

Celebrating 10 years of progress! What should our vision be for advancing GIS in the next 10 years?

WV Framework Data Development

West Virginia's Base Layer Development: Core geographic layers are important because they form the “framework” for most mapping applications. Table 1 lists ongoing and potential data development activities for West Virginia's base mapping layers. Many of these activities include creating value-added products from the new 1:4800-scale base layers derived from the Statewide Addressing and Mapping Board (SAMB) project.

Table 1. Data development of statewide geographic mapping layers requires lines of communication, authority, and defined stewardship roles. Focal issues may include data maintenance, data distribution, published data standards, and effective business models for supporting data development activities.

MAPPING LAYER	PRINCIPAL STEWARDS			DATA DEVELOPMENT FOCAL ISSUES
	Local	State	Federal	
ORTHOPHOTOS			USGS USDA	(1) CURRENT: 2003 SAMB orthos; 2-ft natural color ; public domain (2) FUTURE STATEWIDE IMAGERY: (a) <i>Digital Imagery for the Nation</i> initiative (3-year cycle). (b) USDA National Agricultural Imagery Program (NAIP); 1-meter, leaf on, color-infrared orthophoto product.
TRANSPORTATION ROADS	E-911 Address Coord.	IS&C DHS- EM DOH	Census USDOT USFS	(1) FUTURE: SAMB road centerlines. Road centerline attributes: DOH road classification, correct name, address range, ESZ number. In 2007 publicly available in TIGER format. (2) MAINTENANCE: Baker Project Management Team developing statewide addressing and mapping system.
RAILROADS		PSC	Census USDOT	FUTURE: SAMB railroads ingested into Census TIGER or other state/national transportation data set. WVSAMB must first approve release of railroads. Availability?
TRAILS			NPS USDOI	FUTURE: SAMB contractor creating trail layer with following attributes: name and address/road intersection of trail head. Availability?
NAVIGABLE STREAMS			USACE	FUTURE: SAMB contractor creating navigable waterway with USACE mile markers. Availability?
HYDROGRAPHY		DEP	USGS	FUTURE: In cooperation with USGS, Stream Working Group conduction pilot to convert SAMB streams to “local resolution” National Hydrography Dataset (NHD). Availability?
ELEVATION			USGS	FUTURE: In cooperation with USGS, complete SAMB elevation conversion for 3-meter National Elevation Dataset product. Available in public domain in 2006.
STRUCTURES	E-911 Address Coord.	SAMB	Census USGS	FUTURE: Structures with non-confidential attribute information. Availability?
BOUNDARIES POLITICAL	Assessors & Clerks	????	Census	FUTURE: Municipal boundaries re-aligned by Census to 1:4800 SAMB base. Available in 2010. MAINTENANCE: Activate State Boundary Commission. Establish geographic partnership program between state entities and Census.
PUBLIC LANDS		DNR	USDOI	MAINTENANCE: Collect both proclamation and surface ownership boundaries. Resolve coincidental boundary issues
TAX	Assessors		USGS	
LAND COVER			USGS	FUTURE?: Incorporate patchwork of local resolution land cover datasets into the USGS National Land Cover Dataset (NLCD)
GEOGRAPHIC NAMES		GISTC GES	USGS	MAINTENANCE: Continue to update official national gazetteer, the USGS Geographic Names Information System database.
CADASTRAL (TAX)	Assessors	DTR	BLM	MAINTENANCE: Assessors Association leading an effort to revise legislative rules for maintaining and publishing digital tax maps.

** BASE LAYER NOTES **

1) SAMB Orthophotos:

- a) *Digital Aerial Imagery for the Nation Initiative*: A proposed initiative for nationwide imagery updates every 3 years. Over the past year, the National States Geographic Information Council (NSGIC) has developed a vision to define a sustainable and flexible digital aerial imagery program to serve all levels of government and private partners. NSGIC suggests that \$255 million would cover a three year cycle including imagery at 6", 1 ft and 1 meter, depending on density. Participants could "buy up" should they want higher resolution for their geography. The vision is that such a project would be fully funded by the federal government and that the data would remain in the public domain.
- b) *SAMB Orthophoto Re-Projection and Formats*: The USGS Denver Mapping Center has finished re-projecting the SAMB orthophotos from the current WV State Plane projection to UTM NAD83. WVGISTC is waiting for USGS to resend corrected files without any black pixels located where the North and South State Plane Zones merge (Figure 1). In addition, due to repeated service requests and to assist the statewide geospatial community, WVGISTC will post on its Data Clearinghouse ESRI re-projection (*.aux) and image catalogs files for the State Plane ortho format.

