Motor Vehicle Fleet and Use Characteristics, 2000

Canadian Vehicle Survey

Transport Canada's Canadian Vehicle Survey (CVS) is the first survey to document the principal characteristics of Canada's on-road motor vehicle fleet and its use. The CVS, which became fully operational by the fourth quarter of 1999, is a quarterly survey of approximately 20,000 vehicle owners per year drawn from all provinces and territories. All classes of vehicle from automobiles up to the heaviest of trucks, as well as buses, are included in the survey's population (motorcycles, off-road vehicles, and special equipment such as snow plows are excluded). Each selected vehicle owner receives a diary and is asked to record all trips taken during a seven-day period. *(Note: trip diaries are only sent to residents of the ten provinces; territorial residents receive a postcard and are asked to record just odometer readings for seven days. As a result, many estimates which will be presented below, which are based on trip-level information such as passenger-km, are not available for the territories.)* The individual results are collected and weighted by Statistics Canada to form aggregate estimates. The CVS covers all the main aspects of motor vehicle use describing vehicle, trip, and driver characteristics. Presented below are the main variables collected by the CVS for 2000, the first complete survey year.

Vehicle fleet characteristics

Number of in-scope vehicles by province/territory

The Canadian vehicle fleet stood at 17.3 million vehicles in 2000, split between 16.6 million light vehicles weighing less than 4,500 kg, 320 thousand medium-weight trucks weighing between 4,500 kg and 10,000 kg, 255 thousand heavy trucks weighing over 10,000 kg, and over 74 thousand buses. Table 1 shows the distribution by jurisdiction.

Table 1: Number of vehicles by weight class and jurisdiction, 2000

	Light vehicles			Medium trucks			Heavy trucks			Buses			All vehicles		
	No.	Share	Per capita	No.	Share	Per cap.	No.	Share	Per cap.	No.	Share	Per cap.	No.	Share	Per capita
Nfld.	240.5	1.4	446	3.5	1.1	7	2.6	1.0	5	1.3	1.7	2.4	248.0	1.4	460
P.E.I.	71.7	0.4	516	1.8	0.6	13	2.4	0.9	17	0.1	0.1	0.4	76.0	0.4	547
N.S.	501.4	3.0	533	7.9	2.5	8	6.9	2.7	7	1.8	2.4	1.9	518.1	3.0	551
N.B.	422.9	2.5	559	7.5	2.4	10	4.2	1.6	6	1.9	2.6	2.5	436.5	2.5	577
Que.	3,781.5	22.7	513	43.7	13.7	6	31.7	12.4	4	15.9	21.5	2.2	3,872.7	22.4	525
Ont.	6,268.6	37.7	537	69.3	21.7	6	97.3	38.1	8	26.1	35.3	2.2	6,461.4	37.4	554
Man.	581.8	3.5	507	9.0	2.8	8	10.7	4.2	9	3.4	4.6	3.0	605.0	3.5	527
Sask.	615.8	3.7	602	44.9	14.0	44	21.5	8.4	21	3.8	5.1	3.7	686.0	4.0	670
Alta.	1,909.8	11.5	637	81.8	25.6	27	61.4	24.0	20	11.4	15.4	3.8	2,064.3	11.9	689
B.C.	2,206.5	13.3	543	48.0	15.0	12	14.6	5.7	4	8.1	11.0	2.0	2,277.2	13.2	560
Yukon	21.3	0.1	695	1.2	0.4	39	0.9	0.4	30	0.2	0.3	7.5	23.6	0.1	771
N.W.T.	17.9	0.1	426	0.6	0.2	14	1.0	0.4	24	0.05	0.1	1.1	19.6	0.1	465
Nunavut	2.5	0.01	90	0.2	0.1	8	0.2	0.1	5	0.0	0.01	0.1	2.9	0.0	103
Canada	16,642.1	100	541	319.5	100	10	255.5	100	8	74.1	100	2.4	17,291.3	100	562

No.: Thousands of in-scope vehicles.
Per capita: vehicles per 1,000 population.

Vehicle owners in Ontario and Quebec accounted for about 60% of all on-road vehicles but about 50% of heavy vehicles and 57% of buses. The Atlantic region as a whole accounted for 7.5% of the total fleet and 6.3% of the heavy truck fleet, while the Prairie

provinces accounted for nearly 1/5th of the total fleet and nearly 37% of the heavy truck fleet, with Alberta alone accounting for one-quarter of the national heavy truck fleet. British Columbia represented 13% of the total fleet but only 6% of the heavy truck fleet, while the territories accounted for about 0.3% of the total fleet and 0.8% of the heavy truck fleet.

