

Toronto's Digital Divide

Angus Lockhart, Sam Andrey | May 2024



Acknowledgements



The Dais is Canada's platform for bold policies and better leaders. We are a public policy and leadership think tank at Toronto Metropolitan University, connecting people to the ideas and power we need to build a more inclusive, innovative, prosperous Canada.

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Graph data in this report can be found at:

<https://github.com/thedaisTMU/toronto-divide-2024>

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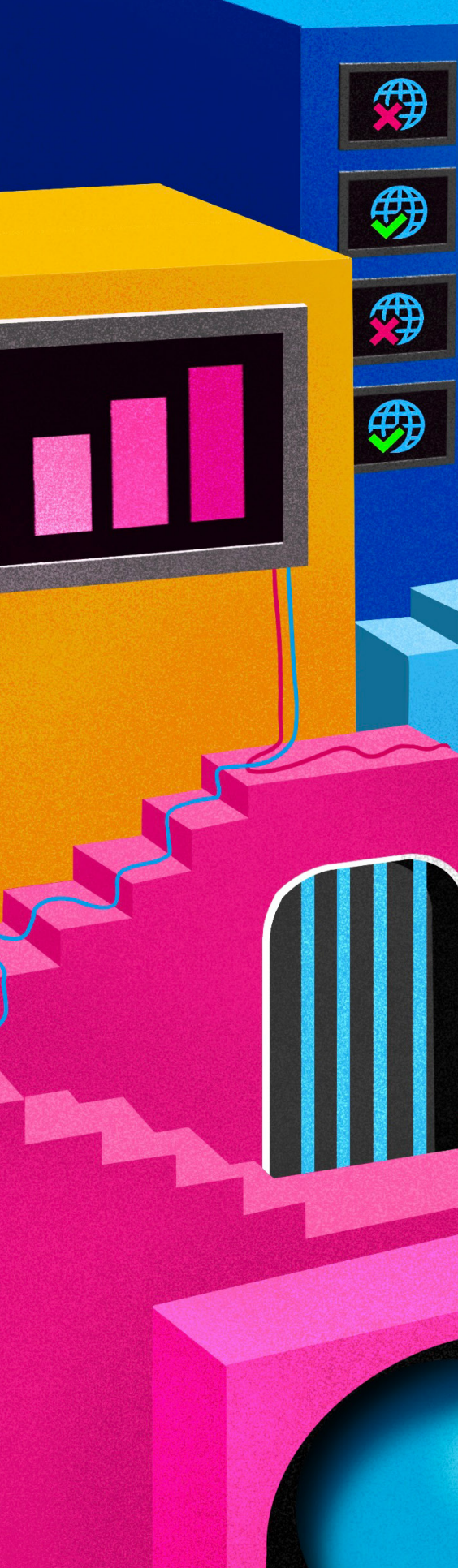


Table of Contents

5 EXECUTIVE SUMMARY

6 INTRODUCTION

- 7 What is the digital divide?
- 7 Current Efforts
- 8 Digital Inclusion

9 METHODOLOGY

11 ACCESS

- 11 Overall Access
- 14 Reasons for Not Having Home Internet
- 16 Access to Services
- 19 Internet Outside the Home

21 QUALITY

- 22 Internet Speeds
- 24 Perceived Internet Quality
- 28 Internet Service Providers
- 29 Devices

31 AFFORDABILITY

- 31 Costs
- 37 Extra Billing Impacts

40 CONCLUSIONS

41 APPENDIX A: SURVEY SAMPLE

- 41 Sample by Forward Sortation Area and Proportion of Total Private Households in 2021 Census
- 43 Sample Demographics

44 APPENDIX B: SURVEY QUESTIONNAIRE

- 44 Screening Questions
- 44 Core Questions
- 46 Demographic Questions

48 END NOTES

1

Executive Summary

In recent years, the City of Toronto has been making advancements to overcome significant disparities in internet access within the City. However, some significant gaps remain and need to be addressed in order to fully close the digital divide.

To understand the current state of the digital divide in Toronto and see how that has changed since 2020, we reconducted a multimodal survey of 2,500 Toronto residents (2,000 online responses and 500 telephone responses) in December 2023. Key findings were:

- 1. Overall, 98% of Toronto residents have home internet, steady since 2020.** While the number is high, it still leaves an estimated 58,000 Torontonians without a home internet connection. This rate (98%) is higher in the City of Toronto than in the entirety of the Greater Toronto Area (96%), as well as urban areas in Canada as a whole (95%). Many of the areas in Toronto with the lowest rates of internet access are designated as either Neighbourhood Improvement Areas or Emerging Neighbourhoods including Downtown Yonge East, Moss Park/Regent Park, O'Connor - Parkview, and Malvern East.
- 2. The high cost of home internet is the top reason households remain unconnected.** Income is the best predictor of home internet — among households in Toronto earning less than \$30,000 a year, 95% say they have home internet. Four in ten of those without home internet say it is because of the cost. The next most common reasons are residents either using their mobile phone instead or accessing the internet outside of their home.
- 3. Home internet speeds are getting faster, though are still impacted by income.** Seventy-four percent of Toronto residents have high-speed internet (>50 Mbps download speed), and an even higher proportion (91%) say their home internet speed is adequate for their needs. However, fewer than two-thirds of households earning under \$50,000 a year have

high-speed internet, compared to 84% of households earning \$100,000 or more. The proportion that has home internet speeds above 100 Mbps grew from 36% in 2020 to 49% in 2023.

- 4. Between home internet and cell phone plans, most Toronto residents are paying at least \$110 per month.** The cost prevents some residents from getting home internet; one in ten have been disconnected from home internet or cell service due to lack of payment. While subsidized programs exist for home internet for some lower-income residents, these households are still most likely to be concerned about paying their internet bills.
- 5. Toronto residents rely on a lot more than just home connections to access the internet.** Between cell phone data, access at work, and access at other public spaces, Toronto residents are getting online everywhere. For those without home internet, public libraries remain a critical point of access (39% used public libraries to access the internet within the last year).
- 6. The average Toronto household has a total of 2.6 laptops, smartphones, or tablets.** In multi-person households, those with at least one device per person are far more likely to say they have enough to meet their needs.

The overall picture in Toronto remains similar to that seen in 2020, though with noticeable improvements in internet speed. As Toronto looks forward to the next stages of its digital transformation, taking a broad lens of digital inclusion — a multilayered approach that starts with **access**, followed by **ability**, and finally **benefits** — will provide better and more equitable outcomes for residents. Only when all residents have both access to adequate internet and the skills to use it effectively will we have fully overcome the digital divide.

2

Introduction

All levels of government in Canada have been working to bridge the internet access gap that has long existed across the country. Often this issue is framed as an urban-rural divide, and for good reason. While 95% of urban Canadian households had access to the internet at home in 2022, only 91% of rural households had home internet — and this represents a significant improvement from previous findings.¹

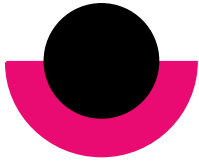
In 2016, the CRTC declared internet as a basic service in Canada,² and the federal government is now working toward achieving a goal of providing all Canadian households with access to high-speed internet by 2030 (defined as internet with faster than 50 Mbps download and 10 Mbps upload speeds).

The urban-rural lens, however, hides the disparities that can exist at the local level. While, according to Statistics Canada, the Greater Toronto Area as a whole may have 96% overall home internet access, that does not make it acceptable to leave behind those who need access. It also masks differences in

both quality and affordability that can exist within the same geographical area. Instead of existing across geographic boundaries, the divide exists across socioeconomic boundaries, with some groups being significantly better connected than others.

In 2020, the City of Toronto partnered with our team to assess the state of the digital divide in the City at the time, with particular attention to how it was intersecting with shifting needs during the COVID-19 pandemic. Since then, they have continued their work through ConnectTO to expand access to free Wi-Fi throughout the City, engaged in efforts to use existing fibre assets to contribute to closing the digital divide, and worked to develop a digital equity policy for the City.³

This project updates past research conducted in 2020, while expanding the scope to better understand issues of affordability and billing.



What is the digital divide?

Reliable internet access has quickly become essential to nearly every aspect of modern life. This rapid increase in the pervasiveness of the internet has created a deep divide between those who are able to effectively access and use the internet and those who cannot. In the past few decades, governments in Canada have deployed a number of strategies to both minimize the impact of that divide while still modernizing their own offerings for the digital age.⁴

Historically, access to the infrastructure that enables home and mobile broadband has been a major factor in contributing to the digital divide. There are significant differences in access to high-speed internet infrastructure between those living in urban and less populated areas. Rural areas face specific challenges caused by geographic distance, lack of density and, in some cases, both weather and topography.⁵

Within urban areas, there still exists a digital divide. Researchers have framed this as a shift from physical access (where the availability of adequate internet is in question) to material access (where it is actual access to both the necessary resources, devices, and subscriptions to have internet access)⁶.

Current Efforts

The Government of Canada has introduced the Connecting Families initiative, enabling low-income families with children eligible for the maximum Canadian Child Benefit, as well as lower-income seniors, to receive \$20 per month home internet (and in some cases a further discounted rate of \$10 for a download speed of up to 10 Mbps).

Internet service providers in Canada both work with the federal government to deliver those low-cost internet plans and often provide their own low-cost packages to support connectivity. For instance, Rogers Connected for Success includes mobile data plans on top of discounted home internet offerings.⁷

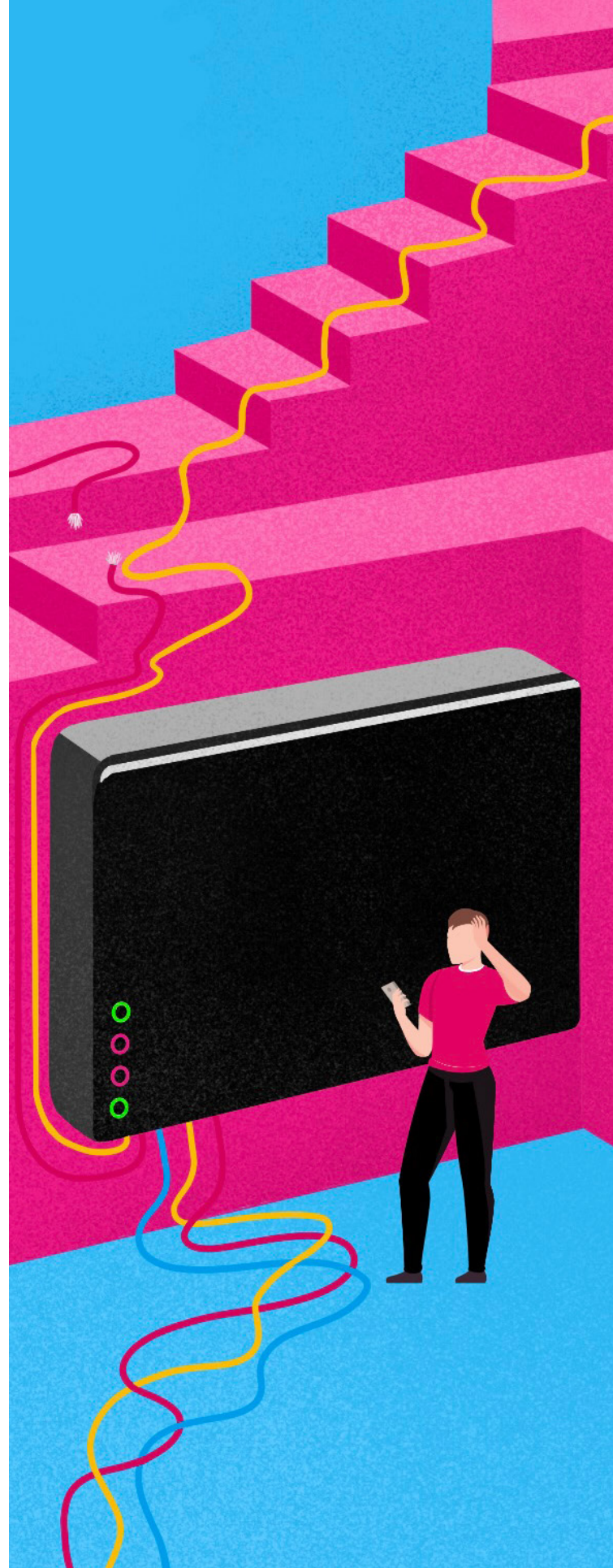
The Toronto Public Library has its own programs to deliver more accessible home internet. They offer Internet Connectivity Kits, including both Wi-Fi hotspots and laptops, to residents that have unlimited data for the period of the program.⁸

Digital Inclusion

Moving beyond the digital divide means taking a more holistic view of digital inclusion in Canada. This is a multilayered approach that starts with **access**, followed by **ability**, and finally **benefits**.⁹

Access is the main issue that has been at the forefront of the conversation about the digital divide since its inception, and for good reason. Without the fundamental infrastructure for home broadband and cellular service, having the appropriate skills and institutional support in place would have no impact. That said, Canada, and Toronto in particular, is nearing universal availability of home internet infrastructure — and so the focus needs to expand beyond merely facilitating access. We had recommended in our past work that the City move beyond just access to set a universal digital connectivity objective and regularly measure the proportion of Toronto residents that actually have home internet services at the CRTC's speed target and the devices needed to connect.¹⁰ This report and other supporting research contribute to this goal.

