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Results of the Annual Motor Carriers of Freight Survey of small for-hire carriers and owner operators, 2002

Highlights

The average operating revenue of for-hire carriers with less than \$1 million in revenue fell almost 3% to \$258,000 in 2002. A sharp jump in the average expenditure on purchased transport (+31%) and a moderate rise in salaries and wages (+6%) resulted in a 1% increase in average operating expenses to \$254,000.

In contrast, owner operators experienced healthy revenue growth (+9%) as average operating revenue reached \$200,000. However, a 33% increase in purchased transport expenses and a 16% rise in salaries and wages drove average operating expenses up 13% to \$187,000.

Small for-hire carriers earned most of their revenue from hauling general freight (32%), other specialized freight (23%) and dry bulk materials (21%). Owner operators reported a similar pattern. These three commodity groups typically account for about three-quarters of revenue for both types of carriers.

Long distance hauls provided owner operators with 54% of their revenue in 2002, a share that has slipped somewhat in recent years. In contrast, small for-hire carriers derived 45% of their revenue from long distance hauls.

In terms of origin and destination, owner operators earned 34% of their revenue from trips that involved crossing either international or inter-provincial boundaries. Only 23% of the revenue of small for-hire carriers came from these kinds of trips.

Small for-hire carriers reported an average of five employees, including owner operators. In addition, they operated one straight truck, two road tractors and three semi-trailers. The average owner operator firm had two employees, the owner operator plus one other person, and operated one road tractor and one semi-trailer.

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Annual Motor Carriers of Freight Survey of small for-hire carriers and owner operators: Financial and operating statistics, 2002

The Annual Motor Carriers of Freight Survey (AMCFS) provides information on the structure and performance of two distinct groups of carriers located in Canada: small for-hire carriers and owner operators.

Small for-hire carriers are carriers with annual operating revenues between \$30,000 and \$1 million. Combined with AMCFS data on medium and large carriers with revenues of \$1 million or more, this information helps to provide a more complete picture of the for-hire trucking industry.

Owner operators are independent operators who provide transport services under contract to for-hire carriers, private carriers, or both.¹ While most owner operators are small businesses, the data in this publication cover all those that generated revenues of \$30,000 or more in 2002. Thus, the estimates will likely include some owner operators who generated revenues of \$1 million or more in 2002.

The financial estimates for the survey (revenue and expense data) are based on administrative files from the Tax Estimates Program. The other types of data (on activities, territory served, employment, equipment, fuel and distance) are collected through computer-assisted telephone interviews.

The publication is in three parts: section 1 contains results for small for-hire carriers, section 2 for owner operators, and section 3 contains a general review of the quality of data used in the survey.

Data limitations

Users are advised that financial data used in this article were taken from administrative records (tax files), which were not collected for statistical purposes. The financial data are compiled by Statistics Canada from a sample of Canada Revenue Agency T1 records of unincorporated firms' tax files and T2 records of incorporated firms' tax files.

Furthermore, operating ratios are not presented because they could be misinterpreted. Unincorporated businesses do not report labour costs in the same manner as incorporated ones on their tax returns. This is because working owners obtain their remuneration from profits, and they do not appear as expenses in the same way as salaries and wages do for incorporated companies. Also, fuel costs may have been reported under more than one expense category or may not be obtainable from the source of tax data. The result is an underestimation of total expenses, which would distort any calculated operating ratio.

1. A **private carrier** is one for which trucking is not the main activity, but which owns or leases vehicles for the primary purpose of hauling its own goods. Private trucking is not part of the for-hire trucking industry. Note that, following persistent problems with data quality, the private carrier trucking survey was discontinued after reference year 1998. Since that date, therefore, it has no longer been possible to obtain data on this segment of the trucking industry.

Section 1 Small for-hire carriers

Sector size and financial results

A total of 44,750 firms were active in the truck transportation industry in 2002. In addition to the 35,100 firms that identified themselves as owner operators, there were 6,150 small for-hire carriers, those with less than \$1 million in revenue, and another 3,500 for-hire carriers above that threshold.

Small for-hire carriers generated total revenue of \$1.6 billion, only a fraction (6%) of the revenue generated by the industry – for-hire carriers with revenue of \$1 million or more accounted for 67% of industry revenue while owner operators had a 27% share.

The average operating revenue of for-hire carriers with less than \$1 million in revenue fell almost 3% to \$258,000 in 2002. A sharp jump in the average expenditure on purchased transport (+31%) and a moderate rise in salaries and wages (+6%) resulted in a 1% increase in average operating expenses to \$254,000.

Table 1 Summary statistics by size, for-hire carriers, 2002

		Small carriers (\$30,000 to \$999,999) ⁵	Medium & large carriers (\$1 million to \$24.9 million) ⁶	Top carriers (\$25 million and over)	Total
Estimated number reporting	No.	6,150	3,449	83	9,682
Operating revenues	\$'000,000	1,586	15,158	6,859	23,602
Operating expenses¹	\$'000,000	1,563	14,206	6,437	22,206
Salaries and wages ²	\$'000,000	383	3,863	1,667	5,912
Fuel	\$'000,000	314	1,738	511	2,562
Owner operator expenses	\$'000,000	61	2,844	1,839	4,743
Purchased transport ³	\$'000,000	234	1,607	969	2,810
Maintenance	\$'000,000	134	978	342	1,454
Depreciation	\$'000,000	164	897	288	1,349
Other expenses ⁴	\$'000,000	273	2,281	822	3,376
Operating ratio		...	0.94	0.94	...
Number of employees	No.	23,836	89,028	34,219	147,083
Equipment operated					
Straight trucks	No.	4,151	9,833	1,173	15,157
Road tractors	No.	12,933	47,040	14,923	74,896

1. Totals may not add due to rounding.

2. Includes employee benefits.

3. Includes driver services, vehicle lease or rent, total purchased transportation and load broker services.

4. Includes terminal expenses and other operating expenses (insurance, administration, etc.).

5. See methodology for 2002 in Section 3.

6. Includes carriers from the Annual Survey of Small For-hire Carriers and Owner Operators with annual operating revenues greater than \$1 million.

Note: Data for top, medium and large carriers are collected from the Quarterly Motor Carriers of Freight Survey while the small carriers data are from the Annual Survey of Small For-hire Carriers and Owner Operators.

Activities

Small for-hire carriers earned most of their revenue in 2002 from hauling general freight (32%), other specialized freight (23%) and dry bulk materials (21%). These three commodity groups typically account for about three-quarters of revenue. Small for-hire carriers were also more active in local transportation, as they generated 55% of their revenue from shorter trips as opposed to long distance hauls.

In 2002, small for-hire carriers earned 77% of their revenue from trips that were completed entirely within their own province or territory. Only 12% of revenue was earned from inter-provincial trips and 11% from international trips.

