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Driving Canada's productivity: The impact of the telecom sector and its role in improving productivity

June 2024

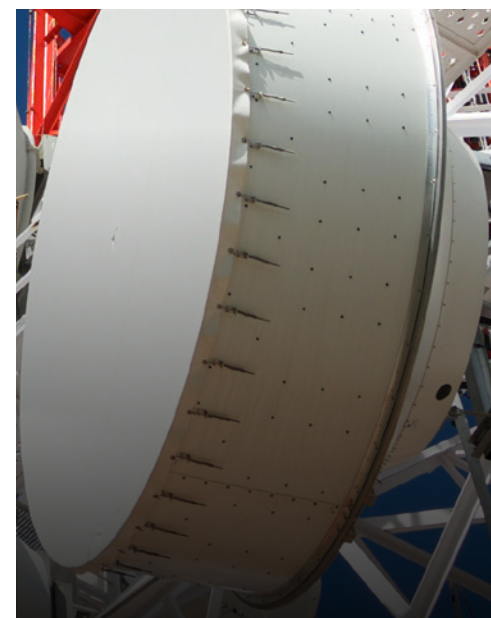


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Executive summary

The telecommunications (telecom) sector is an important part of the Canadian economy; in 2023, the sector contributed almost \$81B in direct GDP and supported up to 782K jobs across industries.¹ As the digital transformation of the Canadian economy progresses, the sector's delivery of enhanced connectivity has the potential to contribute an additional \$112B to Canada's overall GDP by 2035.²

Today, Canadians are increasingly utilizing data for professional tasks, educational purposes, leisure activities and for simply staying connected. In 2023, the telecom sector provided the country with 99.7% mobile wireless network coverage³ and 93.5% high-speed Internet coverage.⁴ Continued advancements are being made to bridge the connectivity gap between urban and rural areas and ensure more equitable access to digital resources. Notably, in 2016, there was a 40% difference in LTE-A mobile (wireless) coverage between rural regions (51%) and urban regions (91%) and, by 2022, this difference was down to 11% (89% and 100%, respectively).⁵

To deliver on this, the Canadian telecom sector made capital investments of \$11.4B in 2023 to provide connectivity to Canadians. This investment represents a significant reinvestment rate of 17.9 cents for every dollar of revenue, surpassing the average reinvestment rates in the U.S. (14.6 cents) and Australia (11.7 cents).⁶ These higher investment rates reflect the unique challenges Canada faces, such as vast population distribution, cold climate and limited economies of scale. In addition to ongoing capital investment, the sector also contributed to deflationary pressures on prices. Notably, the cost of cellular and Internet access services dropped by 26.2% and 15.5%, respectively, from March 2023 to March 2024.⁷

The telecom sector's investments in Canada come at a time where Canada's GDP growth slowed to 1% in 2023, compared to 3.4% in 2022.⁸ This slow GDP growth coupled with persistently high inflation led to the Bank of Canada highlighting the nation's issue of low productivity growth.⁹ Canada's lagging productivity growth has made it more difficult to control inflation (as workers are paid more to produce less), has driven a relative decline in living standards (GDP per capita decreased by 2% in 2023¹⁰) and threatens to impact the nation's global competitiveness.

Canada's low productivity growth can be improved upon through expansion of the digital economy, for which the telecom sector's delivery of enhanced connectivity is vital.¹¹ There is a positive correlation between increased investment in digital infrastructure, the adoption of information and communications technologies, and the growth of labor productivity.¹² To realize productivity gains through increased digital infrastructure investment, Canada needs its telecom sector to continue investing capital.

1 PwC GDP and Job Multiplier Output Analysis, Cross-Industry Analysis, Statistics Canada.

2 PwC Model for GDP forecast by 2035.

3 CRTC, Communications Market Report, Mobile wireless, 2022.

4 ISED (Innovation, Science, Economic Development Canada)—High-speed Internet Access Dashboard, September 2023.

5 CRTC, Communications Market Report, Mobile wireless.

6 Capital IQ, Capital expenditure, revenue, free cash flow figures for large incumbent telcos.

7 StatsCan, Consumer Price Index.

8 Bank of Canada, Monetary Policy Report.

9 Bank of Canada, *Time to Break the Glass: Fixing Canada's Productivity Problem*, March 2024.

10 StatsCan, Gross domestic product, expenditure based.

11 Bank of Canada, Monetary Policy Report.

12 Bank of Canada, *Digitalization: Productivity*, 2023.

Executive summary

While the connectivity and outcomes provided by the telecom sector are increasingly important for Canada, the sector is encountering several headwinds, such as decreasing prices, high borrowing costs, increased competition from OTT players (multinationals), increased network costs and increased climate-related risks. These pressures are leading organizations to reassess revenue projections, planned labour requirements and anticipated capital investments. The headwinds faced by Canada's telecom sector are not unique, with worldwide telecom capital expenditures declining in 2023, for the first time since 2017.¹³

Despite these headwinds, the telecom sector remains a key contributor to Canada's prosperity through its impact on GDP, job creation and investments in digital infrastructure that drive productivity improvement. To sustain these contributions, Canada needs to maintain a regulatory environment that is predictable, transparent and equitable, with sufficient incentives to encourage investment in innovation, technology and infrastructure. This will ensure that network operators can continue to make the investments necessary for deploying advanced connectivity in digital infrastructure to support Canadian productivity and prosperity.

¹³ Dell'Oro Group, Telecom CapEx declined in 2023.

Introduction

This report was prepared by PwC and commissioned by the Canadian Telecommunications Association (CTA) as part of an annual series examining the economic impact of the telecom sector. The report outlines the economic impact of the telecom sector on the Canadian economy in 2023 and provides a view of the headwinds faced by the sector, the costs that it is experiencing and the need for a healthy telecom sector to support Canada's productivity improvements.

In 2023, the Canadian economy grew 1.0%, which represented a slowdown compared to the prior year's 3.4%, as it feels the impact of the Bank of Canada raising interest rates (increased from 0.25% to 5.0% between March 2022 and July 2023), increased borrowing costs and pressured consumer spending and business investment.¹⁴

Throughout 2023, the telecom sector supported economic growth and connected Canadians across the country, contributing \$80.8B in direct GDP to the economy and supporting 782K jobs across industries.¹⁵ Despite the continued economic contribution of the telecom sector, the Canadian economic slowdown impacted the sector with high borrowing costs and declining prices, putting cost pressures on the industry and leading operators to take steps to reduce operational expenditures and planned investment in 2023.¹⁶

As Canada seeks to address these productivity challenges,¹⁷ the investments in connectivity by the telecom sector play an important role in enabling the digital transformation of the country and supporting productivity improvements.

14 Bank of Canada, Interest rates.

15 PwC GDP and Job Multiplier Output Analysis, Cross-Industry Analysis, Statistics Canada.

16 iC, Rogers Voluntary Exit Program, 2023, Global News, Bell to cut 4.8k jobs, 2024; CBC, TELUS Layoffs, 2023.

17 Bank of Canada, *Time to Break the Glass: Fixing Canada's Productivity Problem*.



1. The telecom sector is an important contributor to the economy, delivering positive outcomes for Canadians

The telecom sector is an important contributor to Canadian GDP and jobs, providing nearly \$80.8B in direct GDP and supporting up to 782K jobs across industries in 2023. Telecom prices continued to decline, notably cellular and Internet access services prices, declining by 26.2% and 15.5% between March 2023 and March 2024.

The telecom sector is an important contributor to the Canadian economy and delivers a range of community initiatives

In 2023, the direct estimated GDP contribution and jobs supported by the telecom sector and the connectivity it provides across other industries were up to \$80.8B and up to 782K total jobs. The direct GDP contribution includes \$25.8B directly from the telecom sector's value chain and up to \$55B in direct impact due to the increase of sales and output from other industries through the addition of incremental wireless and wireline connections.¹⁸

Exhibit 1: Canadian telecom sector GDP and job contribution



¹⁸ PwC Cross-Industry Analysis, Statistics Canada, S&P Capital IQ.

