

State of Arkansas



Geospatial Strategic Business Plan

March 2010

This plan was formally and unanimously accepted and endorsed by the Arkansas Geographic Information Systems Board on March 3, 2010.

with support from



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This “word cloud” was produced via the web-site <http://www.wordle.net> by inserting the complete text of the Geospatial Strategic Business Plan. In a word cloud, the size of text is proportional to the number of times that the word appears in the document.

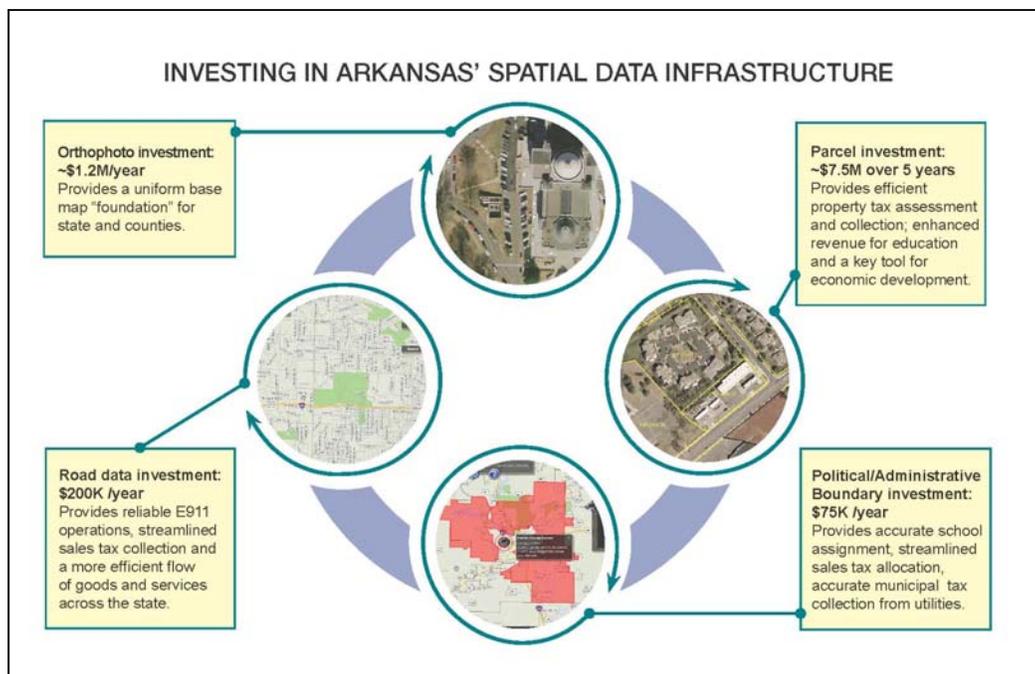
Executive Summary

Almost 20 years ago, President Clinton, as the sitting Governor of Arkansas, drafted a letter of support for a geographic information systems (GIS) symposium aimed at local governments (see next page). In that letter, and referring to GIS, he wrote “I support the use of technology as a means to achieve the quality of government services our citizens deserve.” Over the past two decades Arkansas has made tremendous progress in developing and deploying GIS technology to improve “the quality of government services”. As documented in this strategic plan, today Arkansans apply GIS technology every day to help with property assessment; to protect the state’s natural resources; to respond to natural disasters; to encourage economic development, and to support a wide variety of additional government services.

Arkansas has made great progress in establishing law that clarifies statewide GIS responsibilities, developing first generation geospatial data, establishing technical infrastructure and building an effective statewide GIS office, the Arkansas Geographic Information Office (AGIO). One of the core roles of the AGIO as defined in its enabling legislation (i.e. HB-1356 of the 87th General Assembly) is “coordinat(ing) completion and maintenance of shareable statewide framework data...” Indeed, this strategic plan found that further investments to complete and improve the state’s GIS data is the highest priority among the state’s numerous state government, local government and private sector stakeholders. Nevertheless, there is not a reliable and recurring funding stream for making necessary *data investments*. Thus, the overarching strategic goal for this plan is “**to provide recurring funding for continual investment in, and improvement of the Arkansas Spatial Data Infrastructure.**” Specifically, and as illustrated below, further investments were recommended for four fundamental GIS data sets:

1. **Recurring orthophoto** program with a 3-year re-refresh cycle: \$1.2M/year
2. Completion of a **statewide parcel data layer**: \$7.5M investment spread across 5 years
3. Improve the accuracy and currency of **political and administrative boundaries**: \$75k/year
4. Improve the accuracy and currency of **roads data**: \$200k/year

Cumulatively, approximately \$1.5M of annual funding and a one-time investment of \$7.5M will result in the state creating a geospatial database that will rival any state in the country and will fully meet the needs of Arkansas’ active and engaged geospatial community. Everything else is in place, it is time to provide the AGIO the investment capital needed to fulfill its statutory role as custodian of the state’s geospatial data.



Two Decades Later and We Are Almost There



STATE OF ARKANSAS
OFFICE OF THE GOVERNOR
State Capitol
Little Rock 72201

Bill Clinton
Governor

January 30, 1992

Dear Friend:

Improving the quality of government, education, and public services at any level often requires speedy access to information. Time lost in gathering facts from the massive amounts of public information burdens--sometimes critically--the decision making process.

Public sector decision makers all over Arkansas want to know how to make that process faster and more effective. A little known technology, GIS--Geographic Information Systems--is one innovative tool being used more and more throughout the country in the quest for timely, accurate, and reliable information. GIS can assist in lifting the burden of time consuming research when addressing problems and making plans for the state's human and natural resources.

I support the use of technology as a means to achieve the quality government services our citizens deserve. On March 5 and 6, 1992, the Arkansas GIS Users Forum and the UALR Division of Lifetime Education and Professional Development are sponsoring a symposium to introduce GIS and its capabilities to state and local government. The symposium, GIS in Arkansas: Present and Future, will present valuable ideas to senior level leaders like you.

I encourage you and members of your staff to attend this workshop. You will want to learn how this technology can help you in planning for the future of your community.

Sincerely,

A handwritten signature in black ink that reads "Bill Clinton".

Bill Clinton

BC:pn

1. Strategic Planning Methodology

1.1 PROJECT TEAM

The execution and supervision of this project was conducted by the following team:

PROJECT OVERSIGHT. Arkansas assembled a Strategic Planning Steering Committee that represented key stakeholder groups in the state. The following people and organizations participated in the Steering Committee:

- Shelby Johnson**, representing the Arkansas Geographic Information Office
- William Sneed**, representing the United States Geological Survey
- Tracy Moy**, representing the Arkansas Geographic Information Systems Board
- Alan Price**, representing the Arkansas GIS Users Forum

The Steering Committee acted as an advisor throughout the project and served in the role of “executive editor” of the final document.

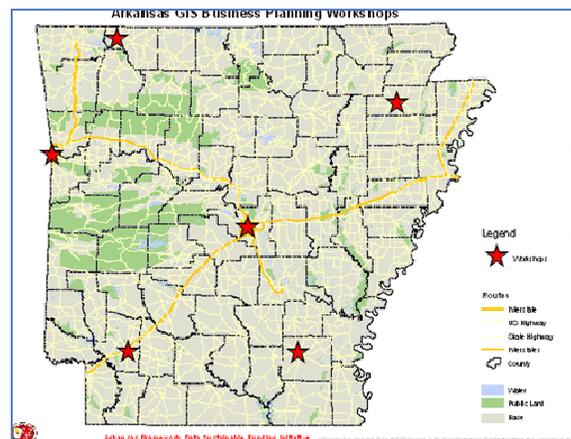
PROJECT MANAGEMENT. Direct project management was provided by the Arkansas Geographic Information Office, through its Director, Shelby Johnson. In addition to management of the contract, the AGIO provided invaluable logistical and research support throughout the project. In addition to Mr. Johnson, AGIO staff members Learnon Dalby, Maria Owen, Adrian Clark, Glen Rhea and Rachel Hood made important contributions to this effort.

PROJECT CONSULTANT. Following a competitive procurement, Arkansas selected Applied Geographics, Inc. (AppGeo) from Boston, Massachusetts to provide project facilitation and report authoring on this project. Michael Turner, a principal in the firm, provide project management on behalf of AppGeo.

1.2 PROJECT ACTIVITIES

The project was initiated in August, 2009 and the following activities were conducted over the course of the next seven months:

1. **Kickoff & Project Planning Meeting**
2. **Conducted 5 Stakeholder Workshops throughout the state.** The map to the right illustrates the location of the workshops that were conducted.



Workshop locations, dates and attendance figures, were:

- ★ **Jonesboro**, August 17, 2009 – 29 attendees*
- ★ **Little Rock**, August 19, 2009 – 60 attendees
- ★ **Monticello**, August 31, 2009 – 19 attendees
- ★ **Fort Smith**, September 1, 2009 – 37 attendees
- ★ **Hope**, September 2, 2009 – 22 attendees

* Note, project team member attendance was only counted once, for Jonesboro, even though the project team attended all workshops.

Please see [Section 2.1](#) for further details on attendance; see [Appendix 1](#) for workshop presentation materials; and, see [Appendix 2](#) for summaries of each workshop.

3. **Key Stakeholder Interviews.** Over the course of the project, the project team conducted 17 interviews with key leaders and decision makers within the current administration, county government and other organizations that represent geospatial stakeholders or implement geospatial technologies. The table below catalogs the interviews that were conducted.

“GIS technology is becoming increasingly important to county government for increased efficiencies of accuracy, time use and service delivery by our County Judges, Assessors, Sheriffs and emergency management personnel. A geographic information system that captures, stores, analyzes, manages and presents data that is linked to a location is extremely useful for real estate assessment; for maintaining and building a county road and bridge system; for support of public safety and criminal justice provided by law enforcement; and for information needed by emergency planners to calculate emergency response times and logistics during natural disasters as well as singular emergencies.”

Eddie Jones
Executive Director
Association of Arkansas Counties

Randy Zook , Arkansas Chamber of Commerce	Butch Calhoun , Arkansas Rural Services
Don Zimmerman , Arkansas Municipal League	Maria Haley , Arkansas Economic Development Commission
Eddie Jones , Arkansas Counties Association	Richard Davies , Arkansas Department of Parks & Tourism
Lee Ann Kizzar , Arkansas Assessor’s Association	Debbie Asbury , Arkansas Assessment Coordination
Dr. Thomas Kimbrell , Arkansas Department of Education	Bill Stovall , Office of the Speaker of the House
Mike Stormes , State Budget Director	Senator John Paul Capps
Jon Moran , Governor Beebe’s Office	Representative Kathy Webb
Kathryn Hazelett , Governor Beebe’s Office (since departed)	Jimmy Hart , Conway County Judge
Emily Jordan-Cox , Governor Beebe’s Office	

4. **Presentation of initial findings at State GIS Conference.** Following the workshops and interviews, the project team developed a slate of findings and recommendations. These findings and recommendations were then presented to the broader GIS stakeholder community during the 2009 Arkansas GIS User's Forum Conference in Eureka Springs. The goal was to determine whether there was general agreement with the direction the plan was taking and to solicit a last round of input.
5. **Report Authoring.** Following the GIS User Forum Conference and the last round of input, this written Geospatial Strategic Business Plan was drafted.
6. **Roll-out the Plan.** With the release of this plan the AGIO will pursue a variety of educational and outreach activities aimed at presenting the substance of recommendations and advocating that they be carried out.

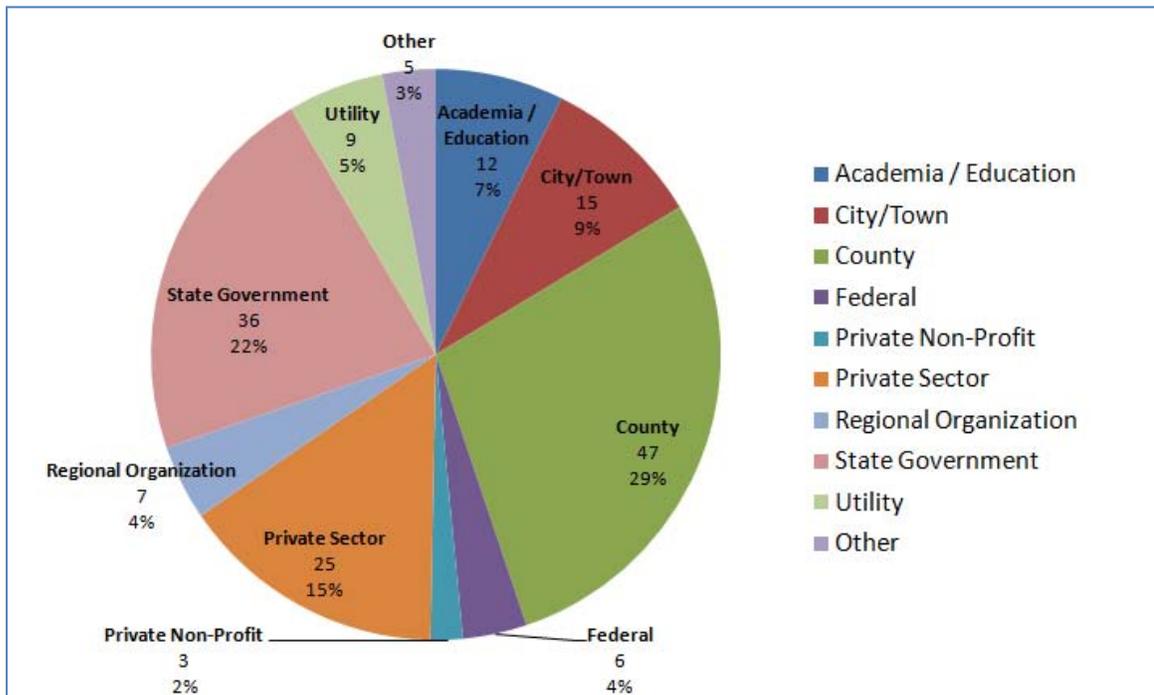
2. Current Situation

2.1 WHO IS THE ARKANSAS GIS STAKEHOLDER COMMUNITY?

Arkansas has a large and highly engaged GIS stakeholder community composed of public and private sector organizations that implement the technology. The stakeholder workshop attendance reflects the size and breadth of this community. The map to the right illustrates the spatial distribution of workshop attendance. The figure below shows the total workshop attendance of 165 people distributed across 10 major sectors.



The image at left shows workshop attendance as illustrated by pins that each attendee was asked to place on the map showing where they lived. Each color (e.g. red, black, yellow, etc.) represented a different workshop location.



2.2 WHAT IS ARKANSAS'S GEOSPATIAL DEVELOPMENT STATUS?

The following presents two assessments of Arkansas' geospatial development status. First, Arkansas is rated using a set of criteria developed by the National States Geographic Information Council (NSGIC), the trade organization that represents state government geospatial programs. Second, the status of

geospatial data development is listed for each of the seven “framework data layers” considered to be part of the National Spatial Data Infrastructure.

2.2.1 Relative To NSGIC’s “9 Criteria For A Successful Statewide GIS Program”

The National States Geographic Information Council has published a listing of “9 Criteria for a Successful Statewide GIS Program.” While these are not firm, binary criteria, they provide a measure by which different states can be compared. As stated in the Fifty States Initiative Action Plan, these criteria “establish a benchmark for statewide coordination activities...(and) are essential for effective statewide coordination of geospatial technologies.” Using different terms, the most successful states tend to have these things in common.

The following describes Arkansas’ extremely strong rating against these criteria.

- 1. A full-time, paid coordinator position is designated and has the authority to implement the state’s business and strategic plans:**
YES. The Director of the AGIO serves this function.
- 2. A clearly defined authority exists for statewide coordination of geospatial information technologies and data production:**
YES. The Arkansas Geographic Information Systems Board (also known as “State GIS Board”) fulfills this function. The predecessor to the State GIS Board, the State Land Information Board was created, and provided coordination authority in 1997 via Arkansas Code 15-21-501¹. In 2009, the current name was given via Act 244 of the 87th Arkansas General Assembly.
- 3. The statewide coordination office has a formal relationship with the state’s Chief Information Officer (CIO):**
YES. The Director of Arkansas Department of Information Systems (DIS) sits on State GIS Board by statute. In addition, the AGIO was formerly housed within DIS and maintains a good working relationship with that organization. Finally, the AGIO maintains a formal contractual relationship with DIS whereby DIS provides data center services (i.e., housing AGIO servers).
- 4. A champion (politician, or executive decision-maker) is aware and involved in the process of geospatial coordination:**
YES. There is growing awareness of both the AGIO and GIS in general at senior staff levels in both state and county government and within the legislature. In addition, during 2009 the AGIO was reorganized out of DIS and it now reports directly into the Governor’s office. Through the new organizational structure, the AGIO maintains direct, formal communication channels with the Governor’s Office.

¹ See http://www.gis.state.ar.us/ASLIB/Ar_Code_15-21-501.htm for the language of the code.

5. **Responsibilities for developing the National Spatial Data Infrastructure and a State Clearinghouse are assigned:**

YES. The AGIO fulfills these functions. As stated on the AGIO’s Web-site, “We coordinate the completion and maintenance of shareable statewide framework data...Our premier service is GeoStor the state’s geographic information systems platform.” The state has clearly taken on NSDI framework data maintenance and the GeoStor platform functions as the state data clearinghouse.
6. **The ability exists to work and coordinate with local governments, academia, and the private sector:**

YES. The AGIO fulfills these functions. As stated on the AGIO’s Web-site, “We coordinate with cities, counties, state, federal governments, and the private sector to reduce the duplication of effort.” Specifically, the AGIO maintains two formal programs that “work and coordinate with local governments.” First, the County Assessor’s Map Program (CAMP) provides a “coordinated statewide initiative to build a statewide digital cadastre.” Second, the Arkansas Centerline File Program (ACF) involves a “coordinated statewide initiative to build statewide centerlines in a common attribute and spatial standard. Program participants include all levels of government and the private sector.”
7. **Sustainable funding sources exist to meet project needs:**

PARTIAL. Although the AGIO has a sustainable budgetary line item that funds operations (i.e. staff and technology) there is *no* sustainable funding available for one of AGIO’s core responsibilities: geospatial data development and maintenance. Indeed, the core recommendations of this study involve developing a sustainable funding model that provides ongoing funding and investment in the states geospatial data assets.
8. **GIS Coordinators have the authority to enter into contracts and become capable of receiving and expending funds:**

YES. The AGIO is a formal part of Arkansas state government and has these capabilities.
9. **The Federal Government works through the statewide coordinating authority:**

YES. The AGIO and the State GIS Board are actively and formally engaged with the federal government. At the same time, there are opportunities for this coordination to be strengthened, including the federal government’s own efforts to better coordinate its activities, across all of its departments, with states.

2.2.2 Relative To Framework Data Layer Development Status

The National Spatial Data Infrastructure defines the concept of seven “federal framework” data layers. This definition, found on the Federal Geographic Data Committee’s (FGDC) Web-site², builds on the notion that “GIS applications of many different disciplines have a recurring need for a few themes of data.” Thus, framework data sets represent the common needs of the GIS community and are therefore considered “one of the key building blocks and...the data backbone of the NSDI.”

All public framework data are available from the GeoStor database maintained by the AGIO. The following summarizes the status of Arkansas’ framework data sets, and further details on these data can be found at the GeoStor Web-site: <http://www.geostor.arkansas.gov> (type “metadata” into the search box).

