GIS & Elections

State of the States

Neil MacGaffey
Retired Director MassGIS
GIS Office of Massachusetts
State Election Director Report 2022

Themes and Takeaways

1. General
2. Voter Address Management
3. Precinct Boundary and Other Data Management
4. Transitioning to GIS
Themes and Key Takeaways:

General

1. Significant Participation by Election Directors
2. GIS integration into Voter Registration Systems
3. Challenges: Lack of GIS Expertise and Resources
4. Concern Election Office Leadership Turnover
5. Future is Bright
Themes and Key Takeaways: Voter Address Management

1. Voter Address Audits Increasing
2. Geocoding Capabilities and Address Points
3. Transition is Slow
Themes and Key Takeaways:
Precinct Boundary and Other Data Management

1. Greater Collaboration Needed
2. Progress in Geo-Enabling Audits
3. Audit Frequency Lags
Themes and Key Takeaways: Transitioning to GIS

1. Progress Being Made
2. Greater Engagement
Conclusions and Personal Insights

1. Continued Education is Vital

2. Cross-Agency Collaboration is Key

Address point locations and:

- Precinct Boundaries?
- NextGen 9-1-1 Call Center Boundaries?
- Broadband Service Provider Territories?
Questions

Thank You!
GIS in Elections

Stuart Fuller
Elections & Voter Services Manager
Montana Secretary of State, Christi Jacobsen
stuart.fuller@mt.gov

Erin Fashoway
Montana GIS Coordinator
Montana State Library
efashoway@mt.gov
Partnership: SOS, MSL, & Counties

A Seat at the Table

- 2018:
  - National States Geographic Geo-Enabled Election (GEE) Project Began – Montana on Steering Group
  - MLIA Grant Funded Voting Boundary Project
  - SOS Explores New State-wide Voter Registration System
  - MSL & SOS Begin Discussions on Integrating GIS into Elections State-wide System

Exploration & Beginning Implementation

- 2019:
  - Montana State Library Partner’s with the Montana Secretary of State’s Office
  - Montana Land Information Council (MLIAC) Prioritizes Exploring NSGIC GEE Best Practices through Annual Land Information Plan & MLIA Grant Program
  - Montana Participates in 2 Rounds of NSGIC’s Pilot Project for Geo-enabling Elections
Partnership: SOS, MSL, & Counties

Exploration & Beginning Implementation (cont’d)

- **2020:**
  - MSL Awards 2 MLIA Grants to Counties for GEE
  - Election Administrators Data Sharing Partnerships

Commitment to Geo-Enabling Montana Elections

- **2021:**
  - Created Foundational Voting Unit Layers: Precinct & Precinct Split Boundaries
  - Geocoding Voter Addresses (MSDI Geocoding Service)
  - Official Agreement Between Montana State Library (MSL) & Secretary of State
  - MSL Hired GIS Specialist Dedicated to the GEE Project

- **2022**
  - New Opportunities for Outreach – MACR
  - Prepare datasets for Go-Live
Partnership: SOS, MSL, & Counties

The Future

- 2023
  - Implementing Workflows
  - Go Live – New Elections Systems
  - Continued GIS Coordination Support to County GIS Professionals & Election Administrators
  - Redistricting
Statistics

Number of Counties Submitted to SOS
55/56 (98%)

Number of Unique Districts
2452

Total Number of Election District Types
33

Number of Splits Sent to SOS
2459 of 2947 (84%)

County with the most Splits
Flathead - 299

County with the fewest Splits
Treasure/Meagher - 2
Boundary Data Collected to Date
Boundary Data Collection

Precincts & Precinct Splits Gathered Overtime: 2019-2023

Refined process to automate split generation

Started Working with EA/County GIS Professionals

2019/2020  2021  2022  2023
Boundary Data Collection: Redistricting

PREPARED

UNPREPARED
Intended Consequences

- Goal: a single, authoritative address point dataset for NG9-1-1, elections, navigation, package delivery, etc.