Many of the groups that have faced the largest barriers in getting and affording access to the internet also face barriers to using it once it is in place. The skillset to use the internet for banking, government services, education, and more is new and far from universal. Additionally, online institutions should be developed in such a way that they provide benefits to all those using them, rather than centralizing these only among some groups. These additional lenses on the digital divide collectively constitute digital inclusion and form the next frontier for programs designed to support internet access in Canada.¹¹



4

Methodology

This study replicates the approach taken in our **2020 report** to explore the digital divide in the City of Toronto. Data collection was conducted from November 17, 2023 to December 5, 2023 with Pollara Strategic Insights. In total, 2,503 City of Toronto residents aged 16 and older were interviewed for the project, using both online and phone survey methodologies. A probability sample of this size would yield results accurate to +/-2.0 percentage points, 19 times out of 20. The margin of error is larger for subsamples.

Online Survey

The online component of the survey was completed from November 17, 2023 to December 5, 2023, with respondents recruited from the Logit Group's double opt-in panel. The panel is recruited from a variety of sources, both in person and online, through telephone recruitment, public events, advertising, and referrals, to ensure a representative panel. The sample of 2,000 City of Toronto residents was recruited to ensure representative subsamples across the six original cities within Toronto (Etobicoke: n=250; York: n=100; East York: n=80; North York: n=590; Old Toronto: n=550; and Scarborough: n=430), based on the latest Census data, to ensure the sample is representative of Toronto as a whole.

Telephone Survey

The second component was a telephone survey conducted from November 17, 2023 to November 23, 2023 using Interactive Voice Response (IVR), which enables respondents to use their phone keypads to input responses to automated questions. Respondents were drawn from a research panel built and operated by Dynata, which is recruited through random digit dialling to both landlines and cell phones. Previous research indicated that low-income households and older adults were least likely to have internet access and to be under-represented in online surveys. As such, the telephone survey sample targeted 34 of Toronto's 95 forward sortation areas (FSAs) that had the highest incidence of low-income households (measured by the percentage of the population in households below the Market Basket Measure poverty line and the Low-Income Measure After Tax) and/or seniors (percentage of the population aged 65 and older) using the latest Census; see Appendix A for a breakdown of the sample.

The combined survey instrument is based on the 2020 study, which was designed in collaboration with academics from diverse fields. The telephone survey included only a subset of all questions included in the online survey to reduce length (see Appendix B for the questionnaire). In the latest iteration, several new questions have been added. The responses were weighted by income, based on the 2021 Census data, to ensure that the sample matched Toronto's population. Fifteen FSAs with a small number of responses were combined with another FSA for reporting. Totals may not sum or add to 100 due to rounding.





5

Access

Overall Access

Home internet in Toronto is approaching universal access — 98% of residents have internet service in their home. This is consistent with the results of the 2020 study, when we also found that 98% of residents have home internet access, and similarly

consistent (though slightly higher) than the most recent 2022 results of the Canadian Internet Use Survey (CIUS) that found 96% of residents in the City of Toronto have home internet access. However, given the size of Toronto, 2% of the population lacking home internet means that nearly 60,000 Torontonians lack internet at home.

Figure 1
Overall Home Internet Connectivity

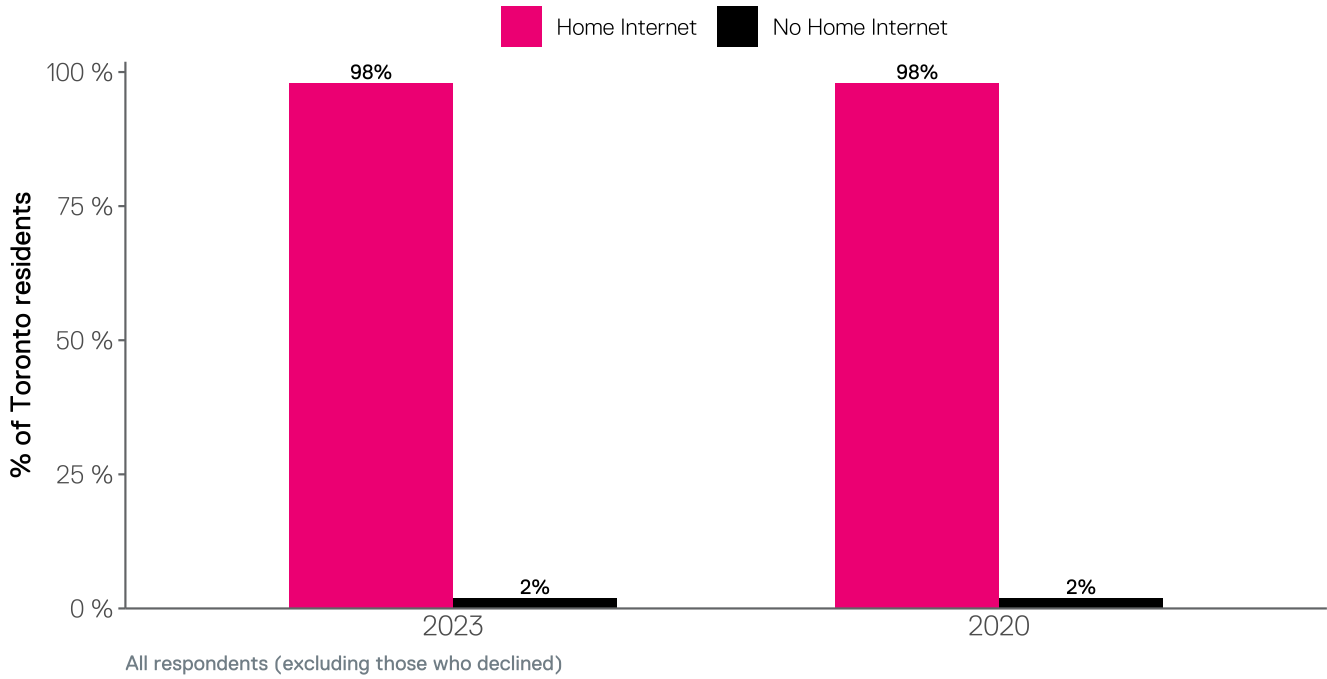


Table 1
Home Internet Connectivity by Household Income

Household Income	Less than \$30,000	\$30,000 to less than \$50,000	\$50,000 to less than \$70,000	\$70,000 to less than \$100,000	\$100,000 or more
Home Internet Access					
Yes	95%	96%	99%	99%	100%
No	5%	4%	1%	1%	0%

Comparatively, according to the CIUS, 94% of all Canadians have access to the internet at home. Focusing more closely on those living in large urban areas (in this case, either Census Metropolitan

Areas or Census Agglomerations), 95% of residents have internet access. This suggests that the City of Toronto has slightly better home internet connectivity than its closest peers.

Connectivity has also improved among older residents of Toronto. In 2020, only 95% of those aged 60 and older said they had home internet access, compared to 97% in 2023.

Although only 2% of respondents (n=47) indicate that they do not have home internet access, the survey provides a detailed profile of who those residents are and why they do not have internet access at home.

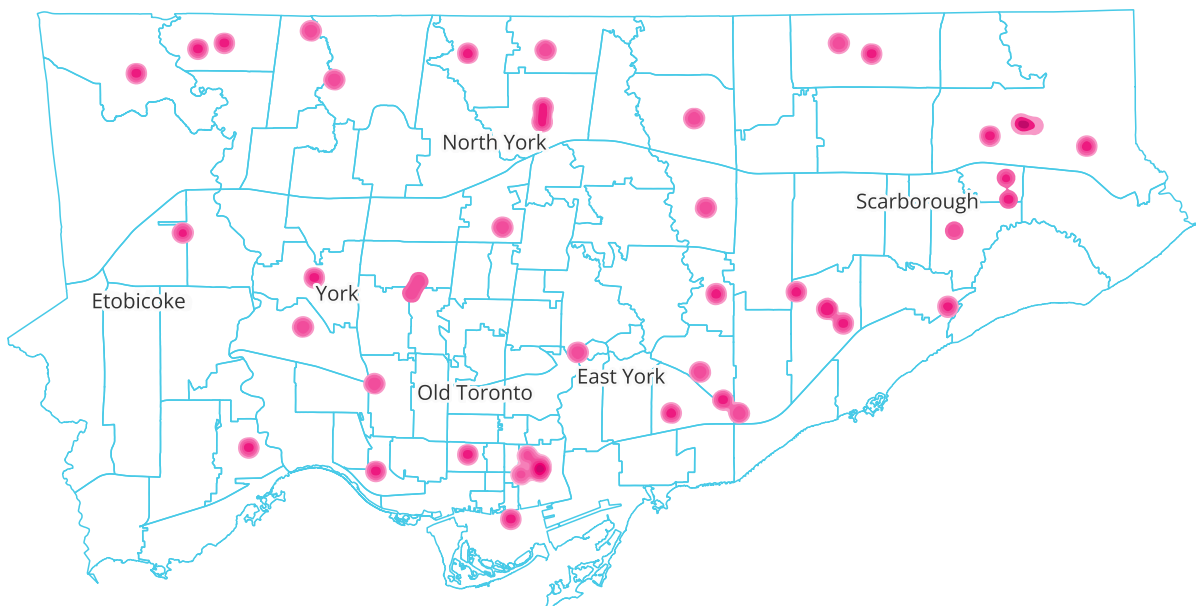
Across all demographic groups, more than 90% of respondents indicate that they have a home internet connection. However, lower-income households are generally less likely to have home internet — in households earning less than \$30,000 before taxes, 5% say they do not have home internet. Comparatively, in households earning \$100,000 or more, that figure is less than 1%.

Figure 2 depicts the location of households within the City of Toronto without home internet access. Caution is recommended in extrapolating significance from any individual point given the small sample size (n=47). However, there are patterns and particular areas that were of note.

There are nine areas of note with less than 96% rates of home internet access. In most cases, these include either neighbourhoods that are designated as Neighbourhood Improvement Areas or Emerging Neighbourhoods, although some areas encompass neither. These regions are:

- Downtown Yonge East (M5C/M5E)
- Moss Park/Regent Park (M5A)
- O'Connor - Parkview (M4B/M4J)
- Glen Park (M6B)
- Malvern East (M1B)
- Kingsview Village - The Westway (M9P/M9R)
- Humber Summit (M9L/M9M)
- Kingsway/Queensway (M8X/M8Y)
- Kennedy (M1K)

Figure 2
Heatmap of Households with No Home Internet



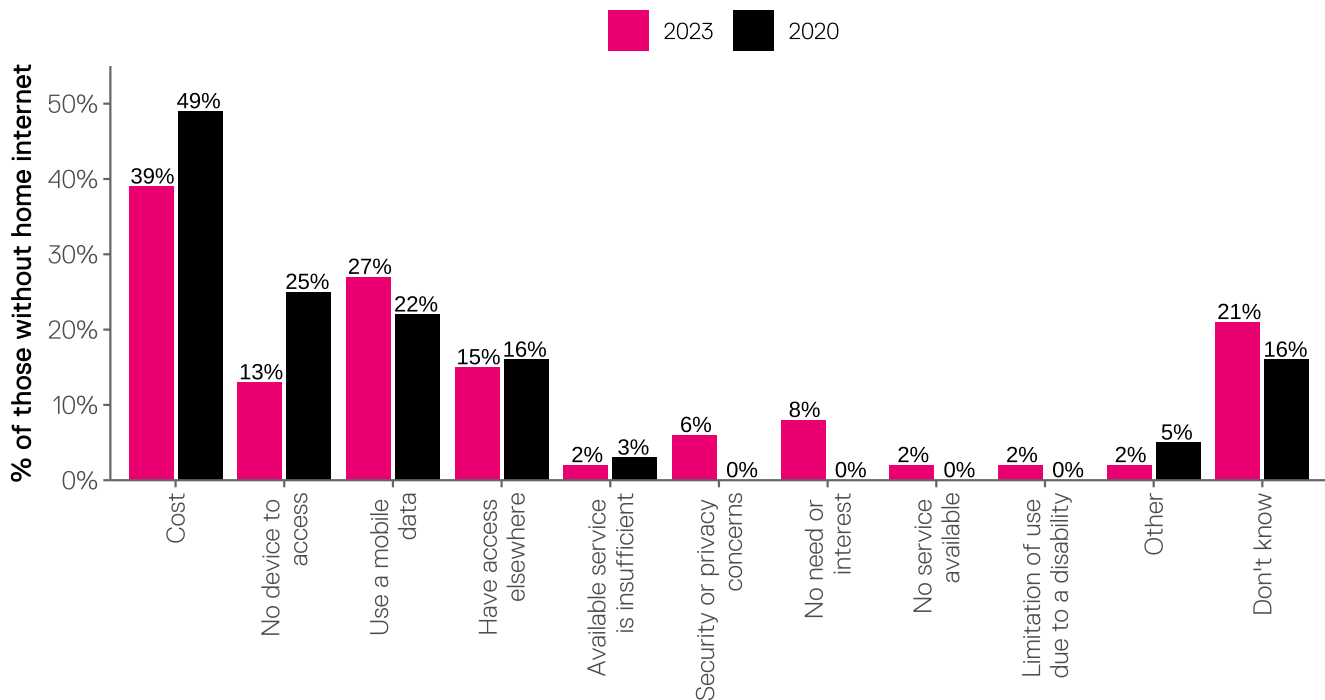


Reasons for Not Having Home Internet

Among residents who do not have home internet, the most commonly cited reason is the cost of the service: 39% mention it as a reason. While this is not surprising given the relatively high cost of broadband

internet in Canada, it underscores the need for Canada to address the cost barrier of internet services for lower-income people.

