

Texas GIS Stakeholder Coordination Meeting: Summary of Input

Introduction

On November 16, 2011 an initial stakeholder meeting was hosted in Austin and organized by the State Geographic Information Officer (GIO), a new responsibility held by the director of the Texas Natural Resources Information System (TNRIS). The GIO presented an overview of the new statute and a historical summary of GIS in Texas. The goal of this meeting was to communicate the new coordination framework authorized by the 82nd Legislature, solicit input to identify needs for geographic information technology and data resources across the state. This information will be used to advise state leadership on policy and funding needs for efficient and effective use of geographic information.

Participants identified issues, challenges and needs in the geospatial community. A variety of issues were presented:

- Data & project collaboration
- Data creation & maintenance
- Data stewardship
- Software licensing
- Resources and staffing
- Professional education
- Skilled professionals
- Software and I/T resources sharing
- Expertise transfer
- Shared funding

Invitations were sent to over 700 individuals at public agencies around the state. Attendance was approximately 10% and the following agencies were represented:

- Texas Department of Public Safety
 - Texas Department of Emergency Management
 - Texas Education Agency
 - Texas General Land Office
 - Commission on State Emergency Communications
 - Texas Department of Transportation
 - Office of the State Demographer
 - Texas State Soil and Water Conservation Board
 - Railroad Commission of Texas
 - Texas Department of Criminal Justice
 - Texas Commission on Environmental Quality
 - Texas Parks and Wildlife Department
 - Texas Historical Commission
 - Texas Department of Agriculture
 - Office of the Attorney General
 - Public Utility Commission of Texas
 - Texas Facilities Commission
 - Texas Comptroller of Public Accounts
 - Texas Department of Information Resources
 - University of Texas at Austin
 - Texas A&M University - CC
- Local/Regional
- Bexar Metro 9-1-1
 - Bexar County Appraisal District
 - Montgomery County Emergency Communication District
 - Travis County
 - Montgomery County
 - Nacogdoches County

- City of Austin COA
Homeland Security and
Emergency Management
- Austin Travis County
Health and Human
Services Department
- City of Midland
- City of Brownwood

- City of Harker Heights
- Deep East Texas Council
of Governments
- South Plains Association
of Governments
- West Texas Council of
Governments

- Central Texas Council of
Governments
- Houston-Galveston Area
Council of Governments
- Capitol Area Council of
Governments
- Austin Community
College

Meeting Summary

Meeting attendees were asked to prepare and contribute answers to a list of questions provided ahead of the meeting.

Representatives from each agency were called upon to deliver their thoughts, ideas, comments, or questions. Participants were well prepared as each agency called upon contributed their issues and concerns to the entire group. All responses were captured during the meeting and then categorized, analyzed and ranked on frequency of feedback by TNRI staff after the meeting. This summary categorizes common themes derived from the responses (Appendix 1. Summary of Responses).

Roll Call of Agencies

Category 1 – Data

- **Project Collaboration**
Project collaboration for the collection of statewide datasets to reduce individual costs and recruitment of non-traditional contributing agencies was the sentiment of several agencies. For example, Two large agencies found that their two separate land cover mapping efforts could have realized reduced costs through shared data sources and alterations to their approach. Priority datasets identified were aerial imagery, transportation, parcel boundaries, address points, city boundaries, geodetic control, and elevation information. Suggestions for data sharing were also made to help defray the cost of single agency purchases.
- **Crowd Sourcing**
Concern is growing in areas of crowd sourced editing and the uncertainty of what checks and balances exist or don't exist with openly edited data. Loss of locational and attribute accuracy is a risk when revisions are not thoroughly reviewed by qualified professionals. Crowd sourced data editing might be an economical alternative or contributor to feature data maintenance such as transportation, address points, and hydrography (surface water features). Public agencies that produce geospatial information are interested in collaborating with commercial producers of geospatial data to share updates via the web to help efficiently correct for anomalies and misrepresentations in the data.
- **Data Standards**
Standardization of data to ensure that all data collected by public entities could be easily shared into a statewide database. Data standards also help to produce the best data that would appeal to many different users of the data.

