Proposal for a technology-enabled staffing model for Ontario Provincial Elections

Post-Event Report: Whitby-Oshawa By-election

X Elections Ontario

The rise of internet-connected technologies has significantly changed public expectation in almost every part of our society.

Elections Ontario

Office of the
Chief Electoral Officer
of Ontario

Bureau du directeur
général des élections
de l'Ontario

The Honourable Dave Levac
Speaker of the Legislative Assembly
Room 180, Main Legislative Building
Queen's Park
Toronto, Ontario
M7A 1A2

Dear Mr. Speaker:

It is with great pleasure that I submit my report on the Whitby-Oshawa by-election held on February 11, 2016.

This report describes the conduct of the Whitby-Oshawa by-election and makes specific reference to the technology-enabled staffing model that was piloted and which included e-Poll Books and Vote Tabulators with assistive voting technology.

For the Whitby-Oshawa by-election I directed changes with the objectives of improving the voting process for electors, realizing administrative efficiencies, and maintaining the integrity of the voting process. A copy of the directive dated January 21, 2016 was filed with your office, and published on Elections Ontario's website.

Under sections 4.1 and 44.1 of the *Election Act*, the additional use of tabulators and ballot marking devices on Election Day, at locations hosting superpolls, was tested.

Under section 4.4 of the *Election Act*, the voting process was modified by using a new staffing model and e-Poll Books at specified voting locations.

This report fulfills the requirements under sections 4.1(5), 4.4(11) and 44.1(9) of the *Election Act*, namely to report on this equipment and the staffing model and to make recommendations with respect to amending this Act to adopt changes on a permanent basis.

The successful administration of the by-election could not have been achieved without the dedication and commitment of our team at Elections Ontario headquarters, the returning officer, Mr. Paul Jones, the election clerk Ms. Jamie Norton, the 20 returning office personnel, and the 600 election officials who worked on Election Day and in the advance polls. I also extend my thanks to the registered political parties and ten candidates for their participation in the by-election.

Respectfully submitted,

Greg Essensa
Chief Electoral Officer

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Message from the Chief Electoral Officer

In the Whitby-Oshawa by-election of February 11, 2016 Elections Ontario completed a successful pilot of a technology-enabled staffing model that reduced the number of polling staff required while improving elector experience and making the work of polling staff easier.

The pilot took place on Election Day in 42 voting locations across Whitby-Oshawa. The remaining 22 locations used the current staffing model and the manual process.

Ninety-six per cent of electors surveyed on Election Day found the technology simple and easy to use: 91 per cent said they would support the use of similar technology in future elections. Feedback from polling officials was also positive. It showed that 89 per cent would support the use of similar technology in future elections and 87 per cent found the technology simple and easy to use.

There were three main goals of the pilot: first, to address the risks in the current staffing model which is unsustainable in the long-term; second, to improve elector experiences by modernizing the voting process; and third, to protect the integrity of the electoral process.

Elections Ontario enjoys enormous public trust. Ninety-two per cent of voters surveyed following the 2014 General Election agreed that Elections Ontario makes the voting process easy. On the surface, the risks to our electoral process are not yet evident but they are present and must be mitigated before they become apparent.

Our current staffing model required approximately 76,000 polling officials on Election Day in 2014. With a growing population and redistribution introducing 15 new electoral districts as many as 100,000 polling officials could be needed by 2018. Elections Ontario is increasingly unable to find the required number of polling officials.

Additionally, the work required in the polls is out of step with public expectations today. A poll official's workday can last an average of 14 to 16 hours. It requires meticulous attention to detail and manually manipulating data The most complex tasks – counting and documenting the vote – are performed at the end of this long day. While there have as yet been no serious incidents affecting the integrity of the process, such a risk only increases if the process does not adapt to meet today's public expectations.

I am pleased to invite you to follow our journey to develop a technology-enabled staffing model that successfully reduced the number of staff required on polling day while improving elector experiences and protecting the integrity of the electoral process. A pilot program by nature is not perfect and we did learn a lot from the pilot to prepare for the 2018 General Election. Overall we are very encouraged by the support from the public and our polling officials. I now require clear direction from the government and/or legislature to move forward. I need this direction by the end of June 2016 in order to have the time to implement a similar model across the province.

Sincerely,

Greg Essensa

Greg Essensa
Chief Electoral Officer

How have public expectations changed regarding Ontario provincial elections?

The rise of internet-connected technologies has significantly changed public expectation in almost every part of our society. Expectations for how a transaction is conducted, by whom, where and in what time frame are all very different than they were even 30 years ago.

At the same time, this always-connected technology environment has raised new concerns about privacy and the security and reliability of digital information.

Elections Ontario's electoral process has served Ontarians well through many significant societal changes: women getting the vote, universal franchise, the rise of mass media, mass immigration and globalized economies -- to name a few.

These changes have completely disrupted other parts of our society and institutions, yet our electoral process has remained sturdy because of its strong foundation in the values of integrity and accessibility.

The changes brought by the integration of technology into our daily lives are the next challenges to which our electoral system must adapt and evolve. As we adapt to those changes, it is critical that we uphold our values of: integrity and accessibility. We must move forward in a measured, principled and evidence-based way to find the efficiencies that technology can provide while ensuring that we protect the integrity of the process from the risks technology brings.

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How have public expectations changed with regards to the electoral process?

How we work has changed

Advancements in technology, and the evolution of the internet have profoundly changed the function of work in Ontario, and around the world. As recently as the early 1980s a large segment of Ontario's workforce was composed of clerical and administrative professionals.

Before the computer became standard issue office equipment it was this large segment of administrative professionals who diligently completed forms by hand (or typewriter) and maintained meticulous hard-copy records of original documents. The skill set required to perform this manual entry and record keeping was a core function for any business or public office of the time. Knowing how to fill out a form in triplicate and ensure proper delivery and filing of each of those copies was an essential skill set then, just as workers today must understand the nuances of word-processing software.

The Windows® operating system was introduced in 1985 – over 30 years ago. Someone who entered the workforce in the middle 1980s, which was the tail end of the transition from paper-based business practices to computer-based business practices, is now 50 years old. Someone who entered the workforce in 1960 spent the first third of their career in a paper-based environment, the second third of their career in the transition to computers and the last third in a computer environment. This person is now approximately 75 years old.

Knowledge of how to conduct business transactions in a paper-based environment is now a non-standard skill set.

The work conducted by poll officials on Election Day and in advance polls is paper-based. It assumes that poll officials are already familiar with working in a paper-based environment. The work has not changed, but the core skill-set of the workforce has. The processes required to administer an election are increasingly unfamiliar to today's Ontarians.

This is not the only barrier Ontarians face when considering work as poll officials. The day is very long. When tasks such as opening and closing polls, counting ballots and filling in the paperwork are included the average poll official's work day can last 14 to 16 hours. The job has also become increasingly complex, the rules governing customer service, accessibility and verifying ID have all changed even from as little as fifteen years ago. All of this is expected of poll officials; and, for most this is a one-day job.

The staffing model for Ontario elections is unsustainable in the long term. It is increasingly difficult to find the 76,000 Election Day staff that were required to administer the 2014 General Election. After each election, the number one concern voiced by Returning Officers across the province is that they have challenges finding the staff they need.

Knowledge of how to conduct business transactions in a paper-based environment is now a non-standard skill set.

The challenge of finding enough staff is not unique to Ontario. It is a common challenge for all election management bodies across Canada and in other jurisdictions. In the most recent Federal Election this past October, Elections Canada was only able to find 285,000 staff for the 329,000 positions they needed to fill.

Redistribution legislation recently introduced in Ontario will exacerbate this staffing challenge. The legislation increases the number of electoral districts in Ontario by fifteen. Elections Canada required an increase of 54,000 staff for 30 additional electoral districts. This means that Elections Ontario will likely need a total of 100,000 Election Day staff for the 2018 General Election. Our current process must adapt before then.

