



WEST VIRGINIA

Geographical
Information Systems
Policy Council

STATEWIDE LAND INFORMATION SYSTEM BUSINESS PLAN

Prepared by the

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With assistance from:



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Our strategy, to realize these full benefits, is to create a geographic information system (GIS) designed to hold the state-wide cadastral data set. This WV Land Information System (LIS) would allow counties to directly enter cadastral information, preferably through a Web interface, so counties without a GIS can participate. The LIS would also allow data importing from counties that have GIS systems. The system will be designed to allow all 55 state counties to use it daily for regular transactions. This is to allow counties that currently have GIS systems to avoid the costs of upgrading and maintenance by moving their operations to the state-wide system. The system would be directly linked to the Integrated Assessment System (IAS), so that geographic queries would have all the valuation data associated with them.

1.2 DESIRED OUTCOMES

This year (2011) the Nick Rahall, II Appalachian Transportation Institute (RTI), in cooperation with the WV Office of GIS Coordination (OGC) conducted a series of planning workshops with state GIS stakeholders. This work was supported by a National Spatial Data Infrastructure (NSDI) grant from the Federal Geographic Data Committee (www.fgdc.gov/nsdi). Anyone interested was invited to attend and the turnout was impressive. After six workshops we had representatives from twenty-nine (29) of the fifty-five (55) counties participate. Nine different state and federal agencies attended along with six private businesses, six of the eleven Regional Councils, three universities were represented, six trade organizations, and eleven people from the WV GIS Steering Committee. We mention this to show that our solution and this plan did not come from one group's perspective. After working through the issues and discussing various solutions the GIS stakeholders reached agreement on what outcomes were needed to benefit the State of West Virginia. This business plan outlines the four major outcomes needed to create a West Virginia state-wide Land Information System, maintain it, and get the most use from it.

- Create a system to hold the statewide cadastral data set
- Work with counties to convert data
- Train counties to use the new system in their daily work
- Build a support system to keep the system operating smoothly



Figure 2: One of Six Planning Workshops with GIS Stakeholders

1.3 NEEDED RESOURCES

In the following sections we not only discuss the benefits of a building the WV LIS, we also show the details of how we arrived at our cost estimates, and time table for implementation. Here we will summarize the project costs in this plan.

The cost of some items that aid building a support system, such as an online feedback system and surveys, are included in building the LIS. The training based on county workflow, which we consider key to success, is estimated to cost \$100,000 and includes building an online version for future review and training. The computer system to hold the data for all the counties, including hardware, software, installation, and server training is estimated to cost \$225,798. The largest expense and biggest job is converting parcels, mineral parcels, and deeds into digital format. The estimate for doing all three is \$26.9 million. This brings the estimate for the entire LIS project to \$27.21 million.

These estimates include vendor help for doing work on the project. In addition, the OGC will need two new staff members to maintain the LIS. Other ongoing support costs include a maintenance fee for hosting the LIS server, expenses for hosting various stakeholder meetings each year (regional and state-wide), and upgrading the hardware and software for the LIS over time. These costs are detailed in Section 4.

PROJECT COMPONENT	ESTIMATED COST	PERCENT OF TOTAL
LIS Hardware, Software, etc.	\$ 225,798	0.83%
County Workflow Training	\$100,000	0.37%
Data Conversion	\$26,884,202	98.80%
TOTAL	\$27,210,000	

Figure 3: Estimated Project Costs by Category (more detail in Section 4 and 5)

2.0 GOALS

In this section we examine the goals of this business plan and how they relate to the West Virginia Statewide GIS Strategic Plan.

BUSINESS PLAN GOALS	2012	2013	2014	2015	2016
Create Land Information System (LIS)					
Train Counties on LIS					
Develop Student Program					
Convert Parcel Data					
Convert Mineral Data					
Convert & Link Deeds					

Figure 4: Business Plan Goals & Year of Completion

2.1 PROGRAM (PROJECT) GOALS

The purpose of this business plan is to create a statewide West Virginia cadastral layer (or data set), provide access to appropriate stakeholders, and help them get the most use from it. To do this we propose building the West Virginia Land Information System (LIS). The overall system of software, hardware, statewide data, training program, and governance system will be known as the Land Information System (LIS). We call the information technology (IT) component (the configured hardware & software) the Cadastral Layer System to distinguish it. This distinction will probably go away once the entire project is complete. There are six major goals that need to be achieved to do this. They are listed here with descriptions.

CREATE CADASTRAL LAYER SYSTEM BY THE END OF 2012

A computer system capable of holding the cadastral data for all of West Virginia’s counties and capable of being used by all counties for their daily cadastral needs, is to be completed by the end of 2012. This system will link to the data in the Integrated Assessment System (IAS), so that geographic searches contain all parcel attributes from the IAS. This system will allow public access through the Web with the minimum functionality being pegged to what our counties most advanced geographic-information-systems (GIS) are offering today. The ability to customized functionality (turn on and off) by at least the county level will be offered for all features (e.g., photos of homes).

TRAIN COUNTIES BY THE END OF 2013

Work with counties to determine needs. Develop training focused on their jobs and transactions. Use training to establish common vocabulary and standards for deeds, surveys, and land and mineral transactions. Documenting the processes counties use for parcel transactions and reaching agreement on what needs to happen (what should initiate a transaction, who needs to be notified when parcel data changes, time frame for update, etc.) when a transaction takes place is key to the training. The plan is to look for ways to make work easier and offer additional

features to county employees and customers with the Land Information System. Training will be saved to an online version for reference, review and training of future employees.

DEVELOP GEOSPATIAL STUDENT PROGRAM BY THE END OF 2013

The plan is to work with geospatial education programs (college, community college, etc.) to develop a system for students to work with counties on parcel data in the State. Parcels that have not been reviewed (surveyed, subdivided, deed search, etc.) in fifty (50) years will be targeted. The idea is to develop a cycle of reviewing all parcels in the State every so many years with this program to determine the period.

CONVERT PARCEL DATA BY THE END OF 2014

Work with all West Virginia counties to determine status of parcel data. Manage vendors (and purchasing process) to convert parcel information to GIS format for above system. Work with counties and vendors to import their data into LIS.

CONVERT MINERAL DATA BY THE END OF 2015

Work with State Tax Department and vendors on determining the best approach and cost for converting (creating) remaining mineral parcels. Import mineral data into LIS. Counties will be able to do complete geographic searches including mineral parcels with all attributes from IAS.

SCAN ALL DEEDS AND LINK TO PARCELS BY THE END OF 2016

For counties that have digital copies of their deeds, make a link to the parcel in the Cadastral Layer System, so deed information can be referenced from a parcel. This should include links to previous deeds if needed to reach the original. For counties that do not have digital copies of their deeds, start a program to scan those deeds and link them to the Cadastral Layer System.

2.2 STRATEGIC GOALS

The West Virginia Office of GIS Coordination and the GIS Steering Committee completed a Statewide GIS Strategic Plan in 2010. As part of this planning process they developed strategic goals. A critical element of the strategic foundation this set of high-level goals (sometimes referred to as “strategies”) identify key areas for action. These goals address important development or operational areas that are critical for long-term GIS development, coordination, and operation in West Virginia. The goals frame the overall intent of the Strategic Plan and give a high-level basis for implementation initiatives. The goals, of West Virginia’s Statewide GIS program are:

1. Enhance and strengthen the governance structure and improve management practices of the statewide GIS program.
2. 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.
3. Identify and secure new funding sources and establish improved financing strategies for GIS development and operation.
4. Encourage and improve collaboration and coordination through increased sharing of geographic data, technology transfer, and project partnerships.

5. Enhance the quality of geographic data and create effective stewardship practices and standards to efficiently develop and maintain statewide coverage of Framework geographic data.
6. Support the development and maintenance of important, non-Framework geographic data.
7. Encourage and enhance programs and opportunities for training, education, and professional development for GIS staff, management, and users.
8. Maintain and upgrade computing and network infrastructure to provide adequate capacity to support current GIS applications and to adopt new information technology tools and environments.
9. Establish core capability for developing in-house geospatial applications and services in state government to provide greatest benefit for State agencies and other GIS stakeholder groups.

2.3 GOAL RELATIONSHIPS

The table below lists the Program Goals for this business plan from above. The second column in the table references the strategies (Strategic Goals) by their number above. This means that a business plan goal with an 8 beside it is helping the State meet the strategy listed as number 8 in the GIS Strategic Plan.

PROGRAM GOAL	STRATEGIC GOAL
Create Land Information System (2012)	2, 3, 4, 5, 8
Train Counties (2013)	2, 3, 4, 5, 7
Develop Geospatial Student Program (2013)	3, 4, 5, 7
Convert Parcel Data (2014)	3, 4, 5
Convert Mineral Data (2015)	3, 4, 5
Scan Parcel Deeds (2016)	3,4,5,6

Figure 5: Strategic Goals Met by This Business Plan

2.4 SUCCESS FACTORS

The guidelines for this business plan ask us to state the success factors or supporting objectives for each program goal. We do this below, but also thought it was important to list overall success factors for all the goals. Here is that list.

- Agreement among WV GIS stakeholders on (business plan) Program Goals
- A plan that shows overall path and clear responsibilities used to measure progress and success
- Regular communication among stakeholders during the project
- A focus on the Program Goals (don't get pulled off task or broaden scope)
- Support from both County and State leaders

Here are the success factors by Program Goal.

CREATE LAND INFORMATION SYSTEM BY THE END OF 2012

- Close work with counties to develop a system useful to them
- Review of attributes and features with private sector for possible customer benefits and revenue streams
- Commitment by State to Operate and Maintain new system
- Validation that new system will be relatively low in cost, due to synergy from existing infrastructure
- Funding from interested state agencies (and perhaps other sources)

TRAIN COUNTIES BY THE END OF 2013

- Working directly with counties to develop requirements based on their jobs and making them easier (create a needs assessment)
- Input from all stakeholders, so downstream impact of actions by county are understood (e.g., don't delete acreage of partially mined property)
- Using training to create a statewide county level community of interest
- Good training facilitator
- Creation of online content to get more return on investment
- Funding for training

DEVELOP GEOSPATIAL STUDENT PROGRAM BY THE END OF 2013

- Involving educational programs at all levels (vocational, community college, college and university)
- Finding engaged sponsors at each institution that wants to participate
- Designing guidelines for the "internship" that make the work done by the students meaningful to the counties and the students
- Collecting and acting on feedback from both students and counties

CONVERT PARCEL DATA BY THE END OF 2014

- Creating the Land Information System above, so counties have a place to put converted data and a way to use it
- Creation of recommended standards for data conversion, so it is done consistently
- Funding for data conversion

CONVERT MINERAL DATA BY THE END OF 2015

- Review data attributes and features with stakeholders (counties, private sector) for possible customer benefits and revenue streams
- Creation of recommended standards for data conversion, so it is done consistently
- Funding for data conversion

SCAN ALL DEEDS AND LINK TO PARCELS BY THE END OF 2016

- Make use of WV State Achieves to convert as many deeds to digital format as possible in one location
- Working with counties so data conversion of recent deed books does not interfere with daily work
- Linking digital deeds to parcels (which will be linked to IAS), so queries provide all the information

3.0 BENEFITS

We believe that there are several interrelated benefits for a statewide cadastral data set for West Virginia and we list many of them below with examples. If we look at what all these benefits have in common, we arrive at the primary reason for this business plan.

We propose making a West Virginia statewide Land Information System (LIS) available to all the appropriate stakeholders. The primary reason for implementing this system is to improve decision making at all levels of government. The types of decisions and the wide variation in applications explain why there are so many benefits and why we think implementing this plan is such a great idea. Let's look at these improved decisions and benefits.

3.1 LOCAL GOVERNMENT

Counties and municipalities stand to gain several benefits from improved decision making using a statewide cadastral data set in the WV Land Information System (LIS). Here are the major categories.

