



WV Statewide GIS Strategic Plan 2022

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West Virginia Geographic Information System Policy Council

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Barbara L. MacLennan Ph.D., WVAGP President, Fairmont State University

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Department of Environmental Protection

Department of Health and Human Resources

Department of Revenue

WV Department of Education

WV Department of Transportation

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Department of Agriculture

Secretary of State's Office

State Auditor's Office

State Treasurer's Office

Office of Technology

WV Association of Counties

WV Municipal League

Regional Planning and Development Councils of WV

County Commissioners Association of WV

WV Sheriff's Association

Association of WV Assessors

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WV Assoc. Of Geospatial Professionals, Barbara L. MacLennan, Ph.D., Fairmont State University

WV Assessors Association, Irv Johnson, Cabell County Assessor

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Executive Summary

Geographic Information Systems and Science (GIS) and Geospatial Technologies have a long and successful history in West Virginia, yet like any rapidly evolving technology, GIS requires constant reinvestment to continue to function. The National States Geographic Information Council formally recognizes both West Virginia's success and its ongoing challenges. However, the state needs to make ongoing strategic investments in data, personnel, and technology to foster the growing need by state and local governments, private investment in the state, and the general citizenry of this critical information infrastructure.

Ongoing Challenges

West Virginia can boast success stories in the field of GIS driven by its years of building the foundational groundwork to foster those successes. However, the state's investments require constant maintenance and retooling to meet ever developing technical, economic developmental, and infrastructural challenges. Current processes have given rise to uneven data and technology development across state agencies and between state and local governments, exasperating the 'have' and 'have not' spatial divide.

Strategic Goals and Proposed Initiatives

The WV GIS Community, through the three organizational pillars of the Office of GIS Coordinator, the WV GIS Technical Center, and the WV Association of Geospatial Professionals, is well positioned to act as a force multiplier for any available resources. Nonetheless, the community has identified critical weaknesses within our existing GIS structures that require attention. This document identifies four key goals: broaden public outreach and services, increase government efficiency, expand statewide infrastructure data development, and foster existing and develop new GIS expertise in the state. To meet these goals, the WV GIS Strategic Plan proposes these key initiatives:

- Establishment of five foundational, statewide spatial data infrastructure programs
- Increase government efficiency and interoperability through data standards enhancement
- Development of publicly available applications and programs to serve the citizenry's needs
- Foster current GIS expertise through training and retention programs, as well as create opportunities for new local GIS employment opportunities.



Summary of GIS in WV

History of GIS in WV

Use of GIS technology in West Virginia in the mid-1980s began when a number of state agencies started using early versions of GIS and image analysis software for land inventory and natural resource assessment applications. In the 1980s, adoption of GIS technology and development of GIS databases continued in state government, selected West Virginia local governments, and public utility organizations. The early success and interest in GIS use in the 1980s led to the formation of an ad hoc user group known as the West Virginia GIS Coordinating Committee with participation from a number of federal, state, and local government agencies and private companies with a need to manage geospatial information.

The growing interest and use of GIS in West Virginia and nationally provided a basis for launching a study and planning effort for the development of a coordinated state geospatial data infrastructure. In 1992, the West Virginia Development Office contracted with PlanGraphics, Inc. to produce a GIS development plan for West Virginia. This project included a needs assessment, conceptual design, cost-benefit evaluation, and a GIS development plan. (See www.wvagnp.org/strategicplan.asp to view or download these documents). The recommendations in the plan were used by the Governor's Office to issue Executive Order EO 4-93 in 1993 to establish West Virginia's statewide geospatial data infrastructure. The program was funded in 1995 through provisions of House Bill 2222, which created a pilot GIS development program, the Mineral Lands Mapping Project, with the Geological and Economic Survey (WVGES), the Property Tax Division (PTD) and the West Virginia GIS Technical Center (GISTC) created by this order as participants.

The Executive Order established a State GIS Coordinator position within the WV Geological and Economic Survey, and created the WV GIS Technical Center and State GIS Data Clearinghouse, and three coordinating bodies: a GIS Policy Council consisting of cabinet secretaries and members of the Board of Public Works to implement the State's GIS plan; a State GIS Steering Committee comprised mostly of geospatial leaders from state government; and GIS Users Group to serve as the vehicle for education, training, and information exchange among GIS users. Of these three coordinating entities, the State GIS Steering Committee, chaired by the WV State GIS Coordinator, was the first GIS coordinating body to organize in 1996 and meet regularly to advance spatial data infrastructure (SDI) and GIS use in West Virginia.

GIS development in West Virginia received a considerable boost in 2001 with the formation of the West Virginia Statewide Mapping and Addressing Board (SAMB). SAMB was created to oversee the development of statewide GIS data to support E911 emergency response.

With funding through Verizon, Inc., statewide orthoimagery, road centerlines, address data and other GIS data layers were developed in coordination with local emergency management organizations. Over the last 10 years, other geospatial data infrastructures have contributed greatly to the availability of GIS data. Among these are:

- The Mineral Lands Mapping Project (MLMP), with its Coal Bed Mapping, Mineral Parcels Mapping, and the Reserve Coal Valuation programs, provides statewide detailed information on mineral land parcels, coal, oil and gas resource ownership. (GISTC, PTD, GES, OGC)
- National Hydrographic Database (NHD) program delivering surface hydrographic features statewide.(GISTC, NRAC, OGC)
- Completion of digital soil survey map data (SSURGO) by the U.S. Natural Resources Conservation Service (NRCS).
- Statewide transportation database development by the state Department of Transportation (DOT), in cooperation with GISTC, provides a rich road centerline database supporting a range of mapping, asset management, and transportation planning applications.
- Digital Flood Insurance Rate Map (DFIRM) database development by the GISTC.
- West Virginia's Water Development Authority (WDA) Comprehensive Planning Study for Water and Wastewater providing invaluable information about the State's infrastructure.
- Broadband Mapping Program delivering information about broadband coverage in the state
- Transportation & Economic Development Information System (TEDIS) by Nick J. Rahall, II Appalachian Transportation Institute (RTI), providing transportation and economic development information
- Technical Applications & Geographic Information Systems Unit (TAGIS) engaged in developing a comprehensive, state-wide spatial database to support environmental monitoring, analysis, and decision making for the Department of Environmental Protection (DEP)
- Geospatial Transportation Information Section (GTIS) integrating and developing comprehensive strategies for an enterprise GIS to support and track projects from design stage to completion within DOT
- Mine Information Database System (MIDS) containing records of every mine map available online at the WVGES website
- Interactive online applications featuring both West Virginia and regional (WV with contiguous states) oil and gas maps developed by WVGES. The public application includes a document viewer for access to scanned or digitized logs, core photos, and references for these reservoirs; and an interactive mapping component consisting of both a well data portal and an interactive spatial tool integrating maps and cross-sections.