Motorisation (per capita vehicle ownership)

Table 1 also provides estimates of vehicle ownership per 1,000 population in each jurisdiction. Alberta, Saskatchewan, and the Yukon had the highest per capita ownership rates of light vehicles at over 600 vehicles for every 1,000 persons. The rest of the provinces with the exception of Newfoundland and the two other territories had light vehicle ownership rates between 500 and 560 vehicles per 1,000 persons. The overall rate for Canada was 540 light vehicles per 1,000 persons. The same basic rankings were also witnessed for the two classes of trucks. Both Alberta and Saskatchewan and the Yukon had the highest rate of ownership of trucks while B.C. and three of the four Atlantic provinces had some of the lowest truck ownership rates. On average, there were about 10 medium trucks for every 1,000 persons and about 8 heavy trucks for every 1,000 persons. The overall per capita ownership rate was 562 vehicles for every 1,000 persons or approximately two persons per vehicle.

Vehicle-kilometres by weight class and province/territory

Table 2 shows the distribution of vehicle-kilometres by vehicle weight class and province/territory. A vehicle-km is a composite measure of distance driven and serves as the principal means for measuring vehicle activity. One vehicle driven 10 kilometres equals 10 vehicle-km while 10 vehicles driven 1 km each also represents 10 vehicle-km. In 2000, the CVS estimated that over 310 billion vehicle-km were driven across all vehicle classes. The vast majority was performed by light vehicles with 282 billion or 91%, followed by heavy vehicles with nearly 21 billion vehicle-km (6.7%), medium trucks with about 6 billion (2%), and buses with 1.9 billion (0.6%). (A passenger-kilometre, which measures the total distance travelled by all passengers in a vehicle, including driver, is another measure of activity that will be presented below.)

Table 2: Vehicle-kilometres and per capita use by weight class and jurisdiction, 2000

	Light vehicles			Medium trucks			Heavy trucks			Buses			All vehicles		
	Bill.	Share	Per capita	Bill.	Share	Per cap.	Bill.	Share	Per cap.	Bill.	Share	Per cap.	Bill.	Share	Per capita
Nfld.	4.8	1.7	10,986	0.06	1.0	132	0.1	0.6	284	0.02	0.9	37	5.0	1.6	11,439
P.E.I.	1.2	0.4	10,809	0.02	0.3	173	0.1	0.3	599	0.00	0.02	3	1.3	0.41	11,584
N.S.	8.5	3.0	11,268	0.18	3.0	236	0.5	2.5	671	0.04	2.1	53	9.3	3.0	12,229
N.B.	8.2	2.9	13,378	0.15	2.5	242	0.2	0.7	252	0.03	1.8	56	8.5	2.7	13,928
Que.	62.9	22.3	10,550	1.30	22.0	219	3.5	17.0	590	0.46	24.2	77	68.2	22.0	11,436
Ont.	106.5	37.8	11,527	1.67	28.2	181	8.9	43.0	963	0.72	38.1	78	117.8	37.9	12,748
Man.	9.3	3.3	10,482	0.18	3.1	206	1.0	4.9	1147	0.06	3.2	68	10.6	3.4	11,904
Sask.	10.5	3.7	13,385	0.32	5.4	405	1.0	4.8	1252	0.09	4.6	112	11.9	3.8	15,154
Alta.	36.2	12.8	15,548	1.15	19.3	493	4.5	21.7	1929	0.30	16.0	130	42.1	13.6	18,100
B.C.	33.3	11.8	10,160	0.88	14.9	269	0.8	3.9	247	0.16	8.6	50	35.1	11.3	10,726
Yukon	0.3	0.1	13,577	0.02	0.3	725	0.1	0.3	2949	0.01	0.4	356	0.4	0.1	17,611
N.W.T.	0.2	0.1	7,496	0.01	0.1	171	0.1	0.3	2374	0.00	0.04	23	0.3	0.10	10,063
Nunavut	0.03	0.01	1,504	0.001	0.01	42	0.00	0.01	162	-	-	-	0.03	0.0	1,701
Canada	282.0	100	11,526	5.93	100	242	20.7	100	847	1.89	100	77	310.5	100	12,692

Note: per capita use based on the population 16 years of age or older.

The distribution by province and territory was largely proportional to the population of the jurisdiction. Ontario performed the most vehicle-km with nearly 120 billion or 38% of the total. Quebec was second with 68 billion or 22% but Alberta followed in third with 42 billion or 13.6% and B.C. was fourth with 35 billion or 11.3%. The rest of the provinces had total shares less than 4%.

Heavy truck activity was tightly concentrated among just three provinces which represented over 80% of the total: Ontario accounted for 43% of heavy truck vehicle-km, followed by Alberta with over 21%, and Quebec with 17%.

Vehicle-km per person

Table 2 also provides estimates of vehicle-km per capita. Overall, the population at least 16 years of age drove 12,700 km in 2000, of which 11,500 km were driven in light vehicles and over 1,000 km were driven in medium and heavy trucks combined. Residents of Alberta drove the most with over 18,000 km on average, followed by the Yukon with 17,600 km and Saskatchewan with 15,100 km. Ontario residents drove 12,700 km a year, while Quebec residents drove 11,400 km. New Brunswick residents drove the most on average in Atlantic Canada with nearly 14,000 km per year.

