State of Kansas

Geographic Information Systems Strategic Plan

May, 2008

Table of Contents

Executive Summary

What was done?

During the past year (i.e. May 2007 – May 2008), Kansas conducted a thorough, statewide GIS strategic planning process. This process was overseen by the Kansas GIS Policy Board and was supervised by State GIS Coordinator in the Kansas Information Technology Office (KITO). This work was funded by a United States Geological Survey (USGS), Federal Geographic Data Committee (FGDC), Cooperative Assistance Program (CAP) grant. The project proceeded through three phases:

1. **Information Gathering**: That involved conducting two GIS stakeholder workshops in Topeka and Salina that collected direct stakeholder input on strengths and weaknesses and the priorities for improvement. In addition, several smaller focus group sessions and one-on-one interviews with key stakeholders were conducted.

2. **Synthesis and Strategizing**: Involving deliberations with the GIS Policy Board, Strategic Plan Steering Committee aimed at properly characterizing the geospatial landscape in Kansas and identifying recommendations for making improvements.

3. **Plan Authoring and Approval**: Creating this document and conducting a consensus building process on the findings and recommendations with Kansas geospatial stakeholders.

What was found?

The following synopsizes major observations uncovered during the information gathering process:

- Kansas state government has strong and mature geospatial operations at several state agencies.

- Kansas maintains an effective and innovative geospatial data clearinghouse through the Data Access and Support Center (DASC) located within the Kansas Geological Survey in Lawrence.

- There is significant and increasing GIS activity at the county and local levels of government.

- While many large counties have benefited from GIS, there remain significant challenges for smaller counties that wish to capitalize on this technology.

- There has been a significant lack of sustainable funding for geospatial programs that has hindered geospatial infrastructure and data development. While overall GIS activity and demand in both Kansas and the nation has increased dramatically, there has been level funding since FY1991 for state GIS data development, and the staffing for GIS coordination has been reduced from 2.5 FTE to 1 FTE.

- There are significant data gaps and requirements for data quality improvements. In particular:
    - High-resolution elevation data are not available

o   While a great deal of parcel data exists, it is not of uniform quality and availability

o   There is not a regularly recurring aerial imagery program

What is recommended:

The following Vision Statement represents the overall direction that Kansas geospatial programs should pursue:

The Kansas Geographic Information System Partnership initiative will be a collaborative effort among the statewide geospatial community that delivers robust, map-based, geospatial information and services to support policy and decision making at all levels of government, to provide access to public information and to enhance the safety, economy, environment and quality of life in Kansas.

In order to realize this vision, this plan recommend pursuing the following programmatic goals:

1. Pursue the development of **statewide high-resolution elevation data**:
   a. Capable of supporting high-resolution contours (i.e. 2 foot interval, or better)
   b. To support flood zone identification and other planning and public safety applications

2. Develop a long-term, **sustainable funding strategy:**
   a. To address staffing decreases and the loss of GIS purchasing power caused by fifteen years of level funding
   b. To support important new initiatives at a time when the use of geospatial technology is expanding greatly in government, the private sector and with the general public.

3. Develop and expand **technical assistance and outreach programs to support county and local government GIS** development efforts:
   a. To ensure that smaller counties are not left behind

4. Formally pursue a program to develop a **statewide parcel data layer** including outreach and coordination with the Kansas Department of Revenue (KDOR)

5. Complete existing efforts by DASC to **improve statewide data for addresses, road centerlines and tax units**:
   a. To ensure timely completion of these initiatives as well as providing for long term maintenance of these dynamic data sets.

6. Develop a long-term, sustainable strategy for the regular development of **high-resolution aerial orthoimagery**.
   a. To give users of these data a reliable schedule for updates and to maximize the state's ability to participate in collaborative funding with the Federal government.

7. Develop a coordinated approach of **statewide critical infrastructure mapping**:
   a. To ensure that these important data are created in a consistent, high-quality fashion and that they are available on a statewide basis to support a variety of emergency response and preparedness activities.

1 Introduction

Kansas has been heavily involved with Geographic Information Systems (GIS) since the 1980's and began formal coordination of its GIS programs with the formation of the GIS Policy Board via gubernatorial Executive Order in 1989. Since that time, GIS been deployed routinely within state government and increasingly at the county and municipal government levels. While there has been great progress since the 1980's, this Strategic Plan documents several existing shortcomings and identifies many opportunities for improvement.

The terrible natural disasters that Kansas experienced in 2007 illustrate both the importance of GIS in emergency preparedness and response as well as some of the limits of the existing Kansas GIS infrastructure. Indeed, while the state's geospatial infrastructure was called on heavily during the response to these emergencies, the types of recommendations that are called for in this plan would have resulted in both improved preparedness and response. At the same time, these geospatial improvements would provide benefits to a wide variety non-emergency programs such as transportation, environment, economic development and alternative energy. While there were many other natural disasters from blizzards to ice storms and other serious flooding and tornado events, the two examples below illustrate how improved geospatial management could have aided pre-event preparedness, emergency response and the recovery effort:

First, during May 2007 the entire town of Greensburg was obliterated by an EF5 tornado that killed 10 Kansans. The destruction was so severe that the pre-existing geography, including streets, signs, and structures were virtually unrecognizable after the storm. As the Kiowa County seat, the county's GIS system was also destroyed during the storm. Search and rescue efforts depended on locating former addresses quickly, however, there were no readily available backups of the county's GIS parcel data on the state's GIS warehouse or elsewhere in the county. Without detailed parcel maps, volunteers from the Kansas Association of Mappers (KAM) immediately supplied emergency personnel with GIS produced maps made with street centerline data and approximate address locations from the U.S. Census Bureau. Eventually, mylar tax maps were located and re-automated and then linked to addresses supplied by Kansas Gas Services. GIS-based damage assessment and inventory continued well after the storm. Even though GIS technology was deployed and was instrumental to helping the response, the existence of the types of data management challenges that are addressed in this plan hindered the ability of the state to most effectively deploy the technology when every minute mattered.

Second, during the June-July 2007 timeframe there was severe flooding in southeastern Kansas. Under emergency conditions, a Declaration of Disaster determines the availability of emergency funding. For flood events such a declaration is dependent on identifying property that is impacted by the flood. GIS technology was engaged to support the Declaration of Disaster by comparing the flood extent to parcel maps maintained by the impacted counties. Due to the unavailability of statewide GIS parcel data this was a laborious and time consuming task even though much of the parcel data already existed in electronic format. Based on these data assembly challenges, GIS staff

from the Adjutant General's office estimated that the declaration could have been made up to 2 weeks earlier if all county parcel data was on-hand prior to event. In addition, the types of elevation data improvements that are recommended in this plan would result in more accurate flood zone delineations which would have helped in flood preparedness and response efforts.

The remainder of this plan will outline the current status – both strengths and weaknesses - of geospatial technology in Kansas as a prelude to presenting a slate of recommended projects and programs that will help move the state forward.

2 Strategic Planning Methodology

This Strategic Plan provides an update to the existing 1997 Kansas GIS Strategic Plan while aiming to account for:

- Significant technology and data advancements

- Alignment with the Federal government's National Spatial Data Infrastructure (NSDI) initiative which may provide some funding support to states

- Alignment with the vision elaborated in the new Kansas Strategic Information Management Plan 2008-2013 (SIM PLAN) particularly with regard to developing and fostering:
    o Improved **information sharing**
    o Enhanced multi-agency, intergovernmental and public-private **collaboration**, and
    o Effective **governance and leadership**

This project was funded through a United States Geological Survey (USGS) and Federal Geographic Data Committee (FGDC) Cooperative Agreement Program (CAP) grant as part of the Fifty State's Initiative.

- The Fifty States Initiative is aimed at fostering the development of the NSDI

Project oversight was provided by:

- The Kansas GIS Policy Board

- Strategic Plan Steering Committee, with representatives from:
    o Kansas Information Technology Office (KITO)
    o Data Access and Support Center (DASC)
    o United States Geological Survey (USGS)
    o Natural Resources Conservation Service (NRCS)
    o Kansas Department of Transportation (KDOT)
    o Kansas Water Office (KWO)
    o Douglas County

The strategic planning process was designed to be inclusive and transparent and to include the perspective of as many Kansas GIS stakeholders as possible. The process consisted of:

- Kickoff meetings to obtain direction from GIS Policy Board and the Strategic Plan Steering Committee
- Conducting two public GIS Stakeholder Information Gathering sessions:
    - Topeka, July 11, 2007: **24 attendees**
    - Salina, September 19, 2007: **33 attendees**

The Information Gathering Session participants represented a wide variety of professional sectors illustrated by the chart below. The complete list of organizations that attended the sessions can be found in Appendix 1.

