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Telecommunications in Canada

1998



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- r revised figures.
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1998 Highlights

- ▶ Operating revenues for the telecommunications industries were \$28.5 billion and operating expenses totalled \$24.7 billion.
- ▶ Operating profit was \$3.8 billion, a \$338.7 million decline from 1997.
- ▶ Operating profits were 13.5% of total operating revenue compared to 18.3% of operating revenues in the previous year.
- ▶ There were 95.5 thousand persons employed in the Telecommunications industries in 1998 (83.3 thousand full-time workers and 12.1 thousand part-time workers).
- ▶ Two-way trade in services (exports and imports) by telecommunications service providers amounted to \$2.9 billion, rendering a positive trade balance of \$85.8 million.
- ▶ Industry assets increased \$2.6 billion from the previous reporting period to \$47.0 billion.
- ▶ Capital expenditures topped last year's record by 11.8%, to reach \$6.4 billion.
- ▶ There were 19.3 million voice-grade access lines in 1998, a 3.4% increase from the 18.7 million lines reported in 1997.
- ▶ 99.5 % of all lines were digital.
- ▶ There were 5.4 million mobile telephony subscribers. This represents a 25.5% increase over the 1997 level of 4.3 million subscribers.
- ▶ 26.3 % of mobile telephony subscribers used digital services in 1998 compared to 11.0% in 1997.
- ▶ Long distance traffic for wireline service providers reached 35.9 billion minutes.
- ▶ 70.5% of long distance traffic originated and terminated in Canada, 18.2% had one leg outgoing to or incoming from the United States, and 11.3% involved an overseas destination.

Introduction

The Telecommunications industry is one of the five industries accounting for more than one fifth of GDP growth since 1971 in the Canadian economy. With revenues in the tens of billions of dollars, telecommunications have come a long way since Alexander Graham Bell first transmitted human speech through electrically energized equipment in March, 1876, thus introducing the telephone. In August of the same year he made a one-way call from Brantford to Paris, Ontario, which marked the first long distance test of his new invention.

Soon after, telephone exchanges sprang up in many communities as companies competed vigorously for new customers. By 1886, there were 13,000 telephones in operation in Canada. As the industry grew, it became necessary to set up federal and provincial agencies to regulate it. By 1941, there were 3,200 independent telephone systems in Canada operating some one and a half million telephones. Since then the number of telephones and corresponding access lines have increased steadily while the number of telephone systems declined sharply, as many small systems were absorbed by larger and more efficient ones.

On November 9, 1972, Anik 1, Canada's first domestic satellite was successfully launched. The Trans-Canada Telephone System (which became Stentor) and Bell Canada reserved channels on it to transmit long distance telephone calls to and from remote areas of northern Canada scarcely thought of 100 years ago. Satellite channels, microwave relay systems and other modern telecommunications media have now replaced a large part of the wire that formerly carried Canada's long distance telephone traffic.

A major advance enhancing the telecommunications options for Canadians came with the licensing of cellular telephone operators in 1985. Regional duopolies were created with the introduction of a national carrier (Rogers Cantel) and the regional mobility companies servicing the same territories as their local wireline services monopoly counterparts (Stentor member telephone companies). Mobility services and competition were extended with the introduction of Personal Communications Services (PCS) in 1996, and two new national competitors, the Microcell and Clearnet groups of companies.

Wireline and satellite services industries have also been subject to increased competition over time. Private line and data services were liberalized starting in 1979 and the provision of customer premises equipment was opened-up in the early 1980's. In 1992 competition was introduced for long distance voice services, which was given a boost in 1994 when the Canadian Radio-Television and Telecommunications Commission (CRTC) mandated 'equal access,' enabling customers to connect with a long distance carrier of their choice without having to dial additional (access) numbers. Teleglobe Canada, Canada's overseas monopoly carrier was privatized in 1987 and its monopoly privileges ended in 1998. Telesat Canada, the monopoly satellite carrier was similarly privatized in 1992 and its monopoly privileges are slated to end in 2000.

A number of regulatory decisions have yet to be realized in the market place, such as local competition and the deregulation of the pay telephone market. These decisions, in tandem with technological invention and innovation and the convergence of cable, internet and telecommunications services will significantly impact our lives. So many spheres of human activity: communication, learning, governance, business, art, culture, entertainment, etc. will undergo at least some changes directly related to the development of these new information networks.

Analytical Overview

The tables presented in the following pages describe the financial, operating and network activity in the telecommunications industry in Canada and where applicable, provincially, for 1998. It should be noted that carrier revenues and expenses were reported on a gross basis starting in 1998 rather than a net basis, as in previous years. Thus the corresponding revenue and expense items as well as total operating revenues and expenses for 1998 and previous years are not comparable. All other revenue and expense variables are not affected by this change and therefore can be compared.

National Indicators

In 1998, **operating revenues** of the telecommunications industry reached \$28.5 billion (Table 3). Wired telecommunications carriers dominate the provision of telecommunications services. They accounted for 80.9% of total industry revenue, unchanged from 1997, while wireless carriers, resellers, and satellite and other service providers accounted for 15.4%, 2.2% and 1.5% of industry revenues, respectively. Resellers share of total industry revenues declined from 3% last year and wireless carriers increased their share from 14%.

Operating revenues are classified into Telecommunications and Other (non-telecommunications) activity categories. **Telecommunications revenues**, those related to the carriage or resale of telecommunication services, made up 87.4% of all operating revenues. The major services provided were local and long distance telephony (31.9% and 26.5% of operating revenue); private line services (5.5%); data and high speed services (4.2%); and calling features, such as call management, tele-messaging, and pay-per-use services, etc. (3.4%).

Voice services revenues increased by nearly \$1.7 billion over 1997, however, owing to growth in other services, their share of total operating revenue excluding carrier services remained unchanged from last year.

Other operating activities accounted for the remaining 12.6% of operating revenues. These activities (e.g., directory publishing, sale or rental of telecommunications goods, repair and maintenance, etc.) are commonly undertaken by telecommunications companies but may also be undertaken by companies that provide neither the carriage nor resale of telecommunications services.¹

Operating expenses totalled \$24.7 billion (Table 4). Network expenses accounted for just under 50% of all expenses, commercial and administration took just under 35%, occupancy 2.5% and residual telecom expenses and non-telecom expenses about 6.5% each. The single largest expense item is depreciation and amortization. Together, the allocation of sunk costs amounted to 23.3% of total expenses for the industry (\$5.8 billion). The next largest categories were selling, marketing and advertising (11.4%), interconnection/settlement (11.1%), network facilities access (e.g., purchased long distance, or circuit rentals) (7.4%) and network operations (7.1%).

It is interesting to note that service providers spent more in purchasing access to networks than facilities-

based carriers spent in operating their networks. As would be expected, purchased network access is most important for resellers, accounting for 59.1% of their total operating expenses.

Operating income or profit, the difference between operating revenues and operating expenses totalled \$3.8 billion, or 13.4% of total operating revenue. This is a decline from the \$4.2 billion reported for 1997, or 18.3% of revenues. Operating income is used to cover interest payments, any extraordinary expenses, income taxes and finally for returns to shareholders (dividends or retained earnings).

Operating incomes were not uniform across the telecommunications industries. The wireline industry posted an operating income to revenue ratio of 17.5%, and the wireless and reselling industries posted losses of 4% and 7.1% respectively (Table 6). Only the satellite and other industries improved their performance over last year, increasing 2.3 percentage points from 3.2% to 5.5%.

The **non-operating revenues and expenses** loss position improved greatly over last year (Table 7). Heavy restructuring costs such as down-sizing and one time write-offs to prepare the wireline industry for an increasingly de-regulated market place, including the industry's transition from regulatory to GAAP (generally accepted accounting principles) accounting rules were applied last year impacting financial statements negatively in 1997.

Even though the **net income** position improved for the industry, it was still negative, -\$328.7 million (Table 5). All industries except wireless carriers improved their position from last year. Wireline carriers were the only group in the black (\$493 million), and wireless operators' losses increased to \$743 million from \$567 million.

Despite the losses, \$1.6 billion of dividends were paid during the year - amounting to 5.4% of operating revenue. Total **retained earnings** for the telecommunications sectors were -\$401 million. Only wired carriers posted positive retained earnings - about \$1.9 billion, down from their opening balance of \$2.2 billion.

Overall, 61.3% of telecommunications service providers in Canada reported positive net income and 65% were **profitable reporting units** in terms of operating income (Table 6). Conventional telephone service providers were the most likely to have positive net incomes and operating margins (80.9% and 89.7% of all reporting units). The number of wireline companies reporting positive net income was largely unchanged

¹ If these activities constituted a majority of a company's operating revenues, the company would be classified as a non-telecommunications service provider and its results would be excluded from the survey tabulations.

from last year whereas there were more resellers and satellite companies and fewer wireless operators reporting positive net incomes this year compared to last.

Telecommunications service providers purchase services from and sell services to non-residents. **International trade** in telecommunications services refers chiefly to interconnection - the termination of calls between Canadian and foreign telecommunications networks. Trade in non-telecommunications services includes commercial, financial, professional, technical, administrative and management services, royalties, commissions, and interest and dividends. These two-way transactions amounted to \$2.9 billion in 1998, rendering a positive services trade balance of \$85.8 million for the Canadian telecommunications industry. This result is marginally lower than \$89.6 million reported last year (Table 11).

In 1998 95.5 thousand persons were employed by this sector (Table 7). Full and part-time **employment levels** were 83.2 and 12.2 thousand, respectively. **Labour costs** during 1998 accounted for approximately the same share of the industry's operating revenue (adjusted for carrier costs) as in 1997. Employees of the satellite industry had the highest earnings (full-time equivalents calculated based on average full-time employee salaries), followed by the wireline, wireless and finally the reseller industry.

Despite having differing labour costs, each industry posted similar revenue per employee (full-time equivalent) - varying from \$304.6 thousand in the wireline industry to \$365.1 thousand in the satellite/other industries, and averaging across industries at \$313.5 thousand. The Satellite and Other telecommunications industry (51334/9) had the highest operating revenue per employee but an operating profit margin of only 5.5% compared to the wireline industry, which had the lowest operating revenue per employee, but the highest operating profit margin (17.4%).

Assets (Table 1) for the industry were recorded at \$47 billion, a 5.8% increase from 1997. Just under 65% of assets are fixed, with 81.5% of this amount being for network infrastructure. Current assets were 18.9% of total assets, and the balance, 16.2%, was made up of financial investments, deferrals and other non-current and fixed assets.

Wireline and wireless industry asset shares of total sector assets parallel their share of sector revenues. Wired carriers accounted for 81.4% of the sector's total assets and 80.9% of revenue, while the wireless industry accounted for 14.8% of assets and 15.4% of sector revenues. The satellite and other industries' asset share was nearly twice their revenue share

(3.0% to 1.5%), reflecting its very capital intensive nature, and resellers, not surprisingly, accounted for only .7% of total assets.

There were fewer outstanding accounts (receivables) at this year end (\$4.1 billion) compared to the last (\$5.6 billion): they accounted for 42.5%, 70.8%, 74.3% and 49.9% respectively of wireline, wireless, reseller and satellite/other current assets. Although this can be seen as an operational improvement, working capital for the sector is solidly negative: current liabilities exceed current assets by \$2.8 billion.

