Hanover
Ontario, Canada

STAFF REPORT TO COUNCIL

FROM Brian Tocheri, CAO/Clerk

DATE December 5, 2016

REPORT CAO-17-16

SUBJECT Municipal and School Board Election 2018 – Alternative Voting Methods

BACKGROUND

Municipal and school board elections must be held every four years and are administered by the Clerk as Returning Officer, pursuant to the Municipal Elections Act, 1996, S.O. 1996, c. 32 (the MEA).

Should Council wish to use an alternative voting method for the 2018 election, Section 42 of the MEA provides that council pass a by-law authorizing the use of voting and vote-counting equipment and electors for an alternative voting method that does not require electors to attend at a voting place in order to vote. Such by-law must be passed by May 1, 2017.

DISCUSSION

This report is being presented to council in response to a growing interest in internet/telephone voting throughout the province. Robert Tremblay, Clerk for the Municipality of Meaford, delivered a presentation on internet/phone voting to Council on October 3 and Council seemed interested in exploring this alternative method of voting further.

1. Vote-by-Mail

The Town of Hanover has conducted its municipal elections through the vote-by-mail system for the past three elections. The system has worked well with very few issues. The turnout in 2014 was 56.39%, the highest in the county. Here's how it works:

1. Electors confirm they are on the Voters' List.
2. Electors receive a vote-by-mail kit in early October containing a paper ballot with instructions on how to complete and return the ballot by mail or drop box.
3. A central tabulator is used to count the ballots.
4. Results are usually available within 30 minutes of polls closing.

There are benefits and drawbacks associated with vote-by-mail:

- ✓ enhances the convenience of voting for some resident and non-resident electors, but some may find it less convenient since there will be a deadline prior to voting day to mail in ballots to ensure receipt by the close of poll
- ✓ eliminates or significantly reduces the cost of staffing and voting places
- ✓ removes the need for proxy voting
- ✓ removes the need for advance polls
- ✓ provides a good audit trail since it requires paper ballots
- ✓ may be more or less accessible than traditional paper ballots and internet/telephone voting, depending on individual electors abilities

- × higher risk of spoiled ballots and unclear voter intent due to voter error
- × erroneous or misleading Voters' List data is exacerbated by vote-by-mail
- × electors may mistakenly receive voter packages intended for other individuals
- × privacy concerns arise as voters may return ballots inadvertently disclosing their identity by returning their ballot in the wrong envelope
- × there are no automatic controls established in order to prevent a spoiled ballot (i.e., by over-voting) as the voter is not present to correct the error
- × reliance on the postal system to disseminate voter kits and for the return of completed ballots exposes the election process to some risk

2. Internet/Telephone Voting

In August 2016, Dr. Nicole Goodman of The Centre for e-Democracy, published the Internet Voting Project Report. The report was prepared to help inform municipalities, stakeholders, and the general public of the effects of internet voting on elections. The executive summary of the report is attached for council's information. Some of the key study findings are as follows:

- 12 municipalities used internet voting in 2003 and 97 of 414 municipalities used it in 2014. It is anticipated 200 municipalities will use internet voting in 2018
- surveyed groups are satisfied with internet voting and voters and election administrators would like to see it used in elections at higher levels of government
- when offered alongside other voting methods, internet voting is Ontario voter's preferred method for municipal elections
- voters who are older, educated, wealthier, interested in politics, and report voting in past elections, primarily use internet voting for reasons of convenience
- municipalities primarily adopt internet voting to enhance voter accessibility and convenience as well as to increase voter turnout
- some non-voters may be encouraged to participate online, but it is not a solution to counter declining voter turnout or to engage young people
- older voters are the biggest users of the service and can present a challenge to deployment
- education and outreach are the biggest challenges for implementation
- there was no noticeable change in the profile of voters, with older voters being slightly more satisfied than younger voters with internet voting
- voters who were not satisfied after using internet and telephone voting said they were frustrated with learning a new voting method

Here's how it works:

1. Electors confirm they are on the Voters' List.
   - In early October, each elector will receive a personal voter notification letter containing information to access the voting system by internet or telephone, including voter ID number, voter unique PIN to vote, URL and telephone number for the voting system, and voting information (i.e., candidates running for office, location of help centres, legal requirements to vote, how to find more information, etc.)
2. Accessing the voting system:
   - electors will be required to confirm they are entitled to vote when accessing the system by entering their ID and PIN number provided on the notice
   - electors will then follow the prompts and confirm his or her selections
3. Help centre(s) would be located to promote the election, assist voters, and provide the following services:
   - adding an elector to the Voters' List
   - assistance and clarification on the election process
   - access to a telephone or computer for voting

