THE STATE OF

INTERNET VOTING IN ONTARIO

Findings from the 2022 Internet Voting Study

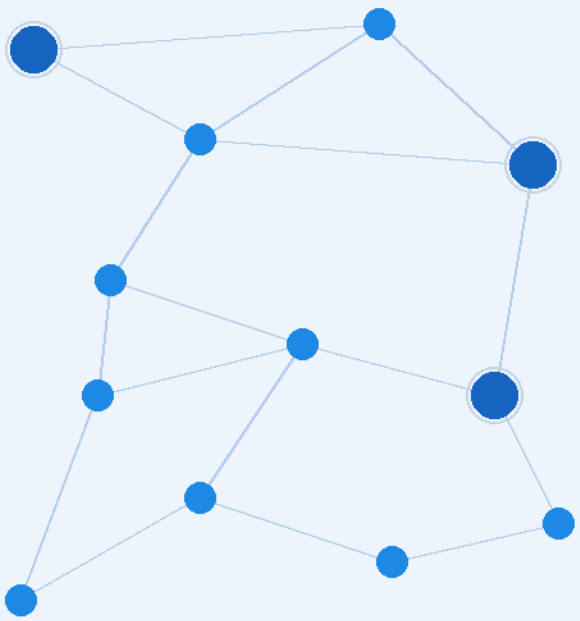
222
Municipalities Used Online Voting

25
Partners in This Study

56%
Online Ballot Uptake Rate

Nicole Goodman & Nathan Olmstead

2026



This report includes contributions from the following organizations:

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NOTE TO THE READER

This report was compiled to synthesize the results of the 2022 Internet Voting Study, conducted in partnership with 25 municipalities during the Ontario municipal elections. The report's purpose is to inform public and policy communities about voter experiences with online voting including why electors vote online, their satisfaction and trust with the voting mode, digital literacy and access, and attitudes toward the voting technology. The study also provides insights into voter engagement trends, context about online election administration in Ontario, and analysis of comparative data based on previous studies conducted in Nova Scotia in 2024 and in Ontario in 2018 and 2014.

The creation of this report was made possible through the generous support of participating municipalities and voters. We extend our deep gratitude to all municipalities that took part in the project and continue to support the collection of data about online voter experiences and attitudes.

This research was supported by Brock University, Delvinia, and the following municipal partners, listed in alphabetical order: City of Kenora, City of Kingston, City of Markham, City of Richmond Hill, City of Timmins, Halifax Regional Municipality, Loyalist Township, Town of East Gwillimbury, and Town of Newmarket.

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How to Cite This Report

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INTRODUCTION

Elections around the world are transitioning from manual to digital at a rapid pace. This shift was accelerated by the global pandemic which emphasized the need to simplify and expedite the voting process. While technology in election and voting processes takes many forms including online training, electronic voter lists, e-poll books, tabulators and telephone voting, online voting continues to attract the most attention because it can be used remotely and avoids many of the limitations of telephone ballots. Its appeal lies in the ability for voters to cast a ballot from a location of their choosing, making participation easier and reducing barriers to voting especially for residents who are traveling, living abroad, have disabilities or illnesses, or who face other barriers that make voting in-person difficult. In many jurisdictions, voters can now cast a ballot on a mobile device or computer, saving time and reducing the perceived costs of voting, such as travel to a polling place. In some instances, the introduction of online voting has increased turnout, especially for citizens living abroad (Germann, 2021; Dandoy & Kernalegenn, 2021).

In Canada, Ontario is the epicentre of electoral digitisation. Municipalities in the province began adopting voting technologies in the late 1990s with hopes of countering low turnout and realizing administrative efficiencies. Online voting was first introduced by twelve cities in 2003 and uptake has consistently climbed with each election cycle. In 2022 this culminated with 222 municipalities deploying the voting mode, representing 54% of the local governments responsible for running elections in the province. This growing use provides an ideal setting to examine voter experiences and attitudes towards the technology.

Leveraging this unique context, the report analyzes exit survey data from online voters in 24 Ontario municipalities during the 2022 municipal elections to update our understanding of voters' perceptions of online voting and their experiences learning about and using it. The report builds upon studies of Internet voting in the 2014 and 2018 Ontario municipal elections to provide insight into how voter attitudes have evolved over time. It also incorporates original data collected from online voters during the 2024 Halifax Regional Municipality's (HRM) local election to highlight differences in voter opinions by region. Like Ontario, online voting is well integrated in Nova Scotia. About 90% of municipalities used the voting method in the 2024 local elections and it has been used by HRM since 2008. The goal of the report is to translate findings for public and policy audiences, primarily the municipal community who continually supports this research and has helped to create rich longitudinal data that enables us to better understand trends in online voting use and voter perceptions.

HISTORY & CONTEXT

Many Ontario municipalities offered online ballots in their 2022 municipal elections. While online voting was a novel election innovation for a time, municipalities adopting the voting method in 2026 can be considered late adopters based on the trajectory of use in the province. Table 1 highlights the percentage of uptake across election years and the features of implementation approaches and systems over time. A few of these changes are noteworthy for understanding the current climate of online voting adoption in Ontario.

Table 1: Phases of Online Voting Adoption in Ontario

Adoption stage	**Phase 1: Innovators**	**Phase 2: Early adopters**	**Phase 3: Early Majority**	**Phase 4: Late Majority**
Uptake (% of municipalities)	2003: 3%	2006-2010: 5-11%	2014-2018: 23-43%	2022: 56%
Authentication Approach	1-step = small municipalities, 2-step = cities	1-step = small municipalities, 2-step = cities	1-step predominantly	1-step predominantly
Voting Period	Full election = small municipalities, Advance = cities	Full election = small municipalities, Advance = cities	Full election period predominantly	Full election period mostly, but some scale back
Telephone voting	Growth among small places	Growth among small places	Growth among places of all sizes	Stagnant
All electronic	Small sized municipalities	Small sized municipalities	All sizes	All sizes
Technology	Generic	Generic	Generic	Generic, Blockchain, Individual and End-to-end verifiable
Regulatory Framework	None	None	None	CAN/DGSI 111-1 passed Dec 2024

Most implementations presently offer online ballots for the full election period instead of only during advance voting, which was a previous adoption trend, and do not require electors to register to access an online ballot. Newer research, however, suggests that adding registration may be useful to mitigate risks associated with relying on date of birth as a credential for authentication (Goodman et al., 2026).[1] As such, we may see a shift in 2026 where municipalities once again consider a 2-step approach.

Telephone voting continues to be used as a complementary voting method to ensure coverage, especially in rural areas that may have more limited digital infrastructure or in

[1] This is true providing the registration process does not allow for easy impersonation.

communities with high senior populations. We speculate that this trend in use will continue to decline as connectivity and Internet familiarity improves. Additionally, the standard for online voting use in municipalities CAN/DGSI 111-1: Online Voting – Part 1: Implementation of Online Voting in Canadian Municipal Elections does not apply to telephone ballots. This lack of regulatory coverage will likely contribute to a continued decline in adoption as many municipalities strive to protect electoral integrity in local digital elections.

Finally, online voting systems now incorporate different technologies or technological features than in earlier phases of adoption. One notable development is that some online voting vendors offer system features that allow ballots and election outcomes to be verified. The option for voters to verify that their ballot was correctly recorded was offered by 9% of municipalities that used online voting in the 2022 Ontario municipal elections, representing a shift from 2018, when no municipalities implemented ballot verification. Being able to ensure that one's ballot has been included and accurate is known as individual verifiability. This feature can protect against undetected manipulation, help identify system issues early on, and strengthen public trust (Goodman et al., 2023). Of the 222 municipalities that used online voting in 2022, 102 contracted vendors that had the potential to support this option either via web-based verification, a downloadable application, or directly through the voting application. Among municipalities that used the feature, however, voters in only 11 communities verified their ballots. Individual verifiability is an important development in online elections, and in 2026 we are seeing growth in the number of vendors offering this option and the proportion of municipalities planning to offer it.

Individual verifiability is a component of end-to-end verifiability, a mechanism widely advocated by election security experts as a means of detecting potential election manipulation. End-to-end verifiability enables individual voters to verify their vote has been correctly cast, stored, and tallied, and allows the public to verify that all stored votes have been accurately counted (Benaloh et al., 2015). While, to our knowledge, this option has not yet been actively used in municipal elections in Canada, the technology is available. In research for a separate project, some municipalities expressed discomfort assigning voters the responsibility of verifying that ballots are tallied as recorded. Others opined that asking voters to verify ballot tabulation exceeds the role that voters are meant to play in an election (Spycher-Krivonosova et al., 2024). These are some objections that help explain why the technology and approach has yet to be used in local elections in Canada. While the introduction of end-to-end verifiability represents a shift in the security of online elections, it has the potential to enhance election integrity and is an important development to watch as municipalities prepare for the 2026 and 2030 local elections.

DATA & SURVEY COMPLETION

This report draws on several data sets to inform its findings. The primary data we rely upon were obtained from online voters in 24 municipalities during the 2022 Ontario municipal elections. Officials that administer local elections were identified via a list obtained from the Association of Municipal Clerks and Treasurers of Ontario and sent an email invitation to take part in the research. Twenty-four municipalities participated in the project, which included exit-surveys of online voters during the designated online voting period in each community. Once a voter cast their ballot, they were prompted to take part in a voluntary survey about their voting experience. In most municipalities, voters were directed to the survey through a link on the thank you page of the voting system. In a couple of cases the online voting vendor did not support the research, requiring voters to be redirected to the municipal website to access the survey link. In total, the survey platform was open between 10:00am on September 26 until 8:00pm on October 24. [2]

Across the 24 participating municipalities, 29,294 surveys were completed for a response rate of 16%.[3] The percentage of respondents by municipality is displayed in Figure 1. The City of Markham, in particular, had a large number of respondents proportionate to the sample due to their promotion of the survey. A total of 89% of surveys were completed during advance polls and 11% were undertaken on Election Day. The average length of time to complete a survey was 8 minutes across all municipalities. Municipalities in our sample vary by population size, geography, and urbanity. Ten communities had populations 9,999 or fewer, eleven municipalities had between 10,000 and 99,000 residents, and three cities had populations over 100,000. Figure 2 depicts the municipalities that took part in the 2022 study. They range from northern communities like Kenora, to urban centres such as Markham, and remote municipalities like Ignace.