Table 2 Summary statistics by type of activity, small for-hire carriers, 2002

		Total ¹	General freight	Household	Bulk liquids	Dry bulk materials	Forest products	Other commodities
Estimated number reporting	No.	6,149	1,735	320	441	1,157	618	1,878
Operating revenues	\$'000	1,585,547	511,925	74,835	128,544	330,255	182,612	357,376
Operating expenses	\$'000	1,562,630	493,273	69,791	122,445	339,176	180,343	357,602
Salaries and wages	\$'000	374,891	108,870	26,869	29,788	76,033	45,852	87,479
Benefits	\$'000	7,710	2,013	744	534	1,963	720	1,736
Fuel	\$'000	313,914	85,566	12,321	27,165	76,400	32,376	80,086
Owner operator expenses	\$'000	61,034	38,135	748	4,131	4,612	3,456	9,952
Purchased transport	\$'000	233,702	67,291	3,968	15,181	62,956	21,884	62,422
Maintenance	\$'000	134,027	38,716	4,523	10,572	31,956	27,251	21,009
Depreciation	\$'000	164,041	54,803	2,810	11,935	35,546	24,380	34,567
Insurance	\$'000	59,259	18,771	2,311	3,420	11,375	8,295	15,087
Rent	\$'000	53,060	20,531	3,356	3,902	10,790	3,680	10,801
Other expenses	\$'000	160,992	58,576	12,143	15,817	27,544	12,449	34,463
Number of full time employees	No.	18,913	5,195	1,159	1,495	3,776	1,656	5,632
Equipment operated	No.	34,697	12,376	1,232	2,467	6,533	3,443	8,646
Straight trucks	No.	4,151	793	568	462	865	250	1,213
Distance travelled	'000 km	243,410	52,320	33,533	18,153	41,761	11,565	86,078
Average distance	'000 km	59	66	59	39	48	46	71
Road tractors	No.	12,933	4,260	214	896	2,587	1,617	3,359
Distance travelled	'000 km	1,368,771	464,380	17,195	92,186	241,068	173,592	380,350
Average distance	'000 km	106	109	80	103	93	107	113
Semi-trailers	No.	15,117	5,901	408	1,068	2,459	1,531	3,750
Other	No.	2,496	1,422	41	41	622	46	324
Total distance	'000 km	1,612,181	516,699	50,728	110,339	282,829	185,158	466,428
Fuel consumed	'000 L	695,305	221,173	12,662	38,828	136,595	68,260	217,787

1. Some totals may not add due to rounding.

Table 3A Summary statistics by type of activity, local transport¹, small for-hire carriers, 2002

Local carriers		Total ²	General freight	Bulk liquids	Dry bulk materials	Forest products	Other commodities
Estimated number reporting	No.	3,010	867	200	936	336	671
Operating revenues	\$ '000	834,277	204,914	79,378	268,529	106,639	174,817
Operating expenses	\$ '000	840,997	204,428	75,892	280,666	108,028	171,983
Salaries and wages	\$ '000	208,123	55,415	19,379	63,058	27,798	42,473
Benefits	\$ '000	4,482	938	431	1,352	653	1,108
Fuel	\$ '000	160,239	33,427	17,182	61,375	18,626	29,629
Owner operator expenses	\$ '000	15,986	5,934	84	4,249	2,248	3,471
Purchased transport	\$ '000	145,536	31,347	11,177	55,910	13,880	33,222
Maintenance	\$ '000	74,822	13,402	6,464	26,562	15,812	12,582
Depreciation	\$ '000	90,114	20,216	7,570	28,772	15,003	18,553
Insurance	\$ '000	30,542	7,115	2,405	8,808	4,508	7,706
Rent	\$ '000	32,419	9,998	3,107	8,800	2,354	8,160
Other expenses	\$ '000	78,733	26,635	8,094	21,780	7,145	15,079
Number of full time employees	No.	9,391	2,452	796	3,085	979	2,079
Equipment operated	No.	17,456	4,622	1,126	5,361	2,502	3,845
Straight trucks	No.	2,652	658	418	843	204	529
Distance travelled	'000 km	142,452	43,728	13,830	40,407	8,426	36,061
Average distance	'000 km	54	66	33	48	41	68
Road tractors	No.	6,802	1,886	306	1,913	1,229	1,468
Distance travelled	'000 km	607,846	179,036	20,222	157,477	96,285	154,826
Average distance	'000 km	89	95	66	82	78	105
Semi-trailers	No.	6,994	1,938	362	2,004	1,044	1,646
Other	No.	1,005	139	41	600	24	201
Total distance	'000 km	750,298	222,764	34,052	197,884	104,711	190,887
Fuel consumed	'000 L	334,500	88,457	19,446	105,674	46,698	74,225

1. Excludes household goods movers.

2. Some totals may not add due to rounding.

Table 3-B Summary statistics by type of activity, long-distance transport¹, small for-hire carriers, 2002

Long distance carriers		Total ²	General	Bulk	Dry bulk	Forest	Other
			freight	liquids	materials	products	commodities
Estimated number reporting	No.	2,821	868	241	222	283	1,207
Operating revenues	\$'000	676,435	307,011	49,166	61,726	75,973	182,559
Operating expenses	\$'000	651,841	288,845	46,552	58,510	72,315	185,619
Salaries and wages	\$'000	139,899	53,455	10,409	12,975	18,054	45,006
Benefits	\$'000	2,484	1,075	103	611	67	628
Fuel	\$'000	141,354	52,139	9,983	15,024	13,750	50,458
Owner operator expenses	\$'000	44,299	32,201	4,047	363	1,208	6,480
Purchased transport	\$'000	84,199	35,944	4,004	7,046	8,004	29,201
Maintenance	\$'000	54,682	25,314	4,108	5,394	11,439	8,427
Depreciation	\$'000	71,117	34,587	4,366	6,774	9,376	16,014
Insurance	\$'000	26,408	11,656	1,016	2,568	3,787	7,381
Rent	\$'000	17,284	10,533	795	1,990	1,326	2,640
Other expenses	\$'000	70,115	31,941	7,722	5,764	5,304	19,384
Number of full time employees	No.	8,365	2,743	699	692	677	3,554
Equipment operated	No.	16,011	7,754	1,341	1,173	942	4,801
Straight trucks	No.	930	134	45	22	45	684
Distance travelled	'000 km	67,426	8,592	4,323	1,354	3,140	50,017
Average distance	'000 km	73	64	96	62	70	73
Road tractors	No.	5,917	2,373	590	675	388	1,891
Distance travelled	'000 km	743,732	285,344	71,965	83,591	77,308	225,524
Average distance	'000 km	126	120	122	124	199	119
Semi-trailers	No.	7,713	3,963	706	454	486	2,104
Other	No.	1,450	1,283	0	22	23	122
Total distance	'000 km	811,157	293,935	76,288	84,945	80,447	275,542
Fuel consumed	'000 L	348,144	132,717	19,382	30,921	21,562	143,562

1. Excludes household goods movers.

2. Some totals may not add due to rounding.

Table 4 Summary statistics by type of movement, small for-hire carriers, 2002

		Extra-provincial carriers						
		Intra-provincial carriers	International					
			Total ¹	Intra-provincial	Inter-provincial	Sub total ¹	Into Canada	Out of Canada
Estimated number of carriers	No.	3,166	2,984	...	...	...	...	...
Operating revenues	\$'000	820,308	765,239	393,751	190,105	181,383	72,846	108,537
Operating expenses	\$'000	833,282	729,348	377,949	178,987	172,412	68,691	103,721
Transportation expenses	\$'000	649,733	550,910	287,429	137,119	126,362	51,491	74,871
Maintenance and garage expenses	\$'000	67,809	66,217	34,313	14,035	17,869	5,999	11,870
Administrative, general office expenses	\$'000	115,740	112,221	56,207	27,833	28,181	11,201	16,980
Number of full time employees	No.	9,877	9,037	...	...	...	...	...
Salaries and wages	\$'000	211,245	163,646	...	...	...	...	...
Equipment operated	No.	17,233	17,464	...	...	...	...	...
Straight trucks	No.	3,363	788	...	...	...	...	...
Road tractors	No.	5,533	7,400	...	...	...	...	...
Semi-trailers	No.	6,619	8,498	...	...	...	...	...
Other	No.	1,717	779	...	...	...	...	...