**GIS Information Gathering Sessions
Attendance by Sector**

- Fed Gov't, 5, 9%
- Academia, 3, 5%
- State Gov't, 14, 25%
- County Gov't, 22, 38%
- Non-Profit, 1, 2%
- Local Gov't, 3, 5%
- For Profit, 9, 16%
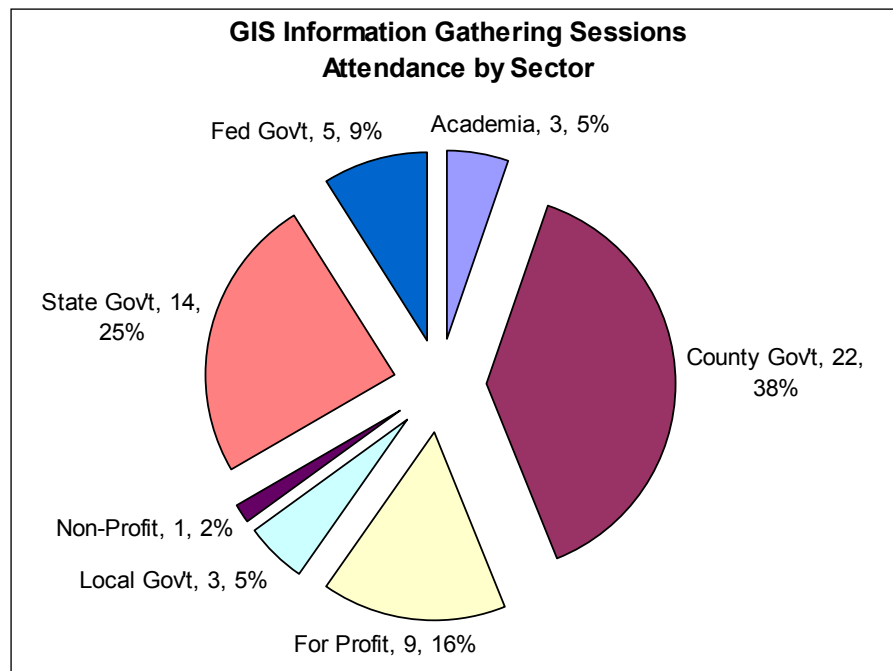
- Conducting topic-based meetings, workshops and interviews, including
    - Health and Environment, Water
    - Transportation, Revenue, Secretary of State
    - DASC/Geological Survey, Biological Survey
    - GIS Governance and Long-Range Funding
    - Information Technology
    - DASC/Academia
    - Executive Chief Information Technology Officer (CITO)
    - Legislative Chief Information Officer (CIO)
    - DASC/Emergency Management
- Following the information gathering workshops and interviews preliminary findings and recommendations were developed and considered by the GIS

Strategic Planning Steering Committee. These findings and recommendations were iteratively refined and tuned to develop consensus around the vision and approach to making geospatial infrastructure improvements in Kansas.

- Once the findings and recommendations were agreed to, this plan was authored with oversight from the Strategic Planning Steering Committee.

3 Current Situation

3.1 Who is the Kansas GIS Stakeholder Community?

The Kansas GIS community is comprised of a broad array of Kansas GIS stakeholders in state, federal, county, and municipal governments, academic institutions, and private sector organizations.

State Government:
- Overall GIS Coordination via Kansas Information Technology Office (KITO) within the Dept. of Administration's, Division of Information Systems and Communication (DISC).

- GIS data clearinghouse operations via Data Access and Support Center (DASC) located at the University of Kansas in Lawrence.

- Strong departmental programs

    o Kansas Department of Transportation (KDOT)
    o Kansas Department of Health and Environment (KDHE)
    o Kansas Geologic Survey (KGS)
    o Kansas Biological Survey (KBS)
    o Kansas Department of Agriculture (KDA)
    o Kansas Water Office (KWO)
    o Kansas Corporation Commission (KCC)
    o Kansas Adjutant General's Department

Federal Government
- United States Geologic Survey (USGS)

- United States Department of Agriculture (USDA)
    o Natural Resources Conservation Service (NRCS)
    o Farm Service Agency (FSA)

- United States Department of Homeland Security (USDHS)
    o Federal Emergency Management Agency (FEMA)

County and Local Governments
Currently there is broad GIS adoption in larger communities and counties and increasing activity in smaller jurisdictions. Parcel (cadastral) data is one key indicator of municipal GIS implementation. As the following 2007 figures from the Kansas Department of Revenue illustrate, there is significant GIS penetration at the county level. The eastern half of Kansas has the most consistent use of GIS technology for parcel mapping and

more complete parcel coverage relative to the western half. All but two counties without GIS in the eastern half of Kansas are planning to use GIS, whereas the planning activities in the western half of the state are less prolific and widespread.
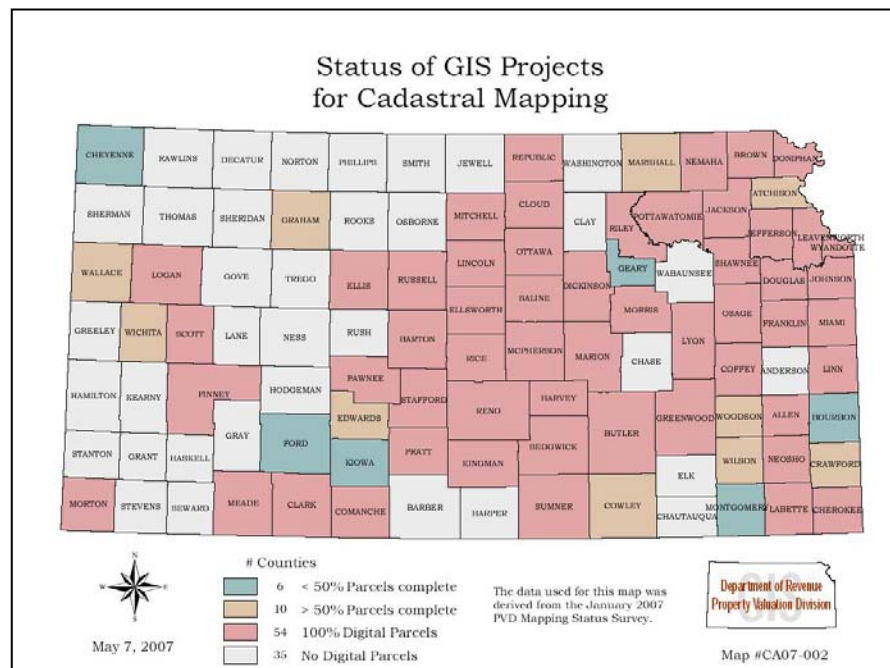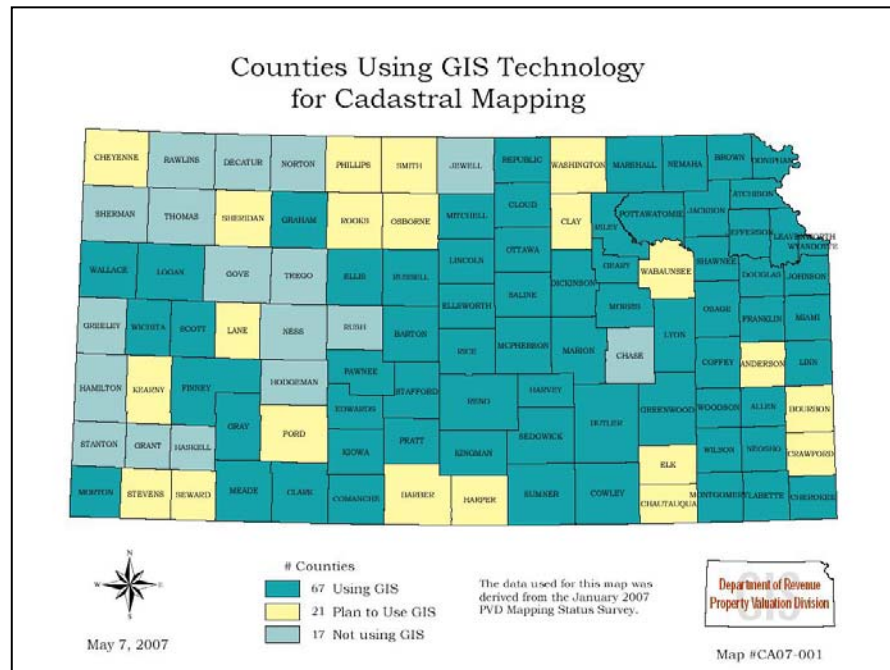
Academic Community
Significant GIS programs exist in several Kansas academic institutions, including:
- University of Kansas
- Kansas State University

- Fort Hays State University
- Emporia State University
- Pittsburg State University

Private Sector
There is extensive private sector use of GIS in Kansas. This use is concentrated in two areas:

- Local **GIS service providers** who provide support services to counties and other government entities

- Private **Utilities** who use the technology for their own asset management and planning applications

3.2 Current GIS Development Status

3.2.1 Overview of GIS Governance in Kansas

GIS Policy Board

The GIS Policy Board was established in 1989 by Governor's Executive Order. The objectives of the order were to coordinate the implementation and use of GIS technology by participating agencies; provide an opportunity for prompt access to GIS technology by all participating agencies and other potential users; promote compatibility and standards for geographic information; promote sharing of computerized, geographically referenced data; reduce the costs that would be involved if each agency developed its own GIS capabilities independently; and to enhance the information analysis and decision making process of participating agencies through the use of GIS technology.