FAIR ASSESSMENT

Most of the history of parcel-level data and maps are tied to assessing value for tax purposes. This includes surface level or land parcels and below surface or mineral parcels. A system that pulls together all available parcel-level information, both land and mineral, and presents it graphically would greatly improve assessment decisions. It would aid the counties in demonstrating fair assessment of property values, collect missing revenue, and meet assessment mandates.

BETTER PLANNING

After assessment, the next most common use of parcel-level data is probably planning of some type. In recent years the push for coordinated development has lead to municipalities, counties, and regions to develop detailed plans for land use and economic development. There is now a mandate for each county in West Virginia to have a Comprehensive Plan with geospatial references on record by 2014. (§8A-3-12. Validation of prior comprehensive plans. 2004)

The Land Information System (LIS) proposed above not only brings together all the information needed for this type of planning, but it presents it in a (geo-) graphical format that makes it easy to understand and gain new insights. The benefits are more, better, quicker and more understandable planning information for better planning decisions.

ECONOMIC DEVELOPMENT

Good planning supports economic development, but the West Virginia LIS we want to build can provide more active economic development services. Site selection for a prospective business is

the center of these activities and the LIS can maintain an inventory of sites, allow searches based on the business's criteria, allow sorting by resources on the site or nearby, and calculate distances to roads, rivers, and other features of interest to a business. The speed with which an area can respond to requests for site information is deemed crucial to economic development. The LIS would make it easier for local governments, regions, and State agencies to work together on economic development, which is a big benefit.

EMERGENCY SUPPORT

Many times in an emergency, such as sudden flooding or fire, the first responders need to know who owns the property. If they can get that information quickly, so they can ask the owners important questions, lives and money can be saved. A statewide LIS would make it easier for emergency crews to access important data quicker, without first needing to figure out who has it.

ASSOCIATED BENEFITS

Building the statewide LIS will require communication between stakeholders that do not always get a chance to talk to each other. At the Local Government level alone, the assessment, planning and emergency people are usually different groups. For the person responsible for the parcel transaction to know how important a particular piece of information is in an emergency can make a big difference. The biggest associated benefit may be the understanding of how many stakeholders are impacted by a parcel data change.

This understanding combined with the proposed training should lead to more consistency, agreement on standards, and more help from interested stakeholders.

3.2 STATE GOVERNMENT

ASSESSMENT

There is a historical relationship between the counties collecting parcel-level data and bringing it to the State Tax Department that dates back to the beginning of the State. In those days the county assessors would bring their maps with their changes, usually a sub-divided parcel, to the Tax Office and they would copy the change on to the State map, by hand.

The Land Information System (LIS) would not only eliminate the need for county assessors to travel to the Capitol with their maps, but it would allow transactional updates to parcel information to happen much more frequently. The State Tax Department will also be able to compare information much more easily and discover where counties may need help making their assessments better. The information also flows in the other direction, so when the State makes updates to mineral parcels or other attributes, the counties will have quick access to this new information. All these benefits bring better assessment for State citizens.

BETTER PLANNING

The benefits of planning discussed under Local Government apply here: more, better, quicker and more understandable planning information for better planning decisions. A State-wide system and data set allows for a more global view and planning that crosses the State. The WV Department of Transportation in particular has many planning activities that cross county lines,

like roads, rail lines and others. The LIS would be a great benefit to many agencies in their state-wide planning.

ECONOMIC DEVELOPMENT

Where in the West Virginia do we have 100 acres of relatively flat land, within half a mile of an interstate highway, and a within a mile of a rail line? This type of question with probably more details gets asked of the Department of Commerce's Development Office on a regular basis. It is difficult to answer these questions today. The LIS will provide these benefits and others, as well as much needed coordination between State and local economic development organizations.

TOURISM

We can think of tourism as a special case of economic development with the businesses focused on tourists. Using the LIS with tourism data can geographically display current physical assets (e.g., state parks), how they are allocated, and tourist traffic and trends. This can greatly benefit tourism decisions by State agencies.

EMERGENCY SUPPORT

Emergencies do not always stay within one jurisdiction. Disasters may bring in Federal and State agencies to help locals in need. A state-wide Land Information System would make it easier for emergency crews to access important data quicker, without first needing to figure out who has it, regardless of what level of government or what lines the emergency crosses.

ENFORCEMENT

State departments like Environmental Protection, Natural Resources and others are charged with enforcing State laws. They would benefit from an LIS that can put attributes of interest to them on a state-wide map. Whether it is clean up sites, buried tanks, poaching incidents, or wildlife sightings, better decisions and better enforcement can happen with the help of the LIS.

ASSET MANAGEMENT

Many State agencies have assets, particularly land and buildings that would benefit from the LIS. Being able to view assets (geo-) graphically can really aid decision making and management. This can be especially valuable with a state-wide data set showing all assets of various agencies. Possible overlap, synergy and reuse can come from "seeing" the entire "inventory."

ASSOCIATED BENEFITS

Similar to the local level the LIS should improve communication and cooperation among State agencies. It should also improve communication between State agencies and county agencies. This will lead to more agreements on data standards, workflow and consistency on how information is stored. As mentioned before, the biggest associated benefit may be the understanding of how many stakeholders are impacted by a data change.

3.3 OTHER STAKEHOLDERS

FEDERAL GOVERNMENT

Most of the benefits for Federal agencies fall under land use planning. They can include many of the benefits mentioned for state agencies, such as, planning, economic development, tourism, emergency support, enforcement, and asset management. Decision making in these areas will be greatly improved by consistent state-wide data in the LIS.

BUSINESSES

West Virginia businesses can benefit in many of the same ways government can with a LIS. Being able to easily access parcel level data will greatly aid their decision making and planning. At a minimum it should greatly reduce the time it takes to gather the information needed for a decision.

WV CITIZENS

The LIS will provide public access to appropriate information through the Web. For many State citizens this will be the first time they will have direct access to their property data. Other citizens will see additional and improved services, since the LIS will benchmark its public features to the best offered today by a few counties. All citizens will see a much more consistent availability of information from county to county.

4.0 REQUIREMENTS

In this section we discuss the requirements and associated costs for building the West Virginia Land Information System (LIS). We discuss our organizational approach to both the project and the system once it is built. We also cover the data standards required by the LIS. This section ends with line item estimates for making a state-wide cadastral data set available to all stakeholders.

4.1 ORGANIZATIONAL APPROACH

LIS PROJECT

The first step is for the West Virginia Geographic Information System (GIS) Policy Council, which oversees and directs the mission of the WV Office of GIS Coordination, to approve this business plan. This insures the various GIS stakeholders in state government are aware of the plan, and helps to focus support for funding. The Policy Council (GPC) can be thought of as a major project sponsor and with the other GIS stakeholders help remove barriers to implementation.

The implementation of the project specified in this plan will be managed by the Office of GIS Coordination (OGC), working directly with the Regional GIS Support Centers. The eleven (11) regions cover all fifty-five counties in West Virginia. The project team is comprised of the OGC, the GIS regions, and the various vendors needed for the project. Regular communication, including monthly status reports to the stakeholders and sponsors, will keep everyone informed on the LIS project's progress.

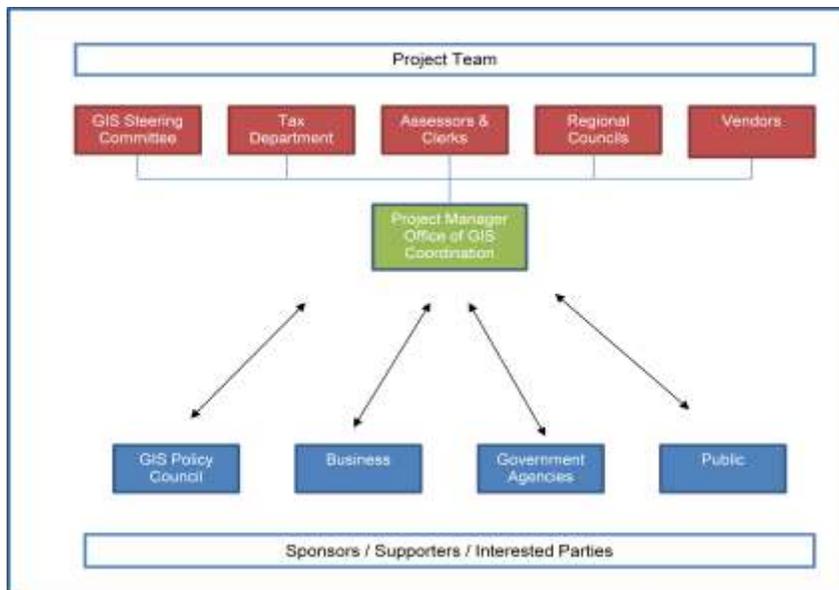


Figure 6: Project Organizational Approach

Keeping the LIS up and running is the responsibility of the WV Office of GIS Coordination (OGC). Although they will ultimately get technical support from a vendor or organization that maintains file servers, computer infrastructure, and data, the OGC is who users of the system will call with technical problems.

The process for changing the LIS over time will work like an online suggestion box combined with a change management review board. The suggestion box will be part of the LIS user interface. Users can click on the option and submit a suggestion to improve the LIS. It was even suggested that we could allow public users (WV citizens) to submit suggestions. The suggestions will be reviewed by the Office of GIS Coordination and sorted into three categories. The first category is "Implementation Queue" and is for the obvious improvements that are easy to do and do not require a lot of expense. The next bucket is "Tabled" and is for suggestions that the OGC does not plan to implement. We plan to list a reason (probably a short list of predefined), but the idea is something like, "Not enough benefit for everyone", "Don't understand suggestion", "Outside of Mission", etc. The last category is "Change Request" and is for suggestions that need review by the GIS Steering Committee, either because they are big changes, complicated, expensive, or all of the above. The GSC will have representatives from state and local government and is expected to approve changes to the LIS for the benefit of all stakeholders. Tabled suggestions can be resubmitted for a second review by the OGC with additional information or clarification. If the suggestion is Tabled a second time, the submitter can request their suggestion be treated as a Change Request and reviewed by the GSC.

Regular meetings at the region level as well as an annual group meeting will provide a forum for LIS users to interact and discuss ways of improving and maintaining the system for the benefit of all West Virginia citizens.

4.2 REQUIRED STANDARDS

During our workshops for creating this business plan we discussed many standards for data, meta-data, attributes, and file formats. Here is what we agreed on as the minimum standards for the West Virginia Land Information System (LIS). The LIS users can of course add to the standards over time to improve the system.

For the design of the LIS we decided the starting point was the suggested standards from the Federal Geographic Data Committee (FGDC) for data, meta-data, attributes, and any other recommendations (see appendix). In particular, we stressed the need for proper labeling of meta-data, which can easily allow different organizations to collect additional data beyond the standard without any confusion during data sharing.

We agreed that the beginning list of attributes would come from the Integrated Assessment System (IAS), which is used by all the counties and reflects their needs. In addition, we agreed that any fields needed to improve county workflow, uncovered during training development, would be added to the system. It should also be mentioned here that the GIS stakeholders did not want any county to lose any functionality. The LIS will benchmark with the best county systems currently in use and include any fields needed to offer the same features state-wide.

4.3 ESTIMATED COSTS

The costs for implementing the project in this business plan, building a statewide Land Information System using a statewide cadastral data set, are estimated at just under \$27.2 million. The bulk of the expenses are for data conversion, which is estimated at about \$26.9 million. The actual system costs for storing and using the data, once it is converted, is estimated at \$191,103 and the training costs are estimated at \$100,000.

ITEM	DESCRIPTION	PRICE	NOTES
Computer System	Hardware	\$47,953	Includes install & training
	Software	\$118,150	Server & client
	Development	\$25,000	Public Access
Data Conversion	Parcel Data	\$4,469,768	
	Mineral Data	\$11,515,860	
	Deeds	\$10,898,574	
Training Costs	Develop & Deliver	\$100,000	
Project Manager / Misc.	Set up project	\$ 34,695	Consultant for PM set-up
	Total	\$27,210,000	
Estimated Support Costs		\$22,546/month	

Figure 7: Summary of Estimated Cost

LIS DETAIL

The hardware and software estimates below reflect the recommended configuration from state approved vendors and the prices on the current State Contract. The web interface price is an estimate based on vendor feedback and previous experience.