The historical value of network infrastructure categories for wireline carriers, in order, are, cables and lines (32.4%), switching equipment (24.8%), transmission equipment (19.6%) and transmission structures (8.0%). As for the wireless telecommunications carriers, due to their different operating systems, 27.7% of their fixed network infrastructure assets were for transmission structures whereas transmission equipment accounted for 26.9% of the total.

Other fixed assets (e.g., computers, software and other non-switched equipment, automotive, office furniture, etc.) accounted for \$2.2 billion and \$888.1 million of fixed assets for wired and wireless telecommunication carriers respectively. This latter amount is an increase from \$516 million in 1997.

The general increase in assets was matched by an increase in liabilities leaving **shareholder's equity** unchanged at \$13.8 billion.

High **capital expenditures** (Table 8) have been characteristic of the telecommunications industry over the past few years. 1998 expenditures were 11.8% above the record amount reported last year, reaching \$6.4 billion. Two-thirds of expenditures were for machinery and equipment and one-third for construction, unchanged from the previous year. Overall expenditures were up 28% for wireline carriers and declined 22.7% for wireless carriers.

Wireline record spending can be attributed to increases in all categories of machinery and equipment whereas the decline in wireless spending came in all categories of equipment, particularly transmission equipment (\$136 million in 1998 from \$711 million last year). This was somewhat offset by a \$100 million increase in construction for transmission structures. The largest single capital item was the nearly \$1.2 billion spent on switching equipment by the wireline carriers, followed by cable and line construction (approximately 30% for optical fibre) and transmission equipment.

The telecommunications **network infrastructure** (Table 9) is highly developed in Canada. Public-switched telephone network (PSTN) **access** reached 19.3 million **lines** (VGE, voice-grade equivalents) in

1998, an impressive increase of about 3.4% from the previous year, considering the maturity of this infrastructure. This compares to the 2.1% growth registered in 1997. Residential lines accounted for 65.3% of the total, while business lines represented 34.7% of PSTN lines. Access lines per 100 population was 62.1, up from 61.2 last year.

Mobile cellular telephony has expanded the provision of network access. At year-end there were 5.4 million **cellular subscribers** - a 25.5% increase over the previous year. Mobile teledensity reached 17.7 per 100 Canadians in 1998 (14.2 in 1997).

There were 1.088 million new wireless access paths to the PSTN this year and 634 thousand wireline additions. Combined wireline and wireless access to the PSTN grew 9.0% over last year and now stands at 79.8 VGE access paths per 100 Canadians.

Digital transmission (Table 10) of communications on the PSTN is an important facilitator of new telecommunications services. 99.5% of PSTN access lines are now digital compared to 26.3% of mobile access to the PSTN. Digital wireless access in 1997 was 11.0%. Together, 83.3% of wired and wireless access to the PSTN is digital.

The **Paging services** (Table 9) also showed continued strong growth despite the strong growth in cellular telecommunications, considered by some to be a substitute for paging. There were nearly 1.5 million pagers in service in 1997, up 20.5% from the 1997 level, which in turn grew 12.5% from 1996.

Long distance traffic (Table 12) for wireline service providers reached 35.9 billion minutes of which 70.5% originated and terminated in Canada. A total of 18.2% had one leg to or from the United States and 11.3% involved an overseas destination. There is rough parity between originating calls in Canada and the USA to either country but overseas traffic initiated from Canada is over twice that of overseas traffic to Canada.

The reseller industry accounted for 7.3% of total long distance traffic but only 5.6% of corresponding revenues. When calling foreign destinations, Canadians are more likely to use facilities-based carriers than resellers: 20.4% of the long distance traffic initiated by Canadians were carried by facilities-based carriers, whereas only 11.7% of reseller traffic was to foreign destinations.

Toll-free calling is an important part of the long distance market in Canada. Nearly one minute out of

every seven minutes of long distance calling was a toll-free minute to the caller.

Provincial Indicators (Tables 13 and 14)

In 1998, there were 241 companies in Canada whose main activity was the provision of telecommunications services. Many of these companies operate (have employees), in more than one province. Using this criteria, there were 381 telecommunications **establishments** in Canada².

For the most part, provincial activity tends to parallel the province's share of national population. Ontario, which had just under 38% of national population, accounted for 39% of national telecommunications revenue. Quebec was next with 24% of revenue and 24.2% of population, British Columbia accounted for 13.4% of revenue and 13.2% of population. All of the other provinces reported a smaller share of national revenue than their share of population except for Alberta, which accounted for 10.9% of revenue despite having only 9.6% of population.

The major deviations from this general rule comes when considering operating profits and wireless subscribers. Despite having 39% of national revenue, Ontario establishments provide only 11.5% of national industry operating profits. Newfoundland establishments had the highest level of operating profits relative to their operating revenues, followed by Nova Scotia, and BC and New Brunswick (the same), establishments. This Ontario anomaly may be because companies find it easier to allocate revenues to establishments than costs. The preponderance of establishments with head offices in Ontario could therefore lead to a disproportionate number of costs being allocated to their head offices, and skewing the profits results.

Quebec accounted for only 17.9% of national **mobile telephony subscriptions**, but far more than its relative weight of **paging subscribers** (35.9%). Alberta showed the greatest relative penetration of mobile subscribers - 42.7% above the national average, and British Columbia was next, 18.9% above what its relative share of the population would suggest.

All provinces (where data can be released) except Nova Scotia (16.5%) had **capital expenditures** close to the national share (22.6%). National machinery and equipment (M&E) expenditures were nearly twice that of construction (C) expenditures, however Ontario and Nova Scotia showed a marginally greater propensity than other provinces for construction capital expenditures (M&E:C ratio of 1.7).

² Some of these companies may provide services in provinces where they do not have employees, but the provision of services alone does not constitute an establishment, therefore such situations have not been included in the establishment count.

The Canada average revenue per full-time employee was \$342 thousand, an increase of 33% over the 1997 value (\$257 thousand). For provinces for which there is published data, Quebec reported the highest level of revenue per full-time employee (\$400 thousand), followed by Ontario (\$381 thousand). Both these provinces also had higher labour costs per full-time worker than other provinces (\$71 thousand compared to a national figure of \$65 thousand), but nevertheless reported higher net revenue per employee (revenue per full-time employee less labour costs per full-time employee). Quebec lead the nation with a net revenue per employee of \$330 thousand, Ontario reported \$310 thousand, Alberta reported \$266 thousand and British Columbia reported \$262 thousand.

Household Telecommunications Infrastructure³ (Table 15)

Over 98% of Canadian homes have at least one fixed line telephone - this is down 0.4 percentage points from 1997. Nova Scotia reported the lowest household penetration. Its 1998 penetration rate increased 0.3 percentage points to 97.3% however, .9 of a percentage point below the national average.

Mobile telephony penetration showed the most marked growth. In 1997, household penetration was 18.6%. One year later, this has increased to 26.1%, an increase of 40.3%. Alberta lead the way, with 37.6% of households having a mobile phone. This rate is 44% above the national average. Ontario and British Columbia were next with penetration of 30% each.

Manitoba, the only western province, and all provinces east of Ontario, had mobile telephone household penetrations below the national average. The eastern provinces however, posted growth rates that exceeded the national average. Newfoundland reported the greatest increase (80%) followed by Quebec (69.4%). Manitoba posted the lowest growth of any province but its penetration stands just shy of the national average, still significantly higher than the faster growing eastern provinces. Overall, the trend for mobile penetration is strong - Canadians are embracing mobile technology as never before.

³ This data is taken from the Survey of Household Spending rather than the Annual Survey of Telecommunications Service Providers. Please see Catalogue No. 66-202-XIE for information concerning survey methodologies, concepts, definitions, etc.

STATISTICAL TABLES

TABLE 1. Balance Sheet, by NAICS Telecommunications Industries, 1998

NAICS Industry	51331	51332	51333	51334/9	5133
<i>Thousands of dollars</i>					
Assets					
Current Assets:					
Cash, deposits and temporary cash investments	1,406,978	54,362	25,353	49,065	1,535,758
Accounts receivable	3,219,038	698,746	105,345	84,711	4,107,840
Inventory (closing)	238,181	111,386	1,583	27,824	378,974
Other current assets	2,717,072	123,022	9,410	8,010	2,857,514
Total - Current Assets	7,581,269	987,516	141,691	169,610	8,880,086
Fixed Assets:					
Land	214,115	19,385	x	x	243,404
Buildings (historical cost)	3,671,024	311,123	x	x	4,055,698
Accumulated depreciation	1,765,684	74,472	x	x	1,870,045
Total - Buildings (net of depreciation)	1,905,340	236,651	x	x	2,185,653
Network infrastructure (historical cost):					
Transmission structures	3,728,316	1,911,584	x	x	5,871,736
Cables and lines	15,088,672	-	-	-	15,088,672
Transmission equipment	9,121,282	1,855,034	-	257,587	11,233,903
Switching equipment	11,989,754	1,482,251	70,963	-	13,542,968
Terminal equipment	3,511,813	181,512	x	x	3,699,314
Other network infrastructure n.e.c.	3,066,743	1,461,378	x	x	5,069,713
Total - Network infrastructure	46,506,580	6,891,759	x	x	55,002,647
Accumulated depreciation	26,866,132	2,692,843	x	x	30,126,962
Total - Network infrastructure (net of depreciation)	19,640,448	4,198,916	x	x	24,875,685
Other fixed assets (historical cost):					
Computers, software & related equipment	2,174,936	773,740	46,551	53,429	3,048,656
Furniture and office equipment	1,559,003	172,147	12,767	15,745	1,759,662
Motor vehicles & other transport equipment	598,984	9,207	491	914	609,596
Residual	857,985	464,769	34,580	64,604	1,421,938
Total - Other fixed assets	5,190,908	1,419,863	94,389	134,692	6,839,852
Accumulated depreciation	2,966,555	531,753	37,561	95,319	3,631,188
Total - Other fixed assets (net of depreciation)	2,224,353	888,110	59,422	39,373	3,211,258
Total - Fixed Assets (net of depreciation)	23,984,256	5,343,062	x	x	30,516,000
Financial Investments	1,991,620	x	12,416	x	2,295,797
Deferred Charges	2,029,067	x	4,632	x	2,321,280
Other assets n.e.c.	2,685,397	194,072	72,414	26,738	2,978,621
Assets - Total	38,271,609	6,971,169	352,281	1,396,725	46,991,784

TABLE 1. Continued.....