Average distance driven per vehicle

Table 3 provides estimates of average distance driven per vehicle by vehicle weight class and jurisdiction. On average, light vehicles were driven nearly 17,000 km per year with most provinces closely bunched around that value. Newfoundland used its light vehicles the most at 20 thousand km per year while B.C. used theirs relatively the least at a little over 15 thousand per year. Medium trucks were driven about 18,500 km per year with the highest use found in Quebec at nearly 30 thousand km per year. Heavy trucks were the most intensively used at over 80 thousand km annually. Quebec heavy trucks were driven an average of 111 thousand km annually, while Ontario and Manitoba trucks were driven over 90 thousand km annually. Surprisingly, N.B. had one of the lowest average kilometrage for its heavy trucks at less than 37 thousand per year. Buses, on average, were driven 25,500 km per year with the highest use taking place in Ontario, Quebec, and the Yukon.

Table 3: Average distance driven, by weight class and jurisdiction, 2000

	Light vehicles	Medium trucks	Heavy trucks	Buses	All vehicles
Nfld.	20.0	16.3	47.0	12.5	20.2
P.E.I.	16.5	10.4	27.4	5.3	16.7
N.S.	17.0	22.5	73.2	22.3	17.9
N.B.	19.3	19.5	36.7	18.0	19.5
Que.	16.6	29.8	111.1	28.7	17.6
Ont.	17.0	24.1	91.5	27.6	18.2
Man.	16.0	20.4	95.1	17.7	17.5
Sask.	17.1	7.1	45.8	23.2	17.4
Alta.	18.9	14.0	73.1	26.6	20.4
B.C.	15.1	18.4	55.3	20.0	15.4
Yukon	15.0	14.5	74.8	36.4	17.6
N.W.T.	12.5	8.7	69.2	14.9	15.4
Nunavut	10.1	3.2	18.0	-	9.9
Canada	16.9	18.6	81.1	25.5	18.0

Average distance driven: annual average distance driven ('000s km).

Distribution by vehicle body type

Table 4 provides a breakdown of the main vehicle use characteristics by body type for the 10 provinces taken together. In 2000, about 10 million vehicles or nearly 3/5s of the vehicle fleet comprised automobiles with an additional 400 thousand station wagons. Light pickup trucks numbered 2.75 million examples or nearly 16% of the fleet, followed by vans with 2.2 million and sport-utility vehicles with a further 1.15 million or nearly 7% of the fleet. Altogether, light trucks and vans accounted for over 6 million vehicles or over 35% of the total vehicle fleet. Medium and heavy trucks (weighing 4,500 kg or more) were split between the straight truck configuration (i.e. tractor and cargo area are a single unit) which made up 71% of the fleet and tractor-trailer combinations (tractor is a separate unit from the trailer) which made up the other 29%.

Cars and station wagons accounted for nearly 170 billion vehicle-km or 55% of the total, followed by pickup trucks with 47 billion vehicle-km (15%), vans with 43 billion vehicle-km (14%) and sport-utilities with 22 billion or 7%. Taken together, vans and light trucks accounted for nearly 112 billion vehicle-km or 36% of total use. While straight trucks were numerically superior to tractor-trailers, the reverse was seen for vehicle-km as the tractor-trailers with their long average trip lengths accounted for 17 billion vehicle-km or nearly 71% of the medium and heavy truck use.

Over 500 billion passenger-km were estimated for 2000 of which cars and station wagons accounted for the majority (283 billion or 56%). Vans and light trucks accounted for nearly 190 billion or 38% followed by buses of all types with 29 billion or nearly 6% of the total.

Table 4: Distribution of vehicle activity by body type, for 10 provinces, 2000

	Vehicles		Vehicle-km		Passenger-km		Fuel (litres)		Average distance driven	Per-sons/	Fuel effic. (L/
	Millions	Share	Billions	Share	Billions	Share	Billions	Share	('000s)	vehicle	100km)
Car	10.05	58.3	161.0	52.0	268.8	53.2	16.3	38.1	16.0	1.67	10.14
Station wagon	0.41	2.4	7.8	2.5	13.8	2.7	0.9	2.1	18.9	1.78	11.49
Van	2.20	12.8	42.7	13.8	85.5	16.9	5.0	11.8	19.4	2.00	11.81
Sport-utility	1.14	6.6	22.1	7.1	36.7	7.3	3.1	7.3	19.4	1.65	14.20
Pickup truck	2.75	15.9	47.0	15.2	67.0	13.3	6.3	14.7	17.1	1.43	13.36
Straight truck	0.35	2.0	7.1	2.3	1.1	0.2	2.5	5.7	20.2	0.16	34.79
Tractor trailer	0.14	0.8	17.1	5.5	0.0	0.0	7.4	17.2	122.4	0.00	43.14
Bus	0.07	0.4	1.8	0.6	29.1	5.8	0.6	1.4	24.2	16.08	32.46
Other	0.13	0.7	3.1	1.0	2.9	0.6	0.7	1.6	24.4	0.92	22.12
Total	17.25	100.0	309.8	100.0	504.9	100.0	42.8	100.0	18.0	1.63	13.82

In terms of average use, cars were the least-used of all body types at 16 thousand km per year; all other light vehicles were used relatively more intensively, averaging nearly 20 thousand km per year. Straight trucks were driven an average of 20 thousand km per year while tractor trailers were driven the most at over 120 thousand km year.

