Burlington's Experience

Chart showing Paper ballots (red) and Internet Votes (teal) for 2010 and 2014. Y-axis from 0 to 50000. 2010 bar reaches ~45000 total with small Internet Votes portion (~2500). 2014 bar reaches ~42500 total with larger Internet Votes portion (~8000).
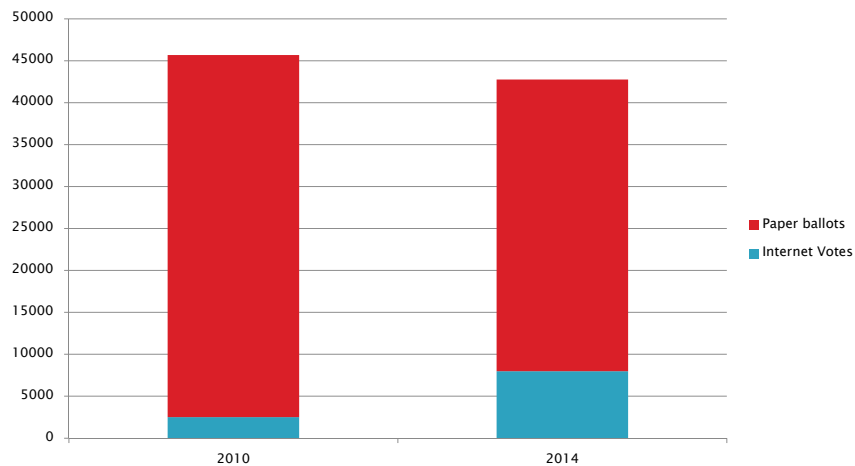
Feedback from voters?

- 85.4% of the public strongly or somewhat agree that they would like to see internet voting in the future (CL-12-15)
- Survey showed that residents were not new to voting, but using due to convenience
- "A drug that is likely to result in serious injury to patients would be rejected, no matter how many people wanted to use it. Internet voting is like a drug we are considering for the country" – Dr. Barbara Simons presentation to the ERRE Oct 2nd 2016

Complete understanding of the issues?

- To my knowledge there has been no public consultation on internet voting in Burlington in which both sides (pro and con) have been presented
- It has only been offered as a positive, and those who wanted to know more had to do their own research

What are the downsides?

- Internet voting enables coercion of voters / vote buying
  ◦ Your ballot may no longer be 'secret'
- Evidence suggests it does little to increase turnout, even among youth
  ◦ Highest demographic for online voting is 45-55 yo
- Computer security experts say it is not secure
  ◦ Need to look no further than the headlines of past month

Turnout

- Halifax's October 2016 Municipal election saw a drop of internet voters by over 10,000 vs 2012
  - The novelty wore off?
- City of Markham – 17.09% of voters cast their ballots online in 2003. In 2006, 17.17%, and 16.07% in 2010
- "Internet voting is unlikely to solve the low turnout crisis" Prof. Nicole Goodman, Director of the Centre for e-Democracy (Oct 2016)

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i-voting Project
@ivotingproject
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Young ontario voters (aged 18-24) more likely to use paper ballots than internet voting
#election #onlinevoting

RETWEETS 2   LIKES 3

4:19 PM - 31 Oct 2015

## Secret Ballot – Relatively new concept!

How does the secret ballot work?

▸ No one gets to go with you behind the screen at the polling booth to make sure you voted 'correctly'
▸ No matter what you tell someone, they have no way to know if you voted the way you said you would
  ◦ Cameras banned in polling station
▸ Makes vote buying and coercion pretty much impossible
▸ Voters in many parts of the world do not enjoy voting free from intimidation

Voting at home changes this

- Voter can be bribed to vote for a particular candidate
  - Briber can confirm voter went through with it, and no one need ever know
- Voter can be coerced / intimidated, possibly even threatened with violence
  - It is unfortunate but abusive domestic relationships / elder abuse exist in our community
  - Spouses/Siblings/Parents/Children don't always agree when it comes to politics