Beyond the telecom sector’s direct contribution of over \$25.8B to Canada’s GDP, it also indirectly contributes an additional \$13.8B and supports 118,000 jobs through the immediate supply chain, driven by the increase in business-to-business activities.¹⁹ The direct and indirect effects increase employee spending, resulting in an induced contribution of \$10.8B in GDP and supporting an additional 78,000 jobs.

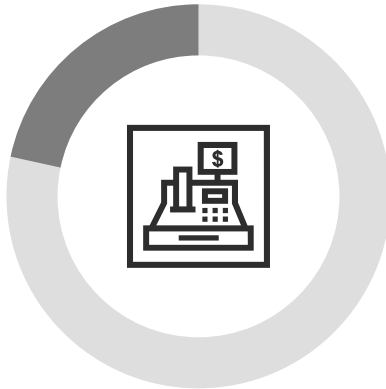
Exhibit 2: GDP contribution breakdown



Direct
\$25.75B



Indirect
\$13.8B



Induced
\$10.8B

¹⁹ PwC Cross-Industry Analysis, Statistics Canada, S&P Capital IQ.

In 2023, the five largest telecom companies in Canada—Rogers, Bell, TELUS, Vidéotron and SaskTel—employed over 100,000 individuals in high-quality, well-compensated positions and contributed nearly \$13B in salaries and benefits.²⁰ In addition, they made \$350M+ of charitable contributions in 2023. Notable charitable contributions across all Canadian telecoms include:

- **Bell:** Current and retired Bell team members contributed over \$2M to 2,000 Canadian charities, which Bell matched with an additional \$1.5M.²¹
- **Rogers:** Created over \$100M in benefits for Canadian charitable organizations through scholarships, grants, the Jays Care Foundation and the Shaw Charity Classic.²²
- **Vidéotron (Québecor):** Supported a variety of community organizations related to health, youth, seniors and the underprivileged in 2023²³ and is actively funding the Pierre Peladeu Bursaries, five bursaries worth up to \$75K awarded to startups in Quebec.²⁴
- **SaskTel:** Donated \$2.9M to 850 organizations in 214 different communities.²⁵
- **Eastlink:** Produces Eastlink Community TV; locally produced, community involved productions helped generate \$3.5M in funding for charitable causes.²⁶
- **TbayTel:** Awards up to \$30K in grants to charities and organizations to enhance communities in Northern Ontario.²⁷

20 Rogers, Bell, TELUS, Vidéotron, SaskTel 2023 annual reports.

21 BCE, 2023 Integrated annual report.

22 Rogers, Sustainability and Social Impact Report 2023.

23 Specific Vidéotron charitable contributions for 2023 are unavailable at the time of writing this report.

24 Québecor, Social Engagement, Pierre Peladeau Bursaries.

25 SaskTel, 2022/23 Environmental, Social, and Governance Report.

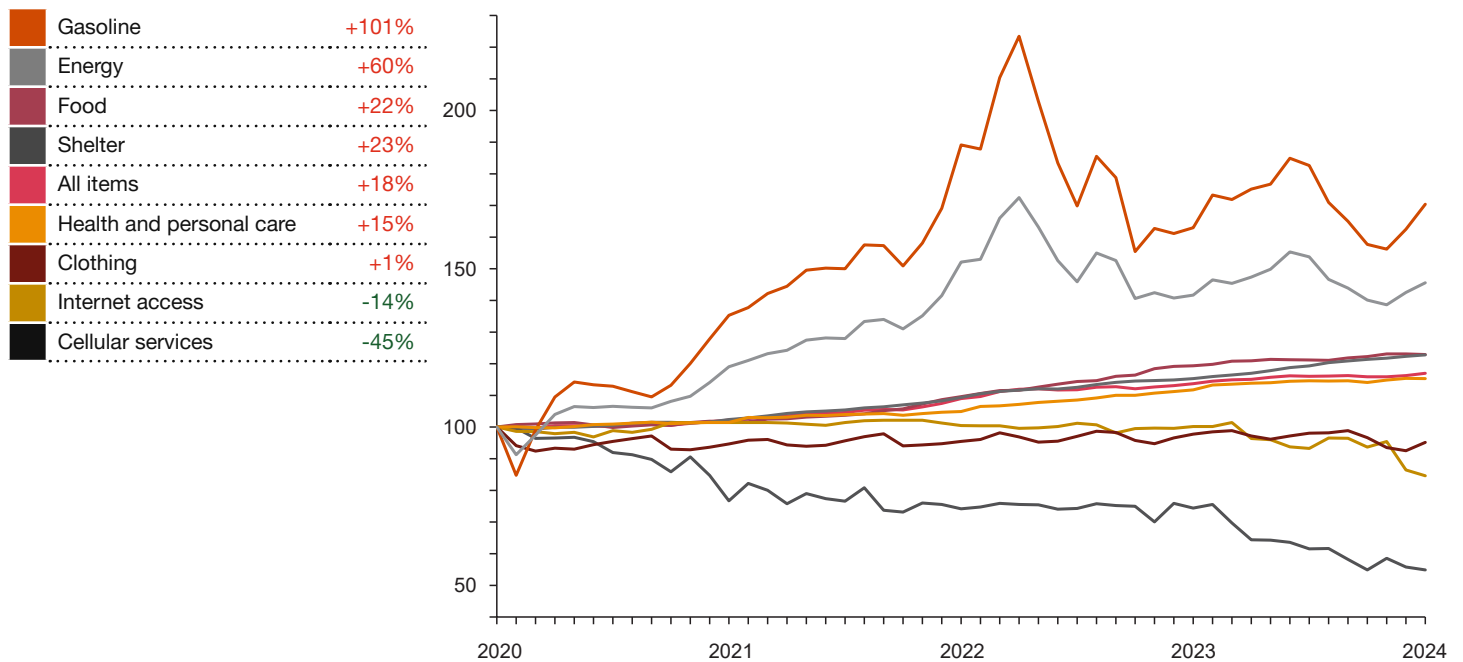
26 Eastlink, Community TV, Community Access.

27 Tbaytel, Brand, Community Fund.

The telecom sector continues to provide increased value and affordability to Canadian consumers

The telecom sector has continued to exert deflationary pressure on prices in Canada, with the cost of cellular and Internet access services decreasing by 45% and 14%, respectively, from March 2020 to March 2024. During the same time frame, the consumer price index for all goods in Canada rose by 18%, with significant price increases observed in gasoline (101%), energy (60%), food (22%) and shelter (23%).²⁸

Exhibit 3: Consumer price index (CPI) for select product categories in Canada: 2020–2024