1. Total may not add due to rounding.

Geographic distribution

Quebec accounted for both the largest number of small for-hire carriers and the largest share of reported revenue (30%) in 2002. In terms of revenue shares, Quebec was followed by Ontario (26%), Alberta (15%) and British Columbia (13%).

Table 5 Summary statistics by province or territory of domicile, small for-hire carriers, 2002

		Canada	Newfoundland and Labrador	Prince Edward Island	Nova Scotia
Estimated number reporting	No.	6,150	24	18	280
Operating revenues	\$'000	1,585,548	10,851	7,676	51,013
Operating expenses	\$'000	1,562,630	10,283	7,308	47,159
Salaries and wages	\$'000	374,891	2,696	1,802	10,312
Benefits	\$'000	7,710	62	x	109
Fuel	\$'000	313,914	2,513	1,589	12,562
Owner operator expenses	\$'000	61,034	0	x	4,160
Purchased transport	\$'000	233,702	1,018	773	3,789
Maintenance	\$'000	134,027	1,028	687	3,909
Depreciation	\$'000	164,041	975	806	3,340
Insurance	\$'000	59,260	432	245	1,216
Rent	\$'000	53,060	386	x	994
Other expenses	\$'000	160,992	1,173	1,147	6,768
Number of full time employees	No.	18,914	143	58	618

		New Brunswick	Quebec	Ontario	Manitoba
Estimated number reporting	No.	105	2,420	1,307	370
Operating revenues	\$'000	33,609	482,998	418,070	64,576
Operating expenses	\$'000	31,938	450,284	413,063	58,789
Salaries and wages	\$'000	8,002	106,405	97,463	13,652
Benefits	\$'000	75	2,252	2,188	184
Fuel	\$'000	7,530	92,974	69,598	12,603
Owner operator expenses	\$'000	615	4,421	37,361	2,391
Purchased transport	\$'000	2,530	59,085	69,385	9,527
Maintenance	\$'000	4,126	41,055	29,659	5,438
Depreciation	\$'000	4,069	50,767	42,527	4,863
Insurance	\$'000	1,303	18,212	16,153	1,949
Rent	\$'000	480	16,012	17,716	2,240
Other expenses	\$'000	3,209	59,101	31,013	5,941
Number of full time employees	No.	467	5,526	5,244	1,191

		Saskatchewan	Alberta	British Columbia	Territories
Estimated number reporting	No.	214	690	715	5
Operating revenues	\$'000	70,820	230,401	213,411	2,121
Operating expenses	\$'000	68,143	237,651	236,073	1,939
Salaries and wages	\$'000	18,707	54,682	60,653	519
Benefits	\$'000	558	1,046	1,218	x
Fuel	\$'000	13,946	41,159	58,974	466
Owner operator expenses	\$'000	237	5,117	6,601	x
Purchased transport	\$'000	9,048	47,289	31,181	80
Maintenance	\$'000	8,273	20,538	19,177	136
Depreciation	\$'000	5,422	27,038	24,031	202
Insurance	\$'000	2,569	9,499	7,580	101
Rent	\$'000	3,703	5,573	5,778	x
Other expenses	\$'000	5,681	25,710	20,879	369
Number of full time employees	No.	714	2,469	2,475	10

Note: Some totals may not add due to rounding.

Employment

Small for-hire carriers employed a work force of almost 28,000 people in 2002, including 24,000 salaried employees and 4,000 owner operators. Drivers, including owner operators, comprised 71% of all employees. Most employees (79%) were employed full-time.

Table 6 Number of employees by type and by province or territory of domicile, small for-hire carriers, 2002

	Canada	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec
Estimated number reporting	6,150	24	18	280	105	2,420
Employees:						
Drivers						
Full time	13,464	109	x	547	336	3,936
Part time	2,386	34	x	36	76	652
Other employees						
Full time	5,450	33	x	71	130	1,590
Part time	2,536	12	x	6	46	535
Total - drivers & other employees						
Full time	18,914	143	58	618	467	5,526
Part time	4,922	46	22	42	122	1,186
Total - owner operators						
Full time	3,144	10	x	35	34	460
Part time	948	x	x	60	15	256
	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Territories
Estimated number reporting	1,307	370	214	690	715	5
Employees:						
Drivers						
Full time	3,470	829	562	1,800	1,822	x
Part time	298	154	194	335	589	x
Other employees						
Full time	1,774	362	152	668	653	x
Part time	635	331	118	538	303	x
Total - drivers & other employees						
Full time	5,244	1,191	714	2,469	2,475	10
Part time	933	485	312	872	892	9
Total - owner operators						
Full time	1,104	67	77	595	755	x
Part time	278	x	20	90	196	x

Note: Some totals may not add due to rounding.

Equipment

Small for-hire carriers operated 35,000 pieces of equipment in 2002, including 15,000 semi-trailers, 13,000 road tractors and 4,000 straight trucks. Owner operators working for these firms operated an additional 5,000 road tractors and semi-trailers. Road tractors were driven an average of 104,000 kilometres during the year, while straight trucks travelled an average of 59,000 kilometres.

Fuel expenses in 2002 totalled \$405 million at an average price of 58 cents per litre, down slightly from the year-earlier average of 59 cents per litre. The average fuel cost per litre ranged from a low of 56 cents in Manitoba and Alberta to a high of 63 cents in the Territories.

Table 7 Equipment operated by province or territory of domicile, small for-hire carriers, 2002

	Straight trucks	Road tractors	Semi- trailers	Other equipment	Total ¹
	Number				
Newfoundland and Labrador					
Owned and leased	23	82	112	27	244
Operated by owner operator	0	0	0	0	0
Prince Edward Island					
Owned and leased	x	x	73	x	127
Operated by owner operator	0	6	6	0	11
Nova Scotia					
Owned and leased	x	488	564	x	1,149
Operated by owner operator	0	56	28	0	84
New Brunswick					
Owned and leased	114	402	403	8	927
Operated by owner operator	0	x	x	0	58
Quebec					
Owned and leased	1,645	3,309	4,108	739	9,802
Operated by owner operator	0	329	236	0	565
Ontario					
Owned and leased	864	3,263	3,975	1,305	9,407
Operated by owner operator	349	1,443	1,242	45	3,079
Manitoba					
Owned and leased	169	1,066	1,273	44	2,552
Operated by owner operator	x	30	x	0	53
Saskatchewan					
Owned and leased	145	513	514	68	1,240
Operated by owner operator	0	x	x	0	6
Alberta					
Owned and leased	502	1,754	2,197	159	4,612
Operated by owner operator	0	247	167	0	415
British Columbia					
Owned and leased	609	1,997	1,886	121	4,612
Operated by owner operator	x	1,053	x	0	1,279
Territories					
Owned and leased	x	x	11	0	24
Operated by owner operator	0	26	26	0	52
Canada					
Owned and leased	4,151	12,933	15,117	2,496	34,697
Operated by owner operator	391	3,228	1,936	45	5,600

1. Some totals may not add due to rounding.

Table 8 Estimated annual distance travelled by type of vehicle and by province or territory of domicile, small for-hire carriers, 2002