- Leveraging a single address point dataset for other uses, including voter addressing, increases the return on investment and helps improve data quality

- Coordination of Address Data at Local Level
  - Election Administrators (EA) will coordinate with their local addressing authority (GIS, 9-1-1, etc.) to ensure new voter addresses are in the GIS data, and correct discrepancies with existing voter addresses
Boundary Data Collection: Redistricting

NEW SPLITS

2023

GEE TEAM
Thank you

Stuart Fuller
Elections & Voter Services Manager
Montana Secretary of State, Christi Jacobsen
stuart.fuller@mt.gov

Erin Fashoway
Montana GIS Coordinator
Montana State Library
efashoway@mt.gov
GIS in Elections

Voter Registration and Tools

Rob Rock
Director of Elections
RI Department of State
rrock@sos.ri.gov

Jess Cigna
Senior Data Analyst
RI Department of State
jcigna@sos.ri.gov
GIS Meets Elections

- **Redistricting and Registration - Voting Precincts**
  - State draws congressional, state senate, state house lines first
  - Cities/Towns draw their local lines next
  - RIDOS Election team brings precinct and districts into Central Voter Registration System (CVRS) as address range text table

- **Commitment to Transparency - Created Public Interactive Tools**

<table>
<thead>
<tr>
<th>Legislative Districts Downloader</th>
<th>Drop Box Locator</th>
<th>Proposed Legislative Boundaries Comparison tool</th>
</tr>
</thead>
</table>

- **Discoveries**
  - Picturing legislative lines leads to improvements
Drop Box Locator

- Interactive tool
- Find closest mail ballot drop box
- Early voting
- English/Spanish
What’s Next

- **Geocoding Voter Addresses**
  - Geolocating by hand to the apartment/unit level using mix of sources
  - Working with CVRS software developer to extract verified, rooftop-level lat/long from Smarty Streets

- **Collaboration across state departments for GIS tools**
  - Statewide Parcel Database
  - Statewide Addressing tool
  - Seat at the RIGIS Table

- **CVRS Transformation from Street Range Table to individual address points for registration verification**
  - Brings together geolocating, verified addresses, and statewide addressing tool
GIS in Elections

Voter Registration and Tools

Rob Rock
Director of Elections
RI Department of State
rrock@sos.ri.gov

Jess Cigna
Senior Data Analyst
RI Department of State
jcigna@sos.ri.gov
GIS & Voter Records

Processes and Lessons Learned

Kori House
Assistant Deputy Secretary for Elections & Commissions
PA Department of State
korhouse@pa.gov

Sindhu Ramachandran
Division Chief, Election Security & Technology
PA Department of State
sramachand@pa.gov

Matthew Ruch
Voting Systems Analyst
PA Department of State
matruch@pa.gov
Overview

- Where we were
  - Customized legacy voter registration system reaching end of life
- Where we are
  - Modernizing the voter registration system with a COTS product
- Where we are going
  - Ready for additional upgrades
- Constraints
Where we were...

- Customized legacy voter registration system reaching end of life
  - Voters assigned to a precinct split based on block ranges
  - No address standardization
  - Custom non-GIS tool for polling place and district look-ups
Where we are...

- Modernizing the voter registration system with a COTS product
  - Introducing address standardization
  - Majority of addresses geocoded to “rooftop” accuracy
  - GIS tools for assigning voters to precincts
  - GIS solution for managing address points and layers
    - Designed for non-GIS users
SUREAddress

- SUREAddress - GIS/Address module of the SUREVote system

  - User Interface to manage address points and layers
  - Allows election officials to import addresses with coordinate data (lat/long)
  - Allows election officials to review address points and move points if required
  - Allows importing layer data
SUREAddress
SUREAddress

Address and Parcel Details

- Save
  - Save the address details
- New Alias
  - Add alias to this address
- Cancel
  - Discard changes to this address

Update
- Update from Plus Code

Enter Plus Code

Rapid Review Address Details

Edit Address: 39 3RD ST YORK 14002

- Type: RESIDENTIAL
- Notes: Added with import on Dec 4 2022 10:48PM

- Street Number: 39
- Street Prefix: 
- Street Name: 3RD
- Street Type: ST
- Street Suffix: 
- City: YORK
- Zip Code: 14002
- Zip+4 Code: Zip+4 Code

- Non Standard:
- Multi-Unit Structure:

- State: PA
- County: YORK
- Province: PA
- Let: 39.962793
- Lon: -76.537692
- Registrant Count: unavailable

Cannot retire address with registrants

Retire
SUREVote

- GIS and SUREVote Integration Steps
  - Developing governance, with county input, to formalize GIS processes for maintaining these datasets going forward to keep SUREVote current
  - Gather required layers from county GIS and other sources
  - Ensuring the layers meet requirements and are accurate
  - Maintaining historical layers
  - Geocode addresses to attach coordinates (lat/long)
  - Update frequency
## Current and future voter precinct assignment process