Framework Layer	Arkansas Status
1. Geodetic Control	Primary data set is the NOAA-National Geodetic Survey collection nationwide survey monuments.
2. Parcels	Managed individually by each of the 75 counties. State supports parcel automation through AGIO CAMP program, and collects and distributes existing parcel data. Approximately 54% of the state’s 2,130,000 parcels are automated as polygons. Approximately 13 counties have completed their parcel polygon automation.
3. Transportation/Roads	The state has recently completed a standardized, statewide road centerline file as a collaborative effort with the 75 counties. The AGIO coordinated this effort through the Arkansas Centerline File (ACF) program
4. Hydrography	The Department of Environmental Quality (ADEQ) has been formally designated as the state’s data steward and collaboratively developed the statewide hydrography data set in association with USGS’s National Hydrographic Data Set Program (NHD). ADEQ will continue to maintain this data set.
5. Elevation	The best available statewide data set is the USGS 30-meter nationwide DEM. USGS 10-meter DEMs are available for approximately 40% of the USGS topographic quad sheets. In addition, there is a statewide 5-meter DEM created as part of the last orthoimagery mission; however, this data set has yet to have its quality certified by the USGS for inclusion in Federal data sets.
6. Aerial Photography	Statewide 1-meter resolution, 4-band color imagery from 2006 is available on a statewide basis. Older color infrared data from 2001 and black-and-white imagery from 1994-1996 are also available.
7. Political/Administrative Boundaries	The AGIO currently coordinates the collection/creation of political and administrative boundaries covering: counties, cities, legislative districts and school districts in association with several sister agencies. County boundaries emanate from USGS source materials, other boundaries are collected from counties and other jurisdictions.

² See: <http://www.fgdc.gov/framework> for further information.

2.3 ARKANSAS'S GEOSPATIAL STRENGTHS, WEAKNESSES, CHALLENGES & OPPORTUNITIES

2.3.1 Geospatial Strengths

- ★ Arkansas has an extremely **engaged, open and communicative geospatial stakeholder community**. As reflected throughout the stakeholder workshops – attended by 165 stakeholders - large numbers of people care about statewide geospatial activities and freely provided their input and willingly shared their experiences. The Arkansas GIS User's Forum email list provides another manifestation of this collaborative spirit. The GIS Users Forum email list distributes several emails per week that share news of GIS development across the state. At other times, users post technical or data availability questions to the list. In almost every case these questions are answered by multiple people – from both the public and private sectors - with useful, practical and at times detailed technical advice. In short, people are willing to help and they want to see other Arkansans succeed.
- ★ In addition to widespread information sharing, the Arkansas geospatial stakeholder community exhibits uniquely **ubiquitous and rich data sharing across all levels of government**. In general, if a member the stakeholder community has geospatial data, then they willingly share it with their colleagues at no cost. This attitude is led by the AGIO which posts all of its data holdings for download at no fee via the GeoStor system. But unlike many other states, during the stakeholder workshops there were no reports of “data holdouts” or counties that sell their data for unreasonable fees. Arkansans seem to understand that the free flow of geospatial data benefits all.
- ★ The AGIO represents a **strong and effective statewide geospatial program**. Three noteworthy aspects of the AGIO include:
 - An extremely **strong geospatial data portal** with ready public access to the state's geospatial holdings. The portal has rich data holdings, an innovative architecture and user interface, and distributes data in a wide variety of formats including consumable web services.
 - Effective **awareness building across state and county government** and with the current Administration. The AGIO has invested time and energy in engaging with geospatial stakeholders across the state and throughout state government, and as a result is a well known and well respected entity. Arkansas GIS users understand what the AGIO does and view it as a resource that is willing, and able to help.
 - The AGIO has shown innovation and foresight in building two model programs (e.g. CAMP, ACF) that have explicitly involved **engagement with county governments to collaboratively create geospatial data**. These efforts have been instrumental in catalyzing the development of higher quality parcel and roads data, and they have

served to strengthen the bonds of state-county collaboration on geospatial activities.

- ★ Arkansas possesses **strong geospatial educational and academic resources** that are capable of producing a trained geospatial workforce and providing direct support to both state and county governments. Institutions that possess geospatial training facilities and capabilities include, but are not limited to:
 - University of Arkansas, Center for Advanced Spatial Technologies
 - University of Arkansas, Cooperative Extension Service
 - University of Arkansas, Little Rock
 - University of Arkansas, Monticello
 - Arkansas Tech University, Russellville through the Emergency Management degree program
 - University of Central Arkansas

In addition, several of the state’s two-year colleges offer introductory programs in GIS.

Last, the Arkansas Department of Education (ADE), in association with ESRI has implemented the Environmental and Spatial Technologies³ (EAST) program that is available to any of the 266 K-12 school districts in the state. As Jim Boardman, the ADE Assistant Commissioner for Research and Technology, states on the program’s Web-site “This is an important step in providing educational opportunities for our students to meet the challenges of the twenty-first century. Learning GIS gives students important skills that can be applied in a wide range of occupations.”

2.3.2 Weaknesses & Challenges

- ★ Although there is a clear mandate for the AGIO to provide stewardship and coordination of the state’s geospatial assets there is **no funding is dedicated to the maintenance, improvement, or expansion of these data assets**. According to the AGIO web-site, the AGIO “acts as the functional arm of the Arkansas Geographic Information Systems Board.” The State GIS Board’s original authorizing language as described in Arkansas Code 15-21-501 includes - as Item C under “duties responsibilities, and authority” – language that states “The board shall coordinate completion and maintenance of shareable statewide framework data..” In spite of this language the AGIO does not currently possess any budget for the explicit completion or maintenance of framework data. Data investments that have been made – such as the 2006 statewide orthoimages – have come through one time funding and/or the collaborative funding of a variety of state agencies. Thus, the State GIS Board and the AGIO have been given a responsibility without the proper ongoing funding to carry it out, and this has hindered data development progress.
- ★ In spite of its success in helping to foster increased geospatial activity across the state and within state government, the **AGIO staffing level has not kept pace with growing programs demand**.

³ See: http://www.esri.com/news/releases/09_4qtr/k-12-arkansas.html for further details.

Currently, the AGIO is staffed with 5 full-time equivalents and the supervision of two contract personnel funded through the streamlined sales tax program. While the reorganization that split the AGIO from DIS has had many positive aspects, it has also served to amplify this staffing shortfall since the AGIO previously had access to DIS administrative support staff. At present, the AGIO now has an increased administrative load as an independent agency without having any administrative staff. At a minimum, the office would benefit greatly from an administrative support position.

- ★ As with many states, particularly rural states, there is a persistent gap between the geospatial technical and investment capabilities of smaller, poorer counties and richer, more developed counties. Indeed, even acknowledging there are a few promising counter examples of strong small-county GIS operations, there remains a **gap between “GIS have” and “GIS have-not” counties**. This gap will prove an impediment to completing some statewide framework data initiatives such as parcels. In addition to considering providing direct funding support to “GIS have-nots”, there may be a requirement for further education of local government officials on the value of GIS and the types of return on investment (ROI) it delivers.
- ★ Counties have found that **it can be challenging to retain trained geospatial technical staff** in light of county government pay scales and the demand for GIS personnel. Counties often begin their GIS programs by hiring less experienced staff, perhaps a recent graduate, at lower pay levels and providing training. Counties have found that once these personnel gain proficiency their skill-set is marketable and many counties have lost GIS staff when they leave for higher paying jobs in other sectors. This can be particularly challenging to address since a competitive salary for a trained and experienced GIS technician can exceed the salary of a County Assessor.

2.3.3 Opportunities

- ★ **Economic Development** remains one of the current priorities of the current administration and a high profile issue throughout the state. GIS has been used extensively in economic development and business recruiting efforts and there is wide acceptance of the value it adds to this important activity. This visibility and the nexus between the technology and Arkansas’ ability to compete in this arena provide important justifications for further investments in geospatial data.
- ★ Although many of county governments – particularly poorer and more rural counties - have been late to adopt GIS, advances in software, hardware and the availability of existing data have lowered the barriers to entry. **GIS technology is now more affordable and easier to deploy than ever before**. In short, it is easier to start now than it has been previously. Thus, there is an opportunity for “late adopters” to make rapid progress and catch up to other counties that have started earlier.

- ★ A variety of factors have coincided to make **the timing right** for Arkansas to make the next level of investments in its geospatial data infrastructure:
 1. With the recent reorganization that has made the AGIO an independent agency it is appropriate to review both its mission and its budget.
 2. As this report documents, geospatial technology has matured and these technologies support the current administration's priorities including *economic development, education* and *emergency response/public safety* in addition to many other public policy goals.
 3. There is wide recognition within both county and state government that advancing GIS provides meaningful benefits, and both levels of government will prosper from further investments.
 4. The state has been thorough and methodical in researching and documenting its requirements and presenting a coherent plan for meeting its needs. In short, the homework has been done to minimize risks and maximize the chances for success.

3. Visions & Goals

3.1 PROBLEM STATEMENT

Although the Arkansas Geographic Information Systems Board (AGISB) and the Arkansas Geographic Information Office (AGIO) are empowered through legislation to have the “responsibility” to *create, update, maintain, and disseminate framework spatial data*, there is currently **not a reliable, recurring funding stream that enables this mission to be fully carried out**. The AGIO’s authorizing act - Act 244 of the Regular Session of 2009 (House Bill 1356 of the 87th General Assembly) – contains the following specific language that reiterates this mission (emphasis added):

- ★ *Under Section 15-21-504. “Duties, responsibilities, and authority.”*
 - *Under Sub-section (c): “The board shall coordinate completion and maintenance of shareable statewide framework data...”*
 - *Under sub-section (d)(2)(A): “The board, using the technical support provided by the Arkansas Geographic Information Office, shall coordinate the development and maintenance of a statewide digital cadastre system.”*
 - *Under sub-section (d)(2)(C): “... shall coordinate the development and maintenance of a statewide road centerline database.”*
 - *Under sub-section (d)(2)(D): “...shall coordinate the development and maintenance of a statewide digital orthophotography database with a priority to be taken in leaf off conditions.”*

While the Act does not guarantee, or provide funding to complete this mission, it does direct the Board engage in “Recommending methods of financing...(and) Developing recommended priorities for the distribution of funds” [Section 15-21-504, Sub-sections (e)(4) and (e)(5)]. To date, the board has been unsuccessful in securing adequate recurring funding to fill identified data gaps, address existing data shortcomings and perform regular updates on key framework data sets. In short, the digital cadastre remains incomplete and the statewide road centerline program does not have funding to ensure that it can be kept current. Similarly, the current funding mechanisms have been unable to update the state’s orthophotography since 2006.

3.2 STRATEGIC GOAL

The overarching **strategic goal** of this plan is to:

To provide recurring funding for continual investment in, and improvement of the Arkansas Spatial Data Infrastructure.

The following sections of this plan identify the funding requirements for the Board and AGIO to fulfill their mission and suggest several “methods of financing” these activities. This includes undertaking focused

one-time efforts to complete framework data layers, ongoing activities to keep existing framework data properly maintained and properly staffing the AGIO to keep pace with its increased program demands.

3.3 PROGRAMMATIC GOALS

In order to grow Arkansas' future in economic development, improve the state's ability to respond to disaster events and to ensure that property tax revenues are fairly and efficiently collected to support education, the state should consider the following investments:

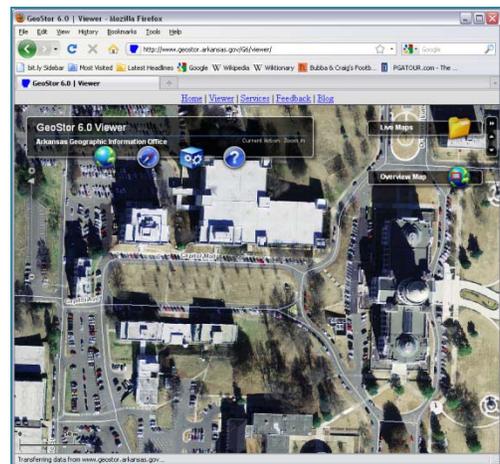
1. Recurring, annual **orthophotography** (i.e. digital aerial imagery): **\$1,167,000 annually**
2. Completion of **statewide parcels**: **\$1,503,000 annually** for five years
3. **Political and administrative boundary** data improvement: **\$75,000 annually**
4. **Road and address data** update and maintenance: **\$200,000 annually**

The following sections will provide a **concise business case**, including cost and benefit enumeration, for making each of these investments.

3.3.1 Orthophotography – Annual Cost: \$1,167,000

BACKGROUND. Orthophotography is one of the most popular, versatile and important data sets maintained by the AGIO. According to AGIO records on the utilization of the GeoStor web services, between May, 2006 and June, 2009 orthophotography was accessed approximately 1.65 million times accounting for 22% of GeoStor's overall web service utilization.

Arkansas currently possesses excellent statewide color imagery at a 1 meter pixel resolution. However, currently these images are approaching four years in age and increasingly, particularly in areas experiencing development, they will cease to be accurate representations conditions on the ground. To maintain its usefulness, orthophotography data sets require periodic update through a new aerial photography mission. The "current" 2006 orthophotos represent the "third edition" and follow black and white imagery that was flown between 1994-1996 and a 2001 statewide mission. Funding for each of these previous missions has been pursued on a one-time basis and via a variety of funding sources with the AGIO playing a central coordinating role that has consumed significant amounts of time.

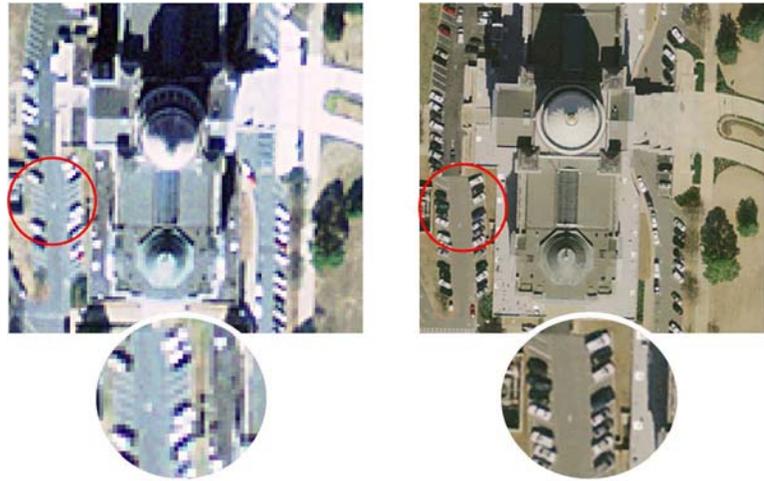


The 2006 orthophotography data set as depicted through the GeoStor data viewer.

There is currently no regularized schedule nor funding stream that allows GIS users in Arkansas to anticipate when the orthophotography will be updated.

IMPROVEMENTS THAT ARE REQUIRED. To ensure that GIS users throughout the state have access to current, high-quality orthophotography, it is recommended that the state institute **a funded and recurring statewide orthophoto program**. Under this program, Arkansas would fly approximately 1/3 of the state every year resulting in orthophotography that is never more than three years old for any part of the state. Ideally, and over time⁴, the three year cycle would be synchronized with the Assessment Coordination Department’s real estate reappraisal cycle so that counties undergoing reappraisals have access to the most current imagery, and imagery that is never older than 3-years.

In addition to the recurring schedule, it is recommended that the state consider **improving the resolution of its orthophotography from 1 meter to 1 foot**. During the stakeholder workshops (see **Appendix 2**) there was a strong preference for higher resolution imagery which would open up and/or improve many different types of applications, such as land development and forest cover change detection, assessment “real property discovery”, and effective parcel mapping in urban areas.



The images on the left show the state’s 1-meter imagery and the images on the right show 1-foot resolution imagery from Pulaski County.

The most important element of this proposal is that it provides a reliable and recurring source of orthophotography. With a known schedule of recurrence, the state’s partners will have a target that they can budget against and the counties should be well positioned to seek **and leverage additional partner funding**. The current system involves orthophotography projects appearing opportunistically and many interested participants do not have the time, or budgetary flexibility to participate. The three-year recurring cycle provides up to three years for partners to arrange funding participation.

The proposed program retains several characteristics from New York’s model program. One additional element that should be carried over from New York is issuing a contract with the explicit provision that **allows partners to “buy up” off of the state’s overarching contract**. In this manner, a county could add additional moneys to procure additional products that can be produced by the contractor. Examples of products that might be “bought up” include higher resolution imagery (e.g. 3”-6”), planimetric layers such as building footprints or digital elevation products such as LiDAR and contours which are produced

⁴ Currently, the ACD reappraisal cycle does not group counties geographically. To ensure cost effectiveness, an orthophotography mission must be planned so that large *contiguous* blocks of counties are flown at one time. Thus, over time ACD may want to adjust some county reappraisal cycles so that they align with the orthophotography program.

through the same photogrammetric technologies that are used for orthophotography. In addition to the benefit of catalyzing improved county data that the state will have access to, such a buy-up mechanism provides counties administrative efficiencies in voluntarily avoiding complex technical procurements.

HOW TO GET THERE. The State GIS Board and the AGIO need to work with the current administration and legislature to **obtain a budgetary line item** for the AGIO that will be sufficient to cover the anticipated annual costs which are outlined below.

Once the budgetary line item is obtained, the AGIO will need **to issue a formal procurement** for photogrammetric services that will cover a recurring statewide orthophotography cycle while providing a local buy-up provision. It is recommended that the contract term cover at least one complete, statewide cycle, while providing an option for a second cycle should there be exemplary performance on the first cycle.

WHAT IT WILL COST. Current industry estimates for the cost of a statewide, 1 foot resolution, 4-band original digital capture mission are: **\$3,000,000 - \$3,500,000** for Arkansas's approximately 53,000 square miles. Since this figure represents the "full state" price, the **annual cost** is estimated to be \$1,000,000 - \$1,170,000. These figures include the costs of improving the state's underlying digital elevation model to support 1 foot orthophotography.

It should be noted that photogrammetry and digital image capture are technologies that undergo continual technological improvements and that costs are shifting. For example, at the annual 2009 NSGIC conference, Microsoft made an announcement that they were entering the statewide orthophoto marketplace, and they have since entered into a contract with Michigan. Such developments will continue to impact the competitive landscape and pricing.

EXPECTED BENEFITS. As described above, orthophotography is one of the most popular and widely used geospatial data sets. Literally, every organization utilizing GIS and almost every geospatial application created by those organizations will benefit from access to high quality and *current* data. The following provides three specific examples of tangible benefits to important issues in Arkansas:

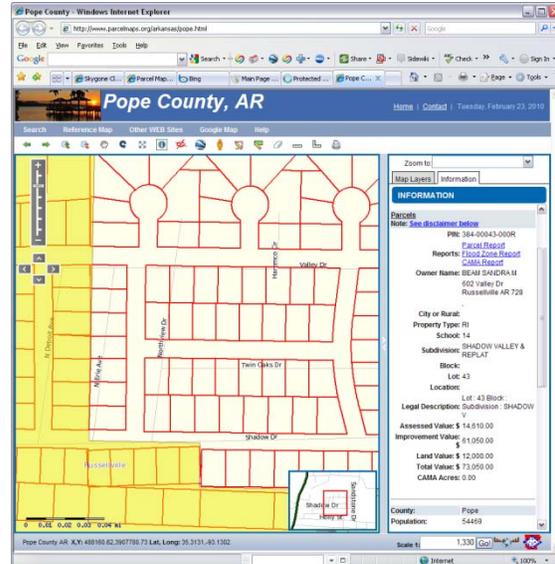
1. Orthophotography serves as the **core base map** for most GIS installations. Orthophotography represents the "visible geography" and thus most other data layers must be designed to properly overlay and not conflict with the imagery. It is apparent, even to a non-professional, that "something is wrong" when a road line does not match how the road is depicted in an orthophoto that shows the pavement and sidewalk. Beyond roads, other data sets that should "match" the orthophotos include parcels, hydrography and political/administrative boundaries. Given its role as a core **base layer**, it is all the more vital that this layer be of high quality and reliable currency. The proposed program will increase the quality and accuracy of this data set by going from 1 meter to 1 foot resolution and the recurring nature of the program will guarantee that it will never be more than three years out of date.