Category 2 – Funding

- **Data Storage Cost**
The rising cost of data storage is of concern to agencies with large volumes of GIS data. GIS data can measure well into the terabyte level. The current policy on state data centralization is straining on agency GIS budgets and some suggest exemption of GIS data from centralized storage to reduce agency costs. Pooled funding for a centralized repository that can serve as a one-stop shop for data retrieval and sharing was also mentioned as a possible solution.
- **Data Software Cost**
The high cost of GIS software is a major concern, especially to small governments and government

agencies unable to afford even one license to analyze data. Suggestions were given for enterprise software licenses that could be shared across agencies and promoting open-source software to help reduce the cost of having a full GIS in their agencies.

- **Funding Sources**

Dedicated funds for consistent refresh of statewide imagery would be beneficial to multiple levels of government agencies. Imagery is an important baseline dataset that can be used for a variety of applications such as identification of change in land patterns and recognition of new features on the ground. These practices further enhance, update or create a wide variety of GIS data layers.

- **Data Collection and Maintenance**

In addition to sustained funding for imagery acquisition, funding for data collection and maintenance should be a line item in the state budget for priority geospatial datasets. The most common datasets requested for statewide collection and maintenance are imagery, transportation, address points, elevation (lidar), utility features, and parcel boundaries.

Category 3 – Collaboration

- **Data Sharing**

Sharing of data across agencies is perceived as a underdeveloped capacity due to lack of awareness and resources, liability concerns, and concern for protection of sensitive data. Suggestions were made for statewide access to a one-stop data inventory portal, interagency agreements for data coordination of sharing, and generalizing shared data to protect citizens' privacy. Map services hosted by agencies responsible for specific datasets could be an effective sharing tool to help reduce the need for individual data downloads and storage costs due to localized storage of data.

- **Enterprise Licensing**

Enterprise organization for improved coordination to share costs associated with software licensing, data licensing, and data storage.

- **Knowledge Exchange**

The inability to hire or keep experienced staff is a big challenge for all agency levels. Identifying and sharing of staff to exchange knowledge and expertise with those who lack resources.

Category 4 – Technology and Enterprise GIS

- **Statewide Project Tracking**

A desire for web-based project awareness and project tracking tools were commonly mentioned. Current advances in web-based mapping technology gives the Texas GIS community the opportunity to work together to solve many of the issues mentioned by the stakeholders regarding project collaboration opportunities and awareness of existing or pending geospatial data.

- **Sharing, Centralization and Enterprise GIS**

Using commercial cloud services to store, manage, and access geospatial data from any location is a desired solution to sharing, centralization, and enterprise GIS. Management and storage of geospatial data in the cloud would reduce redundancy by eliminating individual agency servers. This solution would require an exemption of GIS from the statewide Department of Information Resources (DIR) Data Center Services contract.

- **GIS Software Costs**

Software sharing between agencies, inclusion of more options on the DIR contract, and discovery of

open source software are requested as a solution to the current high cost of popular GIS software licenses. Budgets for GIS are lower than in years prior, causing agencies to seek alternative solutions for GIS software. Suggestions and consensus for what options are available as an alternative are desirable.

- **Secure Data**

Cyber-security was mentioned as a concern for sensitive data. Protocols should exist for sharing and distribution of sensitive geospatial information.

Category 5 – Ethics

- **Ethics Education**

Issues surrounding data integrity and responsibility were raised in response to data requests made by the general public. It is the responsibility of data collectors to make users aware of the limitations of the data as it exists. Education on ethics should be developed for GIS professional.

- **Confidentiality Guidelines/Rules**

Protection of confidential and critical information is not mandated and loosely practiced. Rules should exist along with agreements that indicate how information can be shared. This applies to public and private data providers.

- **Data Security**

Where does the responsibility for enforcement of data security reside? Standards and policies should be implemented for ensuring data security.