Building off previous studies in Ontario municipal elections, where applicable, we compare the 2022 data to findings from exit-surveys conducted with online voters in the 2018 and 2014 Ontario municipal elections. The 2018 study was conducted across 31 municipalities. A total of 52,955 online voters completed a survey for a response rate of 23%. Similarly, the 2014 project surveyed 33,090 voters in 43 communities, yielding a 17%

[2] We are grateful that most vendors continue to support this important research. Communities that redirected voters to the municipal websites had slightly lower response rates because of the extra step.

[3] Response rates ranged from a high of 28% to a low of 6%. Participating municipalities include: Bracebridge, Brighton, Brockton, Dysart et al, East Gwillimbury, Grand Valley, Greater Napanee, Hanover, Huron Shores, Ignace, Kenora, Kingston, Loyalist, Markham, Middlesex Centre, Mono, Newmarket, Parry Sound, Richmond Hill, Scugog, South-West Oxford, Timmins, West Lincoln, Zorra. Although they did not use online voting, the Town of Whitby also took part in the study for paper voters, however, that data is not included in this report.

response rate. While some new survey questions were added in 2022, many remained identical. Voters were recruited in a comparable manner across studies.

Figure 1: Percentage of Survey Respondents by Municipality

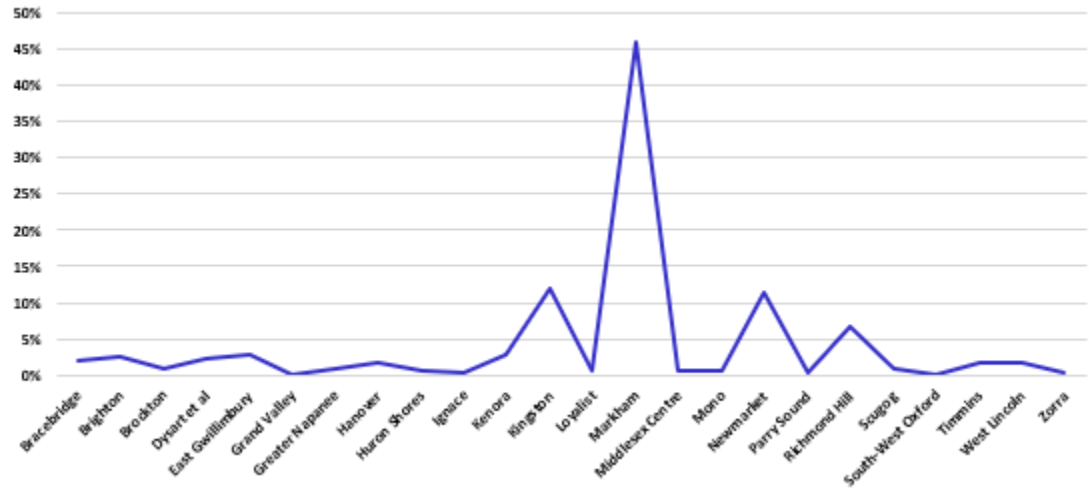
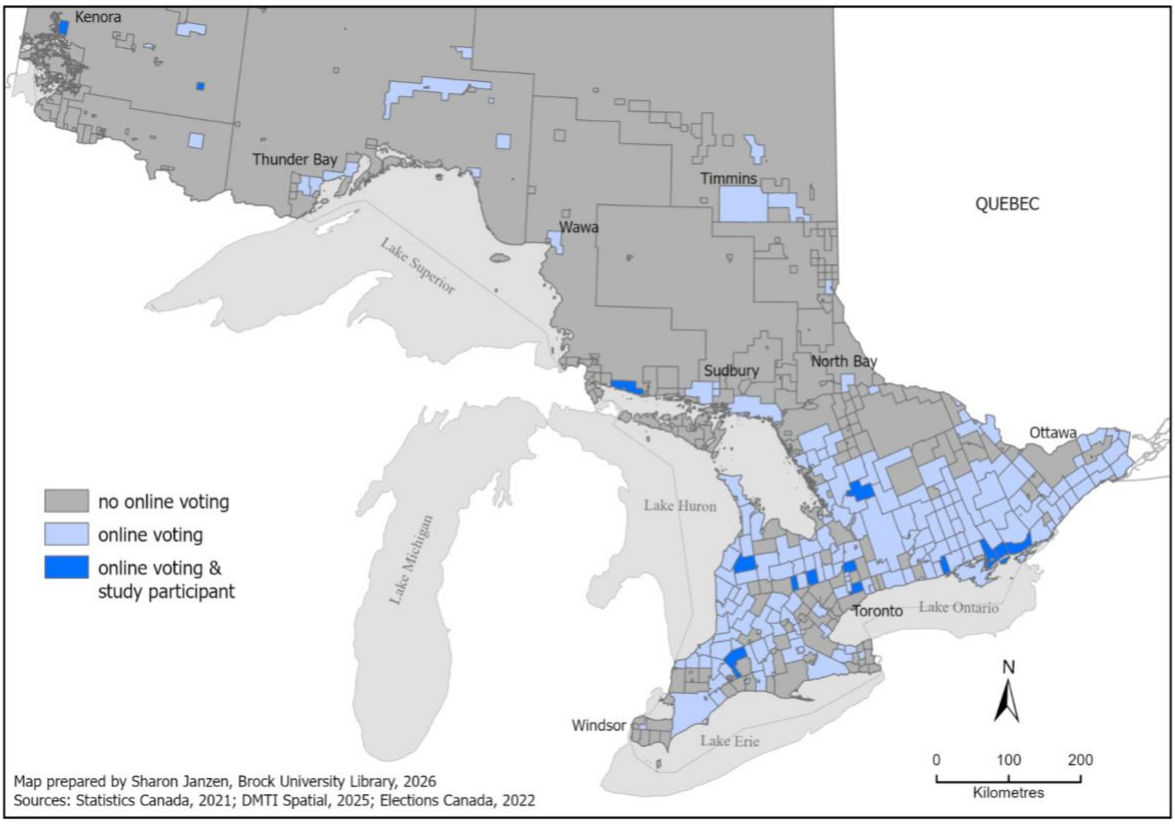


Figure 2: Participating Municipalities in the 2022 Internet Voting Study



Finally, this report includes data from an exit-survey of online voters in Halifax Regional Municipality (HRM) during the 2024 Nova Scotia municipal elections to allow for cross-provincial comparisons in voter experience and attitudes toward online voting. The HRM survey recruited voters in the same way and survey questions were nearly identical in

both wording and sequencing. The survey was open for completion during HRM's advance voting period from 8:00am on October 8 to 7:00pm on October 16, 2024. A total of 12,562 voters completed a survey for a response rate of 16%.

ONLINE VOTER PROFILES & MOTIVATIONS

Who Votes Online?

To better understand the online voting experience in 2022, and who chose to cast an Internet ballot, we look at respondents' sociodemographic characteristics including gender, age, education, income, and marital status, as well as attitudes like political interest and reported past voting behaviour. This information helps us understand who is included in our sample and voting online. It can also be used to explain experiential differences between groups. Table 2, below, provides a comparison of sociodemographic and attitudinal differences across survey years. A fuller breakdown of socio-demographic information for 2022 survey participants is in the Appendix.

Most voters (55%) who completed a survey in 2022 were over the age of 55. Nearly one-third of respondents (32%) were 65 years old or older. This is a slightly older distribution compared to past Internet voter surveys. The average age of a 2022 survey respondent was 56 years, compared to 54 years in 2018 and 53 years in 2014. Conversely, only 11% of 2022 respondents report being between the ages of 18 and 34. Although older electors tend to vote online at higher rates, age-based comparisons should be approached cautiously, as the youngest age group is underrepresented in the survey sample.

Results confirm that older voters are the most likely users of Internet voting in Ontario municipal elections, a finding consistent with historically documented trends in use across the province (Goodman, 2014). It is encouraging that uptake among older voters has remained high especially given concerns about older voters' digital literacy and access to connected devices. Lower uptake among younger voters should not be interpreted as resistance to online voting or their rejection of it. As noted in the previous Internet Voting Study Report (Goodman & Harvey, 2022), lower use by young people partially reflects a weaker propensity to vote. Since young people are less likely to participate in all elections, particularly municipal ones, their use of online voting is also reduced.

Like previous municipal election studies, online voters in the 2022 local election were, in general, an educated group, possessing at least some post-secondary education. They also had an average household income of between $90,001 and $110,000. This range is consistent with the 2018 election and slightly higher than 2014. Nearly half (48%) of online

voting respondents live in a suburban area, while one-third (31%) reported residing in an urban area. Half (50%) of Internet voters in 2022 identified as female, 45% identified as male, and approximately 1% said they were either non-binary or preferred to self-describe. Just 8% of respondents have a disability, a percentage that is slightly lower than the Canadian average. This is notable since Internet voting is often described as being more accessible than in-person voting.

Table 2: Ontario Online Voter Profiles Over Time

Characteristics	2022	2018	2014
Age	56 years	54 years	53 years
Annual household income	$90,001 to $110,000 before taxes	~ $100,000 before taxes	~ $80,000 before taxes
Marital status	Married	Married	Married
Community density	Suburban	Suburban	Suburban
Education	Some post-secondary	Some post-secondary	Some post-secondary
Voting history	Habitual	Habitual	Habitual
Interest level in politics	Moderate	Moderate	Moderate to high

The average online voting respondent in 2022 reported being a habitual voter, with 60% saying they vote in ‘all elections’ for which they are eligible. This compares to 62% of online voters in 2018 and 60% in 2014. Across all three municipal elections, three quarters (75-78%) of respondents said they were at least ‘somewhat’ interested in politics.

Overall, there is modest variation in the characteristics of online voting respondents across election years. Data points to the profile of the average Internet voter survey respondent being older, married, living in a suburban area, with some post-secondary education. They also report a moderate interest in politics and voting most, but not

necessarily ‘all’ of the time in the past. This profile is consistent with data about who votes online in Ontario municipal elections.

Why Vote Online?