How we conduct business has changed

Internet-connected technology has drastically changed how Ontarians conduct even basic business transactions.

Gone are the days when people needed to rush to the bank before it closed, to line up, fill in a deposit slip to deposit a cheque and get cash. Most pay cheques are delivered via direct deposit, banking transactions can be done online at any time of the day, and all paperwork is automated.

Shopping for consumer goods can be done through a variety of channels. A person may choose to go into a bricks and mortar store, shop online, order online and pick up in person, or even order a service to automate basic retail purchases.

Closing a transaction has likewise become highly automated. Most consumers no longer carry cash. They pay with credit or debit cards, mobile apps or other online media.

In the current electoral process the elector must go to a specific table in a specific location on a specific date. They wait in a line to have their identification confirmed and have their name manually crossed off a paper-list. Sometimes they may need to wait for some forms to be filled out in detail and by hand. They will then receive a paper ballot, which they will mark by hand in secret, then return the ballot to a cardboard box to be counted manually at a later time, by a poll official who is working a 14 to 16 hour day.

The voting process has become unlike any other transactional process that the public is used to as part of their daily lives.

The voting process has now become unlike any other transactional process that the public is used to as part of their daily lives.

Why are we not proposing internet voting?

Recognizing that many of the societal changes we have discussed have been possible because of the evolution of the internet, the questions often posed is: why, when other jurisdictions (such as Ontario municipalities) are moving toward internet voting, is Elections Ontario not exploring or proposing an internet voting solution?

Elections Ontario explored the possibility of internet voting in a comprehensive research study conducted between 2010 and 2012. Recommendations and the full analysis of the study can be found in the Alternative Voting Technologies Report available on our website. In the report Elections Ontario provides implementation criteria for networked voting, and outlines the current barriers to those criteria being met. To date, Elections Ontario has not found a networked voting solution that would protect the integrity of the electoral process.

Because of the requirement for a paper ballot, for the purposes of this pilot project the introduction of internet voting does not address our primary concern: reducing staffing requirements for a General Election. To reduce the staffing requirements for a General Election a solution that maintained a paper ballot while automating processes at the voting location was required. Internet voting may provide another channel for electors to use in the future; however, it would not itself reduce the required staff at voting locations.

Internet voting is often considered in the context of increasing voter turnout. As mentioned in the Alternative Voting Technologies Report there is no conclusive evidence that internet voting will have a positive impact on turnout. More recently, the Internet Voting Project published a report[1] on the 2014 Ontario Municipal Elections that supports this assessment that there is not a correlation between internet voting and increased turnout.

How might the electoral process be automated to better serve the elector?

When we at Elections Ontario considered how we might modernize the voting process we looked to other industries and processes that had changed substantively with the introduction of technology: banking, point-of-sale payment and basic business practices.

As we examined the changes that technology has brought business, we saw a common trend emerge: automation. Technology has automated common daily transactions.

Since the voting process is, at its core, a simple transaction, we naturally asked the question: "what parts of the voting process could be automated so that the work of poll officials is made easier and can be conducted by fewer people, while at the same time maintaining or improving elector experience?"

> **To date, Elections Ontario has not found a networked voting solution that would protect the integrity of the electoral process.**

What did we pilot?

Elections Ontario conducted research into automation solutions that have been successfully integrated into electoral processes in other jurisdictions. Proposed automation solutions needed to address our unsustainable staffing model while ensuring that the voting process is easy and efficient for electors and poll officials. The solutions also needed to be economically prudent while maintaining public confidence and the integrity of the process.

New Staffing Model

Our pilot started with the development of the staffing model. The goal of this new staffing model was to use our staff more efficiently. This meant using automated tools to allow one person to both strike off an elector and issue a ballot. It also meant ensuring that electors could be served by any available polling official.

To be able to implement a staffing model that would allow an elector to be served by any available polling official Elections Ontario needed to merge the polls located in multi-poll locations that served three or more polls. For a full description of this process please see the appendix.

The superpolls and the automation solutions discussed below allowed Elections Ontario to eliminate the poll clerk position, and modify other positions.

In the 2014 General Election approximately 76,000 staff were required. Of those, approximately 50,000 were required in the roles of DRO, PDRA, SDRO and Poll Clerks in multi-poll voting locations. If the pilot staffing model was used across Ontario in a General Election, the number of staff required would decrease by approximately 31,000 people. This represents a reduction of 41 per cent from the current model.

In terms of total number projections for the 2018 General Election redistribution (as mentioned above on page 9) is projected to increase staffing requirements from 76,000 to 100,000 using the current model. Using the new pilot model there is the potential to reduce staffing requirements below the 2014 level even with the addition of 15 new electoral districts.