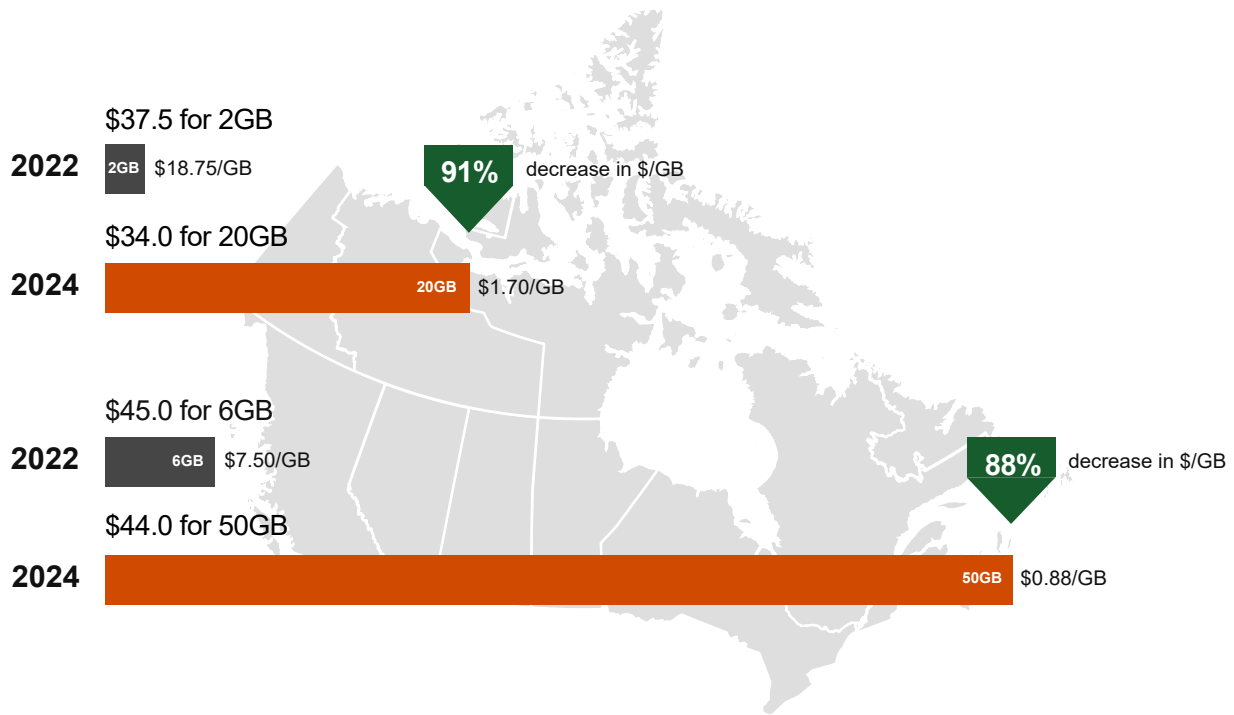


The reduction in prices showcases the benefits of facilities-based competition, delivering greater value to consumers at a time when data consumption in Canada is at an all-time high. Mobile phone data traffic per subscriber per month saw a 25% increase from 2022 to 2023, while average high-speed Internet data volumes per subscriber doubled from 2019 to 2023.²⁹ The increase in streaming, gaming and connected devices, as well as the ongoing trend of remote work and learning, underscore the ever-growing online presence of Canadians. This trend is expected to continue, increasing expectations on the Canadian telecom sector to provide connectivity that meets the evolving demands of businesses and consumers.

²⁸ StatsCan, Consumer Price Index.

²⁹ CRTC, Communications Market Report, High speed broadband.

Exhibit 4: Increases in value provided to Canadians from March 2022³⁰ to April 2024³¹



Canada has achieved high levels of connectivity coverage across the country, through continued capital investments

The Canadian telecom sector delivers wireless and wireline connectivity to Canadians across the country with 99.7% mobile wireless network coverage (combined coverage of HSPA+, LTE, LTE-A and 5G) and 93.5% high-speed Internet coverage (50/10 speeds with unlimited data).

The 99.7% of mobile coverage includes 98.5% coverage of rural areas, 90.5% of First Nations reserve areas and 88.5% of major roads and highways and indicates that Canada is on track to hit its wireless target of 100% LTE coverage in homes, businesses and major transportation roads by 2026.³² The 93.5% high-speed Internet coverage of Canadian households³³ includes 67.4% of rural areas, 50.1% of First Nation reserve areas and 57.5% of areas in the North. Canada is progressing well towards its broadband targets of 98% by 2026 and 100% by 2031.³⁴

In 2023, the Canadian telecom sector continued to make substantial investments in digital infrastructure, with a capital expenditure of \$11.4B. This investment equates to an average of 17.9% of the sector's annual revenue, a figure that is higher than the capital intensity in both the U.S. at 14.6% and Australia at 11.7%.³⁵ (Further reviewed in Section 2.)

³⁰ ISED, Telecom services price tracking, Quarterly wireless services price report (Flanker's included in ISED's price report: Virgin, Koodo, Fido).

³¹ Survey of carrier websites.

³² CRTC, Communications Market Report, Mobile wireless.

³³ ISED, High speed Internet access dashboard.

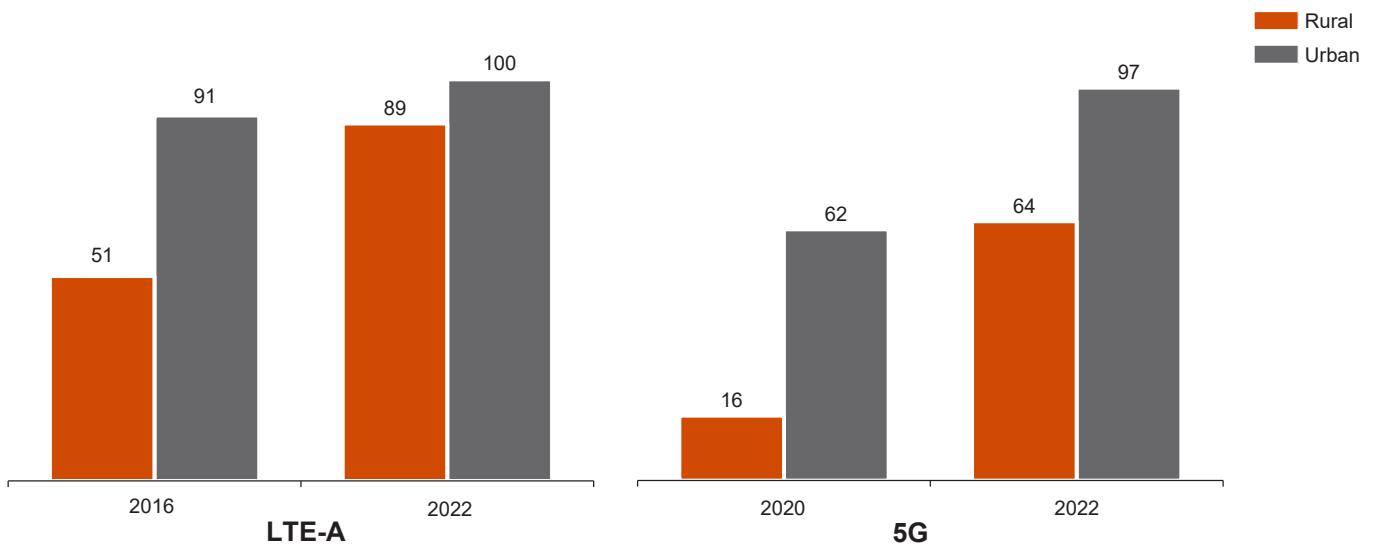
³⁴ CRTC, Communications Market Report, High speed broadband.

³⁵ Capital IQ, Capital expenditure, revenue, free cash flow figures for large incumbent telcos.

Closing the rural urban divide

Canada continues to reduce the connectivity gap between urban and rural communities. In 2016, there was a notable 40% gap in LTE-A mobile coverage, with rural areas standing at 51% and urban areas at 91%. By 2022, this gap had narrowed down to just 11%, with rural coverage improving to 89% and urban coverage reaching 100%.³⁶ Similar progress was made in 5G mobile coverage, with the disparity in coverage between rural and urban areas decreasing from 46% in 2020 to 33% in 2022, reflecting Canada's commitment to bridging the digital divide.³⁷

Exhibit 5: LTE-A and 5G mobile coverage: % coverage over the years, homes, businesses and major transportation roads