NAICS Industry	51331	51332	51333	51334/9	5133
<i>Thousands of dollars</i>					
Liabilities					
Current liabilities:					
Trade accounts payable	2,433,702	789,687	111,958	83,960	3,419,307
Other accounts payable	2,792,763	145,532	16,057	6,380	2,960,732
Short term debt	1,728,206	262,793	x	x	2,365,502
Other current liabilities n.e.c.	2,689,214	190,146	39,241	229,387	2,942,646
Total - Current Liabilities	9,643,885	1,388,158	x	x	11,688,187
Long-term Liabilities:					
Long-term Debt	12,863,176	6,509,761	154,182	276,600	19,803,719
Deferrals and reserve accounts	1,147,713	x	x	x	1,593,866
Other Long-term liabilities	36,977	x	23,592	x	154,493
Total - Long term Liabilities	14,047,866	6,735,546		x	21,552,078
Liabilities - Total	23,691,751	8,123,704	425,107	999,703	33,240,265
Shareholders' Equity					
Share capital	12,282,716	878,040	44,206	498,885	13,703,847
Retained earnings	1,902,628	(2,074,334)	(125,538)	(103,824)	(401,068)
Other equity n.e.c.	394,514	43,759	8,506	1,961	448,740
Total - Shareholders' Equity	14,579,858	(1,152,535)	(72,826)	397,022	13,751,519
Total - Liabilities and Shareholders' Equity	38,271,609	6,971,169	352,281	1,396,725	46,991,784
Working capital	(2,062,616)	(400,642)	x	x	(2,808,101)
Debt:equity ratio	1.00	...	x	x	1.61

TABLE 2. Retained Earnings Statement, by NAICS Telecommunications Industries, 1998

NAICS Industry	51331	51332	51333	51334/9	5133
<i>Thousands of dollars</i>					
Opening balance	2,179,464	(1,237,071)	(50,302)	(38,452)	853,639
Net income or (loss)	534,684	(755,948)	(72,368)	(6,292)	(299,924)
Dividends declared	1,471,984	79,619	3,075	4,891	1,559,569
Other additions and deductions	660,464	(1,696)	207	(54,189)	604,786
Retained Earnings	1,902,628	(2,074,334)	(125,538)	(103,824)	(401,068)

TABLE 3. Revenues, by NAICS Telecommunications Industries, 1998

NAICS Industry	51331	51332	51333	51334/9	5133
<i>Thousands of dollars</i>					
Telecommunications Operating Revenues					
Carrier Services:					
Contribution	x	x	-	-	935,786
Interconnection	2,047,890	64,204	x	x	2,121,630
Circuit/capacity rentals	155,828	x	x	x	229,978
Other	x	2,233	x	x	275,000
Total - Carrier Services	3,225,076	163,953	x	x	3,562,394
Voice Services:					
Local telephony	6,480,404	2,584,785	29,038	-	9,094,227
Long distance telephony	6,770,589	342,931	402,711	29,327	7,545,558
Calling features	872,951	100,726	x	x	974,706
Connection	176,712	30,584	x	x	207,966
Total - Voice Services	14,300,656	3,059,026	432,667	30,108	17,822,457
Data and High Speed Services:					
Narrowband packet-switched services	480,104	-	7,750	-	487,854
High speed switched services ¹	689,060	-	28,682	1,166	718,908
Total - Data and High Speed Services	1,169,164	-	36,432	1,166	1,206,762
Non-switched Services (private circuits):					
Narrowband	1,019,406	-	16,366	-	1,035,772
High speed	374,071	-	4	168,702	542,777
Total - Non-switched Services	1,393,477	-	16,370	168,702	1,578,549
Specialty Wireless Services:					
Paging	3	236,658	19,693	2,072	258,426
Dispatch	-	57,562	13	2,295	59,870
Roaming	437	119,484	-	-	119,921
Administrative (<i>licensing</i>) fees	-	132,156	-	-	132,156
Other narrowband wireless services n.e.c.	-	2,839	-	-	2,839
Total - Specialty Wireless Services	440	548,699	19,706	4,367	573,212
Other telecommunications services	109,219	8,743	7,665	29,055	154,682
Total - Telecommunications Operating Revenues	20,198,032	3,780,421	620,447	299,156	24,898,056
Other Operating Revenues:					
Terminal equipment rentals	413,671	9,563	x	x	433,239
Sale of telecommunications goods	923,598	502,057	6,978	33,199	1,465,832
Directory services	x	x	-	-	466,191
Retail Internet services	92,975	-	750	-	93,725
Other services n.e.c.	x	x	x	x	1,136,893
Total - Other Operating Revenues	2,861,512	597,272	16,005	121,091	3,595,880
Total - Operating Revenues	23,059,544	4,377,693	636,452	420,247	28,493,936

¹ Wide and broadband circuit and packet-switched services.

TABLE 4. Operating Expenses, by NAICS Telecommunications Industries, 1998

NAICS Industry	51331	51332	51333	51334/9	5133
	<i>Thousands of dollars</i>				
Telecommunications Operating Expenses					
Production Expenses:					
Network operations	1,469,864	224,285	35,528	27,714	1,757,391
Depreciation	3,327,959	649,673	x	x	4,081,171
Maintenance and repairs	807,297	72,735	1,274	14,089	895,395
Carrier services:					
Circuit/capacity rentals (wireline, wireless, satellite)	710,202	202,891	159,982	68,056	1,141,131
Purchased long distance service	467,290	54,111	234,839	7,263	763,503
Contribution payments	884,601	6,198	x	-	903,146
Interconnection/settlement payments	2,640,409	102,453	x	x	2,743,046
Total - Carrier services	4,702,502	365,653	x	x	5,550,826
Total - Production Expenses	10,307,622	1,312,346	461,368	203,447	12,284,783
Commercial and Administrative Expenses:					
Selling and marketing	1,387,902	768,517	26,456	25,666	2,208,541
Advertising and related services	301,228	259,120	18,799	2,712	581,859
Billing and collections	239,360	140,687	19,329	2,408	401,784
Office expenses and supplies	1,311,059	149,707	35,711	40,870	1,537,347
Office equipment rentals	44,536	11,603	818	543	57,500
Maintenance and repairs	148,799	10,178	2,097	3,343	164,417
Telecommunications, postage and courier fees	96,583	38,790	7,715	1,858	144,946
Insurance	14,072	3,483	432	7,292	25,279
Travel and entertainment	125,039	16,794	3,288	2,862	147,983
Professional and business fees	381,365	103,485	17,782	6,318	508,950
Management fees paid to head office	128,350	92,205	4,248	630	225,433
Amortization charges	713,686	107,475	8,508	14,737	844,406
Depreciation	672,468	139,942	7,535	21,024	840,969
Bad debts expenses	188,721	59,946	8,971	3,083	260,721
Licensing fees and other taxes	443,495	135,453	437	2,653	582,038
Total - Commercial and Administrative Expenses	6,196,663	2,037,385	162,126	135,999	8,532,173
Occupancy Costs:					
Rental - land, buildings	290,861	41,834	8,355	2,449	343,499
Utilities	83,685	12,293	527	2,352	98,857
Property taxes	161,739	14,860	629	3,362	180,590
Total - Occupancy Costs	536,285	68,987	9,511	8,163	622,946
Other expenses n.e.c. and Residual	854,531	732,329	35,115	3,395	1,625,370
Total - Telecommunications Operating Expenses	17,895,101	4,151,047	668,120	351,004	23,065,272
Other Operating Expenses:					
Cost of goods sold	638,834	346,595	7,892	27,159	1,020,480
Residual	501,916	55,717	5,682	19,136	582,451
Total - Other Operating Expenses	1,140,750	402,312	13,574	46,295	1,602,931
Total - Operating Expenses	19,035,851	4,553,359	681,694	397,299	24,668,203

TABLE 5. Income Statement, by NAICS Telecommunications Industries, 1998

NAICS Industry	51331	51332	51333	51334/9	5133
<i>Thousands of dollars</i>					
Operating Revenues and Expenses:					
Operating revenues	23,059,544	4,377,693	636,452	420,247	28,493,936
Operating expenses	19,035,851	4,553,359	681,694	397,299	24,668,203
Operating income (loss)	4,023,693	(175,666)	(45,242)	22,948	3,825,733
Operating income (loss) (% of revenues)	17.4	-4.0	-7.1	5.5	13.4
Non-Operating Revenues and Expenses:					
Investment income	237,544	14,119	473	7,157	7,157
Net gains on sale of assets	74,025	(12,128)	(12,725)	9,166	9,166
Interest expense on:					
Short term debt	247,937	44,161	x	x	293,085
Long term debt	1,193,108	412,615	x	x	1,632,938
Total - Interest expense	1,441,045	456,776	11,518	16,684	1,926,023
Other non-operating revenues and expenses	(988,626)	2,282	925	3,691	(981,728)
Total - Non-Operating Revenues and Expenses	(2,118,102)	(452,503)	(22,845)	3,330	(2,590,120)
Income Tax:					
Deferred	109,433	8,479	1,154	(430)	118,636
Current	1,301,214	58,798	3,127	33,000	1,396,139
Total - Income Taxes	1,412,623	114,854	4,281	32,570	1,564,328
Net Income (loss)	492,968	(743,023)	(72,368)	(6,292)	(328,715)

TABLE 6. Profit and Concentration Ratios, by NAICS Telecommunications Industries, 1998

NAICS Industry	51331	51332	51333	51334/9	5133
<i>Percentage</i>					
Operating Statistics and Ratios:					
Operating profit margin	17.5	(4.0)	(7.1)	5.5	13.4
Pretax profit margin	8.3	(14.4)	(10.7)	6.3	4.3
Net profit margin	2.1	(17.0)	(11.4)	(1.5)	(1.2)
Pretax profit to assets	5.0	(9.0)	(19.3)	1.9	2.6
Return on equity	3.4	64.5	99.4	(1.6)	(2.4)
% of profitable reporting units (operating income)	89.7	63.1	52.1	36.4	65.0
% of profitable reporting units (net income)	80.9	58.5	51.0	45.5	61.3
Concentration (% of operating revenues):					
Top 10 reporting units	90.7	89.0	74.8	99.6	78.4
Top 30 reporting units	99.7	99.5	94.4	xx	94.5

xx less than 30 reporting units

TABLE 7. Employment and Labour Costs, by NAICS Telecommunications Industries, 1998

NAICS Industry	51331	51332	51333	51334/9	5133
<i>Thousands of dollars</i>					
Labour Costs					
Expensed	3,958,205	554,082	74,827	76,142	4,663,256
Capitalized	651,683	105,360	77	5,150	762,270
Total - Labour costs	4,609,888	659,442	74,904	81,292	5,425,526
Employment Categories for Expensed Labour Costs					
Network operations	1,376,112	61,962	4,501	25,182	1,467,757
Commercial and administrative	2,146,578	251,638	56,030	45,804	2,500,050
Residual	435,515	240,482	14,296	5,156	695,449
Total	3,958,205	554,082	74,827	76,142	4,663,256
<i>Persons</i>					
Employment					
Full-time	69,730	10,584	1,824	1,140	83,278
Part-time	9,846	2,201	111	27	12,185
Employees - Total (000 persons)	79,576	12,785	1,935	1,167	95,463
Total - Full-time Equivalent Employees (FTE)	75,698	12,158	1,870	1,151	90,877
<i>Dollars</i>					
Average employee remuneration (including benefits)	60,898	54,239	40,056	70,627	59,702
Revenue per employee (FTE)	304,626	360,067	340,349	365,115	313,544

TABLE 8. Capital Expenditures, by NAICS Telecommunications Industries, 1998

NAICS category	51331	51332	51333	51334/9	5133
<i>Thousands of dollars</i>					
Construction					
Buildings	153,584	49,664	-	-	203,248
Transmission structures	111,774	470,180	-	-	581,954
Cables/Lines	848,699	-	-	-	848,699
Other	72,210	158,363	x	x	546,649
Total - Construction Expenditures	1,186,267	678,207	x	x	2,180,550
Machinery and Equipment Expenditures					
Transmission equipment	841,181	136,004	123	2,240	979,548
Switching equipment	1,168,370	169,573	2,419	-	1,340,362
Terminal equipment	592,808	6,510	5,976	2,453	607,747
Other	840,430	472,324	18,303	9,690	1,340,747
Total - Machinery and Equipment Expenditures	3,442,789	784,411	26,821	14,383	4,268,404
Total - Capital Expenditures	4,629,056	1,462,618	x	x	6,448,954