Category 6 – Contracts and Purchasing

- **Contracts**

Encourage shared purchases or shared data maintenance through interagency agreements to help reduce individual costs for geospatial data. One example is to share the cost of ESRI licenses across agencies and include smaller local governments that cannot afford the cost of even a single license.

- **Interagency Agreements**

Create standard interagency agreements across all levels of government for data sharing and integration. Many agencies create and manage their own datasets. These datasets can be shared and assembled to cover larger areas or satisfy statewide coverage for Texas.

Category 7 – Policies

- **Emergency Policies**

Many agencies have emergency management and emergency response protocols that involve the use of geospatial information. Policies for readily available and accessible geospatial data should be in place to efficiently and effectively perform the duties required during an emergency situation.

- **Standards**

Policies that require adherence to adopted data standards should be investigated. The use of standards creates better opportunity to share and integrate data.

- **Critical and Confidential Data**

Policy for the protection of critical and confidential data should exist not to create a barrier to sharing data but to establish public trust. Handling of confidential data is the responsibility of the user and should be regulated through policy.

Category 8 – Outreach and Marketing

- **Statewide Project Tracking**
Recognition of similar work, data needs, and projects is critical to eliminating duplication and unnecessary spending. Participants would like to see a project tracking tool that would allow them to find or display a location of interest for new data collection.
- **Education**
Organize to educate public administrators on the value of GIS and continue to request and secure sustained funding for GIS operations within state government.
- **Project Participation**
Seek new recruits for project participation. Find agencies that do not traditionally participate and market the value of quality geospatial data obtained through collaborative collection projects.
- **Ethics Education**
Educate GIS professionals and the public on ethics as it relates to distribution, collection, and analysis.
- **Communicate Costs and Savings**
Educate public about the costs of geospatial data acquisition and the importance of project collaboration. Show the public savings realized by each participating entity.

Category 9 – Education

- **Licensing**
Determine the need for state licensing of GIS professionals. Is it necessary and will it increase the quality of work performed?
- **GIS Certification**
Education and certification of GIS professionals should follow the guidelines published by the Texas Skills Standards Board.
- **Educate Elected Officials**
Develop educational materials, workshops, or other media to educate elected officials and agency administrators on the realized value of GIS.
- **Knowledge Sharing**
Knowledge transfer can occur when staff resources are shared. Agencies with experience should assist others in building their GIS or applications to benefit everyone.

Immediately following the Roll Call, four breakout sessions were offered; participants attended two of the four to share their thoughts and opinions on key topics:

Texas Framework Data

Technology Coordination & Leadership

Data Management Coordination

Leadership & Coordination

Breakout Session Summaries

Texas Framework Data

Question 1: *Would your agency be willing to assume a data stewardship role?*

- Stewardship responsibilities are informally assumed where datasets are already managed by a single agency. Texas Parks and Wildlife Department is managing park boundaries that fall within the state boundary as well as vegetation/ecological systems. The Commission on State Emergency Communications showed interest in being the steward for road centerlines, address points, 9-1-1 and emergency response boundaries for fire, law enforcement, and EMS. Maintenance and responsibility for a local or regional dataset is already managed at the local and regional level. Locals acknowledged that they would only be interested in managing data within their jurisdictional boundaries.
- Shared stewardship of datasets between agencies that develop the same type of data is suggested. Roads are developed by two different entities, the Texas Department of Transportation and 9-1-1. Sharing responsibility for a dataset would require compromise and agreement of the shared dataset.

Question 2: *What should the minimum standards include for accuracy? Refresh cycles?*

- Refresh cycles of geospatial data will vary with type. Imagery collection on an annual basis is desired every year while data such as vegetation cover could be covered every five to ten years. Data should be collected during abnormal conditions, such as drought, to record and better understand how to prepare for future impacts of major environmental events.
- For data such as vegetation cover, crowdsourcing with expert contributors would allow for near real-time data updates which would eliminate the need for overall periodic data refresh for a statewide

dataset. Data capture during disaster response and recovery or in response to dramatic conditions such as drought is also a desired refresh time.