	Total distance	Straight trucks			Road tractors		
		Total ¹	Owned and leased	Operated by owner operator	Total ¹	Owned and leased	Operated by owner operator
		'000 km					
Newfoundland and Labrador	13,371	1,359	1,359	0	12,012	12,012	0
Prince Edward Island	6,997	x	x	x	x	x	x
Nova Scotia	46,557	6,565	6,565	0	39,993	39,993	0
New Brunswick	42,786	5,767	5,767	0	37,019	32,960	4,059
Quebec	491,139	91,774	91,774	0	399,365	346,751	52,614
Ontario	394,093	79,809	59,676	20,133	314,284	280,481	33,803
Manitoba	103,663	5,000	x	x	98,663	93,550	5,113
Saskatchewan	81,614	4,511	4,511	0	77,103	x	x
Alberta	264,757	27,687	27,687	0	237,071	207,711	29,360
British Columbia	490,761	43,485	x	x	447,276	276,068	171,208
Territories	4,691	x	x	x	x	x	x
Canada	1,940,429	266,175	243,410	22,765	1,674,254	1,368,771	305,483

1. Some totals may not add due to rounding.

Table 9 Fuel consumption and cost by province or territory of domicile, small for-hire carriers, 2002

	Estimated number reporting	Fuel consumed	Total cost	Average cost per litre
	No.	Litres	\$	\$
Newfoundland and Labrador	24	3,957,446	2,433,128	0.61
Prince Edward Island	18	2,903,805	1,675,476	0.58
Nova Scotia	280	14,294,907	8,477,216	0.59
New Brunswick	105	15,503,687	9,316,902	0.60
Quebec	2,420	210,632,183	124,283,201	0.59
Ontario	1,307	176,232,187	102,414,600	0.58
Manitoba	370	63,812,391	35,728,548	0.56
Saskatchewan	214	24,110,752	14,045,744	0.58
Alberta	690	86,275,007	48,512,114	0.56
British Columbia	715	97,047,270	57,639,967	0.59
Territories	5	535,848	339,595	0.63
Canada	6,150	695,305,483	404,866,491	0.58

Note: Some totals may not add due to rounding.

Section 2 Owner operators

Sector size and financial results

The 35,100 firms that identified themselves as owner operators represented 78% of all firms active in the truck transportation industry in 2002. These firms generated \$7.0 billion in total operating revenue, which represented 27% of the industry total. Three quarters of owner operators worked exclusively for for-hire carriers, 22% worked only for private carriers while the remainder worked for both.

Owner operators experienced healthy revenue growth (+9%) in 2002 as average operating revenue reached \$200,000. However, a 33% increase in purchased transport expenses and a 16% rise in salaries and wages drove average operating expenses up 13% to \$187,000.

Only a small share (1%) of owner operators reported total operating revenue of \$1 million or more in 2002. Despite their small numbers, these firms accounted for 15% of the total revenue reported by owner operators.

Table 10 Distribution of owner operators by carrier types and by region of domicile, owner operators, 2002

	Number of owner operator working for			Total ¹
	For-hire carriers	Private carriers	Both	
Atlantic	2,306	x	x	2,527
Quebec	6,013	1,061	146	7,220
Ontario	8,176	3,165	246	11,587
Prairies	6,769	1,830	296	8,895
British Columbia	3,181	1,332	303	4,816
Territories	35	x	x	41
Canada	26,480	7,535	1,071	35,086

1. Some totals may not add due to rounding.

Table 11 Summary statistics, owner operators, 1999 to 2002

		2002	2001	2000	1999
Estimated number reporting	No.	35,085	35,931	35,979	37,196
Operating revenues	\$'000	7,023,352	6,598,667	6,329,018	5,896,757
Operating expenses	\$'000	6,566,395	5,935,630	5,709,523	5,074,337
Salaries and wages	\$'000	1,511,473	1,339,347	1,171,309	1,117,913
Benefits	\$'000	32,455	22,420	20,526	20,957
Fuel	\$'000	1,595,854	1,539,092	1,661,371	1,188,111
Owner operator expenses	\$'000	0	0	0	0
Purchased transport	\$'000	744,175	571,852	499,409	274,178
Maintenance	\$'000	618,103	601,029	522,049	436,904
Depreciation	\$'000	789,964	769,132	768,629	671,622
Insurance	\$'000	248,801	217,338	186,451	196,305
Rent	\$'000	246,777	172,929	171,084	165,432
Other expenses	\$'000	778,792	702,491	708,696	1,002,916
Number of full time employees¹	No.	62,400	60,799	58,990	60,488
Equipment operated	No.	90,048	83,744	85,118	89,495

1. Working owner included.

Note: Some totals may not add due to rounding.

Table 12 Summary statistics by size, owner operators, 2002

		Total ¹	Small enterprises	Medium and large
			(\$30,000 to \$999,999)	enterprises (\$1 million and over)
Estimated number reporting	No.	35,085	34,629	456
Operating revenues	\$'000	7,023,352	5,951,709	1,071,643
Operating expenses	\$'000	6,566,395	5,494,561	1,071,834
Salaries and wages ²	\$'000	1,543,928	1,329,032	214,896
Fuel	\$'000	1,595,854	1,476,249	119,605
Purchased transport ³	\$'000	990,952	556,776	434,177
Maintenance	\$'000	618,103	572,007	46,096
Depreciation	\$'000	789,964	666,224	123,739
Other expenses ⁴	\$'000	1,027,593	894,272	133,320
Number of employees⁵	No.	78,783	73,838	4,945
Equipment operated				
Straight trucks	No.	13,896	13,252	644
Road tractors	No.	40,747	37,875	2,873

1. Totals may not add due to rounding.

2. Includes employee benefits.

3. Includes driver services, vehicle lease or rent, total purchased transportation and load broker services.

4. Includes terminal and insurance expenses.

5. Working owners, full and part time employees are included.

Activities

Owner operators earned most of their revenue from hauling general freight (35%), other specialized freight (24%) and dry bulk materials (18%). These three commodity groups typically account for about three-quarters of revenue. Long distance hauls provided owner operators with 54% of their revenue in 2002, a share that has slipped somewhat in recent years.

In 2002, owner operators earned 66% of their revenue from trips that were completed entirely within their own province or territory. A further 22% of revenue was earned from international trips and 12% from inter-provincial trips.

Table 13 Summary statistics by type of activity, owner operators, 2002

		Total ¹	General	Household	Bulk liquids	Dry bulk	Forest products	Other com-
			freight			materials		modities
Estimated number reporting	No.	35,085	13,053	553	1,964	7,247	4,006	8,262
Operating revenues	\$'000	7,023,351	2,473,254	136,990	554,838	1,249,153	909,166	1,699,950
Operating expenses	\$'000	6,566,395	2,304,302	130,465	502,707	1,152,934	875,355	1,600,632
Salaries and wages	\$'000	1,511,474	521,020	45,655	138,937	265,201	214,187	326,474
Benefits	\$'000	32,455	10,448	2,516	3,835	3,165	6,615	5,876
Fuel	\$'000	1,595,854	622,072	14,705	101,637	270,892	209,444	377,104
Owner operator expenses	\$'000	0	0	0	0	0	0	0
Purchased transport	\$'000	744,175	197,704	18,525	69,861	141,276	83,579	233,230
Maintenance	\$'000	618,103	207,579	8,505	57,978	115,795	98,920	129,326
Depreciation	\$'000	789,964	254,340	10,268	54,422	150,464	117,528	202,942
Insurance	\$'000	248,802	98,607	3,499	16,142	38,731	26,728	65,095
Rent	\$'000	246,778	99,673	6,382	14,540	36,902	28,839	60,442
Other expenses	\$'000	778,793	292,858	20,412	45,356	130,508	89,515	200,144
Number of full time employees²	No.	62,400	23,313	1,821	4,521	12,141	6,999	13,605
Equipment operated	No.	90,048	30,689	1,828	5,126	21,033	11,246	20,126
Straight trucks	No.	13,896	3,995	944	1,460	5,173	919	1,405
Distance travelled	'000 km	759,365	261,971	23,456	99,264	227,697	57,622	89,355
Average distance	'000 km	55	66	25	68	44	63	64
Road tractors	No.	40,748	15,998	535	2,266	6,009	5,353	10,587
Distance travelled	'000 km	5,083,423	2,126,133	63,841	288,640	625,778	651,098	1,327,933
Average distance	'000 km	125	133	119	127	104	122	125
Semi-trailers	No.	31,527	9,774	349	1,139	8,936	4,056	7,273
Other	No.	3,876	922	0	261	915	918	860
Total distance	'000 km	5,842,787	2,388,105	87,297	387,904	853,475	708,719	1,417,287
Fuel consumed	'000 L	2,541,688	1,067,186	35,162	173,344	369,775	328,059	568,162