Current staffing model

Pilot model
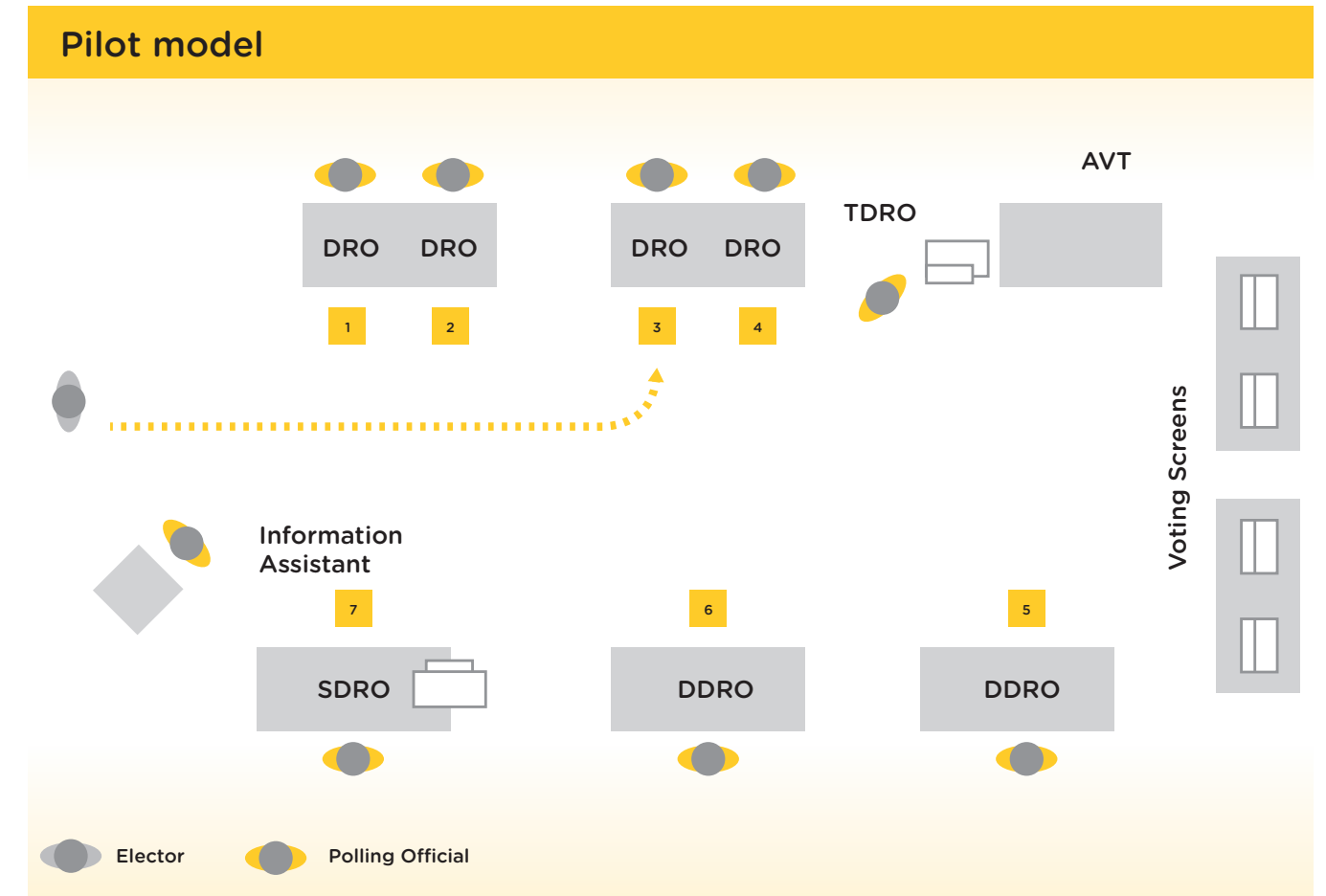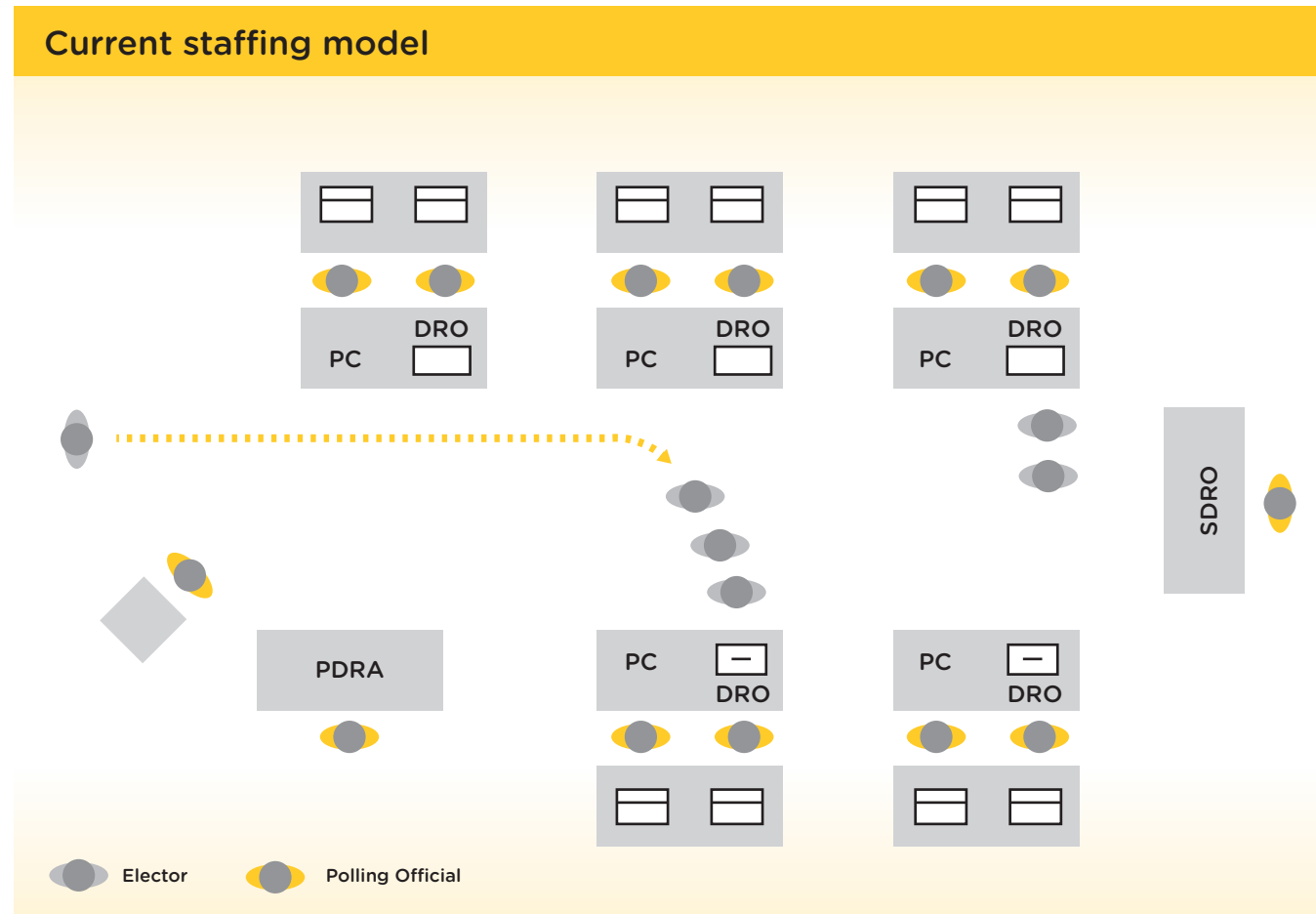
2014 Staffing Positions	Pilot Staffing Positions
Returning Officer	**Returning Officer**
Election Clerk	**Election Clerk**
Returning office staff	**Returning office staff**
Advance poll staff	**Advance poll staff**
Information Assistants	**Information Assistants**

2014 Positions Affected by Pilot*	Pilot Staffing Positions
DRO - Deputy Returning Officers	**DRO - Deputy Returning Officers**
PDRA - Polling Day Revision Assistants	**DRRO - Deputy Revision and Returning Officers**
SDRO - Supervising Deputy Returning Officers	**SDRO - Supervising Deputy Returning Officers**
PC - Poll Clerk	**TDRO - Tabulator Deputy Returning Officers**

*The affected position apply only to voting locations that contained three or more polling stations in the 2014 General Election. Single and double polls retain the 2014 model. For full details see "where we piloted" on page 15.

> **Overall, we expect that this change will result in faster service for electors.**

New Service Streams

Elections Ontario conducted research in the 2014 General Election and several by-elections in 2013 to determine the types of services electors arriving at a voting location required.

The research demonstrated that approximately 80 per cent of electors arrived at a voting location with their Notice of Registration Card[2] (NRC) and ID. These electors required minimal service to have their name struck from the list and be issued a ballot. The remaining 20 per cent of electors either did not have an NRC or ID and they may require a variety of services to revise or add their information to the list of electors before they could be issued a ballot. The research also studied the time of day that electors came to vote and how long it took for poll officials to process electors.

Using the findings of the research as a foundation, Elections Ontario developed the new staffing model to create two service streams for the different groups of electors. Electors who arrived at a voting location with their identification and NRC were

What is a "superpoll"?
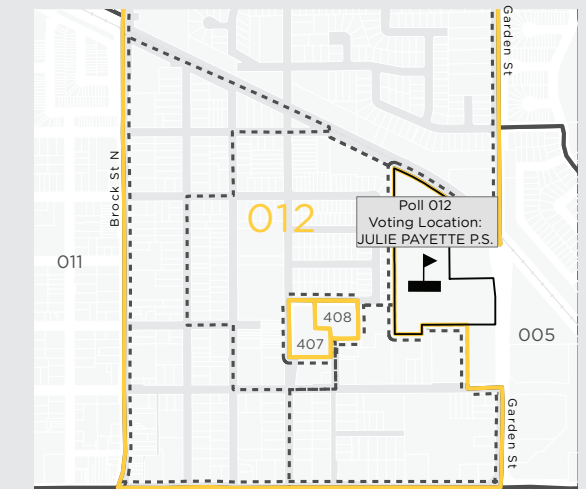
In our current model it is common to find several polling stations inside a single voting location, such as a school gymnasium or community centre. When an elector arrives at the voting location, they must go to their assigned polling station (i.e., the ballot box and the table in the school where their name appears on the list). They may not go to a different polling station. This part of the electoral process can be frustrating for some electors, particularaly when there is a long line up at one polling station and they see other polling stations with no electors being served.

The superpolls were put into voting locations that had three or more polling stations in the 2014 General Election. The superpoll merged all the polling stations that were located in a single voting location into one poll. The voting locations were kept consistent with the 2014 General Election as much as possible with only six locations that required a change. The total number of voting locations in the by-election pilot was consistent with the 2014 General Election.