To understand why voters with the option to vote online choose to do so, participants were asked about their rationale for casting an online ballot in the 2022 municipal elections, Table 3. Looking at motivations for voting online provides insight into the service’s effectiveness and clarifies whether municipalities’ reasons for adopting the technology are consistent with voters’ explanations for using it.

The primary finding is that convenience continues to drive online voting. In 2022, 72% of respondents selected it as their main reason for voting by Internet, which is up six percentage points from 2014 and three from 2018. Respondents expressed that voting online was convenient due to demanding work schedules, being outside of the municipality, or because of mobility and transportation barriers. Many also commented on the speed of voting by Internet, observing that they saved time and money by not having to travel to an in-person polling location.

Table 3: Reason for Voting Online by Election Year[4]

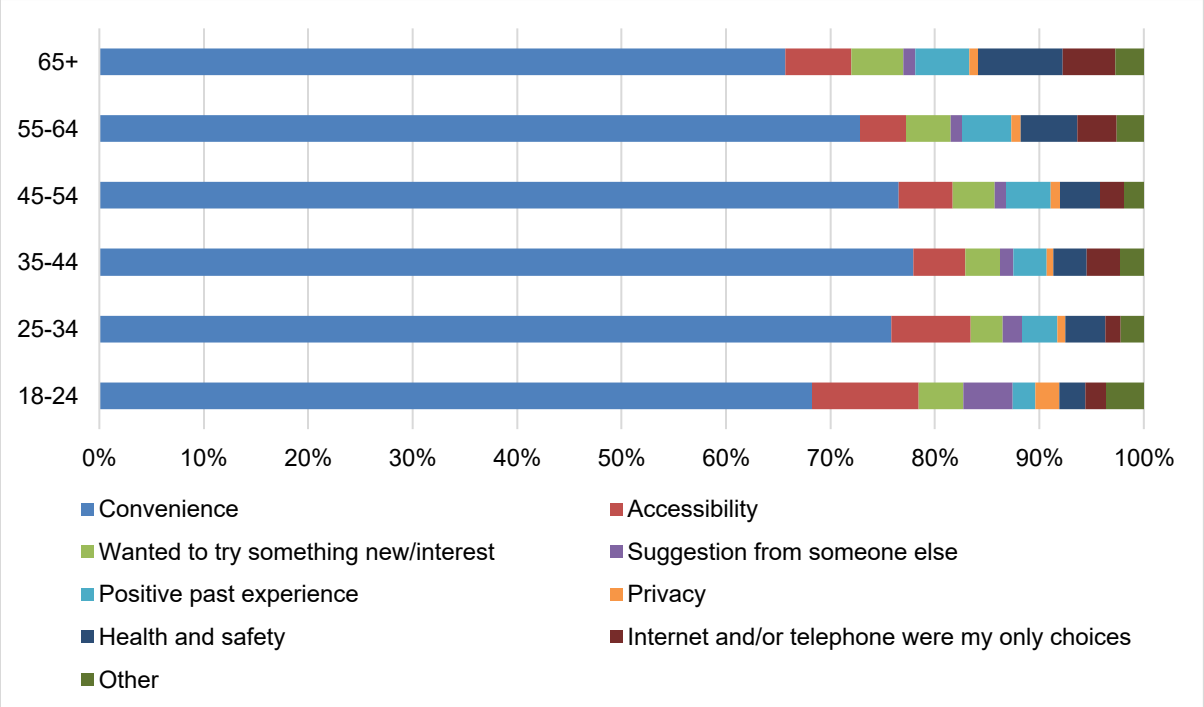
Rationale	2022	2018	2014
Convenience	72%	69%	66%
Accessibility	6%	7%	6%
Wanted to try something new/ Interest	4%	7%	6%
Suggestion from someone else	1%	1%	1%
Positive past experience with voting online	5%	2%	2%
Privacy	1%	1%	1%
Health and safety concerns (COVID)	6%	N/A	N/A

[4] Percentages are rounded and therefore may total to more than 100.

It was my only choice[5]	4%	10%	15%
Other	3%	3%	4%

Accessibility (6%) and novelty (4%) are other consistent reasons for voting online, though the newness of Internet ballots has slightly declined over time. This is not surprising since it has been continually offered by some municipalities that have participated in the study across election years. In line with this reasoning, the proportion of respondents who said they voted online because of a positive past experience with Internet voting increased from 2% in 2014 and 2018 to 5% in 2022. Approximately 6% of respondents conveyed that health and safety concerns were their primary reason for voting online in the 2022 municipal election, corresponding with the height of the COVID-19 pandemic.[6]

Figure 3: Reason for Voting Online in the 2022 Municipal Election by Age



Looking at rationales for voting online by age, we see that the youngest (18-24) and oldest (65+) voters were the least likely to cast an online ballot due to convenience, Figure 3. Two thirds of respondents in these age groups identified convenience as their reason for voting online (compared to three quarters of other voters). This is consistent with survey data

[5] The specific verbiage of this response option differed slightly across survey years.
[6] The 2022 Ontario municipal elections followed the last Covid-19 lockdown in the province.

from the 2014 and 2018 municipal elections. Across all election years, voters in the youngest and oldest age groups were more likely to identify having voted online because of accessibility. As noted in previous Internet Voting Project reports, the rationale of accessibility could be a better fit for post-secondary students away from their home community or seniors who have mobility issues or are traveling outside of the municipality. These factors can act as barriers to in-person voting and thus drive uptake of Internet voting because of its remote accessibility.

Reasons for Not Voting in Previous Elections

Past research has shown that by making the act of voting easier, online ballots can bring some electors into the voting process. Respondents' explanations for not voting in earlier elections point to factors that shaped their past non-voting behaviour and allow us to assess whether online voting lessens some of the barriers to participating in municipal elections.

Respondents from the 2022 survey report the following top reasons for not voting in the 2018 municipal election: not feeling informed about candidates or election issues (19%), being out of town (16%), 'too busy' (15%) or unaware that the election was happening (14%). All other response categories individually constitute 10% of respondents or fewer.

Looking at the reasons for not voting across the preceding elections from all three studies we see some trends worth noting, Table 4. There has been a decrease in the percentage of respondents that report not having voted because they were 'too busy' (23% in 2010 to 15% in 2018) or 'out of town' (20% in 2010 to 16% in 2018). While the municipalities taking part in the study varies across election years, the continued participation of some cities, coupled with the availability of online voting over time, clearly points to the voting mode countering those explanations. At the same time we see a rise in administrative explanations such as being unaware of the election (4% in 2010 to 14% in 2018) or not being on the voters' list (4% in 2010 to 9% in 2018). These rationales cannot be addressed by online voting and are areas that municipalities should consider reviewing to maximize voter participation.

Finally, not feeling informed about candidates or their platforms remains a common rationale across elections. While online ballots cannot counter this non-voting explanation, some municipalities such as the Town of Whitby introduced an online tool called Plan Your Vote, which enables voters to confirm that they are registered to vote, learn about candidates, and verify their voting location. Web-based strategies like Plan Your Vote are one way to reduce these rationales by promoting education about candidates and their platforms.

Table 4: Reason for Not Voting in the Previous Municipal Election

Reason for Not Voting	2018 Election	2014 Election	2010 Election
I didn't feel informed about candidate platforms or election issues	18%	20%	21%
I was out of town	15%	16%	20%
I was too busy	14%	17%	24%
I didn't know it was happening	13%	7%	4%
I was not on the voters' list	8%	7%	5%[7]
Voting locations were inconvenient	5%	5%	9%
I don't care about municipal politics[8]	4%	5%	4%
I didn't support/like any of the candidates	2%	2%	3%
Mobility issues	1%	1%	2%
Illness	1%	1%	1%
Transportation Issues	1%	1%	2%
Weather	<1%	<1%	<1%
Other	9%	11%	N/A
Don't know	7%	7%	6%

We can better understand reasons for not voting in past municipal elections by looking at these responses holistically and grouping them into categories. In 2022, for example, 38% of respondents said they did not vote in the previous municipal election because of 'everyday life issues' compared to 37% of respondents in the 2018 study and 58% in 2014, Table 5. By contrast, there were increases in the percentage of respondents who indicated political (32% to 38%) and administrative issues (5% to 14%) as their reason for not voting in the previous municipal election.

The decline in respondents selecting everyday life issues is unsurprising, given that online voting reduces many routine barriers to participation. As noted above, we expect

[7] In the 2014 survey only the response option 'not old enough' was offered and 1% of participants selected it. We have grouped this 1% in with the category 'I was not on the voters' list.
[8] In 2014, the response option provided to participants was 'I don't care about politics.' This was changed to 'I don't care about municipal politics' in the 2018 and 2022 surveys.

reported barriers to decrease over time as the voting mode continues to be offered and becomes increasingly familiar to electors. At the same time, increases in political and administrative barriers point to new opportunities for municipalities to improve administrative procedures and potentially target disengaged voters. However, variation in participating municipalities across the studies combined with the staggered introduction of online voting across local governments, means that these findings should not be interpreted as a systematic evaluation of online voting's effects.