- Data accuracy should be determined based on dataset, use, and cost. Geocoding accuracy is a concern for the Texas Department of Emergency Management (TDEM). As a result, TDEM is developing standards to help improve geocoding hit rates. Accuracy should be clearly defined for each dataset so the user understands the limitations and how and for what use the data were developed.

Question 3: What are the most important framework layers?

- All current Framework layers produced by the Texas Strategic Mapping Program (StratMap) should remain on the priority list – imagery, Elevation, Transportation, Political Boundaries, Hydrography (NHD), and Soils. Additional priority framework layers suggested by participants are:
 - Address points
 - Floodplain boundaries
 - Parcels
 - Bridges
 - Building footprints
 - Vegetation/land cover
 - Taxing districts
 - Zip codes
 - Legislative districts
 - Area codes

Question 4: What other layers should be considered part of the framework layers?

- Most notably mentioned are parcels and address points. These data layers are the most requested statewide data layers for emergency management. Other data layers requested for consideration as a framework layer are:
 - Postal boundaries
 - Points of interest/landmarks
 - County commissioners
 - School districts
 - Water, oil, gas wells
 - Geodetic control
 - Hospitals

Technology Coordination & Leadership

Question 1: Should the state pursue an enterprise approach to GIS?

- Collaboration on open source resources for GIS tools and applications is a desire for a more shared and economical approach. The ability to provide feedback and direct comments on geospatial data and GIS applications should exist. Using enterprise GIS to share resources across agencies is an attractive approach to minimizing disparate GIS systems.

Question 2: Do you think an online collaborative site is a good idea?

- Unanimously this question received positive nods for collaboration. Several responses were given for the types of collaboration that should occur such as a shared online catalog driven by details in metadata, direct access to data rated through evaluation, and update notifications. Direct access to data downloads and to a data catalog is desired through an online collaboration site where contributors can update their information as updates occur.

Question 3: What are the most important technology needs for GIS in the state?

- An automatic notification system or push notifications to alert data consumers when new data are available.
- A statewide programming team comprised of experienced application developers for supporting agencies lacking resources to build mapping applications.
- Distribution standards in data formats or an open-source tool that would easily convert file formats.

Leadership & Coordination

Question 1: What coordination activities do you think need to be adopted to ensure effective collaboration and awareness of GIS issues?

- A lack of hierarchy for coordination among agencies with interest and investment in GIS. Awareness of efforts, causes, and needs across agencies is crucial for the advancement of change in GIS technology.
- Creation of a task force to share personnel and technology knowledge across agencies.
- Coordination of licensed software purchases.
- Adoption of a guidance document for a universal coordinate system to include options for best uses for recommended coordinate systems.

Question 2: What are the tradeoffs for having a single agency responsible for coordination?

- This question did not solicit much response or negative response. The tradeoff is that one agency could leverage its position to observe the current climate of GIS in Texas through survey.
- The challenge is making sure the single agency maintains awareness and notification of GIS projects in Texas.

Question 3: Are there any existing barriers to inter-agency collaboration/coordination?

- There is a need for collaboration to ensure a funding mechanism across agencies. The High Priority Imagery and Datasets contract is a vehicle for the purchase of geospatial data that allows for multiple agency participation in data collection projects.
- Funding for full-time GIS staff presents a barrier for interagency collaboration if resources to share ideas and technology advancement do not exist. Demand for GIS capabilities is high, yet there are no funds to obtain or sustain staff. Internship programs could provide staff support if developed for multi-agency use.
- Establishing a vision and guidance for the needs of GIS would help with agency coordination and collaboration.

Question 4: Are there opportunities for shared web resources that are joint-funded by multiple agencies?