Table 2. SAMB Orthophoto Formats. Typically, a variety of formats are needed to serve multiple users and applications.

Format	Projection	Tile Format	Compressed (Internet Download)	Uncompressed
SAMB ORIGINAL	WV State Plane	10,000' x 10,000'	MrSID (WVU/RTI)	GeoTIFF
USDA MOSAIC	UTM Zone 17	County mosaics	MrSID (USDA)	
USGS QUARTER QUAD	UTM Zone 17/18	Quarter quads	MrSID (WVU)	GeoTIFF
USGS BAKER 4096 FORMAT	UTM Zone 17	4096 x 4096 pixels	mapWV.com (WVU)	GeoTIFF

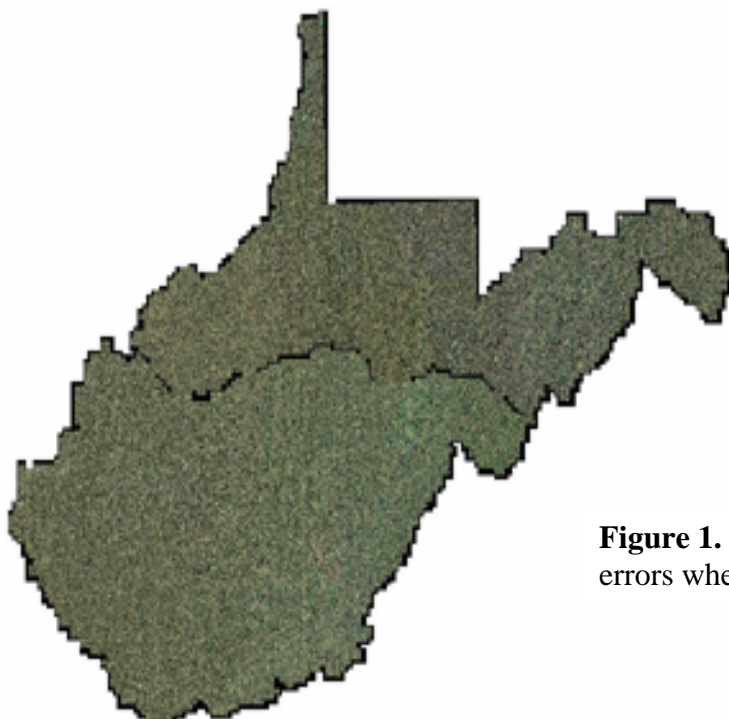


Figure 1. Statewide raster mosaic with black pixel errors where State Plane Zones merge.

- 2) **SAMB Elevation:** *SAMB Elevation Conversion to National Elevation Dataset (NED).* In cooperation with the U.S. Geological Survey (USGS), the WV GIS Technical Center (WVGISTC) is converting SAMB elevation mass points and breaklines into a raster surface for inclusion into the National Elevation Dataset. The horizontal resolution and vertical accuracy of this statewide Digital Elevation Model (DEM) will be 3 meters.

<http://wvgis.wvu.edu/stateactivities/WVSAMB/sambelevation.html>

CONVERSION STATUS: WVGISTC has completed the elevation conversion for 65% of the State. The converted elevation datasets have been submitted to the USGS for certification and eventual inclusion into the National Elevation Dataset. In 2006 the SAMB seamless digital elevation raster data should be publicly available for the entire state.

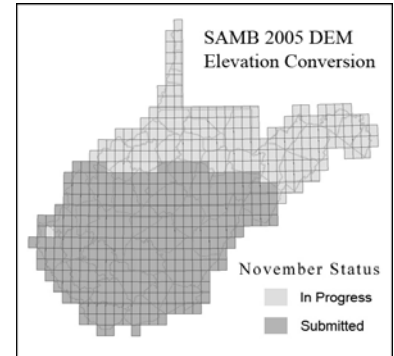


Figure 2. November 2005 elevation conversion status

- 3) **SAMB Streams.** *SAMB Stream Conversion to National Hydrography Dataset (NHD).* In cooperation with USGS, a “local resolution” National Hydrography Dataset project is underway to convert the SAMB 1:4800-scale stream layer to the national NHD standard. Local resolution NHD would ultimately map every surface water feature in the State at a high level of detail, while also providing a framework for many water resource applications. <http://wvgis.wvu.edu/stateactivities/lrnhd.html>
- 4) **SAMB Road Centerlines to Census TIGER:** Census timeline associated with ingesting SAMB road centerlines into Census mapping products for West Virginia.

