.4	С	83.5	Е		F	171.8	Е	16 573.4	С
Total	102 619.3	В	2 133.3	D	5 131.5	D	5 606.4	С	115 490.5	С

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	е	Buses		Total	
Age of Driver										
Under 20 years	816.4	Е		F		F		F	817.0	E
20 - 24 years		F		F		F		F		F
25 - 34 years	10 334.1	С	313.1	Е		F	63.1	Е	11 567.2	D
35 - 44 years	15 832.5	В	389.5	D	1 618.1	D	179.4	D	18 019.5	С
45 - 54 years	17 247.1	С	251.3	Е	1 558.6	Е	145.3	D	19 202.2	С
55 - 64 years	9 510.7	С		F		F	65.6	D	10 147.4	С
65 years and over	6 965.1	С		F		F		F	7 088.0	D
Total	64 315.6	А	1 284.0	В	4 726.7	В	461.5	В	70 787.7	A

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										Ī
Under 20 years	1 663.0	E		F		F		F		F
20 - 24 years		F		F		F		F		F
25 - 34 years	14 751.0	С	449.8	Е		F		F	16 833.1	D
35 - 44 years	26 164.3	С		F	1 844.3	Е	2 541.6	D	31 104.9	С
45 - 54 years	28 193.1	С	425.8	Е	1 622.1	Е	1 054.6	Е	31 295.6	D
55 - 64 years	14 049.0	С		F		F		F	15 903.4	С
65 years and over	11 160.6	С		F		F		F	11 601.2	D
Total	102 619.3	В	2 133.3	D	5 131.5	D	5 606.4	С	115 490.5	С

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	44 257.0	В	1 222.7	С	4 699.2	С	318.7	С	50 497.5	В
Female	20 058.6	В		F		F	142.8	С	20 290.2	С
Total	64 315.6	А	1 284.0	В	4 726.7	В	461.5	В	70 787.7	А

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

					Vehicle Type					
	Vehicles up to 4.5	5t	Trucks 4.5t - 15	t	Trucks 15t or more	9	Buses		Total	
Sex of Driver										
Male	71 311.3	В	2 028.6	D	5 104.0	D	3 824.5	D	82 268.4	С
Female	31 307.9	С		F		F	1 781.9	D	33 222.1	С
Total	102 619.3	В	2 133.3	D	5 131.5	D	5 606.4	С	115 490.5	С

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)	Buses		Total	
Time of Day										
00:00 - 05:59	1 307.8	С		F	653.0	Ε	13.0	Е	2 039.5	С
06:00 - 11:59	21 549.3	В	533.6	С	1 419.0	С	186.9	В	23 688.9	В
12:00 - 17:59	28 624.3	В	541.9	С	1 642.2	D	197.5	В	31 005.9	В
18:00 - 23:59	12 834.1	В		F	1 012.4	D	64.1	Е	14 053.5	С
Total	64 315.6	А	1 284.0	В	4 726.7	В	461.5	В	70 787.7	А

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	1 856.5	С		F		F		F	2 820.7	D
06:00 - 11:59	31 566.9	В	877.9	D	1 567.4	D	2 334.7	С	36 346.9	С
12:00 - 17:59	47 365.3	В	902.3	D	1 798.1	D	2 330.3	С	52 396.0	С
18:00 - 23:59	21 830.6	С		F	1 081.3	D		F	23 926.9	С
Total	102 619.3	В	2 133.3	D	5 131.5	D	5 606.4	С	115 490.5	С

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

					Vehicle Type					
	Vehicles up to 4.	5t	Trucks 4.5t - 15	t	Trucks 15t or more	9	Buses		Total	
Carrying Dangerous Goods										
Declared - yes		F		F	354.9	Е			557.9	E
Declared - no	64 205.7	В	1 190.9	С	4 371.8	С	461.5	В	70 229.8	В
Total	64 315.6	А	1 284.0	В	4 726.7	В	461.5	В	70 787.7	А

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

					Vehicle Type					
	Vehicles up to 4.	5t	Trucks 4.5t - 15	t	Trucks 15t or more	9	Buses		Total	
Carrying Dangerous Goods										
Declared - yes		F		F	373.9	Е			580.5	E
Declared - no	102 509.4	В	2 036.6	D	4 757.6	D	5 606.4	С	114 910.0	С
Total	102 619.3	В	2 133.3	D	5 131.5	D	5 606.4	С	115 490.5	С

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

					Vehicle Type					
	Vehicles up to 4.5	5t	Trucks 4.5t - 15		Trucks 15t or more	9	Buses		Total	
Type of Day										
Weekends and Holidays	16 441.6	В	123.8	Е	744.5	Е	39.0	Е	17 348.9	В
Weekdays	47 874.0	В	1 160.2	С	3 982.2	С	422.5	В	53 438.9	В
Total	64 315.6	Α	1 284.0	В	4 726.7	В	461.5	В	70 787.7	А