TABLE 9. Network Infrastructure, 1998

	<i>Residentiel</i>	<i>Business</i>	<i>1998 Total</i>	<i>1997 Total</i>
PSTN access lines (at year end):				
Individual lines	12,474,720	3,301,911	15,776,631	15,701,284
Multi-party lines	124,693	8,878	133,571	145,078
ISDN BRA	977	68,998	69,975	50,162
ISDN PRA	...	20,563	20,563	11,690
Public telephones	...	180,382	180,382	178,116
Centrex	...	1,927,370	1,927,370	1,640,163
Other	173	662,691	662,864	626,042
Total - PSTN Access Lines	12,600,563	6,170,793	18,771,356	18,352,535
PSTN access lines per 100 population	41.7	20.4	62.1	61.2
Total - B channel equivalents PSTN access lines	12 601 540	6 692 177	19 293 717	18 659 877
- %	65.3	34.7		
Total - Non-PSTN Access Lines			67,248	..
			1998 Total	1997 Total
Wireless Subscribers:				
Mobile telephony - Digital			1,405,594	468,535
Mobile telephony - Analogue			3,948,539	3,797,243
Total - Mobile telephony subscribers			5,354,133	4,265,778
Mobile telephony subscribers per 100 population			17.7	14.2
Total - Paging, Narrowband PCS			1,504,371	1,248,502
Total - RCC (Radio Common Carriage)			71,178	..
Fixed satellite			1,009	..
Mobile satellite			12,089	..
			Total 1998	Total 1997
Number of Cell/repeater sites:				
Mobile telephony - Digital			2,535	..
Mobile telephony - Analogue			1,689	..
Paging			2,356	..
			Total 1998	Total 1997
Number of Switches (wireline and wireless network):				
Digital switch:				
ATM / IP			417	x
Circuit			3,273	x
Total - Digital switch			3,690	3,447
Analogue switch			205	144
Total - Switches			3,895	3,591

TABLE 10. Selected Connectedness Indicators, 1998

			1998 Total	1997 Total
Teledensity (wireline and wireless):				
Wireline access to the PSTN			18,771,356	18,352,535
Mobile access to the PSTN			5,354,133	4,265,778
Total - Access to the PSTN			24,125,489	22,618,313
Access to the PSTN per 100 population - %			79.8	74.7
Additional lines based on VGE			522,361	307,342
Total - PSTN access paths (VGE)			24,647,850	22,925,655
PSTN access paths (VGE) per 100 population - %			99.2	75.7
	Residential	Business	1998 Total	1997 Total
Digitalization:				
PSTN Access Lines:				
PSTN lines connected to digital switches	12,535,456	6,143,632	18,679,088	18,250,010
PSTN lines connected to analogue switches	65,107	27,161	92,268	102,525
Total - PSTN Lines	12,600,563	6,170,793	18,771,356	18,352,535
Digital lines as a % of all PSTN lines			99.5%	99.4%
Mobile Access:				
Digital mobile	...	...	1,405,594	468,535
Analogue mobile	...	...	3,948,539	3,797,243
Total - Mobile Subscribers			5,354,133	4,265,778
Digital subscribers as % of all subscribers	...	...	26.3%	11.0%
Total Digital Access to the PSTN - %	...	...	83.3	82.8

TABLE 11. International Trade, by NAICS Telecommunications Industries, 1998

NAICS Industry	51331	51332	51333	51334/9	5133
<i>Thousands of dollars</i>					
Exports - Payments received by Canadian Telecommunications Service Providers from non-residents:					
to the USA	x	x	60,210	31,613	321,909
to other countries	x	x	8,622	17,982	1,157,760
Total - Exports	x	x	68,832	49,595	1,479,669
Imports - Payments made by Canadian Telecommunications Service Providers to non-residents:					
from the USA	x	3,649	x	x	342,507
from other countries	x	x	x	x	1,051,329
Total - Imports	1,361,672	x	x	x	1,393,836
Services trade balance:					
Canada-USA	x	x	x	x	(20,598)
Canada-Other countries	x	x	x	x	106,431
Canada-World	x	x	x	x	85,833

TABLE 12. Long Distance Traffic, NAICS 51331 and 51333, 1998

NAICS Industry	51331	51333	Total
	<i>(Thousands of minutes)</i>		
Calls and messages			
Outgoing - Canada to:			
Canada	18,399,415	2,299,391	20,698,806
USA	x	227,834	x
Overseas	x	76,666	x
Total - Outgoing	23,776,550	2,603,891	26,380,441
Toll free - Canada to:			
Canada	4,612,022	...	4,612,022
USA	x	...	x
Overseas	x	...	x
Total - Toll free	5,142,954	...	5,142,954
Summary of calls originating in Canada, to:			
Canada	23,011,437	2,299,391	25,310,828
USA	3,171,640	227,834	3,399,474
Overseas	2,736,427	76,666	2,813,093
Total - Calls originating in Canada	28,919,504	2,603,891	31,523,395
International incoming to Canada from:			
USA	3,130,495	...	3,130,495
Overseas	1,232,968	...	1,232,968
Total - International incoming	4,363,463	...	4,363,463
Long distance traffic summary:			
Domestic	23,011,437	2,299,391	25,310,828
International			
USA	6,302,135	227,834	6,529,969
Overseas	3,969,395	76,666	4,046,061
Total - International	10,271,530	304,500	10,576,030
Total carriage ¹	33,282,967	2,603,891	35,886,858

¹ excluding transit traffic

TABLE 13. Profit and Loss Statement, NAICS 5133, by Province, 1998

	Newfoundland	Prince Edward Island	Nova Scotia	New Brunswick	Québec	Ontario	Manitoba
<i>Thousands of dollars</i>							
Operating Revenues							
Local telephony	x	x	x	x	1,881,880	3,387,363	327,782
Long distance telephony	123,336	26,078	206,647	158,684	1,291,113	3,175,807	216,861
Packet-switched services	6,069	x	x	x	99,759	374,849	x
Dedicated services (non-switched)	x	x	12,298	x	289,321	777,912	x
Paging	x	x	x	x	98,350	93,166	3,894
Other telecommunications services n.e.c.	x	x	169,857	99,894	2,321,368	1,705,890	80,857
Telecommunications operating revenues	x	86,520	710,341	x	5,981,791	9,514,987	x
Other operating revenues	x	2,674	54,407	x	865,322	1,592,851	x
Total - Operating Revenues	377,378	89,195	764,748	567,379	6,847,111	11,107,840	872,036
Operating Expenses							
Telecommunications operating expenses	242,044	x	546,856	x	5,378,810	9,928,360	679,763
Other operating expenses	25,110	x	31,870	x	339,690	741,016	11,985
Total - Operating Expenses	267,154	x	578,726	449,096	5,718,521	10,669,384	691,748
Operating Profit							
	110,224	x	186,022	118,283	1,128,590	438,456	180,288
(%)	29.2	x	24.3	20.8	16.5	3.9	20.7

	Saskatchewan	Alberta	British Columbia	Yukon	Northwest Territories/ Nunavut	Canada
<i>Thousands of dollars</i>						
Operating Revenues						
Local telephony	x	1,177,136	1,304,934	x	x	9,094,227
Long distance telephony	248,523	905,845	1,145,016	x	x	7,545,558
Packet-switched services	12,215	44,703	65,113	x	x	637,670
Dedicated services (non-switched)	x	158,357	x	x	x	1,578,549
Paging	1,239	19,480	31,078	x	x	258,426
Other telecommunications services n.e.c.	131,306	497,565	662,540	x	x	5,783,626
Telecommunications operating revenues	x	2,803,086	3,382,666	x	x	24,898,056
Other operating revenues	x	294,421	449,168	x	x	3,595,880
Total - Operating Revenues	812,800	3,097,507	3,831,834	x	x	28,493,936
Operating Expenses						
Telecommunications operating expenses	x	2,249,963	2,794,768	x	x	23,065,272
Other operating expenses	x	214,198	195,904	x	x	1,602,931
Total - Operating Expenses	675,472	2,464,161	2,990,643	x	x	24,668,203
Operating Profit						
	137,328	633,346	841,191	x	x	3,825,733
(%)	16.9	20.4	22.0			13.4

TABLE 14. Selected Operating Indicators, NAICS 5133, by Province, 1998

	Newfoundland	Prince Edward Island	Nova Scotia	New Brunswick	Québec	Ontario	Manitoba
Establishments	7	5	17	7	75	154	12
Capital Expenditures (Thousands of dollars)							
Construction	x	x	46,534	x	505,806	923,863	x
Machinery and equipment	x	x	79,486	x	1,026,503	1,583,845	x
Total - Capital expenditures	x	x	126,020	x	1,532,309	2,507,708	x
% of operating revenues	x	x	16.5	x	22.4	22.6	x
Employment (persons)							
Full-time	x	x	x	x	17,099	29,149	x
Part-time	x	x	x	x	2,904	5,294	x
Total - Employment	x	x	x	2,724	20,002	34,444	x
Labour Costs (thousands of dollars)							
Salaries and wages	x	x	x	x	1,076,222	1,834,266	x
Benefits	x	x	x	x	134,972	236,570	x
Total	x	x	x	x	1,211,194	2,070,836	x
Wireless Subscribers (numbers)							
Mobile telephony	x	x	139,148	x	958,397	2,150,227	188,710
Paging	x	x	x	x	540,012	497,751	20,269
Population (persons)	543,970	137,115	937,330	753,885	7,331,970	11,426,050	1,138,689
	Saskatchewan	Alberta	British Columbia	Yukon	Northwest Territories/ Nunavut	Canada	
Establishments	11	34	53	x	x	381	
Capital Expenditures (Thousands of dollars)							
Construction	67,500	260,994	334,571	x	x	2,180,550	
Machinery and equipment	x	533,756	592,662	x	x	4,268,404	
Total - Capital expenditures	x	794,750	927,233	x	x	6,448,954	
% of operating revenues	x	25.7	24.2	x	x	22.6	
Employment (persons)							
Full-time	x	9,287	12,035	x	x	83,278	
Part-time	x	1,363	1,528	x	x	12,185	
Total - Employment	x	10,650	13,563	x	x	95,463	
Labour Costs (thousands of dollars)							
Salaries and wages	x	535,349	578,607	x	x	4,787,691	
Benefits	x	88,505	105,163	x	x	637,835	
Total	x	623,854	683,770	x	x	5,425,526	
Wireless Subscribers (numbers)							
Mobile telephony	x	736,166	842,995	x	x	5,354,133	
Paging	x	95,208	213,255	x	x	1,504,371	
Population (persons)	1,026,244	2,923,205	4,005,856	x	x	30,323,114	

TABLE 15. Household Indicators, by Province, 1998

1998	Estimated number of households (000)	% of household with telephones				% of household with cellular phones*
		At least one phone	One	Two	Three or more	At least one phone
Canada	11,690	98.2	22.7	34.8	40.7	26.1
Newfoundland	195	96.9	21.6	36.9	38.4	14.4
Prince Edward Island	52	98.7	25.6	37.8	35.3	14.6
Nova Scotia	363	97.3	21.2	34.6	41.5	21.5
New Brunswick	287	98.8	24.6	42.0	32.2	18.8
Quebec	3,051	97.6	25.1	36.3	36.2	16.6
Ontario	4,264	98.7	21.1	32.7	44.9	30.1
Manitoba	437	97.8	25.9	35.9	36.0	24.5
Saskatchewan	386	98.5	29.2	37.6	31.7	28.8
Alberta	1,061	98.6	15.3	34.3	49.0	37.6
B.C., and territories	1,567	98.0	24.7	35.6	37.7	30.0

Source: *Spending Patterns in Canada, Statistic Canada, 1998, Catalogue 62-202-XIE*

* Includes cellular phones for personal use. Excludes cellular phones provided by employers.