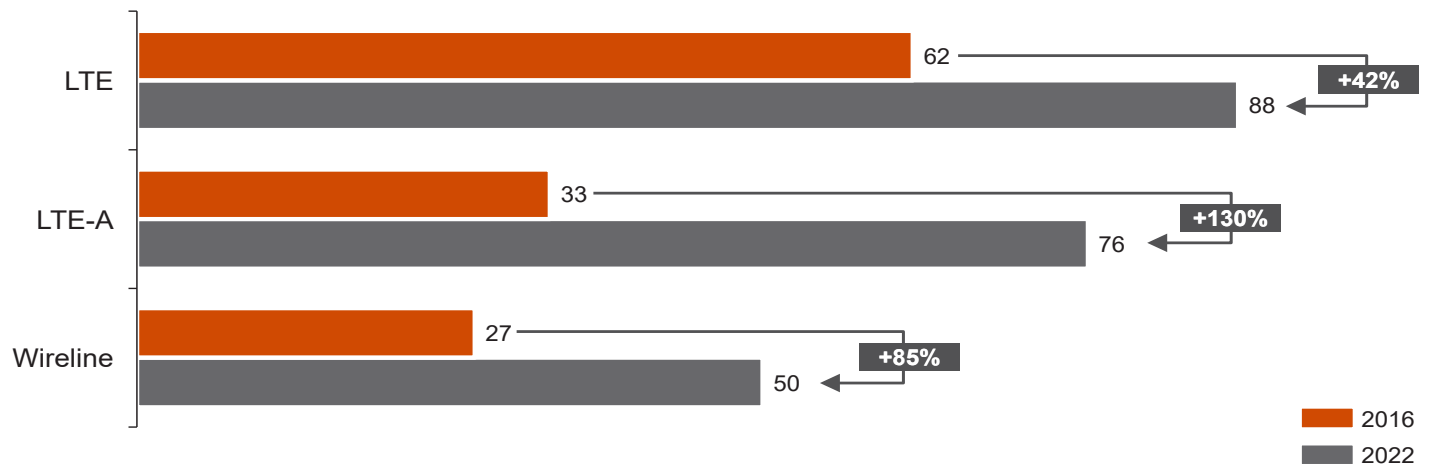
³⁶ CRTC, Communications Market Report, Mobile wireless.

³⁷ Ibid.

First Nations connectivity

Canadian telecoms have made good progress in enhancing wireless and wireline coverage in First Nations reserve areas. Since 2016, LTE and LTE-A coverage have seen increases of 42% and 130%, respectively,³⁸ while 50/10 Mbps speed and unlimited data transfer coverage have increased by 85% from 2016 to 2022.³⁹

Exhibit 6: Coverage percentage of First Nations reserve areas, households: LTE, LTE-A and wireline



³⁸ CRTC, Communications Market Report, Mobile wireless.

³⁹ CRTC, Communications Market Report, High speed broadband.



Spotlight—Telecom initiatives to connect underserved communities

The Canadian telecom sector has invested in numerous initiatives to connect First Nations and rural communities:

- **Bell:** In 2023, Bell spent \$70M on a range of suppliers including businesses managed by numerous underrepresented groups, such as indigenous peoples. Bell also expanded fibre Internet in Manitoba, including in six rural communities, reaching an additional 40K fibre locations province wide.⁴⁰ Northwestel, owned by Bell, continued its work in 2023 to help connect northern communities to high-speed Internet, regularly contributing \$600K to indigenous initiatives.⁴¹
- **Vidéotron (Québecor):** In 2024, Vidéotron announced a plan to install 37 new cell towers in Abitibi-Témiscamingue, home to several Algonquin Anishinaabe communities, and the Laurentians to improve wireless coverage as part of a partnership with the Quebec government.⁴²
- **Rogers:** In 2023, in partnership with the government, Rogers brought high-speed Internet to over 440 indigenous households in Nova Scotia. Rogers also invested in 66 new 5G towers for rural eastern Ontario.⁴³
- **SaskTel:** In 2023, SaskTel launched 5G on 143 towers in Regina, including four First Nations communities. They invested \$200M to expand their Rural Fibre Initiative to over 130 small towns.⁴⁴

40 BCE, 2023 Integrated annual report.

41 NorthwTel, Community.

42 Vidéotron Press Room, Vidéotron to improve wireless coverage for Algonquin Anishinaabe communities and Laurentians.

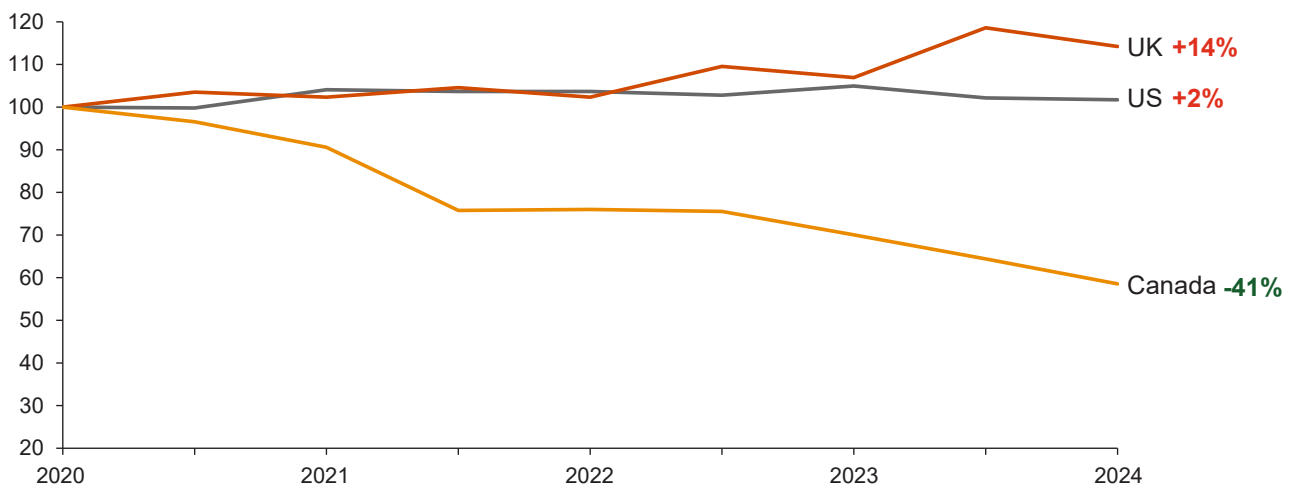
43 Rogers, Sustainability and Social Impact Report 2023.

44 SaskTel, 2022/23 Environmental, Social, and Governance Report.

Canada’s competitive telecom sector is driving world leading outcomes

The consistent annual investments in network enhancements that provide for broader coverage, faster speeds and increased reliability, coupled with the trend of delivering services at decreasing prices, reflect a competitive environment in the Canadian telecom sector. Notably, Canada’s price reductions compare favourably to the U.S. and the U.K.; from 2020 to 2024, wireless prices in Canada decreased by 41%, whereas they increased by 2% in the U.S. and 14% in the U.K. Extending back to start in 2017 and ending in 2024, Canadian prices have decreased over 50%, while in the U.K. prices have increased by 24%.⁴⁵

Exhibit 7: Wireless consumer price index, 2020–2024: Canada, U.S. and U.K.



Canada’s network quality and performance provided to Canadians also compares favourably to global peers. The quality and performance of a network can be quantified by two key metrics: coverage (the percent of population covered by the network) and speed (average upload and download speed in Mbps). On mobile performance, Canada’s mobile download speed is ranked second in the G7, with speeds that are 35% higher than the G7 average.⁴⁶ Canada’s 4G coverage in rural regions is 31% higher than the average in the Americas (including all North and South America).⁴⁷ Canada’s broadband download speed is faster than the G20 average by 68.5% and the global median by 112.5%.⁴⁸ Additionally, Canada’s 1 Gbps broadband coverage is the highest out of all G7 countries at 83%. Canada has been rapidly progressing coverage from 2016 to 2022 in both urban and rural regions.⁴⁹

⁴⁵ StatsCan, U.K. office for National Statistics, US Bureau of Labour Statistics Data.

⁴⁶ Speed Test Global Index.

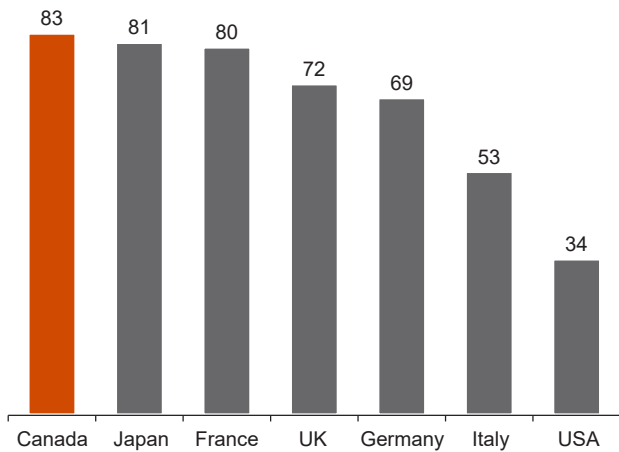
⁴⁷ International Telecommunications Union Network Coverage.