Internet/telephone voting also presents several benefits and challenges:

- ✓ provides greater convenience, accessibility, flexibility, and opportunity for participation
- ✓ allows for a longer voting period and 24 hour per day voting up until 8:00 p.m. on election day
- ✓ removes the need for advance polls and proxy voting
- ✓ voters can use their personal telephones, tablets or desk tops with accessibility features including high volume, headphones or talk-to-you ("TTY") features
- ✓ count is 100% accurate with no risk of spoiled ballots or unclear voter intent
- ✓ system uses clear and plain language with prompts
- ✓ full-time staff resources dedicated to election functions will be reduced

- ➢ this is relatively new technology, so additional communication, outreach and education of voters will be required
- ➢ some electors may be more reluctant to learn a new voting method because of the technology, but at the same time older voters are the biggest users

Internet/Telephone Voting Security

Internet/telephone voting poses a lower security and vulnerability risk than vote-by-mail as voters are required to provide unique voter credentials that have been assigned only to them. Voters must authenticate themselves prior to accessing the voting process.

The security protocol that Dominion Voting utilizes is attached. Since internet voting was first used in 2004, Dominion has not experienced any voting or post voting reporting slowdowns, unexplained delays or successful hacks. All elections have been successfully certified.

Physical security is handled by replicating data at two data centres. Both data centre environments are supported with extensive virus and penetration prevention using firewall protection. Utilizing a dual data centre environment provides the highest level of data security and system availability. In the unlikely event of a failure in one data centre, voter activity is continued on the secondary site and the data is backed up and available. A series of data centre tools are used to continually monitor the system and network for abnormal behavior and any indication of abnormal activity is handled by the technical team assigned to the data centre.

An option is also available that requires the voter to authenticate his identity with a second shared secret beyond the PIN provided in the voter kit. This provides an additional security measure to ensure the elector the ballot was intended for is, in fact, the elector filling out that ballot.

The system includes protections against repeat voting. Once an individual has voted, he will immediately be marked as voted on the Voters' List and no longer able to log into the system and vote again. This is equivalent to striking the voter off the voter's list ensuring one voter one vote.

Dominion Voting also maintains a permanent audit log of all system activity. This access log can be used to review all activity associated with the voting process while maintaining complete voter anonymity.

Combining two or more Voting Methods

Combining two methods of voting, i.e., vote-by-mail with internet/telephone would effectively result in conducting two separate elections simultaneously. Although the process for handling both voting methods is fairly simple, additional resources, and hence, costs will be significantly higher. Running two methods is also bound to result in a high level of voter confusion and the perception of being able to submit more than one vote.

FINANCIAL IMPLICATIONS

The cost to run the 2014 election was $30,046. Based on 5,500 voters, the cost to run a similar vote-by-mail process in 2018 is estimated at $35,000.

Internet/telephone voting in 2018 is estimated at $30,000. This includes a significant amount for training staff, promotion, communications, and advertising of the new voting method to voters. There is the potential of collaboration with other county municipalities to share costs of advertising, training and in developing policies and procedures.

Combining the two methods will result in costs in the range of $45,000 - $50,000 depending on how people ultimately end up voting.

LINK TO STRATEGIC PLAN

This policy supports the Vision and Corporate Values of the Town of Hanover, as well as the Goals and Action Plans set out in the Strategic Plan, particularly with respect to Strategic Direction #4: Sustainable Municipal Operations.

OPTIONS

A. That Council choose the Internet/Telephone system of voting for the 2018 Municipal Elections and that the appropriate by-law be brought forward at a later date.

B. That Council remain with the Vote-by-Mail system of voting for the 2018 Municipal Elections.

RECOMMENDATION

Your Administration recommends Option A. THAT Council choose the Internet/Telephone system of voting for the 2018 Municipal Elections and that the appropriate by-law be brought forward at a later date.

Respectfully submitted,

Brian Tocheri
CAO/Clerk

Internet Voting Project Report

Executive Summary
August 2016

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THE CENTRE FOR
e-DEMOCRACY
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The following are key findings from the research, which are explained more fully in the report.