In 2000 and again in 2006 the incumbent Governors issued Executive Orders to reinforce the composition of the GIS Policy Board and clarify appointees' terms of service. Currently the Board is comprised of 37 appointees from state government, local government, federal government, academia, and private organizations. The GIS Policy Board is supported by the GIS Technical Advisory Group and governs oversight of the Data Access and Support Center (DASC) which acts as the state's GIS data clearinghouse.

GIS Director

The GIS Director position was established in 1989. Historically, the GIS Director position was in the Water Office and was supported by the Kansas Water Plan Fund. In 1999, the position was migrated to the Kansas Information Technology Office (KITO) within the Dept. of Administration's, Div. of Information Systems and Communications (DISC). DISC is responsible for the overall information technology (IT) infrastructure of the state and KITO is a bureau within that division. The position is now supported with overhead operating expenses.

Data Access & Support Center

The Kansas GIS Policy Board established the Kansas Data Access and Support Center (DASC) in 1991 as the State GIS Clearinghouse. The DASC is physically located at the Kansas Geologic Survey (KGS) at the University of Kansas in Lawrence, but operates under the direction of the Kansas GIS Director who is situated in the Kansas Division of Information Systems and Communications (DISC), and the GIS Policy Board. The annual budget provided by DISC provides for 3.5 FTE. Additional staffing resources are variable and depend on the availability of grant or specific project funds.

DASC provides GIS services to support the full Kansas GIS community, which includes the public, state agencies, local government, academic and non-profit institutions. These services include:

- GIS data support
    - Geodatabase development
    - Archive and distribution
    - Quality assurance/quality control (QA/QC)

- General GIS technical assistance

- Geospatial metadata development assistance;

- GIS and web hosting:
    - Data hosting
    - Free data downloads via file and web services
    - Web application development and hosting

- Cartographic services

DASC also participates in coordination, education, and outreach activities to promote geospatial technology in Kansas and over the past two years there has been a significant increase in the demand for these types of services.

DASC relies on baseline annual funding supplied by DISC. This program has been level funded for the last 5 years at $246,316. DASC receives additional operational support from KGS (i.e., access to office space, KGS vehicles, telecommunications, and IT infrastructure), and various fee-for-service activities. Overall, the DASC operational costs during FY07 are estimated to exceed $350,000.

Kansas Water Plan Fund

The Kansas Water Office is the State's water planning agency. In concert with the Kansas Water Authority, a 24-member group of representatives from various water-use interest groups, the Kansas Water Office formulates and develops the Kansas Water Plan.

The State Water Plan Fund was created in 1989 by the Legislature for the purpose of implementing water-related projects or programs and related technical assistance. Expenditures from the State Water Plan Fund are made based on the priorities articulated in the State Water Plan.

The Kansas Water Plan has historically supported three facets of the Kansas Geographic Information Systems (GIS) Initiative:

1. The Board sponsored statewide database development projects

2. Fiscal support of the Data Access and Support Center (DASC) until this funding was migrated to DISC.

3. Fiscal support for the office of the State GIS Director until the position was migrated to DISC in 1999.

With Water Authority approval, the Kansas Water Office has appropriated approximately $250,000 of departmental budget funding every year since FY1991 for GIS data development; in general the GIS Policy Board sets priorities for how this money is spent.

3.2.2 GIS Development Relative to "Successful GIS Program" Criteria

The following table presents the current Kansas GIS status with respect to the National States Geographic Information Council's (NSGIC) 9 Criteria for a Successful Statewide GIS program:

Criterion	Status	Status Description
1. A full-time, **paid coordinator** position is designated and has the authority to implement the state's business and strategic plans.	**MEETS**	Paid GIS Director within KITO is responsible for GIS Coordination in Kansas.
2. A clearly **defined authority** exists for statewide coordination of geospatial information technologies and data production.	**MEETS**	Kansas GIS Policy Board formulated via gubernatorial Executive Order in 1989, and reformulated by Executive Order in both 2000 and 2006.
3. The statewide coordination office has a **formal relationship with** the state's Chief Information Office (**CIO**).	**MEETS**	GIS Coordinator is situated within KITO and reports to the CITO (i.e. the Kansas equivalent of a CIO).
4. **A champion** (politician, or executive decision-maker) is aware and involved in the process of geospatial coordination.	**PARTIALLY** MEETS	The Kansas GIS Program has had key political and executive champions throughout its history. However, there is not currently an active, hands-on executive Champion.
5. **Responsibilities for developing** the National Spatial Data Infrastructure (**NSDI**) and a State Clearinghouse are assigned.	**PARTIALLY** MEETS	The GIS Policy Board has established the Data Access and Support Center (DASC) within Kansas Geological Survey (KGS) and DASC maintains a state-of-the-art State Data Clearinghouse. However, clear data stewardship roles have **not** been assigned for all framework data layers.
6. The ability exists to work and **coordinate with local governments**, academia, and the private sector.	**MEETS**	DASC maintains the Kansas Geospatial Data Commons as an explicit means of supporting the broader Kansas GIS community including local government, academia and the private sector.

7. **Sustainable funding** sources exist to meet project needs.	**PARTIALLY** MEETS	The GIS Policy Board and DASC receive annual funding from the Kansas Water Office. It is anticipated that some new funding recommendations will be made to carry out the vision and programs contained in this plan.
8. GIS Coordinators have the **authority to enter into contracts** and become capable of receiving and expending funds.	**MEETS**	The GIS Coordinator exists within KITO and DASC is within KGS. Both KITO and KGS are state agencies that have the authority to enter into contracts, and to receive and expend funds.
9. The **Federal government** works through the statewide coordinating authority.	**PARTIALLY** MEETS	There are active interests and attempts to maintain strong geospatial coordination with the federal government. However, there is room for improvement from both the state and federal governments.

3.2.3 Framework Data Layer Status

The table on the following pages presents the current, summary status for each of the seven National Spatial Data Infrastructure framework data layers in Kansas.

Framework Layer	GIS Dataset	Definition/Purpose	Coverage, Accuracy, and Currency	Authority and/or Custodian	GIS Maintenance	Outlook and Outstanding Needs
Geodetic Control	None provided by Kansas. Shapefiles can be found on the National Geodetic Survey website	Primary reference system for accurate coordinate positioning; basis for LiDAR and orthoimagery capture; key to accurate land surveys.	Statewide but significant gaps; limited coverage for Continuously Operating Reference Stations (CORS)	State Geodetic Advisor located at KDOT, provided by NGS	County surveyors report monument status to State Geodetic Advisor, many monument locations in paper files; data not maintained in GIS	KS will apply for NGS Height Modernizations grant funding to improve and densify the vertical and horizontal geodetic control network across the State. DASC will provide FTP services to organizations who wish to publish CORS data to NGS and develop a web-based mapping application to facilitate access to control data.
Orthoimagery	National Agriculture Imagery Program (NAIP) Imagery	Natural Color and Color Infrared (CIR) leaf-on imagery; provides a geographic basemap for Kansas.	2006 1-meter pixel resolution	DASC	Dataset does not require maintenance.	KS will partner with FSA for 2008 NAIP; State needs regular NAIP updates every 1-3 years but no program of sustainable funding exists. Additionally, NAIP imagery does not address the need for regular updates of leaf-off imagery.
Elevation	National Elevation Dataset (NED) 1/3 Arc-Second	Seamless elevation data across Kansas providing elevations points at approximately 10-meter intervals.	Statewide coverage, generally derived from 40-year-old 24K topographic vectors	USGS	USGS will integrate updated elevation data as it becomes available.	Outlook is dependent on USGS elevation program guidance, otherwise dataset is complete.
	Light Detection and Ranging (LiDAR) for Kansas River Corridor	High-resolution elevation model along River Corridor for floodplain mapping, dam safety, emergency management applications; Derived products include 2-meter DEMs.	2700 square miles flown in 2006; elevation points had a vertical accuracy of 15-18.5 centimeters on bare earth surfaces	USGS/DASC	Dataset does not require maintenance.	Current, statewide high resolution coverage needed. USGS creates 1/9 Arc-Second NED (3-meter) from LIDAR-derived elevation data.
Transportation	All Roads Database – State System	Statewide geographic representation the State highway system managed by KDOT	Highway centerline geometry captured with GPS, extensive attribute data	KDOT	KDOT	KDOT will continue to maintain the All-Roads – State System and provide regular updates via the KDOT and DASC web sites.
	All Roads Database – Non-State System	Statewide geographic representation of local roads, not including the state highway system	Digitized from 2002 1-meter DOQQ	KDOT	KDOT/Fort Hays State University	KDOT will continue to maintain the All-Roads – Non-State System by integrating local roads data from the Kansas Road Centerline Database, field verification, and aerial photo interpretation.