Occupancy per light vehicle averaged around 1.68 persons per vehicle with the highest occupancy witnessed, not surprisingly, in the multi-seat van which still managed an

average occupancy of only 2 persons per vehicle. Pickup trucks had the lowest average occupancy at 1.43 persons per vehicle. Buses averaged a little over 16 persons per vehicle.

Nearly 43 billion litres or fuel were purchased according to the CVS, of which cars and station wagons accounted for about 40%. Their corresponding fuel consumption rate was the lowest of all types of vehicle at 10.2 litres per 100 km. Light trucks and vans accounted for 14.5 billion litres or 34% of the total fuel purchased while medium and heavy trucks purchased nearly 10 billion litres or 23%. Light truck fuel efficiency averaged about 13 litres per 100 km with vans being the least thirsty at 11.8 l/100km and sport-utilities the most thirsty at 14.2 l/100km. The fuel efficiency rate for straight trucks was nearly 35 l/100km with tractor-trailer combinations the least fuel efficient of all at 43 l/100km. Buses accounted for 1.4% of fuel purchased and had a fuel efficiency rate of 32.5 l/100km. The overall average for the Canadian vehicle fleet was 13.8 l/100km.

Medium and heavy truck configurations

Table 5 analyses truck vehicle-km by configuration. The most popular configuration for medium trucks was the straight truck, with its integrated power unit and cargo area. Over 80% of the medium truck vehicle-km was accounted for by straight trucks. By contrast heavy trucks, weighing over 10,000 kg, were predominately tractor-trailer combinations with a separate power unit and a separate cargo area. Over 80% of heavy truck vehicle-km was accounted for by various tractor-trailer combinations with the tractor-1 trailer combination the most popular. Tractors pulling two trailers carried out about 6% of the vehicle-km. Almost 13% of heavy truck vehicle-km were done by straight trucks.

Table 5: Vehicle-km by truck configuration, 10 provinces, 2000

	Medium trucks		Heavy trucks	
	(bill.)	Share	(bill.)	Share
Straight truck	4.8	81.6	2.6	12.7
Tractor only	0.0	0.6	0.5	2.5
Tractor/1 trailer	0.2	3.6	15.5	75.1
Straight truck/trailer	0.1	2.1	0.4	1.9
Tractor/2 trailers	0.0	0.1	1.2	6.1
Tractor/3 trailers	0.0	0.0	0.1	0.4
Other	0.7	12.0	0.3	1.3
Total	5.9	100.0	20.6	100.0

Bus configurations

Table 6 presents bus activity by the type of operation. As can be seen, school buses accounted for nearly one-half of the vehicle-km and over 60% of the passenger-km performed by buses. Urban transit accounted for over a quarter of the vehicle-km (urban transit was not asked to record passenger-km data), with charter and other busing accounting for a further 20%. Intercity highway bus activity was less than 100 million vehicle-km or 1.8 billion passenger-km, approximately 5-6% of bus activity. Bus occupancy rates averaged about 16 passengers per bus with the highest occupancies

found in charter activity at 33 persons per bus. Intercity and school buses averaged about 20 passengers per bus.

Table 6: Bus activity by type of operation, 10 provinces, 2000

	Vehicle-km		Passenger-km		Persons/
	(bill.)	Share	(bill.)	Share	vehicle
Scheduled urban	0.5	27.2	n.a.	n.a.	n.a.
Scheduled intercity	0.1	5.0	1.8	6.0	19.3
School	0.9	46.7	18.2	61.0	20.7
Charter	0.2	10.4	6.5	21.9	33.4
Other	0.2	10.8	3.3	11.1	16.3
Total	1.9	100.0	29.8	100.0	15.8

Age of the vehicle fleet

Table 7 provides a breakdown of the vehicle fleet by the age of the vehicle. Almost 40% of the light vehicle fleet was under six years old, one-fifth under three years, and on average these vehicles had the best fuel efficiency and were used relatively the most. Light vehicles six years old or less were driven about 20 thousand km annually, while light vehicles seven years of age or older were driven about 14 thousand km annually. Fuel efficiency for vehicles less than 6 years of age was nearly 9% better than for vehicles six years of age and up (10.7 versus 11.7 l/100 km).