INTERNET VOTERS' SURVEY

The Online Voting Process

- There is strong satisfaction with online voting as 95 percent of respondents report being satisfied
- Online voters said that casting a ballot online was "easy", "simple", "straightforward", "private", and "convenient"
- 95 percent of online voters say they would recommend the voting method to others
- Internet voting was the preferred voting method for voters in 93 percent of the communities that participated in this research
- Voting from home is the preferred remote voting location (88 percent of respondents said they voted from home)

Why are Voters Drawn to Online Ballots?

- **Convenience is the primary reason voters decided to vote online**
- Younger voters (aged 18-24) are more likely than any other group to say the top reason they voted online was because of accessibility

Reported Use in Future Elections

- A strong majority of online voters say they would use the voting method in a future election:
    - 98 percent say they would likely use it a future municipal election
    - 95 percent report being likely to use it in a provincial election
    - 94 percent indicate they are likely to use it in a federal election

Online Voter Profile

- **The typical online voter is older, educated and wealthier.**
- **The average age is 53.**
    - Of all age groups, those aged 55-64 years were the biggest users of online voting in the 2014 municipal election.
- **Has an annual household income of $80,000 or more before taxes.**

- **Resides in an urban or suburban area.**
    - However, rural voters were more likely to choose online ballots than to vote by paper at the polls.

Online Voter Profile (Cont.)

- Reports having voted in most of the past elections they were eligible to participate in
- **Has a fast Internet connection at home and uses the Internet frequently** (93 percent say they use it everyday)
- **Is interested in politics (89 percent)**

PAPER VOTERS' SURVEY

Satisfaction with the Paper Voting Process

- **68 percent of paper voters are satisfied with the voting method.**

Knowledge and Opinions of Internet Voting

- A majority, 89 percent, were aware of online voting.
- Among paper voters the **top concern about Internet voting is security of the voting process**, 37 percent.
    - The second largest group, 32 percent, report having no concerns about the technology.
    - This latter group did not use it because they 'forgot', 'waited too long', for reasons that are administrative in nature, or because they had not decided whom to vote for in time.
- **Internet voting is perceived to be the safest remote voting option.**
    - 66 percent believe telephone voting to be less than safe than voting by Internet.
    - 54 percent believe voting by mail to be less safe than online voting.

Using Internet Voting in the Future

- **78 percent would use online voting in a future election.**
    - 47 percent of this group would do so under special circumstances such as inclement weather or illness.
    - 30 percent would do so 'no matter what'.
- **'Convenience'** is the primary reason paper voters would vote online in a future election.

Paper Voter Profile

- **Average age: 44 years**
    - Voters under 44 years of age were more inclined to vote by paper, while those over the age of 45 years voted more frequently by Internet.
- **Annual household income of $60,000-$79,999 before taxes.**
- **Resides in an urban or suburban area.**
    - Paper voters were more likely to live in an urban area than Internet voters, and less likely to live in a rural one.

Paper Voter Profile (Cont.)

- They are committed voters.
    - Report having voted in most of the past elections they were eligible to participate in.
- **Have fast Internet connections and go online everyday.**

CANDIDATES' SURVEY

Candidates' Satisfaction with the Online Voting Process

- **A majority of candidates (64 percent) are satisfied with online voting**
- Similar levels of satisfaction are reported for the security of the election (73 percent) and the posting of election results (64 percent).

How Candidates Learnt about Internet Voting

- **Candidates were most likely to have heard about online voting via municipal-led information initiatives.**
- Specifically, the municipal website, Voter Information Packages, candidate information sessions, and local newspaper notices were the top sources that informed candidates about Internet voting.

Influence on Candidates' Campaigns

- **A majority of candidates (64 percent) say that Internet voting affected their campaign.**
- Popularly cited impacts include: making the beginning of campaign more crucial for attracting and mobilizing supporters, increased voter turnout, a larger number of young voters, talks with electors focusing on the voting method instead of election issues, and a negative impact on older electors.
- Candidates encountered many more electors that had already voted than in previous elections.
    - 91 percent of candidates said that more than half of those who had voted before Election Day reported voting online.