- Orthophotography has been **an important asset in the state’s economic development and business recruitment efforts**. When businesses, or their site selection consultants are looking for properties, it is critical that they be able to view those properties in the context of *current* conditions on the ground. Older or less detailed imagery, may not be able to provide sufficient information for their planning or decision making. The recurring program recommended above will ensure that Arkansas’ statewide imagery is as good as any other state, and it will be far better than most.
- As detailed below (see [Section 3.3.2](#)), GIS has proven an invaluable tool for helping local assessors identify new development that may impact the assessed value. This process of “real property discovery” **helps put new development onto the tax roles, and this will increase the revenues that are available to the county** and school systems. Critically, many of these changes can be efficiently uncovered from the assessor’s office and with a reduced need for fieldwork. The more current and detailed the orthophotography, the more effective the assessor can be in identifying and tracking changes, and validating that these changes result in fair reappraisals. These types of operations are important enough that Benton County and Washington County *self-funded* detailed orthophotography missions for this express purpose on an *annual basis*.

3.3.2 Parcels – Annual Cost for 5 years: \$1,503,000

BACKGROUND. The current State GIS Board was originally named the State Land Information Board when it was formed in 1997, and this reflects the state’s long standing interest in developing an electronic cadastre, or in other words, a **statewide digital parcel data layer**. Indeed, parcel mapping is a key requirement for conducting fair and equal appraisals and it has been clear for at least a decade that electronic, GIS-based mapping is the most efficient way of mapping parcels.

Nevertheless, and in spite of 13 years of progress, Arkansas has only completed electronic parcel mapping for approximately 50% of the state. Further, and exacerbating the situation, many counties continue to not have even hard copy plat maps that show the parcel layouts across the



On-line parcel mapping web-site showing selected computer assisted mass appraisal (CAMA) data from Pope County.

county⁵. Consequently, this section recommends the acceleration of parcel mapping and the near term completion of statewide parcels data layer. In addition to a wide variety of ancillary GIS benefits, at a base level this data set would lead to improved operations within county assessment offices across the state. As Almy, Gloude-mans, Jacobs & Denne found in a report issued for the ACD in 2006, complete mapping and “better use of contemporary information technology would improv(e) the equity of the real property tax and the efficiency of assessment operations...”

IMPROVEMENTS THAT ARE REQUIRED. Accelerate work to **complete a statewide parcels data layer**, as soon as possible and **within 5 years**. This includes completing parcel mapping and parcel polygon automation in counties where the work is not yet done, as well as additional work to potentially improve and standardize the parcels in counties that have parcel maps. For example, in some counties work should proceed to improve the quality of electronic parcel mapping so that the parcels match the orthophoto base map better.

Based on research conducted by the AGIO as part of this project in November, 2009 (See [Appendix 3](#)), approximately 53% of the state’s parcels have been automated as polygons. As the table below indicates, approximately 13 counties are 100% complete, and 16 counties have not begun parcel automation, with another 45 counties in the process of automating their parcels.

	% Parcel Polygon Completion	# Co's	Parcels	Automated	To Be Automated	% Complete
"Maintenance" Counties**	97%-100%	14	705,485	703,026	2,459	99.7%
"Underway" Counties	34%-92%	25	650,905	384,891	266,014	59.1%
"Started" Counties	1% - 24%	20	498,765	55,347	443,418	11.1%
"Not Started" Counties	0%	16	307,409	0	307,409	0.0%
TOTAL		75	2,162,564	1,143,264	1,019,300	52.9%

Please note that estimating the amount of parcel automation that is required is a difficult task and the numbers presented in the table below should be considered a *best available estimate*. This difficulty stems from several factors:

1. Parcel automation is occurring on an ongoing basis so these numbers literally change daily.
2. It is impossible to determine the actual number of polygons that need to be automated until all parcel automation is complete, particularly for counties that do not yet have plat maps. Indeed, the process of completing mapping uncover hidden errors and helps to determine the actual parcel count.
3. In the absence of county-wide mapping, parcel counts are taken from ACD’s records. However, due to situations such as condominiums, or the combination of agricultural parcels owned by the

⁵ Instead, these counties rely on a myriad of individual sub-division plans that have been accumulated over the years.

same tax payer, each tax record counted by ACD is not necessarily represented by a single parcel polygon. Thus, even in the counties which have completed mapping, there remains a difference between the “polygon count” and the “ACD tax record” count (e.g., as illustrated in [Appendix 3](#), in Sebastian County, ACD counts 54,094 parcels where as the completed data set contains 55,511 parcels, or 102.6% of ACD’s count).

HOW TO GET THERE. Given that 13 years since the formation of the State Land Information Board (i.e., the predecessor of the State GIS Board), only approximately half of state’s parcels have been automated through the independent efforts of counties and the limited support provided by the state in the form of the County Assessor’s Mapping Program⁶ (CAMP), it would appear that a greater degree of direct funding support and/or some kind of mandate will be necessary to complete this effort on a statewide basis. The hardware, software, base map data and training that CAMP has provided has helped, but it is not enough. At the current rate of progress, it may take well over a decade for statewide parcels to be completed. Further, given the fact that after many decades several counties still do not have plat maps, and 16 counties have not yet commenced parcel automation at all, **statewide parcel mapping may never happen “on its own.”**

Thus, it is recommended that the state undertake a systematic program to provide direct funding support to counties to **complete statewide parcel polygon automation within 5 years**. Such a program would involve a reexamination and potential update of the state’s **parcel data standard**⁷ so that it expressly anticipates the creation of a uniform, statewide data layer. The details of the form and volume of direct support will need to be determined in association with current administration and the legislature, but it can be anticipated to take several forms that account for the varying levels of GIS maturity found in counties.

1. Providing direct funding support to **initiate parcel automation** in the approximately 16 counties that have not started. This funding will support *new projects* that will create parcel polygon data that adheres to state standards.
2. Providing direct funding support to **accelerate the completion of parcel automation** in counties that have already started the automation process. This funding would support additional, temporary staff to get the work done more quickly, or the outsourcing of the completion of work via the private sector. Any automation supported through this funding would need to adhere to state standards, and thus some funding may be required to retrofit existing parcels to better match the standard.
3. Providing direct funding to **support parcel improvements** in counties that have completed automation in order to facilitate the assembly of a uniform statewide data layer. Three issues, which should be addressed in the final parcel standard, are of particular importance:

⁶ See: http://www.gis.state.ar.us/Programs/Programs_current/CAMP_index.htm for detailed information on this program.

⁷ See: http://www.gis.state.ar.us/Downloads/CAMP/Resources/Standards/Cad_standard_FINAL.pdf for a copy of the existing state parcel data standard.

- ★ Defining the level of accuracy and ensuring that there is a reasonable, and logically consistent overlay with the state’s orthophoto base map.
- ★ Implementing logical and understandable parcel ID numbering systems that ensure that parcel polygons can be linked to county CAMA systems, and can handle condominium and “combined agricultural” parcels situations.
- ★ Defining a “submittal format” that counties can meet from their native systems so that a statewide layer can be assembled and managed by the AGIO. This submittal format should include requirements for standardized metadata production and delivery.

While providing counties 100% of the funding necessary to complete the statewide layer might be the safest tact, it is critical that there is county buy-in to the notion of electronic parcel data management. As a result, it is recommended that this program be implemented with **the state providing 70% of the funding with the balance coming from a required 30% match from counties**. Indeed, it is not enough to simply automate the parcels, but counties must be prepared to take on the annual maintenance of these data as sub-divisions and other parcel transactions occur.

While it cannot be guaranteed that all counties will participate, this level of funding should be adequate to attract the vast majority of counties who are already interested in – with many actively engaged in - parcel mapping. Indeed, the counties will be the primary beneficiaries of the parcel data that is created. During late 2009 and into early 2010 this concept was validated via a very limited parcel grant program that was instituted by the AGIO. With a small pool of \$60,000 that wouldn’t approach a 70% contribution, and was to be divided among several counties, the AGIO attracted 6 serious grant applications. Ultimately, grant awards were made to Jefferson County, Polk County and White County (see [Appendix 4](#) for the AGIO’s grant announcement). **In making this \$60,000 worth of grants, the AGIO secured a commitment of \$80,000 worth of county, city and utility company contributions**, proving that grants can be an extremely effective mechanism for leveraging the states funding with further local funds.

Given that the state will provide the majority of funding, it is recommended that the state issue a contract for parcel automation that obtains pricing based on the state’s group purchasing power. Such a contract may be awarded to multiple vendors capable of meeting the state’s needs to facilitate the work of multiple counties proceeding in parallel. The state would then issue task orders on a county-by-county basis and manage payments after securing county matching funds and performing appropriate quality control in association with counties.

To the extent possible, this program should be closely coordinated with ACD so that they can provide guidance to counties on the importance and relevance of mapping to fair and efficient assessment. Ultimately, Arkansas should consider whether ACD should mandate that counties produce and maintain electronic, countywide tax mapping. Such collaboration would be a logical extension the AGIO’s and ACD’s existing and ongoing “cooperative partnership” through the County Assessors Mapping Program (CAMP).

If after several years, the 70% match proves inadequate to achieve 100% parcel coverage, then the State GIS Board and AGIO would work with the administration and legislature to determine a strategy for addressing the holdouts and completing the state.

WHAT IT WILL COST. Based on discussions with several companies⁸ that do county based parcel mapping in the region it is estimated that **contracted parcel automation would cost between \$3.75 and \$11.00 per parcel.** The relatively large cost variation is based on several factors:

1. Whether, or not county **plat maps exist.** Automating existing plat maps is far less costly than a requirement to perform new mapping and automation from existing plans.
2. The **quality of a county's maps and plans.** A series of well organized and high quality plat maps and/or plans can be automated for a lower cost than county records that need extensive research and organization. In addition, some existing mapping is more accurate than others. For example, it is less costly to automate plat maps and plans that properly overlay orthophotography than it is to automate maps and plans that will require adjustment to fit the orthophotography.
3. **The size of the automation project.** There are economies of scale to ramping up large scale parcel automation efforts. In general, larger pools of work allow contractors to ramp up their capacity and achieve lower unit costs.

Based on the parcel automation inventory work completed in November, 2009, the following bullets summarize the results of a *conservative* cost model for 100% of the cost of completing parcel automation for the state.

- ★ Automating approximately 95,000 parcels from plat maps
- ★ Mapping and automating approximately 924,000 parcels
- ★ **Would cost approximately \$10,738,000**

Note: please see [Appendix 3](#) for more comprehensive information on the parcel cost model that is summarized in the above and is based on data from Nov. 2009

Thus, based on the previous recommendation that the **state provide 70% funding** to be shared with counties, the state's overall share is estimated to be: **\$7,515,000.** If the state pursues a 5-year program, the **annual cost** is estimated to be: **\$1,503,000** per year.

⁸ The companies surveyed included: actGeospatial Inc. from North Little Rock, AR; Midland GIS Solutions from Maryville, MO; and VillaGIS, Inc. from Hollister, MO.

A few further notes on these anticipated costs are warranted:

1. The per parcel costs described above are higher in Arkansas than for other regions of the country due to the large number of parcels that require original mapping from deeds and plans (as opposed to simple automation from plat maps).
2. It is anticipated that these costs could be driven lower with the increased competition that might be expected from large scale state and county purchases of these services.

EXPECTED BENEFITS. Parcels are a critical and versatile data set that is required by the vast majority of state and county GIS practitioners. Even with only 50% parcel of the parcels in the state automated, and a much smaller percentage of those parcel available via the GeoStor database, between May, 2006 and June, 2009 parcel data access accounted for 13% of GeoStor’s web service utilization. Simply put, investments in parcels will benefit a very broad cross section of the geospatial stakeholder community.

1. Completion of parcels will lead to **improved efficiency and equity in property tax assessment, revaluation and revenue collection**. Specific examples include, but are not limited to:
 - ★ **Finding new, untaxed development on existing parcels.** Once parcels are automated, then Tax Assessors can compare those properties to the orthophotography and the existing CAMA database. From those comparisons, Tax Assessors can see whether the CAMA record accounts for all the real property (e.g. structures, mobile homes, etc.) that is visible in the orthophoto.
 - ★ **Performing automated agricultural land assessment based on soils.** Since the state’s soils data are already automated, if parcel polygon data exists, then a GIS-based analysis can be performed that will summarize the soil types found on each property. Such an automated analysis can be completed for an entire county in matter of days whereas manual techniques would take months. The automated analysis will also yield more accurate and repeatable results.
 - ★ **Increased ability to perform analysis** such as viewing assessment sales ratios (ASRs) across an entire county to look for clusters of high or low values. Such tools give Tax Assessor’s an increased ability to look at the fairness of their revaluations and an opportunity to adjust revaluation models that may be yielding skewed results.

2. **Increased revenue collection from property taxes that will lead to increased school funding.** As described above, new GIS tools give Assessors an increased ability to identify real property that was previously not on the tax roles. Once such properties are identified, the valuation of the entire county will rise as will the revenues that are collected. The Sharp County Tax Assessor observed during the Jonesboro stakeholder workshop that she estimated that **county-wide valuations have increased 10%** via real property discovery and finding previously “unmapped” parcels. She also reported that as a result her School Superintendents have become important GIS allies. Indeed, the schools are the primary beneficiaries of comprehensive and efficient assessment and revenue collection.

3. **Routine state government planning and decision making.**

A wide variety of state planners and policy makers require access to, and would benefit from statewide parcels. For instance, the state is a major property owner and benefits greatly from understanding who its neighbors are, and what is occurring on abutting property. The Arkansas Game and Fish Commission provided the following example of a real world request for statewide parcel data that could not be currently answered. Routinely, managers will ask for the property boundary of a state Wildlife Management Area (WMA) as well the “boundary and owner information for all lands adjacent to the WMA”.

4. **Statewide parcels will provide a key tool for economic development** and meeting site selection consultant requirements. When businesses, or their site selection consultants are looking for properties, it is critical that they be easily able to access the property lines and key characteristics of the parcels such as the current assessed value. Of equal importance can be information on abutting properties such as the number of neighbors a given parcel may have. Counties that have their parcels completed and on-line are at a distinct advantage in this arena compared to other counties in Arkansas. Recognizing this, Arkansas’ Site Selection Center web-site⁹

“We are at a point in Arkansas where the Department of Education, Superintendents, Administrators, Principals, School Boards, and Transportation Directors must have maps with vital property assessment, student resident, school location and bus routing for many important decisions. This decision and planning tool will help develop a more efficient and effective educational program for our citizens. We need to make sure our education system in Arkansas is aware and able to utilize this resource and connect them with the people creating the data in the counties.”

Tom W. Kimbrell, Ed.D.
Commissioner of Education
Arkansas Department of Education

In referring to the Arkansas Site Selection Center’s “Geospatial Data Download” capability, Governor Beebe said:

“If your community is not on here, if your community is only here with half of the things that it should have on it, if your community hasn’t in effect done those things that they can do to put their best foot forward and have it reflected on something that is going to be viewed by site selectors across ... the world as we have seen in recent months, then you are going to fall behind.”

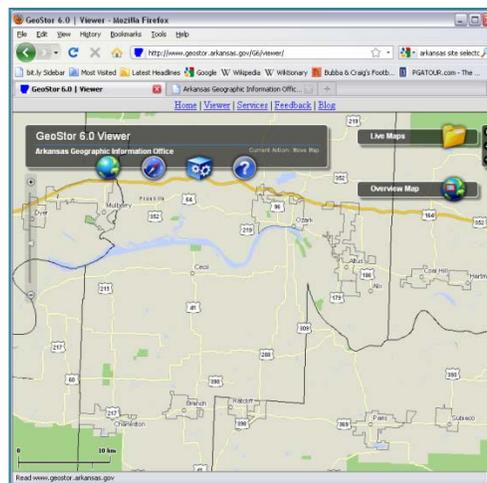
⁹ See: <http://www.arkansassiteselection.com/> for further details.

makes existing parcel data readily available to businesses looking for property.

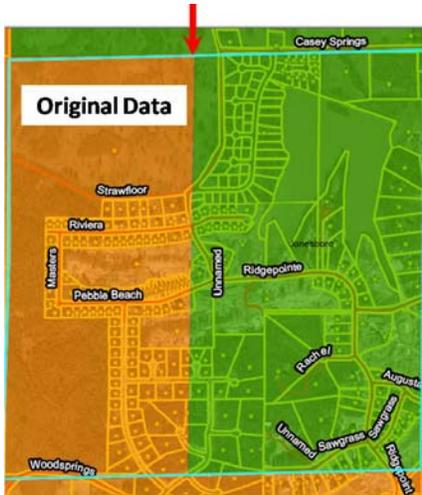
5. In addition to the data content benefits described above, parcels – like orthophotography – fulfill an important base map function. Specifically, a variety of political and administrative boundaries such as **school districts or incorporated city boundaries should be coincident with parcels**. Put another way, a given parcel should not be split by a city or school district boundary so that there is no ambiguity about the taxation and services provided to that parcel. Without statewide parcels, it will be impossible to properly map such boundaries and there will continue to be inequities and time spent resolving jurisdictional boundary questions.
6. The state has a vital interest in assembling a comprehensive, statewide address database for a variety of reasons, particularly in the public safety and emergency response arenas. Indeed, a working and effective E911 system requires current and accurate addressing. While there has been great progress in building this resource, there is additional work required to assemble a more accurate and current statewide address inventory. **Statewide parcels would provide an invaluable tool in assembling the statewide address databases**. While a single parcel can have multiple addresses (e.g. for apartments or various commercial properties), the statewide parcel data would provide an accurate inventory of all places that *should be* addressed and in combination with assessor’s CAMA data an important cross check for address accuracy.

3.3.3 Political & Administrative Boundaries – Annual Cost: \$75,000

BACKGROUND. Political and administrative boundaries are critical and fundamental data sets. Nevertheless, many of these jurisdictions were created over 100 years ago and the precise location of these boundaries is extremely difficult to determine without costly surveying. In short, one cannot see political or administrative boundaries on the ground and with one’s own eyes. At the same time, such boundaries are used to determine critical items such as the tax jurisdictions a property falls within; the tax rates that apply to a property; representation in the legislature and the school that children attend. Modern mapping and geospatial technologies are capable of providing accurate mapping, however, in spite of the importance of these data, the existing digital data (i.e. the original source maps that were automated) and the workflows used to determine boundary changes are antiquated, and at times inaccurate.



County and city boundaries for parts of Franklin and Logan counties as depicted through the GeoStor data viewer.



Example of an inaccurate school district line between the Jonesboro and Valley View school districts that was discovered by reviewing the lines in association with parcel data. According to the Craighead County Assessor's Office – who provided this image – this error impacted approximately 27 parcels before it was corrected.

IMPROVEMENTS THAT ARE REQUIRED. The accuracy and currency of political and administrative boundaries, and their electronic representation **should be improved**. The core jurisdictional boundaries that the AGIO currently maintains and/or distributes include:

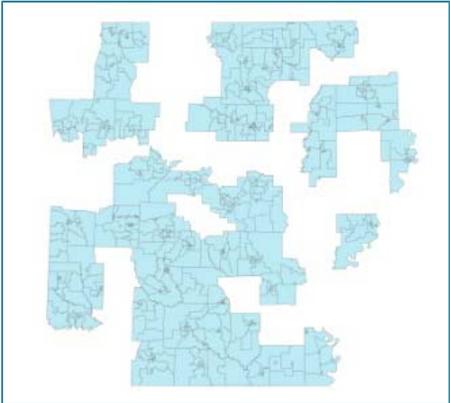
- ★ **City boundaries**, in association with the AHTD
- ★ **School district boundaries**, in association with UALR
- ★ **Political and voting districts**, in association with the Secretary of State

In addition, there should be an ongoing program to assist in the mapping and publication of additional administrative districts with taxation or public safety implications such as levee districts.