- A multi-agency collaborative platform created and managed through interagency agreements would be ideal for sharing and providing access to data.
- Recommended standards, guidelines, and specifications should be published as a basis for the state. This includes recommendations for GIS software and hardware.
- Adopt a model or statewide memorandum of understanding (MOU) for sharing data, software, and hardware. Develop a treaty between agencies to target activities during specific missions or events.
- Develop a tracking system to monitor the demand for enterprise license agreements, assuming the cost will go down as participants increase.

Data Management Coordination

Question 1: What datasets are in most need of a formal custodian?

- Any dataset that is “official” or sensitive requires a custodian. Specific datasets mentioned are:
 - Parcels
 - Streets
 - Imagery
 - Address points
 - Political boundaries
 - Utility infrastructure
 - Wells
 - Zip codes
 - County boundaries
 - Public facilities
- Are there datasets that do not need a custodian?

Question 2: Do you believe it is necessary or valuable to establish custodians for data?

- Data custodians need to exist for all data that are dynamic. The data custodian would ideally be the expert producer of the data or that is legislatively mandated to produce the data.
- In the case where the agency does not have GIS capabilities, another agency should step in as custodian.
- Establishing a custodian for data would prevent the stove pipe effect of not knowing which dataset is the “official” data for the state.
- Custodians should not be established but rather criteria should be set for data appearing on a “centralized” site.

Question 3: What are the primary barriers to local data aggregation?

- The primary barriers suggested are:
 - Funding
 - Availability of data
 - Differences in accuracy
 - Differences in standards
 - Staff resources
 - Cultural attitudes
 - Lack of statewide standards
 - Privacy policies
 - Jurisdictional boundaries
 - Completeness of data
 - Lack of awareness

Question 4: Do you believe multi-agency/enterprise funding can work?

- Yes, if we build a system for all agencies to build into services and share data costs. This approach will work if the funding is well organized and will benefit agency legislative responsibilities. Funding contributions are an issue when not everyone participates equally. Multi-agency funding mechanisms would require formal interagency agreements.
- What options exist to create a multi-agency enterprise? It would require financing and subject matter experts on funding options.
- Some agencies may have difficulty paying into a fund without a clearly defined project. It can work but a consistent product must be the goal.
- If a centralized statewide data warehouse is created, it should be funded separately. If funding came from multiple agencies, each agency would be tempted to cut its contribution in economic times such as these.

Question 5: What is your preferred method of data access?

- Suggested methods are:
 - **Web services**
 - Must have high availability, especially during major events
 - Needs the ability to extract the data
 - Access should be easy
 - Push notifications should be established when data updates occur
 - Ideal for base map data and imagery services
 - Shared among agencies
 - **Locally stored**
 - For quick and uninterrupted access
 - For large datasets
 - For unit of analysis data
 - For emergency situations
 - **FTP download**
 - For access to data as needed
 - Secondary distribution

Summary Table of Issues captured at the November 2011 Stakeholder Meeting

Table 1 (attached) was created by taking each of the documented comments and assigning it to one or more categories. Some of these were explicitly assigned based on the context of the comment during the roll-call session or during the breakout sessions. After assigning the issues to categories, each category was summed to indicate which category had the most discussion. Similarly, each issue was summed across categories to provide insight into how broadly the issue relates to the general discussion. These were then sorted to feature the most frequently mentioned issues to the top of the list and to sort the categories from left to right to indicate which topic had the most relevance to the issues.

This is a draft product and stakeholders are asked to review these results and offer suggestions to clarify, or refine the existing summary. New comments and ideas are welcome.

These results are being further assessed to establish actions for further consideration and input from the stakeholders. In addition, additional meetings are being scheduled across Texas to solicit input from other participants in the public sector GIS community.

Table 1.