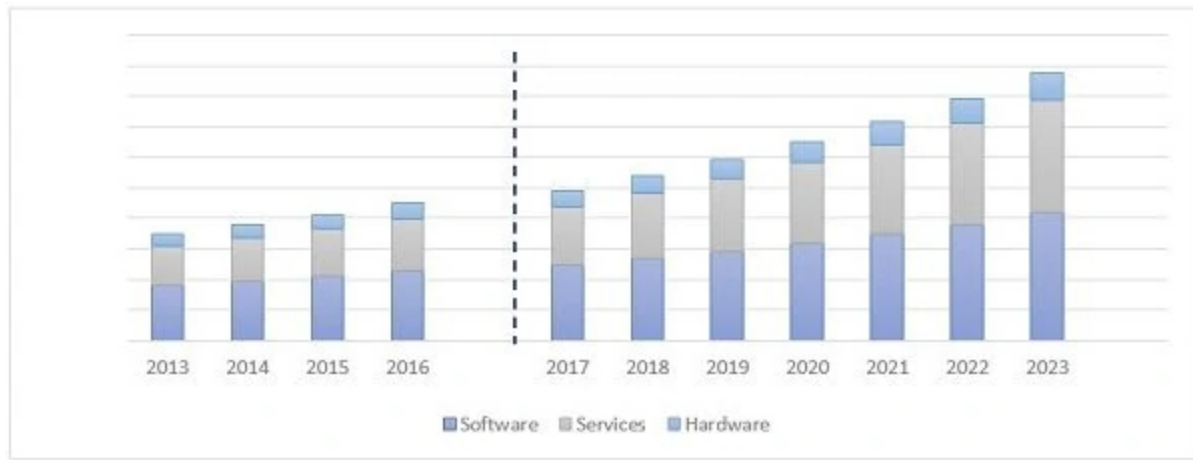
- MapWV, <https://www.mapwv.gov>, a public gateway to online West Virginia mapping resources offering mapping professionals and/or the casual user access to a wealth of high-quality maps and geospatial data via the Internet designed and maintained by the GISTC.

In March 2007, a GIS users group, the WV Association of Geospatial Professionals (WVAGP), formed with the adoption of bylaws and the election of a board of directors from the government and private sectors. The non-profit association was formed to provide broad-level coordination for GIS advocacy issues, information exchange, and sponsorship of educational and training activities. In the fall of 2007, the GIS Policy Council was reconvened to provide high-level GIS coordination for the State. The GIS Policy Council, chaired by the Secretary of Commerce or designee, was organized to include executive leaders from state agencies, including the Chief Technology Officer position created during the 1997 Legislative Session. In July 2008, the GIS Policy Council formally recognized WVAGP as a GIS User Group and re-activated the State GIS Steering Committee.

The need for better statewide coordination in the development and use of geospatial data and technology to support diverse stakeholders across the State was articulated in Executive Order EO 4-93 and reaffirmed by Executive Order EO 10-10, issued by Governor Joe Manchin III on August 24, 2010. A synopsis of the current situation was articulated in EO 10-10, including the following highlights:

- GIS has proven to be an effective tool in policy development, decision making, management, engineering and research in almost all state, local, and federal government agencies and private industry
- GIS use greatly benefits from a statewide coordinated effort to streamline government use of geospatial data, expand agency cooperation, and take advantage of grant opportunities and cooperative leveraged funds
- GIS demand has outgrown current efforts to coordinate and there is a need to plan and prioritize the development of publicly funded geospatial data and to define the roles and responsibilities for geospatial data stewardship

Current Status of GIS in WV



Geospatial Technology is considered a Department of Labor “High Growth Industry”. (<http://www.doleta.gov/brg/jobtraininitiative/>)

The Existing GIS Community

The number of GIS professionals and programs among organizations in the State has continued to expand greatly. GIS Stakeholders include state agencies, federal government agencies, county and local agencies, regional agencies, universities and academic institutions, K-12 Educational Institutions, research and economic development, public and private utilities, private companies, nonprofits and the general public, among many others. These groups employ geospatiality in various ways including but not limited to:

Mapping and Visualization: Understanding locations and relationships with maps, geovisualization, and data visualization.

Data Management: The collection, organization, maintenance of spatial data, a type of big data, that necessitates accurate spatial locations and attribute details about assets, resources, and more.

Field Mobility: Field mobility uses handheld devices to design collection of, access to, and generation of information in the field. A large area of growth in the geospatial industry and workforce.


Monitoring: Monitoring such as by satellites, drones, and other means allows the the ability to track, manage, and monitor assets and change in real time.

Spatial Analytics: Spatial Analysis uses spatial data to predict trends and spatial patterns for decision making.

Planning, Design, and Decision Support: Ability to plan and visuals options for decision making.

Engaging with the public: A growing use of geospatiality is to engage with the public on decision making, promoting projects, and keeping the public informed.

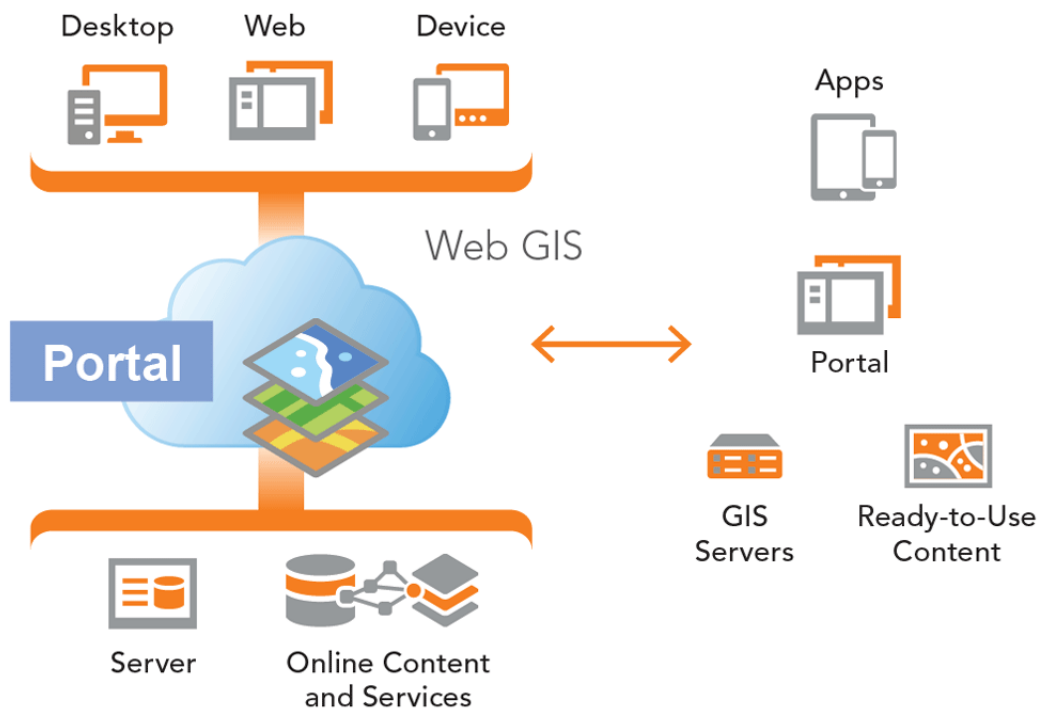
Sharing, Collaboration, and Participatory GIS: The design of and collection and use of GIS to create more accessible and efficient ways to share and participate in a process.



The U.S. Geological Survey (U.S. GES) oversees the geospatial liaison office for West Virginia. Federal agencies such as the U.S. Forest Service, U.S. Fish and Wildlife Service, Federal Emergency Management Agency, U.S. Fish and Wildlife Service, and others have a large geospatial presence in West Virginia. Many state government agencies most notably the Department of Environmental Protection (DEP), Department of Transportation (DOT), Geological and Economic Survey, West Virginia Emergency Management Division, the Department of Health and Human Resources (DHHR), and the Department of Tax and Revenue have greatly expanded their geospatial capabilities and use of GIS technology. Regional agencies and local governments are major users of GIS technology and represent stakeholder groups for which there are substantial opportunities for expansion in GIS use and delivery of significant benefits in such program areas as: public safety, parcel mapping and real property management, utility and transportation asset management, land use and transportation planning, plan and permit review, and others. GIS technology is used, to some extent, in most of West Virginia's 55 county governments and in many large and medium-size municipalities.