⁴⁸ Speed Test Global Index.

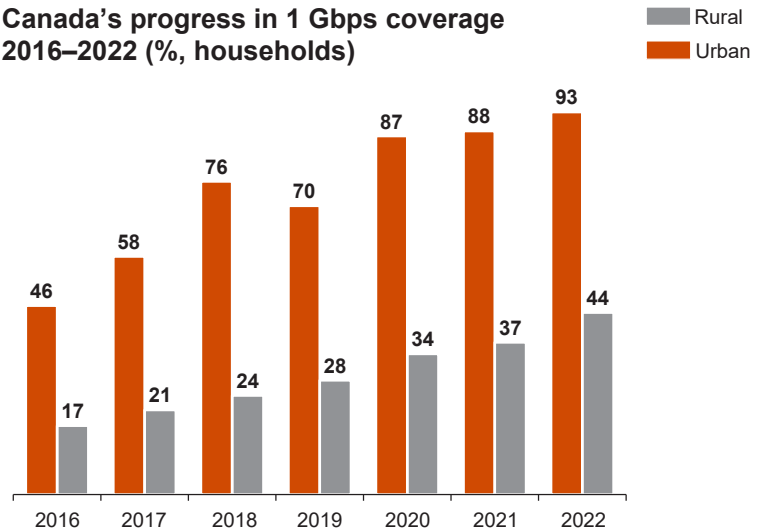
⁴⁹ CRTC Communications Market Report—High speed broadband.

Exhibit 8: Canada vs. comparable countries: 1 Gbps coverage and Canada's progress in 1 Gbps coverage^{50,51,52}

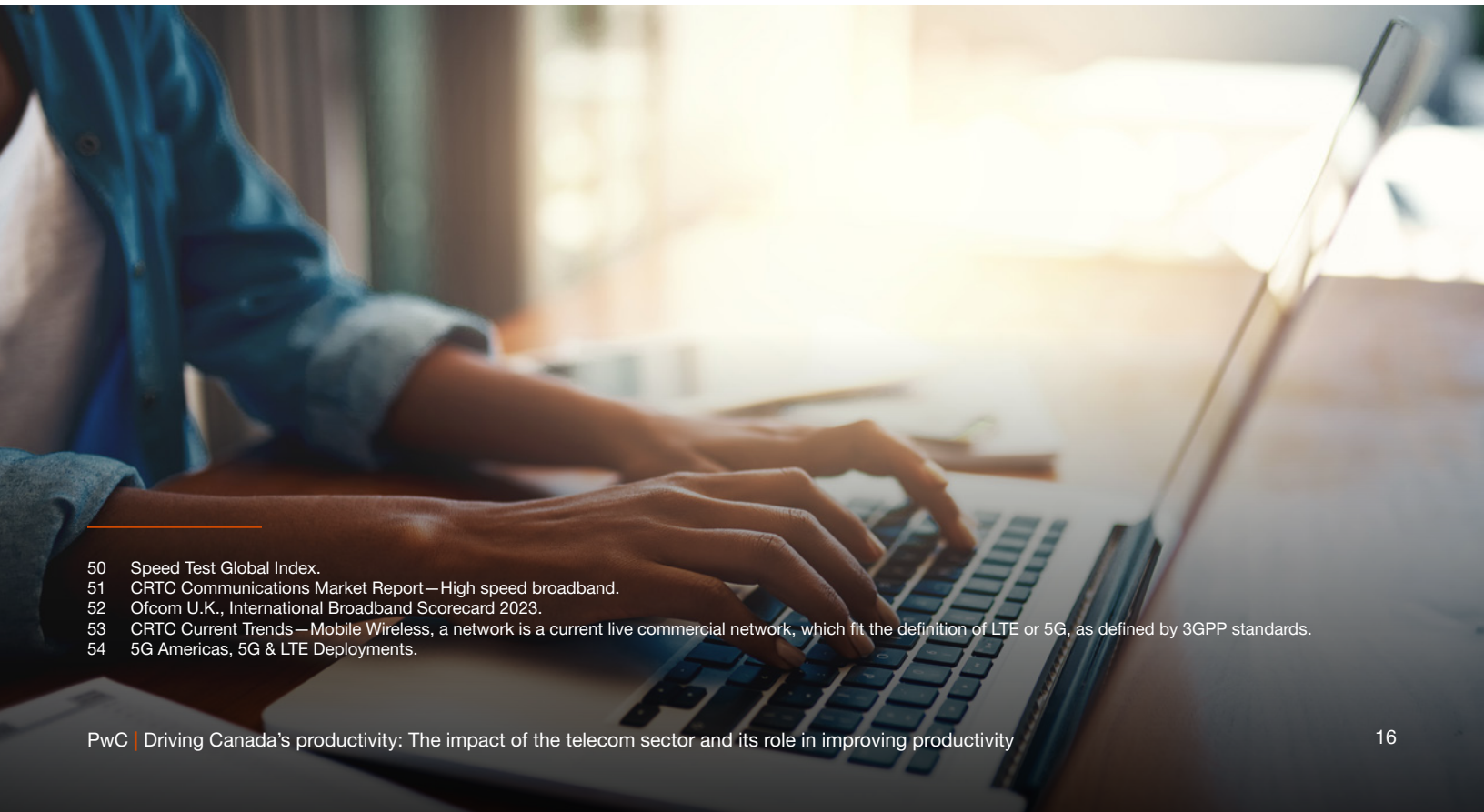
**Canada vs. comparable countries
1 Gbps coverage (% , households)**



**Canada's progress in 1 Gbps coverage
2016–2022 (% , households)**



In addition to its 4G performance, the telecom sector has been deploying 5G rapidly in Canada, progressing from 0% coverage in 2019 to 91.4% coverage in 2022.⁵³ As of 2023, Canada has the second most 5G networks in the world, only behind the U.S.⁵⁴



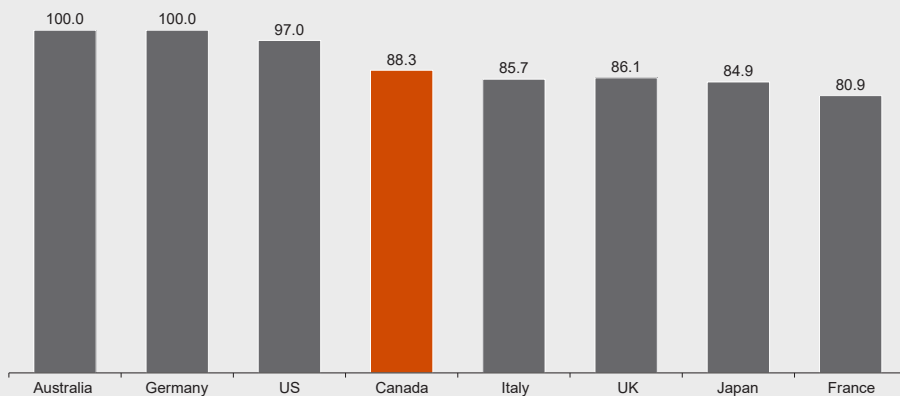
50 Speed Test Global Index.
 51 CRTC Communications Market Report—High speed broadband.
 52 Ofcom U.K., International Broadband Scorecard 2023.
 53 CRTC Current Trends—Mobile Wireless, a network is a current live commercial network, which fit the definition of LTE or 5G, as defined by 3GPP standards.
 54 5G Americas, 5G & LTE Deployments.