Because the superpoll is now one poll it has one list of electors and one ballot box. This means that electors no longer needed to go to a specific polling station in the voting location.
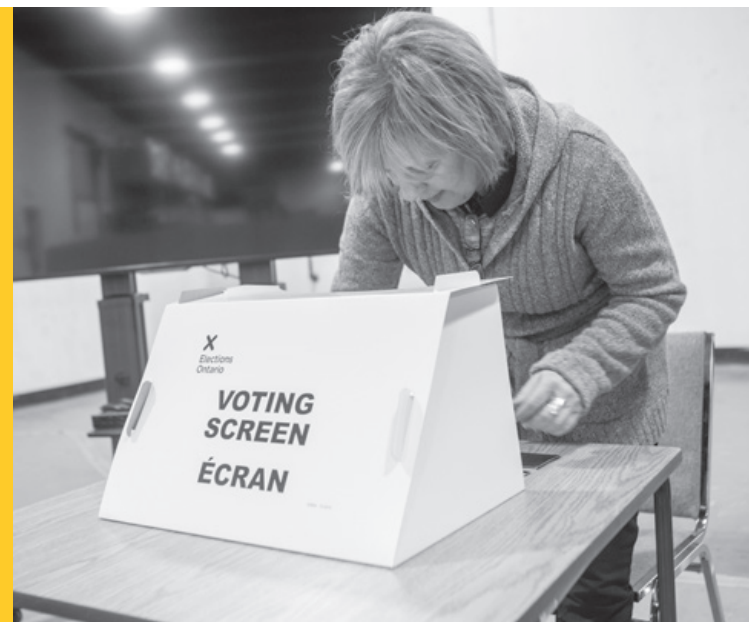
directed to any available DRO. Those missing their identification or NRC -- or who needed registration or revision -- were directed to the Deputy Revision Returning Officers (DRROs).

The new service streams helped to separate electors who did not need any revision assistance from those that had to complete forms. It also ensured that electors who needed revisions were issued their ballot by staff that were already conducting the revisions instead of having to wait in a second line to be issued a ballot. Overall, we expected that this change would result in faster service for electors.

Where we piloted

The pilot was conducted in 42 voting locations that had three or more polls assigned in the 2014 General Election. It is in multi-poll locations that the new model effects the most changes. The remaining 22 single and double poll locations used the current model as did advance polls.

Elections Ontario also put a research program in place that took measurements of the new process and to surveyed electors, poll officials and other stakeholders to conduct a full analysis of the pilot.

Vote Tabulators

Vote Tabulators have been in use widely in other jurisdictions since the 1990s. Elections Ontario has been using Vote Tabulators in its returning offices and satellite offices for General Elections since 2011. Vote Tabulators use proven, reliable election technology to count ballots faster and with more accuracy than manual counts[3].

e-Poll Books

Electronic poll books have been used in several jurisdictions for the past decade. They replace paper-based lists. Instead of manually flipping through a paper list containing a few hundred names, the poll official can scan an elector's NRC and the e-Poll Book returns the voter's record in a fraction of a second. This process is very similar to how a cashier scans a bar code and the correct record is populated into the register.

Strike-Off Portal

The addition of e-Poll Books allowed strike-off data to be transmitted directly from superpolls to a central server. As a secondary consideration for the pilot project, Elections Ontario created an online portal through which eligible political parties could access strike-off data. The goal of this portal was to allow the parties to collect strike-off data for all super polls once an hour.

What is "Strike-Off" data?

When an elector arrives to vote, a poll official checks their ID and finds their name on the list of electors. Their name is then crossed off the list of electors when they receive their ballot. This indicates that the elector has been issued a ballot. This information is used by polling officials to ensure that a person is not given more than one ballot. Candidate representatives may access poll records to compile their own lists of who has been "struck off" and use this information to manage their own get-out-the-vote strategies.

Assistive Voting Technology

Vote Tabulators can be equipped with assistive voting technology that enables people with disabilities to mark and cast their ballots independently. As part of the pilot program, this technology was made available, for the first time on By-Election Day in superpoll locations. This technology has been available in returning offices and satellite offices for the 10 days prior to Election Day since the 2011 election.

Lessons Learned

The pilot improved elector experience, reduced the number of staff required and, made the Election Day process easier for poll officials.

Overall feedback on technology in the polls

Having determined that the new technology-enabled staffing model successfully reduced staff requirements by 41 per cent overall Elections Ontario needed to ensure that this change also improved service to electors and made the process easier for poll officials.

As part of the evaluation of the pilot program, we placed researchers in 12 of the 42 voting locations to conduct exit surveys with electors after they had completed the voting process.

> Feedback from electors was positive. Of those surveyed 96 per cent said the voting process was easy with the new technology.

Previous public opinion surveys warned that electors may be cautious to adopt technology into the voting process after several high profile data breaches in the private and public sectors. As a result researchers asked electors if they believed that the technology maintained the integrity of the process by ensuring voter secrecy and ensuring votes were counted accurately. Public confidence in the ability to maintain the integrity of the voting process with the addition of technology remained high. Ninety-three per cent of electors surveyed agreed that integrity was maintained. Finally we asked if electors would like to see technology similar to the pilot in future elections and 91 per cent agreed or strongly agreed that they would.

Another marker of public support is that social media monitoring showed congratulations to Elections Ontario for the addition of automated technology in the polls.

Tweet
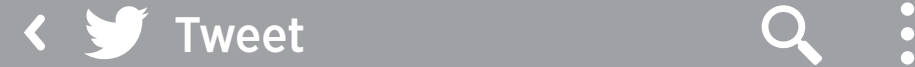
Robert Benzie
@robertbenzie

.@ElectionsON electronic voting pilot project worked well in Whitby-Oshawa. Results came quickly. #onpoli

bobweiers
9:56pm via Twitter Web Client

Impressive Elections Ontario pilot with voting machines - 50% of vote counted inside of 20 minutes of polls closing #onpoli #WhitbyOshawa

1 retweet

blissblogs
9:50pm via Twitter Web Client

Kudos to #ElectionsOntario for their updating website tonight for #Whitby-Oshawa by-election. Decent reality show. #onpoli

2 retweets 2 likes

huangjin2014
8:28pm via Twitter for iPhone

Got my vote in #WhitbyOshawa #byelection ! The new electronic poll book looks do cool @ElectionsON !

JonPukila
9:11pm via Twitter Web Client

Great to see Elections Ontario moving away from the MS-DOS design of the early results page #WhitbyOshawa

freeupgood
8:21pm via LinkedIn

Exciting day & night for Ontario voters - Elections Ontario Testing New Poll Model In Whitby-Oshawa By-election lnkd.it/dFhaXUR

musgravesharon
9:15pm via TweetDeck

PC Candidate Lorne Coe has jumped out to a HUGE lead in #WhitbyOshawa ...and the new Elections Ontario Voting System is working well & fast!

Feedback from electors and polling staff was also strongly supportive of the technology in the polls.

- 96% of electors surveyed in pilot locations said that the voting process was "easy" with the new technology.

- 93% of electors surveyed believed that the technology maintained the integrity of the process: ensuring voter secrecy and that votes were counted accurately.

- 91% of electors would support the use of technology similar to what was in use in this by-election in future elections.

- 89% of polling staff surveyed would support the use of similar technology in future elections.

- 87% of polling staff agreed the technology they used was easy and simple to use.

- 85% of staff believed the technology they used in the by-election maintained the integrity of the process.

Public confidence in the ability to maintain the integrity of the voting process with the addition of technology remained high.