<table>
<thead>
<tr>
<th>Legacy</th>
<th>SureVote</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Precinct boundaries get converted to block ranges</td>
<td>• Statewide precinct split map layer created</td>
</tr>
<tr>
<td>• Block range information typed into SURE</td>
<td>• Precinct split Map Layer imported into Total Address</td>
</tr>
<tr>
<td>• Address looked up in the block range information</td>
<td>• Review finalize and adopt the precinct split layer.</td>
</tr>
<tr>
<td>• Voter assigned a precinct split based on the block range</td>
<td>• Voter Address location is geocoded</td>
</tr>
<tr>
<td></td>
<td>• Precinct split assigned based on the location of the address in the layer</td>
</tr>
<tr>
<td></td>
<td>• County Officials review and finalize the assignment</td>
</tr>
</tbody>
</table>
Where we are going…

- Ready for more upgrades
  - Completely automated GIS tool for assigning and verifying voter precinct assignments
  - Majority of addresses are standardized and have “rooftop” accuracy
  - Map centric dashboards and search tools for the public and internal staff
    - Where do I vote?
    - Who is on my ticket?
    - What are my legislative districts?
  - Using GIS for redistricting
67 varieties of data management
- Mix of GIS knowledge and staffing
- Legacy data maintained differently by different counties

**CONSTRAINT**
The Pennsylvania Department of State (DOS) monitors election activities for all 67 counties.
- Not all data available in GIS format
- Non standardized addresses created bottlenecks for geocoding
- Validation

**CONSTRAINT**

Aggregating data from multiple sources.
- COTS product
  - Data elements and format requirements
  - Configuring for PA specific needs
  - Change orders

- Timing
  - Redistricting
  - Election events
  - Other projects in the State related to addresses (PEMA NG911)

**CONSTRAINT**

Project management with election priorities and limited staff.
GIS & Voter Records

Processes and Lessons Learned

Kori House
Assistant Deputy Secretary for Elections & Commissions
PA Department of State
korhouse@pa.gov

Sindhu Ramachandran
Division Chief, Election Security & Technology
PA Department of State
sramachand@pa.gov

Matthew Ruch
Voting Systems Analyst
PA Department of State
matruch@pa.gov
GIS in Vermont Elections

Will Senning
Director of Elections
Vermont Secretary of State’s Office
will.senning@vermont.gov
2021 Pilot Project

- The Vermont Elections Division and the Vermont Center for Geographic Information (VCGI) were participants in the 2021 Geo-Enabled Elections Pilot Program.
  - VCGI is Vermont’s active, state-level GIS coordinating group, VCGI has a high-quality point-based addressing system as part of the E911 program.
  - The Vermont Elections Division is responsible for the administration of statewide elections in VT, including management of the statewide voter checklist.

- Our participation in the pilot program was highly successful, achieving the following important successes:
  - Building a working relationship between VCGI and the Elections Division that did not exist before. Members of the core team met throughout the process - giving VCGI insight into the current election and voter registration processes and helping the Elections Division understand ways to leverage geospatial data and technology to improve processes and the accuracy of data.
§ Geocode and Validate addresses for the Statewide voter registration checklist - *We achieved over 90% location matching with a first pass of the data without any cleaning or modifications. We classified the unmatched addresses into different categories and found that an additional 6% could be matched by addressing some basic formatting issues and accounting for some idiosyncratic practices by certain municipalities. The unmatched addresses were provided to the clerks and grouped by type of issue to assist with the verification process. Any verified or unverified geocoded address that raised questions regarding whether or not they were in the appropriate district was flagged as a high priority.*

§ Identify voting districts and document process – *A review of voting district and ward assignments was completed. The existing process of creating sub-municipal districts, which only exist in a handful of municipalities, currently lacks standards and a formalized process. The group identified this as an issue that could be addressed to help avoid the potential for future boundary related election issues.*

§ Better position Vermont for redistricting – *Town and City clerks were able to improve the accuracy of their voter checklists with the lists of unmatched addresses, facilitating accurate redistricting of those voters with the adoption of new district lines. VCGI will continue to perform a semi-annual audit of new addresses.*
Continuing Work in 2022

- Biggest Accomplishment from Pilot Project was establishing the working relationship with VCGI, which proved critical in 2022.- As John Adams from VCGI noted in our project summary: “We should have done this sooner. GIS data & technology are extremely well suited to help ensure our elections are accurate and efficient. It did not take very much work to geocode the vast majority of addresses in the voter checklist and confirm their validity and that they are located in the appropriate district. In a day and age when emotions around election security are notably high, its certainly helpful to have additional checks in place to affirm the integrity of our democracy.”