Since its creation, the WVGISTC has disseminated geospatial data and developed web-map services and online mapping applications; it has built new spatial data layers in cooperation with federal, state and local agencies. The center has assisted with strategic planning, development and implementation of GIS and mapping guidelines and has provided technical support to the Office of GIS Coordination. The GISTC (See <http://wvgis.wvu.edu>) continues to maintain the GIS data clearinghouse providing access to the data sources listed above a wide range of other GIS data sources.

Educational and research institutions such as Concord University, Fairmont State University, Glenville State College, Marshall University, Shepherdstown University, and West Virginia University provide geospatial technologies in research, education, and outreach programs. Lastly, more private sector companies have integrated GIS into their business practices and services. GIS technology is currently used by a broad range of organizations in the state and there is growing interest in greater adoption and expansion of GIS.




Proposed High-Level System Architecture for Statewide GIS in West Virginia (Image courtesy of ESRI)

The Existing GIS Technology

Geographic Information Sciences, Geographic Information Systems, and Geospatial Technologies all serve as existing labels for a basket of technologies that underpin their use and operation. Technological advancement within the 'Internet Age' happens at a lightning fast pace and GIS has certainly not been immune to the sweeping changes in the technology landscape. Several trends have dominated that landscape since the emergence of the 21st century and the expectation this rapid pace of change will not abate anytime soon.

Trend: Increased Computing Power and Platforms

Computing technologies have grown dramatically in both computing power and accessibility over the last twenty years. Computers are capable of higher levels of computation, which provide ready access to new modes of collecting, analyzing, and communicating geospatial information. Furthermore, computing has evolved from desktop only platforms of yesteryear. This has led to the dissemination of geospatial



technology into a host of platforms, including mobile, tablet, wearable, cloud based, and even still, desktop use.

However, each platform comes with its own set of technological capabilities and limitations. Functions trivial in a mobile context are challenging if outright impossible within a cloud environment, such as answering the simple question of ‘what is here?’ This balkanization of functionality across a host of platforms has created opportunities for leveraging these new technologies for tasks impossible before today. However, that has also brought a need to be versed and competent in a whole new suite of emerging technologies, each evolving seemingly on a nearly daily basis.

Trend: Connectivity and ‘Always On’ Computing

The emergence of the cloud teamed with mobile services have provided incredible power and efficiency in the hands of everyone. This requires constant connectivity. That connectivity has broadened into a host of technologies, from landlines to wireless access. Communities now have access to a wealth of new GIS services and information, such as online maps or location based services. Furthermore, they can use the increases in broadband speeds to access larger and more detailed geospatial datasets for use in their own communities.

However, broadband still presents an uneven landscape within the state. Physical challenges such as topography and economic challenges such as affordable access to broadband resources mean that not every community, much less every citizen, has access to the same quality of geospatial data and services.


Trend: Geospatial Data Capture and Compilation

Geospatial data is more affordable than ever before due to efficiencies within data capture and storage. Comparatively cheap and accessible storage means that higher quality data can be captured and distributed. Furthermore, that data can be captured more frequently, giving users a more up-to-date understanding of the spatial context of their agency or personal needs. Data capture is increasingly cheaper and more efficient as well. Large data sources such as imagery and elevation can be captured cheaper than ever before.

Yet, WV continues to struggle with capturing these datasets due to the fractured nature of data capture within the state. No statewide program coordinates and assists with data capture or storage, although the state GIS clearinghouse serves as a storage location for what data is collected. GIS users throughout the state must coordinate together to create localized efficiencies. These efforts have created a strong ‘Geospatial Data Divide’ within the state, with the affluent counties having better access to more timely geospatial data.

Trend: Geospatial Data Processing, Management, and Visualization

Cloud computing and distributed systems have constructed new ways of both processing and managing Geospatial data within the industry. Cloud based systems allow users to



leverage powerful servers to process data. Web based systems allow users to query and interrogate data easily, not to mention store data for future retrieval.

Data visualization presents a whole new level of rapid and emerging technology. Web based dashboards pair easily with web maps, which in turn can easily reference mobile platforms. Data from a whole host of both authoritative and volunteered data sources allow GIS users in the state to create robust and compelling visualizations using spatial data, images, text, video, audio, all filtered through interactivity. Social media and the immediacy that it provides gives GIS users in the state direct access to citizens.

Furthermore, whole new bodies of technology, such as Augmented and Virtual Realities, have the potential to provide largely unexplored capability to GIS users and the public, possibly to great benefit to tourism and economic development.

Evaluating GIS Efforts in WV

West Virginia's statewide GIS goals are dependent on the development and ongoing maintenance of high-quality geospatial data. There is a focus on "Framework" geospatial data that include data themes for which there is a significant, common need by a large portion of the state's user community. West Virginia's Framework Data themes are based on the concept developed by the Federal Geographic Data Committee (FGDC) which identifies 7 key geospatial data themes: geodetic control, digital orthoimagery, elevation, transportation, hydrography, governmental units, and cadastral information. Several additional themes (beyond the 7 FGDC themes) have been included in the West Virginia Framework that are important for multiple user groups in the state. It is recognized that there are other geospatial data themes not included that are important for specific organizations and GIS applications. Although not specifically addressed in this Strategic Plan, the Plan encourages the development of business plans to address them.

NSGIC "SCORECARD" Results

The National States Geographic Information Council Geospatial Maturity Assessment provides NSGIC members and other partners with a summary of geospatial initiatives, capabilities, and issues within and across state governments. The NSGIC GMA assesses each state on central data themes and coordination topics every two years. NSGIC maintains a State Summary accessible via the web at <https://www.nsgic.org/states>. In addition to the 2021 GMA report, the state report cards, and each state's response, NSGIC publishes the results in an interactive geospatial web map application customized for each theme on the [The NSGIC 2021 Geospatial Maturity Assessment \(GMA\) Dashboard](#).

GEOSPATIAL MATURITY ASSESSMENT 2021

West Virginia Report Card

Overall Grade: B

COORDINATION	GRADE: B
STATE-LED THEMES	GRADE
Address	A
Cadastre	A
Elevation	B
Orthoimagery Leaf-Off	D
Transportation	B
FEDERAL-LED THEMES	GRADE
Geodetic Control	B-
Government Units	A
Hydrography	Incomplete (C)
Orthoimagery Leaf-On	B-

METRICS:

A - Superior

B - Above average

C - Average

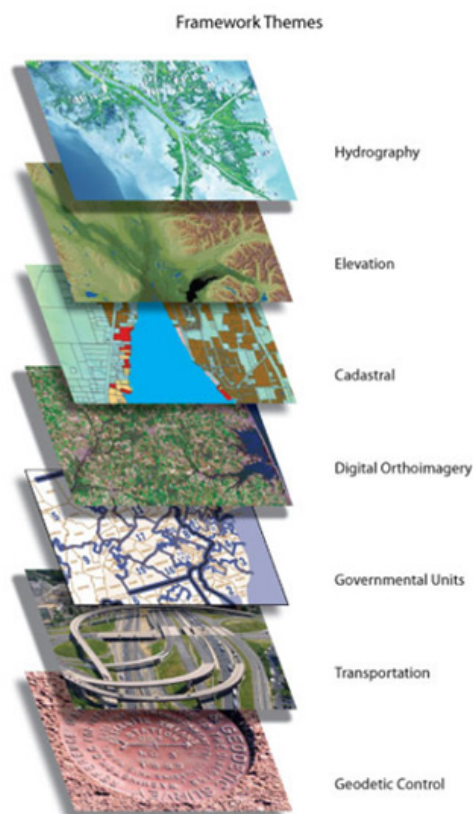
D - Below average

F - Failure

N/A - Not Applicable

The National States Geographic Information Council Geospatial Maturity Assessment provides NSGIC members and other partners with a summary of geospatial initiatives, capabilities, and issues within and across state governments. The NSGIC GMA now produce report cards for each state on central data themes and coordination topics. The assessment is performed every two years.