Table 5: Reason for Not Voting in the Previous Municipal Election (categorized)*

Category	2018	2014	2010
Everyday Life Issues (Access)	33%	37%	58%
Political Issues (Interest)	38%	34%	32%
Administrative Issues	14%	11%	5%
Other/Don't Know	16%	18%	6%[9]

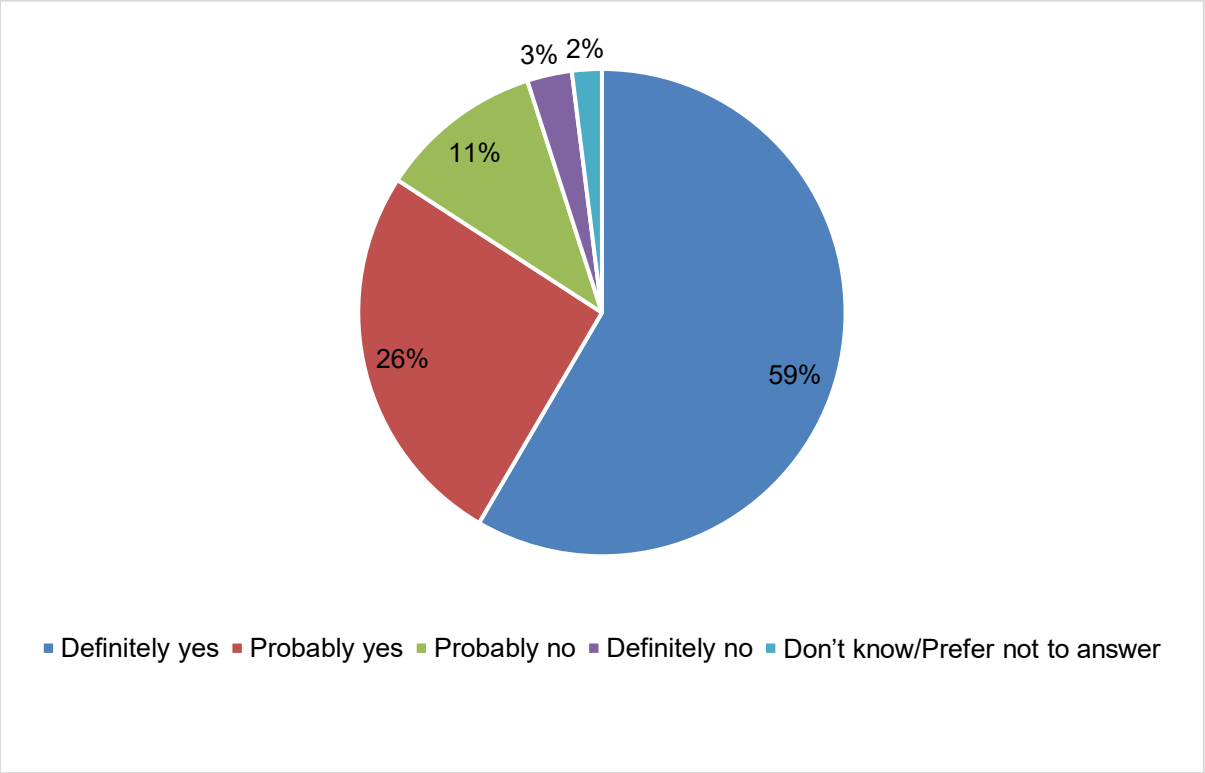
**All percentages are rounded up and therefore may total more than 100%.*

While online voting is not a solution for apathy or administrative issues, it can address some of the 'everyday life issues' that respondents cite for not voting. The voting method can make casting a ballot more accessible for out-of-town voters, those that are 'too busy' and dealing with other issues of life such as issues related to mobility, transportation, weather, illness, and inconvenient voting locations. To assess whether online ballots encouraged voter participation, respondents were asked if they would still have voted in the 2022 municipal election without the option to vote online, Figure 4.

Over half of 2022 respondents (59%) reported that they 'definitely' would have voted without online voting, while 26% said they 'probably' would have done so. Thirteen percent indicated that they 'probably' (11%) or would 'definitely' (3%) not have taken part otherwise.[10] Across all three Internet voting studies, a modest percentage of online voters in each election (14% in 2014, 12% in 2018 and 13% in 2022) said that they would likely not have cast a ballot without the availability of online voting. While these findings cannot point to a definitive increase in turnout, they illustrate that online ballots do bring some voters into the voting process.

[9] 'Other' was not presented as a response option for this question in the 2014 survey therefore the 6% of respondents represents those who selected 'Don't know'.
[10] Percentages are rounded in the report: 2.7% 'definitely no' and 10.5% 'probably no' totals to 13%.

Figure 4: Reported Likelihood of Casting a Ballot Without Internet Voting in 2022



Digital Literacy

Digital literacy plays a central role in shaping voters' online voting experience and perceptions of the voting mode. It encompasses factors such as access to an Internet enabled device, the type and quality of an Internet connection, and voters' reported familiarity with, and confidence in, navigating online platforms. Generally, individuals with higher levels of digital literacy are more likely to feel comfortable and capable when engaging with online services such as using an Internet voting system. When both paper and online ballots are available, for example, voters with higher levels of digital access, knowledge, and confidence show a clear preference for Internet voting. In contrast, when paper ballots are unavailable, evidence shows that electors with low digital literacy are less likely to participate (Goodman et al., 2018).

In the 2022 online voter survey, most respondents (95%) reported using the Internet daily, representing a slight increase from 2018 when 93% reported daily Internet use, Table 6. Self-reported comfort with the Internet also remained high across elections. About 89% of 2022 respondents rated their ability to use the Internet as 'good' or 'very good,' compared to the 90% of 2018 voters. Finally, online service use increased between 2018 and 2022, with more respondents reported having used the Internet to access government or public services, banking and shopping, and news consumption.

Table 6: Reported Internet Use in the 2022 and 2018 Ontario Municipal Elections

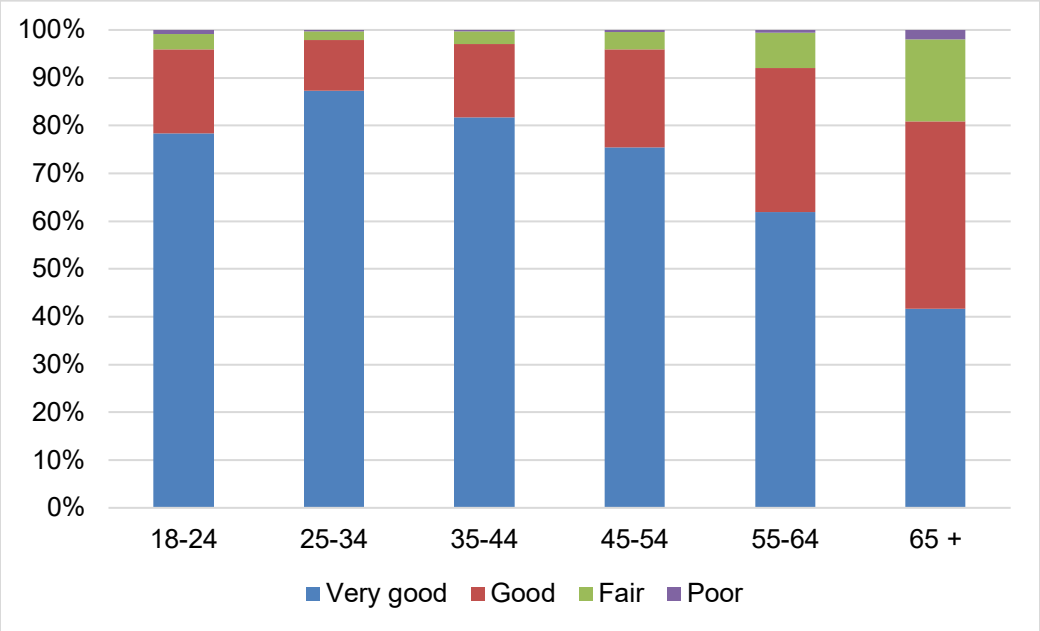
Category / Service	2022	2018
Good knowledge of computers/the Internet[11]	89%	90%
Use the Internet daily	95%	93%
Access government or public services online	67%	62%
Bank online	76%	74%
Shop online	72%	67%
Surf the web or read the news	77%	71%

These changes are likely reflective of younger generations making up an increasingly large share of the electorate. Even though older voters may be growing more comfortable using digital technologies and the Internet, they still have less confidence in their ability to use the Internet compared to younger cohorts. Among voters aged 55 and older, the share who rated their ability to use the Internet positively declined slightly to 85%, Figure 5. This proportion dropped to 80% among voters aged 65 and older, and to 72% among those aged 75 and older. Election administrators should continue to be mindful of differences in perceived Internet familiarity by age when designing online voting implementation.

Although connectivity is not often discussed because Internet penetration and access has become so prevalent it is an important consideration in evaluating digital literacy. Not having access to a high-quality Internet connection can contribute to a digital divide in an online election, since difficulty accessing or loading a voting application may discourage potential voters from participating. While home Internet connectivity is strong among survey respondents: fewer than 1% said they do not have home access while most indicate having cable or DSL (58% in 2022 compared to 60% in 2018) or wireless connections (26% in 2022 and 2018), factors like income and rurality continue to affect connection type.

[11] Responses were combined to include ‘good’ and ‘very good’.

Figure 5: Reported Internet Familiarity by Age (2022)



Although differences are modest, patterns of Internet access vary by income. Respondents from higher-income households are more likely to have cable or DSL service, while those with lower reported incomes, by contrast, were more likely to say they accessed the Internet from a wireless device. While 26% of all respondents reported accessing the Internet primarily via a wireless device, this proportion rises to nearly one-third (30%) among respondents earning $30,000 or less. Conversely, although 58% of all survey participants reported having a cable or DSL connection at home, this figure drops to just 51% for those in the lowest income bracket. Encouragingly, access to high-speed Internet has improved since the 2018 Internet Voter Survey, when nearly one-quarter (18-23%) of respondents earning between $25,000 and $99,000 reported having poor Internet connectivity at home. For municipal officials, these findings reinforce the importance of mobile-responsive system design to support equitable access to online voting across income brackets.