1. Some totals may not add due to rounding.

2. Working owner included.

Table 14-A Summary statistics by type of activity, local transport¹, owner operators, 2002

Local carriers		Total ²	General freight	Bulk liquids	Dry bulk materials	Forest products	Other commodities
Estimated number reporting	No.	18,127	5,000	1,335	5,190	1,884	4,718
Operating revenues	\$'000	3,184,743	870,602	365,853	829,036	425,594	693,658
Operating expenses	\$'000	2,910,480	782,089	320,025	760,140	404,634	643,592
Salaries and wages	\$'000	719,038	180,795	96,026	181,666	99,022	161,529
Benefits	\$'000	13,136	4,142	2,436	2,387	1,789	2,382
Fuel	\$'000	694,372	213,069	61,513	164,723	90,858	164,209
Owner operator expenses	\$'000	0	0	0	0	0	0
Purchased transport	\$'000	279,177	55,726	43,283	97,837	25,675	56,656
Maintenance	\$'000	297,849	82,596	36,167	65,425	57,927	55,734
Depreciation	\$'000	355,629	82,220	33,266	111,922	54,816	73,405
Insurance	\$'000	125,612	42,719	11,530	25,188	14,491	31,684
Rent	\$'000	100,981	30,361	8,865	24,248	17,768	19,739
Other expenses	\$'000	324,689	90,463	26,939	86,744	42,289	78,254
Number of full time employees³	No.	30,225	8,475	2,906	8,590	3,215	7,039
Equipment operated	No.	43,926	10,725	3,291	14,742	5,545	9,623
Straight trucks	No.	9,613	1,963	1,312	4,625	540	1,173
Distance travelled	'000 km	509,578	129,203	87,380	191,579	29,905	71,511
Average distance	'000 km	53	66	67	41	55	61
Road tractors	No.	18,406	5,636	1,225	3,567	2,345	5,633
Distance travelled	'000 km	1,660,035	535,113	109,812	294,538	277,163	443,409
Average distance	'000 km	90	95	90	83	118	79
Semi-trailers	No.	13,820	2,460	623	5,865	2,271	2,601
Other	No.	2,088	666	131	685	389	217
Total distance	'000 km	2,169,613	664,316	197,192	486,117	307,068	514,920
Fuel consumed	'000 L	1,041,703	362,141	94,375	216,041	150,655	218,491

1. Excludes household goods movers.

2. Some totals may not add due to rounding.

3. Working owner included.

Table 14-B Summary statistics by type of activity, long-distance transport¹, owner operators, 2002

Long distance carriers		Total ²	General freight	Bulk liquids	Dry bulk materials	Forest products	Other commodities
Estimated number reporting	No.	16,405	8,053	629	2,057	2,122	3,544
Operating revenues	\$'000	3,701,618	1,602,652	188,985	420,116	483,573	1,006,292
Operating expenses	\$'000	3,525,449	1,522,213	182,682	392,793	470,720	957,041
Salaries and wages	\$'000	746,781	340,225	42,911	83,535	115,165	164,945
Benefits	\$'000	16,803	6,306	1,399	778	4,826	3,494
Fuel	\$'000	886,778	409,004	40,124	106,169	118,586	212,895
Owner operator expenses	\$'000	0	0	0	0	0	0
Purchased transport	\$'000	446,474	141,978	26,579	43,439	57,904	176,574
Maintenance	\$'000	311,748	124,983	21,811	50,369	40,993	73,592
Depreciation	\$'000	424,068	172,121	21,156	38,542	62,713	129,536
Insurance	\$'000	119,690	55,888	4,612	13,542	12,237	33,411
Rent	\$'000	139,417	69,313	5,675	12,654	11,072	40,703
Other expenses	\$'000	433,692	202,395	18,417	43,764	47,226	121,890
Number of full time employees³	No.	30,356	14,839	1,615	3,551	3,785	6,566
Equipment operated	No.	40,448	16,119	1,836	6,291	5,700	10,502
Straight trucks	No.	3,342	2,033	149	548	379	233
Distance travelled	'000 km	226,330	132,768	11,884	36,118	27,716	17,844
Average distance	'000 km	68	65	80	66	73	77
Road tractors	No.	21,804	10,362	1,040	2,441	3,007	4,954
Distance travelled	'000 km	3,359,548	1,591,021	178,828	331,240	373,935	884,524
Average distance	'000 km	154	154	172	136	124	179
Semi-trailers	No.	17,358	7,314	516	3,071	1,785	4,672
Other	No.	1,789	255	131	230	529	644
Total distance	'000 km	3,585,878	1,723,790	190,712	367,357	401,652	902,367
Fuel consumed	'000 L	1,464,823	705,045	78,970	153,734	177,404	349,670

1. Excludes household goods movers.

2. Some totals may not add due to rounding.

3. Working owner included.

Table 15 Summary statistics by type of movement, owner operators, 2002

		Intra-provincial carriers	Extra-provincial carriers					
			Total ¹	Intra-provincial	Inter-provincial	International		
						Sub total ¹	Into Canada	Out of Canada
Estimated number of carriers	No.	19,591	15,495	...	...	...	...	...
Operating revenues	\$'000	3,434,009	3,589,343	1,223,950	848,273	1,517,119	679,579	837,541
Operating expenses	\$'000	3,185,773	3,380,623	1,165,045	799,046	1,416,531	630,940	785,592
Transportation expenses	\$'000	2,358,248	2,529,997	884,555	593,083	1,052,359	464,130	588,229
Maintenance and garage expenses	\$'000	313,576	304,526	103,906	75,870	124,750	57,422	67,328
Administrative and general office expenses	\$'000	513,950	546,098	176,584	130,092	239,421	109,388	130,034
Number of full time employees	No.	32,112	30,289	...	...	...	...	...
Salaries and wages	\$'000	826,707	684,767	...	...	...	...	...
Equipment operated	No.	47,656	42,392	...	...	...	...	...
Straight trucks	No.	10,382	3,516	...	...	...	...	...
Road tractors	No.	19,331	21,417	...	...	...	...	...
Semi-trailers	No.	15,464	16,063	...	...	...	...	...
Other	No.	2,479	1,397	...	...	...	...	...

1. Total may not add due to rounding.

Geographic distribution

Ontario accounted for both the largest number of owner operator firms and the largest share of reported revenue (29%) in 2002. In terms of revenue shares, Ontario was followed by Quebec (22%), Alberta (18%) and British Columbia (13%).