The WV State GIS Coordinator's Office and the GIS Steering Committee review the NSGIC assessment to strengthen WV's NSGIC 2-year score, to set goals, and to plan for the future. An explanation of the WV score and scoring criteria is provided below. See glossary for terms and definitions.



Coordination Criteria

West Virginia designates a full-time, paid State GIS Coordinator position housed within the WV Geological and Economic Survey. State GIS governance structure and funding base are established through Executive order and state legislation which includes State GIS Coordinator, Steering Committee, and Policy Council.

The Office of GIS Coordination, the GIS Technical Center, together with the Coal bed Mapping Program, and Mineral Parcel Mapping Project receive funding through the WV Geological and Economic Survey (WVGES); however data and applications development and implementation is dependent on funds availability from non-permanent external sources.

Executive Order 4-93 designated the GIS Policy Council to oversee the state's geospatial data infrastructure under the management of the State GIS Coordinator. Executive Order 10-10 created the Office of GIS Coordination and further defined responsibilities of the

State GIS Coordinator. Additionally there is a GIS Steering Committee chaired by the State GIS Coordinator. The Steering Committee is set up for the coordination of technical aspects of the WV GIS Strategic Plan. The committee provides advice to the Policy Council and the GIS Coordinator on technical issues and serves as an interagency coordination body.

The WV GIS Technical Center has been designated as a state data clearinghouse. The Coordinator has generally taken the lead role in coordinating data development initiatives in collaboration with several entities; however there are very few formal data stewardship arrangements and funding opportunities.

Scoring Criteria:

- State has a state Geographic Information Officer (GIO) or state GIS Coordinator
- GIOs are authorized by statute or executive order

State-Led Themes

Statewide Addressing

WV has a program for developing or maintaining an authoritative statewide address database

Scoring Criteria:

- State publishes address points to the NENA GIS Data Model (Site/Structure Address Points) or a state-level standard
- Address points used for 9-1-1
- Address data made available for download, via API, publicly, and to the National Address Database

Cadastre

The WVGISTC created a tax map parcel viewer which met the goal of building a statewide cadastral dataset; most counties have been or are in the process of converting surface tax maps to geospatial datasets. Using data from the Property Tax Division the Division of Forestry created a managed timber cadastral dataset. MLMP has mapped over half of the state's mineral (coal) parcels. DOT has developed an in-house DOH parcel view application.

Scoring Criteria:

- Digitizing parcel data is the work of local government across the country
- State has GIS-parcels in 80-100% of their counties
- States have programs for collecting that parcel data from their local governments.
- State has standardized parcel data aggregation program
- Counties make their parcel data freely available
- State program has a designated steward, and formal relationships with local government

Elevation

WV is now fully covered by 3DEP QL2 Topographic Data Quality Levels (QLs) that is available online.

Next step: Need a business plan and statewide funding plan for state coverage.

Scoring Criteria:

- State have 90-100% coverage
- State has LiDAR at least QL 3 or better.
- Data is available for download, with API.
- State has a steward for the data.
- State has business plan

Orthoimagery Leaf - Off

Orthoimagery includes both leaf-on and leaf-off products, and both are important to users of geospatial data in the states. Leaf-off serves tax assessors and the emergency response community, among others. Statewide coverage is important, and the frequency of updates is critical, particularly for areas that are growing and/or changing.

WV has Best Leaf-Off in the U.S. The most recent leaf-off statewide imagery has new flights done using TEIF / REAL, previously it dates back to 2003, leaf-on are the NAIP 2020. CIR 1996-98 Statewide leaf-off. Individual counties are acquiring imagery. The WVGISTC has been collecting MOSAIC.

Next steps: Best of leaf-off in the U.S., completed with FEMA grant for some counties but not all. State needs to help counties that don't have access with fiscal assistance for temporal consistency. Need for a statewide minimum agreed upon standards for a statewide layer at the same resolution.

Scoring Criteria:

- State has statewide coverage.
- Imagery frequently updated (within a five-year period)
- States buy up higher resolutions (one foot to two inches)
- Data is available for download, with API.
- State has a steward for the data.
- State has business plan

Transportation

Transportation-Road Network and Addresses

Stewardship for statewide road centerlines performed by WVDOT has a fully classified and

regularly maintained road network. WVDOT currently releases and publishes a fully updated road network semiannually. WVDOT is consistently refining and evolving its transportation GIS program to meet the ever changing demands placed upon by the Federal government, the West Virginia state government, the organization, and its customers. WVDOT is working on a feasibility project with WVGISTC to bring in updates on road centerlines from the authoritative statewide address database.

Transportation-Other Transportation Modes

WVDOT, Div. of Tourism, WVEMD, Division of Forestry and others are developing and updating various datasets

WVDOT - Regularly maintaining and updating other current other non-road transportation modes datasets and frequently expanding additional other non-road offerings as they become available WVDOT works with WVGISTC to manage and update WV trail network

Local governments, creating local trails that need to collect and share data

Scoring Criteria:

- State has a transportation dataset
- State has a program to support the data.
- State has 100% statewide coverage
- Update their transportation data quarterly or more frequently
- Adhere to a state or national standard
- Data is edgematched along boundaries.
- Data available either through a web service or as downloadable information.
- State has a formal steward and sustainable funding
- Working with local partners.

Federal-Led Themes

Federal-led Themes are often tied to federal funding streams or accessibility.

Geodetic Control

WV DOT spearheaded the Continuously Operating Reference Station (CORS) densification project and WV DOT HARN densification in 2003. The National Geodetic Survey (NGS) High Accuracy Reference Network (HARN) implemented on a state-by-state basis. "This HARN is designed to provide the surveying community with a network of highly reliable positional coordinates that can serve as control for their surveys. A reference network is only as good as the control used to establish it."(NOAA)

Need to move from CORS to VRS

Scoring Criteria:

- State works with the National Spatial Reference System (NSRS) maintained by the National Geodetic Survey (NGS).
- State has a Geodetic Control Program

- State has Public Land Survey Points
- State supports statewide CORS and RTN networks.
- State plans for NSRS Modernization in 2022.
- State has a designated steward and dedicated funding resources
- State has established relationships with state, tribal, local governments, and the surveying community.

Government Units

Boundaries that encompass areas for programs and services administered by a federal, state, regional, or local authority (e.g., U.S. census, election districts, regional planning agencies, health districts, local government service districts, emergency service zones, etc.)

- Public Service District boundaries undertaken by WDA.
- Election Districts - county clerks and secretary of state working with GISTC and others
- 1:24 State and county boundaries digitized by DEP.
- 1:24 Tax district boundaries digitized by Property Tax. Corporation boundaries not updated by PSC or any other state agency.

Next step: Counties need assistance in continuing to define and map boundaries using best practices to address challenges

Scoring Criteria:

- State has reliable governmental unit boundary data
- State has an authoritative source for data.
- State publish governmental unit boundary data to a standard
- State updates data as changes occur.
- Data publicly available.
- Identified steward for the data
- Formal connection to local government.

Hydrography

National support for state GIS coordination and existing USGS liaison in place. MOU for NHD stewardship in place. New LiDAR waiting on new federal model better resolution and capabilities. WVDEP maintains maps of water resources in state including subsurface

Surface Hydrography

EDH is an emerging product for NHD- Elevation-derived Hydrology. Some pilots have been completed recently- closest area to WV is in PA. Scoping of the standards etc is underway, but there will be a pathway for data creation as an NHD product.

Scoring Criteria:

- State has a hydrography dataset above and beyond the National Hydrography

Dataset (NHD) provided by the federal government.