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The Canadian Telecommunications Industry

Market Shares and Performance - Facts and Figures

by Haig McCarrell, December 2000

Introduction

The deregulation of the Canadian telecommunications industry, and the increasingly competitive environment in which its participants operate, has created a demand for information to monitor the industry's performance in light of these changes. Specifically, there is interest in measuring the market shares held by the various constituents of the telecommunications sector, by the different types of industries,¹ suppliers, and by small and medium enterprises (SME's).

The introduction in 1997 of the *Annual Survey of Telecommunications Service Providers* (which collects information from all types of telecommunications service providers, large and small alike) allows for market share analysis on the basis of official statistics for the first time. This paper focuses on analysing market shares of supplier and size groups. It is a follow-up to the initial telecommunications market analysis presented in the 1997 edition of *Telecommunications in Canada* (Cat. No. 56-203).

Whereas official statistics arranges telecommunications service provider into industries, the analysis here regroups these same companies into supplier groups that are helpful in addressing the questions outlined above. The service providers have been grouped as follows:

- ◆ wireline incumbents,
- ◆ wireline entrants,
- ◆ mobile telephony providers (cellcos),
- ◆ the paging industry, and
- ◆ all other service providers.

This "supplier classification" can be related to the North American Industry Classification System (NAICS)

telecommunications industries². For example, NAICS 51331 - the wired telecommunications industry consists of incumbent and entrant facilities-based carriers. The supplier classification separates incumbent and entrant carriers and adds to the latter group wireline resellers (part of the NAICS reseller industry - 51333), to provide a complete picture of wireline entrants.

The NAICS wireless industry consists of cellcos (cellular, PCS, ESMR and automatic mobile telephony carriers), paging companies and radio common carriers. The first group stands alone as a supplier group and the second group (pagers) has been combined with paging resellers (part of NAICS 51333 - resellers) to create a picture of the paging industry. All other service providers form the last supplier category. These are chiefly satellite facilities providers and satellite resellers.

The other major analytical grouping adopted pertains to the size of the service providers based on their operating revenues:

- ◆ large (> 100 million in revenues),
- ◆ medium (> 10 million and < 100 million in revenues), and
- ◆ small (< 10 million in revenues).

The report also further examines the long distance and paging markets, two of the most competitive markets in the industry. Where possible, 1998 results are compared to those posted last year. The main obstacle in making direct comparisons between 1997 and 1998 arise from accounting changes resulting in moving the industry from regulatory to generally accepted accounting principles (GAAP). Comparisons are only made where the data is consistent between reporting periods.

¹ for a complete analysis of the telecommunications industries, see *Statistics Canada Cat. No. 56-203 (annual statistics)* and *Statistics Canada Cat. No. 56-002 (quarterly statistics)*.

² for further information on the NAICS -see *Statistics Canada catalogue number 12-XPE*.

Supplier market share and performance

In 1998, the telecommunications sector generated nearly \$28.5 billion of revenues. The wireline segment of the industry generated 23.7 billion dollars in revenues - \$20.5 billion by incumbent carriers (86.5% of the wireline total) and \$3.8 billion by entrants (facilities-based and resellers). To date, entrants have grown to account for 13.5% of the wireline market and 11.2% of the whole sector.

Most of the revenues are now earned by facilities-based alternatives, whereas in the early years, the

bulk of entrant activity was reselling. This is reflected in the entrants increase in their share of wireline assets, even over last year. Between 1997 and 1998, total wireline assets increased 5%, at the same time the entrants share of total wireline assets went from 9.9% to 17.6%. Their asset share now stands 30% above their corresponding revenue share. The new assets were financed increasingly by equity rather than debt - with entrants' share of wireline equity also increasing from 5.8% to 10.6% of the total.

TABLE 1. Key statistics - by type of supplier

Supplier category	Wireline					Total
	Incumbents	Entrants	Cellcos	Paging	Residual	
Number of units reporting	59	99	25	42	15	240
	(\$'s, thousands)					
Operating revenue	20,465,950	3,204,732	4,195,270	192,973	435,011	28,493,936
Operating expenses	16,187,805	3,493,099	4,377,368	193,743	416,188	24,668,203
Operating income	4,278,145	-288,367	-182,098	-770	18,823	3,825,733
Net income	1,085,647	-650,475	-739,509	-13,901	-10,477	-328,715
Labour costs	4,207,478	467,698	613,977	47,436	88,937	5,425,526
Capital expenditures	3,536,919	1,113,101	1,423,867	28,236	346,831	6,448,954
Assets	31,810,807	6,793,417	6,716,205	228,320	1,443,035	46,991,784
Equity	13,012,580	1,539,282	-1,151,701	-35,344	386,702	13,751,519
	(persons)					
Employees (full and part-time)	72,642	8,666	11,905	934	1,316	95,463
Employees (FTE)	69,047	8,314	11,307	903	1,303	90,874
Operating statistics and ratios	(%)					
Operating profit margin	20.9	-9	-4.3	-0.4	4.3	13.4
Net income margin	5.3	-20.3	-17.6	-7.2	-2.4	-1.2
Units reporting positive operating profits	98.3	51.5	72	52.4	46.7	65
Units reporting positive net income	91.5	48.5	68	50	46.7	61.3
Labour costs (% of operating revenue)	20.6	14.6	14.6	24.6	20.4	19
Capital expenditures (% of revenues)	17.3	34.7	33.9	14.6	79.7	22.6
	(\$/FTE employee)					
Average remuneration	60,936	56,254	54,301	31,269	68,256	59,704
Revenue per employee	296,406	385,451	371,028	213,770	333,969	313,554
Concentration	(%)					
(% of total revenues)	94.3	91.3	92.9	92.2	99.1	78.4
Supplier shares (% of sector total)						
Number of units reporting	24.6	41.3	10.4	17.5	6.3	100.0
Operating revenue	71.8	11.2	14.7	0.7	1.5	100.0
Operating expenses	65.6	14.2	17.7	0.8	1.7	100.0
Employees (FTE)	76.1	9.1	12.5	1.0	1.4	100.0
Labour costs	77.5	8.6	11.3	0.9	1.6	100.0
Capital expenditures	54.8	17.3	22.1	0.4	5.4	100.0
Assets	67.7	14.5	14.3	0.5	3.1	100.0
Equity	94.6	11.2	-8.4	-0.3	2.8	100.0

The growth in assets are directly related to the growth in **capital spending**. This is particularly important for entrants which are making large investments to build their networks. Even though the incumbents account for nearly 55% of sector capital spending, this translates to 17.3% of their operating revenues whereas the entrants' 17.3% of total sector spending represents 34.7% of their revenues. Although the high spending by incumbents reflects their commitment to keep abreast of technological changes, the entrants clearly have a challenge in even establishing a presence in incumbent operating territories.

The capital investment and resulting asset position of the entrants was not rewarded with positive profits. **Operating income** increased 4.6% to nearly \$4.3 billion for the incumbents, but pushed further into the red for the entrants. Losses doubled, falling from -\$143.7 million in 1997 to -\$288.4 million in 1998.

The other major provider of telecommunications is the **mobile telephony industry**. These services are a potential direct competitor (substitute) to fixed (wireline) services. To date it appears these products have complemented the fixed telecommunications services - leading to an overall expansion of the market for telecommunications services. By most size measures, mobile telephony providers are the second largest suppliers of telecommunications in Canada. Mobile telephony companies account for 14.7% (\$4.2 billion) of sector revenues and 12.4% of sector employees (full-time equivalents). This sector showed very strong investment in 1998, spending just over \$1.4 billion, or an amount equivalent to one-third of its revenues. Despite having revenues 30.9% higher than the wireline entrants - the two supplier groups' assets are almost identical (\$6.7 billion). Its equity position, however, is negative (-\$1.2 billion), reflecting accrued losses from 1998 and 1997.

Overall, the **ten largest service providers** account for 78.4% of total sector revenues, a marginal increase from last year when the top ten reporters accounted for 77.3% of total revenue. In keeping with last year's results, the individual market segment shares are quite concentrated. Over 90% of revenues accrue to each of the wireline incumbent, entrant, cellco, pager and residual market segments top ten revenue earners.

Each market segment reported similar results or small increases in **concentration** based on this measure except for cellcos, which saw their top ten providers share of total revenues drop from 96.9% to 92.9%. The most concentrated market share is the residual group (mainly satellite services providers) whose top ten providers accounted for 99.1% of revenues. These measures, especially in the case of wireline providers, tend to under reflect the true extent

of market concentration because the data as it is presented assumes a national telecommunications market. The wireline sector markets in particular are largely sub-national with most markets reflecting the incumbent carriers' traditional operating territories (provinces). The wireless markets tend to cross provincial boundaries - so the measures presented are more reflective of the competitive environment facing these various service providers.

A high level of concentration does not guarantee profitability. Even though each market segment is similarly and highly concentrated, only about half of wireline alternative, pagers and satellite companies had positive operating income in 1998. In marked contrast, 98.3% of incumbent carriers were profitable and 72% of cellcos were profitable. The comparatively high number of profitable units in the cellco market segment still resulted in overall losses for the group of \$182 million compared to the incumbents who reported \$4.2 billion in operating profits.

The telecommunications sector is an important employer. In total 95,463 persons were employed, or approximately 90,874 persons on a full-time equivalent (FTE) basis. Incumbent carriers have a higher proportion of **employees** than their share of the market activity would suggest. This may reflect operating realities of this market segment. The wireline alternatives, which employ similar infrastructure to the incumbents, reported a smaller share of total employees (FTE) (9.1%) than their share of total operating revenues (11.2%). This also shows up in their high level of **revenue per employee** compared to the incumbents. Wireline entrants reported \$385,451 of output (revenue) per employee (FTE) compared to the incumbent telcos which reported \$296,406 per employee (FTE). This probably reflects the fact that facilities-based entrants tend to target business customers over residential customers, which yield higher revenues and therefore higher returns per employee. Cellcos also had a high output employee (\$371,028) - well above the sector average of \$313,554.

Paging companies had the lowest revenue per employee, \$213,770, as well as the lowest employee remuneration (salaries, wages and benefits) (\$31,269). Employee remuneration was not solely dependent on employee output. The wireline alternatives and cellcos, with the highest outputs per employee had lower average employee remuneration below that of the incumbents. The highest average employee remuneration (\$68,256) were earned in the satellite sector. Despite paging companies paying substantially less to employees on average, their labour costs as a share of their revenues was the highest (24.6%). This contrasts to that of the high

wage paying alternatives and cellcos whose wage bills were only 14.6% of their revenues.