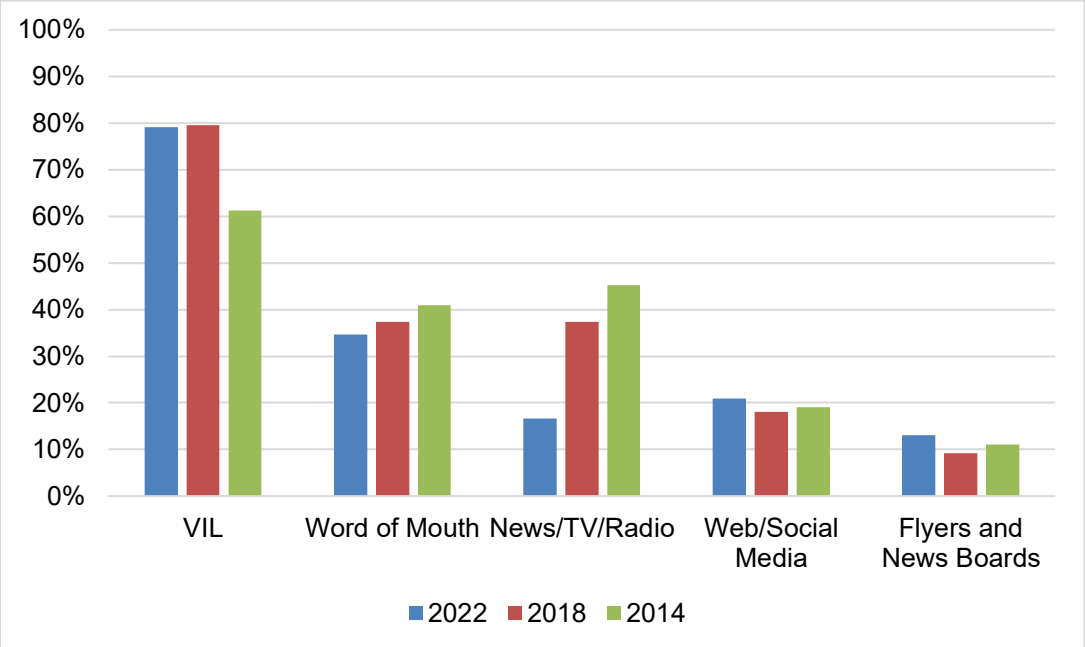
Finally, rurality affects Internet access. While urban and suburban respondents reported accessing the Internet in similar ways, rural participants were far less likely to have cable or DSL service. Instead, rural voters were more likely to rely on wireless connections. More than 15% of rural voters reported using satellite Internet, compared to less than 1% of urban and suburban residents. These differences have important implications for the design and implementation of Internet voting, including considerations related to bandwidth capacity and application size.

Information About Online Voting

Knowing where online voters obtain information about voting and the election is important because it indicates which information sources most effectively reach voters. Respondents were asked how they heard about online voting in the 2022 municipal election. The most cited source of information was the Voter Information Letter (VIL) - a letter residents receive in the mail prior to the voting period that contains information about how and where to vote. Nearly four fifths (79%) of respondents reported that the VIL was their primary source of information ahead of the election, a percentage that is comparable to previous elections. Newspaper, TV, and radio advertisements were also common sources of information (17%), followed by information received from candidates (15%).

The importance of the VIL has remained consistent over time, with more than three-quarters of respondents across the past three municipal elections identifying it as a significant source of information, Figure 6. Word of mouth has likewise remained an important channel, cited by approximately one-third of Internet voters.

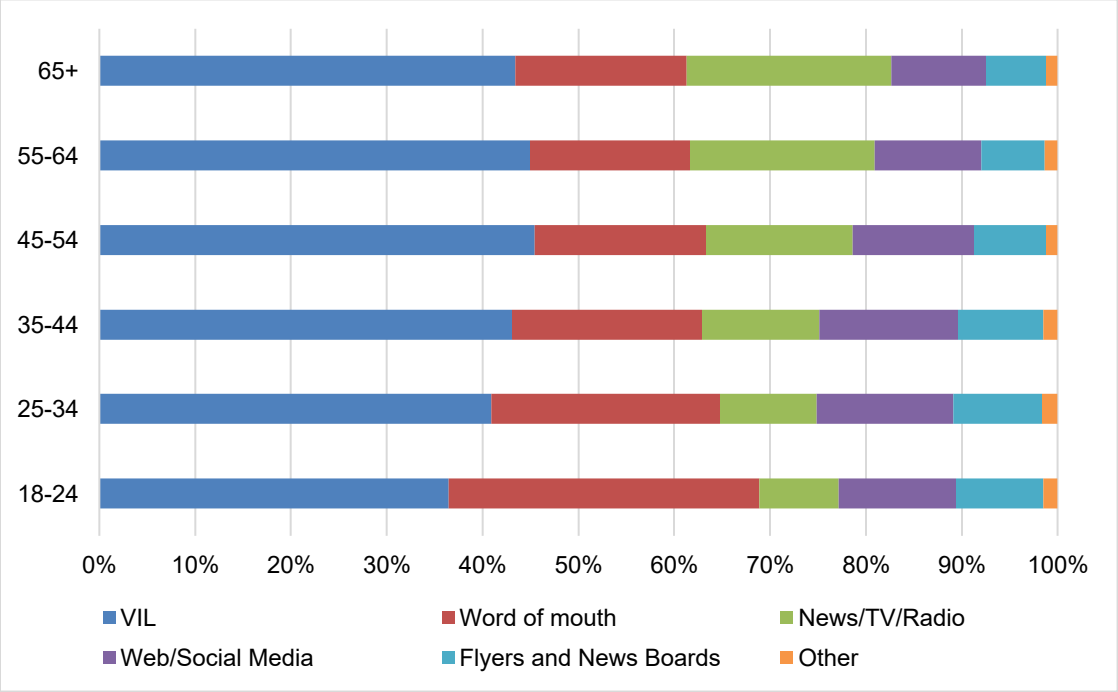
Figure 6: Internet Voting Information Source by Election Year (grouped)



By contrast, information sources have shifted in other notable ways. Online sources, such as the municipal website and social media, have slightly increased in importance since 2018 (rising from 18% to 21% in 2022). Traditional media, including news, TV, and radio, however, have declined sharply. In 2014, 45% of respondents reported hearing about Internet voting from media sources like news, TV, and radio. This share of respondents fell to 37% in 2018 and to just 17% by 2022. These changes are significant for municipal

administrators, signalling a broader decline in reliance on traditional media. Nonetheless, this source remains important for voters over the age of 65, as discussed further below.

Figure 7: Internet Voting Information Source by Age



Looking at voter information sources by age group we see some variation, however. Figure 8 presents these information sources as proportions within each age group. Across all cohorts, the VIL remains the most frequently cited source of information. This consistency highlights the continued importance of the VIL as the primary communication tool for informing electors of all ages about online voting.

Despite this consistency, there is considerable age-based variation among secondary information channels. Younger voters, particularly those aged 18 to 24, were less likely than older cohorts to rely on formal election materials and more likely to obtain information through personal networks. Approximately 18% of this group learned about online voting through friends or family members, compared to fewer than 5% of voters aged 65 and older. Similarly, 9% of 18 to 24 year-olds heard about online voting through word of mouth, the highest percentage among all age groups. As noted in the 2018 Internet voting report, this pattern may reflect the fact that younger voters are more likely to live in family households or to be newer to the electoral process, making them more reliant on interpersonal communication than on direct mail. Flyers and news boards also appear to be somewhat more effective in reaching younger voters (those aged 18 to 34) than older cohorts.

By contrast, traditional media sources such as newspapers, TV, or radio grow in importance with age. Only 8% of respondents aged 18 to 24 relied on these sources compared to 19% of those aged 55 to 64 and one-fifth (21%) of voters aged 65 and older. These patterns point to clear generational divides in media consumption habits.

Finally, web and social media channels were most effective among voters aged 25 to 44 and least effective among those aged 65 and older. Taken together, these findings suggest that while the VIL continues to serve as a universal communication tool, supplementary information strategies must be tailored to different age groups. Local administrators should be mindful of these differences when planning information efforts for the 2026 and 2030 municipal elections.

ONLINE VOTER EXPERIENCES

This section of the report looks at voter experiences with, and opinions of, online voting. Specifically, it reviews voters' satisfaction with the online voting process, willingness to recommend this method to others, concern with online voting and trust in the technology.

Satisfaction with the Online Voting Process

In general, respondents reported high levels of satisfaction with the online voting process in 2022, Figure 8. Across the 24 municipalities, a majority of respondents (96%) said they were satisfied with online ballots. Most (79%) said they were 'very satisfied,' while 17% of participants expressed being 'fairly satisfied' with the online voting process. Consistent with previous years, this suggests a degree of enthusiasm for the voting mode. Satisfaction has remained consistently high across all three elections: 96% of respondents reported satisfaction in both the 2018 and 2022 elections, compared to 95% in 2014.

Unlike in previous elections, when rural voters reported lower levels of satisfaction than their suburban and urban counterparts, location did not have a significant impact on satisfaction levels in 2022. Familiarity with the Internet, however, remained connected to satisfaction with online voting.

While 79% of respondents overall reported being satisfied with online voting in the 2022 municipal election, this declined to 65% among those who rated their Internet familiarity as either 'poor' or 'fair.' By contrast, 81% of respondents who rated their Internet familiarity as 'good' or 'very good' said they were 'very satisfied' with the online voting process. A similar pattern was evident in 2018, when only 44% of online voters reporting 'poor Internet familiarity' were 'very satisfied', compared to 81% among those who indicated 'very good' familiarity with the Internet.