ITEM	DESCRIPTION	PRICE	NOTES
LIS Sever Computer	HP Server w/ 7.2 Terabytes Storage	\$33,053	Includes Microsoft Server 2008 R2
GIS Server Software	ESRI ArcGIS Server Standard Workgroup	\$9,500	3 Core Licenses
GIS Installation	ESRI Server Jumpstart	\$10,000	4 Days Onsite Installation & Configuration
GIS Server Training	Multi-user Geo Data Management	\$4,900	2 People, 2 Classes, 5 Days of Training
Upgrade GIS Edit SW	Upgrade from ArcView to ArcEditor	\$6,650	2 Concurrent Users
Client GIS SW	2 Users per County @ \$3,000/User (seat)	\$102,000	For 17 non-GIS Counties (17 x \$6,000)
Public (Web) Interface	Vendor to Develop LIS Web Interface	\$25,000	Review Current GIS Counties for Features
	Total	\$191,103	

Figure 8: More Detail on LIS Costs

DATA CONVERSION DETAIL

You can see from the table below that our estimates are based on getting a count for each region (by getting a count for each county) and then multiplying it by an estimated rate based on previous experience. Our parcel counts came from work done by the WV Tax Department and reflect numbers from 2011. The parcel counts include parcels not converted in GIS counties and parcels converted, but not updated (maintained) in non-GIS counties. For the deeds we had to call counties and survey their number of deed books and average number of pages per book. We also asked for the number of deeds (pages) already in digital form and in microfilm or microfiche format.

REGION	PARCELS	CONVERT \$/PARCEL	TOTALS
Region 1	95,101	\$8/Parcel	\$760,808
Region 2	51,841	"	\$414,728
Region 3	109,679	"	\$877,432
Region 4	32,372	"	\$258,976
Region 5	64,071	"	\$512,568
Region 6	58,103	"	\$464,824
Region 7	25,736	"	\$205,888
Region 8	31,307	"	\$250,456
Region 9	84,451	"	\$675,608
Region 10	5,321	"	\$42,568
Region 11	739	"	\$5,912
Total	558,721	\$8/Parcel	\$4,469,768

Figure 9: Estimate for Converting Surface Parcels

REGION	MINERAL PARCELS	CONVERT \$/PARCEL	TOTALS
Region 1	6,788	\$45/Parcel	\$305,460
Region 2	11,965	"	\$538,425
Region 3	17,305	"	\$778,725
Region 4	7,969	"	\$358,605
Region 5	95,667	"	\$4,305,015
Region 6	49,308	"	\$2,218,860
Region 7	47,744	"	\$2,148,480
Region 8	1,457	"	\$65,565
Region 9	8	"	\$360
Region 10	17,123	"	\$770,535
Region 11	574	"	\$25,830
Total	255,908	\$45/Parcel	\$11,515,860

Figure 10: Estimate for Converting Mineral Parcels

REGION	SCANNED DEEDS TO COVERT (\$.15/PAGE)	PAPER DEEDS TO COVERT (\$.49/PAGE)	TOTALS
Region 1	Pages 474,400	Pages 2,171,600	\$1,135,244
Region 2	748,800	3,047,562	\$1,605,625
Region 3	296,000	826,500	\$449,385
Region 4	511,600	1,670,480	\$895,275
Region 5	949,200	1,813,637	\$1,031,062
Region 6	1,109,600	4,638,960	\$2,439,530
Region 7	951,200	2,328,111	\$1,283,454
Region 8	606,000	1,065,180	\$612,838
Region 9	350,400	741,953	\$416,117
Region 10	445,200	1,630,883	\$865,913
Region 11	133,600	294,060	\$164,129
Total	\$986,400	\$9,912,174	\$10,898,574

Figure 11: Estimate to Convert Deeds

TRAINING DETAIL

We identified process-based training at the county level as an important key to success. To integrate the Land Information System (LIS) into the workflow of the counties, we will have the training vendor study counties of different sizes and configurations (with GIS, without, etc.). They will then develop training based on the way counties work and the best practices across the counties. We plan to deliver the training by region (with 10 and 11 training together) as their parcel data becomes available. We the experience and feedback of first two or three training sessions, online training will be developed. It will be used as a refresher once county workers are back at work, and for to train new hires.

ITEM	DESCRIPTION	PRICE	NOTES
County Workflow	Study 10 to 12 counties' workflow	\$32,000	Training integrates LIS & county work
Design Live Training	Training for in person delivery	\$15,000	
Conduct / Deliver Training	Deliver 10 sessions of process training	\$30,000	Delivered in 2013 as data is ready
Training Expenses	Classroom rental, food, supplies	\$10,000	
Develop Online Training	Create online version of training	\$13,000	For refresh, help reference, new hires
Total		\$100,000	

Figure 12: Estimate for Training Costs

SUPPORT COST DETAIL

Some of the ongoing costs for supporting the LIS are easy to list. For example, the estimate for maintaining the LIS server by the WV Office of Technology is \$130 per month. We also list the

monthly salary for new staff needed to maintain the LIS in the table below. Not as straight forward is estimating ongoing hardware and software replacement costs. For example, it is reasonable to replace the LIS server hardware and software with newer technology at the end of three years at the latest. This means we will need to spend about \$42,553 (server + server software) every three years. In the table below we rounded up and used the 3-year timeframe. In a similar way, the ESRI client software is upgraded every eighteen months to two years. The current cost is \$3,000 per user. We plan on a minimum of two users per county for a count of 110, plus two seats for the Office of GIS Coordination, for a total of 112. This means \$336,000 every two years for client software. The client software for the 17 non-GIS counties and the two new GIS staff were included as part of the initial LIS costs. The client software upgrades are listed here as support costs.

ITEM	DESCRIPTION	PRICE	NOTES
LIS Server Hosting	Secure environment and data backup	\$130/month	Based on WVOT rates for 2012
GIS Manager	Project manager after initial start-up; LIS manager	\$4,200/month	Based on WV DOP position salaries 2012
GIS Tech	Technical support and maintenance of LIS	\$2,700/month	Based on WV DOP position salaries 2012
LIS Group Meetings		\$1,000/quarter	Estimate
LIS Hardware Upgrade	New server, server SW, GIS server SW	\$42,553/3-years	Based on current prices & discounts
GIS Client SW Upgrade	ESRI Client Software	\$336,000/2-years	Based on current prices & discounts
Total		\$22,546/month	Amortized per month

Figure 13: LIS Support Costs

5.0 IMPLEMENTATION

Building a statewide Land Information System (LIS) for West Virginia is a big project. We started the planning process early in 2011 and estimate finishing the project by the end of 2016. We estimate the total costs of this five year endeavor at just over \$27.2 million. In this section we show the implementation details: showing scope in a work breakdown structure (WBS), detailing the phasing, and then listing our major tasks and time estimates. A budget linked to a monthly schedule wraps up this section.

5.1 PROJECT OVERVIEW

We can look at the West Virginia Land Information System (LIS) project as having four phases. The four major breakouts are shown in this work breakdown structure.

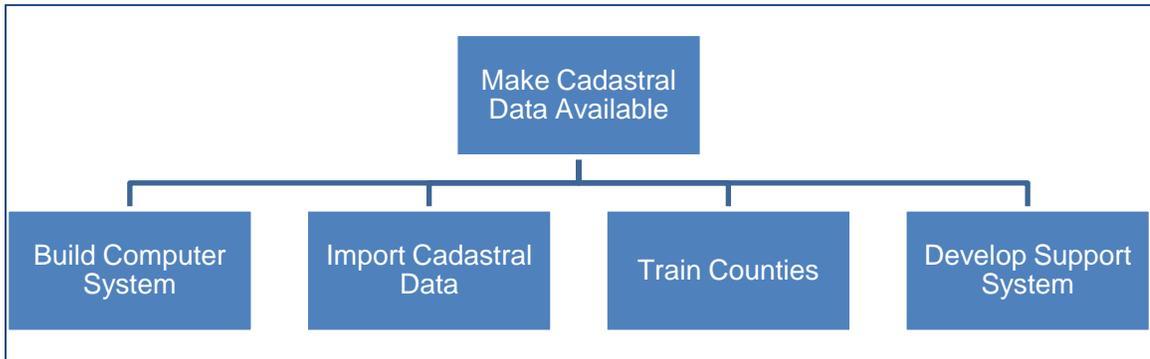


Figure 14: WBS for Project with Four Major Phases

The top level, or project level, is Make Cadastral Data Available, which is the building of the LIS. The four main phases that make the cadastral data available are Build Computer System, Import Cadastral Data, Train Counties, and Develop Support System. There are items under these phases that can happen in parallel to get the project completed in the shortest amount of time, so one phase doesn't have to end before another begins. We can show our first level schedule here by phase.

PHASES	2012				2013				2014				2015				2016				
	q4	q1	q2	q3	q4																
Build Computer System																					
Import Cadastral Data																					

DEMO LIS

The West Virginia Office of GIS Coordination believes it has enough resources to assemble a demonstration of the LIS without any additional funding. Details are still being worked out at this writing and the demonstration may not include scanned deeds connected to parcels, but the main functionality will be demonstrated, including the connection to the Integrated Assessment System (IAS). The Demo LIS will be completed by the end of January 2012 and sixteen weeks was giving to demonstrate the system to as many GIS stakeholders as possible.

TASK	EFFORT	END DATE	NOTES
Assemble Pilot LIS	10 wks	1/6/2012	
Connect Pilot to IAS	2 wks	1/13/2012	
Test Pilot System	3 wks	1/27/2012	
Demo Pilot to Legislature & Stakeholders	16 wks	5/18/2012	Demos can start on 1/30/2012

Figure 18: "Demo LIS" Tasks & Deadlines

BUILD LIS & PUBLIC INTERFACE

Using the Demo LIS the complete system is built out, including the web interface used by the public to access the system (and the feedback system shown below under support systems). This interface will be based on the features West Virginia counties already offering public access use today, and any additional features deemed as best practices. Since counties can decide not use a particular feature (e.g. photos of buildings on parcels), this phase includes configuring the interface each county wants. This part of the project includes installing the server in its permanent location and testing it in a live environment, including backup and restore processes. At the end of this summary task the project milestone of completing the LIS will be complete.

TASK	EFFORT	END DATE	NOTES
Hire Staff: Project Manager, GIS Tech	8 wks	2/24/2012	
Select Interface Vendor	8 wks	3/9/2012	
Build State LIS	15 wks	6/29/2012	Begin 3/19/2012
Import 1 County's Complete Data Set (min)	1 wks	7/6/2012	
Test LIS	4 wks	7/27/2012	
LIS Milestone Complete (all counties can access from web)		7/31/2012	

Figure 19: "Build LIS" Tasks & Deadlines

5.3 PHASE 2: IMPORT CADASTRAL DATA

Import Cadastral Data is our longest phase of the project and the most important. Creating a statewide data set was the driving force behind the plan. We can see from the three major breakouts that our data set will be comprised of parcels, mineral parcels and deeds. The tables

below list the major tasks or milestones for these summary tasks. The Effort column is an estimate of work effort and the End Date is the planned deadline for the task.