Table 16 Summary statistics by province or territory of domicile, owner operators, 2002

		Canada	Newfoundland and Labrador	Prince Edward Island	Nova Scotia
		No.			
Estimated number reporting	No.	35,085	279	198	671
Operating revenues	\$'000	7,023,352	71,719	34,291	149,942
Operating expenses	\$'000	6,566,395	69,426	35,257	135,559
Salaries and wages	\$'000	1,511,473	17,673	7,558	27,783
Benefits	\$'000	32,455	185	x	551
Fuel	\$'000	1,595,854	18,535	9,840	39,107
Owner operator expenses	\$'000	0	0	0	0
Purchased transport	\$'000	744,175	9,176	3,609	17,409
Maintenance	\$'000	618,103	5,221	3,056	11,398
Depreciation	\$'000	789,964	7,097	3,743	16,479
Insurance	\$'000	248,801	2,380	1,316	3,713
Rent	\$'000	246,777	1,614	x	2,414
Other expenses	\$'000	778,792	7,545	5,282	16,705
Number of full time employees	No.	62,401	618	372	1,327
		New Brunswick	Quebec	Ontario	Manitoba
Estimated number reporting	No.	1,377	7,220	11,586	1,553
Operating revenues	\$'000	356,004	1,538,755	2,045,852	295,913
Operating expenses	\$'000	335,493	1,418,250	1,946,773	270,536
Salaries and wages	\$'000	70,460	309,084	450,007	67,599
Benefits	\$'000	1,009	8,111	8,474	378
Fuel	\$'000	89,175	311,283	523,820	79,102
Owner operator expenses	\$'000	0	0	0	0
Purchased transport	\$'000	45,926	192,300	186,617	23,905
Maintenance	\$'000	32,547	173,853	133,103	25,931
Depreciation	\$'000	42,195	156,181	244,631	27,736
Insurance	\$'000	11,258	46,967	80,933	9,668
Rent	\$'000	6,490	49,074	93,332	7,952
Other expenses	\$'000	36,431	171,396	225,855	28,266
Number of full time employees	No.	3,046	13,737	19,357	2,838
		Saskatchewan	Alberta	British Columbia	Territories
Estimated number reporting	No.	1,639	5,704	4,816	41
Operating revenues	\$'000	337,960	1,250,315	934,597	8,004
Operating expenses	\$'000	307,327	1,163,146	877,154	7,474
Salaries and wages	\$'000	67,250	278,104	214,492	1,462
Benefits	\$'000	1,303	6,174	6,251	x
Fuel	\$'000	84,094	237,758	202,118	1,023
Owner operator expenses	\$'000	0	0	0	0
Purchased transport	\$'000	26,804	136,420	99,827	2,181
Maintenance	\$'000	34,398	120,421	77,312	862
Depreciation	\$'000	33,524	147,820	110,048	510
Insurance	\$'000	12,500	47,601	32,164	301
Rent	\$'000	11,145	48,794	24,849	x
Other expenses	\$'000	36,306	140,054	110,093	857
Number of full time employees	No.	2,856	10,648	7,539	64

Note: Some totals may not add due to rounding.

Employment

Including themselves, owner operators employed almost 79,000 people in 2002. Drivers numbered 59,000 and represented three quarters of all employees. Most employees (79%) were employed full-time.

Table 17 Number of employees by type and by province or territory of domicile, owner operators, 2002

	Canada	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec
Estimated number reporting	35,085	279	198	671	1,377	7,220
Employees						
Drivers						
Full time	51,589	483	345	1,099	2,435	11,513
Part time	7,732	120	x	99	379	1,654
Other employees						
Full time	10,811	135	28	228	611	2,224
Part time	8,650	51	x	252	223	1,402
Total						
Full time	62,401	618	372	1,327	3,046	13,737
Part time	16,382	172	107	351	602	3,056

	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Territories
Estimated number reporting	11,586	1,553	1,639	5,704	4,816	41
Employees						
Drivers						
Full time	15,249	2,384	2,408	8,944	6,677	52
Part time	1,597	636	652	1,180	1,321	x
Other employees						
Full time	4,108	453	448	1,704	862	12
Part time	3,225	256	371	1,304	1,530	x
Total						
Full time	19,357	2,838	2,856	10,648	7,539	64
Part time	4,822	892	1,024	2,484	2,851	19

Note: Some totals may not add due to rounding.

Equipment

Owner operators reported operating a total of 90,000 pieces of equipment in 2002, including 41,000 road tractors, 32,000 semi-trailers and 14,000 straight trucks. Road tractors were driven an average of 125,000 kilometres during the year, while straight trucks travelled an average of 55,000 kilometres.

Fuel expenses totalled \$1.5 billion at an average price of 57 cents per litre, down slightly from the year-earlier average of 58 cents per litre. The average fuel cost per litre ranged from a low of 55 cents in Manitoba and Alberta to a high of 63 cents in Newfoundland and Labrador.

Table 18 Equipment operated by province or territory of domicile¹, owner operators, 2002

	Straight trucks	Road tractors	Semi- trailers	Other equipment	Total ²
	Number				
Newfoundland and Labrador	160	420	435	23	1,037
Prince Edward Island	x	295	388	x	799
Nova Scotia	208	996	780	124	2,108
New Brunswick	353	2,013	1,527	118	4,011
Quebec	3,741	8,083	6,568	736	19,128
Ontario	4,518	12,715	7,430	696	25,359
Manitoba	267	2,399	3,029	86	5,780
Saskatchewan	335	2,318	2,240	216	5,109
Alberta	2,097	6,913	4,565	1,080	14,655
British Columbia	2,101	4,544	4,516	778	11,939
Territories	x	52	48	x	120
Canada	13,896	40,747	31,527	3,877	90,047

1. Owned and leased by a company.

2. Some totals may not add due to rounding.

Table 19 Estimated annual distance travelled by type of vehicle and by province or territory of domicile, owner operators, 2002

	Total distance	Straight trucks	Road tractors
	000 km		
Newfoundland and Labrador	58,714	6,870	51,845
Prince Edward Island	44,968	3,354	41,614
Nova Scotia	141,016	11,159	129,857
New Brunswick	275,507	12,313	263,194
Quebec	1,378,169	181,880	1,196,289
Ontario	1,622,432	282,071	1,340,362
Manitoba	401,028	18,450	382,578
Saskatchewan	326,190	22,000	304,188
Alberta	941,391	112,362	829,028
British Columbia	647,948	108,144	539,804
Territories	5,425	761	4,664
Canada	5,842,787	759,364	5,083,423

Note: Some totals may not add due to rounding.**Table 20 Fuel consumption and cost by province or territory of domicile, owner operators, 2002**

	Estimated number reporting	Fuel consumed	Total cost	Average cost per litre
	No.	Litres	\$	\$
Newfoundland and Labrador	279	24,352,078	15,415,932	0.63
Prince Edward Island	198	16,302,644	9,236,023	0.57
Nova Scotia	671	62,574,751	36,424,356	0.58
New Brunswick	1,377	116,140,230	67,194,979	0.58
Quebec	7,220	594,351,652	352,655,782	0.59
Ontario	11,586	755,310,477	431,297,423	0.57
Manitoba	1,553	153,332,486	84,513,504	0.55
Saskatchewan	1,639	126,628,406	72,592,577	0.57
Alberta	5,704	433,544,796	239,315,272	0.55
British Columbia	4,816	256,666,055	149,988,654	0.58
Territories	41	2,483,920	1,523,160	0.61
Canada	35,085	2,541,687,494	1,460,157,661	0.57

Note: Some totals may not add due to rounding.