Candidates' Overall Opinions of Internet Voting

- **80 percent of candidates feel favourably about having Internet voting as an additional voting method.**
- **A majority of candidates (64 percent) is against having Internet voting as the only voting method in elections.**

ELECTION ADMINISTRATOR SURVEY

Satisfaction with the Online Voting Process

- **96 percent of administrators report being satisfied with Internet voting**
- **97 percent of respondents say they would recommend using Internet voting in the 2018 municipal election**
- 96 percent feel it should be offered as an option in provincial elections
- 95 percent believe it should be used in federal elections

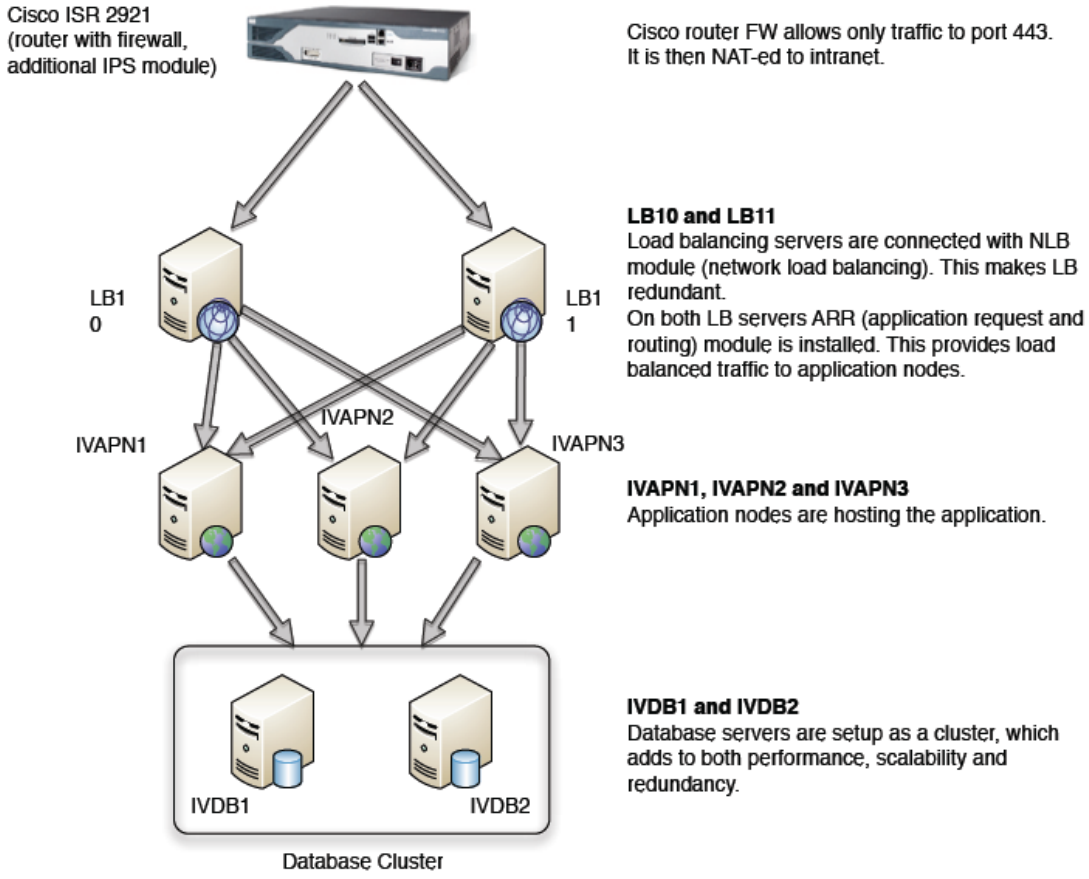
Why Internet Voting?

- **Accessibility for electors is the top reason administrators cite for adopting Internet voting**
- Improving voter turnout and convenience are other common rationales
- The **top three benefits** of Internet voting from an administrator's point of view include: **convenience, accessibility, and counting efficiency.**
- **Public education and outreach, negative media, and potential for fraud are the biggest challenges.**
- Administrators believe the biggest benefits for electors are: convenience, accessibility, and government keeping up with technological change.
- They see the biggest challenges for electors as being familiarity with computers, learning a new voting method, and access to a computer or Internet connection.