Firm size - Market share and performance

The Canadian telecommunications industry, like most telecommunications industries around the world, has been dominated by large service providers holding a territorial monopoly. Opening the telecommunications market to competition has provided an opportunity for smaller firms to play a more prominent role. The table below provides basic financial and operating statistics

by firm size. Nearly nine out of ten firms in the telecommunications sector were of small or medium size - small and medium enterprises (SME's). The majority of SMEs fall into one of the following categories: independent local telephone companies, independent paging companies, resellers of wireline services and resellers of satellite services. Their presence is most significant in the *reseller* industry where they accounted for 74% of total revenues. At the opposite end of the spectrum, SMEs generated only 2.2% of total revenues of facilities-based wireline carriers.

TABLE 2. Key statistics - by firm size

Supplier category	Large > \$100 Million	Medium > \$10 million to \$100 million	Small \$10 million and smaller	Total
Number of units reporting	27	43	170	240
(\$'s, thousands)				
Operating revenue	26,658,279	1,546,481	289,176	28,493,936
Operating expenses	22,436,648	1,915,682	315,873	24,668,203
Operating income	4,221,631	-369,201	-26,697	3,825,733
Net income	346,697	-644,271	-31,141	-328,715
Labour costs	5,043,616	323,192	58,718	5,425,526
Capital expenditures	5,110,901	1,299,976	38,077	6,448,954
Assets	41,109,230	5,152,666	729,888	46,991,784
Equity	12,967,727	487,174	296,618	13,751,519
(persons)				
Employees (full and part-time)	86,611	7,439	1,413	95,463
Employees (FTE)	82,256	7,144	1,305	90,705
Operating statistics and ratios (%)				
Operating profit margin	15.8	-23.9	-9.2	13.4
Net income margin	1.3	-41.7	-10.8	-1.2
Units reporting positive operating profits	77.8	60.5	64.1	65
Units reporting positive net income	55.6	65.1	61.2	61.3
Labour costs (% of operating revenue)	18.9	20.9	20.3	19
Capital expenditures (% of revenues)	19.2	84.1	13.2	22.6
(\$/FTE employee)				
Average remuneration	61,316	45,240	44,995	59,704
Revenue per employee	324,090	216,462	221,590	313,554
Firm size group shares (%)				
(% of sector total)				
Number of units reporting	11.3	17.9	70.8	100.0
Operating revenue	93.6	5.4	1.0	100.0
Operating expenses	91.0	7.8	1.3	100.0
Employees (FTE)	90.7	7.9	1.4	100.0
Labour costs	93.0	6.0	1.1	100.0
Capital expenditures	79.3	20.2	0.6	100.0
Assets	87.5	11.0	1.6	100.0
Equity	94.3	3.5	2.2	100.0

Despite their numerical importance, SME's totalled only 6.4% of sector revenue, while employing 9.3% of the sector's workforce. This translates to output per employee being about one third less than large companies. The lower productivity also shows up in an employee remuneration approximately 26% lower than that of large companies.

SME operating and net incomes were in the red in 1998 as was the case in 1997. For 1998, operating income losses increased from \$245 million to \$396 million. In comparison, large firms posted positive operating profits in 1998 and 1997, however they also declined from 1997 (\$4.6 billion to \$4.2 billion). In 1998 large firms operating incomes were 15.8% of their operating revenues while the SME's margin was -10.3%.

The micro profit picture differs from the macro (aggregate) picture and is more complicated in 1998 than 1997. Whereas last year, the smaller the firm, the less likely it was to be profitable, in 1998 the large firms were still the most likely to earn an operating profit but small firms were more likely to report operating profits than medium sized firms.

The number of firms reporting operating profit this year declined in every category but most noticeably among large firms. Only 77.8% of large firms reported operating profits in 1998 compared to 95.7% in 1997. The corresponding values for small and medium firms was 60.5% and 64.1%, respectively, this year, compared to 68.6% and 66.1%, respectively, in 1997.

The net income results by firm size runs counter to the operating income results. Medium sized firms were the most profitable (65.1%), followed by small firms (61.2%) and lastly large firms (55.6%). Net income reflects non-operating activity and is more likely to be more volatile than operating income - so these results cannot be considered to be reflective of any trend.

The telecommunications sector is going through a transitional period as the sector continues to restructure. This is most evident in the fact that medium sized firms capital expenditures were 84.1% of their revenues. Clearly, they and their investors anticipate growth that would justify this activity. In comparison the large and small enterprises capital spending was the equivalent of 19.2% and 13.2% of their revenues.

The long distance market

The Canadian long distance market was \$7.5 billion in 1998, 26.5% of all revenues earned by telecommunications services providers. This market has been, and remains, at the centre of the new competitive environment in the telecommunications sector. Prior to 1992, this market was almost entirely

held by wireline local telephone companies. By 1998, this share had dropped to 66.7 per cent, relatively unchanged from 1997 (when incumbent share was 66%). Alternative wireline service providers claimed a 28.4% share (down from 30% in 1997) whereas wireless service providers increased their share from 4% to 4.5% (there was a .4% residual earned by satellite and other companies).

Figure 1. Long distance market shares

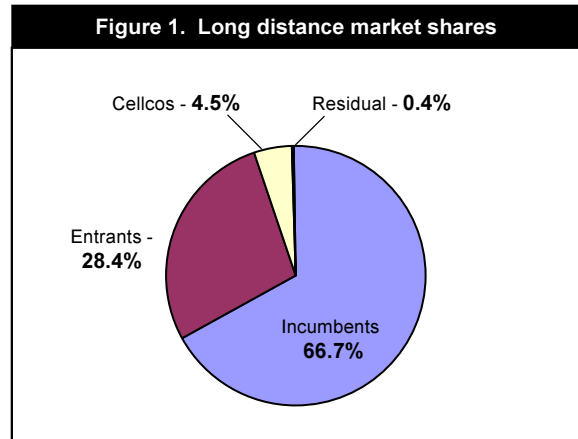
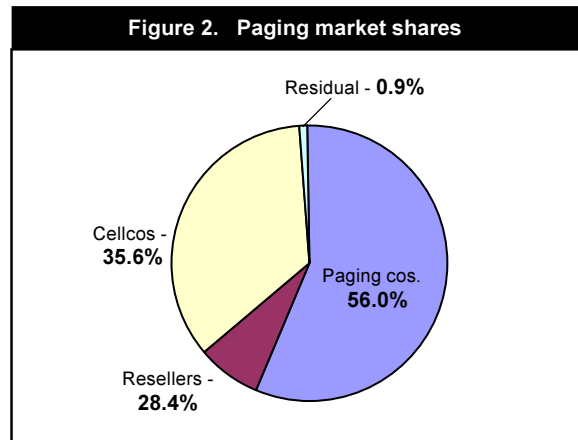


Figure 2. Paging market shares



The paging market

The Canadian paging market grew just over 15% from last year and is valued at \$258.4 million in 1998. Paging companies held the greatest share (56%) of this market, followed by cellco paging operations (35.6%) and paging services resellers (7.5%). A residual amount of 0.9% was reported by companies having a main activity in other telecommunications industries.

Conclusion

The Canadian telecommunications industry has rapidly evolved since the introduction of market liberalization in Canada. New players joined the industry, existing players merged, and inevitably, some players will exit. Largely as a result of an Industry Canada - Statistics Canada partnership in redeveloping the former telephone survey, it is now possible to assess the relative importance of these players.

An additional feature that is expected to enhance the understanding of the state of competition in the marketplace is the introduction of provincial competitiveness indexes for various market segments, products and size groupings. This will enable policy makers and other analysts to track the changing nature of the industry, the economic impacts and market shares of the different types of entities, as well as how each of them performs with respect to other industry participants.

ABOUT THE SURVEY

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Survey Objectives

The Survey of Telecommunications Service Providers collects financial and operating data for the statistical measurement and analysis of the telecommunications industry. These data are aggregated to produce estimates of national and, where feasible, provincial economic production in Canada, as well as estimates of activity by industry. These estimates are used by:

- government for national and regional programs and policy planning,
- the private sector for industry performance measurement and market development, and,
- international telecommunications organizations and the general public to better understand this sector's role in the social and economic fabric of Canada.

Survey Coverage

This survey is a census of business establishments in Canada where the main revenue activity is the provision of telecommunications services (the transmission of voice, data, text, image and video). These companies may also provide services closely related to their provision of telecommunications services such as directory publishing, equipment rental and sales, equipment installation, consulting, etc.

The target universe for the survey corresponds to companies classified to the North American Industry Classification System (NAICS) for the Telecommunications Industry (5133).

The NAICS Telecommunications Industry is differentiated into five constituent industries: Wired (51331); Wireless (51332); Reseller (51333); Satellite (51334)

and Other (51339)¹. The Wired industry includes incumbent telcos such as Bell Canada and SaskTel; alternative facilities-based providers such as AT&T Long Distance Services and competitive access providers, e.g., Fundy Communications - Telecom Division; and independent providers such as Prince Rupert Telephones, Ontario Northland and Co-op de Téléphone de Valcourt. Wireless companies include cellcos such as Rogers Cantel AT&T, Telus Mobility and MT&T Mobility, and paging companies, such as Pagemart and Northstar. Resellers resell wireline and wireless services such as long distance telephony and paging. Resellers also include single hop or extended area services companies. The reselling of satellite services are not part of the Reseller industry but are part of the Satellite industry along with Canada's satellite carrier, Telesat Canada. Lastly, companies which do not clearly fall into one of the designated groups above are classified into the 'Other' telecommunications industry.

The following table indicates the number of respondents to the 1998 Annual Survey of Telecommunications Service Providers, by 5-digit NAICS category:

NAICS Category	NAICS Code	Number of Respondents	
		1997	1998
Wired Telecommunications Carriers	51331	67	68
Wireless Telecommunications Carriers	51332	60	65
Telecommunications Resellers	51333	110	96
Satellite and Other Telecommunications	51334/9	17	11
Total	5133	254	240

¹ The NAICS was jointly developed by Canada, the United States and Mexico, to reflect the industrial structure of the North American economy for reference year 1997. Reporting units are classified according to the activity in which they are primarily engaged and the main technology they employ. This system will allow for more comprehensive coverage of the industry than the previous 1980 Canadian Standard Industrial Classification (SIC). For further details about NAICS and for industry concordance between NAICS and the SIC at all levels, consult Statistics Canada publication 12-501-XPE, issued number 97001.

The wired (wireline) industry comprises establishments primarily engaged in operating and maintaining switching and transmission facilities to provide direct communications via land lines, microwave, or a combination of land lines, microwave and satellite link-ups. Under the Telecommunications Act, companies classified to this industry own and operate facilities such as wires and cables for the transmission of intelligence. Service providers owning only switching apparatus are not considered to be carriers or to have facilities and instead would be classified as resellers.

The wireless telecommunications industry comprises establishments engaged in operating and maintaining switching and transmission facilities to provide direct communications via the airwaves, including cellular, personal communications services (PCS), enhanced specialized mobile radio (ESMR), and messaging (paging).