Figure 8: Satisfaction with Internet Voting by Election Year

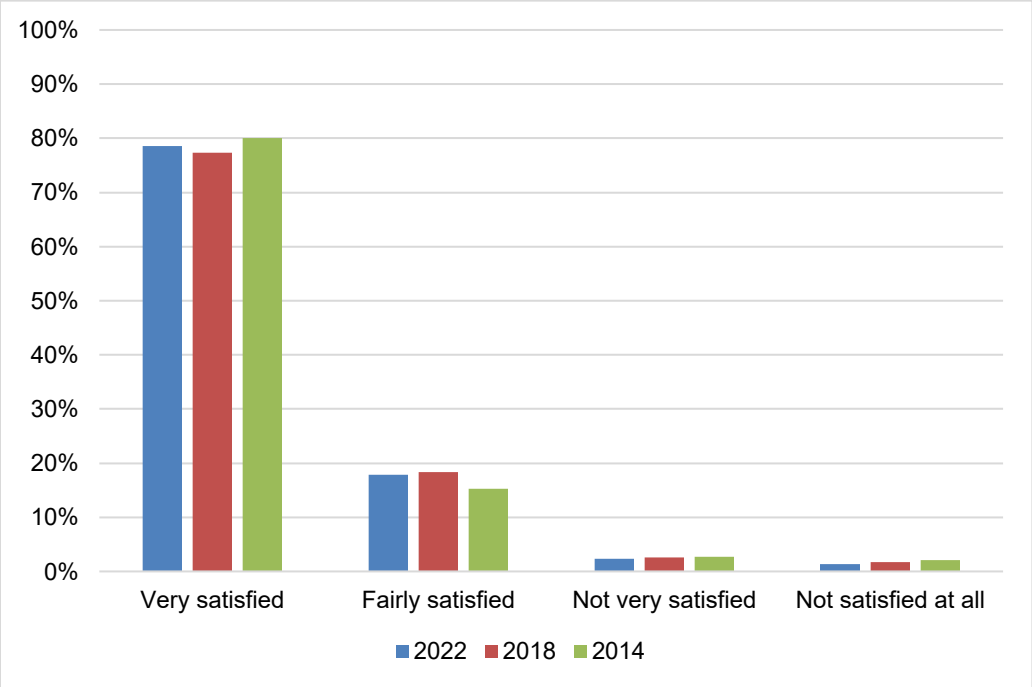
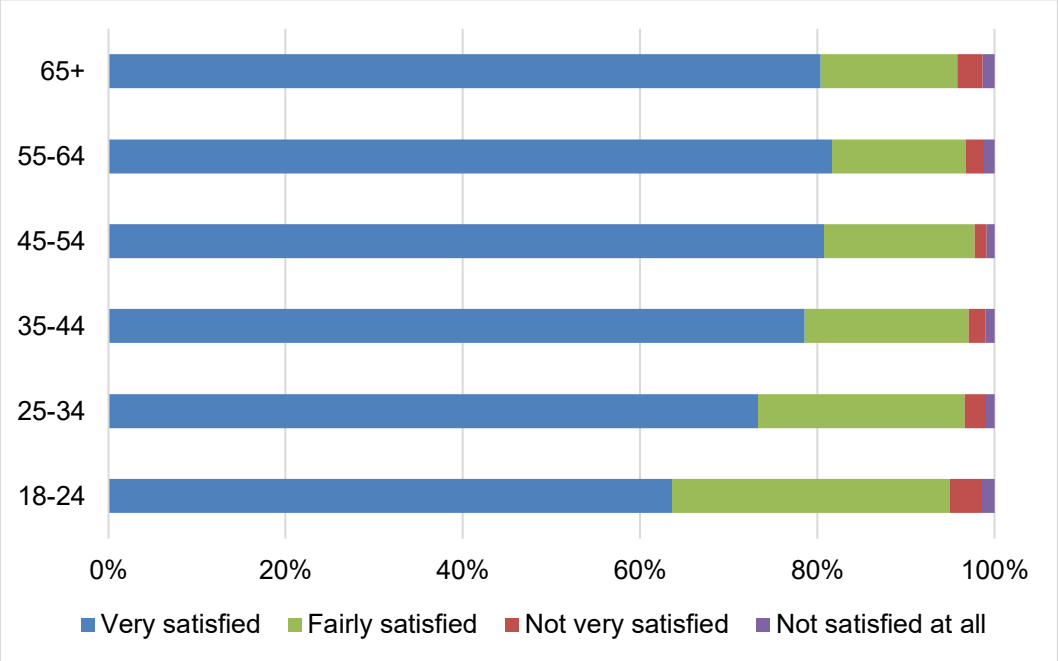


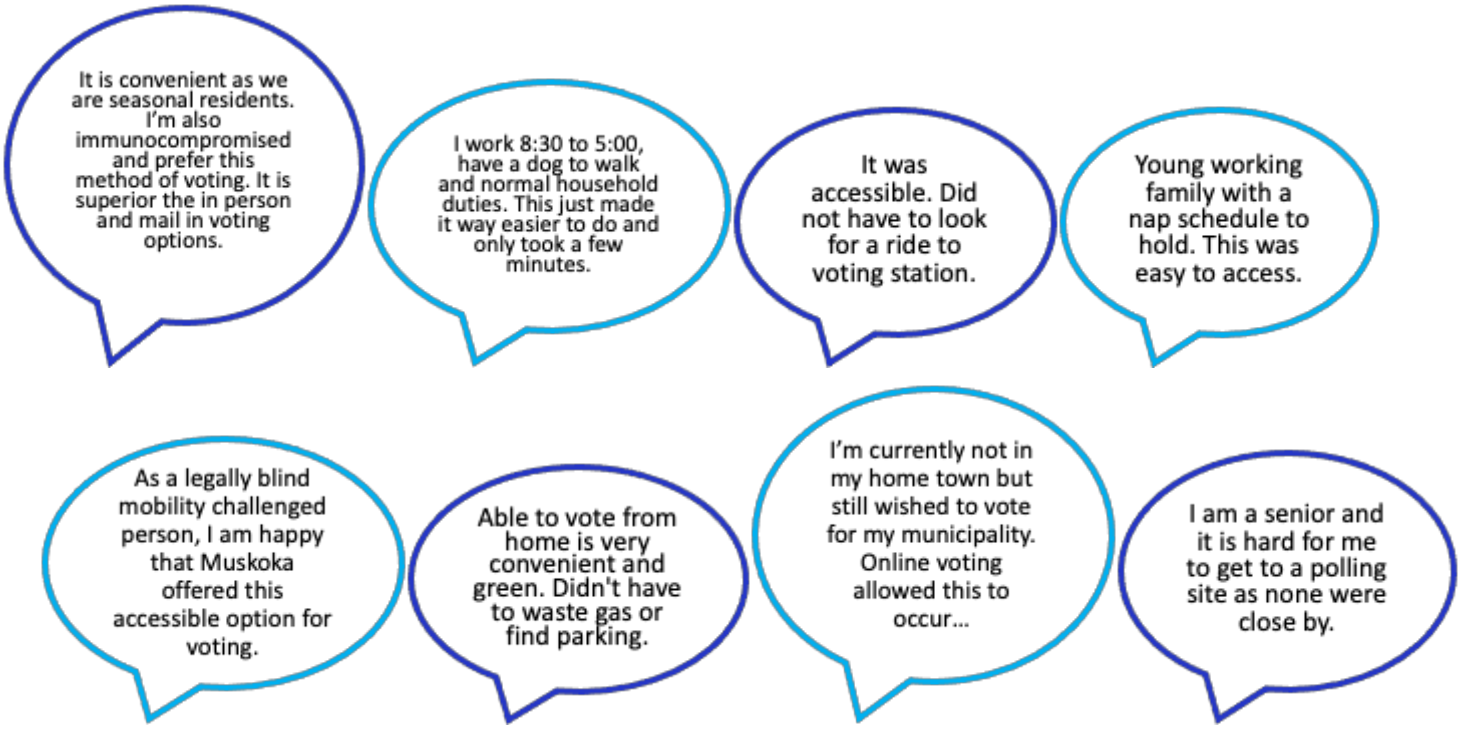
Figure 9: Satisfaction with Internet Voting by Age Group in the 2022 Municipal Election



Turning to differences by age, satisfaction with online voting in 2022 was high across all age groups, with voters 35 and older the most likely to report being 'very satisfied' with Internet voting, Figure 9. Over 80% of voters in this age group said they were 'very satisfied', compared to 73% of voters aged 25 to 34 and just 64% of voters aged 18 to 24. The finding that older voters have higher levels of satisfaction than younger ones is consistent with results from previous election years. Just 1% of voters across all age groups said they were

‘not satisfied at all’ with the Internet voting process, signaling that voters are pleased even in situations where online ballots may be their only option.

To better understand satisfaction with the online voting process, participants were asked to explain their responses in their own words. The majority of responses centered on the added accessibility and convenience online ballots provide, especially for those who live busy lives, those who were outside the municipality or or those with specific accessibility or health considerations. Many respondents highlighted the ease and speed of the process, with one participant noting, “It took me 1 minute.”



Participants also frequently remarked on the convenience of voting from home pointing to the fact that online ballots made participating in the municipal election easier since they did not need to travel to a poll location or wait in line. Others indicated that online voting enabled them to cast a ballot when they might otherwise have been unable or unwilling to do so, citing accessibility challenges or health-related concerns. Finally, some voters noted the environmental benefits of online ballots.

Aside from the additional health concerns due to the COVID-19 virus, this feedback is consistent with previous Internet voting surveys, where respondents have positioned online voting as ‘easy,’ ‘simple,’ and ‘convenient.’ Some of the responses that capture these sentiments are included below.

Most respondents (66%) said they had no issues when voting online. Of those who did, the most common issues were with authentication (6%) and finding the voting website

(6%). Just 1% of online voters said they had issues with connectivity, and 4% with the website being slow. Given the differences in Internet service outlined above, this suggests that while Internet voting applications are doing an effective job of accommodating different Internet speeds, instructions for navigating the online voting process could be more clear.

Willingness to Recommend to Others & Future Use

Respondents were asked about their willingness to recommend online voting to others and whether they would be likely to use the voting mode in a future municipal election. Willingness to endorse online voting to others and use it again in the future are considered by this report as indicators of overall support for online ballots.

The proportion of respondents who said they would recommend online voting to others remained consistently high across the 2022, 2018 and 2014 elections (94-95%). Similarly, the share of respondents indicating they would cast an online ballot in the future remained steady at 96-97% across all three elections. One small change across both questions is a slight decline, over time, in the proportion of respondents who said they would be 'very likely' to use online voting in future or would 'definitely' recommend it to others. Likewise, a slightly larger share of respondents expressed they would be 'somewhat likely' to use online voting or to 'probably' recommend it. These differences are very modest, and because participating municipalities varied across election years, it is difficult to draw firm conclusions about their significance. Among municipalities that participated consistently across elections, most reported either no change or a modest increase in overall levels of support.

Turning to the use of online voting in higher-level elections, reported willingness declines as the level of government increases. While 97% of respondents said they were 'somewhat' or 'very' likely to vote online in future municipal elections, this decreased to 92% for provincial elections and 90% for federal elections. This pattern is consistent with findings from previous Internet voter surveys and suggests that voters continue to attach greater importance to higher level elections, leading to a lower risk tolerance for those votes. Support for online voting nevertheless remains high, suggesting that the service would be welcome in all Canadian elections.