Impacts of Internet Voting

- The costs of introducing Internet voting vary depending on the municipality and the approach used.
- Although many administrators say they are unsure of the cost impact, there are more respondents who say that Internet voting decreased the cost of the election than those who believe there was an increase.
- A majority (58 percent) agree voter turnout was positively affected by Internet voting.
- 74 percent agree the **tabulation of election results is more efficient with Internet voting.**
- A majority of respondents do not believe Internet voting has more risks than other remote voting options such as voting by mail (71 percent) and telephone voting (53 percent)

General System Security and Operations



Secured Channel: Dominion's IV/IVR System utilizes the SSL protocol to provide a secure channel between the voter's web browser and vote processing servers. The complete communication is digitally signed and encrypted.

Security Controls: The Dominion IV/IVR System provides a layered and comprehensive set of security controls for the end-to-end online voting process including pre-voting (election definition), voting (Internet/Telephone voting), and post-voting (results processing, reporting and publishing). Security controls include physical security mechanisms (secure data centers), access control (role based access control and user authentication with real-time audit records), data confidentiality (encryption using NIST verified algorithms such as AES256) as well as data integrity (digital signatures and certificates using NIST verified algorithms such as RSA and SHA256). In addition, the online voting system has a time-controlled validity - the system is operational only when the jurisdiction decides it to be operational.

Controlled Access: Access to the IV/IVR solution is protected by the initial voter authentication process, which interfaces with Voter Management Portal via programmed interface with jurisdiction's voter management system. In that way, the only publicly visible web page is the actual voter login page (authentication page). Only after successful voter authentication, the system allows access to the voting pages.

Audit Logs: It would be a violation of the voter privacy if the system was designed and configured to record every step that was performed by the voter. Essentially, this would allow reconstruction of voter selections and link voter to the votes. Therefore, the Dominion IV/IVR Solution maintains the audit log at the system backend (server) side when the voting session has started and when it has finished, with the additional information such as IP address, session ID, ballot ID, etc. For additional auditing purposes, Dominion Internet/Telephone Voting Solution also keeps an electronic ballot image record for each ballot cast that can be used for auditing as well as any recount purposes.

All electronic records are digitally signed but maintain voter privacy: If user side (voter) digital signatures were used for ballot signing, then voter privacy would be violated. As such, the jurisdiction would be able to link a voter to the ballot, which would be unacceptable. However, the client side digital certificates can be supported for the voter authentication which will provide mutual (two-way) authentication between the voter and Dominion Online Services web server.

Data files are digitally signed: Regarding protection of data on any data interfaces with external systems, any data files (XML and log files) are digitally signed and encrypted when stored. Any data files (XML and log files or other data) utilize SSL or SFTP secure channels for data communication.

Anti-virus protection: The IV/IVR System utilizes the Avast Enterprise Suite for anti-virus protection. This ISCA certified suite of applications provides the following:

- Antivirus protection
- Anti-spyware protection
- Anti-rootkit protection
- Resident protection
- 64-bit OS support
- Boot-time scan

Protection against repeat voting: Once the voter casts their ballot, the system does not allow the same voter to login again. In addition, as soon as the voter casts their ballot online, the IV/IVR system updates the election database, creates audit records and an electronic ballot image with timestamp, and therefore provides multiple ways to verify that votes have not been modified. Of course, for privacy, the voter management database and the election database are separate systems to prevent any way of linking voters with their votes.