Table 3. Census Mapping Activity Timeline.

Date	Mapping Activity
2006	Realignment of TIGER street centerlines to SAMB base.
2007	Start benchmarking TIGER and Master Address File (MAF) to create LUCA map and address files.
2007 (Summer)	LUCA invitation letters mailed. Program continues through 2008.
2007	SAMB Road Centerlines publicly available in TIGER format (This will happen in our twice-a year release of TIGER. The first release in early 2007 might have some WV counties, with more following in subsequent releases.)
Late 2007-2008	Phase 2 of Redistricting Program (States delineate Voting District Boundaries for Census 2010 data tabulation).
2008	Statistical Areas Program (Census Tract/Block Group delineation) underway between Census and WV participants
2009	Canvass WV to update/verify Census Master Address list
2008-2010	Annual Boundary and Annexations Survey (BAS) will update municipal/county boundaries to realigned TIGER files.
2011	Statistical area and census administrative boundaries publicly released
2011	Redistricting GIS file released

- 5) **Statewide Addressing and Mapping System (SAMS).** System in development by Baker Project Team for maintaining addressing and mapping layers.

Table 4. Potential maintenance partners of SAMS.

Maintenance Partners	Role
County E-911	Update addressable data layers
WV Information Services and Communications (IS&C)	Maintain SAMB databases
WV Division of Homeland Security and Emergency Management (DHS-EM)	Validation
WV Division of Highways (DOH)	Validation

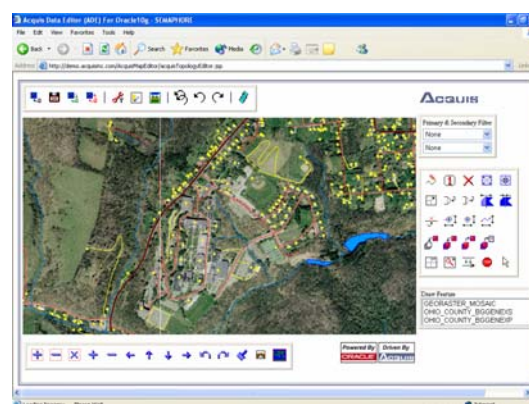
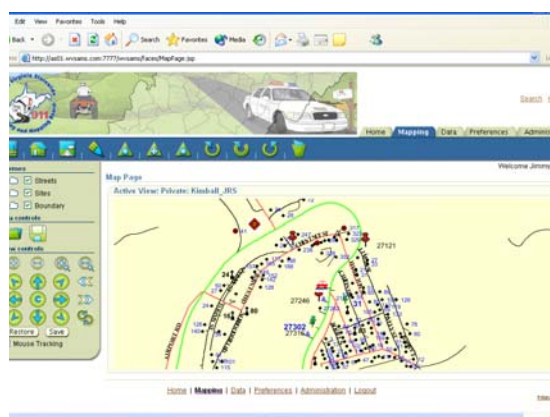


Figure 3. SAMS driven by Oracle Spatial and Acquis software

- 6) **GIS Services - MapWV Initiative:** Public access to a distributed network of GIS servers in West Virginia.

Gateway to WV GIS Services (mapWV.com): A state portal to GIS-related information, data sets and maps. It is modeled after Kentucky's geographic network, with the intention of making GIS services more visible in the State. Potential GIS Resources: basemap resources (WVGISTC; Figure 5), geology (WVGES), environmental protection (WVDEP), recreation (WVDNR), soil conservation (WVSC), and transportation (RTI).

ArcIMS Internet Server (mapWV.com). With ArcMap software, users can add West Virginia base layers directly from the Internet. (Figure 4).

OGC WMS Server: OpenGIS Standard; services registered through National Map Catalog. WVGISTC is cooperating with USGS to bring OGC-compliant services online for WV base mapping layers.