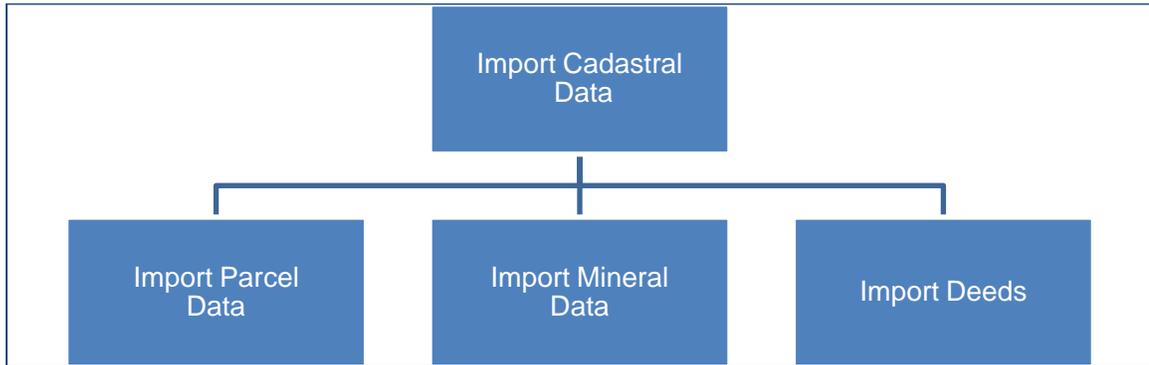


Figure 20: Work Breakdown Structure (WBS) for Phase 2

IMPORT PARCEL DATA

We estimate that if we start at the beginning of July 2012, we can have all of West Virginia's surface parcels in GIS format by mid-May 2014. Most of our GIS stakeholders use parcel data on a regular basis and it makes sense to use it as the foundation for our data set. West Virginia has fifty-five (55) counties, which are organized into eleven (11) regions. Out of the fifty-five counties, thirty (30) have GIS systems and have most of their parcel data already converted. Another six to nine are in start-up mode on GIS systems and have some of their parcel data converted. We will convert and import data from the regions having the least parcels to convert first, getting more counties able to use the LIS sooner and aiding the training schedule.

To do our estimate we started with the premise that a Conversion Team could convert 1,000 parcels a week on average. This was based on previous experience converting West Virginia data. To get our dates we took the parcels needing conversion for each region and rounded up to the nearest thousand. We counted out weeks using fifty (50) weeks in a year to allow for holidays. The Work Effort column gives our estimate of work time. The end dates reflect our estimated elapsed time skipping over those two weeks a year. We used six teams working in parallel, and doubled up teams (and more than doubled on the last region) at the end on the regions with the biggest parcel counts.

TASK	EFFORT	END DATE	NOTES
Develop Data Acceptance Process for Vendors	4 wks	12/16/2011	Need start by 11/21
Create specifications for Parcel Data Work	4 wks	1/13/2012	Needs start by 12/19 or before
Select Vendor(s) (RFP if needed)	20 wks	6/1/2012	Need start by 1/16 Gives vendor(s) 4 wks to start
Convert Parcels into SHP Files (by region)			
Review (accept) Data as Complete			

Import into LIS			
Region 11 Conversion (739)	1 wks	7/6/2012	Begin 7/2/12 Team A
Region 10 Conversion (5,321)	6 wks	8/18/2012	Begin 7/9/12 Team A
Region 7 Conversion (25,736)	26 wks	3/1/2013	Begin 8/21/12 Team A
Region 8 Conversion (31,307)	32 wks	2/22/2013	Begin 7/2/12 Team B
Region 4 Conversion (32,372)	33 wks	3/1/2013	Begin 7/2/12 Team C
Region 2 Conversion (51,841)	52 wks	7/12/2013	Begin 7/2/12 Team D
Region 6 Conversion (58,103)	58 wks	8/23/2013	Begin 7/2/12 Team E
Region 5 Conversion (64,071)	64 wks	10/4/2013	Begin 7/2/12 Team F
Region 9 Conversion (84,451)	84 wks	12/31/2013	Begin 3/4/13 Team A&C
Region 1 Conversion (95,101)	96 wks	4/18/2014	Team B Starts 2/25/13 Team D Starts 7/15/13
Region 3 Conversion (109,679)	110 wks	5/16/2014	Team E Starts 8/26/13 Team F Starts 10/7/13 Team A&C Start 1/6/13 Team B&D Start 4/21/14

Figure 21: "Import Parcel Data" Tasks & Deadlines

IMPORT MINERAL DATA

We estimate that if we start at the beginning of July 2012, we can have all of West Virginia's mineral parcels in GIS format by the end of September 2015. Mineral parcels are very important to our data set too. They are often not directly linked to a surface parcel and can be difficult to define. Because detailed deed searches are usually required to establish when the break from the surface happened and where the resulting boundaries are, mineral parcel conversion can take a lot longer.

To do our estimate we started with the premise a Conversion Team could convert 200 mineral parcels a week on average. This was based on previous experience converting West Virginia mineral data. To get our dates we took the parcels needing conversion for each region and rounded up. We counted out weeks using fifty (50) weeks in a year to allow for holidays. The Work Effort column gives our estimated of work time. The end dates reflect our estimated elapsed time. We used eight teams working in parallel, and doubled up teams at the beginning for the largest parcel count regions. At the end teams jump on the last two regions to complete conversion by the end of September 2015.

TASK	EFFORT	END DATE	NOTES
Develop Data Acceptance Process for Vendors	4 wks	12/16/2011	Need to start by 11/21
Create specifications for Parcel Data Work	4 wks	1/13/2012	Needs to start by 12/19 or before w/ holidays
Select Vendor(s) (RFP if needed)	20 wks	6/1/2012	Need to start by 1/16 Gives vendor(s) 4 wks to start after selection
Convert Parcels into SHP Files (by region)			
Review (accept) Data as Complete			
Import into LIS			
Region 1 Conversion (6,788)	35 wks	3/15/2013	Begin 7/2/12 Team A

Region 4 Conversion (7,969)	40 wks	12/31/2013	Begin 3/18/13 Team A
Region 3 Conversion (17,305)	90 wks	4/18/2014	Begin 7/2/12 Team F
Region 7 Conversion (47,744)	240 wks	11/14/2014	Begin 7/2/12 Team B&C
Region 6 Conversion (49,308)	250 wks	12/31/2014	Begin 7/2/12 Team D&E
Region 2 Conversion (11,965)	60 wks	3/13/2015	Begin 1/6/14 Team A
Region 8 Conversion (1,457)	8 wks	5/8/2015	Begin 3/13/15 Team A
Region 9 Conversion (8)	.10 wks	5/11/2015	Begin 5/11/15 Team A
Region 11 Conversion (574)	3 wks	6/1/2015	Begin 5/12/13 Team A
Region 5 Conversion (95,667)	480 wks	9/4/2015	Begin 7/2/12 Team G&H Team B-C Start 11/17/14 Team D&E Start 1/5/15 Team A Starts 6/2/15
Region 10 Conversion (17,123)	85 wks	9/30/2015	Begin 4/21/14 Team F Team A&B Starts 9/7/15 Team C&D Starts 9/7/15

Figure 22: "Import Mineral Data" Tasks & Deadlines

IMPORT DEEDS

We estimate that if we start at the beginning of July 2012, we may have all of West Virginia's deeds in PDF format by the end of the year 2016. Having deeds linked to parcels in the LIS will speed the workflow of many tasks in the county and help deed research at all levels (e.g., mineral parcels).

This is a difficult estimate, because we do not have deed or deed book counts for all counties. We also do not know how many deeds or pages from deed books are already in non-paper formats (e.g., microfiche) that are faster to scan. We need both of these counts to improve the estimate. You can see out page counts by region in section 4, but since we did not hear from all counties and there was some confusion about deed book status, we think these are overestimates.

TASK	EFFORT	END DATE	NOTES
Develop Data Acceptance Process for Vendors	4 wks	12/16/2011	Need to start by 11/21
Create specifications for Deed Data Work	4 wks	1/13/2012	Needs to start by 12/19 or before w/ holidays
Select Vendor(s) (RFP if needed)	20 wks	6/1/2012	Need to start by 1/16 Gives vendor(s) 4 wks to start after selection
Convert Deeds into PDF Files (by region)			
Review (accept) Data as Complete			
Import into LIS			
Region 1 Conversion (2.4 m)	24 wks	12/28/2012	Needs to start 7/2/12
Region 4 Conversion (2.0 m)	20 wks	5/24/2013	Needs to start 1/7/13
Region 7 Conversion (2.8 m)	28 wks	12/13/2013	Needs to start 5/27/13
Region 2 Conversion (2.4 m)	24 wks	6/6/2014	Needs to start 12/16/13
Region 6 Conversion (2.4 m)	24 wks	11/21/2014	Needs to start 6/9/14
Region 3 Conversion (1.6 m)	16 wks	3/27/2015	Needs to start 12/1/14
Region 5 Conversion (3.2 m)	32 wks	11/6/2015	Needs to start 3/30/15
Region 8 Conversion (2.0 m)	20 wks	4/8/2016	Needs to start 11/9/15

Region 9 Conversion (1.2 m)	12 wks	7/1/2016	Needs to start 4/11/16
Region 10 Conversion (1.2 m)	12 wks	9/23/2016	Needs to start 7/5/16
Region 11 Conversion (.8 m)	8 wks	11/18/2016	Needs to start 9/26/16

Figure 23: "Import Deeds" Tasks & Deadlines

5.4 PHASE 3: TRAIN COUNTIES

We see training, training based on the work processes of the counties, as a key success factor. By tying the Land Information System (LIS) to the work counties need to do every day we make the LIS valuable to all the county stakeholders. We start with developing classroom training after studying several county workflows. After testing and the training with real counties, we leverage our experience and develop online training as a job aid (refresher) and a tool for new employees.

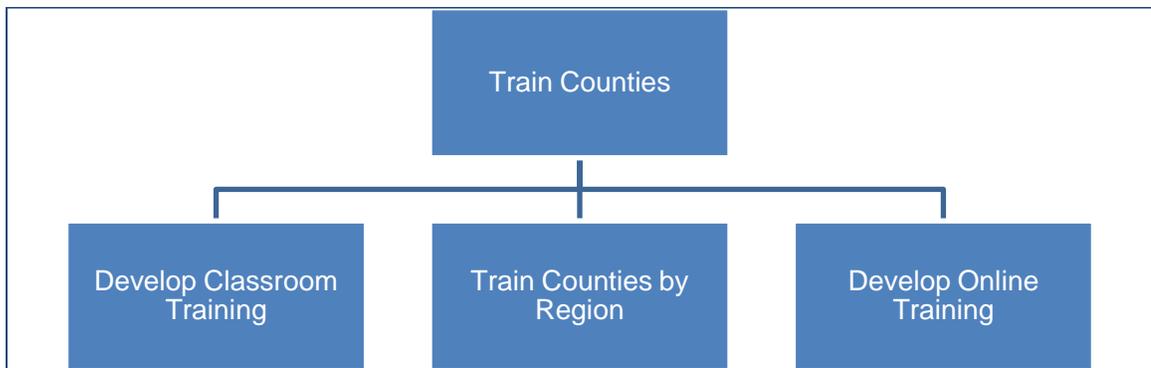


Figure 24: Figure 20: Work Breakdown Structure (WBS) for Phase 3

DEVELOP CLASSROOM TRAINING

We will ask the training vendor to study ten to twelve counties of various sizes and configurations (with GIS and without) to record how they work. They will use these workflows, information from the software vendor, and best practices from the State Office of GIS Coordination to develop the training. The idea will be to make the training as close to a real county office experience as possible. Three rounds of training and feedback are assumed as a minimum to finalize the training.

