Agenda

- Introduction

- Technical Impediments to Remote Participation

- Legal Impediments to Remote Participation

- Next Steps

Wayland Open Town Meeting

- ~10,000 registered voters

- Began on-premises electronic voting in 2011

  ◦ Annual Town Meeting averages 600 voters

  ◦ Town Elections average 2100 voters

- Objectives: speed, accuracy, and privacy

- Security

  ◦ All messages are encrypted

  ◦ Nothing is connected to the Internet

  ◦ Moderator can initiate a real-time audit

- Results

  ◦ Voters make decisions on the merits, without concern for consequences from family, friends, neighbors, co-workers, employees, or employers

  ◦ Town Meeting is more relaxed, deliberate, and methodical; decisions made in this environment are better, to the benefit of every Wayland resident

  ◦ Annual Town Meetings are shortened by an average of 3 hours

Why Enable Remote Participation?

- Some residents can't or won't obtain childcare on school nights
- Some residents must rise early for work the following morning
- Some residents don't drive at night
- Some residents have commitments on weekends

For years, Wayland residents have been asking

"We can shop and bank via the Internet, why can't we participate in Town Meeting via the Internet?"

Remote Participation will increase participation in Town Meeting

Technical Impediments to Remote Participation

- How to make remote participation simple?

- How to detect a widespread Internet outage?

- How to secure votes cast via the Internet?

- How to detect and deter proxy voting (one person casting votes on behalf of another)?

How to Make Remote Participation Simple?

- Each remote participant uses their own smartphone or tablet

  - Desktop computers are not appliances

  - Desktop computers may not have a microphone and video camera

  - Sharing devices would create time pressure when voting

- Remote participation only requires logging in to a web page

  - Downloading and installing an application is not required

  - Same URL for everyone

  - One button for each activity

    - Check In (using Voter Code and Password issued by Town Clerk)

    - Request to Speak

    - Vote

    - Audit

    - Obtain Help

    - Check Out

How to Make Remote Participation Simple?
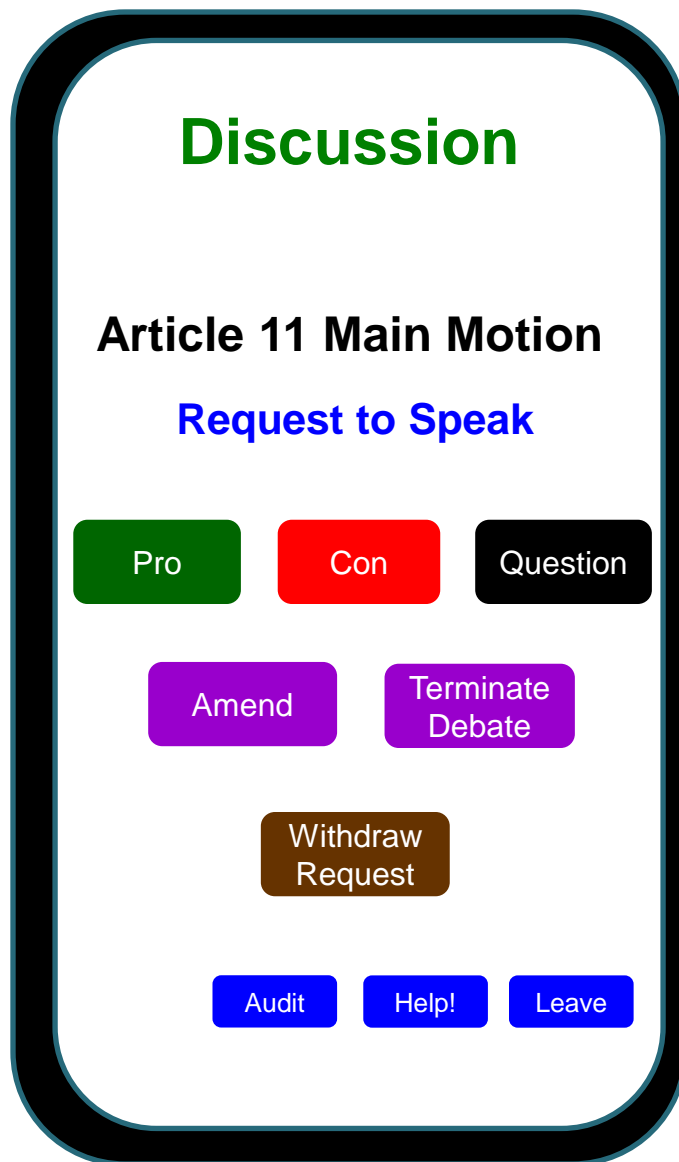
Discussion

Article 11 Main Motion

| Speak | Audit | Help! | Leave |

for illustrative purposes only

How to Make Remote Participation Simple?