In order to capture feedback from poll officials, all pilot locations were given surveys for poll officials to complete. Feedback again was overwhelmingly positive. Eighty-nine per cent of poll officials said that they would support the use of similar technology in future elections and 87 per cent agreed that the technology was easy and simple to use. Poll officials were also asked to assess if the technology maintained the integrity of the process by ensuring voter secrecy and ensuring votes were counted accurately, 85 per cent agreed that it did. This is particularly significant since there were some challenges with deployment and connectivity.

Overall, electors and poll officials clearly support the introduction of technology into the electoral process to automate some elements of the voting process.

Vote Tabulators

Vote Tabulators performed flawlessly in the by-election as they have since they were first used in 2011. Using the vote tabulators, the results from across the electoral district were reported faster than they have ever been before. The results from the superpolls and the returning office advance poll, were live on the Elections

Time needed for results to come in (hours)

- 0.5
- 1.5
- 2.5

■ 42 pilot locations
■ Advance polls
■ Regular polling stations

Percentage of votes cast

- 5.6%
- 22.7%
- 71.7%

■ 42 pilot locations
■ Advance polls
■ Regular polling stations

> **Vote Tabulators performed flawlessly in the by-election as they have since they were first used.**

Ontario website in under 30 minutes – by approximately 9:30 pm. In comparison, results from the 22 single and double polls took a total of 90 minutes to report in. The six advance polls did not report results until approximately 11:30 pm, two and a half hours after polls closed: and, two-hours after the media had declared the election result.

Media coverage also indicated that the faster results obtained with the expanded use of Vote Tabulators was a success. Combined with the revisions to the Elections Ontario website completed in 2015, the media featured live coverage of Elections Ontario's website results page.

This was also the first election where assistive voting technology was available on Election Day in the pilot locations. This allowed voters with a range of disabilities to vote independently on Election Day consistent with other voters.

e-Poll Books

While the public perception of the e-Poll Books was extremely positive (see above) there were some challenges to implementation. Deployment of some of the e-Poll Books took longer than anticipated, some of the scanners attached to the e-Poll Books did not function, and some of the on-site technical support staff were unable to resolve these issues. As a result 12 superpolls opened using the paper process to serve electors. These polls were quickly transitioned to the electronic process shortly after opening. Elections Ontario's e-Poll Book vendor experienced server difficulties shortly after polls opened which resulted in widespread connectivity issues at several superpoll locations throughout the day. Despite the challenges, overall the e-Poll

Books worked as intended in the voting locations themselves and were able to process electors quickly and efficiently.

New Staffing Model

By implementing the technology-enabled staffing model Elections Ontario ran the Whitby-Oshawa by-election with an approximate 41 per cent reduction in staff overall.

Feedback from poll officials showed that even with the reduction in personnel, superpolls were over-staffed.

This may be in part because turnout for by-elections is lower than for General Elections. For example, Whitby-Oshawa had a turnout of 28.8 per cent as compared to the General Election which had 52.1 per cent. However the pilot research indicated that further staffing reductions could be made even while accounting for the lower turnout.
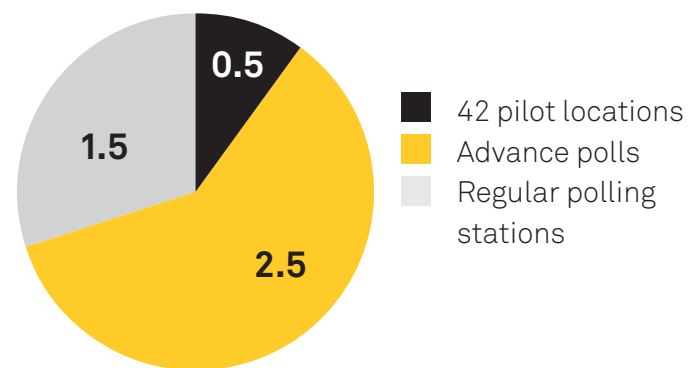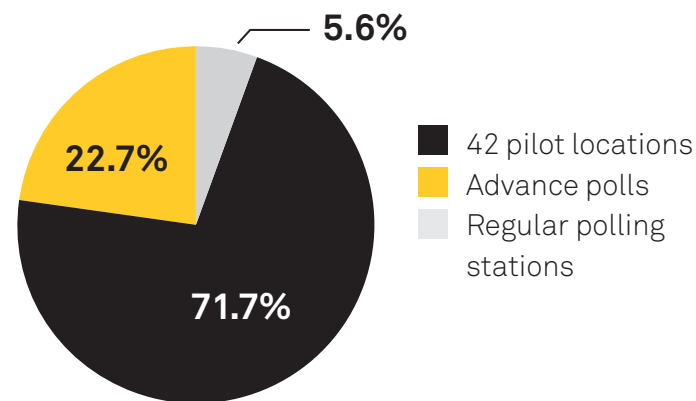
Strike-Off Portal

As a direct result of connectivity problems the strike-off portal failed to meet expectations. Political parties were unable to pull reliable data from the strike-off portal in a timely manner. Connectivity issues also impeded local printing of strike-off data. This in turn lowered the completeness of the on-site strike-off tracking because electors who arrived without their NRC were not easily captured by the manual process.

Considerations moving forward

The pilot program in Whitby-Oshawa met its objectives: to run the election with fewer poll officials, make the work of poll officials easier, maintain elector confidence in the system and, improve elector experience. Despite this success Elections Ontario has identified some areas for improvement for future by-elections and the 2018 General Election.

Deployment

The challenges experienced with the deployment of the e-Poll Books will require us to develop a new strategy for deploying technology -- especially in a General Election. We will look for strategies and best practices for the simultaneous deployment of technology across geographically diverse areas. We will contact vendors that specialize in technology deployment as well as other areas of government for whom rapid technology deployment is part of their core business (e.g. emergency response).

Connectivity

Unfortunately, as a result of our vendor's unexpected server problems, we experienced significant problems with connectivity on Election Day. Prior to Election Day, all sites had been verified for connectivity by the internet service provider and the e-Poll Book technology vendor.

Although local internal networks that synchronized the e-Poll Books continued to function two significant issues emerged:

- a lack of connectivity to the internet, and

- challenges with connectivity to the central server

Several locations experienced small internet outages, while six of 42 locations experienced outages that lasted for most of the day.

Responses to political party surveys indicated that the lack of connectivity had an effect on their get-out-the-vote campaign:

> *The use of the e-Poll Book with no real access to who had voted over the course of the day due to [connectivity] failures denied candidates the ability to identify who had and had not voted over the course of the day, a right they ordinarily have at manually operated locations.*

If a similar service were to be pursued in the future software changes must be made to synchronize e-Poll Books sequentially and not concurrently. We would also require a datacenter with significantly higher bandwidth, more rigorous quality-assurance procedures for configuration and load testing prior to launch should we use such technology during a General Election.

Stakeholder consultations

Elections Ontario consulted extensively about elector and poll official experiences before choosing what technology would be integrated into the process and how. As a result, our pilot was well positioned and planned to meet the needs of electors and poll officials.