- Active progress towards improving statewide coverage including key indicators like regular data maintenance and percentage of geographic areas with improved data.
- Coordination with USGS on NHD
- Accessibility to hydrography data through open data
- Having a data steward actively engaged with USGS and stakeholders within the state.
- Hydrography data is freely available
- Data stewards for hydrography that are actively engaged with USGS.
- Funding for hydrography theme data.
- Elevation derived hydrography

Orthoimagery Leaf-on

Orthoimagery includes both leaf-on and leaf-off products, and both are important to users of geospatial data in the states. The leaf-on product serves interests such as agriculture and forestry. Statewide coverage is important, and the frequency of updates is critical, particularly for areas that are growing and/or changing.

Land Cover/Vegetation

West Virginia Division of Natural Resources (WVDNR) Wildlife Resources funded and worked collaboratively with WVU Natural Resource Analysis Center to produce land cover using high spatial and temporal National Agriculture Imagery Program (NAIP) images (2011 and 2016). In preparation for the 2025 State Wildlife Action Plan and additional planning and modeling, WVDNR is funding a classification of 2020 NAIP to take place in 2022.

Scoring Criteria:

- States that participate in the program via buy-ups received the 'A' grades. State has dedicated funding with the buy-up program through the NAIP federal program.
- State makes this public domain data available to their users via download
- State has identified data steward

New Themes Criteria

Ungraded themes help states to gauge their relative progress for upcoming areas of scoring in the next year.

Next Generation 9-1-1 (NG9-1-1)

WV is one of 40 states with an effort to coordinate the development, normalization, aggregation, and/or distribution of GIS data in support of NG9-1-1.

Scoring Criteria:

- The primary goal of coordinating GIS readiness for NG9-1-1 is to be able to implement geospatial call routing.

- 9-1-1 calls are being spatially routed to the PSAP over an ESInet using Next Generation Core Services (NGCS) and the Emergency Call Routing Function (ECRF) at the state level.
- State GIS coordinating body is included in the state 9-1-1 coordinating body
- State follows data standards for required NG9-1-1 GIS datasets
- State GIS coordinating body assigned with the responsibility for NG9-1-1 GIS data readiness
- Inter-state NG9-1-1 GIS coordination
- Funding and processes in place to normalize and aggregate authoritative GIS datasets required for NG9-1-1 to statewide datasets
- Follows a Nena standard for road centerlines and site/structure address points.

Elections

WV has a formal relationship with the state's election director. With the onset of geo-enabled elections and the determined importance of the relationship between the state geographic information officer (GIO, or equivalent role) and the election director NSGIC geo-enabled elections best practices specifically mention the importance of regular boundary management, as well as point in polygon analysis to ensure voters are casting their votes in the right contests.

Scoring Criteria:

- Formal relationship with the state's election director.
- Best practices for a voting unit GIS layer.
- State has access to an accurate, current statewide voting precinct boundary layer.
- States use and maintain a state or commercial geocoding web service to locate voter addresses and voters.
- Geographic coordinates for addresses are periodically updated to reflect the location found using the most current geocoding reference data (roads and address GIS layers).
- State has data validation processes in place, including performing regular spatial audits of GIS election data.
- State has a statute that regulates address data creation and maintenance
- State has a statute that regulates district data creation and maintenance
- State has a statute that regulates precinct data creation and maintenance
- New precinct boundaries be added to your state's clearinghouse after the 2021 redistricting process

Overarching State Critical Themes

Demography

- WVGISTC offers access to data sets to the public

Education

- Active academic and research community supporting GIS users, special projects, and professional training (growing to other departments, applied to individual areas, etc)
- Growing connection between industry and Higher Ed,
- GIS formally instructed and integrated in K-12
- Presence from federal agencies using GIS (more formalization needed)

Flood Zones

- FEMA and the Division of Emergency Management (EM) commonly known as Emergency Management formerly the Department of Homeland Security (WVDEM) worked on 11 digit watersheds hazards for 20, 50, 100 and 500 year flood models utilizing HAZUS
- WVGISTC created flood tool used as best practice for U.S Flood tool models
- HECRAS tool

Geology and Mineral Resources


- WVGES administers, shares, updates and publishes a coaled mapping program and several gas well datasets for GIS applications. WVGES maintains a confidential karst data set.
- WV DEP maintains gas well and mining permit datasets which are made available to other agencies and the public.

Addressing and Centerlines

Community anchor institutions updated in 2010 utilizing NTIA's broadband grant. SAMS now has SAMS-II datasets available to the public at zero cost through the WV GIS Clearinghouse. SAMS is administered by WVEMD. Counties continue updating SAMS datasets including addresses and centerlines.

Soils

The WV Soils - Soil Survey Geographic Database (WV SSURGO) is completed and updated regularly. A detailed, field verified inventory of the kinds and distribution of soils on the landscape. This data set is generally the most detailed level of soil geographic data



prepared by soil scientists from the U.S. Department of Agriculture, Natural Resources Conservation Service, as part of the National Cooperative Soil Survey.

Telecommunications

- SIRN Tower location map is continuously updated

Water and Wastewater Utilities

- The WV Water Development Authority (WDA) on behalf of West Virginia Infrastructure and Jobs Development Council (IJDC) maintains statewide water and wastewater utility mapping and web based interactive tools.

Many smaller utilities do not have mapping and need help at the local level.

Strategic Foundation for GIS

Vision for GIS in WV

The Vision for GIS in WV lays out a path designed to build upon the strong history of GIS within the state in such a way as to overcome the challenges detailed thus far. This vision serves as the basis for evaluating each strategic goal laid out within the strategic plan.

Build a robust and efficient GIS infrastructure that encourages collaboration and delivers cost-effective geospatial data and services to WV Citizens and West Virginia Organizations that service the state's citizenry.

Strategic Goals

Recognizing that a vision requires a strategy to move forward, this plan suggests five key strategic pillars to organize and evaluate the vision moving forward. They are meant to provide an organizational framework for both goals and for initiatives moving forward. These goals are critical for long-term GIS development, coordination, and operation in West Virginia. No one pillar is more or less important than the other. As such, they are presented as equally critical for the continued evolution and advancement of GIS within the state.

Public Engagement and Government Efficiency

1. Engage with the public to identify critical areas of concern among the citizenry which GIS can help address
2. Expand efficiencies of existing geospatial practices to minimize redundancies and inefficiencies in governmental-citizenry interaction
3. Increase outreach efforts and awareness concerning the powerful impact GIS and geospatial technology makes on West Virginia's citizenry
4. Establish standards and practices to evaluate the returns on investment WV citizenry receives for investments in GIS within the state.

Data and Data Interoperability

1. Develop of five statewide foundational data layers: Imagery, Elevation, Addressing, Parcels, Road Network
2. Mature primary datasets built upon foundational data layers. This include such data layers (but not limited to) : Elections, E911, Geodetic Control, Tourism, Public Places
3. Increase data interoperability between agencies through the adoption and enforcement of data standards
4. Expand and maintain the statewide GIS Data Clearinghouse as well as encourage Open Data initiatives for general public use and benefit

Governance and Coordination

1. Enhance the GIS Coordinator's Office to coordinate GIS efforts throughout the state
2. Address the digital divide of both data, technology, and resources between regional, county, and local governments throughout the state
3. Establish efficient and sustainable funding streams for all agencies using GIS in order to maintain existing and expand GIS development
4. Grow GIS use in and among state agencies, county governments, and local governments

Professional Development

1. Develop, grow, and retain geospatial talent within the state by establishing standards and career pathways
2. Invest and attract talent to WV, both within the public and the private sector
3. Increase pathways for meaningful agency professional interaction and collaboration to maximize efficiencies within the state

4. Increase training, educational, and professional development opportunities for existing GIS professionals and to attract additional talent

Technology

1. Establish core capability for developing geospatial applications and services in state government to maximize efficiency and benefits to stakeholders
2. Improve standards and technology cycles for GIS infrastructure
3. Establish research capabilities to identify and adapt emerging technologies for efficient GIS use within the state
4. Upgrade critical infrastructural elements necessary for the continued use and expansion of GIS and Geospatial technologies, such as CORS network for precision location identification


Business Drivers

A business driver is a major need, program, service area, or challenge faced by organizations that may be impacted or supported by GIS technology and data. Business drivers may reflect strategic or operational goals of the organization, user or customer service needs, legal or regulatory requirements, external conditions (economic, social, political) or other business factors. Business drivers that are impacted or supported by GIS technology and data establish a very strong, strategic foundation for the geospatial data infrastructure. Some business drivers for GIS are high-level and overarching in nature, reflecting overall goals or advantages for the organization as a whole and impacting multiple departments and user groups. Other business drivers are more specific to an individual department or organization, business area, or program.