Spotlight—How the Canadian telecom market structure compares

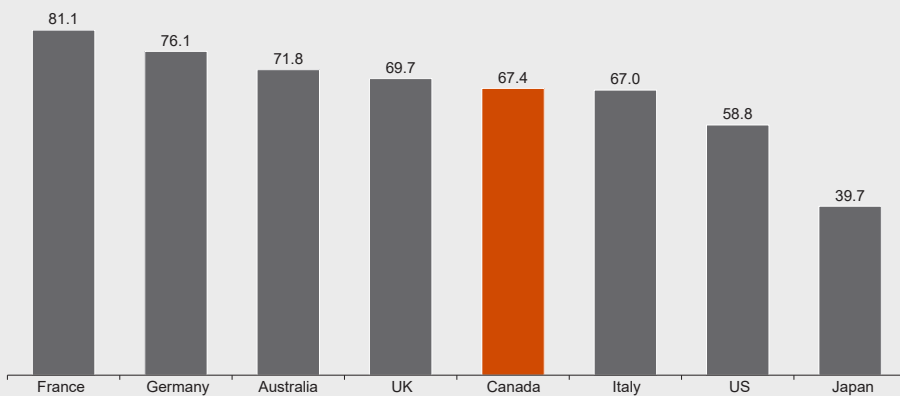
Canada’s wireless market structure consists of three national operators, a near national operator and multiple regional operators. This has resulted in a wireless market that is relatively less concentrated than peer countries in the G7. In Canada, the top two wireless telecom operators (Rogers and Bell) have a 61% share of the total market, compared to the top two players in Australia, Germany and the U.S. that have a 84%, 69% and 69% share, respectively.⁵⁵ A similar ranking is found when comparing market share among the three largest operators.

Exhibit 9: Market share percentage of top three telecoms by number of wireless subscribers: Canada vs. comparable peers⁵⁶



Comparing Canada’s wireline market share with global peers, Canada’s top three telecoms have a combined 67% market share, which is lower than France, Germany, Australia and the U.K.⁵⁷

Exhibit 10: Market share percentage of top three telecoms by number of wireline subscribers: Canada vs. comparable peers⁵⁸



The relatively competitive intensity of Canada’s telecom market is an important enabler of the robust competitive environment that has delivered strong outcomes for Canadians, consisting of declining prices and the ongoing investments in expanding and enhancing network infrastructure.

⁵⁵ Telegeography Global Comms Database.

⁵⁶ Ibid.

⁵⁷ Ibid.

⁵⁸ Ibid.

2. The telecom sector in Canada is encountering a series of challenges and headwinds

While the telecom sector continues to be a significant contributor to the Canadian economy, it faces commercial pressures such as declining prices and high interest rates, which impact its ability to invest in network infrastructure. Additionally, Canada's unique production factors, like population dispersion, geography and climate, pose further challenges for the industry to meet the increasing connectivity demands of businesses and consumers.



Headwinds are pressuring the Canadian telecom sector

In the face of commercial challenges such as high borrowing costs, declining prices, increased network costs, a potential reduction in Canadian immigration, increased competition from OTT players (multinationals), increased network costs and increased climate-related risks, the telecom sector is under pressure. The increase in interest rates from 0.25% in 2022 to 5.0% in 2023 has raised debt costs, squeezed free cashflow and limited the funds available for capital investments in network upgrades, as well as expansion and reliability initiatives. At the same time, Canadian consumers experienced a significant decrease in prices for mobile and broadband services, with the cost of cellular and Internet access services decreasing by 26.2% and 15.5%, respectively, from March 2023 to March 2024.⁵⁹

Canada's recent population growth, with over one million immigrants arriving between 2022 and 2023, has contributed to the growth of mobile subscribers, from 33.6M in 2022 to 35.4M in 2023.⁶⁰ The Canadian government, however, has announced intentions to slow down the number of new permanent residents by 2026 and to impose a 35% reduction in the issuance of study permits as part of a limit on Canada's international student program, which will have an impact on the growth of the number of subscribers for the telecommunications sector.⁶¹ A potential slowdown in the growth of the number of subscribers comes as traditional revenue streams continue to be challenged. Apple and Facebook have notably disrupted the market through the provision of over-the-top solutions (e.g. FaceTime, WhatsApp), while large multinational players (e.g. service providers like IBM, software providers like Amazon and hardware providers like ABB), whose business models rely on connectivity but do not invest in network infrastructure, are disrupting traditional telecom sources of revenue.

In addition to pricing and revenue challenges, the cost of deploying enhanced connectivity (5G infrastructure) is also requiring greater capital investment than previous generations of technology due to the large number of installations required (macro cells and small cells) and the need for additional backhaul infrastructure.

The costs of climate change

Climate change is increasing the severity and frequency of extreme weather events worldwide. In Canada, this translates to higher temperatures and an uptick in wildfires, storms, rain and wind, posing a direct threat to telecom network infrastructure and communities.⁶² For instance, high winds from hurricanes and tornadoes can damage cell towers and overhead lines. Storm-induced flooding leads to erosion, exposing cables and complicating repair efforts.⁶³ These impacts are driving up the total costs of ownership for telecom infrastructure and the need for additional capital expenditure.

59 StatsCan, Consumer Price Index.

60 BNN Bloomberg, Immigration spurring telecom subscriber growth, Feb 2024.

61 Ibid.

62 BC, Severe Weather Centre.

63 Risk Logic, Fire and Property Loss Prevention in the Telecommunications Industry.

Delivering connectivity is challenging and expensive in Canada

In addition to commercial factors, Canadian telecoms face unique challenges compared to their global peers, driven by Canada's unique factors of production. Notably, Canadian telecoms invest, on average, 42.6% more per subscriber on capital expenditures than global peers in the U.S., Japan, Australia and Europe. This is primarily driven by:⁶⁴

- **High population dispersion:** Canada has a low population density of four people per square kilometer, as its relatively small population is spread across a large land area.⁶⁵ Canada also has high population dispersion, with multiple small towns dispersed across its large geography, as compared to peer countries with populations more concentrated in large metropolitan areas. Canadian telecoms must, therefore, deploy and service the population through dispersed network infrastructure, an expensive venture.
- **High spectrum costs:** Spectrum costs are incurred as one-time fees at an auction and ongoing licence costs, with the 2023 3800 MHz auction costing \$2.1B in licences and the previous auction of 3500 MHz costing \$8.9B.⁶⁶
- **Weather patterns:** Canada experiences extreme cold weather during winter months; underground fibre can only be laid for wireline and wireless backhauling during warmer months, limiting construction timelines and incurring higher costs.
- **Economies of scale:** Canadian telecoms are smaller than the largest telecoms in peer countries and are significantly smaller than the network-related and device suppliers they rely on for key products and services.⁶⁷ Canada's limited bargaining power with suppliers results in higher costs for key inputs and stricter contract terms.
- **Labour costs:** The unit labour cost in Canada increased by 18.2% between Q3 2020 and Q3 2023.⁶⁸ Additionally, Canada's labour compensation per hour worked has grown at a faster rate of 4.5% compared to its peer countries, who experienced growth figures from 1.3% to 4.0% from 2019–2023.⁶⁹ Rising labour costs directly impact network deployment and operating expenses.

These high-cost factors of production are reflected in the higher capital intensity ratios that Canadian telecoms maintain compared to international peers. Canada's average capital expenditure as a percentage of revenues is the highest out of all comparable peers, and 23% higher than the second highest percentage of revenue.