Figure 3
Reasons for No Home Internet Connectivity

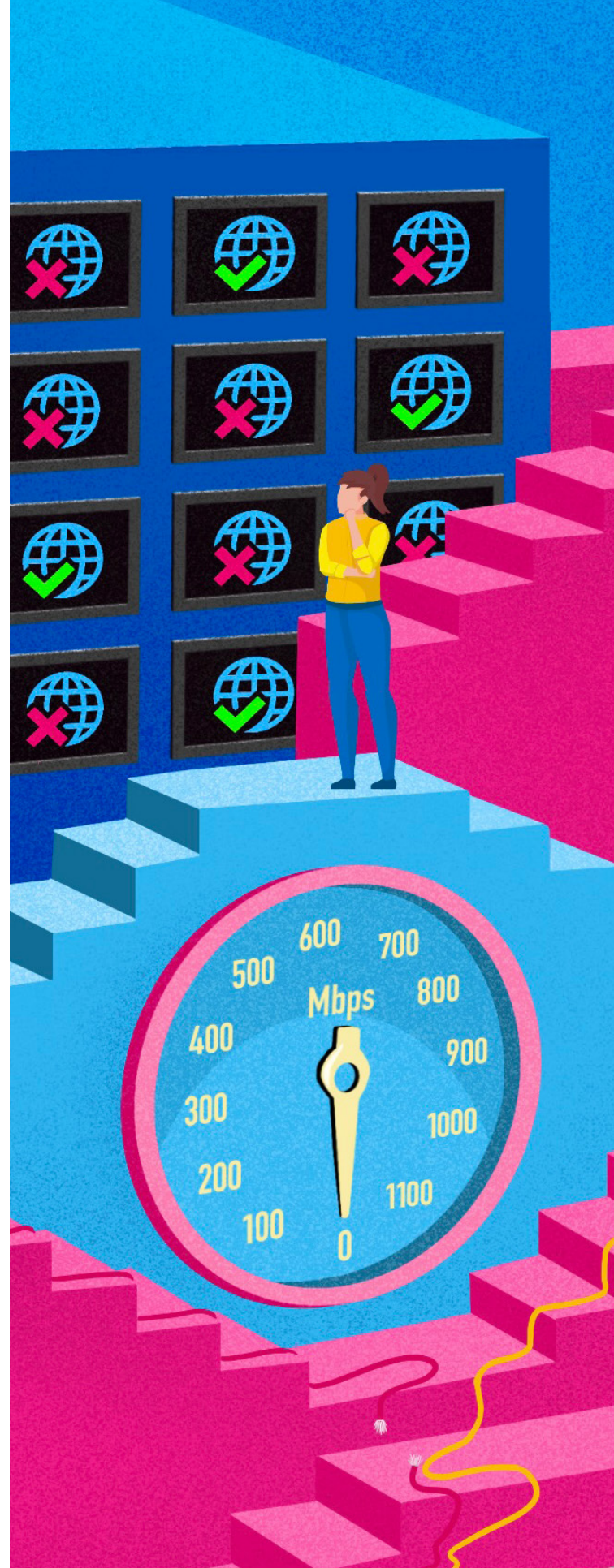


The next most commonly cited reason is that they can use a mobile data plan instead. With 96% of Toronto residents saying they have mobile cell data, this is a real alternative that many residents have access to. This is consistent with CIUS data for Canada as a whole, that shows 12% of Canadians

without home internet use either their cell phone or some alternative form of access. However, cost remains an important factor for cell phone data as well. Similar to home broadband, Canada has very high cell phone data costs, which we explore in more detail in the section on Affordability.

Similarly, many residents without home internet cite their ability to access the internet outside of their home, including places like work, libraries, businesses, and more. As we move out of restrictions resulting from the pandemic, the ability to access the internet at other locations outside the home has increased, as we discuss in the Internet Outside the Home section.

Importantly, Toronto residents without home internet still think they need it. Only 8% say they have no need or interest in the service, slightly higher than we found in 2020, but much lower than other barriers to home internet. Despite being higher than in 2020, this is significantly lower than what was found in the most recent CIUS study — which suggested that, across Canada, 59% of households without internet access say they do not have it because they have no need for it.





Access to Services

Compared to the 2020 survey, our 2023 survey shows there has been an overall decrease in use of home internet to access a range of government, financial, and health services. This study was first

conducted in December of 2020, at a time when the COVID-19 pandemic was a major public health emergency and the City of Toronto was taking significant measures to limit its spread.

Figure 4
Uses of Home Internet

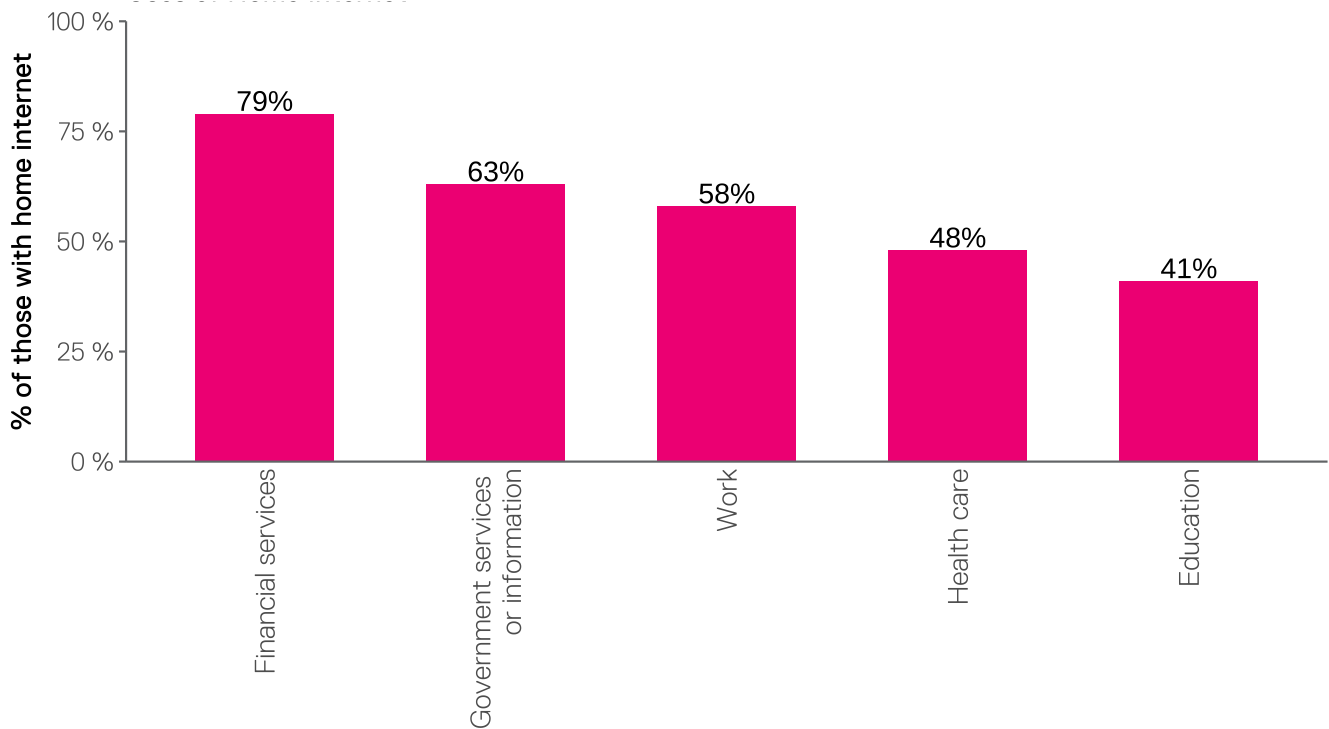


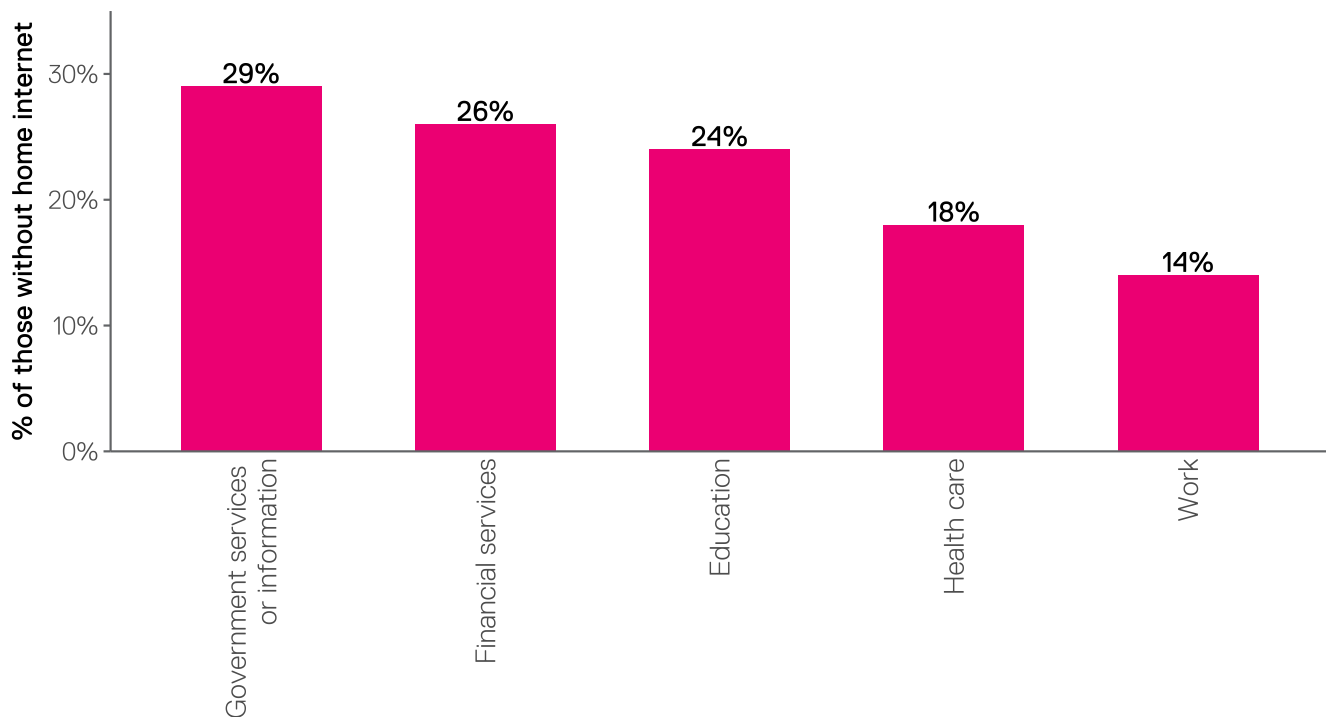
Table 2
Uses of Home Internet by Household Income

Household Income		Less than \$30,000	\$30,000 to less than \$50,000	\$50,000 to less than \$70,000	\$70,000 to less than \$100,000	\$100,000 or more
Services Accessed	Work	38%	48%	52%	66%	75%
	Education	43%	38%	38%	42%	45%
	Healthcare	38%	38%	48%	51%	58%
	Government services or information	53%	57%	63%	66%	74%
	Financial services or Banking	63%	75%	82%	82%	89%
	Don't know or prefer not to say	16%	8%	6%	4%	3%

That said, the internet remains a critical way in which Toronto residents access essential services and go about their daily lives. Nearly four in five Toronto residents used the internet in the last six months to access banking services, 63% used it to access government services, and 41% used it to access

healthcare services. As Table 2 shows, lower-income households are less likely to use home internet to access work, healthcare, banking and government services, while rates of access to online education are consistent across income levels.

Figure 5
Impact of No Internet on Access to Services

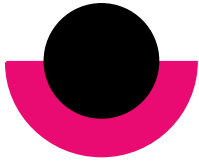


The impact of not having home internet access is felt by Toronto residents on all these fronts. Access to government information is the most cited impact, followed closely by financial services. Most positively, only 14% say that lacking home internet impacted their ability to work. This may be because when residents don't have home internet due to financial challenges, but they require it for work, it is easier to justify the expense.

Comparing how those with internet access use it to the impacts felt by those without a connection, it seems that, in most cases, residents are able to find alternative ways of accessing the services they need. When it comes to government and financial services, most residents with internet access say they used it

to access services in some way. However, fewer than a third of those without internet access say it was a barrier to accessing those services. This suggests that, in both cases, there are alternative pathways to access these services.

Conversely, when it comes to education, it seems to be more difficult to find alternatives without internet access. While 41% of those with internet access have used it for educational purposes, 24% of those without access have felt its impact on their education. That ratio of less than 2:1 is the highest across all areas included in the survey, suggesting it is the most difficult area to find alternatives.



Internet Outside the Home

While home internet access has become nearly ubiquitous in Toronto, it is not the only way residents access the internet. As discussed previously, cell phone data is nearly as universal in Toronto as home broadband, with 96% of residents having access to cell data. Because of this, nearly 70% of residents report having used their data plan to access the internet outside of their home. However, this is far from the only other place Toronto residents are going online.