Only about one-third of the medium truck fleet was under 6 years of age, but these vehicles were used almost twice as much as their older counterparts, about 26 thousand km per year compared to only about 15 thousand annually, and were appreciably more fuel efficient. Average fuel efficiency for medium trucks less than 6 years of age was nearly 25% better (22.5 l/100 km versus 29.6 l/100 km) than for vehicles 6 years or older.

Heavy trucks were considerably newer with nearly half the fleet less than 6 years old. These vehicles accounted for 75% of the vehicle-km and were driven much more on average, over 120 thousand km per year, compared with only about 32 thousand km for vehicles 6 years of age or more. Heavy trucks under 6 years old were 9% more fuel efficient than older vehicles (42.6 l/100 km versus 46.8 l/100 km).

About 38% of the bus fleet was under 6 years of age and these vehicles accounted for about one-half of the vehicle-km. Younger vehicles were driven about 65% more on average per year than older buses (33 thousand km versus 20 thousand km per year) and were over 16% more fuel-efficient (28.5 l/100 km versus 34.2 l/100 km).

(Note that the vehicle count in Table 7 is slightly higher than the total for Table 1. This is owing to the fact that all vehicles on each jurisdiction's registration files are tabulated here and not just the vehicles in-scope for the CVS. The corresponding age distributions for just the in-scope vehicles will be substituted later.)

Table 7: Vehicle characteristics by age of vehicle, 10 provinces, 2000

Age	Vehicle count ('000s)	Share	Vehicle-km (Bill.)	Average distance driven ('000s)	Fuel efficiency (L/100km)
Light vehicles					
Two years or less	3,514	20.9	69.71	19.8	10.7
Three to five	3,018	18.0	64.43	21.3	10.8
Six to nine	4,172	24.9	72.01	17.3	11.3
Ten to thirteen	3,735	22.3	51.26	13.7	12.3
Fourteen or more	2,346	14.0	24.01	10.2	12.0
Total	16,784	100.0	281.42	16.8	11.3
Medium trucks					
Two years or less	66	17.1	1.69	25.5	21.0
Three to five	56	14.6	1.51	26.9	24.2
Six to nine	58	15.1	1.16	19.8	25.8
Ten to thirteen	64	16.5	0.95	14.8	29.0
Fourteen or more	142	36.7	0.60	4.2	37.8
Total	387	100.0	5.91	15.2	25.8
Heavy trucks					
Two years or less	80	30.0	10.70	133.3	42.7
Three to five	51	19.2	5.49	106.7	42.5
Six to nine	38	14.1	1.94	51.3	46.8
Ten to thirteen	41	15.4	1.72	41.9	47.3
Fourteen or more	57	21.3	0.71	12.5	45.6
Total	268	100.0	20.57	76.8	43.5
Buses					
Two years or less	15	19.6	0.42	28.2	29.1
Three to five	14	17.9	0.51	37.1	28.1
Six to nine	18	23.5	0.45	25.1	28.8
Ten to thirteen	17	22.6	0.28	15.9	37.6
Fourteen or more	13	16.5	0.22	17.0	41.2
Total	77	100.0	1.88	24.5	31.4

Driver and trip characteristics

Driver age

Table 8 provides estimates of vehicle-km and passenger-km by age group. The majority of the vehicle-km and passenger-km was carried out by drivers between the ages of 35 and 54 with the single largest share accounted for by drivers aged 35-44 (30% of the vehicle-km and 32% of passenger-km). Drivers under the age of 25 accounted for about 7% of the use, while drivers 65 and older were responsible for nearly 10% of activity. Per capita travel, though, was highest among groups between the ages of 35 and 54: drivers aged 35-44 performed almost 16 thousand v-km and over 30 thousand p-km per year, while drivers aged 45-54 did 16 thousand v-km and 28 thousand p-km in 2000. Per

capita travel was lowest in the group under 20 (3,800 v-km and 6,700 p-km) and the two groups over 75 who did 4,400 and 1,250 v-km, respectively, and 7,000 and 2,500 p-km, respectively.

Table 8: Vehicle use by driver age group, 10 provinces, 2000

			Vehicle-km			Passenger-km		
	Population ('000s)	Share	(Bill.)	Share	Per capita	(Bill.)	Share	Per capita
16-19	1,658	25.8	6.4	2.1	3,833	11.0	2.2	6,658
20-24	2,081	6.8	14.5	4.7	6,549	20.7	4.1	9,923
25-34	4,393	14.3	50.5	16.3	9,681	71.1	14.1	16,196
35-44	5,307	17.3	92.4	29.8	15,748	163.0	32.3	30,708
45-54	4,365	14.2	77.5	25.0	16,215	123.1	24.4	28,210
55-64	2,812	9.1	39.3	12.7	12,772	66.9	13.3	23,800
65-74	2,135	6.9	22.8	7.4	10,490	39.0	7.7	18,264
75-84	1,299	4.2	5.7	1.9	4,405	9.0	1.8	6,921
85+	416	1.4	0.5	0.2	1,248	1.0	0.2	2,479
Total	24,466	100.0	309.8	100.0	11,502	504.9	100.0	20,636