Discussion

Article 11 Main Motion

Request to Speak

| Pro | Con | Question |

| Amend | Terminate Debate |

| Withdraw Request |

| Audit | Help! | Leave |

for illustrative purposes only

How to Make Remote Participation Simple?

Discussion

Article 11 Main Motion

Your Request to Amend Awaits Moderator Recognition

Withdraw Request

Audit | Help! | Leave

for illustrative purposes only

How to Make Remote Participation Simple?

VOTE

Article 11 Main Motion

30 seconds remaining

| Yes | No | Abstain |

Your Vote?

| Speak | Audit | Help! | Leave |

for illustrative purposes only

How to Make Remote Participation Simple?

VOTE

Article 11 Main Motion

16 seconds remaining

[Yes] [No] [Abstain]

You Voted Yes

[Speak] [Audit] [Help!] [Leave]

for illustrative purposes only

How to Detect a Widespread Internet Outage?

- Causes of widespread outages

  - Power failure

  - Internet Service Provider failure (e.g. Comcast, Verizon)

  - Denial-of-Service attack by an adversary

- Alternatives

  - Require participation in every vote

Yes	No	Abstain

  - Design the remote participation web page to send an "I'm alive" message to the voting system at frequent intervals

How to Secure Votes Cast via the Internet?

- Encrypt all messages
- After each vote, display each vote received on a public web page by Voter Code, and enable voters to report discrepancies

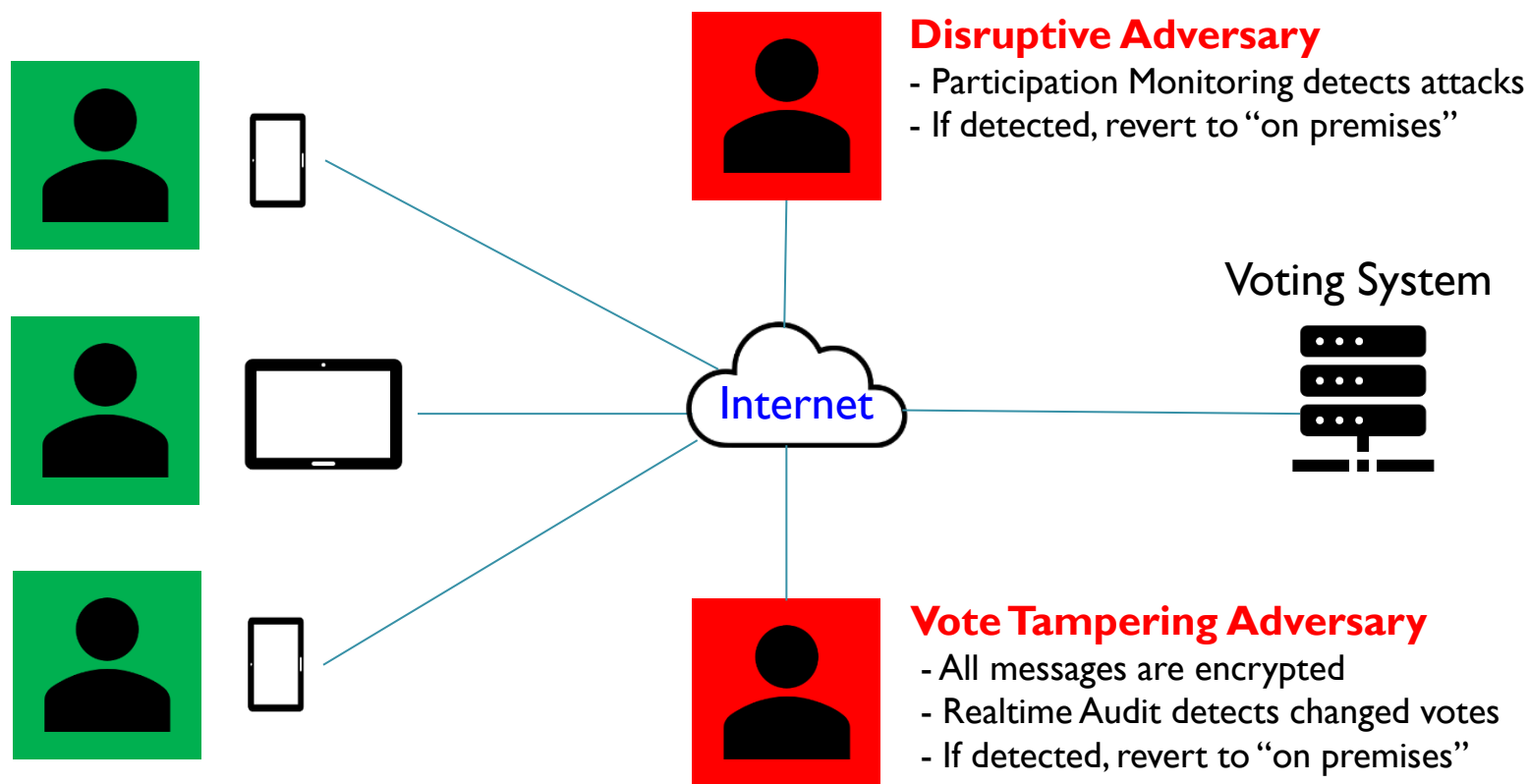| Voter Code	Vote
AYOTLEMUSTORACTA	yes
DFULTYRABACUOUSE	no
EADAVITYPORESTAU	yes
LINATICTITICHORA	yes
NTIUMPREURYARENT	abstain
OCTABROPEFISLUKD	no
REDICEFURYSTRADR	no
STATHOESERNEXTED	no

