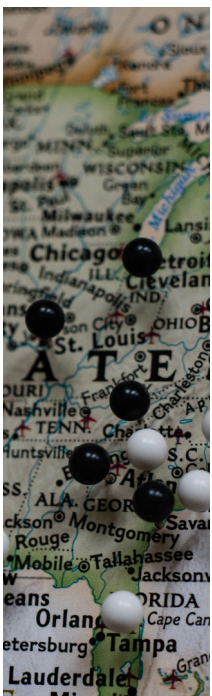




GIS in Elections



RAISING ELECTION **Accuracy** and **Efficiency** with GIS



BEST PRACTICES IN BRIEF



WHY GIS in ELECTIONS?

Does America's electoral system know where each voter resides? By and large, yes. But not nearly well enough to correctly place every voter in the right voting district and avoid election errors.

When voters are given the wrong ballot, results are contested. Controversy, legal battles, and even costly do-overs, follow.

With a presidential election on the horizon, and a redistricting process following shortly on its heels, there has never been a more important time to be able to correctly place voters in the right voting district.

NSGIC'S GEO-ENABLED ELECTIONS PROJECT

Using GIS in elections increases election accuracy and efficiency.

Many states already use GIS for other matters, including emergency response systems, infrastructure management, and zoning. Often, they have geographic information officers (GIOs) on staff. However, few states across our nation have fully geo-enabled their elections.

NSGIC partnered with states and subject matter experts to develop five best practices for implementing GIS in elections, a summary of which is presented here.

Using geographic information systems (GIS) to "pin" the location of each voter residence on a map makes sense in the same way that we use our smartphones to navigate to an unfamiliar location: it enhances accuracy and creates efficiencies. The risk of election errors is reduced, data becomes easier to quality control, and voters can more easily verify that they have been included in the right district or districts.

When we integrate GIS in elections, we strengthen our electoral system by increasing its accuracy and reliability. Ultimately, we increase voters' confidence that their voices are being heard.



NSGIC (pronounced NISS-gyck), or the National States Geographic Information Council, is a state-led organization for developing, exchanging, and endorsing geospatial technology and policy best practices. Its Geo-Enabled Elections project focuses specifically on the use of geospatial information in elections.

BEST PRACTICES

for IMPLEMENTING GIS IN ELECTIONS



For all the rewards from making the transition, implementing GIS into elections management requires a sound plan, effort, and resolve.

Technically, realizing the inherent visualization and analytical advantages of GIS involves replacing non-spatial 'address file' systems with election precinct and voter location data in a GIS format. In practice, this will require some additional investment and technology.

It will require a lasting commitment from election leaders and staff training.

And, it may require collaboration across agencies, changes to policy, and possibly supporting statutory changes.

Following is a set of best practices to guide a GIS transformation, drawn from the insights, experiences, and counsel from ten states who participated in NSGIC's Geo-Enabled Elections project 2017-2019.

“Leveraging GIS in our electoral system increases accuracy and efficiency in elections. It ensures every voter has a chance to vote in the right electoral contests. It also makes election management systems easier to update as our physical environment changes through new development, or after the redrawing of boundaries, as occurs through redistricting.”

Molly Schar, NSGIC Executive Director

LEARN MORE

Find additional information and more detailed guidance here: elections.nsgic.org

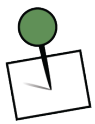
RIGHT BALLOT TO RIGHT VOTER

Five Best Practices



CONVENE A TEAM OF SPECIALISTS

1 Geo-enabling elections requires collaboration at a high level between leaders in elections, information technology and database administration, and geospatial information technology. Working together under the leadership of an engaged project champion, officials and key staff should address critical elements of geo-enabling the elections process: project goals, requirements, timelines, budget, and governance. Including the GIS coordinator or coordination office responsible for coordinating GIS resources and implementation from the outset is highly recommended.



Supreme Court Justice Louis Brandeis once described states as “laboratories of democracy.” This is true in elections management as no two states are organized identically to support our democratic processes. And, accordingly, states should learn from one another’s experiences as they work to assemble their geo-enabled elections implementation team and plans.

FIND MORE INFO

Detailed guidance, including policy and technical considerations, in appendix, “Best Practices for Geo-Enabling Elections: Detailed Guidance” at elections.nsgic.org/action



COLLECT & SUSTAIN A STATEWIDE VOTING UNIT GIS LAYER

2 To geo-enable elections, a GIS layer depicting voting unit boundaries is needed, and this must include both precinct tabulation areas, as well as the minor ballot area boundary divisions (also known as ‘splits’ and ‘subs’). A sustainable approach for updating this data, congruent with all elections-related deadlines and events, is essential.