|						
	Kansas Road Centerline Database	Statewide geographic representation of both state and non-state portions of the All-Roads database with ongoing geometric and attribute updates based on local data sources	Original base (Non-State System) digitized from 2002 1-meter DOQQ. Updates from local sources are generally from higher-resolution imagery and geodectic control	DASC/KDOT	DASC/KDOT/ FHSU	The integration of the KDOT All-Roads (State & Non-State Systems) with locally-derived road centerline databases is currently ongoing and will result in a statewide database that is high-quality, current, rich in attribution, and reflects the local databases.
Hydrography	High Resolution National Hydrography Dataset (NHD)	Surface water feature data includes reaches, drainage network and upstream/downstream order	Derived from digitizing visible surface water features from 2002 Kansas ortho imagery	KDHE is designated data steward through MOU with KS GIS Policy Board	Recent USGS collaboration with Natural Resource Conservation Service (NRCS) and Kansas State University	Future updates require new leaf-off imagery to see stream channels.
Boundaries	Various geopolitical boundaries	E.g. state, counties, incorporated places, legal civil divisions	No unified consistent system of boundaries for KS.	Local Government	DASC to serve as area-integrator for boundary updates	DASC currently developing statewide Tax Unit map based upon local data to form the base of 30 levels of political boundaries.
	Tax Units	Locally-defined tax unit boundaries form the building blocks of 33 different types of administrative boundaries	Tax unit boundaries are being collected from local sources and aggregated into a statewide coverage using the 2002 DOQQ as the geographic reference	County Clerks are responsible for certifying tax units on an annual basis.	DASC is responsible for the maintenance of the statewide file.	Upon completion of the update and local verification process, DASC will dissolve the tax units into 33 administrative boundaries layers and work with local government and KDEM to assign and maintain contact information for each feature in the database.
Cadastral	Public Land Survey System (PLSS)	Rectangular system of land subdivision surveys; useful for easy geographic reference	Digitized from 1:24K maps; Relative system of geographic reference; lacks absolute accuracy	US Bureau of Land Management (BLM)	Kansas PLSS is currently not a priority for BLM and future commitment is unknown.	Outstanding need for improved Geographic Coordinate Data Base (GCDB) from BLM. Kansas could attempt to develop a state dataset from local survey information rather than wait for BLM.
	Parcels	Property boundaries derived from tax maps or land surveys	Spatial coverage, accuracy, and currency varies	Local governments	Local Governments with need for statewide aggregation	Statewide coverage is needed.

Additional Layers	GIS Dataset	Definition/Purpose	Coverage, Accuracy, and Currency	Authority and/or Custodian	GIS Maintenance	Outlook and Outstanding Needs
Land Cover	Land Cover	Consist of satellite-derived information that depicts general land cover types such as cropland, grassland, woodland, urban, and water.	KBS/KARS published a statewide land cover database (10 general land cover types) in 1993, a more detailed GAP Analysis Land Cover database in 2001, and is scheduled to complete a Land Cover update in 2009.	KBS/KARS	Development of a new land cover dataset is a multi-year effort to acquire the satellite imagery and process the land cover data.	State Land Cover updates occur on approximately a 10 year cycle.
Addresses	Address Points	A precise coordinate for each addressable structure in the state with the appropriate addressing information and Parcel ID Number. This information can be used for more precise geocoding than what is possible through traditional road centerline databases.	DASC currently has developed a pilot program with support from local governments and utility companies to develop the methodologies for developing a statewide address points database. The pilot database currently consists of nearly 700,000 unique points and covers more than 1/3 of the state.	Local governments and utility companies.	DASC is responsible for the statewide aggregation of the various data sources.	Statewide coverage is needed.

Structures	Data layers available at DASC include Fire Stations, Emergency Medical Service (EMS) Stations, and Educational Institutions.	Structures are manmade features such as buildings, utilities, and industry. Structures are also referred to as critical infrastructure.	Statewide data layers are current as of 2007.	Kansas Adjutant General's Department	The National Geospatial Intelligence Agency is contracting with TechniGraphics (TGS) to collect critical infrastructure. The Kansas Adjutant Generals Department is working with TGS to create public domain data that can be distributed by DASC.	Additional data layers need to be completed through TGS. In addition, Kansas regional homeland security funding is going to local governments in 18 counties in south central Kansas for a pilot project that will result in the collection of high priority structures.
Names	Geographic Names Information System (GNIS)	Geographic names are recognized by the U.S. Board on Geographic Names (BGN). The USGS Geographic Names Information System (GNIS) is the official database of names.	GNIS was populated in 1985 and contains the names from the USGS topographic maps. Seven counties (Douglas, Jefferson, Johnson, Leavenworth, Sedgwick, Shawnee, and Wyandotte) are currently having their names updated in GNIS and will be completed in 2008.	USGS maintains the GNIS database. The State GIS Director is the POC for the BGN on name controversies.	While USGS currently maintains GNIS, USGS would like to transfer the responsibility to Kansas to develop a Names Data Steward who can help support updating names in GNIS.	GNIS from 1985 needs to be updated for the remaining 98 counties in Kansas.

Additional information of the status of data layers will be posted on the Kansas Geospatial Community Commons website at http://www.kansasgis.org .

3.3 Strengths

- Mature GIS operations and a strong clearinghouse at DASC.

    1. Statewide data are readily available for download.

    2. Innovative deployment of new technology to speed on-line access to orthoimagery enabling agencies new options for limiting image storage and backup, and otherwise maintaining these huge data sets.

    3. Innovative use of new commercial and open source technologies to deploy web services and lightweight viewers that enhance access to Kansas geospatial data. Traditional "data clearinghouse" is evolving to deliver raw data, web-based applications, and web services.

    4. Innovative program to provide data security and disaster recovery via a three state collaborative with Arkansas and Missouri that provides server co-location in other states in case of an in-state failure.

    5. New program that allows local governments to backup their geospatial data assets onto state servers at DASC (for disaster recovery).
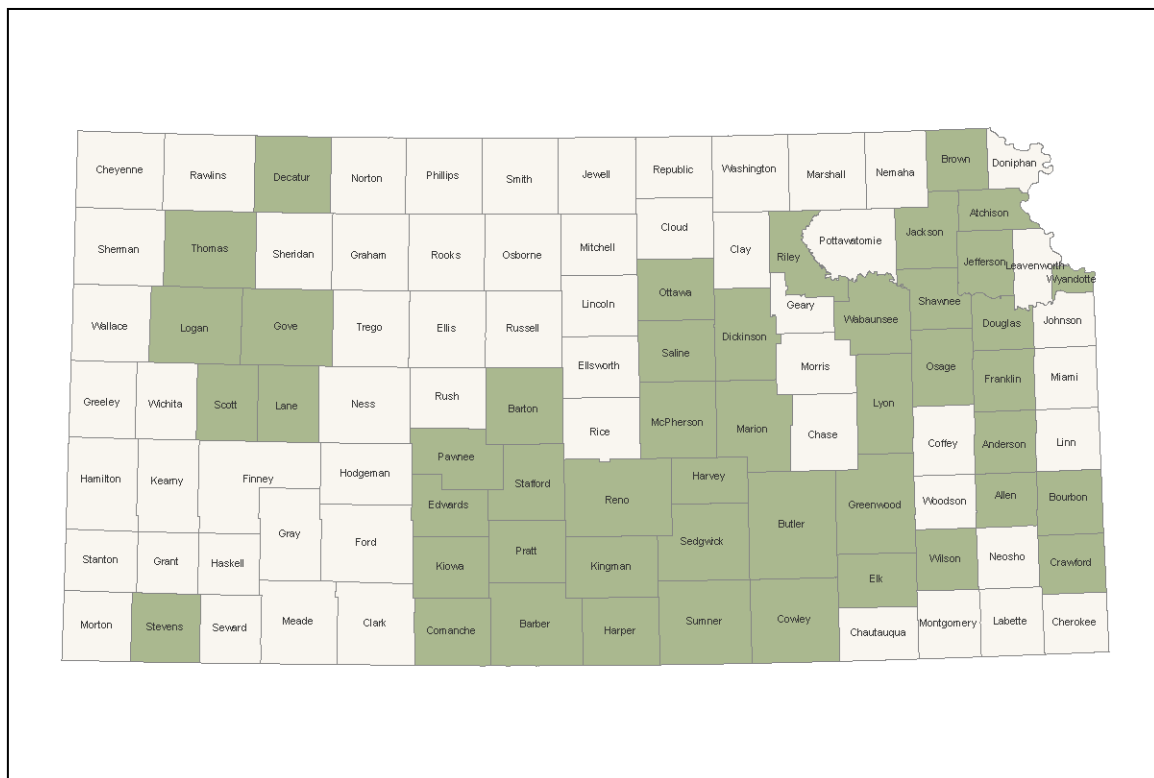
The image above shows Kansas counties that are currently participating in the DASC program that provides local data backup to counties.