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

		Vehicle Type											
	Vehicles up to 4.5t		Trucks 4.5t - 15t		Trucks 15t or more		Buses		Total				
Type of Day													
Weekends and Holidays	28 946.3	В	194.2	Е		F	467.8	Е	30 432.1	С			
Weekdays	73 673.0	В	1 939.1	D	4 307.6	С	5 138.6	С	85 058.4	С			
Total	102 619.3	В	2 133.3	D	5 131.5	D	5 606.4	С	115 490.5	С			

 $\label{lem:Vehicle-km} \mbox{ ('000 000) by Type of Vehicle and Road Type}$

					Vehicle Type					
	Vehicles up to 4.	ehicles up to 4.5t Tr		Trucks 4.5t - 15t		Trucks 15t or more			Total	
Road Type										
Road with posted maximum speed of 80km/h or more	32 834.5	В	502.9	D	2 982.9	D	133.6	D	36 453.9	С
Other roads	31 481.1	В	781.1	D	1 743.8	D	327.9	С	34 333.9	В
Total	64 315.6	А	1 284.0	В	4 726.7	В	461.5	В	70 787.7	А

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

					Vehicle Type					
	Vehicles up to 4.5	Vehicles up to 4.5t			Trucks 15t or more		Buses		Total	
Road Type										
Road with posted maximum speed of 80km/h or more	55 648.7	В	888.8	Е	3 189.8	D	2 092.4	Е	61 819.6	С
Other roads	46 970.6	В	1 244.6	Е		F	3 514.0	С	53 670.9	В
Total	102 619.3	В	2 133.3	D	5 131.5	D	5 606.4	С	115 490.5	С

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

	Estimat	es for					
	Vehicles up to 4.5t						
Passenger Age							
Under 5 years			F				
5-14 years	5	119.8	С				
15 years and over	92	745.4	В				
Total	102	619.3	В				

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

	Est	tima	tes of				
	Passenger-km ('000 (000)	Vehicle-km ('000 000				
Trip Purpose							
Scheduled urban	-		154.8	Е			
Scheduled intercity		F		F			
School	3 645.3	D	192.8	С			
Charter	757.4	Е	31.1	Е			
Other		F	36.1	E			
Total	5 606.4	С	461.5	В			

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	10 413.5	В	7 943.4	С	18 356.9	В
To go to work or school	6 747.8	В	4 586.8	С	11 334.6	В
To do shopping or errands	7 592.7	В	5 052.2	С	12 644.9	В
To go to a recreational or social activity	4 401.5	С	2 668.9	С	7 070.4	В
To go somewhere else	3 709.8	D	3 672.4	Е	7 382.3	С
(Job) picking up or delivering goods		F	2 209.4	Е		F
(Job) to or from service call		F	2 045.8	Е	2 334.4	Е
(Job) other work purpose	1 035.7	Е	1 220.4	Е	2 256.1	D
Total	34 916.3	А	29 399.3	В	64 315.6	А

Vehicles up to 4.5t: Passenger-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	15 550.3	В		F	30 110.4	С
To go to work or school	8 585.7	С	6 743.9	D	15 329.5	В
To do shopping or errands	12 484.3	С	8 382.3	D	20 866.6	В
To go to a recreational or social activity	7 901.5	С	5 888.1	D	13 789.5	С
To go somewhere else	6 926.6	Е	7 042.7	Е	13 969.4	D
(Job) picking up or delivering goods		F		F		F
(Job) to or from service call		F	2 262.0	Е	2 570.7	Е
(Job) other work purpose	1 196.5	Е	1 491.4	Е	2 687.9	D
Total	53 734.4	В	48 884.9	С	102 619.3	В

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	535.2	D		F
	Empty		F		F
	Other work purpose	120.2	Е		F
	Non work purpose		F		F
	Total	1 244.1	С	400.0	D
Other over 4.5t	Driving to or from service call				F
ther over 4.5t	Carrying goods or equipment		F	3 475.8	D
	Empty			628.3	Е
	Other work purpose				F
	Non work purpose		F		F
	Total		F	4 326.6	В
Total	Driving to or from service call	107.9	Е		F
	Carrying goods or equipment	542.7	С	3 709.7	D
	Empty	87.5	Е	642.0	Е
	Other work purpose	120.2	Е		F
	Non work purpose	425.7	Е	195.6	Е
	Total	1 284.0	В	4 726.7	В

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		F
	Empty		F		F
	Other work purpose		F		F
	Non work purpose		F		F
	Total		F		F
ther over 4.5t	Driving to or from service call				F
	Carrying goods or equipment		F	3 721.3	D
	Empty				F
	Other work purpose				F
	Non work purpose		F		F
	Total		F	4 629.4	D
Total	Driving to or from service call	139.5	Е		F
	Carrying goods or equipment	631.4	D	3 974.4	D
	Empty		F		F
	Other work purpose		F		F
	Non work purpose	893.1	Е		F
	Total	2 133.3	D	5 131.5	D