We discovered the opportunity to implement the strike-off portal, as an added value customer service for political parties, later on in the consultation process. As a result, political parties' needs and requirements for the Strike-Off Portal were not as well defined. Ultimately the Strike-Off Portal did not meet stakeholder expectations. Further consultations will need to be conducted regarding the viability and design of the Strike-Off Portal.
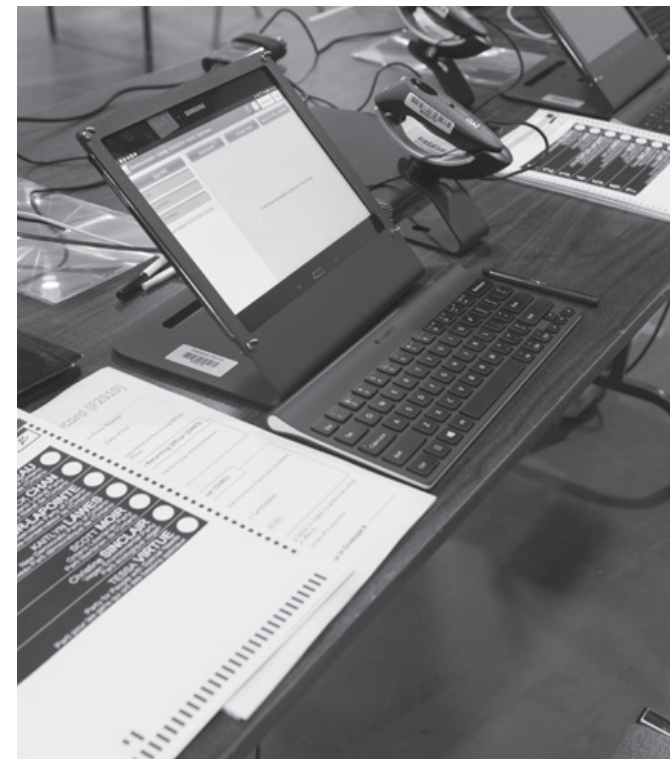
> **The challenges experienced with the deployment of the e-Poll Books will require us to develop a new strategy for deploying technology -- especially in a General Election.**

The Chief Electoral Officer held a debriefing for all parties who ran a candidate in the Whitby-Oshawa by-election. Support for the implementation of Vote Tabulators and e-Poll Books was strong amongst parties who participated in the debrief. The Chief Electoral Officer is also planning to consult with all parties to determine what their strike-off data needs are, in particular to find out if centralized strike-off data is helpful.

Implementation Timing

The work that went into building and deploying the pilot project in one electoral district in an urban setting located close to Elections Ontario head office was significant. If Elections Ontario is to implement this or a similar model for the 2018 General Election, such work must start no later than June 2016.

To be ready to employ the new staffing model with technology for the 2018 General Election, Elections Ontario would need to begin preparations now. Sufficient lead time needs to be provided so that Elections Ontario can:

- Complete consultations with stakeholders to compile requirements for the e-Poll Books, tabulators and assistive voting technology

- Conduct competitive procurement processes for the technology

- Refine processes, policies and procedures to reflect the new staffing model and technology

- Redraw the polling division boundaries and related map products to support the new staffing model

- Test the new staffing model, technology and deployment strategies in a province-wide simulation

- Select and publish all voting locations six months in advance of the 2018 General Election

- Prepare the technology and related materials for the 2018 General Election

To be ready to employ the new staffing model with technology for the 2018 General Election, Elections Ontario would need to begin preparations now.

Implementation Recommendation

The initial purpose of the pilot was to improve services for electors and reduce the required number of polling officials. Public support and support from poll officials is strongly in favour of moving forward with a similar model in the 2018 General Election, as demonstrated in this report.

The business case in the appendix recommends that a technology-enabled staffing model similar to the one piloted in the Whitby-Oshawa by-election should be implemented in all voting locations across Ontario on Election Day and in advance polls. An exception would be made for mobile polls, because the technology piloted does not have mobile capability.

The business case recommends full implementation across Ontario because it provides consistency of process for all electors, simplified training for polling day staff and improved speed, accuracy and integrity of the results.

Legislative Recommendations

The Chief Electoral Officer recommends that the *Election Act* be amended to permit the expanded use of vote tabulators by removing the provisions that limit the use of vote tabulators to advanced polls in returning offices.

The vote tabulators performed flawlessly in the by-election as they have since they were first used in Ontario provincial elections. The expanded use of tabulators meant that results from across the electoral district were reported faster than they have ever been before. The results from all tabulators were published on Elections Ontario's website in less than 30 minutes. This represented 71.7 per cent of the vote. If the advanced polls had also used tabulators the results for over 90 per cent of the vote may have been reported in less than 30 minutes.

Vote Tabulators are a proven, reliable election technology. They are able to count ballots faster and with more accuracy when tested against manual counts[4].

> For electors and poll officials, this pilot was an overwhelming success.

For Elections Ontario to deploy vote tabulators across the entire province for the 2018 General Election work must begin now. It will take approximately two years to ensure the infrastructure is in place to use vote tabulators in all advance poll and election day voting locations for the 2018 General Election.

The Chief Electoral Officer recommends that the *Election Act* be amended to clearly provide the Chief Electoral Officer discretion to introduce technology solutions into the electoral process when it can provide efficiencies, improve accessibility and elector experiences, and protect the integrity of the process.

As we have outlined, our current model is unsustainable in the long term, does not meet public expectations for service delivery and poses risks to the integrity of the process if left as-is.

In the 2016 budget the Ontario government recognized that Ontarians deserve simple and straightforward processes that are intuitive and easy to use and promised the development of a "digital-by-default" strategy for service provision across the province. Given that changes will be made to other areas of government services, we must change the electoral process so that it remains intuitive and easy to use for electors.

For electors and poll officials, this pilot was an overwhelming success. It clearly demonstrated that we are able to introduce technology

solutions into the electoral process in a measured, principled and evidence-based way. It proved that we correctly identified solutions to find efficiencies in the process while making voting easier for the elector and upholding the integrity of the process.

If we are to adopt this process and similar technology across the entire province on a permanent basis work must begin now. It will take approximately two years to ensure the final process is fit-for-purpose across the province and in place for the 2018 General Election.

The Chief Electoral Officer recommends that the *Election Act* be amended to formalize the provision of strike-off data to parties and candidates.

Currently Elections Ontario provides strike-off data to parties and candidates as a customer service. Parties have come to rely on this practice. The *Election Act* permits examination of election documents but offers no clear direction on strike-off data. The practice of providing strike-off data to parties and candidates has served the purpose of finding efficiencies for parties to access the strike-off data in election documents. The practice also helps to create a level playing field because the same data is released to eligible registered parties at the same time.

Formalizing the provision of strike-off data to parties and candidates can improve the integrity of the electoral process and better protect the privacy of elector information.

> **If we are to adopt this process and similar technology across the entire province on a permanent basis work must begin now.**

The Chief Electoral Officer recommends that provincial election legislation be amended to permit the Chief Electoral Officer to provide technology and assistance to other electoral management bodies in Canada.

Investing in technology solutions will mean a capital investment. This investment is necessary. It is more than a systems upgrade. It protects our electoral process from risks that if left unmitigated, may erode public trust in the integrity of our democracy. It plays a role to bring Ontario services up to the standards that the public expects, and it sets the foundation for Elections Ontario to continue to respond to changes in technology that will undoubtedly continue to shape public expectations in elections to come.

At the same time we recognize that it is very important to be prudent and careful with public funds. General Elections typically happen once every four years. The lifecycle of Vote Tabulators is approximately 15-20 years, or about 3-4 election cycles. To maximize the investment of public funds, the Chief Electoral Officer recommends that Elections Ontario be allowed to offer to share technology and expertise with other jurisdictions in Ontario and Canada that indicate an interest.

Allowing municipalities to source Vote Tabulators directly from Elections Ontario could significantly reduce the number of Vote Tabulators municipalities are required to purchase or lease.

Appendix A

BUSINESS CASE

Reduced Staffing

The technology-enabled staffing model allows Elections Ontario to reduce the polling day staff required for a General Election by 41 per cent.

In the current model each poll requires a Deputy returning officer (DRO) and a Poll Clerk (PC). In multi-poll voting locations, other positions are added to assist with the workload; Polling Day Revision Assistants (PDRA) and Supervising Deputy Returning Officers (SDRO).

Each poll is assigned approximately 300 to 500 electors. Part of the reason for this is so that the processing and counting of electors and ballots is manageable by two people in a manual system.