Workplaces, businesses like malls or coffee shops, and other people's homes remain very common places to access the internet. Since 2020, the biggest change in this regard has been the use of the internet at other public locations like airports or subway stations. Now, nearly half of all residents report using the internet at these locations. This is in line with the re-opening of public spaces as restrictions resulting from the COVID-19 pandemic have decreased since December 2020.

Figure 6
Access Locations

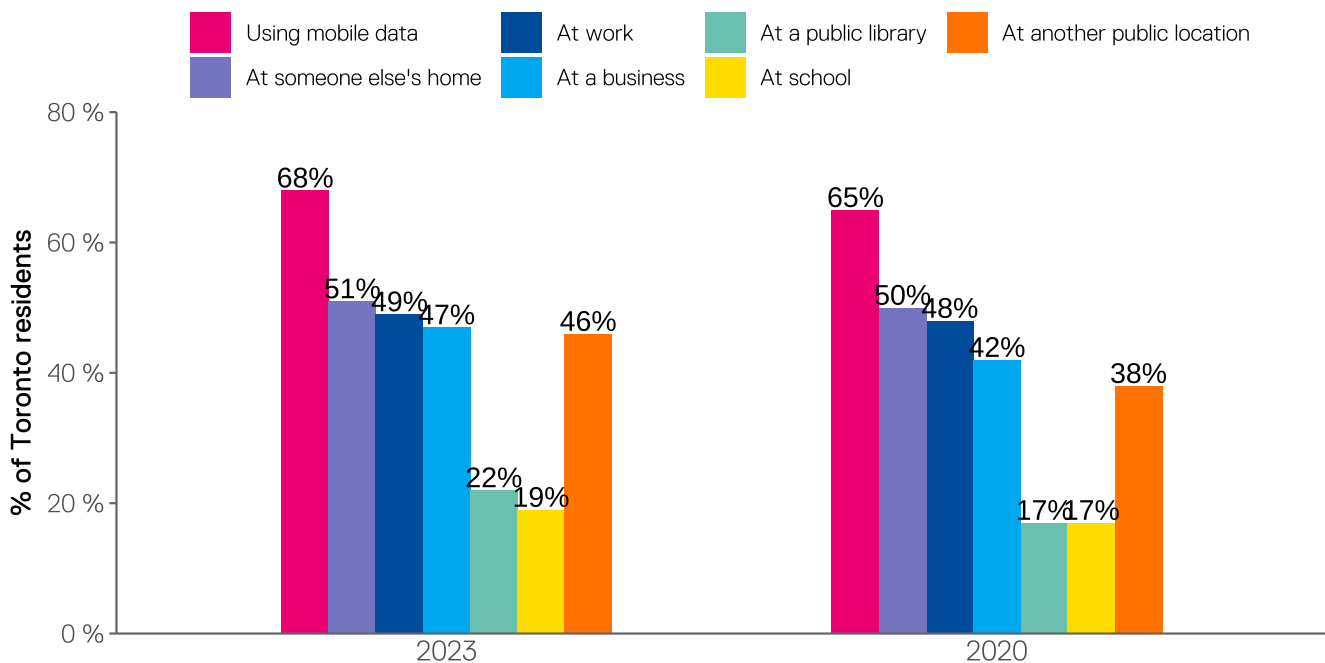


Table 3
Internet Access Locations by Household Income

Household Income		Less than \$30,000	\$30,000 to less than \$50,000	\$50,000 to less than \$70,000	\$70,000 to less than \$100,000	\$100,000 or more
Location of Internet Access	At work	28%	38%	48%	57%	63%
	At a public library	32%	25%	21%	20%	18%
	At a business like a mall	39%	40%	47%	45%	56%
	At someone else's home	42%	47%	48%	54%	57%
	Outside your home using your mobile phone data plan	61%	58%	67%	75%	76%
	At school or an education institution	26%	17%	17%	17%	20%
	At another public location	40%	44%	45%	43%	54%

Somewhat counterintuitively, in most cases, those with home internet are also more likely to access the internet at any given non-home location. The only exception to this is public libraries — 21% of those with home internet have used Wi-Fi from a public library in the last year, compared to 39% of those without home internet. For those without home internet, the library is the third most common location for internet access, only behind cell phone data plans and other public spaces.

Cell phone data also clearly serves as an important stopgap for many without home internet. As noted earlier, many Torontonians without home internet made that choice because they can use their cell phone data instead. Indeed, 85% of those without home internet say they have a cellular data plan, leaving only 0.2% of Toronto residents with neither home internet nor a cell phone data plan.



6

Quality

The CRTC has a goal for Canada to have universal access to home broadband internet with download speeds of at least 50 megabits per second (Mbps) and upload speeds of at least 10 Mbps.¹² High-speed internet like this is fast enough to comfortably stream high-definition television, or download music and videos. Innovation, Science and Economic Development Canada reports that, as of 2022, 93.5% of households in Canada now have the option to subscribe to high-speed internet, and they have set a target for 2026 to have 98% of households with access to the same.¹³ Despite the significant challenges in Canada posed by our geography, average internet speeds are globally competitive. A recent study ranks Canada as 13th globally for average internet speeds.¹⁴

That said, given the high cost of broadband internet, there is a significant difference between the internet speed that is available and the internet speed that residents choose to pay for. It's important to differentiate between three different ways of discussing home internet speed: maximum available internet speeds; maximum subscription speed of an internet connection shared by all that subscription's users; and average speed experienced by internet users.



Internet Speeds

Nearly three-quarters (74%) of residents report having high-speed internet (more than 50 Mbps download), with nearly half saying they have internet speed above 100 Mbps. This represents a combination of two types of responses — some respondents will have answered based on the speed of their internet as described by their internet service provider; however, the survey included a link to a speed test for those who were unsure what their internet speed is. The intention was to improve the

response rate to the question — without providing access to a speed test, there is a significant risk that those who pay less attention to their internet speed would not have responded. Because of this, another set of respondents will instead have described the average internet speed they were experiencing at the time of the survey, which in some cases will have been lower than when respondents reported the promised speed from their ISP.

Figure 7
Internet Speeds

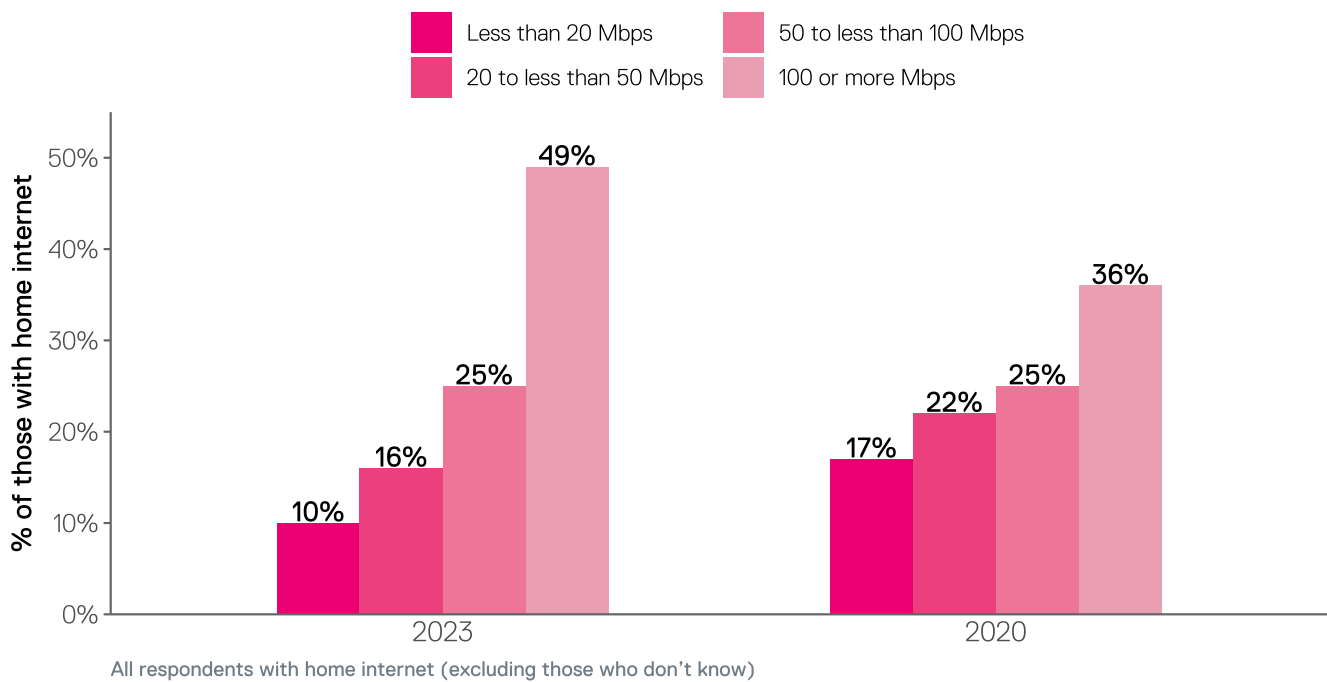


Table 4
Internet Speeds by Household Income

Household Income		Less than \$30,000	\$30,000 to less than \$50,000	\$50,000 to less than \$70,000	\$70,000 to less than \$100,000	\$100,000 or more
Reported Internet Speed (including those who don't know)	Less than 10 megabits per second (Mbps)	7%	3%	2%	2%	1%
	10 to less than 20 Mbps	10%	9%	5%	4%	2%
	20 to less than 50 Mbps	18%	17%	12%	12%	11%
	50 to less than 100 Mbps	13%	19%	22%	21%	21%
	100 or more Mbps	27%	32%	39%	40%	46%
	Don't know or prefer not to say	25%	20%	20%	21%	19%

These speeds represent a significant improvement from those reported in 2020. At the time, only 61% of respondents report high-speed internet access at home, including only 36% reporting speeds faster than 100 Mbps. Conversely, 17% report speeds below 20 Mbps — a figure that has since dropped to only 10%. However, those living in multi-unit houses are more likely to have slower internet speeds, with 15% saying they have internet that is less than 20 Mbps.

Otherwise, there is little difference in internet speeds across different types of housing. Among those living in houses, 64% have high-speed internet. Comparatively, 63% of those living in apartments

have high-speed internet, 64% of those in multi-unit houses have high-speed internet, and 67% of those in townhouses have high-speed internet.

There is a significant difference in internet speed between those who are employed and work from home, and those who are employed but work outside the home. More than three-quarters of those working from home have high-speed internet and half have speeds above 100 Mbps, while only 69% of those who work away from home have high-speed internet and only 41% have speeds over 100 Mbps.



Perceived Internet Quality

While not everyone is receiving high-speed internet, there are major differences in how households use the internet, resulting from differences in their needs. While high-speed internet is important for those who stream high-definition video frequently, other households might only use the internet for email or to check social media, where speed requirements are much lower.

Only 7% of Toronto residents describe their internet as either slow or very slow, while 91% say their internet is at least adequate, including 51% who say their internet is fast or very fast.

Figure 8
Perceived Home Internet Speed

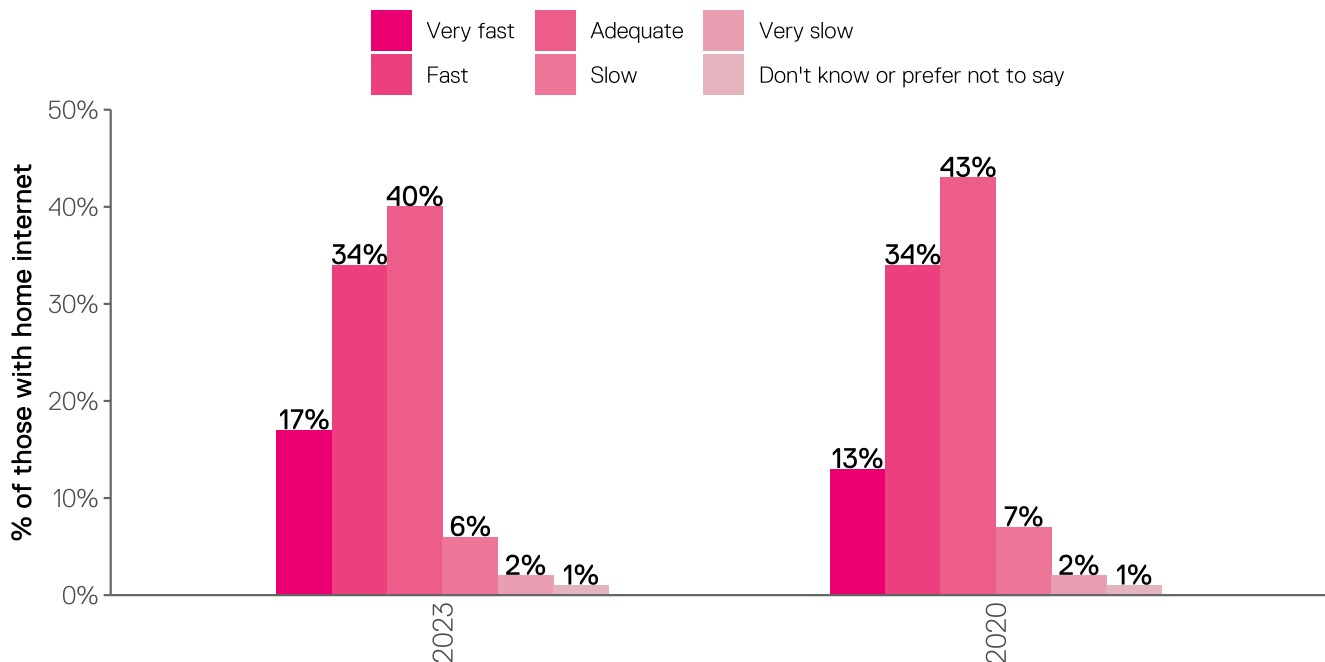


Table 5
Perceived Home Internet Speed by Household Income

Household Income		Less than \$30,000	\$30,000 to less than \$50,000	\$50,000 to less than \$70,000	\$70,000 to less than \$100,000	\$100,000 or more
Perceived Internet Speed	Very slow	4%	2%	0%	1%	1%
	Slow	10%	5%	4%	7%	4%
	Adequate	41%	44%	41%	41%	35%
	Fast	30%	34%	36%	34%	38%
	Very fast	14%	14%	17%	17%	22%
	Don't know or prefer not to say	2%	1%	1%	0%	0%

The distribution of households with high-speed internet is not equal across Toronto. Similar to the distribution of any home internet, those with higher household incomes are more likely to have high-speed internet — only 53% of households earning under \$50,000 a year have high-speed internet, compared to 84% of households earning \$100,000 or more.