TASK	EFFORT	END DATE	NOTES
Create specifications for Training	4 wks	2/10/2012	Start 1/16/12
Select Vendor (RFP if needed)	20 wks	6/29/2012	Start 2/13/12
Study County Workflow	4 wks	7/27/2012	Start 7/2/12
Develop Classroom (live) Training	8 wks	9/28/2012	Start 7/30/12
Train (Test) 1st County (with data)	1 wks	10/5/2012	
Review Feedback, Make Any Corrections	1 wks	10/12/2012	

Train 2nd County (with data)	1 wks	10/19/2012	
Review Feedback, Make Any Corrections	1 wks	10/26/2012	
Train 3rd County (with data)	1 wks	11/2/2012	
Review Feedback, Finalize Classroom Training	1 wks	11/9/2012	

Figure 25: "Develop Classroom Training" Tasks & Deadlines

TRAIN COUNTIES BY REGION

Once the Live (classroom) Training is complete a training schedule by region can be developed. We want counties to be able to train with their own data as much as possible. This means the training schedule will follow the parcel data conversion. We do not know at this point how long the training will take for a region (it not being developed yet). For planning we assume it will not take over a week, and allow a month for the vendor to conduct training for one region, get feedback, make any adjustments, and move on to the next region. With the Live Training schedule to be complete in mid-November 2012, we decided to start training in January 2013.

TASK	EFFORT	END DATE	NOTES
Develop Training Schedule	1 wks	11/16/2012	
Train Remaining Counties:			
Region 1 Training		1/31/2013	
Region 4 Training		2/28/2013	
Region 7 Training		3/29/2013	
Region 2 Training		4/26/2013	
Region 6 Training		5/31/2013	
Region 3 Training		6/28/2013	
Region 5 Training		7/31/2013	
Region 8 Training		8/30/2013	
Region 9 Training		9/27/2013	
Region 10 Training		10/31/2013	
Region 11 Training		11/29/2013	

Figure 26: "Train Counties" Tasks & Deadlines

DEVELOP ONLINE TRAINING

Sometime after the Live (classroom) Training is finalized work on the online version can begin. If things stay on our estimated schedule, there is time for this development to happen before the full Live Training schedule starts in January 2013. We plan for the Online Training to be complete before the end of the first quarter in 2013. If anyone misses their region Live Training, they will have the option of joining another region or using the Online Training.

TASK	EFFORT	END DATE	NOTES
Develop Online Training	8 wks	1/18/2013	Start after classroom
Test Online Training with Previously	1 wks	1/25/2013	

Trained County			
Review Feedback, Make Any Corrections	1 wks	2/1/2013	
Test Online Training with non-Trained County	1 wks	2/8/2013	
Review Feedback, Make Any Corrections	1 wks	2/15/2013	
Test with State LIS Users (and other Stakeholders?)	1 wks	2/22/2013	
Review Feedback, Make Any Adjustments (organize material for best results for all stakeholders)	1 wks	3/1/2013	

Figure 27: "Develop Online Training" Tasks & Deadlines

5.5 PHASE 4: DEVELOP SUPPORT SYSTEM

The long term success of the Land Information System (LIS) will depend on building support throughout the Geographic Information System (GIS) stakeholder community and growing the community. In this section we describe developing a communication plan, developing a feedback system, and starting student program, all intended as support systems. As everyone gains experience with the LIS, other support systems may be developed.

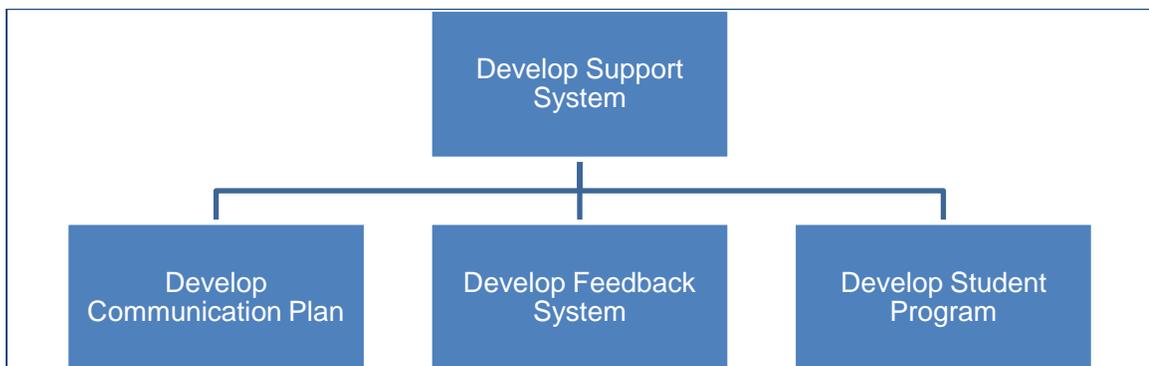


Figure 28: Work Breakdown Structure (WBS) for Phase 4

DEVELOP COMMUNICATION PLAN

The first part of developing a Support System for the Land Information System (LIS) and a common thread through both the project and the life of the system is building a communication network. The initial Communication Plan is for the project and spells out how project status will be communicated to GIS stakeholders. Another communication plan should be developed for on-going support of the LIS and should include outreach to citizens to inform them of what the LIS means to them. All this communication will be greatly enhanced by a meeting schedule and policy on who should attend. This gives us something to communicate and lets stakeholders know how they can have input.

TASK	EFFORT	END DATE	NOTES
Develop Stakeholder Communication Plan (decide citizen outreach)	1 wks	12/23/2011	Initial plan is monthly project status; Should continue after project
Implement Stakeholder Communication Plan	1 wks	12/30/2011	Build project website, email lists, etc.
Create Stakeholder Meeting Schedule for 3 Years (regional, annual, steering committee, etc.)	1 wks	3/30/2012	Can happen after Comm Plan; Should finish before 2 nd Qtr.
Develop Policy for Who Can Attend which Meetings (can business stakeholders attend, etc.)	1 wks	6/29/2012	Can happen after Meet Schedule (may need approval)

Figure 29: "Develop Communication Plan" Tasks & Deadlines

DEVELOP FEEDBACK SYSTEM

We discussed in other parts of this document the idea of using an online suggestion box and stakeholder satisfaction surveys for feedback. We believe this is an important part of building ongoing support for the WV Land Information System (LIS). Developing the policy will decide if the general public can make suggestions and if we treat them as a separate pool from government worker suggestions (and if we separate out-of-state {Federal} suggestions from in-state for workers and the public). The same question will need to be answered for stakeholder (customer) satisfaction. Do we need separate surveys for the public and government workers? If we decide to survey the public regularly, we may need to add that specification to the LIS interface.

TASK	EFFORT	END DATE	NOTES
Develop Suggestion Box Policy	1 wks	12/30/2011	Will suggestions be public, is anonymous ok
Turn Policy into Vendor Specifications	3 wks	1/20/2012	Needs to start 1/2/12
Develop LIS Online Suggestion Box	? wks	7/6/2012	Vendor
Test LIS Online Suggestion Box	4 wks	7/27/2012	With rest of LIS
Approve LIS Online Suggestion Box	Milestone	7/31/2012	With rest of LIS
Develop Stakeholder (customer) Satisfaction Survey(s)	1 wks	8/3/2012	
Decide How Survey Will Be Delivered (LIS, email, web etc.)	1 wks	8/10/2012	

Figure 30: "Develop Feedback System" Tasks & Deadlines

DEVELOP STUDENT PROGRAM

Ongoing support for many things relies on getting young people involved while they are still students. We plan to develop a student program that will get them working with the LIS in county offices and maybe some state agencies. We plan to work with geo-spatial education and vocational programs in the State that are looking for learning experiences for their students.

TASK	EFFORT	END DATE	NOTES
Develop Student Program	16 wks	10/19/2012	Begin 7/2/2012
Stakeholder Review (approve) Student Program	4 wks	11/16/2012	
Meet with "Schools" to Review Program	4 wks	12/21/2012	
Sign-up Schools (then students)	6 wks	2/15/2013	Begin 1/7/2013

Figure 31: "Develop Student Program" Tasks & Deadlines

5.6 PROJECT BUDGET

In this section we take our cost estimates and approximate when funds would need to be spent to arrive at a monthly budget. This gives a good idea of funds needed for a particular time period. The table below summarizes the annual expenditures and shows a five year total of over \$20.5 million. The following sections show the details for each year by month.

YEAR	BUDGET	FOCUS
1. 2012	\$3,624,863	Start everything & build system
2. 2013	\$8,446,360	Training all the counties; Student program
3. 2014	\$7,120,360	Finish converting parcels
4. 2015	\$5,319,360	Finish mineral parcels
5. 2016	\$2,699,057	Finish deeds and wrap up
Total	\$27,210,000	

Figure 32: Estimated Expenses by Year

MAKE CADASTRAL DATA AVAILABLE STATEWIDE: YEAR 1 (2012)

We included in our budget the salaries for the additional staff needed to operate the Land Information System once it is operational. During the first year we show a project manager hired as a part-time contractor to help us get the project off the ground. Keeping the project on track will fall to the GIS Manager once the contractor wraps up. During this first year we see the initial costs for setting up the LIS. The public web-based interface is developed and in July training development and data conversion begin.

ITEM	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Project Manager	\$3,200	\$3,200	\$3,200	\$3,200	\$3,200	\$3,200	\$3,200	\$3,200	\$3,200	\$3,200		
GIS Manager			\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200
GIS Tech							\$2,700	\$2,700	\$2,700	\$2,700	\$2,700	\$2,700
LIS Hardware	\$33,053											
Server Software	\$16,150											
Server Install	\$10,000											
Server Training	\$4,900											

Server Hosting	\$130	\$130	\$130	\$130	\$130	\$130	\$130	\$130	\$130	\$130	\$130	\$130
Interface Vendor				\$5,000	\$5,000	\$5,000	\$5,000	\$5,000				
Training Vendor								\$6,000	\$6,000	\$6,000	\$6,000	\$6,000
Parcel Vendor								\$192,000	\$192,000	\$192,000	\$192,000	\$192,000
Mineral Vendor								\$288,000	\$288,000	\$288,000	\$288,000	\$288,000
Deed Vendor								\$202,000	\$202,000	\$202,000	\$202,000	\$202,000
Support Meet(s)	\$1,000			\$1,000			\$1,000			\$1,000		
Totals	\$68,433	\$3,330	\$7,530	\$13,530	\$12,530	\$12,530	\$16,230	\$703,230	\$698,230	\$699,230	\$695,030	\$695,030
	Total for 2012											\$3,624,863

Figure 33: Project Expenditures by Month for Year 1

MAKE CADASTRAL DATA AVAILABLE STATEWIDE: YEAR 2 (2013)

During the second year we wrap up training and buy GIS client software for the counties that need it.

ITEM	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
GIS Mnger	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200
GIS Tech	\$2,700	\$2,700	\$2,700	\$2,700	\$2,700	\$2,700	\$2,700	\$2,700	\$2,700	\$2,700	\$2,700	\$2,700
Server Hosting	\$130	\$130	\$130	\$130	\$130	\$130	\$130	\$130	\$130	\$130	\$130	\$130
Client Sftware		\$12,000	\$18,000				\$18,000	\$6,000		\$24,000	\$6,000	\$18,000
Train Vendor	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000
Parcel Vendor	\$192,000	\$192,000	\$192,000	\$192,000	\$192,000	\$192,000	\$192,000	\$192,000	\$192,000	\$192,000	\$192,000	\$192,000
Mineral Vendor	\$288,000	\$288,000	\$288,000	\$288,000	\$288,000	\$288,000	\$288,000	\$288,000	\$288,000	\$288,000	\$288,000	\$288,000
Deed Vendor	\$202,000	\$202,000	\$202,000	\$202,000	\$202,000	\$202,000	\$202,000	\$202,000	\$202,000	\$202,000	\$202,000	\$202,000
Support Meet(s)	\$1,000			\$1,000			\$1,000			\$1,000		
Totals	\$696,030	\$707,030	\$713,030	\$696,030	\$695,030	\$695,030	\$714,030	\$701,030	\$695,030	\$720,030	\$701,030	\$713,030
	Total for 2013											\$8,446,360

Figure 34: Project Expenditures by Month for Year 2

MAKE CADASTRAL DATA AVAILABLE STATEWIDE: YEAR 3 (2014)

During the third year we complete converting all the surface parcels, which lowers the expenditures and starts the downturn in spending for the project.