Driver age and sex

Table 9 provides a separate breakdown of vehicle use by sex and three principal age groups: 16-24, 25-54, and 55+. Most striking was the dramatic difference in both absolute and per capita vehicle use between males and females. As a whole, males accounted for over 70% of vehicle use and in per capita terms drove nearly two and a half times more than females (18,200 v-km versus 7,300 v-km). The discrepancy was especially large in the 55+ age group where males drove 17,400 v-km on average and females only 4,300 v-km. Among the group 25-54, males drove 22,000 v-km on average while females drove 9,300 v-km. No appreciable difference in vehicle use existed between males and females under 25. Males between the ages of 16 and 24 drove 5,800 km per year while females drove 5,400 km per year.

Table 9: Vehicle use by driver age group and sex, 10 provinces, 2000

			Vehicle-km			Passenger-km		
	Population ('000s)	Share	(Bill.)	Share	Per capita	(Bill.)	Share	Per capita
Male, 16-24	1,914	7.82	11.1	3.6	5,784	17.3	3.4	9,040
Male, 25-54	7,065	28.9	155.2	50.1	21,972	243.8	48.3	34,507
Male, 55+	3,030	12.4	52.7	17.0	17,405	91.0	18.0	30,020
Male	12,009	49.1	219.0	70.7	18,239	352.0	69.7	29,315
Female, 16-24	1,825	7.46	9.8	3.2	5,357	14.4	2.8	7,883
Female, 25-54	7,000	28.6	65.3	21.1	9,327	113.5	22.5	16,208
Female, 55+	3,632	14.8	15.7	5.1	4,318	25.0	4.9	6,880
Female	12,457	50.9	90.7	29.3	7,285	152.8	30.3	12,269
Total	24,466	100	309.8	100.0	25,524	504.9	100.0	20,636

Passenger-km by age of passenger

Table 10 breaks down total passenger-km by age of passenger. Motor vehicle travel is largely the domain of the adult population with persons aged 15 and over accounting for nearly 90% of total passenger-km. The average person aged 15 or more travelled nearly 17 thousand km in motor vehicles of all kinds an amount much higher than for children. Children under five accounted for only 15 billion passenger-km (3%) and averaged about half the passenger-km per capita at 8,300. Older children aged 5 to 14 represented about 8% of passenger-km and their per capita usage was a little bit higher at 9,300 km.

Table 10: Passenger-km by age of passenger, 10 provinces, 2000

	Passenger-km		Population		Per
	(Bill.)	Share	'000s	Share	capita
Less than five	14.8	3.1	1,777	5.8	8,305
5-14	37.9	8.0	4,094	13.3	9,265
15 or more	422.4	88.9	24,879	80.9	16,978
Total	475.1	100.0	30,750	100.0	15,450

Seasonality

The seasonal pattern of vehicle use is depicted in Table 11 which tabulates data by quarter. Light vehicle activity peaked in the third quarter with over 76 billion vehicle-km (27%) and 135 billion passenger-km (28.5%) taking place during the summer. The slowest quarter was in the winter or 1st quarter with 22% of the activity. The table also shows that light vehicle occupancy was highest during the summer at 1.76 persons per vehicle, consistent with the busy intercity summer travel season. Truck activity by quarter depended on the type of vehicle. For medium trucks, the busiest season was the summer which accounted for nearly 30% of vehicle-km. Heavy trucks, in contrast, experienced their busiest period during the 1st quarter with 28% of vehicle-km being performed in the winter. The slowest period was the summer, quarter 3. Bus activity was highest during the second quarter with nearly 30% of vehicle-km and 32% of passenger-km taking place in the spring. The weakest quarter was the summer. Bus occupancies were highest in quarters 1 and 2 and lowest in the summer. This observed pattern is consistent with the sizeable school bus component in the data.

Table 11: Vehicle use by quarter, 10 provinces, 2000

	Light vehicles			Truck vehicle-km		Buses			All vehicles		
	Vehicle-km	Pass.-km	Persons/vehicle	Medium truck	Heavy truck	Vehicle-km	Pass.-km	Persons/vehicle	Vehicle-km	Pass.-km	Persons/vehicle
Quarter 1	62.4	100.8	1.62	1.1	5.8	0.5	9.0	17.24	69.8	109.8	1.57
Quarter 2	71.9	121.9	1.70	1.5	5.2	0.6	9.6	17.24	79.2	131.6	1.66
Quarter 3	76.6	135.2	1.76	1.8	4.7	0.3	4.1	12.33	83.4	139.2	1.67
Quarter 4	71.1	117.2	1.65	1.6	5.0	0.5	7.1	14.76	78.2	124.3	1.59
Annual	282.0	475.1	1.68	5.9	20.7	1.9	29.8	15.75	310.5	504.9	1.63
Percentage distribution/ratio of quarterly value to annual value											
Quarter 1	22.1	21.2	-4.1	18.6	28.0	27.5	30.1	9.5	22.5	21.7	-3.3
Quarter 2	25.5	25.7	0.7	25.0	25.2	29.6	32.4	9.5	25.5	26.1	2.2
Quarter 3	27.2	28.5	4.8	29.9	22.7	17.4	13.6	-21.7	26.9	27.6	2.7
Quarter 4	25.2	24.7	-2.2	26.5	24.1	25.6	23.9	-6.3	25.2	24.6	-2.2
Total	100.0	100.0		100.0	100.0	100.0	100.0		100.0	100.0	