Additionally, more recent migrants to Canada are less likely to have high-speed internet. While there’s no strong relationship between immigration and having any home internet, only two-thirds of those who recently immigrated to Canada (in the past 10 years) have high-speed internet. When it comes to age, the gap between older and younger residents has closed. In 2020, only 52% of those aged 60 and older reported having high-speed internet, while now 72% among this age group say they have high-speed internet.

That said, not all residents will need high-speed internet to be satisfied with the connection they have. Comparing reported speeds to how residents describe them, we find that, among those with the slowest internet (less than 10Mbps download speed), only 65% say they have at least adequate internet. Once speeds move up to 10 to 20 Mbps, that share who are satisfied with their internet jumps to 84%, including a total of 25% who say they have fast or very fast internet.

Table 6
Perceived Internet Speed by Actual Internet Speed

Actual Internet Speed		<10 Mbps	10 to 20 Mbps	20 to 50 Mbps	50 to 100 Mbps	100+ Mbps	Didn't answer
Perceived Internet Speed	Very Slow	12%	7%	0%	0%	0%	0%
	Slow	21%	9%	9%	5%	2%	4%
	Adequate	51%	59%	61%	47%	26%	42%
	Fast	12%	22%	27%	39%	37%	38%
	Very Fast	2%	3%	2%	9%	35%	11%
	Didn't answer	2%	0%	0%	0%	0%	4%
	At least adequate	65%	84%	90%	94%	98%	91%

Figure 9

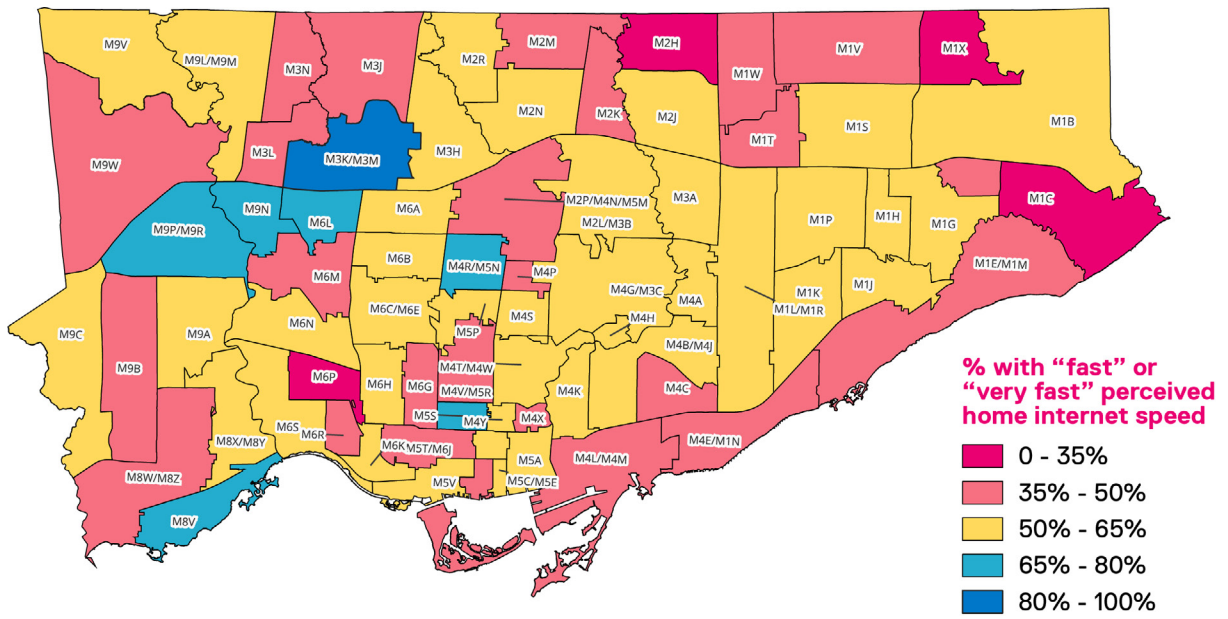
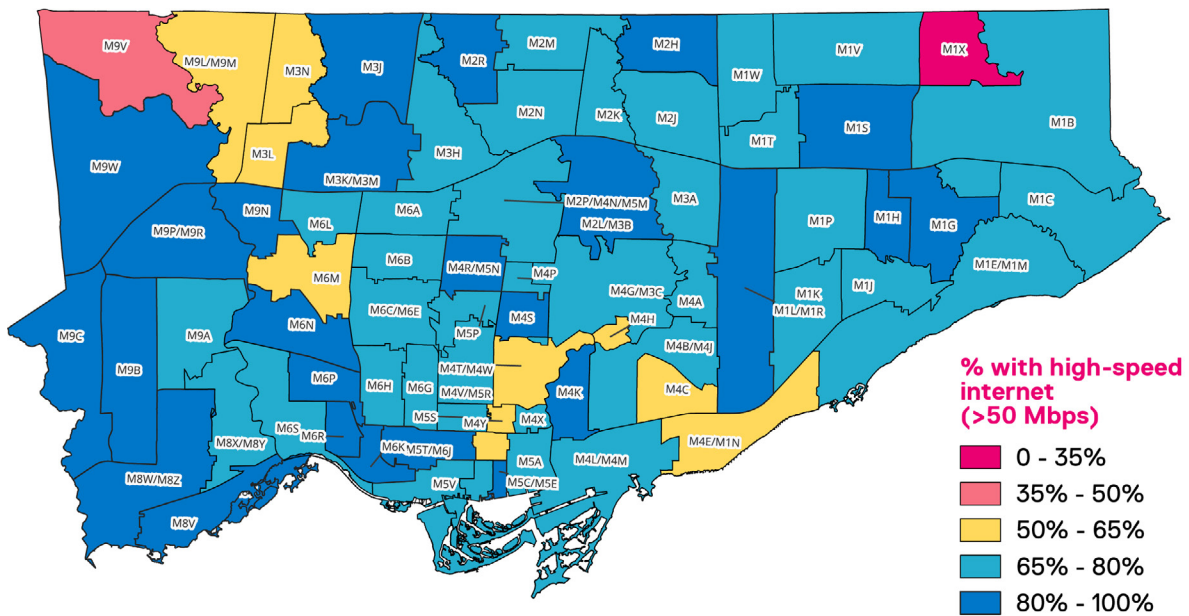


Figure 10





Internet Service Providers

In recent years, Toronto has experienced growth in alternate internet providers, giving residents options for their home internet beyond incumbents Bell and Rogers. While so far the growth has largely been in copper based third party offerings, the CRTC is actively engaged in efforts to increase access to third party fibre offerings.¹⁵

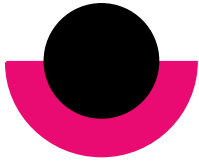
While, according to our survey, 79% of Toronto residents use either Bell or Rogers, that leaves 21% who use a different provider. The appeal of these alternate providers is generally that they offer lower cost services: 48% of those with an alternate provider report paying under \$110 a month, compared to only 37% of those who use either Bell or Rogers.

And, while a quarter of those with Bell or Rogers internet service report paying more than \$150 a month, only 12% of those using a third-party provider pay as much.

However, that discount tends to come with slower home internet speeds. While 61% of those with either Rogers or Bell as their internet service provider say they have high-speed internet, only 48% of those with a different provider say the same. Similarly, only 44% of those with an alternate provider describe their internet as fast or very fast. That said, those using alternate internet service providers still believe their internet speeds are adequate, with only 5% describing their internet as slow.

Table 7
Internet Service Provider by Household Income

Household Income		Less than \$30,000	\$30,000 to less than \$50,000	\$50,000 to less than \$70,000	\$70,000 to less than \$100,000	\$100,000 or more
Internet Provider	Bell	31%	32%	38%	39%	39%
	Rogers	44%	47%	42%	38%	43%
	Another provider	21%	20%	19%	22%	18%
	Don't know or prefer not to say	4%	1%	1%	1%	0%



Devices

Of course, having sufficient devices capable of accessing the internet is necessary for home internet access. The average Toronto household has 2.1 smartphones, 2.0 laptops, and 1.1 tablets, for a total of more than five devices per household. Accounting for the number of adults in a household, the average household has 2.6 internet-capable devices per adult: 1.0 cellphone, 1.0 laptop, and 0.6 tablets.

Those aged 65 and older have the lowest average number of devices per adult in their household (at only 2.4), compared to the highest device count cohort between 45 and 54 (an average of 2.9). A large portion of this difference comes from smartphones — on average, those aged 65 and older are the only group with fewer than one smartphone in their household (0.8). This is driven by 12% of

those aged 65 and older saying they do not have a smartphone, compared to 2% of those under 65. By comparison, in 2020, 20% of those aged 60 and older said they do not have a smartphone.

As with overall connectivity, across all demographic groups nearly all Toronto residents believe they have enough internet-capable devices in their home to meet their day-to-day needs. Overall, 95% of households say they have enough devices. However, again there are still significant differences across groups. Importantly, the number of these devices in a household per adult has a significant impact on perceptions of whether there are enough — households that have fewer than one internet-capable device per adult are less likely than other households to feel their needs are met.

Table 8
Access to Sufficient Devices by Number of Device in the Household

		<1 Device Per Person	1 to <2 Devices Per Person	2+ Devices Per Person
Enough Devices in the House	Yes	91%	94%	98%
	No	6%	4%	2%
	Didn't answer	3%	2%	1%

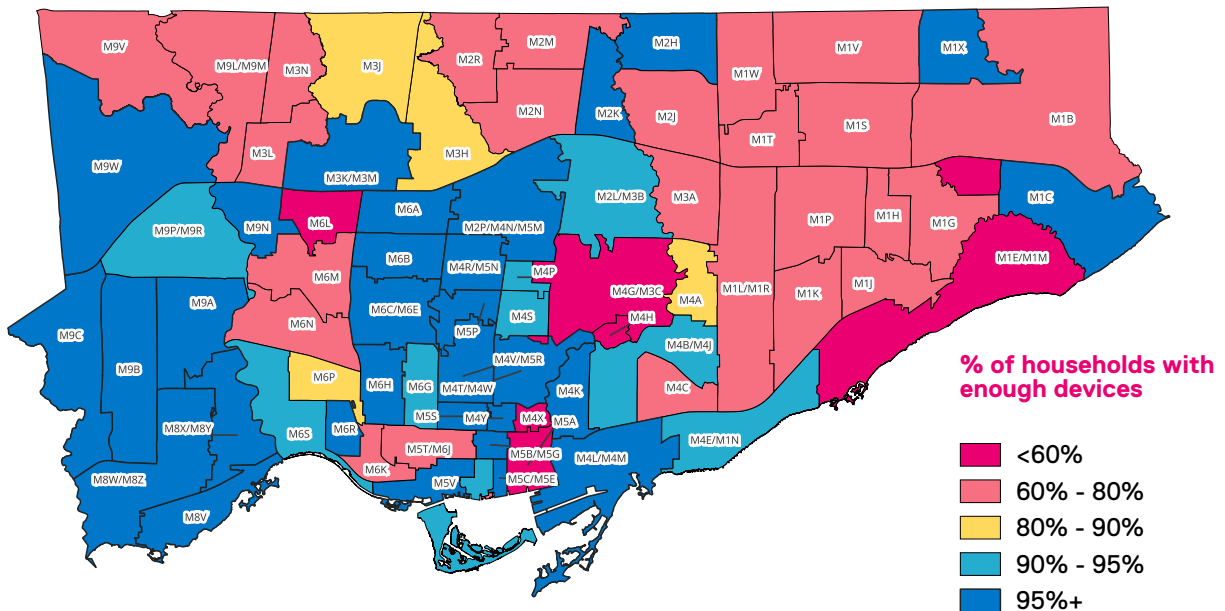
Households with kids are slightly more likely to feel they do not have access to enough devices. While 97% of households with two or more adults and no children under 18 say they have enough devices, 95%

of households with either young kids (under the age of 12) or teenage kids (13 to 17) say they have access to enough devices.