Overall Drivers

Improving collaboration among state, local, and regional agencies for resource sharing and cost reduction

GIS technology provides a basis and a catalyst for cross-agency collaboration and project partnership at all levels of government in the state; common needs for geospatial information provide the impetus for inter-agency cooperation. Currently, agencies at all levels of government in the state work independently to develop standards and partnerships. In most instances, funding is pursued, and data is developed individually with limited collaboration. This current model does not require or incentivize agencies to partner, resulting in agencies not realizing the full benefits of a strong, cohesive effort to acquire funding and developing data. Data stewardship tends to suffer from the unbalanced access to human and funding resources agencies across the state have, along with no collaborative standards for stewardship being available, namely in cadastral and address location data. In the situations where agencies do not have matured geospatial



operations, there is little or no development support to encourage growth. There is a need to provide better coordination of funding and geospatial data development efforts in the state and to facilitate collaborative geospatial activities across all organizations. There is also a need for agencies to help share costs of geospatial data collection and maintenance where establishment of standards or framework for this sharing would provide immense benefit to all agencies.

Improvement in the quality, consistency, timeliness, and efficiency of geospatial data stewardship

Geospatial data is an asset with great business value as demonstrated through practical GIS applications within and outside of West Virginia. Establishment of sound policies for GIS data stewardship helps maintain the value and usefulness of the data. Currently, data quality is inconsistent across counties, agencies, and organizations due to fiscal and personnel limitations, and inadequate standards for data stewardship. There needs to be a more formalized standard for best practices to promote good data stewardship by promoting quality and consistency of data collection and dissemination.

Improved access to geospatial data for decision making, public consumption, and enhanced quality of life

GIS technology, created by many agencies and organizations, has grown to provide accessible, high-quality data and currently provides a range of tools to support decision-making at local, regional, and statewide levels. From basic query and mapping to sophisticated geospatial analysis tools, GIS technology provides input for planning (e.g., land use decisions, historic preservation, transportation, public health, and emergency management) and for allocation of resources for operational purposes. Public access to geospatial data encourages an informed populace

The increase of digital information and services available to private citizens and businesses (through Web-based applications and improved networks) has helped fuel demand for enhanced services and quicker response. GIS technology supports e-government, geospatial information needs of private companies, and consumer demand. State and local organizations have been facing increasing demand and push for digitizing and having data online. The pursuit of public demand is dynamic and changing at all levels. There are external and internal organization demands for information and services.

GIS applications support planning and operations relating to multiple factors that contribute to enhanced health and well-being of people in West Virginia. Geographically-based decisions in such areas as regulatory program management, public health services, comprehensive planning, environmental quality, historic preservation and

protection of cultural resources, and utility infrastructure planning are all supported by GIS technology and data.

Better leveraging of sustainable funding and resourcing mechanisms

While funding of geospatial data infrastructures, particularly in the private sector, has traditionally relied upon general fund budget allocations, fiscal constraints place demands to examine additional funding sources (grants, fee-based sources, cost-sharing partnerships, and innovative staffing approaches) to continue to sustain and enhance geospatial data infrastructures. There are a range of “non-traditional” sources which can be pursued. The growing call for GIS and increasing required GIS data continue to make better leveraging of funding vital to success.

Program-Specific Drivers

Land Management:

- Tracking public land transactions (acquisition, sale, lease)
- Access to current information on land development and development restrictions
- Identification or orphan, unused land to new productive uses

Economic Opportunity:

- Increased economic development and tourism
- Effective energy policy and development of energy resources
- Demographic analysis and electoral redistricting and redefinition of apportionments in a way that reflects local needs and improves opportunities for federal funding

Infrastructure:

- Inventorying of and improving access to broadband communications assessment and mapping
- Efficient transportation and utility planning, development and maintenance
- Response to more stringent environmental, health, and safety regulations
- Positioning and implementation of active and passive sensor networks for the public good
- Efficient emergency planning and response

Proposed Initiatives and Architecture

Supporting the strategic goals requires a set of definitive proposed initiatives. These are organized into five themes which mirror the five themes of the strategic goals.

Public Engagement and Government Efficiency Initiatives

Public Engagement Initiatives are designed to interface directly with state, local, and community stakeholders which benefit directly from the growth of GIS and Geospatial Technologies in the state. These are designed to collect the growing concerns of the citizenry and stakeholder groups and then service their needs.


Initiative: Increase outreach efforts and awareness of the benefits of GIS technology and data and expand GIS access and use for all parts of the statewide GIS community.

Increasing awareness and participation as well as maintaining support for the statewide geospatial data infrastructure will require active promotion and outreach directed at different communities: senior management/decision makers, program and operational managers, and users. Through the use of multiple communication channels (print and electronic media, conferences, participation at events of professional associations, and web resources), this promotion and outreach will focus on the ways in which GIS can support user needs and help deliver benefits to the entire GIS user community.

Initiative: Identify and secure new funding sources and establish improved financing strategies for GIS development and operation

Statewide GIS development and ongoing operation will require the allocation of funds and staff time from multiple sources. The current geospatial data infrastructure at the state level has been fortunate to receive annual legislatively supported funding. But these annual allocations (from HB 2222) along with other funds supporting GIS projects are not sufficient for accomplishing all strategic goals and geospatial data infrastructure implementation initiatives. This goal includes initiatives to prepare a business case for geospatial data infrastructure enhancement and demonstrations of application opportunities aimed at senior decision makers. As explained in the Strategic Plan (Section 6) there are also initiatives to explore and put in place additional, non-traditional funding and resourcing approaches.

Data Development Initiatives



Reliable data is the bedrock of GIS. Authoritative, maintained, accurate, extensible, interoperable and timely data is necessary for a well functioning GIS. There are five key foundational datasets which are used in nearly every GIS application, system, analysis, or mapping activity. Absent a state-wide development program for each of these foundational datasets, various state, regional, and local agencies or governments have been forced to develop their own localized versions of each of these.

Initiative: Create Statewide Programs for Five Foundational Layers

Imagery, Elevation, Parcels, Addresses, and Road Networks each need a statewide data development and maintenance program. Statewide programs would allow data stewards to create high quality, high scale, regularly updated datasets that can be freely shared between governmental agencies and the public. These foundational layers should be constructed to allow maximum flexibility and extensibility so that future applications and uses might be developed to support the state.

Initiative: Data Interoperability Standardization


The state should construct a series of minimal and desired data standards to maximize the potential for interoperability. These data standards will be published on a publicly accessible form and or platform, such as the WV State GIS Clearinghouse. Agencies, governments, and groups within the state seeking to develop datasets would be asked to follow the data standards to the extent individual projects allow.