- Kansas has managed to maintain strong GIS programs with extremely limited financial resources. In spite of program downsizing and inadequate budgets for

maintaining, much less expanding data holdings for a physically large state, GIS interest, innovation and utilization continue to expand.

- Clear GIS organizational authority situated independently of any one particular government agency/mission.

- Broad and increasing adoption of GIS technology at the county level.

- At the local and county level, with few exceptions, there is a general willingness to share data and a spirit of collaboration.

3.4 Weaknesses

- There is an overall **lack of sustainable funding** to support digital data creation and maintenance. Currently, only the Kansas Water Authority contributes funding to statewide data development at the level of $250,000 per year. For a state with the physical size of Kansas, this funding level is insufficient for expanding the data holdings to address existing data gaps. Other significant data consumers and users such as KDOT, KDHE, KDOR and/or others could potentially join the Water Authority in supporting baseline geospatial data development and maintenance.

The following provides three examples of how sustainable funding challenges inhibit GIS development in Kansas:

1. Over the past five years the Kansas Information Technology Office has incrementally downsized GIS staffing. In 2003, approximately 2.5 FTE were supporting statewide GIS administration and coordination activities. Today only the GIS Director position is available to support statewide GIS coordination efforts. At a time of increasing GIS use, new technologies and increasing demands for geospatial data, Kansas has been forced to reduce the staff attention to GIS. Indeed, now that Kansas is making stronger uses of its geospatial infrastructure it becomes more important that appropriate attention and staff resources are directed at maintaining this infrastructure and in coordinating the numerous participants.

2. Over the past several years, Kansas has received the USDA's National Agricultural Imagery Program (NAIP) imagery for 2003, 2004, 2005 and 2006. This imagery is extremely valuable and there is wide demand for it across the stakeholder community and it remains one of DASC's most popular downloads. Unlike the orthoimagery typically developed by individual counties, NAIP uniquely is flown during the summer with leaves-on to provide a fuller picture of agricultural land uses. In November of 2007, Kansas became aware of an opportunity to partner with the USDA Farm Services Agency (FSA) on 2008 NAIP. This partnership would be necessary for NAIP to be flown in 2008.

Unfortunately, this timing meant that most of the already scarce GIS Policy Board funding had *already* been allocated for 2008. Without adequate sustainable funding, a last minute "pass the hat" effort barely pulled together enough funding from one federal agency, several state agencies, one university, and one county to meet FSA's matching funds requirement. This "pass the hat" effort consumed

significant staff resources and with insufficient GIS data development planning and subsequent funding, this situation will recur. Given the highly valuable data that is created and that Federal funds typically cover a large majority of program costs Kansas needs to find a way to take advantage of this annual program. For instance, State agencies may need to include NAIP partnership funding in their budgets as a means of providing a sustainable, supplemental GIS data funding source beyond the KWA funds.

3. The level funding of DASC, at a time when overall GIS utilization is growing rapidly, has prevented the organization from being able to fully keep up with demand. While DASC has been incredibly adept and innovative at doing more with less and taking advantage of new technologies, there remain many opportunities that are unrealized, particularly with regard to the level of outreach that is provided local government.

- **Data gaps and weaknesses**: Several of Kansas' key data sets are either inadequate for some intended uses, are inconsistent, or not updated on a regularly recurring basis.

    1. Current statewide **elevation data is inadequate** for many purposes such as flood zone delineation. The best statewide elevation data currently for Kansas is the national elevation data set (NED) that is capable of producing, at best, 10 foot contours. Accurate flood zone delineations require elevation data that can support at least 2 foot contours.

    2. Currently, there is a **lack of a GIS data standard for parcels**. This results in inconsistent data from county to county and makes it difficult to assemble, both regional and statewide parcel data sets. While a great deal of parcel data already exists, strong standards that cover both data content and data accuracy would be extremely useful for assembling a statewide parcel data set.

    3. While there are several existing imagery data sets, including the leaf-on NAIP imagery described above, the production of this imagery is not programmed, or funded on a regular, recurring basis. Flyovers occur opportunistically and the **lack of a recurring orthoimagery program** causes both funding challenges and an inability to rely on recent imagery being available.

- In spite of recent, positive efforts such as the Kansas Collaborative's GIS Breakthrough Team, the stakeholder sessions documented that there remains a lack of readily available information to support **general awareness of the importance of county and local government GIS programs**. At the county and local level there is strong interest in additional non-technical information that would help "make the case" for investments in geospatial technology. Examples of the types of information that would be most useful include:

    o Funding and ROI case studies.
    o Use cases that document the benefits of specific data sets such as elevation.
    o Best practices for governance and staffing models.
    o Best practices for data management.

3.5 Opportunities

- **Geospatial data awareness is at an all-time high** and increasing. Whether it's the real-time use of GIS in displaying election results on television; or the availability of commercial mapping and navigation sites like MapQuest and Google Maps; the routine use of onboard GPS navigation systems in cars and boats; or the availability of 3D "globe viewing" via freely available tools like Microsoft's VirtualEarth or Google Earth, the general public increasingly understands the relevance and importance of geospatial data. This increased awareness provides significant opportunities for generating support for geospatial programs and explaining the policy relevance of individual initiatives to elected officials and decision makers.

- Local government has expressed a strong interest in **survey quality section corner data** that would help to improve the accuracy of local GIS data sets (e.g. parcel or administrative boundary data). KDOT has collected a large amount of these data as part of its ongoing operations and projects. However, the KDOT data are not readily available and are largely found only on hard copy plans and data sheets at KDOT facilities. There is a large opportunity for KDOT to make these data more publicly and readily available in electronic format[1]. KDOT has begun scanning historical survey information. The next step would be to implement a program of putting new section corner data – collected through any KDOT internal or contract efforts, and potentially local survey efforts as well – into a database that can be made publicly available.

- Given that the state DOR is already intimately involved in supporting county appraisers (e.g. provision of the statewide Orion CAMA system; email service to 9 counties, etc.) there may be an opportunity to **extend that same type of DOR support to county parcel mapping**. Good mapping, using GIS technology would support the goal of fair and equal assessments and statewide parcel data would provide broad benefits to a variety of stakeholders and application areas.

- There is an opportunity to develop a **formal local government technical assistance program** to assist counties that are just starting out with GIS. Many counties have fledgling and struggling GIS programs, and there is a diverse need for support, including but not limited to:

  1. Educational materials (e.g. a "GIS starter kit")

  2. Procurement support (e.g. a state blanket contract for GIS services and/or a listing of pre-qualified vendors)

  3. Technical assistance and access to the "lessons learned" by others.

  Again, the existing work of the Kansas Collaborative's GIS Breakthrough team provides a useful starting point that can be expanded and extended over time.

- **Strong geospatial education programs at Kansas institutions of higher learning** provide significant opportunities for strengthening the state's geospatial capabilities. The partnership between the University of Kansas and the Kansas Geological Survey

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[1] Several other states have already done this, and the link below from New York provides an example:
  https://www.nysdot.gov/portal/page/portal/divisions/engineering/applications/geodetic-control-viewer

in housing and supporting DASC provides a strong model for governmental and academic collaboration. The academic community is a strong resource that should continue to be leveraged for activities that range from providing the next generation of GIS staff to participating in data development initiatives to supporting the broader geospatial education of county and local governments (as described in the bullet above).