ITEM	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
GIS Mnger	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200
GIS Tech	\$2,700	\$2,700	\$2,700	\$2,700	\$2,700	\$2,700	\$2,700	\$2,700	\$2,700	\$2,700	\$2,700	\$2,700
Server Hosting	\$130	\$130	\$130	\$130	\$130	\$130	\$130	\$130	\$130	\$130	\$130	\$130
Parcel Vendor	\$192,000	\$192,000	\$192,000	\$192,000	\$192,000	\$192,000						
Mineral Vendor	\$288,000	\$288,000	\$288,000	\$288,000	\$288,000	\$288,000	\$288,000	\$288,000	\$288,000	\$288,000	\$288,000	\$288,000
Deed Vendor	\$202,000	\$202,000	\$202,000	\$202,000	\$202,000	\$202,000	\$202,000	\$202,000	\$202,000	\$202,000	\$202,000	\$202,000
Support Meet(s)	\$1,000			\$1,000			\$1,000			\$1,000		
Totals	\$690,030	\$689,030	\$689,030	\$690,030	\$689,030	\$689,030	\$498,030	\$497,030	\$497,030	\$498,030	\$497,030	\$497,030
	Total for 2014											\$7,120,360

Figure 35: Project Expenditures by Month for Year 3

MAKE CADASTRAL DATA AVAILABLE STATEWIDE: YEAR 4 (2015)

During the fourth year we finish converted mineral parcels by the end of the year, but the drop in cash flow doesn't show up until next year. This year our hardware, the LIS server turns three years old, so we included a budget item for upgrading the server and server software. The GIS client licenses will also be due for an upgrade, and the amount in July is for 55 copies or about half of what we need. We plan to upgrade the other half next year.

ITEM	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
GIS Mnger	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200
GIS Tech	\$2,700	\$2,700	\$2,700	\$2,700	\$2,700	\$2,700	\$2,700	\$2,700	\$2,700	\$2,700	\$2,700	\$2,700
Server Hosting	\$130	\$130	\$130	\$130	\$130	\$130	\$130	\$130	\$130	\$130	\$130	\$130
Mineral Vendor	\$288,000	\$288,000	\$288,000	\$288,000	\$288,000	\$288,000	\$288,000	\$288,000	\$288,000			
Deed Vendor	\$202,000	\$202,000	\$202,000	\$202,000	\$202,000	\$202,000	\$202,000	\$202,000	\$202,000	\$202,000	\$202,000	\$202,000
Support Meet(s)	\$1,000			\$1,000			\$1,000			\$1,000		
Upgrde Server	\$50,000											
Upgrde Client							\$165,000					
Totals	\$548,030	\$497,030	\$497,030	\$498,030	\$497,030	\$497,030	\$663,030	\$497,030	\$497,030	\$210,030	\$209,030	\$209,030
	Total for 2015											\$5,319,360

Figure 36: Project Expenditures by Month for Year 4

MAKE CADASTRAL DATA AVAILABLE STATEWIDE: YEAR 5 (2016)

This last year is spent wrapping up the conversion of all the state deeds. We also upgrade more GIS client software in July. We added a miscellaneous expense in January that we used to round

our total to an even number. It might make more sense to put around \$4,000 in each budget year, but we decided to show it in one place.

ITEM	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
GIS Mnger	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200	\$4,200
GIS Tech	\$2,700	\$2,700	\$2,700	\$2,700	\$2,700	\$2,700	\$2,700	\$2,700	\$2,700	\$2,700	\$2,700	\$2,700
Server Hosting	\$130	\$130	\$130	\$130	\$130	\$130	\$130	\$130	\$130	\$130	\$130	\$130
Deed Vendor	\$202,000	\$202,000	\$202,000	\$202,000	\$202,000	\$202,000	\$202,000	\$202,000	\$202,000	\$202,000	\$202,000	\$202,000
Support Meet(s)	\$1,000			\$1,000			\$1,000			\$1,000		
Upgrde Client							\$165,000					
Misc.	21,697											
Totals	\$231,727	\$209,030	\$209,030	\$210,030	\$209,030	\$209,030	\$375,030	\$209,030	\$209,030	\$210,030	\$209,030	\$209,030
	Total for 2016											\$2,699,057

Figure 37: Project Expenditures by Month for Year 5

6.0 MEASUREMENT

In order for the West Virginia Land Information System (LIS) to be a valuable asset over the long term, we need to measure success and feedback for recalibration. We need to measure success in two areas. At first the focus will be on the project to build the LIS and statewide data set. Later we will need to measure how well the new system is working. These two areas are addressed below.

6.1 MEASURING PROJECT SUCCESS

The program goals of this business plan are the major milestones for the project. Project success will be measured by meeting these goals by their deadlines. In order to meet these goals the project needs to stay on track with regular feedback and recalibration. Below we detail the project management tools and structures we will put in place and our criteria for meeting the program goal milestones.

KEEPING THE PROJECT ON TRACK

The West Virginia Office of GIS Coordination (OGC) will use a project manager to insure the project stays on schedule, within budget, and in scope. The project will be tracked at the task level with no one task longer than two-weeks in duration. Using weekly status meetings the Project Manager will be able to catch slipping tasks early enough to act and recalibrate. Monthly status updates for GIS stakeholders will include a budget and scope review. All professional project management tools will be used to monitor the project, collect feedback and recalibrate when needed. They include:

- Project Statement of Work
- Project Schedule
- Project Budget
- Communication Plan
- Risk Plan
- Risk Log
- Change Management Process and Log

The OGC plans to use a web-based project management information system (PMIS) to store project documents and enhance collaboration and communication among GIS stakeholders. The OGC feels the best way to keep the project on track and successful is through regular and open communication with GIS stakeholders.

MEASURING PROJECT (PROGRAM) GOALS

The program goals of this business plan serve as major milestones for this project. These program goals are:

- Create Land Information System (LIS) by the end of 2012
- Train Counties by the end of 2013
- Develop Geospatial Student Program by the end of 2013
- Convert Parcel Data by the end of 2014
- Convert Mineral Data by the end of 2015
- Scan All Deeds and Link to Parcels by the end of 2016

Our criteria for meeting each of the program goal milestones are detailed below.

CREATE CADASTRAL LAYER SYSTEM BY THE END OF 2012

The overall system of software, hardware, statewide data, training program, and governance system will be known as the West Virginia Land Information System (WVLIS or just LIS). We call the information technology (IT) component (the configured hardware & software) the Cadastral Layer System to distinguish it. This distinction will probably go away once the entire project is complete. We will consider this goal complete and successful, if by the end of 2012 these conditions are met.

- An LIS server with enough storage for all counties' data is up and running
- A service contract for maintaining the LIS Server is in place
- A minimum of one county's parcel data is in the server and accessible by all counties
- A minimum of one county's mineral data is in the server and accessible by all counties
- A minimum of one county's deeds scanned and linked to parcels
- Data from the WV Integrated Assessment System (IAS) linked to parcels
- Ability to access system from the Web (anywhere)

The idea behind these criteria is to demonstrate a functional system showing all the features that the statewide system will have once all the data is converted.

TRAIN COUNTIES BY THE END OF 2013

This goal will be considered completed successfully if by the end of 2013 the following criteria are met.

- Both classroom and online training materials are complete (tested & approved)
- Review and any recalibration made after first three counties complete training
- A majority of counties have completed the training (28 out of 55 minimum)
- A minimum of 4 out of 5 average satisfaction score with training on survey
- Training schedule for any remaining counties to complete training

Since we plan to link training counties to the completion of their parcel data conversion, we decided to recognize that some data may not be available until the end of 2013. This implies some counties may not complete training until into 2014. We will consider this goal completed successfully if training is on track to complete as soon as their data is available.

DEVELOP GEOSPATIAL STUDENT PROGRAM BY THE END OF 2013

This goal will be considered completed successfully, if by the end of 2015 the student program is designed and documented, introduced to educational organizations across the state, and a minimum of three schools have signed-on for the program.

CONVERT PARCEL DATA BY THE END OF 2014

This goal is straight forward and there are only two caveats to clarify success. This goal will be considered completed successfully if by the end of 2014 all parcels in West Virginia are converted to ESRI "shape" (shp) files and stored in the LIS server.

CONVERT MINERAL DATA BY THE END OF 2015

Like the parcel data goal, this goal is straight forward and there are only two caveats to clarify success. This goal will be considered completed successfully, if by the end of 2015 all mineral parcels in West Virginia are converted to ESRI “shape” (shp) files and stored in the LIS server.

SCAN ALL DEEDS AND LINK TO PARCELS BY THE END OF 2016

Like the other data goals, this goal is straight forward and there are only two caveats to clarify success. This goal will be considered completed successfully, if by the end of 2015 all property deeds in West Virginia are converted to Adobe PDF files and stored in the LIS server.

6.2 LAND INFORMATION SYSTEM (LIS) SUCCESS

Once the LIS is up and running, the online suggestion box mentioned under LIS Governance & Support in the Requirements Section (page 13) will be the main channel for ongoing feedback and recalibration. We believe allowing GIS stakeholders to make suggestions for a change at the time an issue occurs is a key to success. In addition to this built in feedback mechanism the WV Office of GIS Coordination (OGC) will conduct an annual “customer satisfaction” survey (online) to be reviewed at the annual meeting. We think these two methods will help keep the ongoing system on track and a valuable asset to the citizens of West Virginia.

APPENDIX A

PARTICIPANTS OF WV GIS CADASTRAL DATA PLANNING WORKSHOPS

NAME	TITLE	ORGANIZATION
Joseph M. Alongi	Assessor	Hancock County
Shane Ashley	Commissioner	Monroe County
Juan Barrios	Research Associate	RTI
Curtis Bias	GIS Manager Assessor's Office	Raleigh County
Jack Booda	President	WV Society of Professional Surveyors
Tyler Bragg	GIS Programmer II	Property Tax Division
Tyler Carpenter	GIS Tech. County Commission	Ohio County
Rob Casto	Executive Director	Precision Laser & Instrument, Inc.
Leigh A Cielensky	Executive Assistant	Office of GIS Coordination
Arron Cox	Hampshire County GIS Coordinator	Hampshire County
Joseph Curry	Assessor's Office	Mingo County
John M. Cutright	Assessor	Barbour County
Kurt Donaldson	GIS Manager	WV GIS Technical Center
Michael Duminiak	GIS Programmer	WV WDA
Hussein Elkhansa	GIS Unit Manager	WVDOT
Tom Elkins	Storm Water Manager	City of Charleston
John Ferguson	Mapper Assessor's Office	Monongalia County
Scott Ferry	Senior Planner	RIC
Terri L. Funk	Assessor	Preston County
Ruth Glasscock	Deputy Assessor	Wetzel County
Rob Godbey	Facilitator	RTI
John Green	Member	WV Society of Professional Surveyors
Maria Grey	GIS Programmer	Property Tax Division
Patrica L. Hamilton	Executive Director	WV Association of Counties
Steve Harrouf	GIS Manager	WV Division of Forestry
Sherry L. Hayes	Assessor	Putnam County
Beth Hayes	Deputy Assessor	Wetzel County
Pamela Hoskins	Contract Mapper Assessor's Office	Ritchie County
John Hriblan	Mapper Assessor's Office	Monongalia County
Curtis Jones	Research Associate	RTI
Steve Keadle	Assessor	Greenbrier County
Jeffrey V. Kessler	Senate President	
Roger Kirkbride	GIS Coordinator Assessor's Office	Berkeley County
Larry Kilpatrick	President	Atlas Geographic
Kevin Kuhn	Research Associate	WV GIS Technical Center
Paula Langley	Land Records Specialist	Bureau of Land Management
Mark Lecher	Senior Account Executive	ESRI
Robert Lesiure	GIS Programmer	Property Tax Division
Diana Long	Principal Investigator	RTI
Rose Ann Maine	Assessor	Mineral County
Derrick Massey	Assessor's Office	Boone County
Jason Moore	GIS Analyst	EQT Production