In general, all these boundaries have two potential shortcomings that may be reflected in the publicly available electronic data, and that should be improved:

1. The electronic depiction of boundary lines do not have the accuracy to definitively determine which addresses and/or utility poles fall within a given a jurisdiction (see school district example above).
2. The data sets do not necessarily reflect the most recent boundary changes, particularly for municipal annexations.

3. Data automation is not yet complete. For example, as the map to the right demonstrates, data on the County Quorum Court, Justice of Peace districts are only available for 43 of the state's 75 counties. Having these data available on a statewide basis will be increasingly important given the redistricting that will take place beginning in 2011.



Status map showing completion status for county Justice of the Peace districts.

HOW TO GET THERE. There are two principal activities that should be pursued to initiate these improvements.

First, there should be legislative clarification of the annexation process and further supervision to ensure that the same process is being followed by all jurisdictions. During the stakeholder workshops this

process was described by several different jurisdictions, in several different ways (i.e., the timing and agencies involved differed). At a minimum, there appears to be a variety of interpretations and this has resulted in a variety of timelines. The net result has been that in some jurisdictions, notification of an annexation to the state, and the related availability of the new boundary in the state database has been delayed.

Understandably, current legislation was drafted before the advent of electronic mapping, the AGIO and the GeoStor database. Similarly, the current annexation process did not envision broad use of geospatial technologies whereby utilities are using their systems in an attempt to identify which utility poles are subject to local taxes based on electronic boundary lines. A key step in improving the current boundaries would be legislative clarification of the process that involves some kind of **recognition of the AGIO and the GeoStor database as the official repository** for completed and approved boundaries that must be submitted in *electronic form*. Such a process might clarify that the annexation cannot become final until the data are *publicly available* through the state's database. In this manner, all communities would need to follow the same process, and the state would have an opportunity to provide a data review prior to annexations being completed.

Second, whenever possible and until statewide parcels are available, **administrative boundaries should be constructed so that they match parcel lines**. As statewide parcel polygons continue to be completed, existing boundaries should also be adjusted to match parcel linework whenever possible so that there is no ambiguity as to which district a given parcel falls within. Obviously, this will need to be an ongoing effort that is aligned with the statewide effort to complete parcels described above (see [Section 3.3.2](#)).

WHAT IT WILL COST. At present, it is simply recommended that the legislation, workflow and processes of boundary determination be clarified, and potentially modernized. In addition, it is recommended that new standards of boundary accuracy be put forward that acknowledge the importance of the overlay between parcels and political and administrative boundaries. Neither of these changes is anticipated to cost money, and it is not recommended that the state undertake a large scale and potentially costly "boundary improvement" effort until after the legislative and workflow improvements are made, and most likely until after statewide parcels are completed.

In the interim, it is recommended that **a new "boundary data layer manager" position be created within the AGIO** that focuses exclusively on political and administrative boundary data stewardship. It is envisioned that this person would take the lead in working with other state agencies, the administration and legislature on the technical elements of legislative clarification. This person would also work with individual counties to help them understand any new requirements and also how to perform the technical work of boundary improvement. Finally, this person would work in concert with existing personnel at the AHTD, UALR and Secretary of State who are involved in assembling and updating the statewide city boundary, school district and legislative district boundary data layers.

As a result, the only new cost anticipated for this recommendation is a **adding a GIS Analyst (DFA-OPM C123) position to AGIO. This is estimated to be in the range of \$50,000 - \$75,000 per year for salary and benefits.**

EXPECTED BENEFITS. The primary benefit of these types of improvements will be increased reliability and accuracy of the jurisdictional boundary data sets. This increased reliability ultimately means that decisions and assessments that are made based on political or administrative boundaries will be fairer to both the tax payers and the taxing entities. In this manner, **taxing authorities will collect all revenues that are due to them, and by association tax payers will be equitably paying for the services that they receive.**

A secondary benefit of these improvements will be the **removal of significant duplicated effort by multiple levels of government that are mapping political and administrative boundaries.** For instance, during the stakeholder workshops, it was documented that in addition to the state, many individual cities, counties and utilities currently have overlapping efforts aimed at mapping annexations. A clarified workflow should result in a single annexation boundary being carried throughout the process, and then at the end of the process when the boundary is approved, it is made publicly available to everyone via the AGIO and GeoStor. Thus, the primary actor in the workflow (e.g. a municipality initiating an annexation) would be responsible for accurate mapping, and then at the end of the process the impacted county, utilities and the state would gain access to the new boundary.

3.3.4 Road Centerlines – Annual Cost: \$200,000

BACKGROUND. While almost everyone is familiar with old fashioned “street maps” and increasingly with mapping web-sites such as Google Maps, Bing Maps or MapQuest, fewer people understand that street mapping is a challenging exercise and that maps can be inaccurate, or just plain wrong. Indeed, roads are constantly being constructed and even existing roads may have their names changed. Commercial mapping organizations – both hard copy, and on the web – often rely on *government mapping* efforts. This effect can be exacerbated in more rural places whereas there is less demand for these data and commercial organizations may focus on the more popular (and populated) parts of the country. In short, the road data and GPS navigability of Los Angeles, California is more likely to be current than for a rural county in Arkansas.



To address this market reality, Arkansas – through the AGIO – has undertaken the Arkansas Centerline File (ACF) which, according to the ACF web-page, is designed to “compile a standardized statewide road centerline GIS map data layer that can be used by all levels of government, the private sector and

individuals.” The unique element of the ACF program is that it is “built from many different local source (city and county) datasets using a common standard...the State simply integrates the various local sources into a common format in a standardized and consistent manner across jurisdictional boundaries.” As the map above from June, 2009 shows, after approximately eight years of effort, the state is nearly finished with all counties either complete, or under contract.

IMPROVEMENTS THAT ARE REQUIRED. With the initial focus on the ACF being the completion of a statewide road centerline data set, it is now time to **shift the emphasis to the ongoing maintenance and improvement** of this critical resource. There are three primary types of improvement that are required:

1. The road data in the ACF file should not exceed one year of age. In other words, the **data in the ACF should be maintained on at least an annual basis**. In the current edition of the ACF, the data for some counties has not been updated since 2008.

2. The **quality of line work is variable across the state**. In some parts of the state the lines match the orthophotography base map well, in other parts the match is off and this can lead to end user confusion (see image to the right).



The image above shows an area adjacent to the Cabot City boundary. Note how the yellow ACF line does not accurately match the depiction of the road in the orthophoto.

3. Increased emphasis should be placed on **extending the ACF to contain improved addressing data**, including the development of countywide address point data sets. As described above, with the increasing availability of countywide parcel data sets there will be new opportunities to further improve the address information contained and maintained through the ACF.

HOW TO GET THERE. The **next phase of the ACF program should focus on regularizing data update and improving data accuracy**. This should begin with an expansion of the ACF Data Standard, whose publication date is June, 2002, to include guidance on expected and/or required data update cycles (e.g. at least one update annually).

Similarly, **the ACF Data Standard should be updated to provide clearer standards for the expected quality of line work**, including issues such as: expected level of match and consistency with the statewide orthophoto base maps and edgematching to neighboring counties.

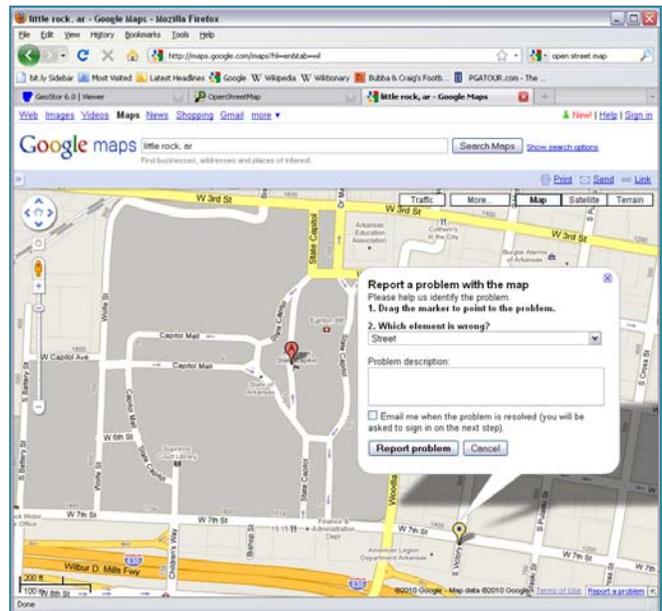
As the first phase of the ACF demonstrated, it is critical that **counties be provided technical assistance** that will help them meet more rigorous standards for data update and the line work improvement processes. As with the first phase, such technical assistance should continue to be provided via the direct

support of AGIO staff who regularly visit counties. It is also recommended that this technical support be supplemented with a grant program to help fund county efforts to update their data, particularly in counties that do not yet have in-house GIS capabilities.

In addition, the AGIO should work on improving its technical infrastructure so that counties that are successfully maintaining their street centerline data on a regular basis can submit their data for inclusion into the statewide ACF on a regular basis. Right now, advanced counties – such as Pulaski County – maintain data that are significantly more current than what is available in the ACF. Such counties would like to see their improvements show up in the ACF with less lag time. As the ACF moves into maintenance mode, a technical architecture for accepting “trusted contributions” from authorized partners and employing techniques such as database replication should be considered. Automated, or semi-automated routines and workflows for maintaining the ACF will become increasingly important as the volume of updates increases.

Finally, as the general public becomes increasingly sophisticated with web-based mapping technologies, it will become increasingly important for organizations such as the AGIO to **have a strategy for both communicating and collaborating with the public on data quality issues.**

Indeed, members of the general public may be the first to notice shortcomings in the state’s geospatial data. Initiatives such as OpenStreetMap¹⁰ are built on the premise that “volunteered geographic information” (VGI) from a network of public contributors is the best way of ensuring that roads data is kept current. Similarly, Google Maps now contains a “Report a problem” link which allows the public to notify them of data problems that are encountered (see image above). At a minimum, the AGIO should facilitate the development of a web-based and geo-enabled capability for the general public to report errors as well as submit questions and suggestions on the GIS data layers that the state maintains.



WHAT IT WILL COST. It is recommended that a **new position be created within the AGIO that focuses exclusively on furthering the ACF program and overall road centerline data stewardship.** As with current AGIO personnel who work on ACF, this person would work closely with county data partners and would *actively solicit* data updates. This person would provide technical assistance to counties that are having difficulty with data update and would work to foster best practices for road data maintenance across the

¹⁰ See: <http://www.openstreetmap.org/> for further information.

geospatial stakeholder community. This person would also be responsible for assembling county contributions into a coherent, statewide data set and working with the AGIO technical team on next generation approaches for integrating contributed data into a statewide data set and soliciting public comment on data holdings. The cost for this **new position is estimated to be in the range of \$50,000 - \$75,000 per year for salary** and benefits.

In addition to a new, dedicated position, it is recommended that a pool of resources ranging from **\$75,000 - \$125,000 annually be provided for a grant program aimed assisting counties in their ability to update and improve their road centerline data**. This grant program would represent an annual state investment in the maintenance of a mission critical data set.



The road ahead for making all required improvements to the ACF may be “crooked and steep”, but the benefits from success will be large.

EXPECTED BENEFITS. Roads represent a crucial framework data set that is used by almost the entire geospatial community. As such, it is critical that these data be as reliable, accurate and current as possible. It will not be easy to make all required improvements, but if they are achieved there will be large benefits experienced by a large cross section of Arkansans. Examples of specific anticipated benefits include, but are not limited to:

1. One of the core drivers of the development of the ACF was completing the addressing required for automated E911 systems. These systems, driven by ACF data are used on a daily basis for emergency response. Improvements to the quality and currency of the street centerline will lead to more accurate dispatching and more efficient routing of emergency vehicles providing **overall**

improvements in public safety and preparedness. Similarly, improved roads will help improve emergency planning activities such as the creation of safe and efficient evacuation routes.

2. Strong and reliable statewide road centerline data set would likely be incorporated into commercial road centerline data products and mapping web-sites (e.g. Google Maps, MapQuest, et al) providing **accurate geolocation, more reliable GPS navigation and convenience for the general public**. Indeed, this process has already started. In their Fall Quarterly Newsletter¹¹, NAVTEQ Inc. – one of two dominant commercial road centerline data providers – announced that it had developed a “strategic relationship” with the AGIO that would result in the ACF being integrated into their commercial products. Similarly, in February of 2010, TeleAtlas – the other major commercial road centerline data provider – informed the AGIO that they had used the ACF to edit their commercial product.
3. While difficult to measure, improvements to the ACF which end up improving the commercial mapping data that businesses rely on, will lead to more efficient routing and **an improved flow of goods and services across Arkansas**. Already, the AGIO regularly hears from citizens who are

¹¹ The Newsletter article was titled: “NAVTEQ Integrates Data from the State of Arkansas to Create Fresh, Accurate and Reliable Map Updates”

frustrated that street and address changes aren't reflected in the commercial data used by the national package delivery companies. A concerned citizen from Cash in Craighead County wrote "I can no longer be found at my address by UPS or Fed.Ex. My utility service companies with home offices outside of the state can't find my location to dispatch service technicians. This problem seems to be growing a life of it's (sic) own..." believing that official "government maps" were the source of her problem. Rather, the state's ACF data properly reflects her correct address but the commercial road centerline data used by UPS and FedEx apparently do not. As the ACF continues to improve its accuracy, currency and reliability, it will continue to be picked up by the commercial data providers in the manner NAVTEQ has already done. With higher quality, the state may also consider being proactive in providing its data to the commercial companies.

4. Improved road centerline quality and currency will assist in routine state government production of road mapping and the GPS navigation of state employees. The following two examples come from the Arkansas Game and Fish Commission (AGFC):
 - ★ The Communications Division periodically produces a map book that shows all AGFC properties and facilities in each county. The management of the Division assumed and expected that accurate and current roads, including forest roads was available for every county. Without these data the map books will not portray the full picture of access to AGFC facilities. The centerline improvements described above will address these shortcomings.
 - ★ The Enforcement Division uses GPS units to assist in navigation and locating their whereabouts in the sometimes remote parts of the state they visit. The Division routinely reports situations where field crews could not locate themselves due to roads not being portrayed on the GPS unit. As with the general public, state government will benefit from improved and more current roads data being made available to the commercial mapping sector.

4. Budget Overview

The following provides a summary of the expenditures that are anticipated to implement the four major recommendations outlined above. In addition, given the current lack of administrative support and an increased level of activity, the budget below recommends the creation of an Administrative Assistant position for the AGIO. Although the narrative above presents some costs as budget ranges, for budgeting purposes, the spreadsheet below presents the higher cost estimate from any budget range.

Arkansas Geospatial Strategic Business Plan				
Budget for implementing recommendations				
5 year program				
Recommended Activity	Additional Funding Need	Additional One-time Funding Need	Overall Amount for 5 years	Notes
Annual Orthoimagery Program	\$1,166,667		\$5,833,333	Cost represents 1 ft. resolution with a 3-year statewide cycle (i.e., 33% of the state/year). *Overall Amount* represents costs across five years (i.e. 1.67 statewide imagery cycles).
Completion of statewide parcels		\$1,503,000	\$7,515,000	Cost allocated across 5-years as a 5-year *general improvement program*. Cost represents the state paying 70% of total cost with the 30% that is not shown coming from matching funds from counties.
Political/Administrative boundary management	\$75,000		\$375,000	Cost represents a new staff person for the AGIO identified as the *Administrative Boundary Data Layer Manager*.
Road and address data maintenance	\$200,000		\$1,000,000	Cost represents a new staff person for the AGIO identified as the *Road and Address Data Layer Manager* as well as \$125,000 of funds to be distributed to counties as grants to assist their road and address maintenance efforts.
Organizational maturity	\$50,000		\$250,000	Full-time *Administrative Assistant* position for the AGIO
TOTAL	\$1,491,667	\$1,503,000	\$14,973,333	

4.1 FUNDING MECHANISMS

The budget presented above proposes a mix of additional funding needed for the AGIO to fully carry out its mandate as well as a one-time funding request for the acceleration and completion of statewide parcels.

Appendices

1. Strategic Business Plan Workshop Presentation Materials
2. Strategic Business Plan Workshop Summaries
3. Parcel Development Status Spreadsheet
4. AGIO Announcement of 2010 Parcel Grant Awards

Appendix 1

Strategic Business Plan Workshop Presentation Materials

Geospatial Strategic Business Plan for: Arkansas

Stakeholder Workshop

Presented
August, 2009

www.AppGeo.com

Slide 1

What's this workshop all about?

- **Arkansas** is developing a Strategic Business Plan for ongoing investments in statewide geospatial data
- Focus of plan is sustainable funding to meet data needs
- Plan needs to be informed by GIS users in Arkansas
- Five workshops are being held to directly solicit stakeholder input on:
 - Approaches
 - Priorities
 - Benefits

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Slide 2

Introductions

- **Tracy Moy**
Chair State GIS Board
- **Alan D Price**
Chair Arkansas GIS Users Forum
- **Shelby Johnson**
State Geographic Information Officer
- **Bill Sneed**
Liaison, USGS
- **Michael Turner**
Applied Geographics, Inc.

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Slide 3

Agenda

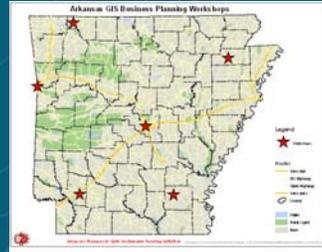
Time	Topic
9:30-10:00	<i>Registration and sign-in</i>
10:00-10:30	Overview & Project Background
10:30-12:00	Discussion of "Local-to-State" Framework Data Layers <ul style="list-style-type: none">• Transportation (roads and addresses)• Parcels• Administrative boundaries Open Microphone: What else is on your mind?
12:00-1:00	L U N C H - Guest Speaker : Sen. Shane Broadway
1:00-2:00	Discussion of "State-to-Local" Framework Data Layers <ul style="list-style-type: none">• Orthoimagery• Elevation• Hydrography• Geodetic control/PLSS

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Slide 4

Project Overview

- **Why?** To make the case for sustainable funding of geospatial data
- **Federal funding via the USGS 50 States Initiative**
 - To date, 43 of 50+ states & territories have received funding
- **Project oversight and cooperation from:**
 - AGIO
 - GIS User Forum
 - State GIS Board
- **Five Regional Stakeholder Meetings**
 - Held throughout the state in Aug & Sept.
 - Jonesboro, Little Rock, Ft. Smith, Monticello and Hope + **progress report at GIS User Forum Conference in Oct**
- **Report Authoring**
 - Strategic Business Plan for sustainable funding for geospatial data
 - Business case for making investments
 - The data and data improvements that are necessary
 - What they will cost
 - The value they will add
 - Where can we find the funding?