- This proved extremely valuable when the new district lines for the state legislature were adopted in April of 2021–

  - Our current election management system (EMS) uses a street listing / street address approach for assigning voters to districts.
  - This requires the clerks to review new district lines and update their street listings accordingly.
  - When these lines bi-sect a town or city, knowing exactly where the line falls is critical.
  - The maps produced by the legislature did not contain the necessary level of detail.
Continuing Work in 2022 - Redistricting

- The Elections Division was able to turn to VCGI to create the detailed maps required to enable the clerks to do what they needed to do:
  
  - Recognizing that maps defining the new districts in sufficient detail for the clerks to update their street listings did not exist – I placed a call to John at VCGI and explained what we needed.

  - In a matter of days, VCGI produced a set of three different web-based interactive maps displaying the new Senate and House Districts for the VT Legislature. The maps had search features by address, district, etc. and were interactive, user-friendly, and had the level of precision to appropriately update the street listings.

  - Links to these maps were immediately forwarded to town and city clerks across VT and when they were received the relief was palpable. Where the work had stalled for many clerks, it was quickly re-started and completed with far greater ease, accuracy, and speed than would have been possible without the maps produced by VCGI.

  - The value of the working relationship between the Elections Division and VCGI in facilitating the creation of these maps for use by the clerks can’t be overstated.
Continuing Work in 2022 - Other

- Geocoding audit of voter registration file in relation to the new districts.
  - We intend to engage in this soon as we put the 2022 General Election behind us.
- Published updated voting districts, local districts, and voting tabulation areas.
  - Ensures that results being reported have a corresponding geography.
- VCGI & Elections will work together as boundaries are refined to identify impacted addresses.
  - Many districts in Vermont are based on town boundaries, which can be poorly defined and have not been surveyed. As the accuracy of those boundaries are incrementally improved, we will work together to make sure voting district boundaries are managed accordingly.
- Election management system RFP – Geo-coding voter checklist.
  - Opportunity to move towards a geo-enabled system – VT is working on an RFP for a new EMS now, for posting in early 2023, and having a geocoded voter checklist would be the preferred outcome of this procurement process to put VT on the forefront of this effort.
Thank You!

Will Senning
Director of Elections
802 – 828 – 0175
Will.senning@vermont.gov
Questions

Thank You!
Geo-Enabled Elections and Redistricting Work Group

Promoting effective coordination and the use of geospatial data and technologies in the election process
GeoEnabled Elections and Redistricting Work Group

Steering Group Co-Chairs

John Adams
Vermont Center for Geographic Information
john.e.adams@vermont.gov

Greg Bunce
Utah Geospatial Resource Center
gbunce@utah.gov

Tim Johnson
North Carolina Center for Geographic Information and Analysis
tim.johnson@nc.gov

Alison Slaats
Minnesota Geospatial Information Office
alison.slaats@state.mn.us

NSGIC Liaison

Lindsey Peña
NSGIC
lindsey.pena@nsgic.org
Mission

Promote effective coordination and the use of geospatial data and technologies in the election process.

Why are we pursuing this?
Purpose of Work Group

- Identify challenges and opportunities and make recommendations for better integration of geospatial data into the election process
- Advocate for state election programs
- Interact and coordinate with state and local partners for integrating geospatial data
- Host the Elections GeoSummit as an annual or biannual event

What are some of our objectives?
The Work Group Membership Roster

The work group is open to all
   You do **not** need to be a NSGIC member
Strive to represent diverse segments of the election process
Invite anyone interested in elections and GIS to engage
The work group will have a NSGIC staff member as staff liaison

Question: Who can join the Work Group?
Answer: You!
The Work Group Meeting Schedule

Virtual (using Zoom)
Fourth Wednesday of the month at 10:00 am MT (Noon ET)

   Even months: full work group
   Odd months: steering committee

NSGIC mid-year and annual conference

Meeting minutes and recordings for presentations will be available on the NSGIC website

When and where do we meet?
Bimonthly* meetings (60-90 minutes)

Time in between meetings used to review, refine, and validate work products as necessary.

*Bimonthly is a terrible word. It can mean twice a month or every two months. In this case, we mean once every two months.
Steering Committee Goals

Establish the **new** Geo-Enabled Elections and Redistricting Working Group within NSGIC.