Use by day of the week

Table 12 provides estimates of vehicle-km by day of the week, broken down by vehicle weight class. Light vehicle use was distributed very evenly over the days of the week but did exhibit some peaking on Thursday and Friday with each day responsible for over 15% of vehicle-km. Light vehicles were used the least on Sunday at only 12.5%. Buses, with the heavy representation by urban transit and school buses, displayed a strong weekday pattern with only a little over 10% of activity accounted for on weekends. The same strong weekday pattern was witnessed among medium and heavy trucks as well. In 2000, the busiest day of the week for trucks was Tuesday and the least-busy days were Saturday and Sunday.

Table 12: Vehicle use by day of the week, 10 provinces, 2000

	Light vehicle		Medium truck		Heavy truck		Buses		Total	
	(Bill.)	Share	(Bill.)	Share	(Bill.)	Share	(Bill.)	Share	(Bill.)	Share
Monday	39.3	13.9	0.9	15.9	3.2	15.4	0.3	16.4	43.7	14.1
Tuesday	40.1	14.3	1.1	19.3	4.0	19.3	0.3	17.8	45.5	14.7
Wednesday	39.6	14.1	1.1	18.3	3.9	18.8	0.4	18.9	44.9	14.5
Thursday	43.3	15.4	1.1	19.0	3.7	18.2	0.3	18.5	48.5	15.7
Friday	45.3	16.1	1.0	16.7	3.2	15.6	0.3	17.6	49.8	16.1
Saturday	38.7	13.7	0.4	6.2	1.3	6.5	0.1	5.5	40.5	13.1
Sunday	35.3	12.5	0.3	4.6	1.3	6.2	0.1	5.2	36.9	11.9
Canada	281.4	100.0	5.9	100.0	20.6	100.0	1.9	100.0	309.8	100.0

Vehicle use by time of day

Table 13 tabulates vehicle-km by time of day and by vehicle weight class. Overall, about three-quarters of all travel took place during daylight hours with the afternoon period from noon until 8pm the most heavily used with about 45% of the total activity. Truck activity was heavily concentrated during the day with about 85% of the total taking place at this time. The least heavily used period was, not surprisingly, the early morning period from midnight to 6am with only 4% of total v-km, although heavy trucks were over-represented with almost 20% of total activity during this period.

Table 13: Vehicle use by time of day, 10 provinces, 2000

	Light vehicle		Medium truck		Heavy truck		Buses		Total	
	(Bill.)	Share	(Bill.)	Share	(Bill.)	Share	(Bill.)	Share	(Bill.)	Share
0-5:59	9.2	3.3	0.3	4.6	2.3	11.1	0.1	3.9	11.8	3.8
6:00-11:59	87.4	31.0	2.5	42.7	7.3	35.5	0.8	43.1	98.0	31.6
12:00-17:59	127.7	45.4	2.6	43.7	7.4	36.1	0.8	42.6	138.5	44.7
18:00-23:59	57.2	20.3	0.5	9.0	3.6	17.3	0.2	10.4	61.5	19.8
Total	281.4	100.0	5.9	100.0	20.6	100.0	1.9	100.0	309.8	100.0

Trip length

The distribution of vehicle-km by trip length is shown in Table 14. Approximately, 75% of total vehicle use had a trip length of at least 25km with trips over 80km in one-way length accounting for the highest share at 42%. Heavy truck activity was overwhelmingly in the long-haul market with 90% of use having trip lengths at least 80 km. Medium trucks were less heavily concentrated at the top end with about two-thirds

of their trips 80 km+ but 90% at least 25km. Buses were surprisingly long-haul in orientation with over 90% of use having trip lengths of at least 25km.