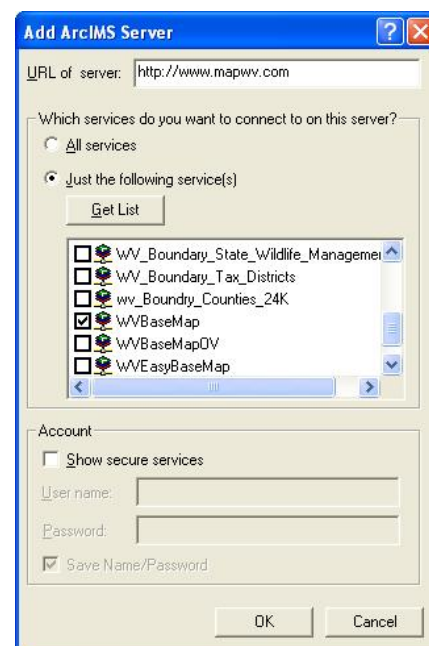


Figure 4. Add WV base layers directly from the Internet

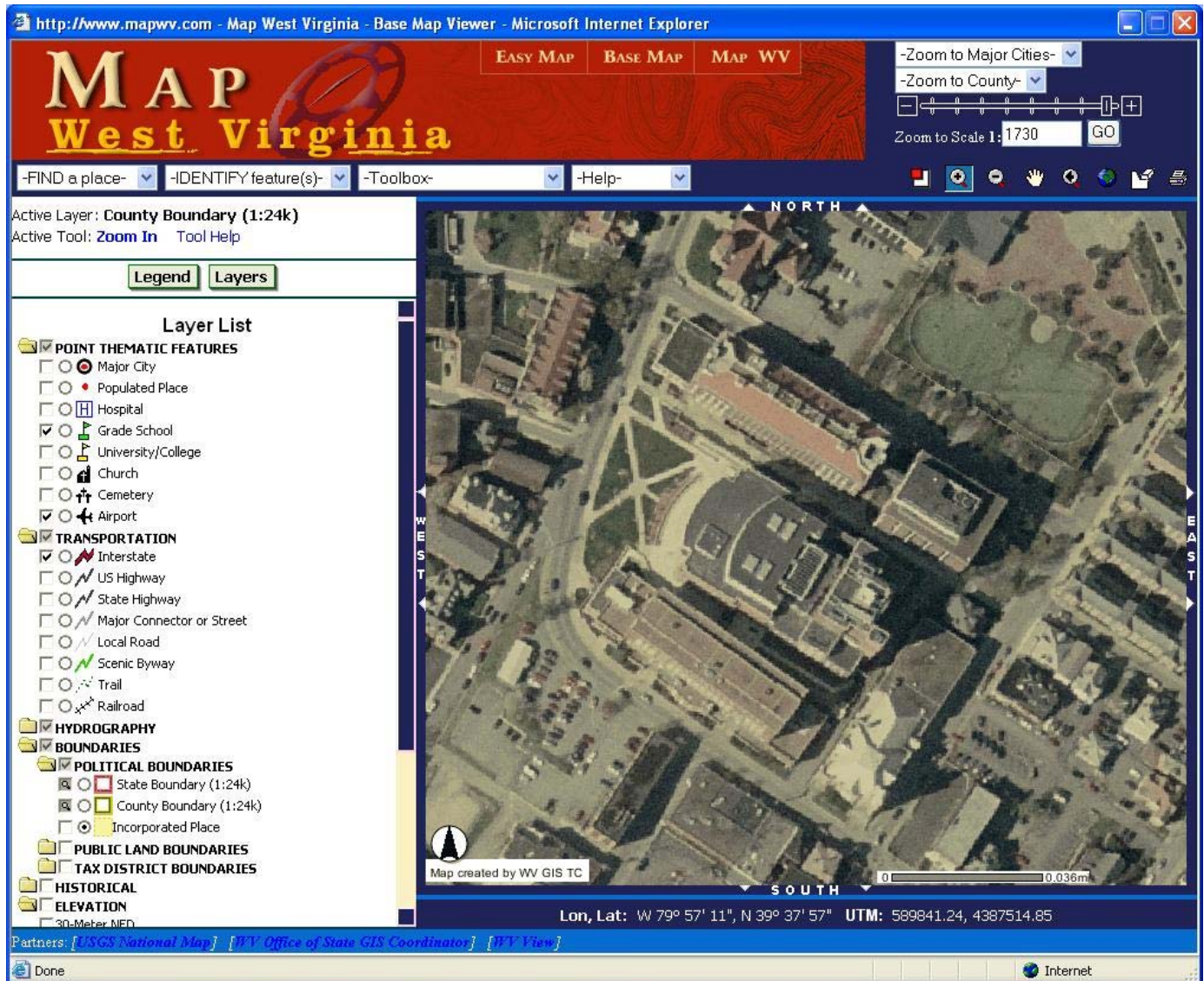


Figure 5. WV Base Layers Viewer Application (mapWV.com). Please review and send comments to Kurt Donaldson at kdonalds@wvu.edu

7) Cadastral Layer – New Directions?