Current staffing model

PC   DRO   SDRO   PDRA

Elector   Polling Official
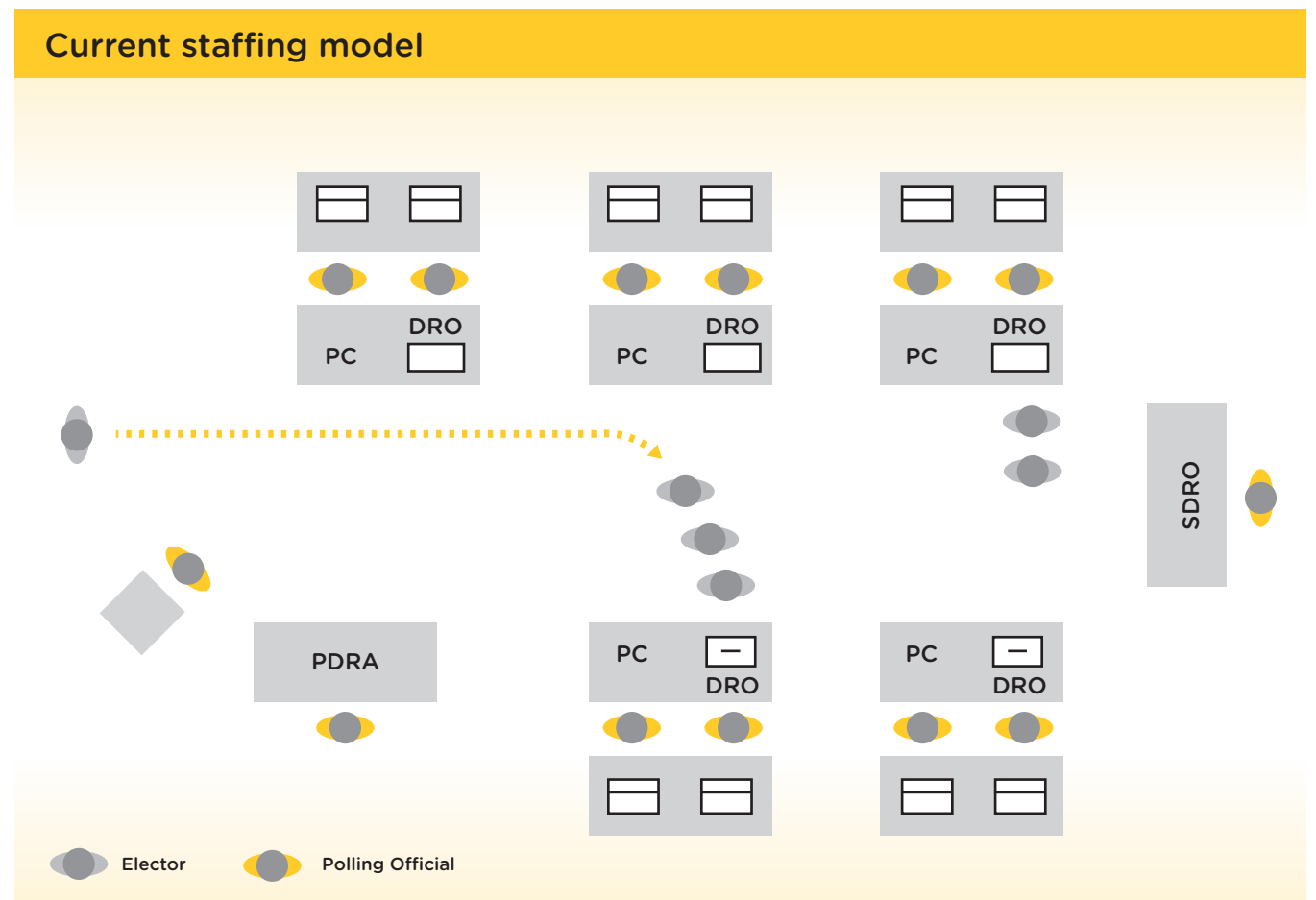
A key challenge in this model, and a point of significant frustration is that when electors arrive at the voting location, they must go to their assigned poll to receive their ballot. This is because the elector is listed on the List of Electors only in their specific poll.

In the "current staffing model" example shown above, the elector who has just arrived at their voting location will need to go to the poll where there is already a long line up. At the same time, the elector sees that there are two desks with four staff that have no electors to serve. This is frustrating to the elector and an inefficient use of scarce human resources.

One of the main goals of the technology-enabled staffing model is to be more efficient with human resources. This means ensuring that one poll is not overwhelmed by electors while other polling staff sit idle. To meet this goal superpolls were created by merging the polls in multi-poll voting locations – which are a strong majority of voting locations. The superpoll means that there is one List of Electors for the entire location. This allows the elector to be served by any available DRO.

Because many DROs would be working with the same list the e-Poll Book was introduced. This ensured that once an elector was recorded as having received a ballot by a DRO the elector's voting status would be updated on all lists in the location. This ensures that electors are not able to vote twice by visiting different DROs.

The introduction of the e-Poll Books combined with barcodes on the Notice of Registration Cards meant that the strike-off function for the process had been automated. This allowed Elections Ontario to eliminate the role of the Poll Clerk.

Another frustration for electors was that if they needed assistance to register or update their information on the list of electors they first needed to visit the PDRA and then they needed to get into a second line up at their polling station to receive a ballot.
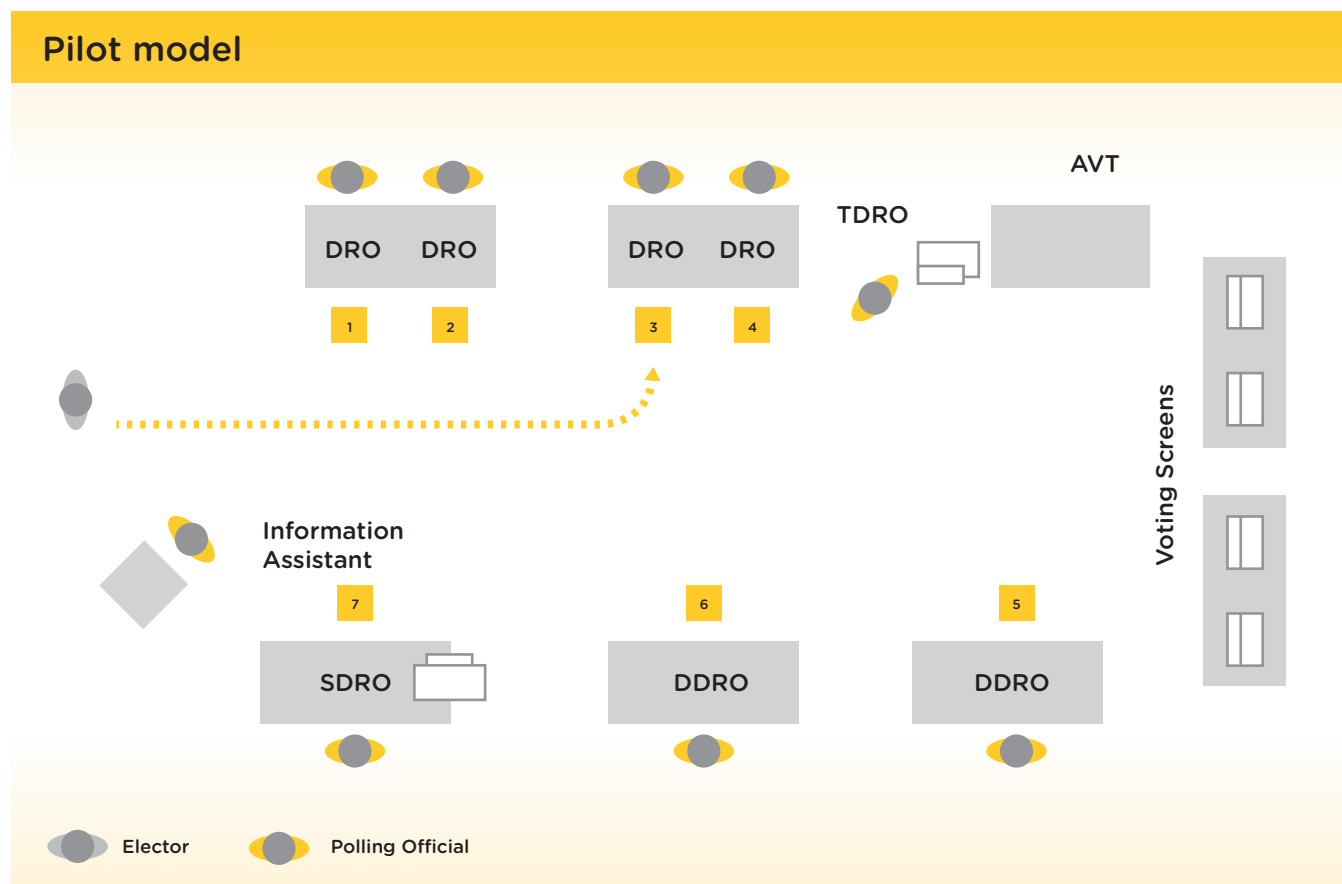
In the technology-enabled staffing model, the role of the PDRA was replaced with the Deputy Revising and Returning Officer(DRRO), who helped each elector who needed assistance to register or update their information and then issued a ballot directly.