Table 9
Devices Access by Household Income

Household Income	Less than \$30,000	\$30,000 to less than \$50,000	\$50,000 to less than \$70,000	\$70,000 to less than \$100,000	\$100,000 or more
Devices Per Person	2.44	2.44	2.75	2.67	2.82
% with enough devices	92%	95%	95%	97%	99%

Figure 11





7

Affordability

Costs

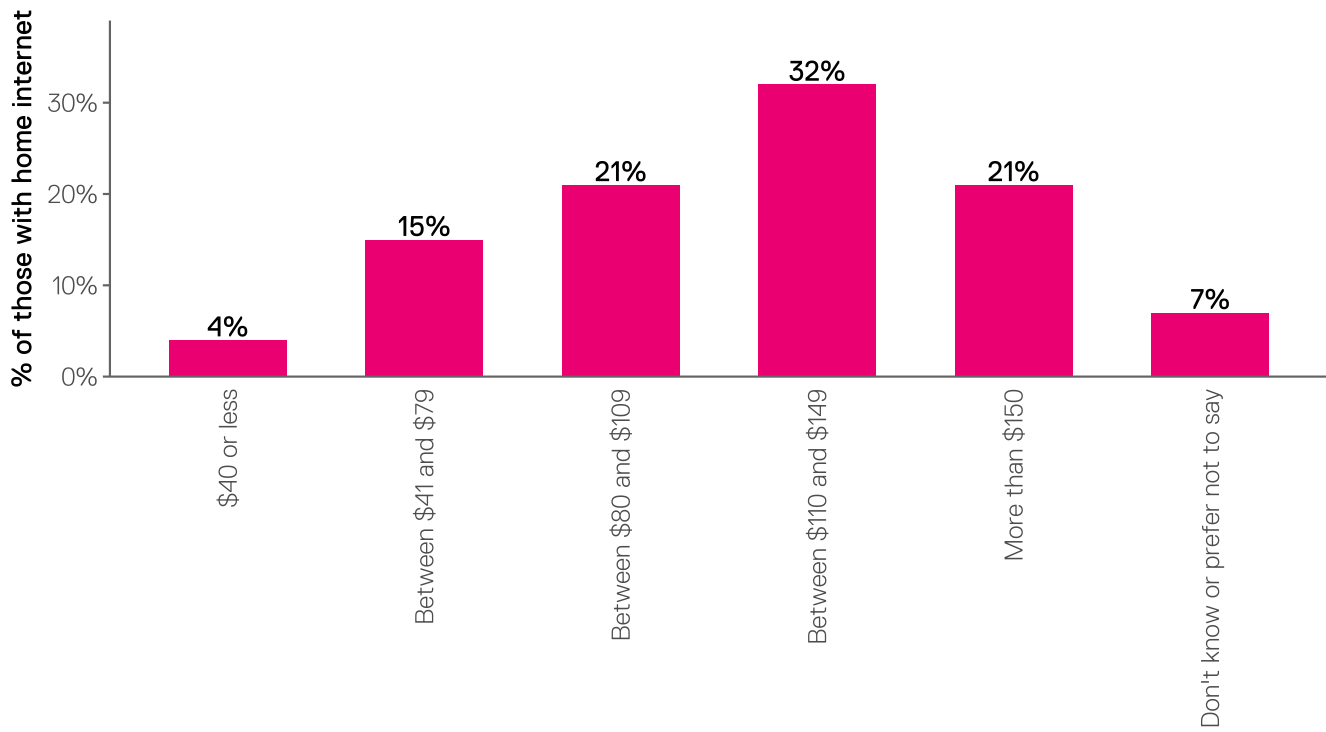
In recent years, the issue of affordability has quickly become one of the most prominent issues in Toronto. With the cost of everything from food to housing increasing, the already high costs of broadband internet in Canada risk becoming an even greater issue.

Combined Bills

This year, to better assess internet and cell phone costs, we adjusted the survey instrument to ask respondents with combined internet and phone bills about their combined monthly bill rather than asking them to estimate the share of each. The analysis here presents both the results of the individual bills among those who receive separate bills and the results of combined bills for every respondent.

In order to create a combined bill for respondents who received two separate bills, we used the mid-point in each range as an estimate of the actual amount a bill cost for residents. Then, the two separate bills were combined to find a bundled cost.

Figure 12
Combined Cost of Home Internet and Cell Phone Service



A majority of Toronto residents report paying at least \$110 a month for their combined home internet and

cell phone bills, with 21% reporting that they pay more than \$150 a month for these services.

Table 10
Cost of Home Internet and Cell Phone Service

Household Income	Less than \$30,000	\$30,000 to less than \$50,000	\$50,000 to less than \$70,000	\$70,000 to less than \$100,000	\$100,000 or more
	Cost of Home Internet and Cell Phones				
\$40 or less	8%	3%	3%	2%	2%
Between \$41 and \$79	26%	22%	16%	13%	9%
Between \$80 and \$109	22%	20%	27%	22%	18%
Between \$110 and \$149	23%	35%	31%	39%	36%
More than \$150	12%	14%	17%	22%	32%
Don't know or prefer not to say	10%	5%	6%	2%	3%

Among those who pay separate bills, 74% of residents report paying at least \$50 a month for their home internet, and 53% report paying at least \$50 a month for their cell phones. Only 18% of respondents report paying less than \$50 a month for home internet, and 45% report paying less than \$50 for their cell phones.

As expected, there is a relationship between the cost of home internet and cell services, and the actual internet speed that Toronto residents get (0.28 correlation coefficient). However, the correlation is much weaker when comparing the cost of these services and perceived internet adequacy (0.10).

Households with the highest incomes tend to spend more on their combined internet and cell phone bills. Among households that made \$100,000 or more, 68% report spending more than \$110 a month on

these services, compared to only 35% of households making under \$30,000. Lower-income houses making under \$30,000 instead tend to opt for the cheaper available options — more than a third of households in this group manage to spend under \$80 combined on their cell phone and home internet.

Table 11 shows the share of income households spend on home internet and cell phone service at different monthly costs and different income levels. Notably, for those in the lowest income group, spending even \$40 a month on these services is nearly the same share of their income as those in the highest income group spending \$150 a month.

Table 11
% of Income Spent on Internet and Cell Phone

Annual Household Income		\$30,000	\$50,000	\$70,000	\$100,000
Monthly cost of home internet and cell phone	\$40 a month	1.6%	1.0%	0.7%	0.5%
	\$80 a month	3.2%	1.9%	1.4%	1.0%
	\$110 a month	4.4%	2.6%	1.9%	1.3%
	\$150 a month	6.0%	3.6%	2.6%	1.8%

Table 12
Estimated % of Income Spent on Internet Connectivity by Income Bracket

Annual Household Income	Less than \$30,000	\$30,000 to less than \$50,000	\$50,000 to less than \$70,000	\$70,000 to less than \$100,000	\$100,000 or more
Estimated Average Income	\$15,000	\$40,000	\$60,000	\$85,000	\$100,000
Estimated Average Monthly Bill	\$94.51	\$105.64	\$108.14	\$115.10	\$121.34
% of Income	8%	3%	2%	2%	1%

Bills are also typically higher for those living in houses compared to other types of dwellings. Nearly three in ten (27%) of those living in houses report paying more than \$150 across services, compared to only 19% of those living in apartment buildings under 10 stories, and 18% of those living in larger apartment buildings.

Toronto and Canada have existing programs that support lower-income households with the high cost of accessing the internet. As mentioned previously, the federal government provides low-income households with access to discounted home broadband. In total, 4% of Toronto residents have a home internet plan that costs them \$20 a month or less, the current cost of these discounted plans.

Figure 13
Concern About Paying Bills

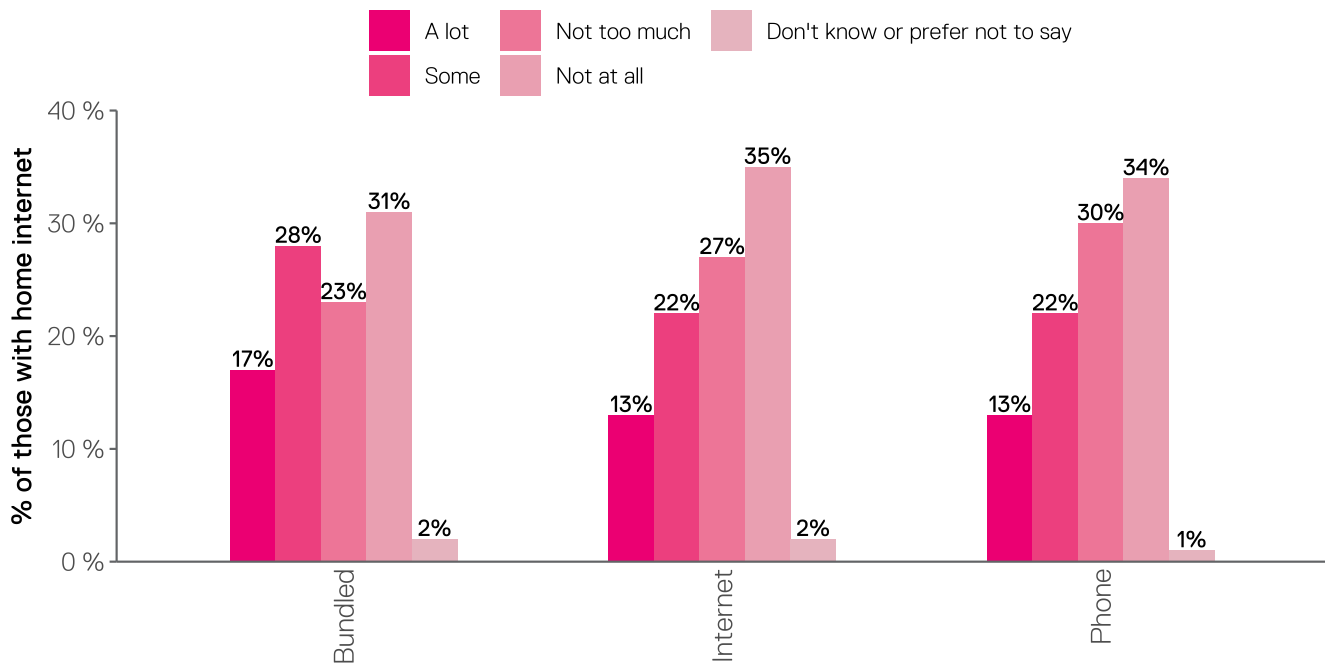


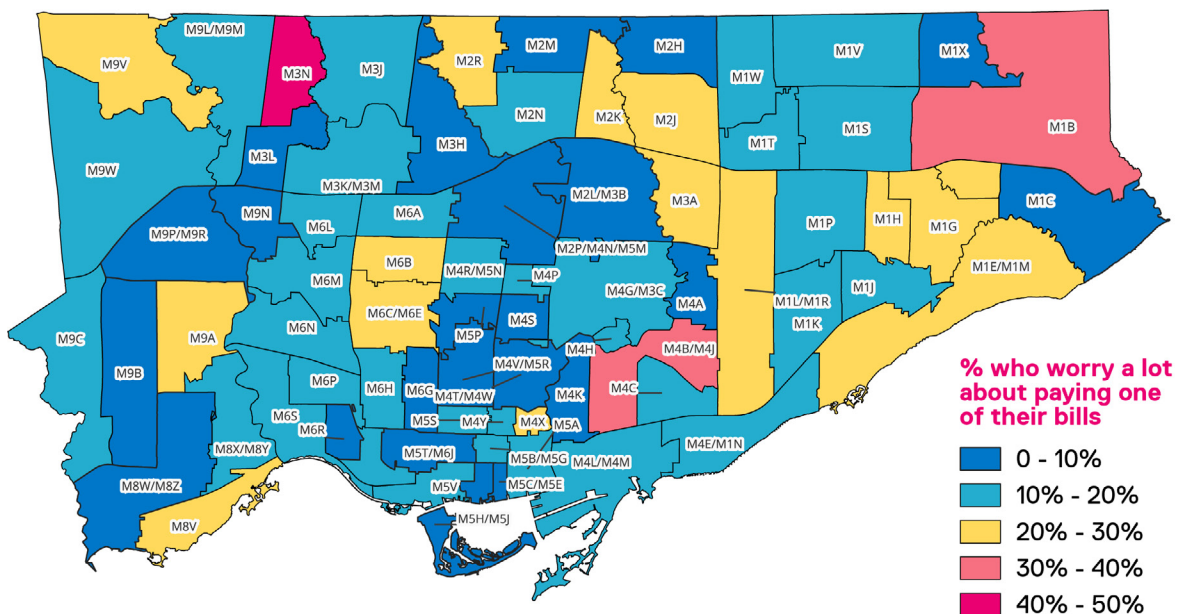
Table 13
Cost of Home Internet and Cell Phone Service by Household Income

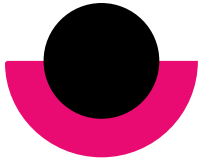
Household Income		Less than \$30,000	\$30,000 to less than \$50,000	\$50,000 to less than \$70,000	\$70,000 to less than \$100,000	\$100,000 or more
Concern About Paying Different Bills	Worry a lot - Home Internet	21%	18%	12%	14%	6%
	Worry a lot - Cell Phone	21%	17%	13%	12%	6%
	Worry a lot - Bundled	30%	20%	15%	16%	13%

These prices lead to some residents feeling concerned about paying their bills — of those with a home internet bill or a cell phone bill, 13% worry a lot about paying it. Among those who have a single bundled bill, 17% worry a lot about paying it. Overall, these findings are largely stable since 2020, possibly because, although cost of living has been rising, the average cost of home internet has fallen slightly over that period.¹⁶

As would be expected, concern about paying phone and internet bills is far higher in lower-income households. More than one in five households making under \$30,000 worry a lot about paying both bills. Additionally, those living with disabilities are also more likely to be concerned about paying their bills; for those with a home internet bill, 18% are worried about paying it, compared to only 10% of those not living with a disability.