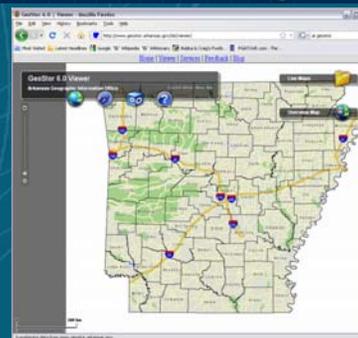
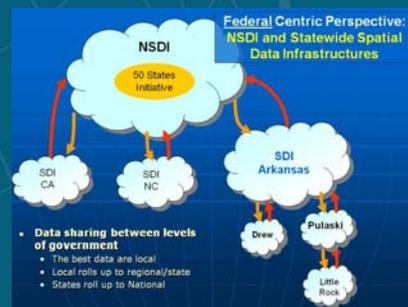


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Slide 5

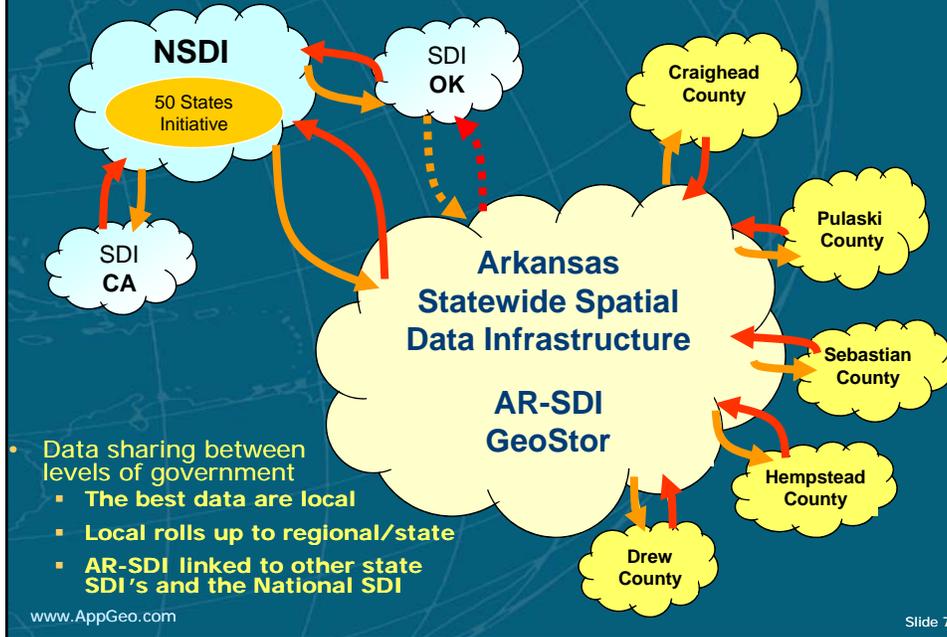
The National Spatial Data Infrastructure (NSDI)

- Compilation and integration of consistent, high-quality nationwide data for:
 - 7 Framework Data Layers**
 1. Geodetic Control
 2. Cadastral (parcels)
 3. Political Boundaries
 4. Hydrography
 5. Imagery (orthos)
 6. Elevation
 7. Transportation (Air, Roads, Inland Waterways, Rail, Transit)
 - Soils & Geology** are also "framework" in AR
- **50 States Initiative:**
 - Effort to catalyze creation of NSDI
 - Including the CAP grant funding this project

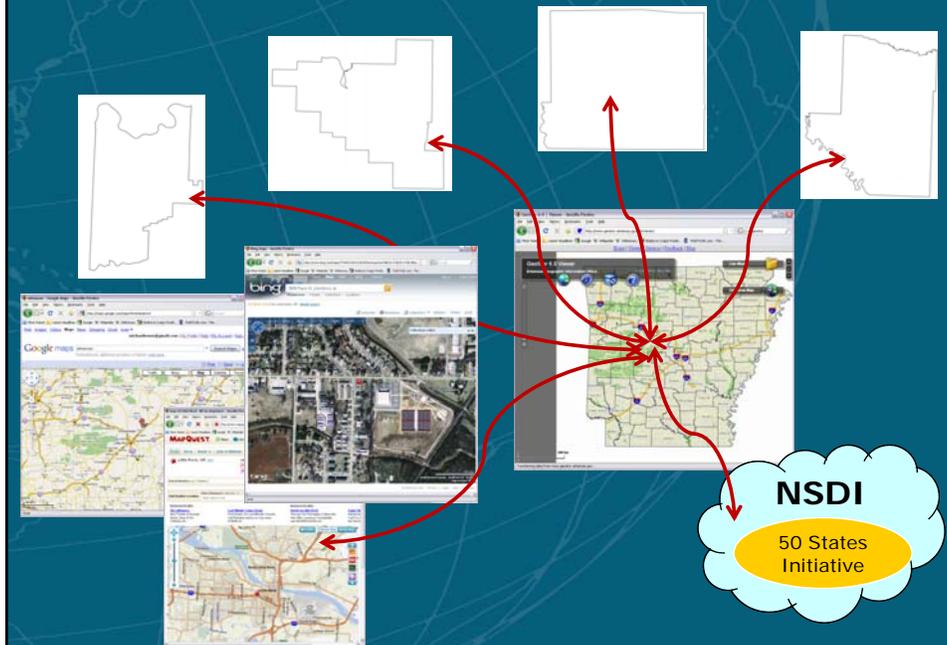


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Statewide Spatial Data Infrastructures & NSDI



The AR-SDI: Provides data to the public and many partners



Arkansas Planning Context

- Arkansas has made tremendous progress in the past 20 years
- Statewide program is recognized as strong, innovative and effective
- State is demonstrating **national leadership** and influence
 - Learnon Dalby is the current President of the National States Geographic Information Council (NSGIC)
- BUT, “**all the low hanging fruit is gone**”
- There are still requirements for:
 - Further strategic **data investments**
 - Sustainable funding for **data maintenance**
- How do we make the **business case** for making these investments?

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Slide 9

Why is data sharing important?

- **It's part of the business case!**
 - One data investment can meet the needs of many users
 - GIS data are expensive to create, but easy to share
- ***Shouldn't government decision making – at all levels of govt. – be based on the best available data?***
- **There are local benefits in rolling data up**
 - Economic development
 - Emergency response
 - State Troopers having access to county data in their cruisers
 - Multi-jurisdictional/Multi-state emergencies
 - State and Federal resource allocation decisions
- **Arkansas has created a positive data sharing culture**
 - Data are routinely shared now
 - Active user-to-user communication and collaboration via the GIS User Forum

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Slide 10

Data maintenance is critical

It's not just about creating new data...

- Maintenance requires both resources and commitment
- As a result, data sharing is **not a one time exercise**
- Relationships between layers
 - Parcels as a source of addresses
 - Parcel boundaries, new annexations and county boundaries are all interrelated
- Hence, the emphasis on **sustainable** funding

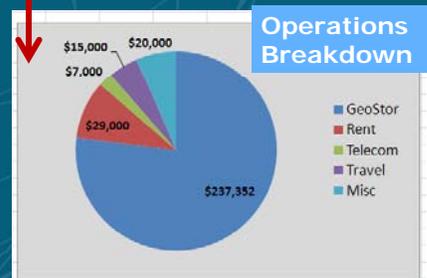
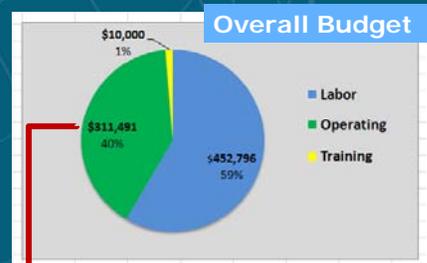


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Slide 11

Current AGIO budget does not include explicit resources for data investment

- AGIO Annual budget = ~\$775,000
- No current budget for data development and/or maintenance
 - Some staff allocated to "data support"
 - "Misc" used for some data activity
- Data investments are made on a one-time basis
 - E.g., 2006 Orthophotos
 - Collaborative funding
 - "Passing the hat"
- Why so much for GeoStor?
 - It is a complex and invaluable tool
 - Costs are for:
 - Hardware & software maintenance
 - Hosting fees to DIS



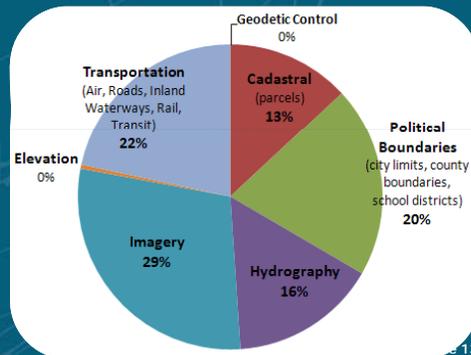
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GeoStor Utilization Statistics

Extremely valuable and well-used tool

- Web services between May 2006 – June 2009:
 - Accessed >7,400,000 times
 - Framework data accessed >5,680,000 times
 - 77% of data access is for framework layers
- Additional access via FTP download
- Note: Cadastral access reflects that:
 - Only ~50% of counties have parcel data
 - Only ~50% of those counties have polygons



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Slide 13

Lets look at framework data; layer by layer

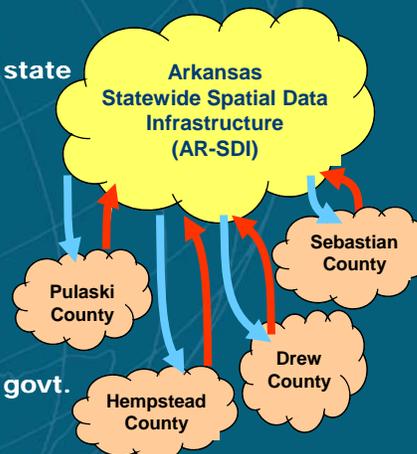
Two General Categories

"Local-to-State"

- General flow is *from local govt. to state*
- Transportation
- Parcels
- Administrative Boundaries

"State-to-Local"

- General flow is *from state to local govt.*
- Orthoimagery
- Elevation
- Hydrography
- Geodetic Control



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The Primary Goal of this Project is to: *Develop a strategy for sustainable of funding framework data*

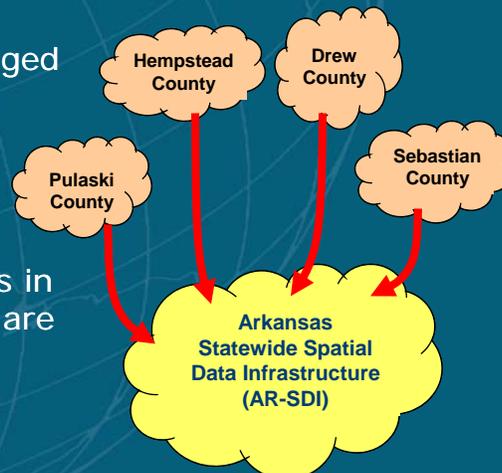
So what are the questions we need to answer?

- What condition are the framework data in?
- What improvements are required/desirable?
- Who needs these data?
- Who is creating/maintaining these data now?
- What will the data improvements costs?
- What does ongoing maintenance cost?
- Where do we get the money?

Framework Datalayers: “Local → State”

Transportation/Roads, Parcels Administrative Boundaries

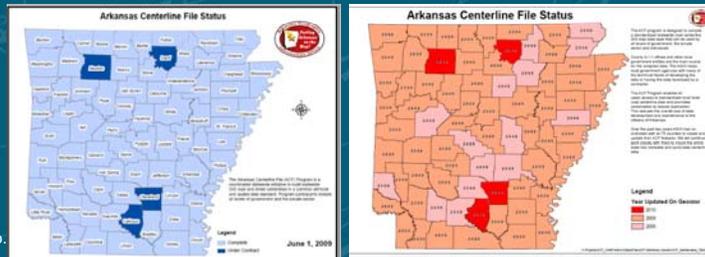
- Data are generally managed by local government
- Data change frequently
 - Harness local knowledge
- Significant improvements in data content/availability are desirable



Transportation/Roads Status

22% of GeoStor
Web Service Use

- Arkansas Centerline File (ACF) program
 - “The ACF program is designed to compile a standardized statewide road centerline GIS map data layer that can be used by all levels of government, the private sector and individuals.”
 - “The State simply integrates the various local sources into a common format in a standardized and consistent manner across jurisdictional boundaries.”
- Almost 100% complete, “wall to wall” coverage
 - Now on to updating
- Key resource for implementing **Streamlined Sales Tax**
 - \$16M distributed to localities since 2005



Transportation/Roads Issues, Opportunities & Discussion

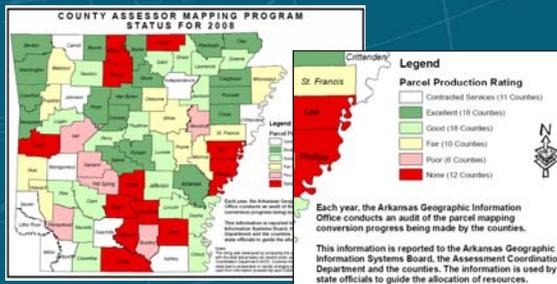
- Now that we're done, how do we keep it current?
 - Is annual update feasible?
 - What kind of assistance to counties may be necessary?
- How do we improve it?
 - E.g., Accuracy issue involving Cabot City boundary



Parcel Status

13% of GeoStor Web Service Use

- County Assessor's Mapping Program (CAMP) has fostered significant progress
 - Non-mandatory program that provides standards & guidance
 - Phase 1: Hardware, software & training to create "point based" maps with link to CAMA
 - Phase 2: Additional training to create polygon-based parcel representations
 - Phase 3: Storage and maintenance through GeoStor
- Still a way to go for statewide parcels

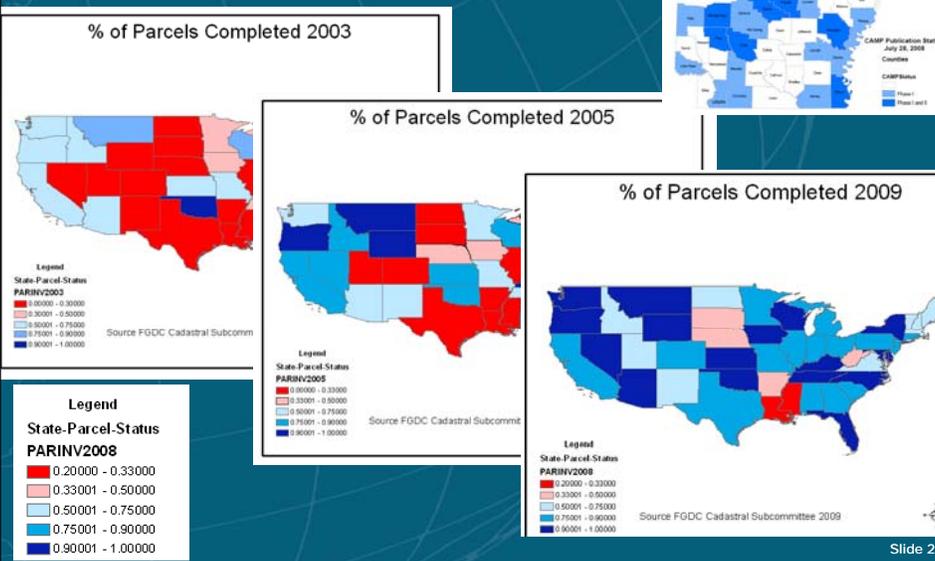


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Slide 19

Parcel Status

How does Arkansas stack up nationally?



Slide 20

Parcel Issues, Opportunities & Discussion

- How do we get statewide coverage?
- Enormously valuable data set
- Statewide parcels is a step towards statewide addressing
- Numerous applications in:
 - Public safety
 - Real estate/assessing
 - Planning
 - Economic Development
 - Utilities
 - Etc.



Gov. Beebe: "If your community is not on here, if your community is only here with half of the things that it should have on it, if your community hasn't in effect done those things that they can do to put their best foot forward and have it reflected on something that is going to be viewed by site selectors across ... the world as we have seen in recent months, then you are going to fall behind."

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Parcel Issues, Opportunities & Discussion

- How do we get statewide coverage?
- Examine what other states have done
 - TN achieved statewide parcels by funding their creation via Comptroller of the Treasury
- Arkansas challenge: not all counties have even complete parcel *mapping*
 - March 2006 report prepared for AACD found:
Complete mapping and "better use of contemporary information technology would...improv(e) the equity of the real property tax and the efficiency of assessment operations..."
From: Almy, Gloudemans, Jacobs & Denne
- Arkansas approach:
 - Counties do it themselves
 - State support by providing:
 - Orthophoto base map
 - Standards and technical assistance via CAMP
 - Publication of data via GeoStor
 - Is that enough?

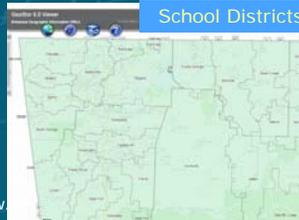
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Boundaries Status

20% of GeoStor
Web Service Use

- County boundaries from USGS topo-quads
- For other boundaries, original source data collected from local govts. and assembled statewide by:
 - **Cities:** Highway & Transportation Dept.
 - **Legislative districts:** Secretary of State
 - **School districts:** collected/assembled by UALR GIS Lab
- Data are published by AGIO
 - Via GeoStor



Boundaries Issues, Opportunities & Discussion

- Accuracy of county boundaries
 - The “puzzle pieces” for statewide parcels
- Keeping up with annexation
 - Standards (e.g. accuracy)
 - Structured timing and workflows
 - The last step in the process could be “publish update to GeoStor”
- Key data for utilities
 - Required for business property tax calculation



Open Microphone: Other Topics of Discussion?

- What else is on your mind?
- What do you need?
- How is AGIO doing?
- What do we need to hear?