A simple data content specifications document should be developed and adopted in coordination with election offices, including spatial data validation rules and processes to ensure data integrity.

It is recommended that development of an application programming interface (API) should be considered for both single and bulk point-in-polygon GIS query capabilities. This will enable automated determination and validation of voter assignments to voting units.

Finally, for transparency, an interactive web map should be created for stakeholder and public viewing of the most current voting unit data.



The major inputs needed to create GIS precinct and smaller voting unit boundary maps — redistricting results, census blocks, and local boundaries — are now born as digital data. So it is only natural that election management systems evolve to build upon this existing digital data foundation. Moving from legacy address list data tables and metes and bounds descriptions for official records and information systems promises significant advancements in data quality, visualization, analysis, and communication with the public. Simply put, there is a better, more efficient way.



IMPLEMENT A STATEWIDE GEOCODING STRATEGY

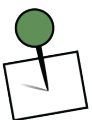
3 An overall geocoding strategy is needed to specify a consistent, cost-effective method for assigning geographic coordinates to each residential address using state, local, and/or commercial GIS reference data.

Whether using public sector or commercial geocoding datasets, or a combination thereof, the approach to geocoding can be coordinated with other state-level entities to maximize the chance of potential partnerships that can greatly reduce costs and improve data quality.

The elections-specific portion of the geocoding strategy should also include a method for manually placing or assigning geographic coordinates for geocoding correction or omission.

Where possible, automated processes for geocoding should be put in place using multiple geospatial data sources (e.g., street-range GIS data, address point GIS data, public and commercial geocoding APIs, etc.) to ensure the best possible validation of an address.

A complete lineage, or, at a minimum, basic record-level metadata should be kept for address locations, describing how, when, and by whom geographic coordinates for each voter residence have been updated.



People use geocoding every day and may not even know what it is. Geocoding is the process of taking a physical address with a number, street, state, and zip code and transforming it into an accurate point on a map, and it is critical to modernizing elections systems.



ASSEMBLE BEST AVAILABLE CONTEXTUAL GIS LAYERS

4 In order to geo-enable elections, relevant, accurate, verified, and accessible data are needed. While precincts, districts, and voter address points are required to ensure proper precincting and districting of voters, the importance of contextual GIS layers is also paramount.

The recommended contextual GIS layers that should be accessible within a geo-enabling elections system include: boundaries for cities, towns, school districts, and service districts but also reference materials such as aerial photography, base maps, zip codes, and even tax parcels. Identifying the data content expectations and an expected refresh schedule for each of the needed contextual layers is important.



Most states have a geographic information officer (GIO) who works to create connections, define common needs, and support adoption, innovation, and efficiency in the use of geographic information systems across state government. GIOs have expert knowledge of the GIS data assets and existing and planned applications within a state. Mapping requires context just like many things in life. Learn more about the role of supporting contextual GIS layers — like aerial photography, address points, road centerlines, and parcels — in Best Practices for Geo-Enabling Elections: Detailed Guidance, and contact your GIO or lead GIS professional to learn more about the data available in your state.



DEFINE & IMPLEMENT DATA VALIDATION PROCESSES

5 An analysis of the information provided in interviews of state elections directors highlights the need for additional work to create spatial auditing processes for precinct assignments. This will continue to be a need in a geo-enabled elections system and the spatial audit focus should include the voting unit GIS data, geocoding resources, and results.

Validating the elections data using geanalytics (e.g. does the candidate or voter fall within the correct district) and cross-checking geocoding results against multiple sources will provide greater confidence in the elections system to administrators and the public. Validation processes should include: operational data quality controls; periodic full review and reporting; change logging, metadata documentation; and periodic archiving.



Some states have begun geo-enabling their elections by using the analytical capabilities of GIS to perform systematic audits of their voter registration databases, ensuring that the right ballot gets to the right voter. See the North Carolina case study for more details. While this is a great use of the technology, the power of GIS can be used in so many more ways.

FIND MORE INFO

Detailed guidance, including policy and technical considerations, in appendix, “Best Practices for Geo-Enabling Elections: Detailed Guidance” at elections.nsgic.org/action

TAKE ACTION

Ready to get started on implementing GIS in elections?