64 Capital IQ, Annual Financial Reports, Statista.

65 World Bank, World Development Indicators, Population density 2018.

66 Government of Canada 3800 MHz and 3500 MHz Auction—Process and results.

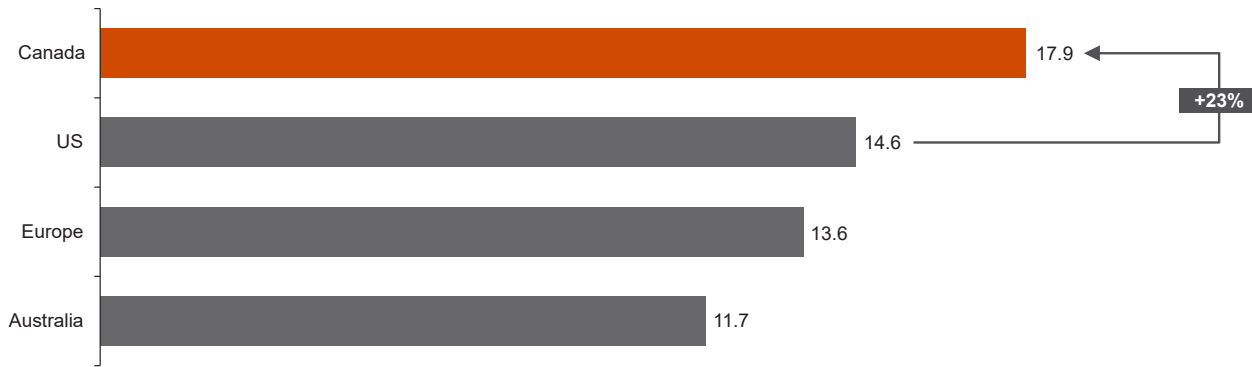
67 Capital IQ, OECD exchange rates.

68 StatsCan, Indexes of business sector labour productivity, unit labour cost and related measures.

69 OECD Statistics, Unit labour costs.

Exhibit 11: Average capital expenditure as a percentage of revenues of large telecom incumbent players per region⁷⁰

Average capital expenditure of telecoms, 2023 (%)



After adjusting for the differences in capital investment, Canadian telecoms have the lowest free cash flow to revenue ratio out of their comparable peers in the U.S., Australia and Europe; 4% lower than the second lowest average free cash.⁷¹ Although it is observed that Canada’s telecom sector maintains relatively high EBITDA margins compared to global peers, high capital investment results in Free Cash Flow (FCF) ratios that are below comparable peers.

Exhibit 12: Average free cash flow to revenue ratio of large telecom players: %, 2019–2023



70 Capital IQ, Annual Financial Reports.

71 Capital IQ, Revenue, FCF of large incumbent telecoms in Canada, US, Europe, Australia.

3. A healthy telecom sector is important for improving Canada's productivity

In 2023, Canada's low GDP growth and persistent inflation highlighted the country's long-standing productivity challenges. Improving productivity can be achieved through increased investment in digital infrastructure, with connectivity serving as an important economic enabler. Maintaining a healthy telecom industry in Canada will allow the sector to make the necessary network investments to increase the nation's productivity.

Canada is faced with a productivity crisis

The combination of high inflation and interest rates, along with Canada's relatively low GDP growth in 2023, brought the country's long-standing productivity issues into focus. Notably, the Canadian economy in 2022 generated 71% of the economic output compared to the U.S. economy, marking a decline from 88% in 1984, the second largest decline in economic value produced relative to the US among all G7 countries.⁷²

Canada's slow productivity growth can be attributed to a variety of factors, including low levels of capital investment, a shortfall in innovation, insufficient investment in labour, the structure of the labour market and its regulatory framework.⁷³ Notably, Canada's investment in business R&D is 0.8% of GDP per annum, which ranks last among G7 nations, representing only half of the 1.6% G7 average and is well below the United States' R&D investment of 2.3%.⁷⁴

The expanding digital economy and digital infrastructure support productivity improvements

The expansion of the digital economy, particularly through the deployment of advanced connectivity solutions like 5G, is projected to add an additional \$112B to Canada's GDP by 2035.⁷⁵ Globally, the digital economy enhances labour productivity, as sectors with higher digital intensity demonstrate greater productivity than those with lower digital intensity.^{76,77,78} Notably, enhancing Canada's digital economy is important for improving productivity, as Canada's contribution to productivity growth from sectors that utilize and produce information technology is relatively modest, which has been cited as a reason for why productivity growth in Canada has lagged behind the U.S.⁷⁹

72 Bank of Canada, *Time to Break the Glass: Fixing Canada's Productivity Problem*, March 2024.

73 Ibid.

74 Government of Canada, *Federal Budget 2022, A Strong, Growing and Resilient Economy*.

75 PwC Analysis, IHS Markit.

76 Bank of Canada, *Digitalization: Productivity*, 2023.

77 Trava Security, *Digital infrastructure definition and why it's important to protect your company's digital infrastructure*.

78 Aston Business School, *Infrastructure and Productivity: A Review*.

79 Bank of Canada, *Digitalization: Productivity*.



Spotlight – Digital infrastructure at the firm level⁸⁰

Exhibit 13: How digital infrastructure impacts productivity at a firm level

At the firm level, greater digital infrastructure investment impacts productivity through:



Automation: at a firm level, digital infrastructure enables automation, which in turn increases the speed and quality of manufacturing goods and delivering services.



Data availability and quality: large comprehensive datasets coupled with the ability to extract enhanced insights allows firms to optimize their business processes and make more informed decisions.



Capital efficiency: improvements in technology provide a means to increase the quality and optimize the process of turning labour inputs to outputs.

80 Bank of Canada, Digitalization: Productivity.

Maintaining a healthy telecom sector supports improving Canadian productivity

For Canada to improve its productivity, it is important to maintain a healthy telecom sector capable of making the necessary investments to meet the economy's connectivity demands and support the growth of the digital economy. Regulatory frameworks must offer sufficient incentives to encourage investment in innovation, foundational technology and infrastructure and should be predictable, transparent and equitable. Overall, it is important to consider the wider implications and advantages of connectivity within the economic landscape to ensure the health of the telecom sector.⁸¹

The challenge of maintaining a healthy telecom sector in Canada comes against the backdrop of a worldwide telecommunications industry that is experiencing sluggish revenue expansion and a contraction in capital expenditures. Notably, worldwide telecom capital expenditure declined in 2023 for the first time since 2017 and is forecast to decline 2% per year over the next three years.^{82,83}

The consequences of not maintaining a healthy industry extend beyond telecom

The importance of Canada maintaining a healthy telecoms sector is underscored by the cautionary tales from other nations where telecommunications entities failed to invest adequately in digital infrastructure. This shortfall led to inferior network performance, compromised service quality and, consequently, hindered the expansion of the digital economy.⁸⁴

81 PwC, The importance of a healthy telecommunications industry to Canada's high-tech success.

82 Dell'Oro Group, Telecom CapEx Declined in 2023.

83 Dell'Oro Group, Worldwide Telecom CapEx to drop 7% by 2025.

84 PwC, The importance of a healthy telecommunications industry to Canada's high-tech success.



Spotlight—Cautionary tales from peer countries



Australia

- In 2007, Australia initiated the National Broadband Network to transition its telecom infrastructure from copper to high-speed fibre.
- Political turmoil, delays and escalating costs resulted in large plan revisions and the original fibre-to-the-premises (FTTP) plan was scrapped in favour of a plan featuring a mix of copper, fibre-to-the-nodes and FTTP.⁸⁵
- The flawed deployment of the NBN has culminated in sluggish speeds, which are 32% below the global average for broadband speed (and over 60% below Canada),⁸⁶ prices that are 44% above the global average,⁸⁷ restricted coverage and a deteriorating financial standing for the NBN.⁸⁸
- The government is currently faced with the quandary of needing to transition to FTTP to enhance service quality, which is constrained by low consumer willingness to pay for the upgrade and the challenge of delivering adequate service with the existing network.⁸⁹



Italy

- The Italian telecom sector has historically adopted a “wait-and-see”⁹⁰ approach to new technologies, prioritizing the establishment of a regulatory framework and absolute confidence in the efficacy of the technology. This cautious stance has resulted in a slower adoption of technology and a preference for short-term competition over long-term growth.⁹¹
- Similar to other European telecom sectors, Italy’s market is mature, with several established and small regional players. Regulatory interventions have led to uniform services and a reliance on price competition for market share. Consequently, Italian telecoms have experienced shrinking margins, reduced capacity to fund infrastructure improvements, low adoption of new technology and a lag in telecom performance in comparison to their peers.⁹²
- The sector’s underperformance has led to the provision of government aid packages—amounting to \$1.5B in 2023,⁹³ buyouts of network assets to remain solvent in challenging financial conditions and divestments.⁹⁴