Section 3 Survey methodology and data quality

Introduction

This section describes the methodology of the Annual motor carriers of freight survey of small for-hire carriers and owner operators. Included are descriptions of the target and survey populations, the sample design, and the data processing and estimation methods. The quality of the data presented in this publication is discussed and quality indicators for some key statistics are given.

This information will provide the user with a better understanding of the strengths and limitations of the data, and how they can be effectively used and analysed. The information may be of particular importance when making comparisons with data from other surveys or sources of information, and in drawing conclusions regarding changes over time, differences between geographic areas and differences among sub-groups of the target population.

Several terms used in this chapter are defined below:

Target population: all units (e.g. carriers) for which the information is required.

Survey population: all units (e.g. carriers) for which the survey can realistically provide information. The survey population may differ from the target population due to the operational difficulty of identifying all the units that belong to the target population.

Survey frame: a list of all units in the survey population that carries classification information (e.g. industrial, geographical and size) of the units. This list is used for sample design and selection.

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

Sampling weight: a raising factor attached to each sampled unit 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 requires a more complicated way of calculating the sampling weight. However, the sampling weight is still equal to the number of units in the population that the unit represents.

2. Data sources and methodology

A. Survey objectives

The objective of this survey is to obtain information on small for-hire carriers and owner operators in terms of their structure and performance on an annual basis.

B. Populations

Target population

The target population includes all Canadian-domiciled for-hire motor carriers (companies) with annual operating revenues greater than or equal to \$30 thousand and less than \$1 million, as well as all Canadian-domiciled owner operators with annual operating revenues of \$30 thousand and more. Courier and messenger services are not covered by this survey, nor are private carriers.

Survey population

The 2002 survey population consists of all companies on Statistics Canada's Business Register, the Central Frame Data Base (CFDB), classified as trucking companies with annual gross business income greater than or equal to \$30 thousand and less than \$1 million, or with annual gross business income of \$1 million and more if these companies are known as owner operators. In addition, the survey population includes some companies from an administrative file of 2002 tax filers, classified as trucking companies with annual operating revenues greater than or equal to \$30 thousand and less than \$1 million that are not yet found on the Business Register.

C. Sample design

The number of trucking companies on the survey frame is large and for that reason a sample of them is selected to represent the population. The survey uses a two-phase sample design, where a large first-phase sample is selected and the second-phase sample is drawn as a sub-sample from these companies. The design of the sampling procedures used in each phase is described below.

First-phase

The first-phase sample is drawn independently for incorporated and unincorporated companies. The list of unincorporated companies on the Business Register is classified using province/territory of domicile, North American Industrial Classification System (NAICS) code, and size (measured by annual gross business income). Companies with the same classification form a stratum within which a first-phase sample is selected. The complete list of incorporated companies on the survey frame is included in the first-phase sample.

Second-phase

The second-phase sample is a sub-sample of the first-phase sample. The companies included in the first-phase sample are again classified using province/territory of domicile, NAICS code, and size. Companies with the same classification form a stratum within which a second-phase sample is selected.

The overall size of the second phase sample and its allocation among strata are determined to satisfy precision requirements for provincial estimates under given cost constraints. The coefficient of variation is used as the measure of precision. The sample size and the estimated population size by province or territory of domicile are given in Table 21.

Table 21 Estimated population size and sample size by province or territory of domicile, Annual motor carriers of freight survey: Small for-hire carriers and owner operators, 2002

	Estimated number of carriers in survey population	Number of carriers selected (Phase 1)	Number of in-scope carriers selected (Phase 2)
Newfoundland and Labrador	309	351	110
Prince Edward Island	217	144	65
Nova Scotia	957	583	179
New Brunswick	1,490	896	273
Quebec	9,820	7,387	737
Ontario	13,050	5,837	514
Manitoba	1,943	847	243
Saskatchewan	1,890	1,122	278
Alberta	6,470	4,986	485
British Columbia	5,618	2,908	429
Yukon	32	42	30
Northwest Territories and Nunavut	17	24	13
Canada	41,813	25,127	3,356

D. Data collection and processing

During the collection period, financial data is obtained for all units in the first-phase sample from an administrative file of tax filers. The companies included in the second-phase sample are contacted via telephone interview in order to collect operational data.

The survey data are checked for errors and inconsistencies. Problems or missing data are replaced with consistent values (are imputed) using Statistics Canada's Generalized Edit and Imputation System. The system imputes data using imputation rules that select representative data from another carrier. The data are then verified by subject matter specialists.

E. Estimation

Since only a sample of carriers was contacted for the AMCF survey, the individual values are weighted to represent the whole industry within the scope of the survey. The value of each carrier is multiplied by the weight for that carrier, and then the weighted data from all sampled carriers belonging to a given estimation domain (e.g. Ontario) are summed to obtain the estimate.

F. Reference period

The reference period for collection purposes is the firm's own 12-month accounting period whose year-end occurred on any date from April 1, 2002 to March 31, 2003, inclusive.

3. Data quality

Any survey suffers from errors. While considerable effort is 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. The total survey error consists of two types of errors; sampling and non-sampling errors. Sampling error occurs when a sample survey is carried out. Non-sampling errors arise due to various reasons other than sampling. These two types of errors are further explained below.

A. Sampling error

The Annual Motor Carriers of Freight Survey of Small For-hire Carriers and Owner Operators is subject to sampling error. When a sample is selected from a population, estimates based on the sample data will not in general be exactly the same as what would be obtained from a census of that population.

The difference between the estimates from a sample survey and a census conducted under the same conditions is referred to as the sampling error. 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. In general, a larger sample size produces a smaller sampling error. If the population is very heterogeneous like the trucking industry, a large sample size is needed to obtain a reliable estimate.

B. Non-sampling errors

The sampling error is only one component of the total survey error. Errors arising from all phases of a survey are called non-sampling errors. For example, non-sampling error can arise when a respondent provides incorrect information or does not answer certain questions or when a unit in the target population is omitted or covered more than once or 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.

The effects of some of the non-sampling errors will cancel out 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, if carriers consistently tend to under-report their revenues, then the resulting estimate of the total revenues will be below the true population total.

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.

In general, non-sampling errors are difficult to evaluate and special studies must be conducted to estimate them. However, certain measures such as imputation rates are easily obtained and can be used as indicators for portions of the non-sampling errors. Different types of non-sampling error together with their associated measures are discussed below.

I. Coverage errors

Coverage errors arise when the survey frame does not adequately cover the target population. As a result, certain units belonging to the target population are either excluded (under coverage), or counted more than once (over coverage). In addition, out of scope units may be present in the survey frame (over coverage). Errors in the North American Industrial Classification Standard (NAICS) code on the survey frame may also result in either over or under coverage of the trucking industry.

II. Response errors

Response errors occur when a respondent provides incorrect information due to 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.

III. Non-response errors

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

IV. Processing errors

Apart from coverage, response and non-response errors as 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, imputation, outlier detection and treatment, and other types of data handling.

A coding error occurs when a field is coded erroneously because of misinterpretation of coding procedures or poor judgment (e.g. errors in NAICS coding). A data capture error occurs when data are misinterpreted or keyed incorrectly. For this survey, errors in financial data can occur when the data are being transcribed from the tax returns.

Once data are coded and captured, they are subject to editing and imputation of missing or erroneous values. The quality of the data depends on the amount of imputation and the difference between the imputed and the true, but unknown, values. Using invalid assumptions when developing the imputation system could result in bias in the imputed data.