Find more detailed guidance, resources, and insights on our website.

elections.nsgic.org/action

- **Best Practices for Geo-Enabling Elections: Detailed Guidance**
Including policy & technical considerations
- **Learnings from Pilot Studies**
KY, MN, NE, PA, WV
- **Learnings from Case Studies**
HI, NC, UT, WA, WI
- **The state of GIS implementation in elections across the nation**
- **Five questions to get the conversation started between GIOs and election directors**

During 2019-2021, NSGIC will complete the Geo-Enabled Elections project, phase two, to coincide with the nationwide redistricting that follows the 2020 Census.

Learn more on the website, and sign up to stay up-to-date on findings.



GEO-ENABLED ELECTIONS 2019-2021

NSGIC will complete the Geo-Enabled Elections project, phase two, to coincide with the nationwide redistricting expected to follow the 2020 Census.

GIS technology is particularly helpful for reducing the risk of errors when voters are re-allocated to new districts following a redrawing of district boundaries. Also, the period leading into, and immediately following redistricting is a beneficial window to increase the use of GIS in an elections system. As a result, many states can be expected to increase their use of GIS in elections during this time.

The goal of the Geo-Enabled Elections project, phase two, is to raise awareness and help prepare states to adopt GIS in elections. The project is currently selecting pilot states to participate in phase two; any state interested in participating may contact the project via the website elections.nsgic.org.

Visit the website today and sign up to be notified about latest developments.

elections.nsgic.org

THANK YOU

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Minnesota

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Nebraska

Michelle Andahl, Wayne Bena, Heather Doxon, Eric Herbert, Nikki Lampe, Angie Nelson, John Watermolen

Pennsylvania

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West Virginia

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CASE STUDY STATES

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North Carolina

Ballingam Chepuri, Michael Chuang, Veronica Degraffenreid

Utah

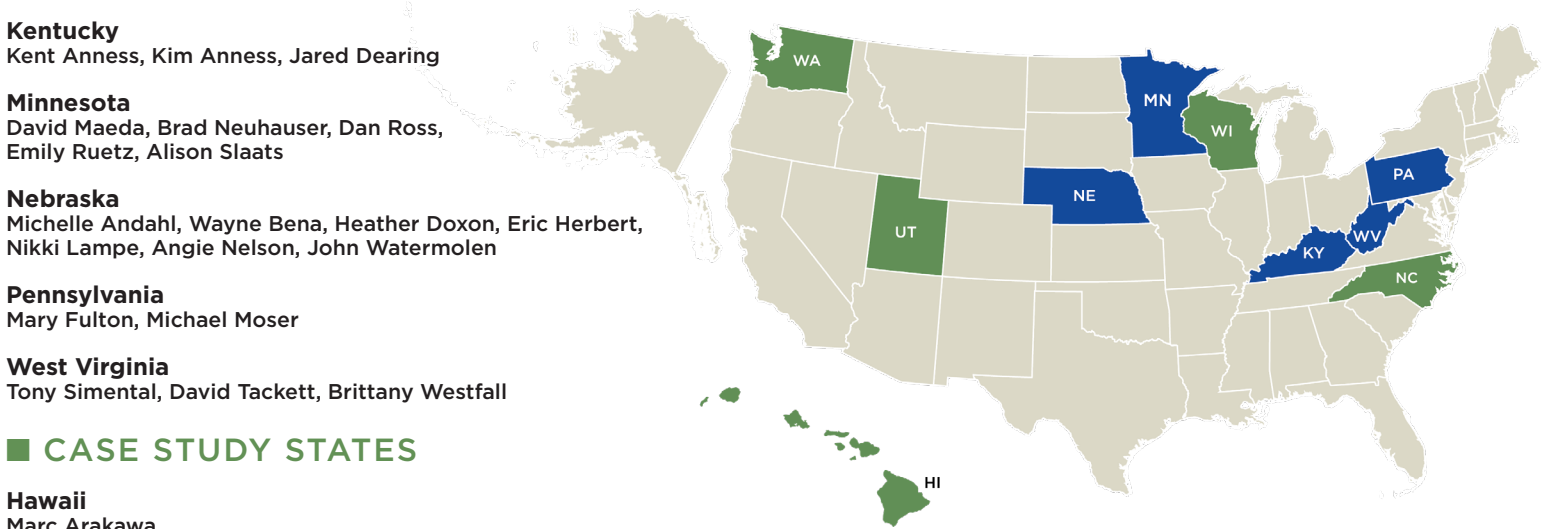
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