85 CNET, Why Australia’s Internet has turned into a literal car crash, 2018.

86 SpeedTest Global Index, Australia.

87 Energy Matters, Why Australia’s Internet speeds are slow and expensive, 2023.

88 Macro Business, NBN sheds jobs as death spiral worsens, Feb 2024.

89 Independent Australia, NBN Co fails to improve service conditions, 2023.

90 Doxee, Paradoxes in the telecommunications industry in Italy.

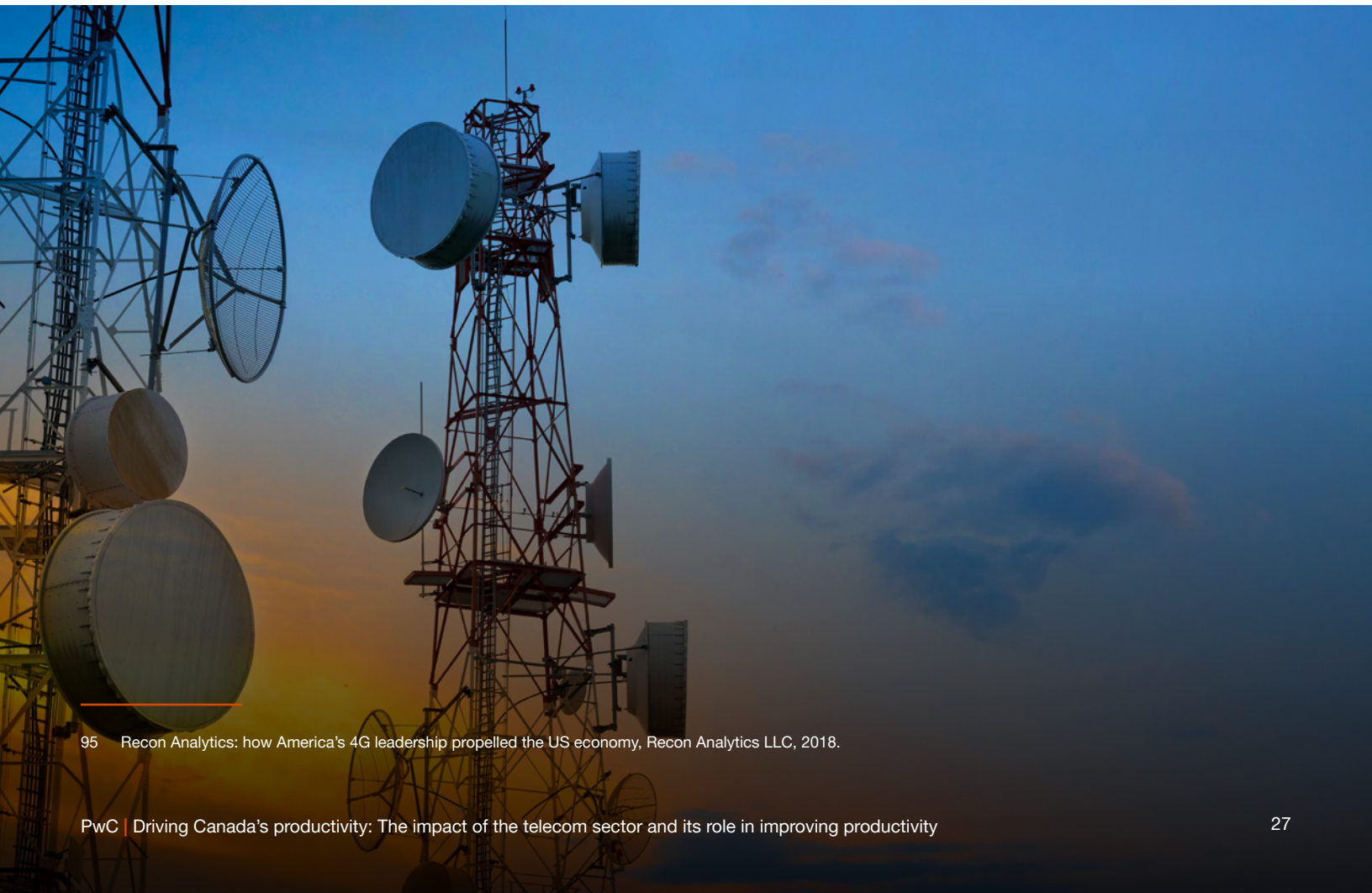
91 Ibid.

92 Hermes Investment, what is driving the sudden spate of telecom buyouts.

93 Reuters, Italy drafts aid package for battered telecom sector, 2023.

94 Fortune, Vodafone offloads Italian operations, March 2024.

The impact of an unhealthy telecom sector, where telecoms lack adequate free cash flow to fund investment in connectivity, impacts not only the industry itself but also the broader economic productivity of the country. When telecoms cannot advance connectivity, the quality and availability of digital infrastructure becomes limited and decreases relative to other countries. Digital infrastructure sets constraints on the tools companies and workers can use to produce economic output. Poor connectivity can hinder economic productivity and innovation, and negatively affect a country's global economic competitiveness.⁹⁵



95 Recon Analytics: how America's 4G leadership propelled the US economy, Recon Analytics LLC, 2018.

Conclusion

The telecom sector plays a significant role in Canada's economy, contributing \$80.8B in GDP output and supporting over 782K jobs across industries in 2023.⁹⁶ In the future, the Canadian telecom sector will continue to contribute significantly to Canadian GDP and jobs, positively impact revenues across industries and progress against its connectivity targets. However, recent trends could potentially reduce the capacity of the sector to make ongoing investments in network infrastructure. Interest rate increases are raising debt costs, limiting available funds for investment. A potential slowdown in immigration could challenge organic subscriber growth. Climate change risk poses a direct threat to telecom network infrastructure.

It is important for Canada to maintain a healthy telecom industry capable of making the necessary network investments and providing connectivity required to support the development of digital infrastructure. Digital infrastructure will enable Canada to drive improvements in productivity and power Canada's economic growth in the future.

The telecom sector in Canada will play an important role in enabling the delivery of productivity improvements in the economy, increasing Canada's global competitiveness and enabling a prosperous economic future for all Canadians.



96 PwC GDP and Job Multiplier Output Analysis, Cross-Industry Analysis, Statistics Canada.

Methodology

General Canadian telecom sector calculations

The telecom sector as defined in this report and used in the economic modeling refers to network operators supplying wireless and wireline connectivity services—excluding television video services and infrastructure, as well as satellite connectivity and other supporting sub-industries. The majority of figures in this report combine data for the major providers, which represent over 99% of the sector’s revenues: TELUS, Rogers Communications, Bell Canada Enterprises, SaskTel and Vidéotron. Where applicable, analyses were performed using operator figures from the calendar year January 1, 2023, to December 31, 2023. Weather events and government regulations included 2023 events where applicable. All dollar figures are represented in Canadian dollars using the Bank of Canada exchange rate to the relevant country’s currency.

Economic analysis

The economic impact highlighted in this study represents the telecom sector’s contribution to the Canadian economy through its value chain as well as the impact on additional industries that could drive greater sales and increase output due to new wireless and wireline connections. Multipliers used are the 2020 Statistics Canada multipliers for the information and culture industry at the national level. In order to show the impact of new connections on other industries, the estimated relationship between increases in connections of mobile and fixed broadband was applied to industry output/sales.

Incremental impact of 5G analysis

To quantify the potential future impact of 5G on Canadian GDP, IHS Markit projects an industry-by-industry percentage of sales enabled by 5G in 2035. Starting in 2023, leveraging these IHS growth projections, we estimate, on an industry-by-industry basis (per Statistics Canada NAICS), the incremental impact of the deployment of 5G-enabled technologies in Canada by 2035.

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