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Lunch & Luncheon Speaker

Jon Chadwell

Director

Newport Economic Development Commission

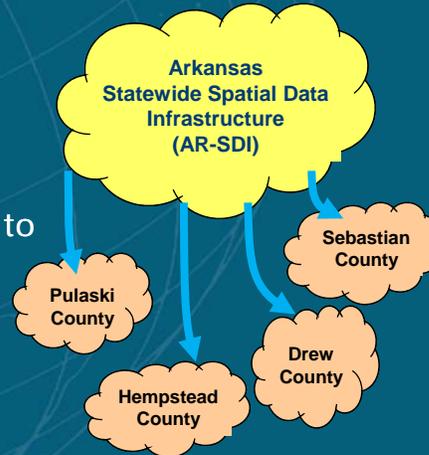
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Slide 26

Framework Datalayers: “State → Local”

Orthoimagery, Elevation, Hydrography, Geodetic Control

- Existing statewide data sets are in place
- Uniform statewide
- Periodic update, as opposed to ongoing update
- Significant economies of scale for data development



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Ortho Status

29% of GeoStor
Web Service Use

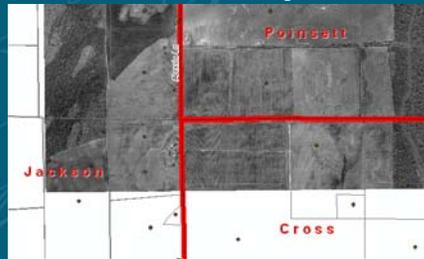
- 1994-1996 first statewide imagery
- 2001 statewide color-infrared
- 2006 is most recent statewide imagery
 - 1 meter resolution
- Planning for 2010
 - “Appropriated” for 2010, however, funds are not yet “authorized”



Ortho Issues, Opportunities & Discussion

- The potential for county/local buy-ups
 - Local governments have made the case to invest in imagery
- Develop a statewide program with a **regular schedule**
 - State buys imagery on a cycle
 - State contract allows partners to “buy-up”
 - Better accuracy/resolution
 - Additional products: elevation; planimetrics, 3D buildings, etc.
 - Facilitates partner planning
 - Leverages the state’s buying power into better pricing for all
 - Facilitated contracting
 - New York has a model program

Local High Resolution Imagery

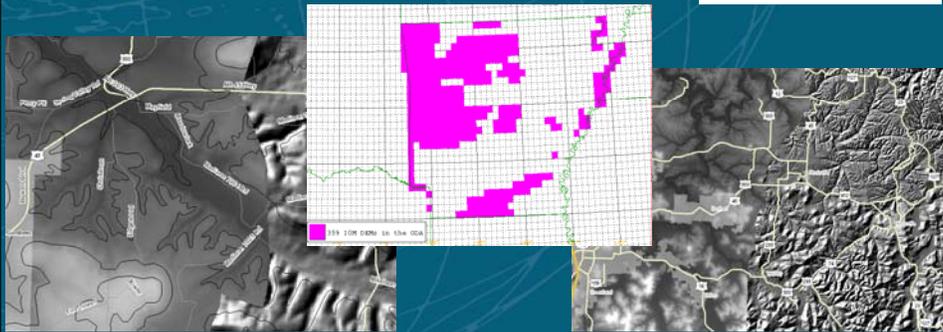


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Elevation Status

0% of GeoStor Web Service Use
(Accessed 24,409 times)

- 30 meter DEM/10 ft. contour is best available on a statewide basis
 - 10 meter DEM available for 359 of 909 topo quad sheets (39%)
 - 5 meter DEM from 2006 orthos
 - Scattered pockets of better county data (e.g. 2 ft contours and LiDAR)
- In general, reasonable coarse grained data
 - Suitable for general planning
 - This is what is typical in many states



Elevation Issues, Opportunities & Discussion

- 2 foot contours required for many applications
 - Floodplain mapping
 - Local planning
- Very expensive data to create on a statewide basis
 - But less costly than ever; thus, many states are pursuing statewide elevation projects
 - One-time cost of several million \$'s
- How important are these data?
 - Pulling it off will require a coordinated strategy

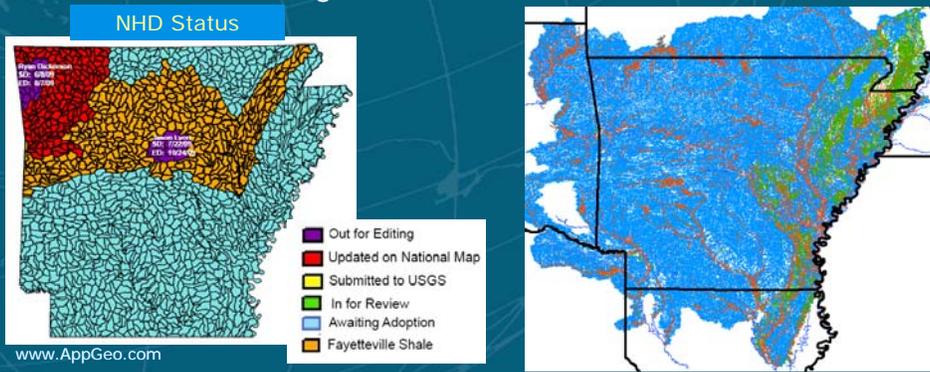
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Hydro Status

16% of GeoStor
Web Service Use

- ADEQ is participating in the USGS's National Hydrography Dataset (NHD) program
- Improving the quality of Arkansas hydro data
 - Moving from USGS "quad sheet" base map to the 2006 orthophoto base map
 - Some areas using better, local orthos



Hydro Issues, Opportunities & Discussion

- Are there unmet needs?

Environmental
Resource Waters



Ecologically Sensitive
Water Bodies



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Slide 33

Geodetic Control & PLSS Status

0% of GeoStor
Web Service Use
(Accessed
173 times)

- AGIO publishes existing datasets
 - Geodetic control points from the National Geodetic Survey (NGS)
 - PLSS from AHTD
 - Section, township & range
- Issues and/or Opportunities?
 - Are there any better local data sets?



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Slide 34

Sustainable Funding Options

What is realistic and feasible?

- New, annual appropriation for data development and maintenance
- “Chargebacks” to user agencies
- Allocation from existing revenue stream
 - For example, the “Real Estate Transfer Tax”
 - 2008 revenues >\$35M
 - Act already funds many programs
 - Strong nexus between this tax and mapping
 - Would require new legislation
- Surcharge/fee on transactions
 - For example, Act 328
 - Funds the “automated court management system”
 - Users pay fees that fund operation of the system
- Additional ideas?
- Which ideas could you actively support?

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Open Microphone v.2: Other Topics of Discussion?

- What else is on your mind?
- What do you need?
- How is AGIO doing?
- What do we need to hear?

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Slide 36

Please contact me...

- Michael Turner
- mgt@AppGeo.com

Appendix 2

Strategic Business Plan Workshop Summaries

Arkansas Geospatial Strategic Business Plan Jonesboro and Little Rock Stakeholder Workshop

Summaries

Prepared by:

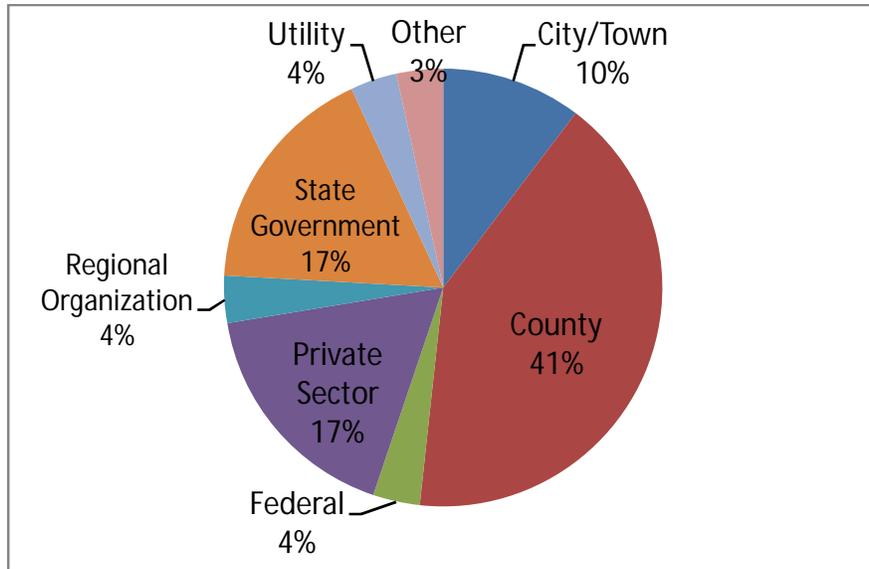
Applied Geographics, Inc.

October, 2009

Jonesboro

On August 17th a geospatial strategic and business plan workshop was held in Jonesboro. The following characterizes the attendances and major topics of discussion at that workshop

Sector	Attended*	%
City/Town	3	10.3%
County	12	41.4%
Federal	1	3.4%
Private Sector	5	17.2%
Regional Organization	1	3.4%
State Government	5	17.2%
Utility	1	3.4%
Other	1	3.4%
Total	29	100.0%



*Please note project team attendance was counted as part of the Jonesboro workshop. Attendance by project team members at other workshops was discounted.

The observations below do not reflect “meeting minutes”, rather they are organized, synthesized and paraphrased from comments made directly by the workshop participants:

Data Update & Workflow

- Arkansas One Call is actively collecting GPS-based info on the location of new roads. Is there an opportunity to formally engage them as part of the Arkansas Centerline File update/maintenance process? While they don’t necessarily collect full attributes, they have good indicators of where change has taken place
- Road centerlines are often not updated *systematically* at the local level. Rather, it is done on an ad hoc basis as errors or omissions are found.
- In some situations, utilities will receive information on annexation changes before counties. Utilities receive data directly from cities so that city surcharges on the utility bill can be implemented as quickly as possible.
- What happens when a user discovers an error in a statewide layer? Is there a formal procedure for notifying the custodian of errors?
- When using data downloaded from GeoStor, if someone finds an error, they will often fix it themselves (to make the data usable for their own purpose). Is there a process for a user to submit a “data fix” back to the custodian?

County – City Communication and Collaboration

- There can be significant communication and data sharing challenges between counties and cities.
 - Cities can be demanding data sharing partners with counties. “They want our data (e.g. for annexations), but they won’t necessarily share back.”
 - Changes (e.g. a new road; new annexation) are made at the city level but there is not always prompt and regular notification to the county about where new mapping and updates are taking place.

Building Support for GIS and Getting Started

- Counties need support for making the case for building GIS capabilities. The Fulton County Assessor wants GIS, however, needs to overcome county perceptions “that there’s no value in automating the maps” in order to obtain funding and move forward. The start-up costs are the largest concern. “If we could get it built, we could fund its maintenance.”
 - In response to a question, the Arkansas Geographic Information Office reported that it will provide educational and GIS advocacy support at Quorum Court *if asked* and explicitly invited by the county

- Counties reported the availability of “matching funds” (e.g. a 50% match) would in some cases be sufficient to instigate counties to invest in GIS data automation and startup.
- Utilization of GIS to support public safety – e.g. tornado tracking and damage assessment – might help raise the profile of GIS with public officials.
- Sharp County reported their school superintendents were highly supportive of GIS efforts in the county, and were key allies in gaining funding. The superintendents recognized that their funding – which comes from property taxes - is based on effective, comprehensive and efficient assessment process. If the Assessors have good tools, they will do a better job of raising revenues for the county and the schools are the greatest beneficiaries. The Sharp County Assessor estimated that they have increased the valuation in the county by 10% by finding new buildings and previously un-mapped parcels through the automation process.
- GIS is relatively new in smaller counties (e.g. IZARD). There is not a formal GIS implementation, rather effort is focused in a single individual. These people would benefit from training and experience sharing. As one attendee stated: “We need someone to teach us how to be good GIS managers”.
- The increasing utilization of geospatial technology in “high-tech farming” (i.e. “precision agriculture”) provides an opportunity to approach this constituency to support state and local geospatial development efforts. For instance, there is a private network of 75 GPS CORS stations in northeast Arkansas that has been built to support the “precision agriculture” of the farming community.

Funding

- There was general agreement that a chargeback framework would be a bad idea. However, if such a framework came into being it was suggested that “data contributors” should be provided “free access” to the data, while non-contributors would pay the chargeback.
- It was suggested that E911 cell phone surcharges be investigated as a potential funding stream for data sets such as addressing and street centerlines.
- There was general receptivity to investigating whether the Real Estate Transfer Tax might provide a “geospatial data funding stream”. It was observed that such a vehicle:
 - Had an existing infrastructure for collecting the fees
 - Provided a logical nexus to the “cadastral framework” (i.e. parcel) data layer
 - Provided a potential nexus to other data layers such as floodplains

Road Centerlines:

- Uses of the ACF data:

Sharp County: law enforcement, county road department

Parcels:

- Counties can be frustrated that the \$7/parcel for “reassessment” which comes from the Assessment Coordination Department cannot be used to support mapping.

Orthophotos:

- Better resolution beyond the current 1 meter imagery is highly desirable.
- The notion of local government buy-ups to a statewide contract was attractive to counties and local governments.

Administrative Boundaries & Annexations:

- There appear to be a variety of workflow practices involving annexations and the result is the amount of time it takes for an annexation to be completed and then available as part of the GeoStor database can vary widely. Some counties reported that it can take in excess of one year for an annexation to become available in the statewide database. The general flow of annexation approvals involves:
 1. City approves annexation →
 2. Quorum court approves annexation →
 3. Annexation is filed with the Secretary of State →
 4. City boundary file is updated by AHTD to include new annexation →
 5. AHTD data provided to AGIO for inclusion in GeoStor on a periodic basis
- There should be standards for electronic annexation data. Examples of material to include in such a standard:
 - Annexation legal descriptions must close
 - Annexation boundary data should tied down to a coordinate system
 - Jonesboro currently requires that annexations must be submitted in an electronic form in the state plane coordinate system.

Elevation:

- There is interest in elevation data and recognition of the limitations of existing GeoStor elevation data. But there is also recognition that this is an expensive data set to create.
- Flood issues can be a driver of elevation data interest
 - Sharp County became more interested after recent flood events

- Limitation of existing FEMA FIRM maps: many “Zone A” designations that do not have a “determined” flood elevation
- Counties are wondering why FEMA is not more interested in improving the flood maps. Currently, FEMA will update *only if* the county provides the funding for the enhanced flood studies.

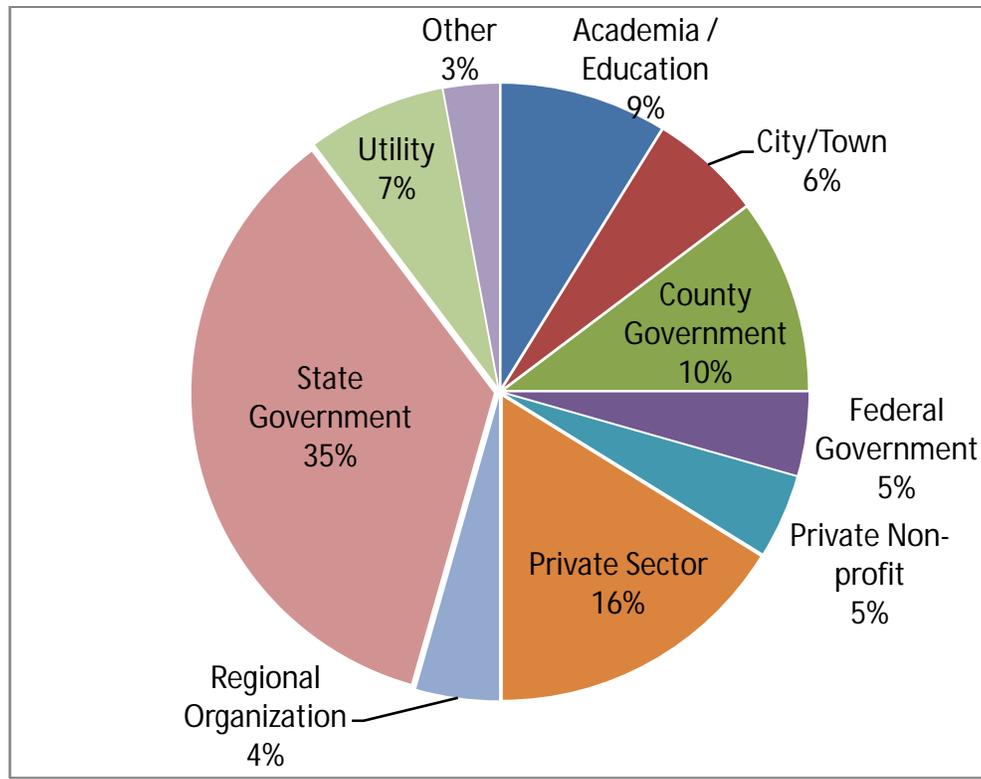
Geodetic Control:

- It was acknowledged the National Geodetic Survey (NGS) is currently involved in a formal “height modernization” initiative, and it was asked whether Arkansas is formally participating in this program.

Little Rock

On August 19th a geospatial strategic and business plan workshop was held in Little Rock. The following characterizes the attendances and major topics of discussion at that workshop:

Sector	Attended	%
Academia / Education	6	10.0%
City/Town	4	6.7%
County Government	7	11.7%
Federal Government	2	3.3%
Private Non-profit	3	5.0%
Private Sector	10	16.7%
Regional Organization	2	3.3%
State Government	19	31.7%
Utility	5	8.3%
Other	2	3.3%
TOTAL	60	100.0%



The observations below do not reflect “meeting minutes”, rather they are organized, synthesized and paraphrased from comments made directly by workshop participants:

Building Support for GIS and Getting Started

- Entergy (who is working with the Administration on economic development initiatives) reported that economic development is an extremely important driver that can resonate with decision makers. They reported that:
 - Site selection has been professionalized with site selection consultants
 - Such consultants make “data calls” in response to opportunities and these data calls “always require maps and GIS data”
 - A typical data call might involve: “provide all parcels >10,000 acres owned by a single land owner”
 - AR needs good GIS capability to compete effectively in a “global competition” for economic development
- One county reported that “the Quorum Court doesn’t fully understand the need” and that has made obtaining funding impossible. There needs to be further education of decision makers on the need for, and importance of GIS.

Funding

- There was acknowledgement there’s been an ongoing, and as of yet unsuccessful effort to identify a sustainable funding stream.
- At least one stakeholder stated a strong preference to not pursue any form of surcharge stating that this simply amounted to “another tax”
- There was an extensive discussion concerning the ACD “reappraisal money” that is provided to counties at the rate of \$7/parcel. Some counties remain concerned that using these funds for parcel mapping is explicitly prohibited even though some counties believe that mapping is part of the reappraisal process. Both counties and ACD are frustrated that the funds to support reappraisal are inadequate and this has not only prevented the reimbursement rate from being raised from \$7/parcel, but it has also catalyzed efforts to reduce the number of parcels that are appraised and are eligible for reimbursement (e.g. through combining separate parcels that are under the same ownership). Regardless, new legislation would be required to alter the amount of funds and how they are distributed to counties.

Road Centerlines:

- AR One Call: described that they GPS collect the location of new roads where there’s digging (e.g., utility construction work). GPS data are downloaded from a “sister company” on a nightly basis.

- It was observed that “lease roads” are not present in the ACF data set
- USFS: Approximately 30% of “forest roads” in the Ouachita National Forest are missing from the ACF data set. Some of the roads that are present are inaccurate and/or have errors in the road name.
- Annual update of the ACF database is not adequate for many purposes. Monthly or quarterly updates are desirable.
- There are inconsistent practices in how, and how often road updates are provided to the AGIO for inclusion in GeoStor. In some cases road updates are provided directly to AR One Call because there is a known lag in how long it takes to get a new data set loaded into GeoStor.
- Pulaski County: Reported that they provide the data to GeoStor faster than the AGIO can post the data. They make changes on a monthly basis and it can take longer than one month for data updates to be posted to GeoStor. It would be desirable to have an infrastructure that allowed trusted users to post their own data sets to GeoStor.
- Marion County: the volume of road updates can be overwhelming and it can be difficult to keep up with only the 911 coordinator and a single mapper working on it.
- One county assessor reported that cities are directly involved in addressing and road acceptance and these kinds of transactions are not always reported to the county in a timely fashion. Therefore it is difficult for counties to keep the roads current when they don’t necessarily know when changes have taken place/been approved.
- It would be highly desirable to enhance the ACF by adding an attribute for functional classification.

Parcels:

- It was observed that county mapping personnel typically make around \$8/hr and that is not enough to train and retain good, capable staff. When people get trained, they may leave for higher paying jobs and this can be a significant setback.
- Pulaski County: Parcels provide the foundation for all types of district and administrative boundaries and therefore must be mapped accurately.
- Chicot County: Reported that the existence of hand-drawn maps made the parcel automation proceed much more smoothly.
- Many counties are proceeding with parcel mapping and automation in one step using their own resources. While this is feasible, it is taking a very long time, in some cases >5 years.

- USFS: There are 2 million acres of National Forest in AR and there is questionable parcel data for these lands. Some comes from the Federal Govt's NILES system. Unreliable data from counties, if it even exists.
- Parcel changes often indicate new road construction (e.g. new sub-divisions) and thus there is an opportunity to coordinate road and parcel data maintenance.
- Arkansas CAMA Technologies: The "CAMP¹ program taught people how to spell GIS" and that has been a great success in that it has created a broad-based demand for GIS parcel automation. People want to have GIS in their counties and are no longer skeptical of the technology even if many continue to lack the means to fund and implement GIS. In short, for the most part, Assessor's universally *want* GIS.
 - Getting GIS also requires leadership. There are poorer counties that have leadership and have succeeded with GIS while some larger counties have not been able to get started. One person can make a difference in getting things started and moving forward
- It's not always "just about the money". In at least one county, a 50% subsidy for parcel automation was offered and proved insufficient to get the county to invest the other 50%.