Initiative: Encourage and improve collaboration and coordination through increased sharing of geospatial data, technology transfer, and project partnerships

Even with the successful history of GIS activity in West Virginia over the past 15 years and significant cooperation among GIS user organizations, there are still obstacles to effective collaboration and project partnerships. Changes to the statewide geospatial data infrastructure governance structure, creation of policies and standards that enable improved cooperation and better use of current technology for technical integration will be put in place to help achieve this goal.

Governance and Coordination Initiatives

Coordination is key to minimizing redundancy and costs in data development. This plan recognizes that a singular GIS cannot be all things to all groups or people. However, overlaps and efficiencies can be found between groups engaged in GIS activities in the state. Rather than leave coordination and governance to individual users on an ad-hoc basis, these initiatives will help users maximize resources devoted to GIS use for the state.



Initiative: Enhance and strengthen the governance structure and improve management practices of the statewide geospatial data infrastructure.

The current geospatial data infrastructure governance structure and management practices currently have many of the elements needed for future success but there are limitations that present obstacles for achieving strategic goals and realizing all potential benefits from GIS technology. This plan includes strengthening and clarifying the roles of and relationship among existing entities as well as the formation of several new elements and policies that enable wider involvement and collaboration on GIS initiatives for all stakeholders.

Professional Development Initiatives

GIS is a dynamic field constantly in flux. Maintaining highly qualified personnel is critical to success in GIS development. Professional Development includes developing professional standards in the state, development of training opportunities for existing GIS staff, attracting new GIS staff from other states as well as developing opportunities for WV citizens looking to enter the field, and providing opportunity for professionals to meaningfully interact with others in the profession within and outside the state.

Initiative: Encourage and enhance programs and opportunities for training, education, and professional development for GIS staff, management, and users.

The health and ongoing development of the statewide geospatial data infrastructure is dependent on knowledgeable and skilled technical staff, managers, and users. In addition, professional development programs support career advancement for GIS professionals which helps enhance GIS services and user support. This goal addresses the need to build on current training and educational programs to offer expanded opportunities for GIS professionals statewide. This includes university courses and GIS certificate programs, focused training and workshop offerings (from vendors, professional associations, and other training providers), in-house training and mentoring, and greater use of Web-based guided training (e.g., ESRI Virtual Campus). Finally, encouragement and support for active involvement in professional associations will support professional development needs of GIS technical and management personnel.

Technology Initiatives

Technology underpins GIS. As everyone is well aware, the pace of technological advancement is both breathtaking and challenging. Reacting to this pace of change



requires initiatives designed to be adaptable and evolvable as technology and their capabilities change.

Evaluation, Monitoring, and Implementation Management

Each of these three stages represent a different scale of assessment of the strategic plan. Implementation Management coordinates the ongoing interactions between GIS agents within the state. Monitoring provides a check to ensure continuing implementations are engaging the plan at some meaningful level. Evaluation provides an opportunity for a 'post initiative' scrutiny to create lessons learned or document necessary changes to the plan based upon constantly evolving technology, data, and resources available to implement the plan.

Fortunately, WV has several existing groups whose functions can be mapped to those three stages of assessment. It is important to note that while these groups map to these three stages, in practice each group will be reflexively and interactively involved in each stage.

The Office of GIS Coordinator, as the name suggests, is best positioned to coordinate Implementation Management. As such, the Office of GIS Coordinator should be charged with presenting regular reports to the greater GIS Community, either through the Policy Council, the Steering Committee, or associated groups such as the WV Association of Geospatial Professionals.

The WV GIS Steering Committee in tandem with the Policy Council will monitor these reports as well as implementations as they pertain to the initiatives contained within this plan. The WV GIS Steering Committee and the Office of GIS Coordinator will provide a yearly report assessing progress on these initiatives, as well as providing suggestions for attaining the initiatives and their strategic goals. This report will be given to the Policy Council and the greater GIS Community.

The Policy Council will take the above mentioned reports and use them to alter, update, change, add, or delete initiatives in consultation with the Office of the GIS Coordinator and the WV GIS Steering Committee.

On a five year basis, the above reports and used to produce report assessing the existing strategic plan, the initiatives contained therein and altered by the Policy Council, This State of GIS In WV report will be available to the public, the greater GIS community, the Policy Council, the WV GIS Steering Committee, and the Office of GIS Coordinator as a means of detailing and reporting progress. That report will be used as the basis of constructing the next five year plan.



Organization Acronyms


GIS Policy Council (GPC): The GIS Policy Council (GPC) was created through the Executive Order 4-93, and refined in Executive Order 10-10. The Council oversees the development and implementation of West Virginia's geospatial data infrastructure, in seeking to optimize the benefits of GIS technology for the state into the future. The Council is composed of executive leaders from state departments, local government, and the GIS professional community. The WV Office of GIS Coordinator provides operational support for the Council and the State Steering Committee provides technical advice to both the Council and the GIS Coordinator. Membership includes senior management from state agencies and representatives of GIS stakeholder organizations outside of state government (Association of Counties, Municipal League, and the WVAGP). See www.gis.wv.gov/policycouncil

GIS Steering Committee (GSC): The GIS Steering Committee (GSC) is charged with the development and implementation of the GIS Strategic Plan for the State of West Virginia. The Steering Committee was created by Executive Order 4-93, and refined in Executive Order 10-10 with a newly formalized membership of GIS representatives from West Virginia state agencies, local government, the academic, federal, and private sectors, and a representative from the WVAGP. See <https://www.wvgs.wvnet.edu/www/giscoord/index.php>

The National States Geographic Information Council (NSGIC): The National States Geographic Information Council Geospatial Maturity Assessment provides NSGIC members and other partners with a summary of geospatial initiatives, capabilities, and issues within and across state governments. The NSGIC GMA assesses each state on central data themes and coordination topics every two years.

Office of GIS Coordination (OGC): The position of GIS Coordinator was created through Executive Order 4-94 and the Office of GIS Coordination (OGC) was created through Executive Order 10-10 and both were administratively placed in the WVGES with formal oversight by the GPC. The mission of the OGC is to work with state agencies, West Virginia's GIS community, and regional and federal partners to provide and promote cooperative leadership, support, and innovative solutions for utilizing geospatial technology in serving the public good. The OGC participates in and provides support for the GPC and the Steering Committee. See <https://www.wvgs.wvnet.edu/www/giscoord/index.php>

State Geological and Economic Survey (WVGES): The State Geological and Economic Survey (WVGES) is an Executive branch agency within the Department of Commerce. The WVGES is the administrative home of the Office of GIS Coordination (OGC) with administrative authority in the management of budgets, administration of contracts, and support in project management associated with the work of the OGC. See www.wvgs.wvnet.edu.