Figure 14





Extra Billing Impacts

The cost of a cell phone or home internet plan is not the only cost that Toronto residents experience with respect to digital access. There are a myriad of ways

that residents can be charged fees, including late bill payments or data overages (both for home internet and for cell phone data).

Figure 15
Additional Fees Charged

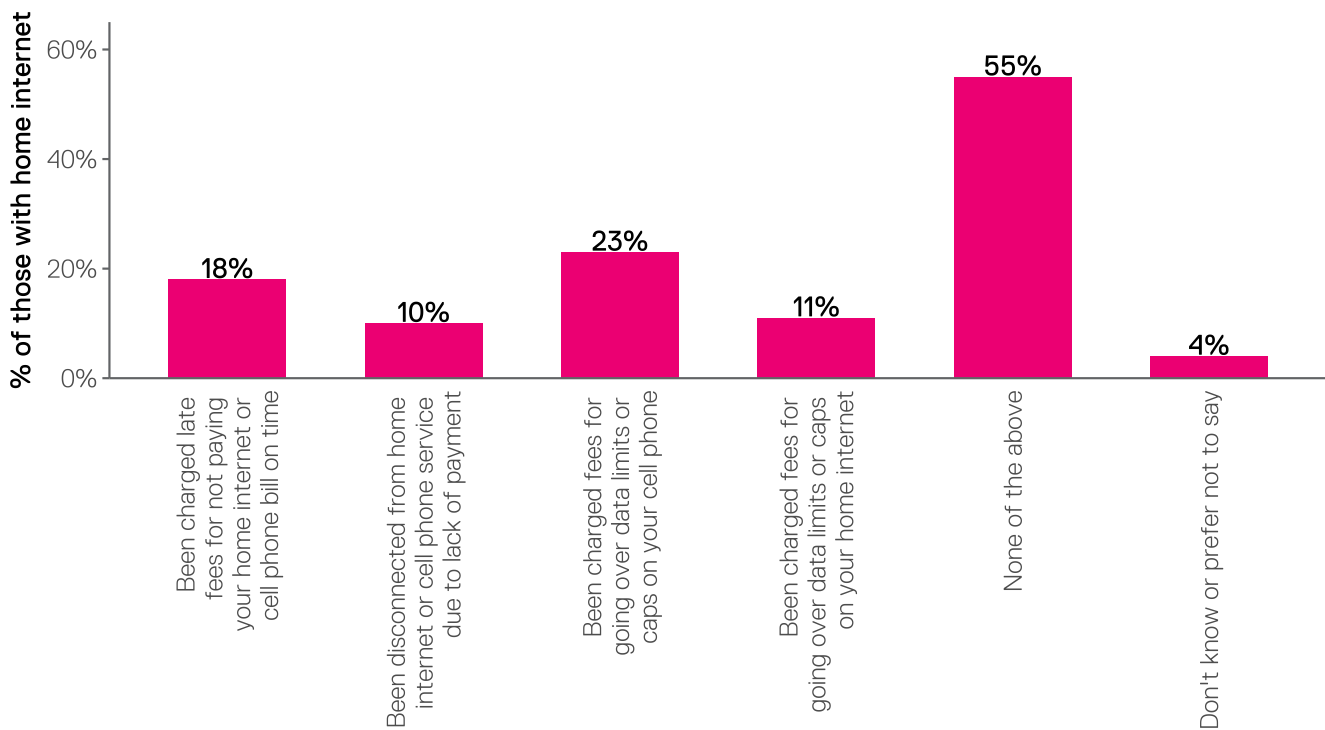


Table 14
Additional Fees Charged by Household Income

Household Income		Less than \$30,000	\$30,000 to less than \$50,000	\$50,000 to less than \$70,000	\$70,000 to less than \$100,000	\$100,000 or more
Fees Charged	Been charged late fees for not paying your home internet or cell phone bill on time	24%	24%	19%	16%	13%
	Been disconnected from home internet or cell phone service due to lack of payment	17%	15%	9%	9%	5%
	Been charged fees for going over data limits or caps on your cell phone	24%	26%	22%	24%	24%
	Been charged fees for going over data limits or caps on your home internet	11%	14%	9%	12%	11%
	None of the above	47%	46%	57%	57%	62%
	Don't know or prefer not to say	5%	3%	2%	2%	2%

Overall, four in ten residents say they have been either charged an additional fee for their home internet or cell data, or have had it disconnected because they did not pay their bill on time. The most common of these is paying a fee for cell phone data overages: 23% of residents say they have been charged for this.

These impacts are particularly concentrated among younger Torontonians and newcomers to Canada. A majority of those who have been in Canada for less than 10 years (51%) say they have been charged a fee or had their internet disconnected, and similarly

50% of those under 35 have experienced the same. In particular, these groups are also most likely to have had their home internet disconnected because they did not pay their bill on time.

Between home internet and cell phone data overage fees, 28% of households experience either one or the other. Among those who paid these fees, most have paid a modest amount over the last 12 months — 40% say they have been charged less than \$25 in the last year. However, some are paying significantly more, with 8% of respondents saying they spent more than \$100 in the last year.

Figure 16
Data Overage Fees Paid

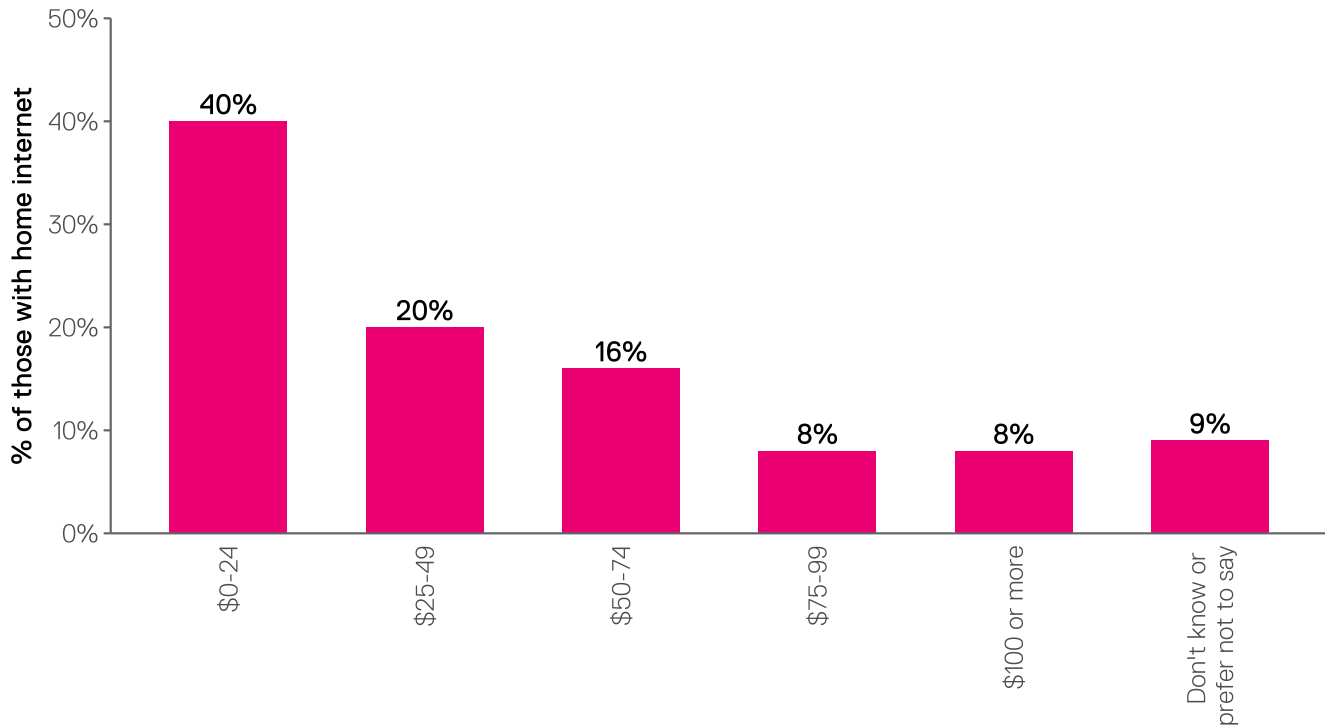


Table 15
Data Overage Fees Paid by Household Income

Household Income	Less than \$30,000	\$30,000 to less than \$50,000	\$50,000 to less than \$70,000	\$70,000 to less than \$100,000	\$100,000 or more
Total Data Overage Fees Paid					
\$0-24	35%	38%	39%	39%	47%
\$25-49	16%	18%	21%	20%	21%
\$50-74	24%	22%	21%	11%	11%
\$75-99	8%	7%	10%	9%	7%
\$100 or more	8%	7%	5%	12%	8%
Don't know or prefer not to say	9%	9%	4%	9%	6%



8

Conclusions

The overall picture in Toronto remains similar to that seen in 2020, though with noticeable improvements in internet speed. Nearly all residents in Toronto now have access to home internet, with 2% of the population remaining unconnected, largely due to the cost of the service or the alternate use of a mobile data plan.

This leaves affordability and capability as the remaining barriers to overcome. Home internet and cell phone data remain significant costs for Toronto residents who can afford them, and they also represent a significant barrier to these services for those who can't afford them. Public libraries and other public spaces continue to serve as critical infrastructure to fill connectivity gaps for these individuals.

Looking beyond this, we must also ensure that those with internet access are able to use it effectively. Connecting the remaining 2% of households is only valuable if those new connections know how to use the required technology and, importantly, also know what services they can access online. Once connected to the internet, they will still need to learn how those services can be accessed more conveniently online.

As Toronto looks forward to the next stages of its digital transformation, taking a broad lens of digital inclusion will provide better and more equitable outcomes for residents. Only when all residents have both access to the internet and the ability to use it effectively will we have overcome the full digital divide.

Appendix A: Survey Sample

Sample by Forward Sortation Area and Proportion of Total Private Households in 2021 Census

FSA (Online and Phone)	Weighted Count	% of census
M1B	63.6	0.29%
M1E/M1M	69.9	0.26%
M1G	36.7	0.34%
M1H	27.7	0.31%
M1J	38.8	0.29%
M1K	56.6	0.30%
M1L/M1R	52.7	0.21%
M1P	61.5	0.36%
M1S	44.1	0.31%
M1T	41.4	0.30%
M1V	53.6	0.32%
M2J	94.4	0.37%
M2M	51.4	0.39%
M2N	116.6	0.32%
M2R	63	0.39%
M3A	56.3	0.41%
M3J	43.2	0.41%
M3L	13.3	0.20%
M3N	28	0.20%
M4A	28.1	0.45%
M4C	82.1	0.40%
M4G/M3C	63.9	0.25%
M4H	24.7	0.38%
M4X	36.5	0.33%
M5A	96.5	0.32%
M5B/M5G	16.1	0.08%
M5T/M6J	43.5	0.16%
M6K	68	0.27%
M6L	15.1	0.20%
M6M	46.9	0.28%
M6N	45.6	0.27%
M6R	10.7	0.12%
M9L/M9M	33.5	0.27%
M9V	38.6	0.22%

FSA (Online only)	Weighted Count	% of census
M1W	56.3	0.33%
M2H	11.1	0.12%
M2K	19	0.15%
M2L/M3B	11.2	0.12%
M2P/M4N/M5M	34.6	0.18%
M3H	24.2	0.15%
M3K/M3M	10.9	0.08%
M4B/M4J	10.5	0.04%
M4E/M1N	11.7	0.05%
M4K	20.7	0.14%
M4L/M4M	35.5	0.13%
M4P	21.3	0.13%
M4R/M5N	13.2	0.10%
M4S	14	0.08%
M4T/M4W	14.4	0.10%
M4V/M5R	17.9	0.06%
M4Y	40	0.15%
M5C/M5E	13.3	0.13%
M5H/M5J	11.7	0.08%
M5P	11.2	0.11%
M5S	11.3	0.10%
M5V	33.9	0.08%
M6A	17.7	0.18%
M6B	14.5	0.12%
M6C/M6E	22.9	0.08%
M6G	11.3	0.08%
M6H	22.5	0.11%
M6P	17	0.08%
M6S	16.7	0.11%
M8V	15.7	0.06%
M8W/M8Z	14.6	0.08%
M8X/M8Y	17.6	0.11%
M9A	23.6	0.14%
M9B	14.8	0.11%
M9C	30.3	0.19%
M9N	12.8	0.11%
M9P/M9R	12.5	0.06%
M9W	10.2	0.07%

Sample Demographics

Age:

- 16-24: 10%
- 25-34: 18%
- 35-44: 14%
- 45-54: 15%
- 55-64: 17%
- 65-74: 16%
- 75+: 11%

Race/Ethnicity:

- White: 56%
- East Asian: 14%
- South Asian: 9%
- Black: 7%
- Southeast Asian: 4%
- Latin American: 3%
- Indigenous: 2%
- West Asian: 2%
- Arab: 1%
- Other: 4%
- Don't know or prefer not to say: 4%

Household Income Before Taxes and Deductions Last Year:

- Less than \$30,000: 14%
- \$30,000 to less than \$50,000: 14%
- \$50,000 to less than \$70,000: 15%
- \$70,000 to less than \$100,000: 18%
- \$100,000 or more: 27%
- Don't know or prefer not to say: 13%

Gender:

- Woman: 54%
- Man: 44%
- Non-binary/third gender: 1%
- Prefer to self-describe/not to say: 1%

Length of Residence in Canada:

- Born in Canada: 60%
- Less than 10 years: 11%
- More than 10 years: 27%
- Don't know or prefer not to say: 2%

Housing:

- House: 42%
- Apartment or condo in building of 10 or more stories: 29%
- Apartment or condo in building of less than 10 stories: 16%
- Townhouse: 9%
- Multi-unit house: 3%
- Other: 0%
- Don't know or prefer not to say: 2%

Employment Status:

- Employed full- or part-time and working from home: 41%
- Employed full- or part-time and working at place of employment: 21%
- Retired: 19%
- Not employed or unable to work: 9%
- Student: 6%
- Other: 3%
- Prefer not to say: 2%

Language Spoken Most Often at Home:

- English: 86%
- Other language: 13%
- Prefer not to say: 1%

Appendix B: Survey Questionnaire

Screening Questions

S1: What is your postal code?