Report Discrepancy

How to Detect and Deter Proxy Voting?

- Why?
  - Wayland voters were concerned that on-premises Electronic Voting would enable proxy voting from Town Meeting floor
  - Remote participation enables proxy voting on a broader scale, e.g. hundreds of "borrowed" devices used to pass a re-zoning Article

- To deter proxy voting, petition the Massachusetts Legislature to make it illegal

- To detect proxy voting, use each voter's smartphone or tablet to perform 3-dimensional (3D) facial recognition
  - When checking in to a Town Meeting Session
  - Randomly throughout each Session

Why Facial Recognition?

- Suppliers are tested by the National Institute of Standards and Technology (NIST)
  - Accuracy: 99.95%
  - To authenticate, users move their device from an arms-length away to 1 foot away from their face, guided by an on-screen oval
  - The resulting 3D facial model is much less subject to race/gender/age bias than the 2D matching algorithms used for law enforcement

- Alternative authentication techniques fall short
  - GPS is impeded by metal roofs and beams, and can't prevent proxy voting by multiple residents of a home or occupants of an office
  - Manual verification via participant-to-staff video would require too many staff members to verify significant numbers of remote participants

- Failures can be resolved by participant-to-staff video

- Privacy can be protected
  - Biometric data can be maintained on air-gapped storage except during Town Meeting Sessions
  - Biometric data can be expunged after the last Town Meeting Session

Technical Solutions for Remote Participation

Disruptive Adversary
- Participation Monitoring detects attacks
- If detected, revert to "on premises"

Voting System

Internet

Vote Tampering Adversary
- All messages are encrypted
- Realtime Audit detects changed votes
- If detected, revert to "on premises"

Voters
- Friction-free user experience
- Deter Proxy Voting
  - 3-dimensional face recognition detects proxies
  - Legal Consequences discourage attempts

Voter Code	Vote
AYOTLEMUSTORACTA	yes
DFULTYRABACUOUSE	no
EADAVITYPORESTAU	yes
LINATICTITICHORA	yes
NTIUMPREURYARENT	abstain
OCTABROPEFISLUKD	no
REDICEFURYSTRADR	no
STATHOESERNEXTED	no

Legal Impediments to Remote Participation

- Remote participation in Open Town Meeting is not legal

  ◦ Remote participation in Representative Town Meeting has been made legal

  ◦ State Senator Rausch is drafting a Bill to legalize remote participation in Open Town Meeting during the Covid-19 Emergency

  ◦ Via Article 16 of Wayland's 2021 Annual Town Meeting, Wayland's Board of Selectmen seeks authorization to petition the Legislature to permanently legalize remote participation in Open Town Meeting

- Proxy voting in Open Town Meeting is not explicitly illegal

  ◦ Wayland's Board of Selectmen proposes to petition the Legislature make proxy voting a misdemeanor

Next Steps

- Identify towns interested in remote participation

- Identify voting system providers interested in supporting remote participation

  ◦ Option Technologies has reviewed preliminary requirements

- Engage with the Massachusetts Moderators Association

- Engage with the Massachusetts Town Clerks Association

- Engage with Massachusetts Municipal Association

- Petition the Massachusetts Legislature to

  ◦ permanently legalize remote participation in Open Town Meeting

  ◦ make proxy voting a misdemeanor

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