Concerns about Voting Online

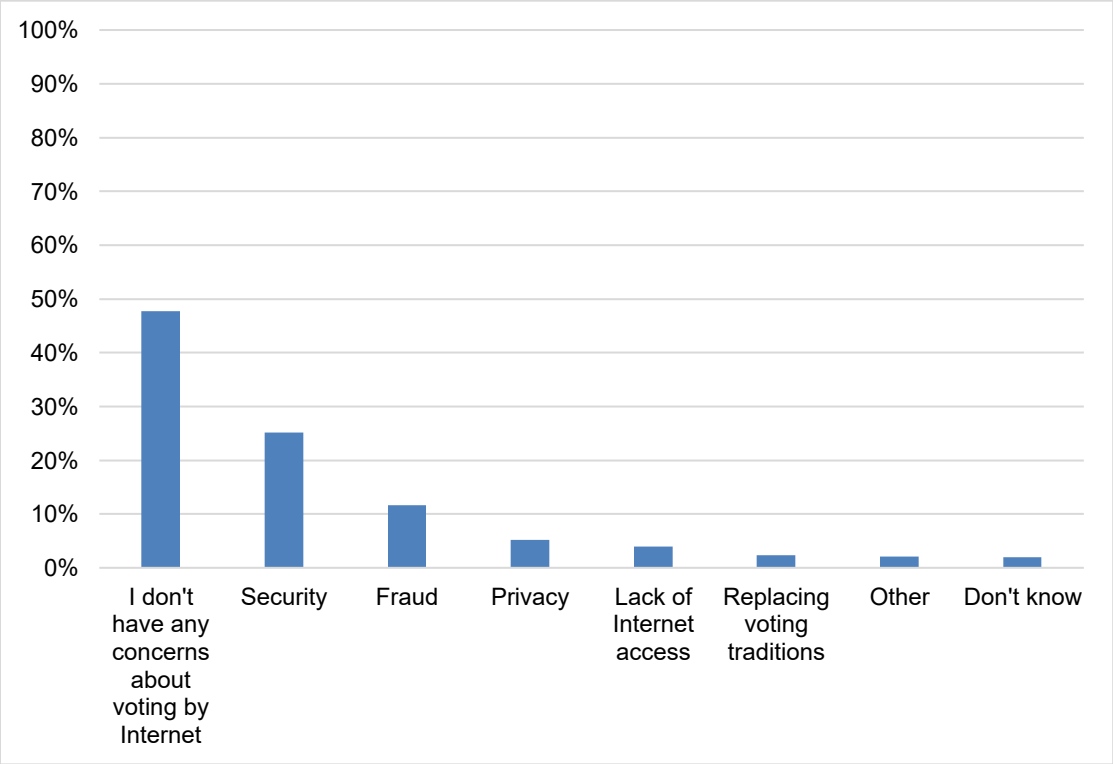
In addition to understanding motivations for using online voting, it is important to examine their concerns about the technology. Voters' concerns may affect uptake and offer

municipalities insight into how messaging and voter outreach can be adjusted as concerns evolve.

In general, concerns about Internet voting have decreased over time. When asked about respondents' top concern with voting online in 2022, over half (58%) said they did not have any concerns. This is a 13-percentage point increase compared to 2018, when just 45% of respondents said they had no concerns about Internet voting.

Among those who *did* have concerns in 2022, security (25%), fraud (12%), and privacy (5%) were the most cited issues, Figure 10. This is consistent with the findings from 2018, when 40% of respondents expressed security (29%) or fraud (11%) as their primary concerns. Taken together, these results suggest that while many voters are unconcerned with online voting, a subset remain wary of the technology's vulnerability to security breaches and fraud. These concerns present an opportunity for local governments to strengthen voter education and outreach efforts, particularly by communicating how voting systems are secured and what measures are in place to protect election integrity

Figure 10: Concerns about Internet Voting in the 2022 Municipal Election

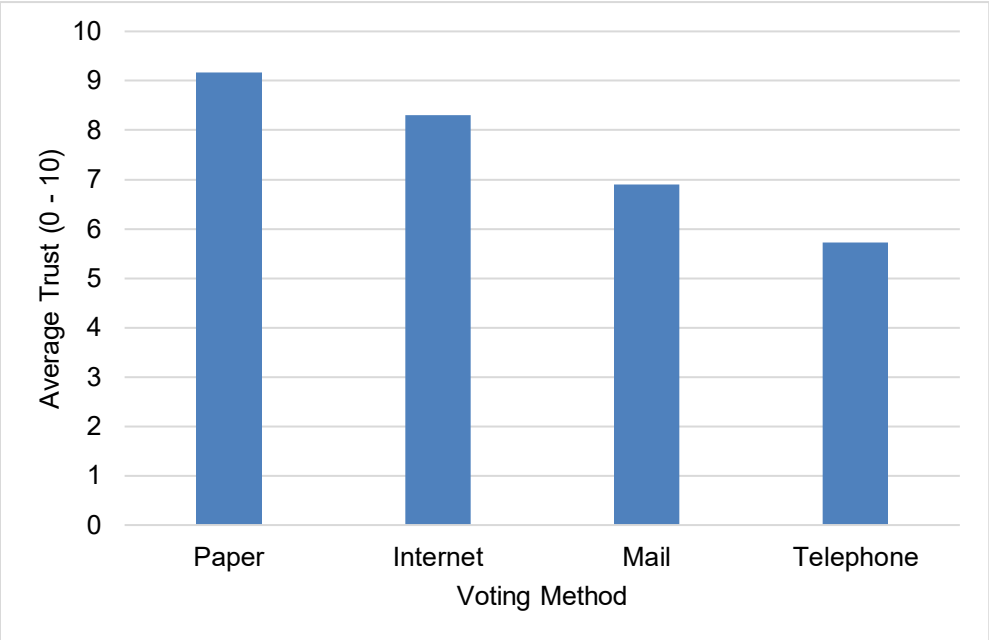


Perceptions of the safety of Internet voting were similarly high. Respondents were asked to assess whether voting online is 'risky' or 'safe'. Half of the sample received a binary question (risky/safe) with a 'don't know' option, while the other half was asked to rate the safety of Internet voting on an 11-point scale where 0 indicated 'risky' and 10 indicated

'safe'. Three quarters (74%) of respondents felt that Internet voting was safe, compared to 10% who determined it to be risky. About 17% indicated they were unsure. Among respondents asked to assess the safety on a scale of 0 to 10, Internet voting received an average rating of 8.1, suggesting most voters leaned toward perceiving online voting as safe. This confidence, however, did not extend to replacing paper ballots entirely, as only 40% of respondents agreed that Internet voting makes paper ballots unnecessary.

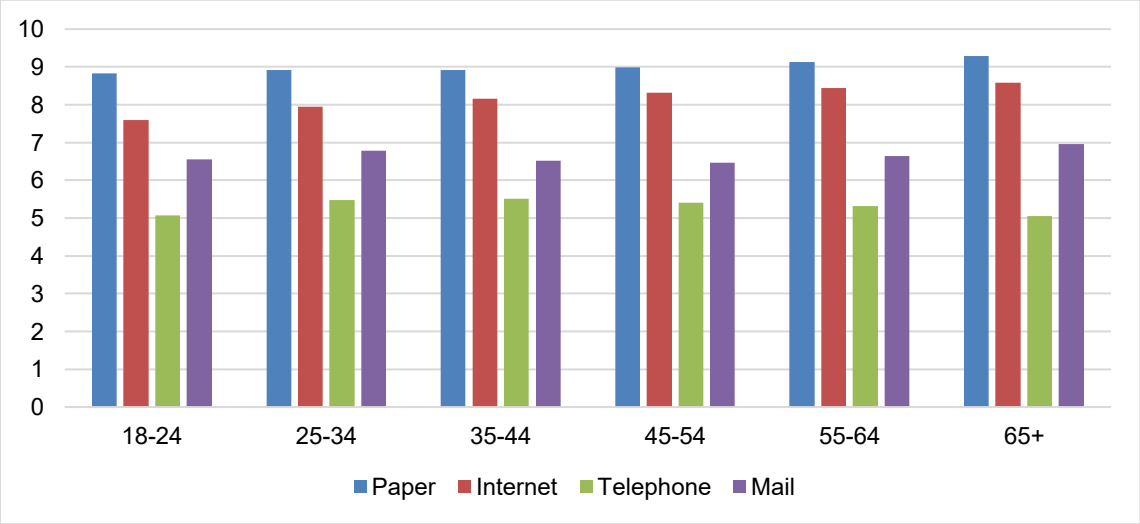
Finally, we asked respondents about their trust in the different voting methods used in Ontario's municipal elections. While Internet voting was more trusted than other remote forms of voting, such as telephone and mail-in voting, respondents indicated the highest trust in paper ballots, Figure 11. On a scale of 0 to 10, with 10 being the most trustworthy, respondents rated the trustworthiness of Internet voting an average of 8.3. By contrast, in-person voting was rated an average of 9.17, while telephone voting (5.72) and voting by mail (6.9) were rated lower.

Figure 11: Average Trust in Voting Methods in 2022 (mean score)



This pattern was consistent across all age groups, with voters aged 65 years or older rating the trustworthiness of Internet voting more highly than younger voters, Figure 12. Interestingly, voters in this age group were also the most trusting of mail-in voting but were least trusting of voting over the telephone. Trust findings continue to point to support for online ballots, however, they also show that paper ballots are highly trusted. When considering whether to add or eliminate specific voting methods, election administrators should take these levels of public trust into account.

Figure 12: Trust in Voting Methods by Age Group (2022)



In the 2022 study we conducted an experiment to evaluate whether giving voters information about an online voting system with the ability for voters to verify that their ballot had been cast correctly affected their trust. The experiment included two treatment groups that each asked voters about their trust in Internet voting with a different verification feature. A third group served as the control and was asked only about their trust in Internet voting in general.

The results indicate that respondents who were informed about the verification features had substantially lower trust in Internet voting systems without the feature compared to the control group. Trust in online voting systems with the verification feature was higher, although still lower than perceived trust in paper ballots. This experiment points to the value of educating voters about verification or security features when municipalities implement them. More broadly, it suggests that such information may boost trust and security consciousness among voters.

COMPARING ONTARIO TO NOVA SCOTIA

To date our Internet voting studies have focused on Ontario municipalities. To extend this research and collect comparative data, a survey was conducted with Nova Scotia municipalities during their 2024 municipal elections. Data collection procedures differed across municipalities, as the online voting vendor was unable to integrate a survey link on the exit page in all communities except Halifax Regional Municipality (HRM). Since the recruitment and survey experiences were identical to the data collected in Ontario, our analysis focuses on HRM to assess how online voters in Nova Scotia compare to Ontario.