Develop the Geo-Enabled Elections Theme questions for the 2023 NSGIC Geospatial Maturity Assessment.

Keep [elections.nsgic.org](http://elections.nsgic.org) up to date

Latest news and information – including a summary and the recordings of this event
What is the Geospatial Maturity Assessment (GMA)?

<table>
<thead>
<tr>
<th>STATE</th>
<th>OVERALL GRADE</th>
<th>STATE</th>
<th>OVERALL GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>B</td>
<td>Montana</td>
<td>B</td>
</tr>
<tr>
<td>Alaska</td>
<td>B-</td>
<td>Nebraska</td>
<td>B</td>
</tr>
<tr>
<td>Arizona</td>
<td>B-</td>
<td>Nevada</td>
<td>C</td>
</tr>
<tr>
<td>Arkansas</td>
<td>B+</td>
<td>New Jersey</td>
<td>B+</td>
</tr>
<tr>
<td>California</td>
<td>B-</td>
<td>New Mexico</td>
<td>B</td>
</tr>
<tr>
<td>Connecticut</td>
<td>B</td>
<td>New York</td>
<td>A-</td>
</tr>
<tr>
<td>Delaware</td>
<td>B</td>
<td>North Carolina</td>
<td>A-</td>
</tr>
<tr>
<td>District of Columbia</td>
<td>A-</td>
<td>North Dakota</td>
<td>B</td>
</tr>
<tr>
<td>Florida</td>
<td>B+</td>
<td>Ohio</td>
<td>B</td>
</tr>
<tr>
<td>Georgia</td>
<td>D+</td>
<td>Oklahoma</td>
<td>B</td>
</tr>
<tr>
<td>Idaho</td>
<td>B-</td>
<td>Oregon</td>
<td>A-</td>
</tr>
<tr>
<td>Illinois</td>
<td>C</td>
<td>Pennsylvania</td>
<td>B+</td>
</tr>
<tr>
<td>Indiana</td>
<td>A</td>
<td>Rhode Island</td>
<td>B</td>
</tr>
<tr>
<td>Iowa</td>
<td>B+</td>
<td>South Carolina</td>
<td>B</td>
</tr>
<tr>
<td>Kansas</td>
<td>A-</td>
<td>South Dakota</td>
<td>B</td>
</tr>
<tr>
<td>Kentucky</td>
<td>B+</td>
<td>Tennessee</td>
<td>A-</td>
</tr>
<tr>
<td>Louisiana</td>
<td>C+</td>
<td>Texas</td>
<td>B+</td>
</tr>
<tr>
<td>Maine</td>
<td>B</td>
<td>Utah</td>
<td>B</td>
</tr>
<tr>
<td>Maryland</td>
<td>B+</td>
<td>Vermont</td>
<td>B+</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>A-</td>
<td>Virginia</td>
<td>B-</td>
</tr>
<tr>
<td>Michigan</td>
<td>B+</td>
<td>Washington</td>
<td>B+</td>
</tr>
<tr>
<td>Minnesota</td>
<td>A-</td>
<td>West Virginia</td>
<td>B</td>
</tr>
<tr>
<td>Mississippi</td>
<td>B</td>
<td>Wisconsin</td>
<td>B-</td>
</tr>
<tr>
<td>Missouri</td>
<td>C+</td>
<td>Wyoming</td>
<td>C+</td>
</tr>
</tbody>
</table>
2023 Working Group Goals

- Engage Geo-Enabled Elections and Redistricting Community on My.NSGIC.ORG

- Engage State Election Director community
  - Bimonthly meetings: Create a “Voices from the States” rolling thirty-minute presentation opportunity for the community to connect, share, and learn
  - Annual/Biennial Elections GeoSummit
  - Geospatial Maturity Assessment results – outreach to get communities to understand value and opportunity of geo-enabling elections
GeoEnabled Elections and Redistricting Work Group

Steering Group Co-Chairs

John Adams
Vermont Center for Geographic Information
john.e.adams@vermont.gov

Greg Bunce
Utah Geospatial Resource Center
gbunce@utah.gov

Tim Johnson
North Carolina Center for Geographic Information and Analysis
tim.johnson@nc.gov

Alison Slaats
Minnesota Geospatial Information Office
alison.slaats@state.mn.us

NSGIC Liaison

Lindsey Peña
NSGIC
lindsey.pena@nsgic.org
Questions

Thank You!