NAME	TITLE	ORGANIZATION
Arlene Mossor	Assessor	Ritchie County
Matt Mullenax	GIS Coordinator	Region 9 Planning & Development Council
Jim Mylott	Executive Director	Region 5 Planning & Development Council
Craig Neidig	Geospatial Liaison	United States Geological Survey
Vivian Parsons	Executive Director	County Commissioners' Association
Elizabeth Paulhus	Policy Analyst	WV Center on Budget & Policy
Bill Phipps	Executive Director	Region 10 Planning & Development Council
Bruce L. Power, Sr.	911/OEM Director	Monroe County
Ryan Price	Assessor's Office	Monongalia County
Jim Priester	Assessor	Marion County
Rodney A. Pyles	Assessor	Monongalia County
Robert Rickard	Project Manager	Woolpert Inc.
Jason Roberts	GIS Director	Region 1 Planning & Development Council
Bart Schauman	GIS	USDA - Forest Service
Melissa Scott	Floodplain Manager, GIS Coordinator	Greenbrier County
Rich Shaffer	Assessor	Wood County
Robb Shaffer	Mapping Supervisor Assessor's Office	Wood County
Robb Shaffer	President	WV Association of Geospatial Professionals
Maria E Simental	GIS Analyst III	WVDHSEM
Tony Simental	State GIS Coordinator	Office of GIS Coordination
Denick A. Spencer	Deputy Assessor	Barbour County
Kathy Stalnaker	Marshall County GIS Coordinator Assessor's Office	Marshall County
Bobby Stover	GIS Tech. Assessor's Office	Putnam County
Jim Vassar	District GIS Manager	US Army Corps of Engineers Huntington District
Norma J. Wagoner	Assessor	Hampshire County
Kyle Weatherholt	GIS Programer	WVDOT
Dave Weaver	GIS Coordinator Ohio County Community Dev.	Ohio County
Steve Weir	Executive Director	Greenbrier Valley Economic Development Corp.
Jerry Workman	President	Mountain CAD
Yueming Wu	GIS Manager	WVDOT
Phyllis K. Yokum	Assessor	Randolph County
Sang Yoo	Research Associate	RTI

APPENDIX B

SURVEY FROM WORKSHOP 1: MOST IMPORTANT GIS ISSUES

We surveyed the participants at the first workshop and asked them to rank the following GIS issues. We had thirty-seven (37) respondents and these were the survey instructions:

Please rank the list of GIS issues below, by placing a 1 beside the most important one to you, a 2 beside second most important, and so on. Please rank at least your top three (3).

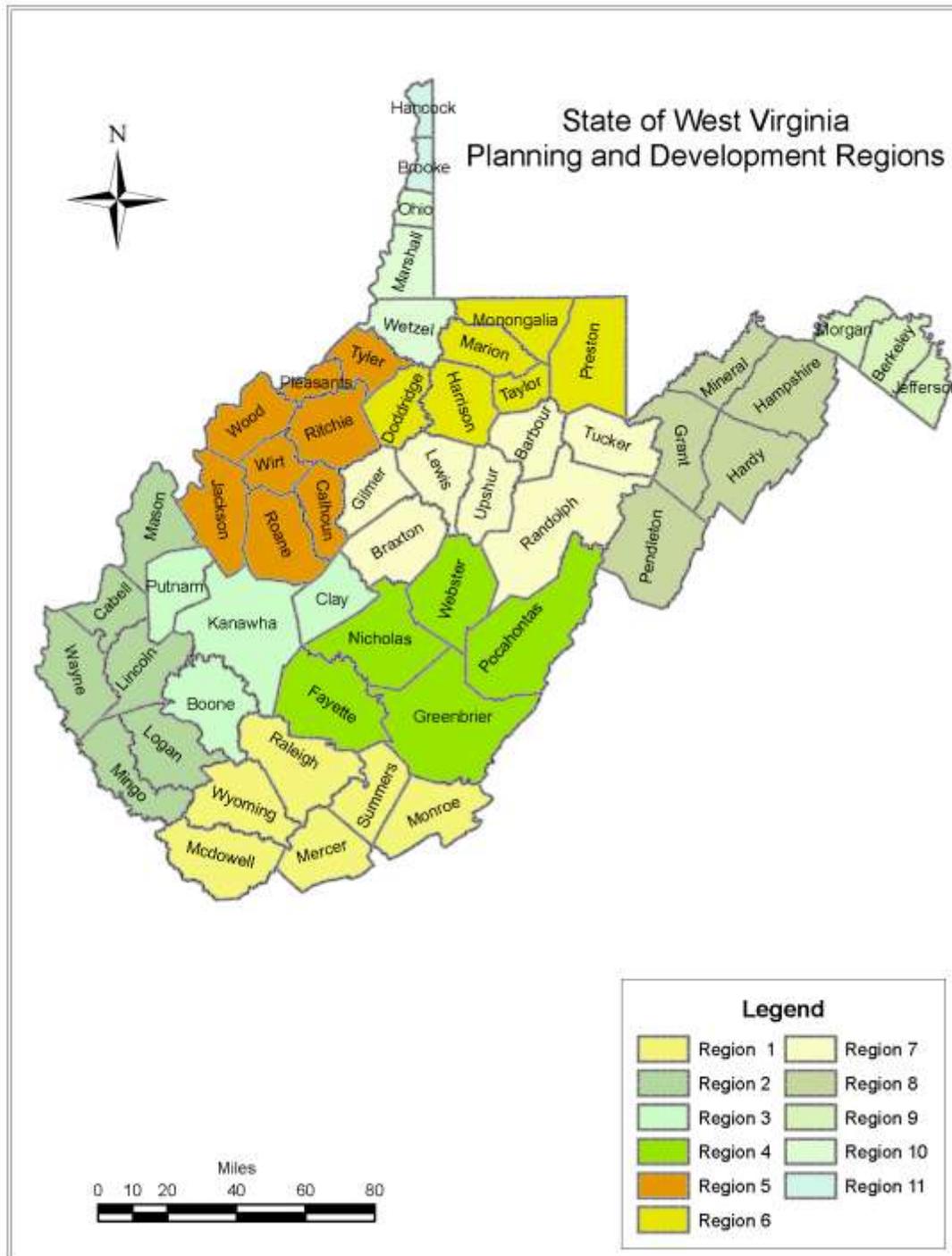
ISSUE	AVERAGE RANK
Insufficient opportunities for training and education	4.08
Lack of, or insufficient use of data and system standards	2.71
Difficulty in integration of data from different sources	3.54
Problems with data quality and how current (timeliness of updates).	3.31
Staffing limitations (number of staff and staff skill level)	2.88
Funding limitations and need for increased cost sharing	2.52
Unclear protocol and documented best practices for GIS	3.24
Poor inter-agency, inter-organizational coordination in GIS	3
Insufficient awareness or support from senior management.	4.5

The top three issues from our participants were:

1. Funding limitations and need for increased cost sharing
2. Lack of, or insufficient use of data and system standards
3. Staffing limitations (number of staff and staff skill level)

APPENDIX D

MAP OF WEST VIRGINIA REGIONAL PLANNING & DEVELOPMENT COUNCILS



APPENDIX E

SUGGESTED STANDARDS FROM THE FEDERAL GEOGRAPHIC DATA COMMITTEE

Cadastral Data Content Standard for the National Spatial Data Infrastructure

The Federal Geographic Data Committee was established by Office of Management and Budget Circular A-16 to promote the coordinated development, use, sharing, and dissemination of geographic data.

The Federal Geographic Data Committee is composed of representatives from the Departments of Agriculture, Commerce, Defense, Energy, Housing and Urban Development, the Interior, State, and Transportation; the Environmental Protection Agency; the Federal Emergency Management Agency; the Library of Congress; the National Aeronautics and Space Administration; the National Archives and Records Administration; and the Tennessee Valley Authority. Additional Federal agencies participate on Federal Geographic Data Committee subcommittees and working groups. The Department of the Interior chairs the Subcommittee on Cadastral Data.

Federal Geographic Data Committee subcommittees work on issues related to data categories coordinated under the circular. Subcommittees establish and implement standards for data content, quality, and transfer; encourage the exchange of information and the transfer of data; and organize the collection of geographic data to reduce duplication of effort. Working groups are established for issues that transcend data categories.

For more information on this standard or to be notified of subcommittee activities please contact:

Bob Ader, BLM Cadastral Survey
MS CO955
2850 Youngfield Street
Lakewood Colorado 80215
Telephone: (303) 239-3817
Facsimile: (303) 239-3815
Internet (electronic mail): bob_ader@blm.gov
World Wide Web: <http://www.nationalcad.org>

The following is the recommended bibliographic citation for this publication: Federal Geographic Data Committee, 2008, Cadastral Data Content Standard for the National Spatial Data Infrastructure, Version 1.4, Subcommittee on Cadastral Data, Reston, Virginia.

The full 111 page document can be found at:

<http://www.nationalcad.org/data/documents/CADSTAND.v.1.4.pdf>

APPENDIX F

VALIDATION OF PRIOR COMPREHENSIVE PLANS - §8A-3-12

CHAPTER 8A. LAND USE PLANNING. ARTICLE 3. COMPREHENSIVE PLAN.

§8A-3-1. Purpose and goals of a comprehensive plan.

(a) The general purpose of a comprehensive plan is to guide a governing body to accomplish a coordinated and compatible development of land and improvements within its territorial jurisdiction, in accordance with present and future needs and resources.

(b) A comprehensive plan is a process through which citizen participation and thorough analysis are used to develop a set of strategies that establish as clearly and practically as possible the best and most appropriate future development of the area under the jurisdiction of the planning commission. A comprehensive plan aids the planning commission in designing and recommending to the governing body ordinances that result in preserving and enhancing the unique quality of life and culture in that community and in adapting to future changes of use of an economic, physical or social nature. A comprehensive plan guides the planning commission in the performance of its duties to help achieve sound planning.

(c) A comprehensive plan must promote the health, safety, morals, order, convenience, prosperity and general welfare of the inhabitants, as well as efficiency and economy in the process of development.

(d) The purpose of a comprehensive plan is to:

(1) Set goals and objectives for land development, uses and suitability for a governing body, so a governing body can make an informed decision;

(2) Ensure that the elements in the comprehensive plan are consistent;

(3) Coordinate all governing bodies, units of government and other planning commissions to ensure that all comprehensive plans and future development are compatible;

(4) Create conditions favorable to health, safety, mobility, transportation, prosperity, civic activities, recreational, educational, cultural opportunities and historic resources;

(5) Reduce the wastes of physical, financial, natural or human resources which result from haphazard development, congestion or scattering of population;

(6) Reduce the destruction or demolition of historic sites and other resources by reusing land and buildings and revitalizing areas;

- (7) Promote a sense of community, character and identity;
- (8) Promote the efficient utilization of natural resources, rural land, agricultural land and scenic areas;
- (9) Focus development in existing developed areas and fill in vacant or underused land near existing developed areas to create well designed and coordinated communities; and
- (10) Promote cost-effective development of community facilities and services.

(e) A comprehensive plan may provide for innovative land use management techniques, including:

- (1) Density bonuses and/or density transfer;
- (2) Clustering;
- (3) Design guidelines, including planned unit developments;
- (4) Conservation easements;
- (5) Infill development;
- (6) Consolidation of services; and
- (7) Any other innovative land use technique that will promote the governing body's development plans.

§8A-3-2. Study guidelines for a comprehensive plan.

(a) When preparing or amending a comprehensive plan, a planning commission shall make comprehensive surveys and studies of the existing conditions and services and probable future changes of such conditions and services within the territory under its jurisdiction.

(b) The comprehensive surveys and studies may cover such factors as population density, health, general welfare, historic sites, mobility, transportation, food supply, education, water and sanitation requirements, public services, accessibility for the disabled and future potential for residential, commercial, industrial or public use.