Multiple ballots cast by one voter

- Don't think this has happened in Ontario? Think again…
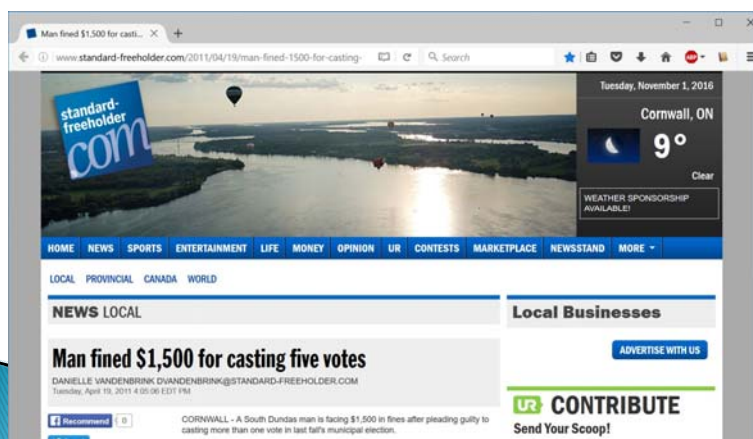
Could it happen here?

Possible excuses someone might give for casting multiple ballots via the internet

- My kids are away at University so I voted for them
- My friend/neighbour/husband/wife wasn't going to vote anyway

Illegal, but chances of getting caught are low as having multiple votes from a single IP address not unusual / unexpected as several members of household may share one internet connection

What about Security?

- We bank online and file our taxes online, why can't we vote online?
  - "Online banking transactions are individually **identifiable and reversible**. When people's banking accounts are hacked – and they are hacked all the time – the charges are reversed by the bank at no cost to the customer. Votes can't be either individually identifiable or reversible."
- We can't even make interbank transactions secure; earlier this year the core interbanking system SWIFT was compromised and millions of dollars were stolen.

Another week, another high profile hack...

- Cyber Attack to blame for EQAO test chaos – Toronto Star, October 24 2016
- US political system under attack by Russian hacking – The Guardian, October 14 2016
- Yahoo says 500 million accounts stolen – CNN, September 23 2016
- Attempted cyber-attack holds up NDP leadership vote – CTV, March 24, 2012
- Foreign hackers attack Canadian government Computer systems at 3 key departments penetrated – CBC, February 16 2011

- In 2010, the District of Columbia's Board of Elections & Ethics conducted a pilot project where they built an Internet voting system for overseas and military voters in effort to expedite the absentee voting process. The system was simple: voters would log in, receive a ballot, print the ballot, cast their vote, and upload their ballot to the Internet. In the weeks prior to the general election, a **public trial** was held to see if the system could be infiltrated.

- J. Alex Halderman, professor of computer science and engineering at the University of Michigan, welcomed the opportunity to try to legally break into government software with his students. Within **36 hours**, they found a tiny error that gave them full control of the system.

- "The flaw that we exploited was just such a small error—in tens of thousands of lines of computer source code, in one specific line the programmer had used double quotation marks instead of single quotation marks and that was enough to let us remotely change all the votes," said Halderman.

- To have a bit of fun, Halderman and his students did not alert officials of the their finding. Instead, they made modifications so that the University of Michigan fight song would play after a vote was cast. It **took officials two days to realize** there had been a hack, which spotlights yet another concerning element of online voting: a system could be hacked and, without a calling card like a university theme song, officials could be none the wiser.

Matter of trust

▸ We can only trust computer programs as much as we can trust those who write them
▸ Even when we trust the programmer, others find exploits and holes in software on a daily basis
▸ How can we completely trust any electronic voting system, from internet voting software to vote tabulating machines?

We can make it secure by testing ahead of time!