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

						Vehicle Type					
		Vehicles up to 4.	5t	Trucks 4.5t - 15	t	Trucks 15t or mor	9	Buses		Total	
Type of Day	Time of Day										
Weekends and	00:00 - 05:59	360.2	D		F	135.1	E		F	502.1	D
Holidays	06:00 - 11:59	4 931.2	В	48.5	Е		F	10.4	Е	5 200.5	В
	12:00 - 17:59	7 825.9	В	56.0	Е		F	16.1	Е	8 114.6	В
	18:00 - 23:59	3 324.3	С		F	182.4	Е	10.6	Е	3 531.6	С
	Total	16 441.6	В	123.8	Е	744.5	Е	39.0	Е	17 348.9	В
Weekdays	00:00 - 05:59	947.6	С		F	518.0	Е	11.0	Е	1 537.4	С
	06:00 - 11:59	16 618.1	В	485.1	С	1 208.6	С	176.5	В	18 488.4	В
	12:00 - 17:59	20 798.4	В	485.9	С	1 425.6	С	181.4	В	22 891.3	В
	18:00 - 23:59	9 509.9	В	128.5	Е	830.0	D	53.5	Е	10 521.9	В
	Total	47 874.0	В	1 160.2	С	3 982.2	С	422.5	В	53 438.9	В
Total	00:00 - 05:59	1 307.8	С		F	653.0	Е	13.0	Е	2 039.5	С
	06:00 - 11:59	21 549.3	В	533.6	С	1 419.0	С	186.9	В	23 688.9	В
	12:00 - 17:59	28 624.3	В	541.9	С	1 642.2	D	197.5	В	31 005.9	В
	18:00 - 23:59	12 834.1	В		F	1 012.4	D	64.1	Е	14 053.5	С
	Total	64 315.6	А	1 284.0	В	4 726.7	В	461.5	В	70 787.7	А

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 mor	е	Buses		Total	
Type of Day	Time of Day										
Weekends and Holidays	00:00 - 05:59	554.0	D		F		F		F	735.6	D
HOLLUAYS	06:00 - 11:59	7 794.1	В	67.2	Е		F		F	8 164.3	С
	12:00 - 17:59	14 181.8	В	87.7	Е		F		F	14 694.9	С
	18:00 - 23:59	6 416.5	D		F	198.9	Е		F	6 837.4	E
	Total	28 946.3	В	194.2	Е		F	467.8	Е	30 432.1	С
Weekdays	00:00 - 05:59		F		F		F		F		F
	06:00 - 11:59	23 772.9	В	810.7	D	1 326.9	С	2 272.2	С	28 182.6	С
	12:00 - 17:59	33 183.5	В	814.6	D	1 558.9	D	2 144.1	С	37 701.0	С
	18:00 - 23:59	15 414.1	В		F		F		F	17 089.6	С
	Total	73 673.0	В	1 939.1	D	4 307.6	С	5 138.6	С	85 058.4	С
Total	00:00 - 05:59	1 856.5	С		F		F		F	2 820.7	D
	06:00 - 11:59	31 566.9	В	877.9	D	1 567.4	D	2 334.7	С	36 346.9	С
	12:00 - 17:59	47 365.3	В	902.3	D	1 798.1	D	2 330.3	С	52 396.0	С
	18:00 - 23:59	21 830.6	С		F	1 081.3	D		F	23 926.9	С
	Total	102 619.3	В	2 133.3	D	5 131.5	D	5 606.4	С	115 490.5	С

						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	29 219.6	В	911.0	С	4 006.1	D	253.2	D	34 390.0	С
	Female	14 194.1	С		F		F	134.5	С	14 398.9	С
	Total	43 413.7	В	953.8	С	4 033.6	D	387.8	С	48 788.9	В
55 years and over	Male	13 217.5	С		F		F	64.3	D	13 955.3	С
	Female	3 258.3	D		F		F		F	3 280.1	D
	Total	16 475.8	В		F		F	72.6	D	17 235.4	С
Total	Male	44 257.0	В	1 222.7	С	4 699.2	С	318.7	С	50 497.5	В
	Female	20 058.6	В		F		F	142.8	С	20 290.2	С
	Total	64 315.6	А	1 284.0	В	4 726.7	В	461.5	В	70 787.7	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 more	9	Buses		Total		
Age of Driver	Sex of Driver											
Under 25 years	Male	3 221.6	Е		F		F		F		F	
	Female		F		F		F		F		F	
	Total		F		F		F		F		F	
25 - 55 years	Male	47 327.4	С	1 356.7	D	4 371.3	D	2 679.4	Е	55 734.9	С	
	Female	21 780.9	С		F		F	1 616.7	D	23 498.8	С	
	Total	69 108.4	В	1 430.4	D	4 398.8	D	4 296.1	D	79 233.6	С	
55 years and over	Male	20 762.2	С		F		F		F	22 869.2	С	
	Female	4 447.4	D		F		F		F	4 635.4	E	
	Total	25 209.6	В		F		F	1 287.3	Е	27 504.6	С	
Total	Male	71 311.3	В	2 028.6	D	5 104.0	D	3 824.5	D	82 268.4	С	
	Female	31 307.9	С		F		F	1 781.9	D	33 222.1	С	
	Total	102 619.3	В	2 133.3	D	5 131.5	D	5 606.4	С	115 490.5	С	

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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	7 824.9	В	65.3	Е		F	12.1	Е	7 913.8	В
Diesel		F	240.6	D	1 988.1	D	135.4	С	2 706.5	С

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