At a recent Property Valuation Training and Procedures Commission (PVC) meeting the Assessors Association were given authority to develop new digital tax mapping guidelines.

Below are some ideas / action items to consider regarding the development, maintenance, and publishing of surface tax maps in West Virginia:

Establish PERFORMANCE MEASURES for Assessors' tax mapping programs. When do county assessors, for example, know that they have a "functional" GIS mapping system in place? Some suggested guidelines:

- (1) GIS FORMAT: Assessors should maintain their computer tax mapping files in a GIS format. That is...
 - Geographic files are spatially referenced to a common coordinate system (e.g., State Plane, UTM).
 - Geographic tax files are seamless countywide.

- Geographic parcel files can be linked to external databases like CAMA.
- Geographic annotation files can be easily exported.

(2) MAINTENANCE: Assessors must continually maintain their digital tax files. Parcel file edits should be done using Coordinate Geometry (COGO), utilizing other GIS reference layers, or both methods.

(3) PUBLISHING: Assessors should have the ability to create computer-generated "pretty maps."

- Map book applications or programs allow assessors to create print-on-demand maps quickly for public or internal use.
- Optional Internet Mapping applications allow the public greater accessibility to tax map information.

GUIDELINES AND STANDARDS:

- Review and promote IA00 Standard on Digital Cadastral Maps and Parcel Identifiers (IA00, July 2003)

http://wvgis.wvu.edu/stateactivities/standardsandguidelines/tax/IAAO_tax_standard_july03.pdf

- Review national and other state mapping standards. How effective and efficient is West Virginia's tax mapping program when compared to other state models?

<http://www.nationalcad.org/>

<http://www.nationalcad.org/showdoclist.asp?doctype=16&navsrc=Standards>

<http://www.nsgic.org/states/index.cfm>

- Review GIS Plan for setting up a successful countywide GIS program in West Virginia

http://wvgis.wvu.edu/stateactivities/strategicplans/Monongalia_Co_GIS_Plan_jul04.pdf

Revise the Property Valuation Training and Procedures Commission (PVC) procedural rules for STATE TAX MAPPING GUIDELINES

- Update the Statewide Procedures for the Manual Maintenance of Surface Tax Maps, Title-Series 189-04, set forth by the State's Property Valuation Training and Procedures Commission, for general guidelines regarding map content and cartographic design. When producing digital tax maps, the assessors should have flexibility regarding line width, color, and annotation within an adopted statewide framework. The principal guideline should be that the computer-generated surface tax maps convey parcel information and other geographic features in a manner that is visually appealing, legible, accurate, and consistent. In addition, map readers should realize that the digital tax maps represent the "relative" position of the tax parcels; thus, the tax maps should only be used as a general reference of the parcels' approximate location and not construed to be an "official" land survey.

<http://www.wvsos.com/csrdocs/worddocs/189-04.doc>

Revise the Property Valuation Training and Procedures Commission (PVC) procedural rules for TAX MAP SALES

- Update the Tax Maps Sales, Title-Series 189-05, set forth by the State's Property Valuation Training and Procedures Commission, for general guidelines regarding digital tax map sales. The sale of GIS mapping files and computer-generated hardcopy maps should follow similar pricing guidelines. Digital files published on the Internet should be accessible at no charge. If state government agencies consent to disclosure agreements, then agencies like the WV DOT, Development Authority, and WV Division of Homeland Security and Emergency Management Office, which rely on accurate and current parcel data, should have access to digital tax mapping files from a centralized data warehouse maintained at the WV DTR.

<http://www.wvsos.com/csrdocs/worddocs/189-05.doc>

- 8) **Register now for 2006 WV GIS Forum and Workshops:** (<http://wvgis.wvu.edu/conference/2006/>) May 15-19, Morgantown, WV. More information about base layers and applications layer development. (geology, soils, farm lands, flood mapping, critical infrastructure). An updated agency roll call report will be published as part of the Forum.