The telecommunications reseller industry comprises establishments primarily engaged in purchasing access and network capacity from owners and operators of telecommunications networks and reselling telecommunications services to their clients. These establishments do not operate or maintain a full network.

The satellite industry comprises establishments primarily engaged in operating, maintaining and providing access to fixed and mobile satellite telecommunications facilities for the transmission of voice, data, text, sound and full motion videos. Resellers of satellite communications are also included.

The 'Other telecommunications' industry includes companies providing telecommunications services not covered by the industries described above (e.g., telemetry, satellite tracking, radar stations operations).

The redesigned survey significantly expands coverage from previous years. Resellers, satellite telecommunications providers and paging companies (part of the wireless industry) were surveyed for the first time starting in 1997 and radio common carriers (dispatch telecommunications services) were added for the 1998 reference year. This latter change did not significantly add to the frame because most companies providing these services provide non-telecommunications services as well which tend to be more dominant and therefore do not qualify them to be included in this survey.

Survey Methodology

Data in this publication is obtained from the Annual Survey of Telecommunications Service Providers, a census of all telecommunications provisioning companies (whether publicly or privately controlled, including co-operatives, municipal corporations and foreign-owned companies operating in Canada). This survey is the result of a redesign process to reflect regulatory, market, technological and statistical innovations in the past two decades. The redesign process was undertaken in conjunction with an Advisory Group consisting of representatives from industry, academia and government. The new survey replaced the annual telephone survey, designed in 1971 and updated in 1987, which initially only surveyed the wireline industry.

Because the new survey was intended to cover all telecommunications activity as described in the new NAICS, a new expanded survey universe needed to be established. This was developed using Statistics Canada's Business Register and telecommunications survey programs, CRTC registration lists, Industry Canada licensing data bases, industry directories and trade publications. Several thousand companies were vetted: each company's activity was verified by telephone contact and is subject to ongoing regular updating.

The standard fiscal year for most telecommunications companies is the calendar year. Because of development of a new survey vehicle, survey management and data processing system, the surveys were not mailed out until the summer of 1999. Most companies mailed or faxed their responses, although data was collected from some small operators over the phone. Tax records were accessed for some companies which were not able to comply with reporting deadlines. The first preliminary release was made in March, 2000 for the wireless sector and all NAICS industries were released in August, 2000.

In conducting the survey eight forms were used, a long or detailed version for larger companies and a short for

smaller companies for wireline and wireless providers, and then one form for each of the reseller, satellite, RCC/paging and 'other' industries. Respondents were asked to complete all sections that were applicable to their operations. The questionnaires consisted of up to nine modules designed to complete a comprehensive picture of each company's operations: operating revenues, operating expenses, an income statement, a balance sheet, capital expenditures, employment, international trade (in services), network infrastructure and traffic. Companies with operations (employees) in more than one province or territory were provided with an appendix to record provincial detail.

Survey questionnaires can be seen at our website: www.statcan.ca/english/concepts/pdf/science.htm and clicking on the appropriate telecommunications surveys. Only long versions of the annual are available at the website, but all the telecommunications questionnaires are derived from these two forms.

Quality and Limitations of Data

Statistics Canada does not control the sources of data. The data supplied by the respondents relating to their finances and operating systems are considered to be of good accounting quality. Nearly 1800 communications (telephone calls, letters, faxes and e-mails) were recorded in the collection and follow-up editing of the survey questionnaires. Despite attempts to obtain complete responses, non-response, in whole or in part occurred. In these instances, tax records were used to supply the missing data and where this was not possible, data was imputed based on results from respondents that had similar operating characteristics to the firms that could not respond or based on related data provided by the respondent. Imputation was mainly undertaken for smaller respondents whose operations had a limited impact on aggregate results.

Most respondents reporting operations in more than one province or territory were able to provide some provincial disaggregations of their data, as requested. Provincial information on operating revenue and labour costs could also be found in the tax records, which were used to estimate other missing variables. The data-source table (p. 27) shows how much of total industry activity for selected variables is attributable to survey or administrative sources or was imputed.

Annual data published prior to 1997 is not necessarily comparable to data presented in this publication due to changes in the industry classification to reflect the NAICS, as well as changes in the survey frame to expand survey coverage. Starting in 1997, Satellite and Reseller industries, alternative and competitive access providers in the wireline industry, and new mobile

telephony licensees and paging companies in the wireless industry, were included in the survey. In general, aggregate financial data and network infrastructure relating to access lines and wireless subscribers are consistent with concepts used in previous years.

Starting in 1998, respondents reported intra-industry transactions (interconnection and contribution) on a gross basis rather than on a net basis. For this reason, total operating revenue and total operating expenses cannot be compared between 1998 and previous years. Net income, as well as operating revenues and expenses for many commodity activities or expense line items are not affected, nor are other variables relating to employment, capital expenditures, the income statement, traffic, international trade or infrastructure which can be meaningfully compared to last year's results.

Another problem regarding the publication of data is

confidentiality. The smaller the geographic, industry or other characteristic considered, the more problematic the release of data potentially becomes owing to confidentiality concerns. This particularly effects the release of provincial detail, but it also impacts the release of data by NAICS industries, hence the grouping together of the Satellite industry (NAICS 51334) with those of 'Other' providers (NAICS 51339). Statistics Canada does not release data they may directly or residually disclose information pertaining to an individual respondent's operations without that respondent's written consent.

Revisions

Revisions are made periodically to reflect corrections in the data. Revisions come about as more complete data becomes available or when respondents contact Statistics Canada to report errors in data previously reported. 1998 represents the second year of the redesigned survey so it is anticipated that there will be fewer revisions than with 1997 data - which has yet to be revised based on this year's results.

Cell description	Data Source (%)		
	Survey	Administrative	Imputed
Total LD revenues - National level	97.45	-	2.55
Total LD revenues - Provincial level	94.35	-	5.65
Total Operating revenues - National level	99.46	0.52	0.02
Total Op. revenues - Provincial level	92.95	0.05	7.01
Paging subscribers - National level	90.34	-	9.66
Paging subs. - Provincial level	88.75	0.86	10.39
Total Operating expenses - National level	99.39	0.53	0.08
Total Operating expenses - Provincial level	82.11	0.38	17.51
Switching equipment (Assets) - National level	96.74	-	3.26
Total Assets - National level	99.51	0.48	0.01
Construction expenditures - National level	99.89	0.06	0.05
Const. exp'd - Provincial level	84.30	0.06	15.59
Total Employees - National level	98.72	0.04	1.23
Total Employees - Provincial level	93.70	0.29	6.01
Total Labour costs - Provincial level	93.08	0.77	6.15
PSTN Access lines - National level	99.81	-	0.19
PSTN Acc. lines - Provincial level	99.68	-	0.32

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GLOSSARY OF TERMS

Advanced services ratio. The ratio of operating revenues from software enhanced telecommunications services (e.g., calling features), services supporting internet and packet-switched communications, and other high speed applications (switched and non-switched services), and traditional telephony (local and long distance voice, connection and narrowband non-switched or private line services).

Alternative providers of long distance services. Non-incumbent (entrant) facilities-based and non-facilities-based (resellers) companies providing long distance telecommunications services.

Average labour costs per FTE employee (annualized). Total industry labour costs (wages, salaries and benefits paid to full-time and part-time employees) divided by the number of full-time equivalent employees. This calculation is a moving average, such that previous quarter data is included in the current quarter calculation, and adjusted to arrive at an annual estimate. The first quarter estimate is multiplied by four, the second quarter estimate is calculated by summing labour costs for the first two quarters divided by the average number of FTE employees for both quarters, and multiplying that result by two, etc.

Average revenue per long distance minute. Long distance operating revenues divided by long distance outbound minutes (including toll-free).

Broadband access. High capacity two-way links between end-user and suppliers networks (central offices) such as hybrid-fibre-coaxial-cable systems, fibre-to-the-curb and fibre-to-the-home systems for residential users, with speed in one direction exceeding 1.544 Mbps.

Calling Features. Specialized software and database applications linked to telecommunications networks such as call waiting, call forwarding, caller identification, three way calling, speed dialing, etc.; call management services: call display, call return, call screen, call blocking, automatic call-back, etc.; and, tele-messaging: call answer, extension call answer, voice mail, voice menus, etc. These features are commonly offered on a per-use, or on fixed monthly charge basis. Calling features are also referred to as optional or enhanced local services).

Calls/messages, Outbound. Calling/messaging units originating in Canada and terminating in Canada, the United States, and overseas (foreign countries other than the United States).

Calls/messages, Incoming/Inbound. Calls/messages from either the United States or overseas (foreign countries other than the United States) and terminating in Canada.

Capital expenditures per subscriber. Dollar amount of wireless capital expenditures for every wireless subscriber.

Carrier services. Services provided to other telecommunication service providers (common carriers or resellers). This includes contribution, interconnection and other services provided to telecommunications service providers such as co-location, access to support structures, data base access, the recovery of start-up costs, other unbundled elements associated with the provision of dial tone, etc.

Cellular telecommunications. A telecommunications system that uses radio frequencies in the 800 MHz (megahertz) frequency band to provide mobile access to the PSTN (public switched telephone network). Cellular telecommunication can use either analogue or digital transmission technology over a multi-cell architecture.

Circuit. A facility consisting of the equipment and apparatus required to form a path suitable for the transmission of voice, text, audio, video or data communication between telephones and other communication equipment in the telecommunications network.

Connection. The one-time activation of telecommunications subscribers by connecting or reconnecting them to the PSTN. This does not include premises wiring.

Contribution. Payments (per minute or per circuit) derived from domestic and international long-distance telecommunications revenues to cover the revenue shortfall in the provision of local/access services.

Conversation minutes. The actual elapsed period in minutes a respondent's switches, circuits, lines or groups of lines are in use, or in the case of rebillers, the actual conversation time their customers use for calls and messages. Billing increments other than conversation time were converted to conversation minutes and reported by respondents accordingly.

Data and high speed services. This includes all wideband and broadband services (greater than 64 kbps), as well as narrowband packet-switched services. Wholesale internet services are not reported separately, and are included here.

Dispatch services. Non-switched services provided by radio common carrier (RCC) license holders for the provision of radio communications services (e.g., dispatch services for taxis or field service personnel, mobile data for police departments, etc.).

Employee. Any person drawing pay for services rendered or for paid absences and for whom an employer must complete a Revenue Canada T4 Supplementary Form. This includes full-time (work performed or paid absence of 30 or more hours in a typical work week) and part-time employees (work performed or paid absence of less than 30 hours a week), working owners, directors, partners and other officers of unincorporated businesses. It excludes owners or partners of unincorporated businesses, the self employed, unpaid family workers, persons outside Canada and casual workers for whom a T4 is not required.

Enhanced Specialized Mobile Radio (ESMR). A telecommunications system that uses radio frequencies primarily in the 800 MHz frequency band to provide mobile dispatch services and mobile access to the wireline PSTN. ESMR uses digital transmission technology over a multi-cell network architecture. Its activity is reported as part of mobile telephony.

Establishment. A telecommunications service provider which is an operating entity capable of reporting basic elements of financial and network statistics, such as revenues, (wireless) operated.

Facilities-based operator. A telecommunications service provider that owns or operates any transmission facility (wire, cable, radio, optical, or other electromagnetic system, or any similar technical system) for the transmission of intelligence (signs, signals, writing, images, sounds or intelligence of any nature) between network termination points.