Administrative Boundaries & Annexations:

- Pulaski County: Parcels do not cross county or city lines, thus all administrative boundaries should be derived from parcel boundaries.
- Randy Everett, First Electric Cooperative: Utilities pay taxes based on districts and thus it is critical that district boundaries (i.e. counties, cities, school districts) be accurately mapped. For instance, utilities need to definitively know which district their poles and lines lie within.
 - The AHTD county boundary data set (derived from the USGS topographic quadrangle sheets at 1":24,000" scale and +/- 40 foot accuracy) are often not accurate enough to which county a pole lies within.
 - Because of a lack of an accurate and definitive county boundary map there can be edgematching challenges when obtaining the parcels from two adjoining counties.
 - Utilities are forced to "rough in" boundary data when definitive statewide sources are not available (knowing that they are inaccurate)
- Lack of definitive boundaries is a significant operational challenge for GIS practitioners and it is becoming increasingly evident and important with more GIS activity.

¹ CAMP – County Assessor Mapping Program is a joint effort between the Assessment Coordination Department and the Arkansas Geographic Information Office to integrate GIS into the work of the County Assessor Offices.

- City/County notification on annexations are not a large problem although one stakeholder noted that there can be a lag of as long as 6 months for the County Clerk to provide notification to the GIS department following an annexation.

Orthos:

- Universally acknowledged as incredibly important data set that is used every day by most stakeholders. Example uses that were cited include:
 - Timber industry: thinning and road building planning
 - Fayetteville Shale: Oil development for ponds and pads
 - Change detection: to identify new development (e.g. oil facilities on a property)
 - General public: accesses aerial photography to support hunting and real estate
- General support for providing local buy-ups on top of a statewide orthoimagery project.
 - Pulaski Area GIS (PaGIS) reported that there was a precedent for this and they bought up on top of the state's 2006 flight.

Elevation:

- Existing 5M DEM acknowledged to be inadequate for flood studies and FEMA map modernization.
- Elevation data requirements that were cited include:
 - USFS: Conducting hydrological studies
 - Saline County: Flood plain administrator for assessing permits for construction in the flood zone
 - Timber harvest planning
 - State Dept. of Health: identifying sources waters for reservoirs; time of travel for contaminants into public water supplies is a currently unmet need because the currently available data don't support the analysis.
 - Water utilities: planning for new facilities and infrastructure expansion
 - Game & Fish: fish hatchery siting
 - U of A Cooperative Extension: watershed nitrogen load modeling

Geodetic Control:

- Arkansas Department of Environmental Quality: expressed an interest in obtaining better, more detailed PLSS² data (i.e. quarter sections, or quarter-quarters)
- Pulaski County observed that while survey-level PLSS section corners would be of interest, capturing the data would be extremely expensive and cost millions.

² PLSSS – refers to the Public Land Survey System of township, range and section polygons that form the foundation of parcel mapping.

Arkansas Geospatial Strategic Business Plan
Monticello, Ft. Smith & Hope Stakeholder Workshop
Summaries

Prepared by:

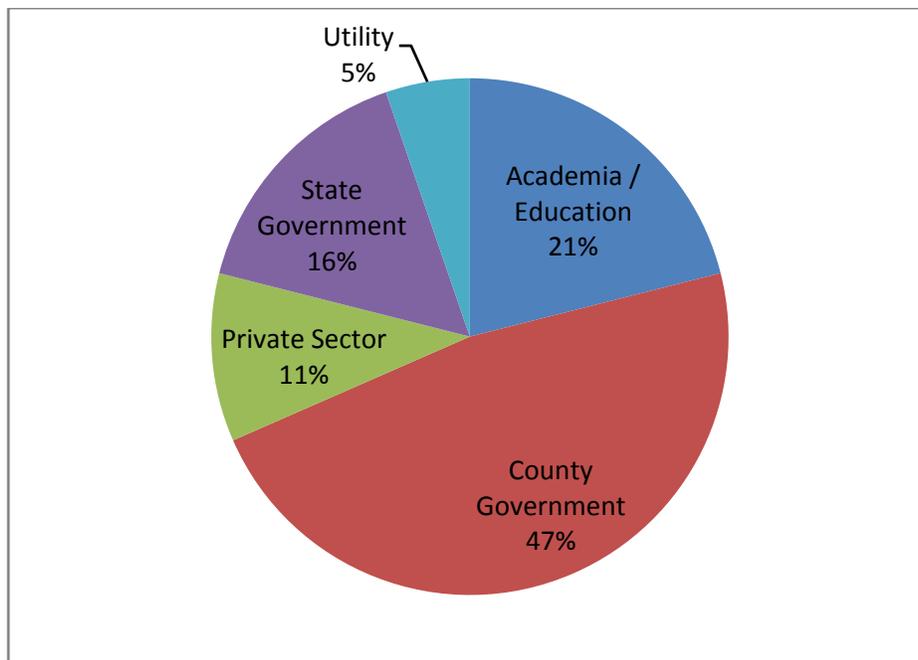
Applied Geographics, Inc.

December, 2009

Monticello

On August 31st, 2009 a geospatial strategic and business plan workshop was held in Monticello. The following characterizes the attendances and major topics of discussion at that workshop

Sector	Attended*	%
Academia/Education	4	21.1%
County	9	47.4%
Private Sector	2	10.5%
State Government	3	15.8%
Utility	1	5.3%
Total	19	100.0%



*Please note project team attendance was counted as part of the Jonesboro workshop. To avoid double counting, attendance by project team members at other workshops was discounted.

The observations below do not reflect “meeting minutes”, rather they are organized, synthesized and paraphrased from comments made directly by the workshop participants:

Building Support for GIS and Getting Started

- One county expressed the belief that a single, consolidated “GIS group” within a county was the preferred mechanism for staffing a GIS. A single person could cover all the GIS requirements for parcel, E911 and general mapping. A single person doing GIS full-time is preferable to three people doing it part-time.

- Similarly, this workshop noted that counties where GIS is most successful often will have multiple departments – e.g. Assessor and E911 – working *together* and collaboratively

Funding

- A strong preference *against* any type of “chargeback” funding was expressed during this workshop.
- One county that has made substantial progress on their parcels noted that if the state provides new funding to support county parcel automation they should not overlook providing support to counties that have some capability. In other words, counties that have moved forward should not be “penalized” for making their own investments (while counties that have *not* made investments are “rewarded”). Indeed, even some of the “have” counties would benefit from support to do things such as:
 - Improve the quality and accuracy of existing parcel data
 - Move their data into a statewide parcel standard

Hydrography:

- This part of the state indicated a strong interest in more detailed mapping of drainage canals and farm ditches. As appropriate, detailed mapping of these features within the hydrography data set would add value.

Parcels:

- Strong county interest in seeing additional parcel mapping.

Orthophotos:

- Higher resolution orthoimagery would be highly desirable. 1 foot resolution statewide would be ideal.
- It was suggested that a statewide program that recurred on a 3-year basis could be aligned with the current re-appraisal cycle. That is, if 1/3rd of the counties were flown every 3 years, those counties might match the counties that require reappraisal. It was acknowledged that adjustments of counties in the reappraisal cycle might be warranted since flyovers are most efficient when there are large continuous areas to be covered.
- Current uses, and expanded uses of orthoimagery include:
 - Game & Fish: performing landuse interpretation, especially for forested lands and determining landuse change over time.
 - Identifying impervious surfaces for drainage calculations.
 - Assessors: “real property discovery”, particularly for new buildings and determining which properties mobile homes sit on.

Administrative Boundaries & Annexations:

- Stakeholder described a need for accurate mapping of “levy districts” where tax payers are surcharged for improvements to levies and drainage canals. Current mapping is fairly weak and thus there is not a high degree of certainty that all of the proper tax payers are being assessed the fees.

Elevation:

- A private contractor noted that they have successfully used the state’s 5M DEM and found them reasonably useful. They also noted that the major flaw in the DEM is that in many forested areas the DEM indicates the elevation of “tree canopy” not the surface elevation. Thus, if there is clear-cutting, the DEMs can be significantly off.
- Fish & Game described one specific need for detailed elevation being a determination of when to close flood prone areas to hunting. Certain areas are closed based on a specific elevation that requires 2 foot contours (e.g. all areas below 122’ are closed).

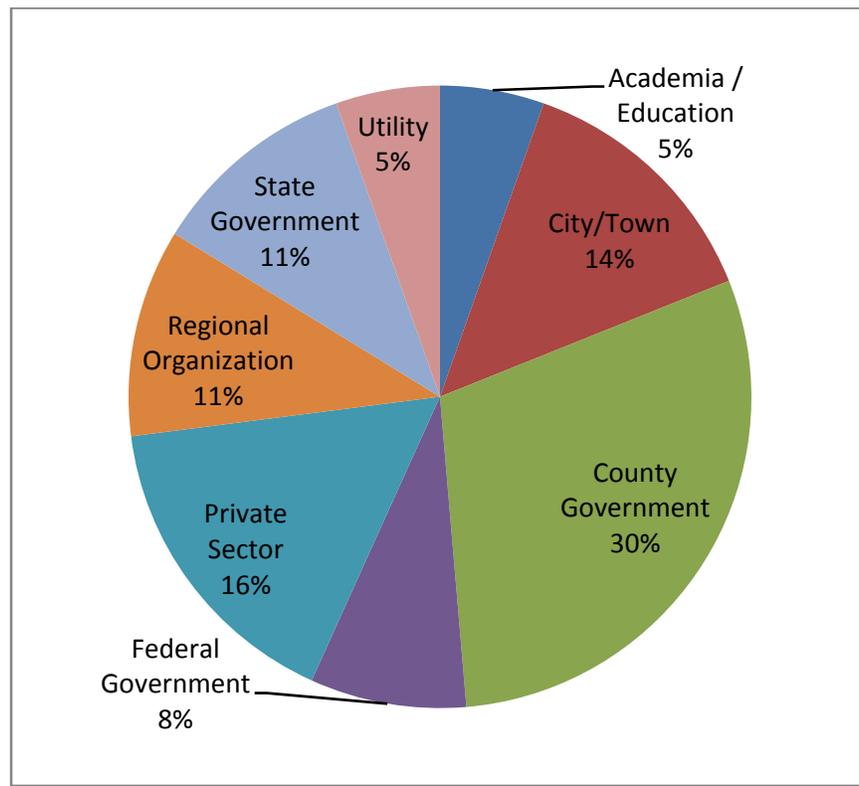
Other Issues:

- The workshop included a discussion about potential requirements for “privacy protection” in the Arkansas spatial data infrastructure. One example that was cited was a potential need to protect “private timber roads” within the street centerline from public access.

Ft. Smith

On September 1st, 2009 a geospatial strategic and business plan workshop was held in Ft. Smith. The following characterizes the attendances and major topics of discussion at that workshop:

Sector*	Attended	%
Academia / Education	2	5.4%
City/Town	5	13.5%
County Government	11	29.7%
Federal Government	3	8.1%
Private Sector	6	16.2%
Regional Organization	4	10.8%
State Government	4	10.8%
Utility	2	5.4%
TOTAL	37	100.0%



*Please note project team attendance was counted as part of the Jonesboro workshop. To avoid double-counting, attendance by project team members at other workshops was discounted.

The observations below do not reflect “meeting minutes”, rather they are organized, synthesized and paraphrased from comments made directly by workshop participants:

Building Support for GIS and Getting Started

- Several stakeholders reiterated the important role that GIS plays in emergency preparedness and response and observed that these issues can resonate with both local elected officials and the general public. The connection between GIS should be made when “selling” new projects at the local level. As one stakeholder observed, with a touch of regret: “the tornado really opened my Judge’s mind to the importance of GIS”.

Road Centerlines:

- One stakeholder enquired why AHTD wasn’t more actively involved in the stewardship of the ACF.
- Strong interest in additional ACF attributes to enable advanced symbolization and routing.

Parcels:

- While there is strong agreement that statewide parcels is desirable, it is unclear whether it will happen without some kind of support. When the rhetorical question was asked: “if we wait long enough will we get statewide parcels?” In response, one stakeholder observed: “No, the fact that there is not yet complete parcel *mapping* shows that it is not just a matter of time.” Indeed, counties have had many decades to complete tax parcel mapping and many counties remain unmapped (whether on paper, or digitally).
 - There appeared to be stakeholder consensus that some kind of “push” from the state would be necessary to complete parcel automation within the next decade. An example of a “push” that was raised by stakeholders was a “formal mandate” for complete parcel mapping by counties (recognizing that any new mapping at this juncture is likely to be electronic mapping). During this discussion it was noted that AACD’s “mandate for CAMA and periodic reappraisal” have been effective and all counties now implement CAMA systems and perform regular and standardized reappraisals.
 - One option for a “mandate” that was raised was to broaden the current “reappraisal mandate” to include a “mapping requirement”.
 - It was noted that even if there was a mandate emanating “from Little Rock” it remained critical that there be efforts to demonstrate the “local needs and benefits”.
 - There was additional discussion about whether to be effective a “mandate” had to be “funded”, or not. The idea of “partial funding” was also considered. One assessor estimated that if the state provided 80% parcel automation funding to counties that would be adequate to complete approximately 70%-75% of the remaining counties that do not have automated parcels at present.

- It was noted that in the 25%-30% of counties where an 80% funding subsidy would not be adequate, that “it’s not just about the money”. Rather, local leadership and vision are required for successful deployment of GIS.
- Stakeholders identified that automating parcels is not entirely enough. Even some of the existing parcel data have accuracy issues when compared to the latest orthoimagery. Thus, parcel quality improvement should accompany the completion of statewide parcel automation.
- Washington County reported that they completed the automation of commercial personal property records. After completing this, additional inspections uncovered several hundreds-of-thousands of dollars of personal property valuation that was not previously assessed.
 - It was noted that some tax payers may be upset if their assessed values go up following GIS-assisted assessments. However, it was also noted that the other tax payers are the beneficiaries of a fairer and more equitable assessment process.
- Counties that have successfully completed parcel automation strongly encouraged other counties to “tie parcel automation to education funding”. Parcel automation improves the effectiveness of assessing and improvements in assessing lead to increased property tax revenues, the majority of which go to school funding.
- It was noted that parcel automation can be easier in smaller counties for two reasons. First, there are fewer parcels to automate so it is an inherently simpler job. Second, in smaller rural counties there is less complexity in the “section layouts” so the parcel geometry is inherently simpler, and thus easier to automate.
- Stakeholders were in agreement that the vast majority of assessors now **want mapping**, and are no longer against it. This attitudinal change was attributed to the CAMP program. At the same time, some counties remain challenged in finding the means to complete mapping.

Administrative Boundaries & Annexations:

- There was agreement that there is significant duplication of effort in municipal boundary mapping following annexations across jurisdictions. During the workshop, the following organizations acknowledged that the **all** map annexations at times: counties, utilities, E911 mappers, and AHTD.
 - For example, Ozark Electric described their attempts to obtain all annexations for entry into their system. At the same time, they acknowledged that they have missing annexations and need to spend research effort at the county courthouse to obtain these.
- Workshop participants described that municipal boundary mapping is complicated by the fact that there is not a single, unified legal description of the entire circumference of municipal

boundary. Rather, the complete boundary must be cobbled together from potentially dozens of individual legal descriptions.

- Workshop participants identified that it would be extremely useful to tie the municipal boundary geometry to scanned renditions of the legal description.
- Van Buren City undertook a project to definitively identify their municipal boundary from all of the legal descriptions. This was a time-consuming task that was estimated to have taken from 200 – 375 hours (i.e. 2-3 hrs/day for a period of 4-6 months).
- Washington County affirmed that they map their municipal boundaries so that the boundaries are coincident with parcels (i.e. no parcels are split by a municipal boundary).
- This workshop identified that there can be different interpretations of the “workflow and timing” to complete an annexation. Given these interpretations one workshop participant theorized that “some cities may be jumping the gun with regard to taxation and utility fees”. For instance, Van Buren City described that they had to wait until the county “de-annexed” land before their annexation was formally completed. In other workshops, participants described an annexation process that did not include de-annexation requirements.

Orthos:

- Many participants described and endorsed the importance of orthoimagery and the desirability of a recurring program.
 - When the cost of a statewide, 1 meter resolution project was described as approximately \$1 million, one participant noted: “Are we so poor that this state can’t afford \$1 million every 3-4 years?”
 - There was consensus that higher resolution (i.e. 1 foot) for statewide imagery would be highly desirable.
 - It was noted that 1 foot resolution imagery is essential for urban area/city parcel mapping.
 - Van Buren City noted that a published schedule of statewide flights would be extremely useful and would allow for fiscal planning at the local level. If a county is to buy-up (and many are interested) they need time to budget.
- Several counties in this region (e.g. Benton and Washington) fund their own flights on an annual basis and noted that there are “assessing timelines” that need to be taken into consideration to make imagery as useful as possible. For instance, counties need to have their deliverables before the “lien date”. Thus, if there is to be a coordinated “state-local” imagery program, perhaps implemented through local buy-ups off of a statewide baseline, there needs to be a mechanism for county control over schedules for buy-up products.

Elevation:

- It was noted that if the state were to undertake an elevation improvement project the enhanced elevation data would have the side effect of making a better DEM available to future orthoimagery projects, thereby enhancing the accuracy of future orthoimages. Indeed, one of the major costs involved with improving the resolution of statewide orthos from 1 meter to 1 foot would be a requirement for a new, improved DEM.
- Examples of uses of enhanced elevation data that were cited, include:
 - Flood plain administration
 - Washington/Benton County: Watershed protection and local water supply management (e.g. for Beaver Lake).
 - Hazard mitigation and pre-planning

Geodetic Control:

- It was noted that Arkansas’s PLSS data suffers from a lack of a “Corner Perpetuation Act” such as the one the Oklahoma has. Such a Corner Perpetuation Act *requires* the publication of PLSS corners whenever they are surveyed.
- Strong PLSS data was identified as a key ingredient for accurate parcel mapping.

Funding

- Stakeholders encouraged the state to further investigate the use of FEMA Hazard Mitigation funding, particularly for data sets such as elevation (which are extremely relevant for flood mapping). Such data will be invaluable for “pre-planning” activities.
- During the workshop both a Real Estate Transfer tax allocation and a “surcharge” on current recording fees were brought forward as potential mechanisms for funding GIS parcel work. It was observed that the Real Estate Transfer tax funding would be controlled and could be allocated by the *state*. On the other hand, any surcharges on recording fees would be controlled by *counties*. While there is nothing wrong with this, it was observed that this might have the effect of widening the gap between “have” and “have not” counties. Ultimately, there may not be enough recording fee volume in smaller counties (i.e those without parcel data) to raise enough funds for parcel automation through such a surcharge. At the same time, counties which already have their parcels would be raising additional funds through a surcharge.
- One stakeholder suggested (with agreement from others) that if funding was made available for parcel automation (or parcel improvement) it would be “smart politics” to provide those funds directly to county governments, perhaps through a competitive grant program.
- One stakeholder suggested investigating whether the state “gas tax turnback” could be used to fund some types of GIS work. They described that the turnback can be used for “capital improvements on roads” and surmised that improved roadway mapping could be envisioned

as a capital improvement. The stakeholder also mentioned that the gas tax turnback was being re-examined by the legislature and this provided an opportunity for the GIS expenditures to be *explicitly allowed* from this funding source (with legislative approval).