Savings from staffing reduction

Internet-connected technology has drastically changed how Ontarians conduct even basic business transactions.

Overall reductions in staff are approximately 41 per cent. Taking a closer look only at the staffing positions that are affected by the new model these positions[5] were reduced by 61 per cent, saving 44 per cent in costs for those positions affected.

In the 2014 General Election there were 50,736 DROs, Poll Clerks, PDRAs and SDROs in multi-poll voting locations that contained three or more

polls. Using the technology-enabled staffing model that number could be reduced to 19,764 in the same locations for the 2018 General Election.

Reducing staff by 30,972 positions would reduce total staffing costs by approximately $5 million. Because the current model is tied to population, staffing costs will rise as Ontario's population grows.

By implementing the technology-enabled staffing model, Elections Ontario saves nearly $16 million in cumulative staffing costs by 2026.

Elections Ontario also realizes modest cost savings in terms of training and materials as a direct result of requiring fewer staff. Combined these savings are approximately $500,000.

Capital investment in technology

Using the technology-enabled staffing model and the 2014 General Election as a footprint we estimate that approximately 6,705 Vote Tabulators would be required for the General Election. This would allow deployment to all voting locations with the exception of mobile polls. The current technology does not allow for mobile set up and take down.

Three of the poll officials require e-Poll Books: DROs, DRROs and SDROs. Elections Ontario estimates this is approximately 21,535 e-Poll Books with accessories that would be required for a General Election.

Pilot model

Overall, we estimate that the initial capital investment in technology is approximately $36 million. Vote Tabulators represent approximately $13 million of that capital investment. The remainder is made up by e-Poll Books and accessories such as scanners, keyboard and printers.

Ongoing maintenance costs

Elections Ontario estimates approximately $2 million per year in ongoing storage, maintenance and service and full time staffing costs.

Ongoing Costs	Estimated cost/year
Storage	**$225,000**
Maintenance and service	**$1,747,500**

Additional savings from inter-jurisdictional cooperation

Many municipalities began using Vote Tabulators in the early 2000's. The municipalities that started using Vote Tabulators at that time will need to purchase new tabulators during the next two election cycles as their tabulators will soon reach the ends of their lives.

Elections Ontario can provide municipalities with the provincial tabulators including assistive voting technology for municipal elections.

Elections Ontario has been in touch with the six municipalities listed below to confirm the number of tabulators they would require in a municipal election. We have also contacted AMTCO to gage the receptiveness of other municipalities.

The City of Toronto published an estimated cost of $15 million for 2,000 tabulators in 2009. This number likely includes the ongoing storage maintenance and service for those tabulators. Other municipalities tend to lease tabulators and savings have been estimated at a reduced cost as compared to Toronto.

Municipality	Estimated number of tabulators	Estimated savings
Toronto	**2,000**	$15,000,000
Ottawa	**500**	$1,875,000
Mississauga	**225**	$843,750
Hamilton	**250**	$937,500
London	**170**	$637,500
Windsor	**160**	$600,000
Other Municipalities	**4,105**	$7,856,250
TOTAL		**$27,750,250**[6]

Net costs for full deployment of vote tabulators and e-Poll Books in Ontario General Elections				
	Start Election Cycle 2018 GE	First Election Cycle 2022 GE	Second Election Cycle 2026 GE	2 Election Cycles TOTALS
Staff Savings	$5,298,928	$5,503,885	$5,760,082	$16,562,896
Total Municipal	$15,637,500	$4,256,250	$6,907,500	$26,801,250
Total Savings	**$20,936,428**	**$9,760,135**	**$12,667,582**	**$43,364,146**
Technology Costs				
Vote Tabulators	$13,410,000	$0	$0	$13,410,000
e-Poll Books	$18,547,455	$2,153,505	$2,153,505	$22,854,455
Technology Costs Subtotal	$31,957,455	$2,153,505	$2,153,505	$36,264,455
Storage	$470,000	$900,000	$900,000	$2,270,000
Maintenance and Service	$3,285,005	$6,360,510	$6,360,510	$15,587,025
Total Costs	**$35,242,450**	**$8,514,015**	**$8,514,015**	**$51,851,480**
Net - Tabulators, e-Poll Books (full deployment)	**−$14,306,002**	**$1,246,120**	**$4,153,567**	**−$8,487,334**

Total projected costs

Elections Ontario projects that full deployment of technology to all voting locations in Ontario will, after two election cycles (3 General Elections), cost Ontario approximately $8 million.

This investment is more than a systems upgrade. It protects our electoral process from risks that if left unmitigated, may erode public trust in the integrity of our democracy. It plays a role to bring Ontario services up to the standards that the public expects, and it sets the foundation for Elections Ontario to continue to respond to changes in technology that will undoubtedly continue to shape public expectations in elections to come.

Implementation Recommendation

Elections Ontario examined several options for implementation. The findings of the pilot exceeded our expectations. Staff reductions were significantly higher than expected. Feedback from electors and polling officials was also outstanding at 91 per cent and 89 per cent respectively. Media stakeholders were impressed with the speed of results and Elections Ontario received no complaints about introducing technology or the revised staffing model. As a result, our evaluation is that this model (or one very similar to it) is sufficiently developed for province-wide implementation in all voting locations across Ontario on Election Day and in advance polls. An exception would be made for mobile polls, because the technology piloted does not have mobile capability.

End Notes

[1] Internet voting project report: results from the 2014 Ontario Municipal Elections

[2] An NRC is a card that informs and elector when and where they may vote. It contains their name, address, poll number, voting location and advance poll locations.

[3] The Voluntary Voting Systems Guideline in the United States requires a vote counting system to produce no more than one error per 125,000 ballots. The Logic and Accuracy Testing conducted on the tabulators used by Elections Ontario passed an ISO accuracy test processing 1,549,703 consecutive ballots. There is no logic and accuracy testing for a manual count.

[4] The Voluntary Voting Systems Guideline in the United States requires a vote counting system to produce no more than one error per 125,000 ballots. The Logic and Accuracy Testing conducted on the tabulators used by Elections Ontario passed an ISO accuracy test processing 1,549,703 consecutive ballots. Manual vote count is not as accurate or consistent.

[5] Affected staffing positions include: DROs, Poll Clerks, PDRAs and SDROs in the current model and DROs, DRROs, TDROs and SDROs in the new model. Information Assistants, Returning Officers, Election Clerks and other returning office staff, advance poll staff and special ballot officers or not affected by the technology-enabled staffing model.

[6] The represents the capital investment in the technology, the total projected costs below include software licensing, maintenance, service and storage.

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