▸ There's no way someone could write a software program that would behave differently during testing, right?
▸ Oops…

Phishing attacks continue to get more sophisticated

- "A phishing email sent to Clinton campaign chairman John Podesta may have been so sophisticated that it **fooled the campaign's own IT staffers**, who at one point advised him it was a legitimate warning to change his password." CNN, October 30 2016

Some 'hacks' are simpler than you think…

greatersudburyvotes.com

Welcome to the City of Greater Sudbury - 2014
Municipal and School Board Elections
Bienvenue aux élections municipales et scolaires de
2014 - Ville du Grand Sudbury

After you have logged in, you will have twenty minutes to vote.
Après l'ouverture de votre session, vous aurez 20 minutes pour voter.
If you require assistance, contact the Voter Help Centre at 1-855-378-0099
Si vous avez besoin d'aide, appelez le Centre d'aide au 1-855-378-0099

English   Français

Which one is the actual website?

Spot the difference?

www.GreaterSudburyVotes.ca
≠
www.GreaterSudburyVotes.com

Even if the system is secure, what about the user's device?

- Up to 30 percent of computers in the U.S. are already infected with malicious software, and malware could prevent ballots from being transmitted or replace them with entirely different votes.
- Ransomware encrypts users personal data and asks the user to pay to get it back; imagine if this was used to get them to vote a certain way?

Identity Verification

- Current system relies mainly on the PIN mailed to voter's home mailing address and some personal information (Date of Birth)
- Could be enhanced through the requirement of biometric data (ie fingerprint, retina scan)
- Requires city to create, maintain and **secure** a database of voters biometric info

Where have they studied the issue and stopped or said no to internet voting?

- Mississauga, ON (2016) rejected due to security concerns, lack of turnout effect, cost
- Huntsville, ON (2013) experienced issues with online system in 2010, returned to paper ballot for 2014
- Kitchener, ON – detailed 2012 staff report considered a number of factors and recommended against. Council agreed.
- Alberta – Minister of Municipal Affairs withdrew support for internet voting in 2013
- B.C. – a five-member expert panel chaired by the Province's Chief Electoral Officer opposed online voting in a 2013 report
- Quebec created a moratorium on all electronic voting in 2005 which is still in effect
- Norway announced it would stop using internet voting for national elections in 2014

Third Party Security Analysis of City of Toronto Internet Voting RFP

- "It is our opinion that no proposal provides adequate protection against the risks inherent in internet voting. It is our recommendation, therefore, that the City not proceed with internet voting in the upcoming municipal election." – Jeremy Clark (Concordia University), Aleksander Essex (Western University), February 2014

Third Party Analysis con't...

- The report looked at three internet voting system vendors including the one used by Burlington in 2010 and 2014
- Burlington's system achieved a grade of *Satisfactory* on 13 of 25 categories
- It received a grade of *Needs Improvement* or *Insufficient Detail* in 7 categories
- It received a grade of *Weak* on 5 categories

Opposition crosses party lines

- "When we started, it seemed that online voting could be a solution to a lot of our problems, including accessibility. You've just taken that and thrown it in the trash can for me." Liberal MP John Aldag (Cloverdale – Langley City, BC)
- "I'm now firmly committed to not moving to electronic voting." Conservative MP Scott Reid (Lanark—Frontenac—Kingston, ON)
- "When it comes to our democracy it has to be sacred – the vote must be sacred and experts can't seem to guarantee it yet and they don't feel that's coming anytime soon." NDP MP Nathan Cullen (Skeena–Bulkley Valley, BC)

Best Practices?

▸ "Coming up with the best practices for Internet voting is like coming up with best practices for drunk driving." – Professor Ronald Rivest, MIT

Summary

▸ All of these technical challenges are damning, but the concept fails long before we get to this point because internet voting fails to protect the secret ballot

Options for Burlington?

- Return to paper ballot!

- Study issue further, consult with public; educate citizens on negatives as well as positives

- At minimum, perform independent third party security audit of online voting platforms