In addition to comparing HRM with the participating Ontario municipalities, we highlight the City of Markham where relevant. Markham and HRM are strong comparator municipalities: both large cities with more than 100,000 electors and are among the longest standing municipalities to deploy online voting - Markham since 2003 and HRM since 2008.

Table 7 presents percentages from selected survey items to provide a sense of how online voters compare. Satisfaction with the online voting process is very high across all communities, as is respondents' willingness to vote online in future municipal elections. HRM respondents are more likely to report voting online for reasons of convenience than voters in Markham and participating Ontario municipalities. Part of this difference is attributable to context: a larger proportion of Ontario respondents selected "health and safety concerns" as their primary reason for voting online. The timing of the Ontario study, which was conducted during the COVID-19 pandemic, likely explains this pattern.

Table 7: Selected Survey Items Compared

Survey Item	Ontario	Markham	HRM
Satisfied with the online voting process.	96%	97%	99%
Voted online for convenience.	72%	74%	82%
Voted online for accessibility.	6%	6%	5%
Would not have voted without online voting.	13%	14%	10%
Has no concerns about voting by Internet.	48%	43%	60%
Likely to vote online in future municipal elections.	97%	97%	99%
Good ability to use the Internet.	89%	87%	95%
Paper voting is not needed in municipal elections where Internet voting is available (agree)	40%	43%	29%
Trust in Internet voting (mean score)	8.31	8.33	8.58
Trust in paper voting in-person (mean score)	9.09	9.00	8.97

Across all three samples, a modest proportion of respondents say they would not have participated in the election without the option to vote online. These percentages are slightly higher in Ontario than in HRM, suggesting that Internet ballots may be encouraging a somewhat greater number of voters to take part in the Ontario context.

A high percentage of respondents across all three groups rate their ability to use the Internet as 'good' or 'very good'. This figure is highest in HRM, which may reflect the

characteristics of voters drawn to online ballots, particularly given that paper voting remains widely available in the city's elections.[12]

In terms of concerns and attitudes, the results point to some subtle differences. HRM respondents are more likely (60%) to say that they have no concerns voting online compared to Ontario respondents (48%). Trust in Internet ballots is also slightly higher among HRM respondents, and the gap between trust in Internet voting and trust in-person paper ballots is narrower in Ontario. Despite these more favourable perceptions of Internet voting, HRM respondents are less likely to agree with the statement "Paper voting is not needed in municipal elections where Internet voting is available. Only 29% of HRM respondents agree, compared to 40% in participating Ontario municipalities and 43% in Markham. Greater agreement in Ontario is consistent with some municipalities eliminating or reducing in-person paper polling stations. Although similar changes are prevalent in small Nova Scotia towns, HRM has maintained in-person paper ballots for now.

Overall, respondents across all three samples demonstrate strong support for online voting. There are subtle differences in voter perceptions and opinions between Ontario and HRM, Nova Scotia. Understanding whether these are unique contextual or cultural differences is something we plan to explore in future research, notably by including data from smaller municipalities in Nova Scotia.

CONCLUSION & KEY TAKEAWAYS

This report synthesizes findings from the 2022 Internet Voting Study, drawing on earlier studies from 2018 and 2014, as well as comparative data from HRM where relevant. The goal of these projects is to collect data over time to gain insights into both the changing patterns of online voting use and the attitudes of its users. Results support evidence-based policy and practice by helping municipal administrators to understand who is using the service and how they feel about it. While some findings have stayed consistent across election years, other areas have experienced notable changes.

Key Takeaways:

- Satisfaction with online voting is exceptionally high and stable over time. 96% of online voters expressed satisfaction in the 2018 and 2022 Ontario municipal elections.

[12] In 2024, 31% of HRM voters voted in-person by paper ballot on Election Day. This is the only day paper voting was offered.

- Voters remain consistently likely to both recommend online voting to others and to say they will vote by Internet in future elections.
- Convenience remains the primary driver of online voting cited by 72% of respondents as their reason for use in 2022.
- The youngest (18-24) and oldest voters (65+) continue to be more likely to vote online for accessibility reasons.
- Online voting consistently reduces some of the ‘everyday life’ barriers to voter participation such as being ‘too busy’, out of town, or facing mobility or transportation challenges.
- Digital literacy is high, with nearly nine in ten respondents (89%) describing their ability to use the Internet as ‘good’ or ‘very good.’ This reflects a broader trend of growing Internet familiarity over time.
- Digital inequalities persist by age, income, and rurality. Lower-income and rurally based voters are more likely to rely on wireless or mobile Internet connections, which emphasizes the need for mobile-responsive, bandwidth-efficient voting system design.
- Age continues to be an important factor that shapes online voter experiences. Older voters report higher satisfaction and trust, but lower confidence in their abilities to use the Internet. Age also highlights the importance of targeted voter education.
- While the VIL remains the top source of voter information, there have been small increases in reliance on Internet sources. The importance of traditional media such as news, TV, and radio has declined.
- Online voting is highly trusted by respondents; however, in-person paper ballots remain the most trusted voting method. This finding reinforces the need to offer both voting options, if feasible.
- Providing voters with information about verification and security features can influence trust in online voting systems.
- Subtle differences between survey results in Ontario and HRM suggest that context matters. This includes decisions in the deployment and approach of online voting, local norms, and digital literacy which can shape how voters experience and perceive online voting.

RECOMMENDATIONS

Recommendation #1: Choose a mobile friendly online voting design to encourage equal experiences for rural and lower income voters who are more likely to rely on

mobile devices to access online ballots. We also recommend using bandwidth-friendly graphics to accommodate slower Internet connectivity to optimize the mobile experience.

Recommendation #2: A multi-method strategy is essential to ensure that voting information reaches all electors. While the VIL remains the most common way voters learn about Internet voting in Ontario's municipal elections, there is considerable age-based variation in other sources of online voting information. Voters aged 18-24 are considerably more likely to learn about online voting through word of mouth (about 4 in 10 compared to approximately 2 in 10 for electors over age 35). By contrast, voters aged 65 and older relied more on traditional media sources such as news, TV, and radio. Similarly, flyers and posters were more likely to reach voters aged 55-64, whereas municipal social media reached voters aged 35-54 more than other cohorts. Given the pace of change over recent election cycles, we additionally recommend that municipal practitioners closely track sources of voting information in 2026.

Recommendation #3: Continue to offer online voting alongside other voting methods when feasible. Voters trust paper ballots slightly more than online ones, and many disagree that paper ballots are not needed in municipal elections where Internet voting is available. Additionally, as echoed in the 2018 report, it is important for municipalities to maintain a secondary voting method that can be quickly deployed to ensure voter accessibility and enfranchisement in the event of technical issues. While respondents' attitudes are shifting away from reliance on paper voting, many voters continue to identify with it as an important voting channel.

Recommendation #4: Consider web-based tools as a means of countering non-voting explanations. While online voting has reduced "everyday life" barriers over time (from 58% in 2010 to 33% in 2018), political and administrative barriers have increased slightly across elections. In response, some municipalities (e.g., Town of Whitby, City of Vancouver) have introduced web-based tools that allow voters to learn about eligible candidates, confirm their voter registration, and find their voting location. Although such tools are not a panacea for all reasons for non-participation, they can help mitigate specific barriers, encourage voter participation, and contribute to a smoother voting process.

Recommendation #5: Educate voters about security measures and verification processes where applicable. With the proliferation of digital technology, voters are becoming increasingly technologically literate. Evidence from a survey experiment in the 2022 Ontario municipal elections suggests that providing information about voter verification

can influence voter trust. Other preliminary data suggests that it may also reduce concerns about online voting. While further research is needed in the 2026 election to determine the most effective language and framing, incorporating this information as part of voter education is something municipal administrators could consider when planning their election communications.

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APPENDICES

Distribution of Respondents by Age Group (2022)

Age Group	Percent
18-24	3.46%
25-34	7.17%
35-44	10.60%
45-54	17.34%
55-64	23.64%
65+	31.79%
Prefer not to say	5.99%

Distribution of Respondents by Gender (2022)

Gender	Percent
Female	49.93%
Male	45.01%
Non-binary/non-conforming	0.47%
Prefer to self-describe	0.19%
Don’t know/Prefer not to answer	4.39%

Distribution of Respondents by Ethnicity (2022)

Ethnicity	Percent
Arab	0.43%
Asian	21.69%
Black	1.21%
Indigenous	1.07%
Latino/Latina	0.67%
South Asian	5.65%
Southeast Asian	1.53%
West Asian	0.57%
White	54.64%
Other	3.41%
None of the above	1.57%
Don’t know/Prefer not to answer	10.69%

Distribution of Respondents by Highest Level of Education (2022)

Education Level	Percent
No schooling	0.13%
Some elementary school	0.23%
Completed elementary school	0.30%
Some secondary/high school	1.93%
Completed secondary/high school	7.46%
Some technical, community college	5.86%
Completed technical/community college	16.07%
Some university	8.26%
Bachelor’s degree	33.15%
Master’s degree	12.67%
Professional degree or doctorate	9.08%
Don’t know/Prefer not to answer	4.87%

Distribution of Respondents by Annual Household Income (2022)

Household Income	**Percent**
No income	1.37%
$1 to $30,000	5.66%
$30,001 to $60,000	11.66%
$60,001 to $90,000	13.62%
$90,001 to $110,000	9.42%
$110,001 to $150,000	10.94%
$150,001 to $200,000	8.44%
More than $200,000	8.84%
Don’t know/Prefer not to answer	30.05%

Distribution of Respondents by Marital Status (2022)

Marital Status	**Percent**
Single	14.01%
Married	65.70%
Common Law	4.92%
Divorced	4.60%
Widow/Widower	4.39%
Don’t know/Prefer not to answer	6.38%

Percentage of Respondents with a Disability (2022)

Response	**Percent**
Yes	7.67%
No	86.93%
Don’t know/Prefer not to answer	5.40%

Distribution of Respondents by Geographic Area (2022)

Response	**Percent**
Urban	31.06%
Suburban	48.23%
Rural	13.93%
Don’t know/Prefer not to answer	6.78%