WV Association of Geospatial Professionals (WVAGP): The WV Association of Geospatial Professionals (WVAGP) is an independent, volunteer-based body with a mission to facilitate the advocacy, use, development, sharing, and management of geospatial data and communicates the value of geospatial information to citizens and decision-makers. Members of WVAGP include representatives from local, state and federal agencies, educational and research institutions, the private sector, and other professional organizations. The WVAGP is governed by a Board of Directors and its operation is guided by formally approved by-laws. These by-laws establish several standing committees and allow for the creation of “special committees” as needed. The WVAGP has been formally identified through HB 4003/SB 359 as a GIS User Group. See www.wvagp.org

WV Department of Arts, Culture, and History:

The mission of the West Virginia Department of Arts, Culture and History is to identify, preserve, protect, promote and present the ideas, arts and artifacts of West Virginia’s heritage, building pride in our past accomplishments and confidence in our future. See <https://wvculture.org/>

WV Department of Environmental Protection (WVDEP):The West Virginia Department of Environmental Protection (WVDEP) enforces state and federal environmental laws in West Virginia to help protect our air, water, and land. With the enactment of Senate Bill 217 during a special session of the West Virginia Legislature, the Division of Environmental Protection was established in October 1991. Following years of restructuring and reorganizing, the Division was elevated to a cabinet-level agency in 2001, and thus the Division of Environmental Protection became the Department of Environmental Protection. See <https://dep.wv.gov>

WV Division of Emergency Management Division: The primary purpose of the West Virginia Division of and Emergency Management is to protect life and property. Guided by West Virginia State Code and the West Virginia Emergency Operations Plan, the agency is responsible for disaster preparedness, response and recovery, and mitigation. (Mitigation is the effort to lessen the impact disasters have on people's lives and property through damage prevention and flood insurance.) During state emergencies, this division activates the State Emergency Operations Center to respond to and coordinate materials and assistance needed by county emergency services to protect the lives and property of citizens. County emergency services offices provide direct assistance to citizens. WVDEM provides assistance to county emergency services offices. The agency also coordinates the recovery efforts after the disaster with all responsible government agencies. After a federal disaster declaration, the WVDEM works closely with the Federal Emergency Management Agency to administer assistance programs




WV Division of Emergency Management (EM): SB 586 renames the Division of Homeland Security and Emergency Management (WVDHSEM) as the Division of Emergency Management. It will be commonly known as Emergency Management or EM. The agency will continue to lead the state's response to manmade or natural disasters, help to ensure the protection of life, property, and economic viability by providing coordination, guidance, support and assistance to local emergency managers and first responders. See <https://emd.wv.gov/>

West Virginia Division of Natural Resources (WVDNR): The statutory mission of the West Virginia Division of Natural Resources to provide and administer a long-range comprehensive program for the exploration, conservation, development, protection, enjoyment, and the use of the natural resources of the State of West Virginia. Primary divisions include Wildlife Resources Section, West Virginia State Parks Section, Law Enforcement Section. See <https://wvdnr.gov/about/>

WV Department of Transportation (WVDOT): It is the mission of the West Virginia Department of Transportation to create and maintain for the people of West Virginia, the United States and the world a multi-modal and inter-modal transportation system that supports the safe, effective and efficient movement of people, information and goods that enhances the opportunity for people and communities to enjoy environmentally sensitive and economically sound development. The West Virginia Department of Transportation (WVDOT) is composed of more than 6,000 men and women who work in the Division of Highways; Division of Motor Vehicles; Division of Public Transit; the Public Port Authority; the Parkways, Economic Development and Tourism Authority (W.V. Turnpike); the State Rail Authority; and the Aeronautics Commission. See <https://transportation.wv.gov/about/Pages/default.aspx>

WV GIS Technical Center (GISTC) and GIS Data Clearinghouse: The WV GIS Technical Center (WVGISTC) was established through Executive Order 4-93 and Executive Order 10-10 and receives funding through HB 2222. The GISTC, located in West Virginia University's (WVU) Morgantown campus, plays a major role in providing technical services, data, and GIS application services to the statewide GIS user Community. The GISTC has a major role in hosting and maintaining the state's GIS Clearinghouse. See <http://wvgis.wvu.edu>

West Virginia Infrastructure and Jobs Development Council (IJDC): The West Virginia Infrastructure and Jobs Development Council (IJDC) was enacted in 1994 by the West Virginia Legislature, The West Virginia Infrastructure & Jobs Development Council (IJDC) was created to be West Virginia's funding clearinghouse for water and wastewater projects. Please use this site as your first source for general information about the council, important dates, meeting times & locations, IJDC forms & submittal requirements, project information and funding data. The Infrastructure Fund is administered by the West Virginia Water Development Authority (WDA) www.wvwater.org and WDA services bonds and loans are made at the direction of the Council for IJDC. See <http://www.wvinfrastructure.com/>



The WV Water Development Authority (WDA): The West Virginia Water Development Authority (WDA) serves as a revenue bond bank that provides financing for construction of wastewater and water facilities to Local Governmental Agencies (LGAs--municipalities, public service districts and other political subdivisions). The WDA's mission is to provide communities in West Virginia financial assistance for development of wastewater, water and economic infrastructure that will protect the streams of the State, improve drinking water quality, protect public health and encourage economic growth. See <http://www.wvwda.org/>

Glossary

Administrative Boundaries: Boundaries that encompass areas for programs and services administered by a federal, state, regional, or local authority (e.g., U.S. census, election districts, regional planning agencies, health districts, local government service districts, emergency service zones, etc.)

Cadastral: Boundaries of real property parcels, public rights-of-way, and legally defined easements. Also includes taxing district boundaries which establish the basis for property appraisal.

Demography: Includes boundaries of geographic units for which demographic data is compiled as well as aggregated demographic data for these geographic units (population, income levels, ethnic background, etc.). Includes data from Census Bureau Decennial Census statistics as well as demographic statistics from other sources.

Elevation: Elevation points or a digital elevation model in a grid or TIN format compiled photogrammetrically from stereo aerial photography, from LiDAR, or derived from digitized contour maps.

Flood Zones: Boundaries of predicted flood zone areas based on FEMA flood rate insurance maps.

Geodetic Control: Horizontal and/or vertical control points established with accurate field survey techniques with permanent marker and documentation. Can be referenced with high precision to geographic coordinates (lat/long), horizontal and vertical datum, and appropriate plane coordinate systems.


Geology and Mineral Resources: Surficial bedrock geology and selected subsurface geological strata including coal and other extractable mineral resources.

GIS Stakeholder Organizations: Includes any public, private, or non-profit entity in the state which is currently using or is interested in GIS technology.

Governmental Units: Boundaries of state, county, municipal jurisdictions and public service districts (school districts) used for allocation of real property taxes.

Land Cover/Vegetation: A characterization of the vegetative or non-vegetative cover at the surface.

Orthoimagery: Orthorectified raster data derived from scanned aerial photography, digital aerial cameras, or commercial satellites. Pixel size of 1 foot or less in B&W, color, or four bands. Orthorectified raster data derived from scanned aerial photography, digital aircraft scanners or satellite imagery with a pixel size normally in the 1 to 5 meter range.



Public Safety Critical Facilities: Location of facilities important for emergency planning and response (law enforcement and fire/EMS stations, shelters, schools, hospitals and medical clinics, etc.).

Regional GIS User Groups: Regional user groups are formally defined bodies or informal groups established to promote communication, collaboration, sharing of resources, and transfer of technology among GIS user organizations in a geographic region of the state. The current "Eastern Panhandle GIS User Group " and the MMAGIC in Morgantown area are examples of regional user groups.

Soils: Detailed soil unit boundaries (SSURGO) mapped by the National Resource Conservation Service.

Surface Hydrography: Surface water courses, water bodies, and hydrographic basin boundaries (e.g., NHD data).

Telecommunications: Utility infrastructure supporting telephone, cell phone, and radio transmission. Includes towers, land lines, and facilities for voice and data transmission.

Transportation-Other Transportation Modes: Other, non-road, transportation modes including trails, aviation facilities, railroads, and water navigation routes and facilities.

Transportation-Road Network and Addresses: Road network including all highway and road classifications, local streets, and selected private roads. Includes address ranges applied to street/road centerline segments.

Water Utility: Water supply facilities (reservoirs, tanks, and treatment plants), water transmission lines, and the distribution network that delivers water to consumers. Including boundaries of utility service areas and other sub-service area boundaries used by a utility organization for management of the utility system.

Wastewater Utility: Treatment facilities and the collection network that moves wastewater from generation points (homes and businesses) to treatment sites. Including boundaries of utility service areas and other sub-service area boundaries used by a utility organization for management of the utility system.