- Input or “No fixed address (e.g., shelter, experiencing homelessness, staying with others)”

S2: What is your age?

- Input

Core Questions

C1: Do you currently have internet service installed at home?

- a) Yes
- b) No
- c) Don't know or prefer not to say

C2: Do you currently have cell phone service?

- a) Yes
- b) No
- c) Don't know or prefer not to say

[IF YES TO C1 and C2]

C3: Are your cell phone and home internet services bundled together in a single bill or do you receive separate bills for each service?

- a) Yes I only receive one bill for both services together
- b) No I receive separate bills for each service
- c) Don't know or prefer not to say

[IF YES TO C3]

C4A: What is the total monthly cost of your bundled cell phone and home internet services before taxes? Note: exclude any financing for your cell phone device

- a) \$40 or less
- b) Between \$41 and \$79
- c) Between \$80 and \$109
- d) Between \$110 and \$149
- e) More than \$150
- f) Don't know or prefer not to say

[IF NO TO C3 and YES TO C1]

C4B: What is the monthly cost of your home internet service before taxes?

- a) \$20 or less
- b) Between \$21 and \$49
- c) Between \$50 and \$69
- d) Between \$70 and \$99
- e) More than \$100
- f) Don't know or prefer not to say

[IF NO TO C3 and YES TO C2]

C4C: What is the monthly cost of your cell phone service before taxes? Note: exclude any financing for your cell phone device

- a) \$20 or less
- b) Between \$21 and \$49
- c) Between \$50 and \$69
- d) Between \$70 and \$99
- e) More than \$100
- f) Don't know or prefer not to say

[IF YES TO C1]

C5A: What is the maximum download speed of your home internet service? If you are at home now, you can use an Internet speed test to check the current speed.

[ONLINE ONLY]

- a) Less than 10 megabits per second (Mbps)
- b) 10 to less than 20 Mbps
- c) 20 to less than 50 Mbps
- d) 50 to less than 100 Mbps
- e) 100 or more Mbps
- f) Don't know or prefer not to say

C6A: How would you describe the speed of your home internet service relative to your needs?

- a) Very slow
- b) Slow
- c) Adequate
- d) Fast
- e) Very fast
- f) Don't know or prefer not to say

C7A: Which home internet service provider are you using? [ONLINE ONLY]

- a) Bell
- b) Rogers
- c) Beanfield
- d) Diallog
- e) Distributel
- f) FibreStream
- g) Fido
- h) oxio
- i) Primus
- j) Start
- k) Telus
- l) TekSavvy
- m) VMedia
- n) Virgin Plus
- o) Other - please specify
- p) Don't know or prefer not to say

C8A: In the last six months, has your household used your home internet service to access any of the following? [ONLINE ONLY]

- a) Work from home
- b) Education
- c) Health care
- d) Government services or information
- e) Financial services or banking
- f) Don't know or prefer not to say

[IF NO TO C1]

C5B: Why do you not have internet service installed at home? (Select all that apply)

- a) Use a mobile phone data plan instead [IF YES TO C2]
- b) The monthly cost of internet service
- c) No device at home that can connect to the internet
- d) Have access to the internet elsewhere
- e) Available internet service does not meet your needs
- f) Lack of confidence or knowledge to use internet
- g) No need or interest in using internet
- h) No internet service available
- i) Limitation of use due to a disability
- j) Other - please specify
- k) Don't know or prefer not to say

C6B: In the last six months, has the lack of home internet service impacted your household's ability to access: (Select all that apply)

- a) Work from home
- b) Education
- c) Health care
- d) Government services or information
- e) Financial services or banking
- f) Don't know or prefer not to say

[ALL]

C9: In the last 12 months, where have you accessed the internet? (Select all that apply)

- a) Outside your home using your cell phone data plan [IF YES TO C2]
- b) At work
- c) At school or an education institution
- d) At a public library
- e) At another public location (e.g., medical centre, airport, community centre, subway)
- f) At a business establishment (e.g., shopping mall, restaurant, coffee shop)
- g) At someone else's home (e.g., friend, relative)
- h) None of the above
- i) Don't know or prefer not to say

C10 - How much, if at all, do you worry about being able to pay for each of the following over the next few months?

[IF YES TO C3] A) Home internet and cell phone bill
[IF YES TO C1 and NO TO C3] B) Home internet bill
[IF YES TO C2 and NO TO C3] C) Cell phone bill

- a) A lot
- b) Some
- c) Not too much
- d) Not at all
- e) Don't know or prefer not to say

C11A - Have you ever experienced any of the following? (Select all that apply)

[ONLINE ONLY]

- a) Been charged late fees for not paying your home internet or cell phone bill on time
- b) Been disconnected from home internet or cell phone service due to lack of payment
- c) Been charged fees for going over data limits or caps on your cell phone
- d) Been charged fees for going over data limits or caps on your home internet
- e) None of the above
- f) Don't know or prefer not to say

[IF YES TO C11A-C/D SELECT]

C11B - In the past three months, how much have you paid in data overage fees?[ONLINE ONLY]

- a) \$0-24
- b) \$25-49
- c) \$50-74
- d) \$75-99
- e) \$100 or more
- f) Don't know or prefer not to say

C12 - How many of the following devices do you currently have in your household? [Drop down/input: 0 to 9] [ONLINE ONLY]

- a) Smartphone
- b) Laptop or desktop computer
- c) Tablet (e.g., iPad)

C13 - Are there usually enough devices to meet your household's day-to-day needs?

[Drop down/input: 0 to 9] [ONLINE ONLY]

- a) Yes
- b) No
- c) Don't know or prefer not to say

Demographic Questions

D1: Including yourself, how many people live in your household between the following age ranges? [Drop down/input: 1 to 9]

- a) 18 years or older
- b) Between 13 and 17 years old
- c) Between 5 and 12 years old
- d) Between 0 and 4 years old

D2: What was your total household income, before taxes and deductions, last year?

- a) Less than \$30,000
- b) \$30,000 to less than \$50,000
- c) \$50,000 to less than \$70,000
- d) \$70,000 to less than \$100,000
- e) \$100,000 or more
- f) Don't know or prefer not to say

D3: How long have you lived in Canada?

- a) Born in Canada
- b) Less than 10 years
- c) More than 10 years
- d) Don't know or prefer not to say

D4: What is your gender?

- a) Woman
- b) Man
- c) Non-binary/third gender
- d) Prefer to self describe:
- e) Prefer not to say

D5: What language do you speak most often at home? [ONLINE ONLY]

- a) English
- b) A language other than English
- c) Prefer not to say

D6: Do you identify as a person with a disability?

- a) Yes
- b) No
- c) Prefer not to say

D7: Do you self-identify as: (Select more than one and/or specify, if applicable)

- a)** Arab, Middle Eastern or West Asian (e.g., Afghan, Iranian)
- b)** Black (e.g., African, Afro-Caribbean, African-Canadian)
- c)** East Asian (e.g., Chinese, Korean, Japanese, etc.)
- d)** Indigenous, that is First Nations (Status/Non-Status), Métis or Inuit
- e)** Latin American or Hispanic
- f)** South Asian (e.g., East Indian, Pakistani, Sri Lankan, etc.)
- g)** Southeast Asian (e.g., Filipino, Thai, Vietnamese, etc.)
- h)** White
- i)** Not listed - please specify
- j)** Don't know or prefer not to say

D8: Which of the following best describes your current housing? [ONLINE ONLY]

- a)** House (e.g., detached, semi-detached, bungalow, townhouse)
- b)** Multi-unit or split-level house (including basement apartment)
- c)** Apartment or condominium in a building of less than 10 stories
- d)** Apartment or condominium in a building of 10 or more stories
- e)** Other - please specify
- f)** Don't know/prefer not to say

D9: Which of the following best describes your current employment? [ONLINE ONLY]

- a)** Employed (full-time, part-time or self-employed) and working mostly from home
- b)** Employed (full-time, part-time or self-employed) and working mostly at my place(s) of employment
- c)** Retired
- d)** Currently enrolled student
- e)** Full-time homemaker or caregiving
- f)** Unemployed, on a leave or unable to work
- g)** Other
- h)** Prefer not to say

Final: Is there anything else you would like to add about your access and use of the internet? [ONLINE ONLY]

End Notes

- ¹ Statistics Canada, "Stats in Brief: Canadian Internet Use Survey, 2022," *The Daily*, July 20, 2023, <https://www150.statcan.gc.ca/n1/daily-quotidien/230720/dq230720b-eng.htm>
- ² Canadian Radio-television and Telecommunications Commission. Telecom Regulatory Policy CRTC 2016-496. Ottawa, December 21, 2016. <https://crtc.gc.ca/eng/archive/2016/2016-496.htm>
- ³ City of Toronto, "ConnectTO: Internet Connectivity," <https://www.toronto.ca/city-government/accountability-operations-customer-service/long-term-vision-plans-and-strategies/smart-cityto/internet-connectivity-connectto/>
- ⁴ Sam Andrey and Nour Abdelaal, "Towards a Digital Equity Policy for the City of Toronto," *The Ryerson Leadership Lab*, March 2022, <https://dais.ca/reports/digital-equity-in-the-city-of-toronto/>
- ⁵ Helen Hambly and Reza Rajabiun, "Rural broadband: Gaps, maps and challenges," *Telematics and Informatics* 60 (2021), <https://doi.org/10.1016/j.tele.2021.101565>
- ⁶ Alexander JAM van Deursen and Jan AGM Van Dijk, "The first-level digital divide shifts from inequalities in physical access to inequalities in material access," *New Media & Society* 21 no. 2 (2019): 345-375, <https://doi-org/10.1177/1461444818797082>
- ⁷ Rogers, "Rogers Connected for Success," <https://about.rogers.com/our-impact/rogers-connected-for-success>
- ⁸ Toronto Public Library, "Free Internet Connectivity Kits from the Library provide vital connection for some of Toronto's most vulnerable residents," https://torontopubliclibrary.typepad.com/news_releases/2020/05/free-internet-connectivity-kits-from-the-library-provide-vital-connection-for-some-of-torontos-most-.html
- ⁹ Najeh Aissaoui, "The digital divide: a literature review and some directions for future research in light of COVID-19," *Global Knowledge, Memory and Communication* 71 no. 8/9 (2022): 686:708, <https://doi.org/10.1108/GKMC-06-2020-0075>
- ¹⁰ Sam Andrey and Nour Abdelaal, "Towards a Digital Equity Policy for the City of Toronto," *The Ryerson Leadership Lab*, March 2022, <https://dais.ca/reports/digital-equity-in-the-city-of-toronto/>
- ¹¹ Najeh Aissaoui, "The digital divide: a literature review and some directions for future research in light of COVID-19," *Global Knowledge, Memory and Communication* 71 no. 8/9 (2022): 686:708, <https://doi.org/10.1108/GKMC-06-2020-0075>
- ¹² Canadian Radio-television and Telecommunications Commission, 2016.
- ¹³ Innovation, Science and Economic Development Canada, "High-speed Internet for all Canadians," <https://ised-isde.canada.ca/site/high-speed-internet-canada/en>
- ¹⁴ Cable.co.uk, "World broadband speed league 2023", <https://www.cable.co.uk/broadband/speed/worldwide-speed-league/>
- ¹⁵ Canadian Radio-television and Telecommunications Commission, "CRTC takes action to increase choice and affordability of high-speed Internet", November 6, 2023, <https://www.newswire.ca/news-releases/crtc-takes-action-to-increase-choice-and-affordability-of-high-speed-internet-866041290.html>
- ¹⁶ Statistics Canada, "Consumer Price Index, December 2023," *The Daily*, January 16, 2024, <https://www150.statcan.gc.ca/n1/daily-quotidien/240116/dq240116a-eng.htm>