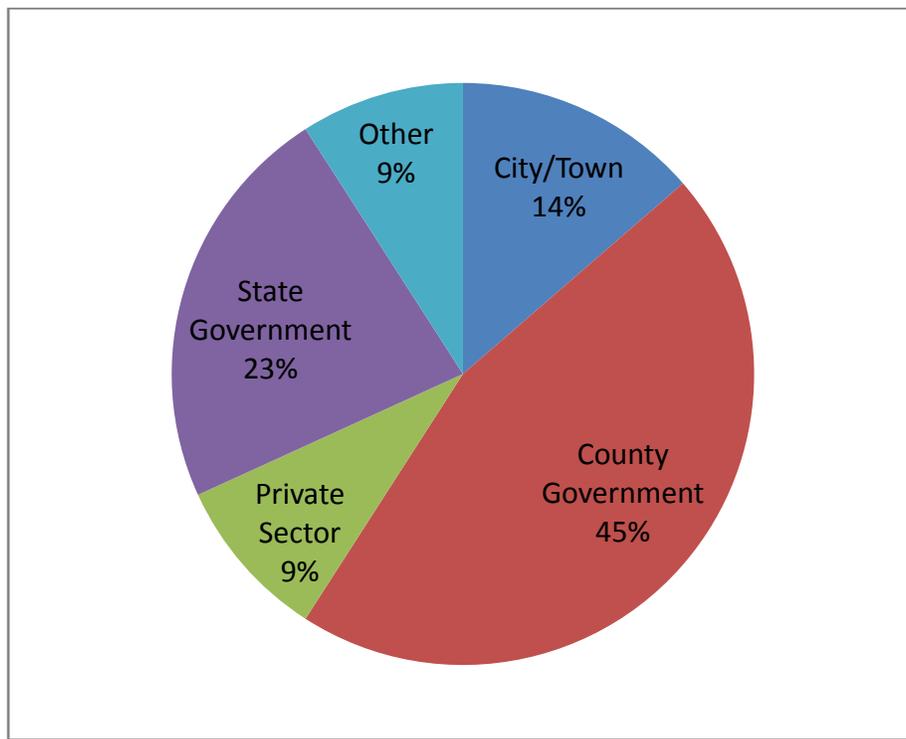
Other Issues & Observations:

- During a discussion on “geospatial standards”, one stakeholder observed that the state should seek to identify “minimum standards” and should avoid an attempt at “best possible standards”. The idea was to make standards compliance relatively simple and straightforward. His hope was that simpler standards would “inspire the middle” to adopt and retro-fit their data to the standards in spite of their existing condition. In short, don’t just aim the standards at those who have yet to begin.
- There was a general sense of optimism that the “climate was right” and that there was a real possibility for Arkansas to make substantive investments in GIS *data*. With this climate, the GIS community should be “ready for yes” and the requirement to act in a coordinated fashion in an environment of increased activity.

Hope

On September 2nd, 2009 a geospatial strategic and business plan workshop was held in Hope. The following characterizes the attendances and major topics of discussion at that workshop:

Sector*	Attended	%
City/Town	3	13.6%
County Government	10	45.5%
Private Sector	2	9.1%
State Government	5	22.7%
Other	2	9.1%
TOTAL	22	100.0%



*Please note project team attendance was counted as part of the Jonesboro workshop. To avoid double-counting, attendance by project team members at other workshops was discounted.

The observations below do not reflect “meeting minutes”, rather they are organized, synthesized and paraphrased from comments made directly by workshop participants:

County – City Collaboration

- In some regions, the cities are more advanced with GIS than the counties. For example, the City of Texarkana is automating the parcels on behalf of one of its “parent counties”, Bowie County, Texas.

Building Support for GIS and Getting Started

- One of the forestry companies represented said that they had recently been able to sell and justify the creation of a dedicated GIS staff person. The keys to making this case included:
 - Taking advantage of an overall internal re-organization
 - Describing how the GIS would allow for more efficient task assignment across the company
- Many stakeholders acknowledged that “building awareness” of GIS was essential to getting local support for GIS initiatives. Participating in GIS Day activities was identified as one vehicle for this type of awareness building.

Funding

- There was consensus among workshop participants that any kind of a “data chargeback” system was highly undesirable.
- There was some receptivity to the notion of there being a “surcharge” on deed recording fees. It was noted that this type of surcharge was analogous to the E911 surcharge that’s placed on cell phone bills (to fund E911 systems).

Road Centerlines:

- A timber industry representative stated a strong interest in additional ACF attributes such as standard road classification and road width. He also indicated a willingness to add these attributes to the ACF for roads on his company’s property. Finally, he identified that a core opportunity and challenge of statewide roads is getting people to share the same geometry and core attributes while adding “industry specific” information onto that linework. To enable this, a persistent, unique road/segment numbering system would be required on a statewide basis.
- Local uses of road centerline data as expressed by a County Judge who attended the session:
 - Using the data to assist in the assignment and inventory of bridge classifications
 - Improving the local routing of commercial truck traffic

- City of Hope expressed that road centerline data is relatively strong in light of small amounts of new road construction in this region. Their core interest is in improving the addressing on the street centerlines and moving to “address points”.
 - A Fire Dispatching participant expressed similar concerns about addressing and his interest in a “statewide geocoding capability”. He noted this interest emanates from the poorer quality of street centerline based addressing in rural areas and the lack of commercial data alternatives (e.g. poor roads data in Google Maps too).

Parcels:

- Columbia County is automating their own parcels but acknowledges that it is taking a long time going at the rate of 2-3 sections per day (working from deeds and plans). They also acknowledged that their productivity is impacted by a lack of a dedicated GIS person and an inability for other Assessing staff to focus solely on GIS work. Rather, the GIS mapper is regularly called into other duties within the Assessor’s office. As stated by the stakeholder: “it would happen quicker if we could focus on it.”
- Other county assessing staff indicated that their productivity is impacted by a lack of training opportunities, or the costs of existing training. They stated: “most of what we have learned comes from other counties”.
 - In addition, assessors identified that a secondary problem is *keeping* people who have been trained. Once trained, county personnel have obtained a marketable skill and many counties have seen their GIS people leave for higher paying jobs in other regions or industries.
 - To combat this type of job turnover, some acknowledged that finding a way to pay the GIS personnel more money was essential. One way of doing this was to “re-write the job description” to add more responsibilities.
- During this workshop participants were asked, hypothetically, what their reaction would be to a “mandate” for parcel mapping coming from AACD. Key reactions included:
 - “You might get pushback from the Quorum Court, but not from the Assessors”
 - To be successful, such a mandate must have an established timeline. For instance, parcel mapping must be completed within *five years*.
- Assessors were interested in whether it would be possible for AACD to allow “reappraisal funds” to be used for mapping activities.
- Assessors in this region agreed that if counties could be provided assistance for completing the up-front, original automation of the parcels, they could be effective in maintaining and keeping the parcel data sets current. Obtaining the “initial slug” of funding has proven most difficult.

Orthophotos:

- Stakeholders stated a strong preference for imagery at a higher resolution than the current 1 meter statewide product. Both city governments and the forestry industry represented that 1 meter resolution was not adequate for activities such as:
 - Urban parcel mapping
 - Landuse/forest cover change detection
- Texarkana relayed that they fund and contract their own flyovers every two years. They require high-resolution imagery and obtain their data with 6” pixels.
- When the notion of a recurring, statewide orthoimagery program that would allow local “buy-ups” was discussed, a representative from a forestry company enquired whether “private buy-ups” might be considered. The forestry industry is potentially amenable to contributing funding for higher resolution imagery in their areas of operation.
- AHTD relayed that they contract for some flyovers, generally to support their construction activities, every year. Typically, these flights produce 1 foot resolution imagery. Could this program be further aligned with AGIO sponsored flyovers to increase the coverage and/or resolution (or to provide a funding contribution to a recurring program)? Could the project specific needs of AHTD be met by a statewide contract (that allowed targeted, on-demand activity for any requirements not met by a recurring, statewide high-resolution program)?

Administrative Boundaries & Annexations:

- A representative from AHTD relayed that they have dedicated a full-time equivalent (FTE) to city limit boundary maintenance. The representative also relayed that they regularly send review maps to local governments but that it is extremely rare that they get feedback on those review maps.
- While other parts of the state see a high volume of annexations, the City of Hope relayed that they have had only two annexations in the last 10 years.
 - They also relayed that they have prepared and cleaned up a definitive city boundary and that it took approximately 2-3 person months to complete the work.

Elevation:

- Representatives of the timber industry relayed that their requirements for “harvest planning” require better elevation data than is currently available.
- Texarkana reported that they have completed citywide LiDAR capable of producing 2 foot contours.
 - Texarkana reported that they successfully received funding to improve their FEMA Flood Insurance Rate Maps (FIRM) partly due to the fact that they had access to

improved elevation information. Hope – where improved elevation data is not available - reported that they had sought similar funding but were turned down by FEMA.

- Potential uses of improved elevation data that were reported by stakeholders:
 - Timber industry: “intelligent land acquisition” to avoid purchasing properties that will not be productive. In the past, timber companies have purchased land where there are slopes that are too steep to cost effectively harvest timber on.
 - City of Hope: Spurring economic development by making full site-level data, including topography available to prospective developers.

Geodetic Control:

- One stakeholder noted that an increasing number of local ordinances require the digital submission of site and sub-division plans. Such ordinances provide an opportunity for more detailed, electronic PLSS data to be collected, provided that the ordinances require the PLSS to be tied down to a coordinate system.

Appendix 3

Parcel Development Status Spreadsheet

Parcel/Mapping Automation Cost Estimation

Assembled by Applied Geographics, Inc. in association with AGIO staff research

November, 2009

County	Parcel Count (ACD)	Total Polys (Done in GIS)	% Polys Done*	Polys to Be Automated	Total Mapped (Paper Mapping)	Amount to Be Mapped	Data Source
13 Counties Where Parcel Mapping is in "Maintenance" (i.e. >95% complete)							
Benton	128,447	142,406	110.9%	0	100%	-	County
Pulaski	168,541	178,500	105.9%	0	100%	-	County
Washington	89,469	99,000	110.7%	0	100%	-	County
Saline**	69,435	63,278	100.0%	0	100%	-	County
Sebastian	54,094	55,511	102.6%	0	100%	-	County
Pope	35,081	33,318	95.0%	1,763	100%	-	County
Crawford	33,319	35,811	107.5%	0	100%	-	County
Conway	18,876	19,338	102.4%	0	100%	-	County
Arkansas	18,107	17,623	97.3%	484	100%	-	County
Stone	16,380	17,201	105.0%	0	100%	-	County
Clay	15,873	16,783	105.7%	0	100%	-	County
Cross	13,453	13,241	98.4%	212	100%	-	County
Montgomery	11,016	11,016	100.0%	0	100%	-	County
TOTAL	672,091	703,026		2,459			

* Note: there may be discrepancies between ACD and county parcel counts which results in >100% calculations

** Saline County has completed parcel automation, however, their ACD count exceeds their "polygons count"

County	Parcel Count (ACD)	Total Polys (Done in GIS)	% Polys Done*	Polys to Be Automated	Total Mapped (Paper Mapping)	Amount to Be Mapped	Data Source
25 Counties Where Parcel Automation is "Underway" (i.e. >25% and <95% complete)							
Baxter	37,344	34,394	92.1%	2,950	92%	2,950	County
Craighead	47,021	42,748	90.9%	4,273	90%	4,702	County
Johnson	19,044	17,180	90.2%	1,864	90%	1,864	County
Poinsett	20,076	17,723	88.3%	2,353	88%	2,353	County
Little River	15,147	12,462	82.3%	2,685	82%	2,685	Contractor
Randolph	18,163	14,591	80.3%	3,572	80%	3,572	County
Van Buren	35,503	27,900	78.6%	7,603	85%	5,325	County
Boone	27,217	17,882	65.7%	9,335	90%	2,722	County
Jackson	16,704	9,913	59.3%	6,791	59%	6,791	County
Hot Spring	21,860	12,486	57.1%	9,374	57%	9,374	County
Lawrence	17,465	9,754	55.8%	7,711	56%	7,711	County
Clark	23,455	12,630	53.8%	10,825	85%	3,518	County
Logan	19,336	10,119	52.3%	9,217	52%	9,217	County
Carroll	23,805	12,132	51.0%	11,673	95%	1,190	Contractor
Sharp	45,442	22,497	49.5%	22,945	50%	22,945	County

Ashley	21,562	10,323	47.9%	11,239	0%	21,562	Contractor
Faulkner	54,617	26,000	47.6%	28,617	10%	49,155	County
Miller	27,656	11,831	42.8%	15,825	0%	27,656	Contractor
St. Francis	20,536	8,743	42.6%	11,793	43%	11,793	County
Columbia	26,740	11,263	42.1%	15,477	42%	15,477	County
Nevada	14,696	6,000	40.8%	8,696	41%	8,696	County
Chicot	16,887	6,884	40.8%	10,003	41%	10,003	County
Pike	11,200	4,150	37.1%	7,050	37%	7,050	County
Jefferson	54,495	20158	37.0%	34,337	37%	34,337	County
Lafayette	14,934	5,128	34.3%	9,806	0%	14,934	Contractor
TOTAL	650,905	384,891	59.1%	266,014	56%	287,583	

County	Parcel Count (ACD)	Total Polys (Done in GIS)	% Polys Done*	Polys to Be Automated	Total Mapped (Paper Mapping)	Amount to Be Mapped	Data Source
20 Counties Where Parcel Automation has "Started" (i.e. <25% complete)							
Newton	12,833	3,181	24.8%	9,652	25%	9,652	County
White	45,796	10,927	23.9%	34,869	24%	34,869	County
Howard	10,471	2,460	23.5%	8,011	23%	8,011	County
Perry	10,661	2,197	20.6%	8,464	21%	8,464	County
Crittenden	27,865	5,470	19.6%	22,395	20%	22,395	County
Greene	26,567	5,000	18.8%	21,567	19%	21,567	County
Desha	14,746	2,277	15.4%	12,469	15%	12,469	County
Cleburne	30,041	4,273	14.2%	25,768	14%	25,768	County
Lincoln	13,470	1,846	13.7%	11,624	14%	11,624	County
Lonoke	36,886	4,948	13.4%	31,938	13%	31,938	County
Mississippi	27,844	2,881	10.3%	24,963	0%	27,844	County
Izard	30,981	3,000	9.7%	27,981	10%	27,981	County
Sevier	13,414	1,246	9.3%	12,168	95%	671	Contractor
Franklin	16,174	1,246	7.7%	14,928	0%	16,174	County
Drew	18,665	1,247	6.7%	17,418	7%	17,418	County
Calhoun	11,503	733	6.4%	10,770	6%	10,770	County
Polk	20,007	742	3.7%	19,265	4%	19,265	County
Garland	79,390	1,454	1.8%	77,936	90%	7,939	County
Fulton	32,812	200	0.6%	32,612	1%	32,612	County
Madison	18,639	19	0.1%	18,620	90%	1,864	County
TOTAL	498,765	55,347	11.1%	443,418	30.0%	349,295	

County	Parcel Count (ACD)	Total Polys (Done in GIS)	% Polys Done*	Polys to Be Automated	Total Mapped (Paper Mapping)	Amount to Be Mapped	Data Source
17 Counties Parcel Automation Has "Not Started"							
Union	42,192	0	0.0%	42,192	25%	31,644	County
Independence	28,654	0	0.0%	28,654	0%	28,654	County
Ouachita	27,134	0	0.0%	27,134	0%	27,134	County

Hempstead	23,788	0	0.0%	23,788	0%	23,788	County
Phillips	22,208	0	0.0%	22,208	0%	22,208	County
Marion	19,819	0	0.0%	19,819	0%	19,819	County
Yell	18,846	0	0.0%	18,846	0%	18,846	County
Grant	15,280	0	0.0%	15,280	0%	15,280	County
Dallas	14,877	0	0.0%	14,877	0%	14,877	County
Bradley	14,391	0	0.0%	14,391	0%	14,391	County
Cleveland	12,794	0	0.0%	12,794	0%	12,794	County
Searcy	12,317	0	0.0%	12,317	0%	12,317	County
Lee	11,982	0	0.0%	11,982	0%	11,982	County
Prairie	11,386	0	0.0%	11,386	0%	11,386	County
Scott	11,044	0	0.0%	11,044	85%	1,657	County
Monroe	10,551	0	0.0%	10,551	0%	10,551	County
Woodruff	10,146	0	0.0%	10,146	0%	10,146	County
Totals	307,409	0	0.0%	307,409	6%	287,474	

GRAND TOTAL	2,129,170	1,143,264	53.7%	1,019,300	56.6%	924,351	
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Appendix 4

AGIO Announcement of 2010 Parcel Grant Awards

From: camper-bounces@eciolist.state.ar.us [mailto:camper-bounces@eciolist.state.ar.us] **On Behalf Of** Shelby Johnson
Sent: Thursday, February 18, 2010 1:07 PM
To: CAMP (camper@eciolist.state.ar.us)
Subject: [Camper] 2009 Arkansas Parcel Grant Awards

The Arkansas Geographic Information Office (AGIO), on behalf of the State Geographic Information Systems (GIS) Board, is pleased to announce awards for the 2009 Parcel Grant Program. Grants will be awarded as follows:

Jefferson County Assessor Office was awarded \$6,400 for a software upgrade to ArcEditor, training to streamline its polygon production workflow, and to conclude its mapping.

Polk County Assessor Office was awarded \$44,000 for a contract to complete parcel polygon mapping. The county leveraged matching contributions of over \$70,000 from the county, the City of Mena, SWEPCO, Rich Mountain Electric and Mena Water and Sewer.

White County Assessor Office was awarded \$10,000 for a contract to complete parcel polygon mapping. The county is matching the award with \$10,000 from its own budget.

Several Assessor Offices began digital mapping in 2003 through a joint effort promoted by the GIS Board, the Arkansas Assessment Coordination Department and the AGIO. By 2009, however, the counties had only been able to map 50 percent of the state. The State GIS Board recognized that without additional funding to accelerate development, the data may not be completed until after the year 2020. In response to this need the GIS Board developed the Parcel Grant Program for county assessors to close that gap and accelerate the completion of parcel polygon data statewide. The goal of the grant is to map as many counties as possible for the money provided.

The GIS Board originally announced it would provide \$60,000 for the program but adjusted the amount to \$60,400 for the three awards. In all a total of six counties applied, requesting over \$122,000 in funds. The GIS parcel data is used for a variety of projects.

Polk County said their data would be used in their daily operations and economic development, and that it would be an invaluable tool used in the upcoming Wickes and Van Cove School District Consolidation. Public education in Arkansas is largely funded by real estate taxes. Accurate parcel mapping supports the entire process and helps ensure revenues are collected in a fair and equitable manner.

White County explained that the driving force for their application has been the Fayetteville Shale Play. The GIS data will greatly aid in the assessment of mineral rights. The Assessor has received many calls from the Chamber of Commerce on

issues related directly to economic development. White County has added over 200 new businesses related to the Gas Play to their tax rolls just in the last couple of years. With this parcel layer, the county assessor's office will be able to better assist the Chamber in determining future sites for development.

Other counties competing for the award were Dallas, Lee and Marion whose applications were not awarded. The GIS Board does not plan to let other counties fall behind, however. GIS Board President Tracy Moy said, "During the 2009 stakeholder meetings held throughout the state, several counties identified parcel mapping as one of their greatest spatial data needs. The GIS Board will continue to seek additional funding sources and assist counties so that this important work can be completed more expeditiously." Ultimately the parcel data will be published on GeoStor the state's GIS data platform where it can be consumed and used for other purposes. A major example is the Arkansas Site Selection Center which aids the state in competing for economic development opportunities. Parcel data for this system is a key step to ensure Arkansas is in a competitive position.

Shelby D Johnson - Geographic Information Officer

Arkansas Geographic Information Office - Putting Arkansas on the Map

1 Capitol Mall

2nd Floor 2B 900

Little Rock, AR 72201

501.682.2767 Tel

501.682.6077 Fax

shelby.johnson@arkansas.gov Email

<http://www.gis.arkansas.gov> Web

<http://www.linkedin.com/in/shelbyjohnson>