Table 14: Vehicle-km by trip length, 10 provinces, 2000

	Light vehicle		Medium truck		Heavy truck		Buses		Total	
	(Bill.)	Share	(Bill.)	Share	(Bill.)	Share	(Bill.)	Share	(Bill.)	Share
0-4km	7.2	2.6	0.0	0.7	0.0	0.1	0.0	0.1	7.3	2.3
5-24km	73.4	26.1	0.5	8.5	0.4	1.9	0.1	5.5	74.4	24.0
25-79km	94.5	33.6	1.5	25.7	1.6	7.6	0.6	33.6	98.2	31.7
80+km	106.4	37.8	3.8	65.1	18.6	90.4	1.1	60.9	130.0	42.0
Total	281.4	100.0	5.9	100.0	20.6	100.0	1.9	100.0	309.8	100.0

Trip purpose for light vehicles

Table 15 analyses light vehicle activity by trip purpose. Trips to or from work or school accounted for 22% of vehicle-km but only 16% of passenger-km. Shopping trips represented over one-quarter of the activity while recreational or social purposes made up about 20% of vehicle-km and 23% of passenger-km. Other, non-specified, purposes made up another fifth of vehicle-km and one-quarter of the passenger-km. Use of light vehicles for work purposes accounted for 11.5% of vehicle-km and 8% of passenger-km. On balance, recreational/social trips, which have a large intercity travel component, had the highest vehicle occupancies at about 2 persons per vehicle, while the lowest occupancies were for work/school trips at only 1.3 persons per vehicle.

Table 15: Light vehicle activity by trip purpose, 2000

	Vehicle-km		Passenger-km		Persons/
To or from	(bill.)	Share	(bill.)	Share	vehicle
Work/school	61.0	21.7	76.9	16.2	1.26
Shopping/errands	73.1	26.0	126.8	26.7	1.73
Recreational/social	54.9	19.5	111.0	23.4	2.02
Other destination	59.8	21.3	120.6	25.4	2.02
Pick-up/deliver goods	11.3	4.0	13.0	2.7	1.15
Service call	9.1	3.2	10.9	2.3	1.19
Other work purpose	12.1	4.3	15.8	3.3	1.30
Total	281.4	100.0	475.1	100.0	1.69

Note: the category "To go home" has been allocated to the other destinations in proportion to the other destinations' shares of vehicle and passenger-km to better represent trip purpose.

Trip purpose for heavy vehicles

Table 16 provides estimates of heavy truck vehicle-km by purpose. Heavy trucks were used primarily for hauling goods or equipment with approximately three-quarters of the vehicle-km accounted for by this activity. Nearly 14% of heavy truck vehicle-km involved pulling an empty trailer. About 6% of heavy truck activity also involved a non-work purpose. By contrast, medium trucks were used quite a bit more for non-work purposes. In 2000, over one-quarter of medium truck vehicle-km were for non-work purposes. Approximately one-half of the medium truck activity involved hauling goods

and equipment with empty hauls accounting for 6% of vehicle-km. Nearly 12% of vehicle-km took place going to or from service calls.

Table 16: Truck vehicle-km by trip purpose, 10 provinces, 2000

	Medium trucks		Heavy trucks	
	(bill.)	Share	(bill.)	Share
To/from a service call	0.7	11.6	0.7	3.6
Carrying goods/equipment	3.0	50.0	15.5	75.2
Empty	0.3	5.8	2.8	13.6
Other work purpose	0.3	5.5	0.3	1.3
Non-work purpose	1.6	27.1	1.3	6.3
Total	5.9	100.0	20.6	100.0

Conclusion

The Canadian Vehicle Survey has documented some interesting facts concerning the composition and use of the motor vehicle fleet, information that was unknown and only subject to conjecture before. For the first time, credible estimates of the size of fleet and its distribution by vehicle type, along with distance driven and characteristics of trip making are now available. Some areas deserve special notice:

1. the number of light trucks and vans is truly astounding, over 35% of the entire fleet and 37% of the light vehicle fleet. These vehicles were driven intensively as well accounting for 36% of the total vehicle-km and averaging more kilometres per vehicle than passenger cars. Although traditionally used for business purposes only, light trucks and vans have become substitutes for household's primary vehicles. This of course has implications for fuel consumption since the fuel efficiencies of these vehicles was over 25% higher than for passenger cars (13 l/100 km versus 10.2 l/100 km).
2. the enormous difference in driving between men and women is also remarkable. Other than the group under 25 years of age, driving is dominated by males with about 2.5 times more vehicle-km per capita than females.
3. the use of medium and heavy trucks is also notable. In 2000 there were over 575 thousand trucks and these were used the most intensively of all vehicle types, averaging 18.6 thousand km annually for medium trucks and over 80 thousand km annually for heavy trucks. About one-half of the heavy truck fleet was under six years of age the, highest of all vehicle types and indicative of the demand for trucking that has arisen since North American trade liberalisation of the 1990s.

Overall, the survey results seem reasonable with very few surprises or apparent anomalies. The level of motorisation (vehicles per capita), the average distance driven, fuel efficiency, provincial/territorial distribution, age distribution, temporal distribution and trip purpose all appear to be reasonable. The only variable that is a bit puzzling is the trip length distributions which appear to be overly long-distance. At any rate, the initial results from the survey are very promising and should mean that the CVS will become an important tool in the analysis of road transport issues.