- **The NAIP program** and the federal government's favorable matching funds (i.e. the federal match covers the large majority of most projects) provide Kansas an excellent opportunity to obtain **subsidized, relevant and recurring aerial imagery**. Due to the extremely large percentage of the state covered by agricultural landuse, NAIP's leaf-on imagery is extremely important to both FSA and Kansas. As such, it is critical that Kansas find a way to *programmatically* provide its share of the matching funds.

- There are numerous independent efforts at both the state and local level that develop aerial photogrammetric and LIDAR products. Currently, these efforts generally result from independent solicitations and RFP from local governments. Given the technical nature of such procurements, as well as significant economies of scale in this area there is an opportunity for **the state to establish a master service agreement (a.k.a "blanket contract") for high-quality aerial imagery and elevation products** that *all* government entities can use. In this manner, individual governments are saved the effort of conducting the procurement; high quality products are guaranteed; and the combined buying power of state and local government can be leveraged for more favorable pricing. Several states, such as New York, have such contracts although they are often anchored by a recurring state purchase of imagery.

- Recently Shawnee, Douglas, Jefferson, Johnson, and Wyandotte Counties and several additional partners banded together to produce high quality LIDAR-based elevation data. There remain significant opportunities for this type of **multi-government collaborative funding approach** to address data gaps.

- There is an **increasing trend in counties outsourcing their IT functions** to the private sector. As such, there is an opportunity for the state to engage and coordinate with the private sector outsource providers on geospatial matters. As these entities play an increasing role they provide the **opportunity to promote geospatial best practices and standards adherence** across their customers.

- There is an opportunity for **greater coordination in the collection of critical infrastructure information**. Right now there appears to be considerable overlap between various efforts that collect the same or similar data multiple times for different purposes.

- Given the current **overlap between state and federal crop land mapping efforts** there is an opportunity to better align these programs to **eliminate redundancy** and to pool resources to create better data products (e.g. aerial imagery, crop lands). While there remain a significant opportunities to increase efficiency, the state's ability influence a federal program like FSA is limited. Nevertheless, the state and local FSA partners should fully document the opportunities for enhanced collaboration and

efficiency and should articulate current concerns to the FSA's GIS team in Washington, DC.

3.6 Threats & Barriers

- **Currently there is non-uniform interpretation and/or application of Kansas Open Records Act** including how the act pertains to digital geospatial data.

- **Inconsistent digital data pricing practices** inhibit the free flow of geospatial data in Kansas. Ultimately, there are inconsistent policies within individual jurisdictions with some places being averse to data sharing and others highly willing, and this is reflected in the pricing which ranges from freely available for internet download to more than $1,000.

- Some of **the smallest counties in Kansas are at risk of never being able to afford GIS technology,** and there is a "digital divide" between GIS "haves" and "have nots" counties. At the same time, the same benefits of GIS accrue no matter what the size of the county.

- In an environment where there is more geospatial activity and more users than ever, there is also **a trend of decreasing resource availability**. Thus, it becomes increasingly important that government entities attempt to coordinate their geospatial initiatives and purchases so as to avoid redundant expenditures. Opportunities for coordinated spending, such as the multi-county LIDAR initiative described above, are critical for counteracting this threat. Similarly, the modest costs of pursuing active coordination at the state level have the potential to result in large efficiencies and benefits.

4 Vision & Goals

4.1 Strategic Goal

Kansas Spatial Data Infrastructure Vision Statement:
The Kansas Geographic Information System Partnership initiative will be a collaborative effort among the statewide geospatial community that delivers robust, map-based, geospatial information and services to support policy and decision making at all levels of government, to provide access to public information and to enhance the safety, economy, environment and quality of life in Kansas.

The key elements of this vision are:

- **Partnerships** between agencies and between all levels of government

- **Collaboration** between all GIS stakeholders including government, academia and the private sector

- The notion of providing both **data and geographic services** to the **public**

- To support the **policy outcomes and planning** that will improve the quality of life in Kansas

4.2 Programmatic Goals

In order to realize the vision for a Kansas Spatial Data Infrastructure (KS-SDI) described above, several programmatic goals will be pursued:

4.2.1 Develop improved statewide elevation data that supports high resolution contours and the detailed topographic mapping necessary for a multitude of critical applications and risk determination

The highest priority data gap in Kansas is high-quality statewide elevation data that is suitable for flood zone identification and many other uses. Some of these data currently exist or are under development for specific regions of the state – e.g. the Kansas River Corridor from Junction City through the Shawnee/Douglas/Jefferson/Johnson/Wyandotte County region – however, this programmatic goal is aimed at creating a *statewide* elevation data set suitable for developing high-resolution contours (i.e. 2 foot interval or better). To further this goal, the GIS Strategic Plan Steering Committee has initiated the development of GIS Business Plan for producing high quality statewide elevation data that will fully identify the options for constructing these data, as well as the costs and the business case for undertaking this initiative.

4.2.2 Development of a long-term, sustainable funding strategy that will enable Kansas to better build and sustain its spatial data infrastructure

As identified earlier, current GIS data funding levels are inadequate and the staff resources devoted to statewide GIS coordination have been reduced over the last five years. As such, opportunities for improving the state's GIS data are being missed and there is an inability to undertake new initiatives. The GIS Policy Board should focus on developing and then strongly advocating for a new sustainable funding strategy that will help generate the resources necessary to carry out this Strategic Plan and to advance Kansas' geospatial infrastructure.

Interestingly, Kansas' criminal justice agencies have collaborated under a model that is quite similar the Kansas GIS Policy Board. Their equivalent of the GIS Policy Board is the Criminal Justice Information Systems Committee and they have been highly successful in generating funding support criminal justice information technology initiatives. Elements of their success, which could be emulated by the GIS Policy Board include:

- Committee being staffed by senior managers of Criminal Justice agencies

- Clear focus of the Committee is gaining funding for new initiatives

- Committee identifies and prioritizes important, new initiatives requiring funding and gains consensus on the priorities

- When necessary, new initiatives are crafted as legislation

- All member agencies work to gain support for funding for a package of initiatives. Thus, rather than having competing proposals, all agencies are pushing for the support of the entire package, and any related legislation.

A renewed focus by the GIS Policy Board on documenting the inadequacy of existing geospatial funding and generating suitable, long-term sustainable funding for important initiatives is the first step towards achieving this programmatic goal. Making this happen will also involve outreach and recruitment of senior managers and legislators who understand the importance of the technology and are prepared to help garner additional support.

4.2.3 Development of a technical assistance and outreach program for county and local government GIS efforts and corresponding governing bodies

Due to the fact that many core GIS layers such as street centerlines, parcels or tax units are maintained at the local level, building further local GIS capacity will help improve the overall Kansas spatial data infrastructure. Further, the GIS stakeholder sessions documented a strong local government interest in obtaining a variety of both technical and non-technical GIS support services. Specific forms of support may include:

- Development of direct local government outreach and support services and/or resources such as:

    o Funding and return on investment (ROI) case studies.
    o Use cases that document the benefits of specific data sets such as elevation.
    o Best practices for governance and staffing models.
    o Best practices for data management

    Delivering these types of resources should involve leveraging existing efforts, such as those by the Kansas Collaborative's GIS Breakthrough Team, and utilizing existing resources such as the training capacity of the state's institutions of higher education.

- Support of indirect local government outreach and support through involvement in governing bodies such as the Kansas Association of Counties and the League of Kansas Municipalities to raise awareness of GIS among local elected officials and decision-makers.

- State procurements to establish state blanket contracts for geospatial services that state and local governments can utilize:
    o Blanket contract for photogrammetry products
    o Pre-qualified vendors for general geospatial services

- Revisit, revise and re-issue existing geospatial data standards to provide further guidance to local government on building high quality data. This may include providing geospatial data model/schema templates for core local data sets such as street centerlines and parcels.

- Continue and expand current DASC efforts to provide services such as local government data hosting and the provision of off-site data backup for local government GIS programs and the coordination of this activity with the Kansas Division of Emergency Management (KDEM).

- Creation of a DASC staff position focused on providing local government liaison and support services.

4.2.4 Work with the Kansas Department of Revenue to pursue the goal of a statewide parcel data layer

In light of the large demand for parcel data across the stakeholder community, there needs to be a focused effort to create a **statewide parcel data set**. While there have been significant local efforts that have resulted in a majority of counties having electronic parcel data, completing the state – particularly smaller, rural counties - will not happen without a focused effort, and likely state support. Although these data need to be owned and managed at the local level, they should be assembled and aggregated into a statewide resource. Doing this would provide several benefits:

- Statewide data would be available for the numerous applications that require them

- Efficiencies would be gained by avoiding redundant efforts to assemble and aggregate parcels from multiple counties.