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 this survey. For instance, 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.

C. Some measures of data quality

This section presents some indicators of the data quality of the Annual motor carriers of freight survey of small for-hire carriers and owner operators as shown in Table 22. To assist the user in evaluating the potential effect of non-response and imputation, relative imputation rates for key characteristics (number of employees, fuel consumed, and operating revenues) are presented. The relative imputation rate is defined as the proportion of the corresponding published estimate that is accounted for by imputed data. For example, assume that 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 0.2 (\$5 million divided by \$25 million) or 20%. The lower the relative imputation rate, the more reliable the published estimate.

A total response rate is also provided. This rate is defined as the number of carriers that responded to the survey divided by the total number of in-scope units in the sample.

As a measure of the sampling error, estimated coefficients of variation (CV) for some variables are presented in Table 22. CV's for other estimates may be obtained from Transportation Division upon request. Note that the provided CV estimates do not consider the fact that some of the data were imputed and thus may underestimate the true CV's. The CV and the relative imputation rate should be considered simultaneously to make an assessment of the reliability of an estimate.

Table 22 Quality measures by province or territory of domicile, Annual Motor Carriers of Freight Survey: Small for-hire carriers and owner operators, 2002

	For-hire carriers			Owner operators		
	Response rate (%)	Relative imputation rate (%)	CV (%)	Response rate (%)	Relative imputation rate (%)	CV (%)
Newfoundland and Labrador	75.0			70.9		
Total employment		20.7	18.2		32.6	11.5
Fuel consumed ¹		37.3	9.4		35.0	11.7
Total revenues		0.0	7.0		0.0	7.0
Prince Edward Island	85.7			68.6		
Total employment		10.4	12.8		21.4	22.5
Fuel consumed ¹		20.1	13.1		25.2	22.1
Total revenues		0.0	11.9		0.3	13.0
Nova Scotia	73.3			73.8		
Total employment		18.7	13.0		28.1	7.3
Fuel consumed ¹		17.2	11.1		44.0	13.4
Total revenues		0.0	14.1		0.2	4.1
New Brunswick	66.7			73.5		
Total employment		41.0	10.5		22.5	9.9
Fuel consumed ¹		33.7	10.4		30.3	7.1
Total revenues		0.0	9.6		0.3	4.2
Quebec	78.1			71.2		
Total employment		32.0	8.8		28.4	6.3
Fuel consumed ¹		35.0	12.2		31.2	6.4
Total revenues		0.0	4.6		0.3	3.6
Ontario	73.1			61.0		
Total employment		24.7	13.5		26.8	10.1
Fuel consumed ¹		22.0	37.5		45.3	14.1
Total revenues		0.0	12.7		0.0	6.4
Manitoba	85.1			70.4		
Total employment		20.0	43.8		23.7	10.2
Fuel consumed ¹		24.5	42.3		34.9	9.8
Total revenues		0.0	10.4		0.0	6.2
Saskatchewan	68.9			71.8		
Total employment		28.5	8.8		24.3	6.6
Fuel consumed ¹		33.9	8.5		34.9	7.0
Total revenues		0.0	5.9		1.2	6.3
Alberta	73.9			65.2		
Total employment		36.2	16.4		33.8	7.2
Fuel consumed ¹		29.5	12.7		40.3	10.0
Total revenues		0.0	9.7		0.3	5.1
British Columbia	81.7			63.0		
Total employment		21.9	11.4		35.2	7.9
Fuel consumed ¹		23.3	14.6		44.6	8.8
Total revenues		0.0	7.3		0.5	5.2
Yukon	75.0			57.7		
Total employment		6.7	33.6		32.3	3.8
Fuel consumed ¹		34.9	25.1		54.9	12.5
Total revenues		0.0	31.3		0.0	6.0
Northwest Territories and Nunavut	75.0			55.6		
Total employment		8.9	6.0		33.3	0.0
Fuel consumed ¹		60.2	8.0		36.3	0.0
Total revenues		0.0	3.2		0.0	0.0
Canada	76.2			68.2		
Total employment		27.8	6.1		29.0	3.7
Fuel consumed ¹		27.6	12.9		37.9	4.7
Total revenues		0.0	4.0		0.2	2.3

1. All the for-hire carriers in the AMCF sample (whether they had actual annual operating revenue above or below \$1 million) were used to calculate the response and imputation rates presented in this table. See section on Comparability of data for more details.

Note: The quality of the estimates is classified as follows:

- * Excellent CV is 0.01% to 4.99%
- * Very good CV is 5.00% to 9.99%
- * Good CV is 10.00% to 14.99%
- * Acceptable CV is 15.00% to 24.99%
- * Caution CV is 25.00% to 34.99%
- * Unreliable CV is larger than 35.00%

Comparability of data

For the 1999 reference year, changes were made to the derivation of certain financial variables from the administrative tax files. The variables for which historical comparison may be affected are transportation revenues, fuel expenses, Owner-operator expenses and miscellaneous expenses.

Effective for the 1998 reference year, the survey underwent a major redesign. The redesign involved major changes to the frame creation process, the sample design and the estimation strategy. The frame for 1998 was created from Statistics Canada's Business Register. The sample design at the second-phase has been optimized, and the estimation strategy now uses a calibration approach to make use of information that became available after the sample had been drawn (e.g. an updated frame is used in calculating the estimation weights to make use of updates to the Business Register since the sample was drawn). The overall effect of these changes is an improved reliability in the survey estimates. In particular, this improved reliability comes from i) an improved coverage of the target population (which results in an increase in the estimated number of in-scope companies), and ii) an improved precision in the survey estimates (i.e. lower coefficients of variation).

In order to improve the combined coverage of the trucking industry by the AMCF survey and its complement, the Quarterly Motor Carriers of Freight (QMCF) survey, a group of large companies will be included in the AMCF, effective for 1998. Since the QMCF uses the annual gross business income from the Business Register, which is not identical to the true annual operating revenues, to define the survey population, some companies in the QMCF target population (those with annual gross business income less than \$1 million, and actual annual operating revenues over \$1 million) are not included in the QMCF survey population. Although these companies do not fall into the target population for the AMCF, it was decided to include them in the AMCF survey population to improve the overall industry coverage of the two surveys. The effect of this is the addition of a small number of large companies to the AMCF survey population. Although the number of such companies is small, their large size leads to a noticeable increase in the survey estimates. In order to facilitate historical comparisons, separate domain estimates will be produced for i) companies with actual operating revenue less than \$1 million and ii) companies with actual operating revenue greater than or equal to \$1 million.

From 1995 to 1997, the survey covered for-hire carriers and owner operators with annual operating revenues greater than or equal to \$30 thousand and less than \$1 million. Starting with 1998, owner operators with annual operating revenues greater than or equal to \$1 million will also be covered.

From 1990 to 1995, the survey covered for-hire carriers and owner operators with annual operating revenues greater than or equal to \$25 thousand and less than \$1 million.

The survey data prior to the 1990 survey covered for-hire carriers with annual operating revenues of \$100 thousand or more. Owner operators were not included in the 1989 and preceding surveys.

Symbols

The following standard symbols are used in Statistics Canada publications:

- . not available for any reference period
- .. not available for a specific reference period
- ... not applicable
- 0 true zero or a value rounded to zero
- 0^S value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
- ^P preliminary
- ^r revised
- X suppressed to meet the confidentiality requirements of the *Statistics Act*
- ^E use with caution
- ^F too unreliable to be published

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