Summary of Issues Raised - Ranked by Category and Frequency Mentioned	Data	Funding	Collaboration	Technology/Enterprise GIS	Ethics/Security	Contracts/Purchasing	Policies	PR/Outreach	Education	# of Categories Covered
Interagency data sharing	1	1	1	1	1	1		1		7
Providing appropriate data to the right people	1	1		1	1	1	1			6
Need utility boundary files	1	1	1		1	1				5
Better socioeconomic data needed	1	1	1		1					4
Statewide access to data	1		1	1		1				4
One stop shop for data	1		1	1		1				4
Map services	1		1	1		1				4
Earmark funding for collaborative imagery acquisition	1	1	1			1				4
Recognize similar projects to collaborate		1	1			1		1		4
Data location and storage - e.g. historical imagery	1		1	1				1		4
Data Partnerships	1	1	1			1				4
Plans for cascading events related to emergency response	1	1					1		1	4
Data interdependencies for disasters	1	1					1		1	4
Protection of confidential, critical data	1			1	1		1			4
Similar projects		1	1			1		1		4
Continue to secure funding		1	1			1		1		4
Less staffing more work		1	1						1	3
Public expectations of higher data standards	1					1		1		3
Routine update of city boundaries	1	1	1							3
Refresh of aerial photography is important	1	1	1							3
Local organizations need mapping assistance		1	1					1		3
Web-based project awareness tool			1	1						3
Cloud services - tools etc.		1		1		1				3
Consistent refresh cycle for leaf on/off imagery	1	1	1							3
Standardized QA/QC	1						1	1		3
Management of GIS Data Volume	1	1		1						3
Sharing staff from other agencies to solve problems			1				1		1	3
Recruit new funding sources		1	1					1		3
Questions of confidentiality with private firms/data	1				1		1			3
Cost of Esri licensing		1		1		1				3
Open source software		1	1	1						3
Data provided to public - retract, accuracy	1				1		1			3
Data storage and accessibility	1	1		1						3
Availability of software - sharing		1		1		1				3
Cloud storage as cost saving measure		1		1						2
Services offered to public to meet needs		1		1						2
GIS vs. IT perspectives			1	1						2
Local support to aid state effort			1				1			2
Purchase GIS hardware		1		1						2
Statewide exemption of GIS from DCS		1		1						2
More elevation data needed	1	1								2
Desire for enterprise organization			1	1						2
Need housing unit data	1				1					2
Cost of Software/Enterprise Benefits?		1				1				2
Need for Address Points and Data Standards	1						1			2

Table 1.

Who's responsible for data security					1		1		2
Data security	1				1				2
Data security	1				1				2
Educate public about costs of data acquisition							1	1	2
Cyber security				1	1				2
Facility location accuracy	1						1		2
Authoritative city limits	1		1						2
Concerned about data captured by public - standards needed (crowd sou	1			1					2
Educate GIS professionals and public on ethics					1		1		2
Annual funding for imagery		1							1
Staffing RIF		1							1
Software Sharing between agencies				1					1
Software Statewide contract via DIR				1					1
Policy ethics regarding distribution of data					1				1
Sensitivity to public perception of data security					1				1
Informing public that GIS community operates with high ethical standards					1				1
Education of Elected Officials								1	1
State Skills Standards Board								1	1
Collaboration of data changes and updates thru all levels of govt			1						1
Accuracy of data	1								1
Time related demographics	1								1
Working with private companies to assure data accuracy	1								1
Annual funding for imagery	1								1
Standardized Addressing	1								1
Crowd sourced solution for data updating	1								1
Data Universal Standards Needed	1								1
Authorized data sets needed	1								1
Development of a data mangement catalogue	1								1
Geodetic Control of High Resolution Data (Lidar/Elevation)	1								1
Build change into processes (ie. Geodetic Control evolution)							1		1
Coordinated data sharing			1						1
GIS Admin rule up for review							1		1
State licensing of GIS professionals								1	1
Credibility of GIS internally							1		1
More options for GIS education needed								1	1
Utilize GIS savvy of new graduates								1	1
Keeping Developers		1							1
Hyperdata such as swings and parks	1								1
Transient population data (day/night migration)	1								1
Parcel data accuracy	1								1
Educating elected officials							1		1
GIS professionals should recognize public perception of power					1				1
Mobile population is difficult to map	1								1
TX skills standards board (certification)								1	1
Issues per Category	44	33	27	24	17	16	14	13	11