(c) The major objective of the planning process is providing information to and coordination among divergent elements in the municipality or county. The elements in the comprehensive plan shall be consistent and governing bodies, units of government and planning commissions must work together to ensure that comprehensive plans and future development are compatible.

§8A-3-3. Authority for planning commission.

(a) A planning commission shall prepare a comprehensive plan for the development of land within its jurisdiction. A planning commission shall then recommend the comprehensive plan to the appropriate governing body for adoption.

(b) A county, multicounty, regional or joint comprehensive plan may include the planning of towns, villages or municipalities to the extent to which, in the planning commission's judgment, they are related to the planning of the unincorporated territory of the county as a whole: *Provided*, That the comprehensive plan shall not be considered a comprehensive plan for any town, village or municipality without the consent of the planning commission and/or the governing body of the town, village or municipality.

(c) A comprehensive plan should be coordinated with the plans of the department of transportation, insofar as it relates to highways, thoroughfares, trails and pedestrian ways under the jurisdiction of that planning commission.

(d) A county planning commission may prepare a comprehensive plan for either the entire county or a part of the county.

(e) A multicounty, regional or joint planning commission may prepare a comprehensive plan for land within its jurisdiction.

§8A-3-4. Mandatory components of a comprehensive plan.

(a) The comprehensive plan is a written statement on present and future land use and development patterns consisting of descriptive materials, including text, graphics and maps, covering the objectives, principles and guidelines for the orderly and balanced present and future economic, social, physical, environmental and fiscal development of the area under the jurisdiction of the planning commission.

(b) A comprehensive plan shall meet the following objectives:

(1) A statement of goals and objectives for a governing body, concerning its present and future land development;

(2) A timeline on how to meet short and long-range goals and objectives;

(3) An action plan setting forth implementation strategies;

(4) Recommend to the governing body a financial program for goals and objectives that need public financing;

(5) A statement of recommendations concerning future land use and development policies that are consistent with the goals and objectives set forth in the comprehensive plan;

(6) A program to encourage regional planning, coordination and cooperation with other governing bodies, units of government and planning commissions; and

(7) Maps, plats, charts and/or descriptive material presenting basic information on the land included in the comprehensive plan, including present and future uses.

(c) The comprehensive plan shall have, but is not limited to, the following components:

(1) *Land use.* -- Designate the current, and set goals and programs for the proposed general distribution, location and suitable uses of land, including, but not limited to:

(A) Residential, commercial, industrial, agricultural, recreational, educational, public, historic, conservation, transportation, infrastructure or any other use of land;

(B) Population density and building intensity standards;

(C) Growth and/or decline management;

(D) Projected population growth or decline; and

(E) Constraints to development, including identifying flood-prone and subsidence areas.

(2) *Housing.* -- Set goals, plans and programs to meet the housing needs for current and anticipated future residents of the jurisdiction, including, but not limited to:

(A) Analyzing projected housing needs and the different types of housing needed, including affordable housing and universally designed housing accessible to persons with disabilities;

(B) Identifying the number of projected necessary housing units and sufficient land needed for all housing needs;

(C) Addressing substandard housing;

(D) Rehabilitating and improving existing housing; and

(E) Adaptive reuse of buildings into housing.

(3) *Transportation.* -- Consistent with the land use component, identify the type, location, programs, goals and plans to meet the intermodal transportation needs of the jurisdiction, including, but not limited to:

(A) Vehicular, transit, air, port, railroad, river and any other mode of transportation system;

(B) Movement of traffic and parking;

(C) Pedestrian and bicycle systems; and

(D) Intermodal transportation.

(4) *Infrastructure.* -- Designate the current, and set goals, plans and programs, for the proposed locations, capabilities and capacities of all utilities, essential utilities and equipment, infrastructure and facilities to meet the needs of current and anticipated future residents of the jurisdiction.

(5) *Public services.* -- Set goals, plans and programs, to ensure public safety, and meet the medical, cultural, historical, community, social, educational and disaster needs of the current and anticipated future residents of the jurisdiction.

(6) *Rural.* -- Consistent with the land use component, identify land that is not intended for urban growth and set goals, plans and programs for growth and/or decline management in the designated rural area.

(7) *Recreation.* -- Consistent with the land use component, identify land, and set goals, plans and programs for recreational and tourism use in the area.

(8) *Economic development.* -- Establish goals, policies, objectives, provisions and guidelines for economic growth and vitality for current and anticipated future residents of the jurisdiction, including, but not limited to:

(A) Opportunities, strengths and weaknesses of the local economy and workforce;

(B) Identifying and designating economic development sites and/or sectors for the area; and

(C) Type of economic development sought, correlated to the present and projected employment needs and utilization of residents in the area.

(9) *Community design.* -- Consistent with the land use component, set goals, plans and programs to promote a sense of community, character and identity.

(10) *Preferred development areas.* -- Consistent with the land use component, identify areas where incentives may be used to encourage development, infill development or redevelopment in order to promote well designed and coordinated communities and prevent sprawl.

(11) *Renewal and/or redevelopment.* -- Consistent with the land use component, identify slums and other blighted areas and set goals, plans and programs for the elimination of such slums and blighted areas and for community renewal, revitalization and/or redevelopment.

(12) *Financing.* -- Recommend to the governing body short and long-term financing plans to meet the goals, objectives and components of the comprehensive plan.

(13) *Historic preservation.* -- Identify historical, scenic, archaeological, architectural or similar significant lands or buildings, and specify preservation plans and programs so as not to unnecessarily destroy the past development which may make a viable and affordable contribution in the future.

§8A-3-5. Optional components of a comprehensive plan.

The comprehensive plan may have, but is not limited to, the following components:

(1) *History.* -- An analysis of the history of the area to better provide for the future.

(2) *Environmental.* -- Recommend programs where appropriate to appropriate regulatory agencies to protect the area from all types of pollution and promote a healthy environment.

(3) *Tourism.* -- Recommend programs to promote tourism and cultural and heritage development in the area.

(4) *Conservation.* -- Recommend programs to conserve and protect wildlife, natural habitats, sensitive natural areas, green spaces and direct access to sunlight.

(5) *Safety.* -- Recommend public safety programs to educate and protect the public from disasters, both natural and man-made.

(6) *Natural resources use.* -- Identify areas for natural resources use in an urban area.

§8A-3-6. Notice and public participation requirement for a comprehensive plan.

(a) Prior to recommending a new or amended comprehensive plan to a governing body for adoption, the planning commission shall give notice and hold a public hearing on the new or amended comprehensive plan.

(b) At least thirty days prior to the date set for the public hearing, the planning commission shall publish a notice of the date, time and place of the public hearing as a Class I legal advertisement in compliance with the provisions of article three, chapter fifty-nine of this code. The publication area shall be the area covered by the comprehensive plan.

(c) A planning commission shall include public participation throughout the process of studying and preparing a comprehensive plan and amending a comprehensive plan. A planning commission shall adopt procedures for public participation throughout the process of studying and preparing or amending a comprehensive plan.

(d) A planning commission shall request input from other affected governing bodies and units of government.

§8A-3-7. Submission of comprehensive plan.

(a) After the comprehensive plan is prepared and before it is approved, the planning commission shall hold a public hearing. After the public hearing and approval, the planning commission shall submit the recommended comprehensive plan to the applicable governing body for consideration and adoption.

(b) At the first meeting of the applicable governing body following the submission of the recommended comprehensive plan by the planning commission to the governing body, the planning commission shall present the recommended comprehensive plan to the governing body.

(c) After the presentation of the recommended comprehensive plan by the planning commission to the governing body and prior to adoption, the governing body shall hold a public hearing after giving notice.

(d) At least fifteen days prior to the date set for the public hearing, the planning commission shall publish a notice of the date, time and place of the public hearing as a Class I legal advertisement in compliance with the provisions of article three, chapter fifty-nine of this code. The publication area shall be the area covered by the comprehensive plan.

§8A-3-8. Adoption of comprehensive plan by governing body.

(a) Within the latter of ninety days or three scheduled meetings after the submission of the recommended comprehensive plan to the governing body, the governing body must act by either adopting, rejecting or amending the comprehensive plan.

(b) If the comprehensive plan is adopted by the governing body, then the governing body may adopt the comprehensive plan as an ordinance or designate what other effect the comprehensive plan may have.

(c) If the comprehensive plan is adopted by the governing body and an ordinance is published, the comprehensive plan may be incorporated by reference in the ordinance and the full text of the comprehensive plan does not have to be published.

§8A-3-9. Filing the comprehensive plan.

After the adoption of a comprehensive plan by a governing body, the governing body must file the adopted comprehensive plan in the office of the clerk of the county commission where the comprehensive plan applies. If an adopted comprehensive plan covers more than one county, a certified copy of the adopted comprehensive plan must be filed in the office of the clerk of the county commission of each county covered by the adopted comprehensive plan.

§8A-3-10. Rejection or amendment of comprehensive plan by governing body.

(a) If a governing body rejects or amends the recommended comprehensive plan, then the comprehensive plan must be returned to the planning commission for its consideration, with a written statement of the reasons for the rejection or amendment.

(b) The planning commission has forty-five days to consider the rejection or amendment and make recommendations to the governing body.

(c) If the planning commission approves the amendment to the comprehensive plan, then the comprehensive plan shall stand as adopted by the governing body.

(d) If the planning commission disapproves of the rejection or amendment, then the planning commission shall state its reasons in its written recommendations to the governing body.

(e) Within forty-five days of receipt of the planning commission's written recommendations for disapproval, the governing body must act on the comprehensive plan.

(f) If the planning commission does not file a written recommendation with the governing body within forty-five days, then the action in rejecting or amending the comprehensive plan is final.

§8A-3-11. Amending comprehensive plan after adoption.

(a) After the adoption of a comprehensive plan by the governing body, the planning commission shall follow the comprehensive plan, and review the comprehensive plan and make updates at least every ten years.

(b) After the adoption of a comprehensive plan by the governing body, all amendments to the comprehensive plan shall be made by the planning commission and recommended to the governing body for adoption in accordance with the procedures set forth in sections six, seven, eight and nine of this article. The planning commission shall hold a public hearing prior to its recommendation to the governing body.

(c) If a governing body wants an amendment, it may request in writing for the planning commission to prepare an amendment. The planning commission must hold a public hearing within one hundred twenty days after the written request by the governing body to the planning commission is received.

(d) Within the latter of ninety days or three scheduled meetings after the submission of the recommended amendment to the comprehensive plan to the governing body, the governing body must act by either adopting, rejecting or amending the comprehensive plan.

§8A-3-12. Validation of prior comprehensive plans.

(a) The adoption of a comprehensive plan or any general development plans by a planning commission, under the authority of prior acts, is hereby validated and the plans may continue in effect for ten years after the effective date of this chapter or until the plans are revised, amended or replaced in accordance with this chapter.

(b) After the effective date of this chapter, amendments to prior plans shall be made in accordance with the provisions of this article.

§8A-3-13. Intergovernmental cooperation.

(a) With a view to coordinating and integrating the planning of municipalities and/or counties with each other, all governing bodies and units of government within the lands under the jurisdiction of the planning commission preparing or amending a comprehensive plan, all governing bodies and units of government affected by the comprehensive plan, and any other interested or affected governing body, unit of government or planning commission, must cooperate, participate, share information and give input when a planning commission prepares or amends a comprehensive plan.

(b) All planning commissions, governing bodies and units of government are authorized to cooperate and share information with each other and may adopt rules and regulations to coordinate and integrate planning.

(c) All planning commissions, governing bodies and units of government must make available, upon the request of a planning commission, any information, maps, documents, data and plans pertinent to the preparation of a comprehensive plan.

§8A-3-14. Jurisdiction of municipal planning commission.

The jurisdiction of a municipal planning commission shall not extend beyond the corporate limits of the municipality.

APPENDIX G

CONTACT FOR QUESTIONS OR CONCERNS

Please contact us with any questions about this business plan.

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