- Parcel data serve as a substrate for numerous derivative layers such as protected open space, critical infrastructure, tax units or land use. Statewide parcel availability would result in improved data accuracy for these derivative layers.

A key element of this process will be developing a **strategy for engaging the Kansas Department of Revenue** (KDOR), likely through the Division of Property Valuation. Ultimately, KDOR is already intimately involved with counties and provides technical support for things like the statewide Orion CAMA system and the provision of email. In addition, high quality tax mapping is an element of implementing fair and equal assessment and KDOR has a history of providing directives that give guidance on mapping and GIS (e.g. Directive #98-036[2]). Given KDOR's reach and internal interests in parcel information their participation in this type of initiative would be key to success.

There is no doubt that this type of initiative would be a long-term effort that would require careful planning. Elements of the initiative would include, but not be limited to:

- Developing a detailed plan for this initiative, including the potential for assembling a GIS Business Plan that will provide implementation details and the business case.

- Strengthening existing parcel standards and developing a data schema that can be deployed on a statewide basis.

- Begin the assembly of the statewide data layer on a county by county basis, likely working with DASC

- Develop/refine a strategy for timely update of the data as parcel data change regularly and assembly of a statewide layer cannot be considered a one-time exercise

Kansas is one of many states that are interested in this pursuit. In 2007, the National Research Council published a study titled National Land Parcel Data: A Vision for the Future[3]. This study documented the universal importance of parcel data to a variety of

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[2] See: http://www.ksrevenue.org/pdf/dir98-36.pdf for text of directive.

[3] See web-site at http://www8.nationalacademies.org/cp/projectview.aspx?key=219 for a summary of the project and access to committee membership and other project details.

activities and calls for the creation of a nationwide resource. Recognizing that statewide data layers are the first step toward realizing this broader vision, the study *recommended* that in order for states to receive geospatial funding or funding that is "directly associated with a property" (e.g. disaster assistance) from the federal government the state must participate in the federal initiative and make its parcel data available in the public domain.

4.2.5 Support and fully fund current DASC efforts for improving additional key statewide data layers

As described earlier, in spite of challenges with sustainable funding, Kansas has been innovative and creative in attempting to move forward with important, statewide data initiatives. Many of these efforts have been focused at DASC which has the ability to engage university personnel and graduate students on a cost effective basis. Currently, DASC is pursuing three important statewide data layer improvement projects for:

A. Improving the KDOT **road centerlines** by adding street names for all local and secondary streets (see DASC image below for current status) and working to improve road accuracy through the use of available orthoimagery. As appropriate, improving the statewide road centerline data might also include the acquisition and integration of the best available data from existing federal, state and local sources.

Current status of statewide road centerline improvements. Shaded counties have had their data improved, or data improvements are in process.
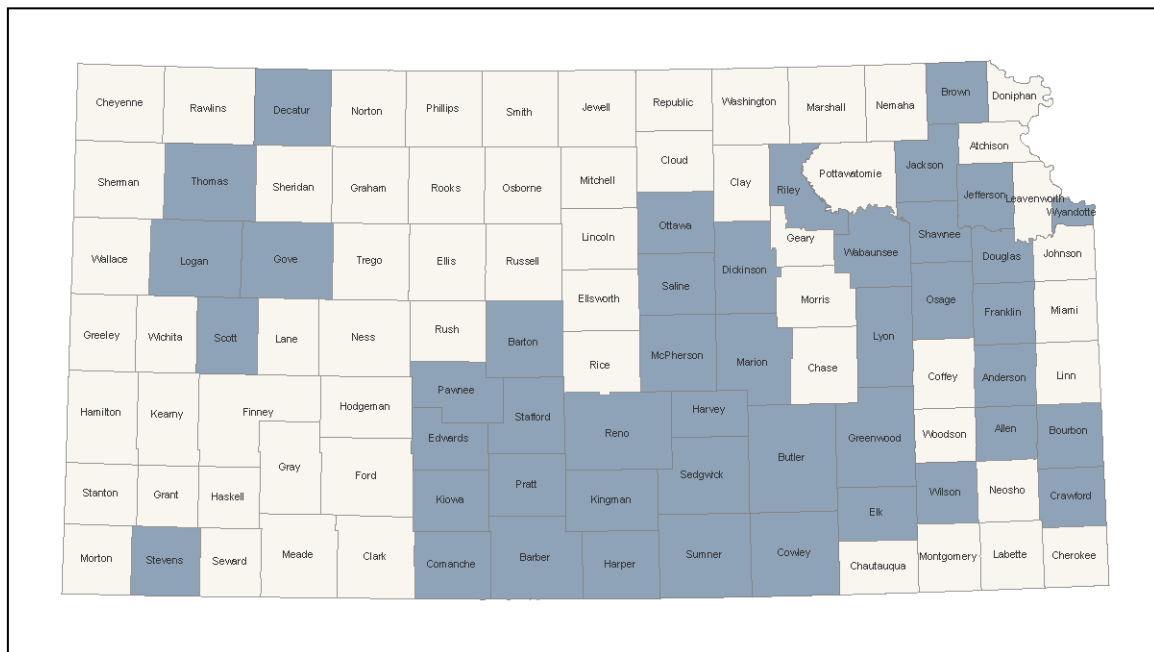
B. Development of distinct **situs address points** for every address in the state. Thus far, a pilot project has assembled over 800,000 situs address points in collaboration with numerous counties and private utilities (see DASC image below for current status). Ideally, for the long-term, this project will be pursued in collaboration with the

KDOR Property Valuation Division (PVD). The PVD oversees the statewide implementation of the computer assisted mass appraisal (CAMA) system which is an important source for parcel addresses.
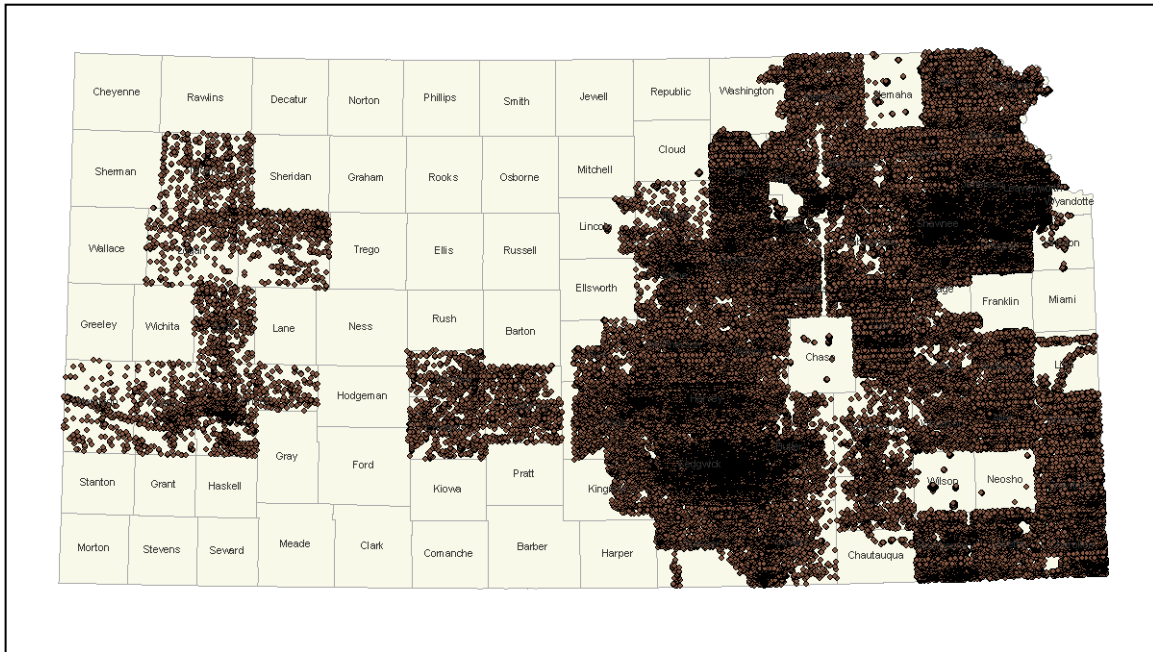
Current status of statewide situs address development. Each dot represents one of the approximately 800,000 addresses currently in the database.