Fixed wireless. The use of radio frequencies for the provision of telecommunication services from a fixed place. This is used for access to the PSTN in remote areas or for alternative access to the PSTN in built-up areas. In these circumstance, fixed wireless is known as wireless local loop (WLL). Fixed wireless can use either digital or analogue transmission technology.

Fringe benefits. Employer contributions to pension plans, medical and other welfare plans, unemployment insurance, Canada and Quebec Pension Plans and

workers compensation. Not included are non-taxable benefits provided by an employer such as premiums under a private health plan, recreational facilities, moving expenses and certain employee counselling services. Reported with **Labour costs**.

Full-time equivalent (FTE) employees. Full-time employees plus part-time employees converted to full-time equivalents. For this survey, this is calculated by dividing total part-time labour costs by the average full-time salary (full-time labour costs divided by full-time employees).

Interconnection. Services and facilities beyond the point of interconnection (such as switching and aggregation) to terminate traffic on behalf of an originating telecommunications service provider. This includes transiting or transport where provided pursuant to an interconnection tariff or agreement. Interconnection occurs between local exchange carriers (LEC s) and interexchange service providers (IXC s), including alternative providers of long distance services (APLDS), LEC s and wireless service providers (WSP s), and between domestic and foreign service providers.

Labour costs. The total remuneration paid to employees before deductions (the equivalent to the taxable employment income reported in Box 14 of the employees Revenue Canada T4 slips). This includes regular wages and salaries, overtime pay, paid leave, taxable allowances and benefits, gratuities, director's fees, vacation pay and special payments such as bonuses and commissions, retroactive and accumulated wage payments, termination/severance payments, cost of living adjustments and working owner's draws, for expensed or capitalized labour. This also includes fringe benefits (see **Fringe benefits**). Readers should note that the amount reported as part of Operating expenses may differ from what is reported in the labour cost section, since the latter may include payments for labour that are capitalized.

Local switched telecommunications. The switching and transmission of voice, data, image and video messages over the PSTN within local calling areas.

Long-distance switched telecommunications. The switching and transmission of voice, data, image and video messages over the PSTN between local calling areas.

Messaging. An interactive telecommunications service that provides for information interchange among users by means of store-and-forward, electronic mail, or message-handling functions such as paging and narrowband PCS. Telephone answering services are not included.

National industrial employment. Total national employment from Statistics Canada's Survey of Employment, Payrolls and Hours (SEPH). The target population is composed of all employers in Canada, except those in agriculture, fishing and trapping, private households services, religious organizations and military personnel of defence services. This figure does not include self-employment. For further information see Statistics Canada Catalogue No. 72-002-XPB.

Narrowband PCS. A telecommunication system that uses radio frequencies in the 900 MHz frequency band to provide one or two-way messaging services. This service uses digital transmission technology with radio frequency channels of 50 kHz (kilohertz) or less.

Net income before taxes. Total revenues (operating revenues plus non-operating revenues) less total expenses (operating expenses plus non-operating expenses).

Network access service. Primary connection to a company owned network for the purpose of telecommunications, regardless of the physical characteristics of the link. This includes individual and party line circuits; trunks connecting company facilities with switching devices located on customers premises; licensed radio-telephones; primary connections within networks (i.e., drops); WATS; and primary special services circuits.

Non-switched telecommunications. Dedicated communication lines or paths between specified points for the exclusive use of the lessees or owners typically not involving the PSTN for routing or switching the communication, e.g., private voice and data networks linking multiple business locations, dedicated links for transferring high-resolution video, etc.

Non-PSTN Lines. Telecommunications lines not connected to the PSTN, e.g., non-switched transport services such as low-speed data links for automated teller machines; private voice and data networks linking multiple business locations; and dedicated links for transferring high-resolution video. Analogue lines (voice, sub-voice) are typically used for alarm monitoring, traffic control, point-of-sale terminals, etc.

Operating profit. Total operating revenues less total operating expenses.

Operating revenue per capita. Industry operating revenue per person based on the quarterly population estimate.

Packet switched telecommunications. Voice, data or video telecommunications that are divided into packets of fixed or variable length to be routed along non-reserved circuits to their destination. Each packet is addressed and numbered so it can be routed to its proper destination and reassembled in its proper sequence upon its arrival. These packets typically follow various routes depending on what is available at the time, which maximizes the network's operating efficiency.

Paging. A one-way telecommunications system that provides signaling or information transfer by such means as tone, tone-voice, tactile, or optical read-out. Analogue or digital transmission technology may be used.

Paging revenue per subscriber. Paging revenues per paging subscribers (does not include undercoverage estimate).

Personal Communications Services (PCS). Mobile telecommunications using radio frequencies in the 1900 MHz frequency band connected access to the PSTN. PCS uses digital transmission technology over a multi-cell network architecture.

Public Switched Telephone Network (PSTN). The worldwide dial-up telephone network (switching, circuits, transmission and access services), or a portion of that network, used to establish voice and non-voice (text, audio, video or data) communications carried over a path initially established using normal telephone signaling and ordinary switched long-distance telephone circuits.

PSTN, Centrex access lines. A business telephone service offered by a service provider that permits direct inward dialing to a customer's extensions, transfer of incoming calls from one extension to another, and identification of extension telephones for billing of long-distance calls. Centrex is based on switching equipment usually located on the service providers' premises.

PSTN, Individual access line. A subscriber line arranged to serve one main telephone. This includes PBX (private branch exchange) lines for businesses that have corresponding dedicated ports in the telephone exchange equipment.

PSTN, ISDN access line (Integrated Services Digital Network). A high capacity digital line the equivalent of 2 (BRA) or 23 (PRA) voice grade lines. These are counted as single lines despite their greater capacity. See voice-grade equivalents for a measure that is frequently used to take into account the enhanced capacity of these lines.

BRA (Basic Rate Access) access lines deliver two 64 kbps channels (B channels) and one 16 kbps channel (D

channel) over a standard twisted-pair loop. The 64 kbps channels are capable of transmitting voice or data simultaneously while the D channel transmits call control messages and packet data at 9.6 kbps.

PRA (Primary Rate Access) lines can transmit at 1.544 Mbps (T1 trunk facility) consisting of 23 64 kbps B channels and one 64 kbps D channel. The B channels carry voice and data at 64 kbps while the D channel carries out-of-band signaling for one or more primary rate links.

PSTN access paths per FTE employee. Access lines for the wireline industry and mobile subscribers for the wireless industry, per full-time equivalent employee in the respective industries.

PSTN, Other access lines. Wireline access lines not specified by any of the defined categories (individual, ISDN, public, centrex) such as WATS, Mobile access lines (this is not the same as mobile telephony subscribers).

PSTN, Party access line. A subscriber line arranged to serve two or more main telephones (e.g., residential party lines).

PSTN, Public telephones. Coin or card payphones including semi-public phones (payphones available to the public on a restricted basis owing to their location, e.g., those on private premises such as restaurants).

Reseller. A telecommunications service provider primarily engaged in purchasing access and network capacity from owners and operators of telecommunications networks and reselling telecommunications services to their clients. Resellers may own some network facilities such as switching equipment or apparatus to manipulate and control intelligence but do not operate or maintain a full network, nor own transmission facilities such as wire, cable, radio or optical systems.

Retail Internet services. The value reported in these quarterly reports represents only a small part of retail internet services in Canada, as most telecom companies have subsidiary companies or separate operating divisions (ISP's - Internet Service Providers), which are not telecommunications industries according to the North American Industry Classification System (NAICS).

Revenue per FTE employee. Total operating revenues per full-time equivalent employee.

Satellite, fixed. Communications via satellite transmission in which the terrestrial terminal points are fixed.

Satellite, mobile. Communications via satellite transmission in which the terrestrial terminal point can be mobile.

Subscriber. A customer of a wireline or wireless telecommunications service provider having unique access to the PSTN.

Switching equipment. Digital and analogue equipment and related software used to switch traffic over the PSTN. PBX s used as public switches are included whereas PC's used as switches are excluded.

Telecommunications. Any transmission, emission or reception of signs, signals writing images, sounds or intelligence of any nature, by wire, radio, visual or other electro-magnetic system.

Telecommunications, wireline (wired). Establishments primarily engaged in operating and maintaining switching and transmission facilities to provide direct communications via land lines, microwave, or a combination of land lines, microwave and satellite link-ups.

Telecommunications, wireless. Establishments engaged in operating and maintaining switching and transmission facilities to provide direct communications via the airwaves.

Telecommunications, other. Establishments primarily engaged in providing specialized telecommunications services such as satellite tracking, communications telemetry and radar station operation. The includes establishments primarily engaged in providing satellite terminal stations and associated facilities connected with one or more terrestrial systems and capable of transmitting telecommunications to, and receiving telecommunications from, satellite systems.

Teledensity. A measure of the number of phone lines (fixed access lines and mobile subscribers) per 100 of population. Between 40 and 50 lines per 100 of population indicates fairly good density. The OECD average was 48.9 in 1997. Teledensity is a measure of a country's economic development.

Telemetry. The measurement or recording of an activity from a distance by monitoring equipment connected to a telecommunications network.

Telephone. A compact unit containing the parts necessary for the transmission and reception of speech and for ringing or signalling the party called, and which can be interconnected to any other such unit in the general telephone network.

Terminal equipment. Equipment on customer premises connected to telecommunications lines: e.g., PBX's not used for public switching, telephone sets, routers, modems in customer sites, key systems, etc.

Voice services. Services generally associated with voice communication, narrowband or voice-grade communication, including voice telephony, fax, PSTN access, etc.

Voice-grade. A voice-grade access line can transmit voice or data at 64 kbps. They also transmit communications in an audio frequency range between 300 and 3000 Hz, typical of the human voice.

Voice-grade equivalents ('B channel' equivalents). Refer to how many voice-grade lines would be needed to provide the same or equivalent bandwidth to the line in question. ISDN BRA lines (bandwidth = 144 kbps) are the equivalent of 2 voice-grade lines while ISDN PRA (bandwidth = 1.544 Mbps) are the equivalent of 23 voice-grade lines.

Wide area telephone service (WATS). Service provided by a telephone company enabling a subscriber to dial certain distant exchanges on either a flat rate or a measured time charge basis.

Wideband. Telecommunications of bandwidth greater than 64 kbps up to and including 1.544 Mbps. A telecommunications path with 2 way capabilities with speed in at least one direction fitting the criteria described above.

Wireless Broadband Services. A multipoint telecommunications systems that use radio frequencies to allow the transmission and/or reception of information such as multimedia, data, and video over radio frequency channels of 50 kHz or greater (e.g., LMCS). Either digital or analogue transmission technology is used.

FOR FURTHER READING

Selected Publication from Statistics Canada

Title	Catalogue
Cable Television - <i>Annual</i> , Bilingual	56-205-XIB
Canadian Economic Observer - <i>Monthly</i> , Bilingual	11-010-XPB
Broadcasting and Telecommunications - <i>Service Bulletin</i> , Occasional, English or French	56-001-XIE
Detailed average household expenditures by size of area of residence of Canada (10 provinces) - Standard table (Family expenditures, household facilities and equipment) - <i>Annual</i> , Bilingual	62F0035XPB
Innovation Analysis Bulletin - English or French	88-003-XIE
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