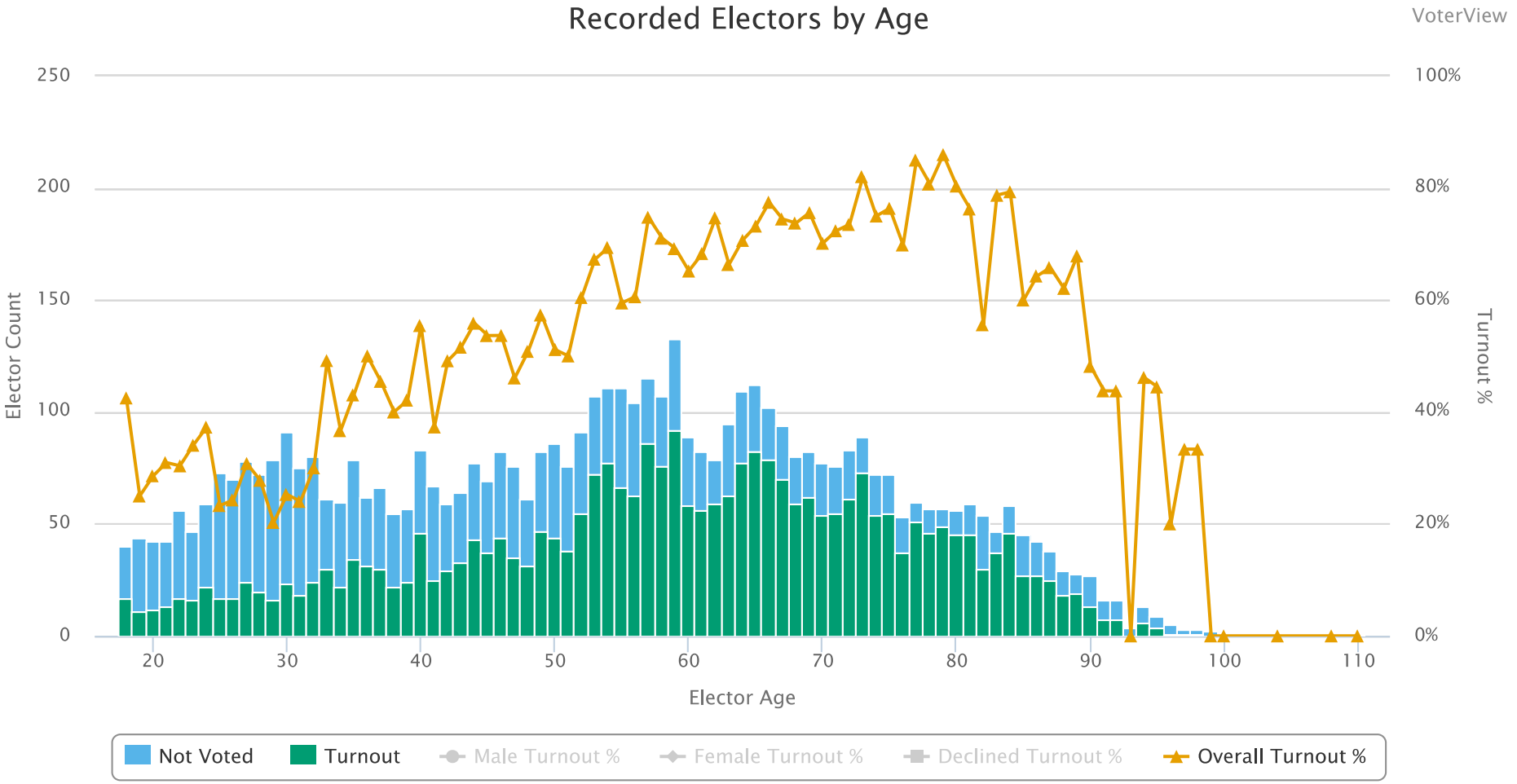
Complete Separation of Voter and Ballot data: The Voter Management Portal and the Internet/Telephone Voting System databases are separate. Casting of the ballot results in real-time strike-off of that voter on the voter list system. As discussed, no link between voter and votes cast can be established.

Configuration management: All system components (OS and other components such as database server software) are kept current with the latest patches and updates. All patches and updates are stringently tested by Dominion Quality Assurance Department before release. Dominion Quality Assurance policy locks down the production version of the election system well in advance of the election event, as it is unwise to update systems too close to an election.

Role based permissions: Dominion provides means for role based permissions within the system. It is up to the jurisdiction to define permissions for each role, if the default set of permissions is not appropriate.

Business Continuity Plans: Dominion IV/IVR System utilizes redundant servers for application and database servers. Load balancers and real-time database synchronization keeps system balanced and protected in case of failure. In addition each server integrates RAID controllers with data mirroring. If required, data periodically can be also transferred to the Customer data center for additional off-site data redundancy.
Dominion uses Cisco based firewalls. Two levels of firewalls are provided within the system with configured filtering rules to allow only certain IP and TCP/UDP ports. All traffic is performed using SSL/HTTPS and SFTP protocols and only these ports are open.
Proper data security and data backup services are integrated within the Dominion IV/IVR System.

As outlined in the Network Diagram, the Dominion IV/IVR solution is deployed on two independent data centre environments. Dominion is the only IV/IVR services company in Canada that can provide this level of data security.
From a data protection and backup point of view, all system components are designed around redundancy on several levels - multiple web, application and database servers, RAID controllers for data mirroring, load balancing, multiple levels of networking infrastructure equipment, etc.


Recorded Electors by Age
VoterView
250
200
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50
0
100%
80%
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