C. Development of accurate and verified **tax units boundaries**. As with street centerlines this is being pursued on a county-by-county basis and as funding permits. DASC is working directly with the county clerks offices in order to acquire local data and to verify the content in the statewide database (see DASC images below for current status).
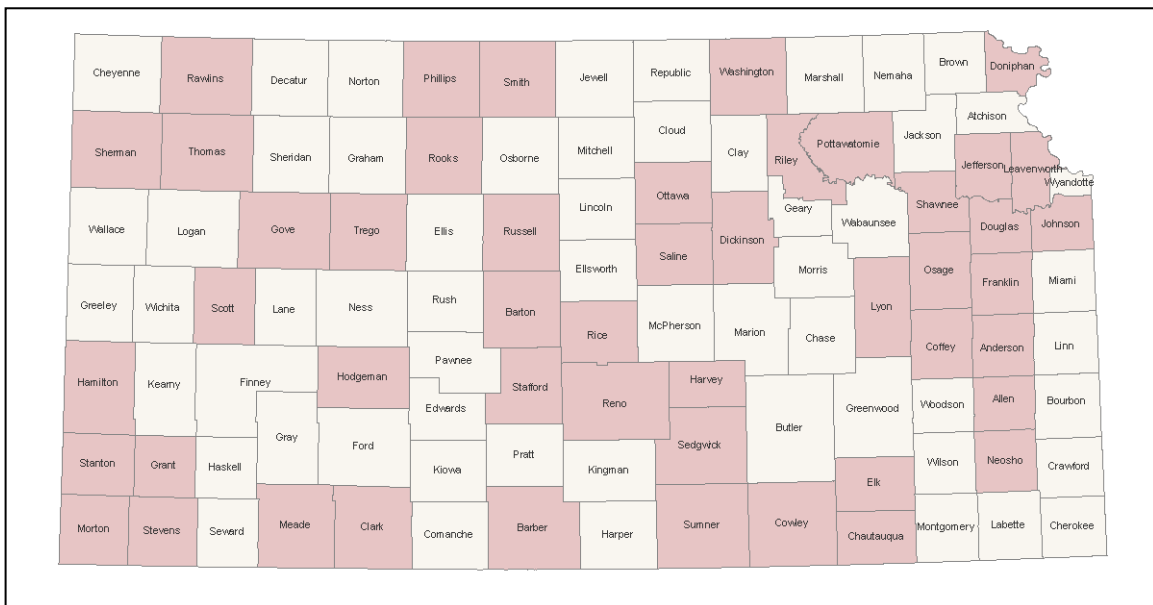
Current status of verified tax unit mapping. Shaded counties have had their data improved, or data improvements are in process.
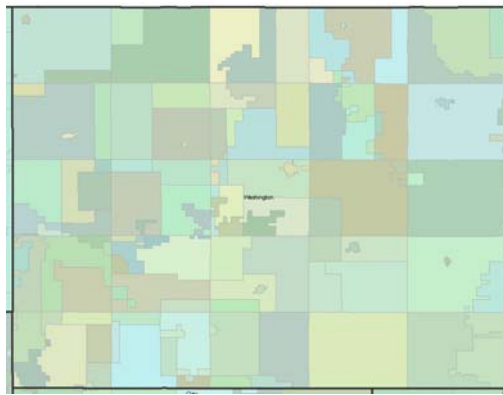
Edited & verified
tax units for
Washington
County

All of these projects are important steps in improving Kansas' baseline spatial data, however, each is conducted on a project basis and there is not committed funding for a statewide effort for any of them. As such, generating funding support to complete this work is an important programmatic goal. But, initial development is only one goal. Since all of these layers are relatively dynamic and change regularly, an appropriate long term strategy for keeping the data current also needs to be developed. Most likely, this data stewardship role should be fulfilled with a new DASC position explicitly responsible for the stewardship of these three important layers.

4.2.6 Develop a coordinated approach for developing regularly recurring high-resolution orthoimagery

While Kansas has been successful in creating several statewide imagery data sets, principally in concert with the USDA's NAIP program, each of these has been the result of a unique set of opportunities and circumstances and has been pursued as one-time project rather than an ongoing initiative. Due to the importance of orthoimagery, which serves as a base map that other layers (e.g. administrative boundaries, roads, parcels, etc.) are registered to, and the ability to detect land use and agricultural changes from orthoimagery, increasingly, states are looking to put in place a regularly, scheduled flyover program with recurring funding and a published schedule.

In addition to Federal flyovers, many counties are conducting their own flyovers and there are numerous opportunities for coordination and joint funding. Federal agencies are pursuing an initiative called Imagery for the Nation (IFTN) which aims to coordinate federal spending on aerial imagery and may provide cooperative funding opportunities to states. Kansas should closely monitor the evolution of IFTN while at the same time developing a coordinated strategy for supporting ongoing orthoimagery updates in Kansas. The importance of orthoimagery to supporting the accuracy and change detection capabilities of other data layers such as roads and parcels makes this imperative. As with the parcel and elevation goals described above, a key first step in achieving this goal is developing a detailed business plan for this initiative that would define implementation details and present the business case.

4.2.7 Develop a coordinated approach for statewide critical infrastructure mapping

Developing strong critical infrastructure data sets is an important programmatic goal for enhancing public safety in Kansas. While many efforts have been completed, or are underway, there is not yet a single, uniform statewide critical infrastructure data set. As such, there should be efforts aimed at planning for, and ultimately implementing a coordinated, statewide approach. Initiatives such as the existing, multi-county critical infrastructure data collection effort in south central Kansas potentially provide models that could be applied elsewhere, or on a statewide basis. In addition, achieving other programmatic goals enumerated in this plan – such as statewide parcels and/or statewide situs addressing – will provide new opportunities for developing consistent critical infrastructure data layers that have a higher degree of accuracy.

4.2.8 Develop a program for electronically managing and disseminating existing, surveyed PLSS data to the public

The stakeholder sessions document strong local interest in gaining access to survey quality section corner and other PLSS data. The KDOT is a major developer of this kind of survey data and has extensive historic survey records in its possession, and it is in the process of scanning most of those records. As a major developer of this kind of survey data, KDOT should play key role in this initiative even though eventually such an effort might encompass survey data from other public entities such as counties, cities or other state agencies. In addition, given KDOT's expressed interest in local parcel data and local input for street naming, providing access to survey data could be the basis of a reciprocal agreement whereby counties receive something of value from the state in exchange for their parcel data and local street information.

5 Requirements

5.1 Inventory of Existing Infrastructure & Suitability Assessment

Kansas has built a solid foundational data management and data sharing infrastructure which is deployed by DASC. This infrastructure is adequate to support current functions, but as described below may need to be enhanced if some of these functions are expanded. The current infrastructure supports:

- Hosting the Kansas Geospatial Community Commons web-site which includes:
    - o Index of available data
    - o Digital data download
    - o On-line data viewers
    - o General dissemination of relevant GIS news

In addition to DASC, many state agencies (see section 3.1) maintain their own geospatial infrastructure which includes desktop GIS software and GIS server capabilities for both data management and web publishing.

In almost all instances, the technological infrastructure is adequate and the recommendations presented above focus on improvements to the data and organizational elements of Kansas' geospatial programs.

5.2 Data Requirements

The programmatic goals presented above in section 4.2 describe several priority data oriented initiatives:

- Improved statewide **elevation** data that supports high resolution contours
- Embarking on a program to create statewide **parcel** data in association with KDOR
- Completing an improved statewide **road centerline** data set
- Completing the development of a statewide **situs address** data set
- Completing an improved statewide **tax unit** data set
- Supporting a recurring, statewide **orthoimagery** program
- Supporting a coordinated and standardized statewide **critical infrastructure** mapping initiative
- Supporting the development of an accurate **statewide PLSS** data set that will be readily available to state and local governments

5.3 Resource Requirements

The core weakness uncovered during this strategic planning process was the lack of adequate, sustainable funding for Kansas geospatial programs. At a time when the use of geospatial technology is exploding both in government and private industry, Kansas has only kept level, and in some cases has pulled back on funding its core geospatial programs. One of the most critical programmatic goals (see section 4.2.2) is the development of a sustainable funding program, and more importantly a renewed focus by the GIS Policy Board to advocate for the support of that program thereby ensuring that adequate resources are available to sustain and grow the Kansas geospatial infrastructure.

5.4 Standards

Historically, Kansas has recognized the importance of standards and there remain some older data standards[4] that are not widely used. At present, there is a renewed need to update these standards and expand them to include other GIS data sets. Ultimately, in 2008 there are numerous entities – particularly counties and cities – producing digital data such as parcels and addresses. As described in the programmatic goals, the state hopes to assemble these types of data into uniform, statewide data layers and thus it is imperative that they have standard qualities and formats. Standards are a key tool in articulating the base line quality and content that defines "good data". Equally, standards can provide helpful, common sense, guidance to GIS newcomers who face questions on how to structure their data.

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[4] Examples of existing standards include the <u>Kansas Geospatial Data Addressing Standard</u> from 1999 and the <u>Kansas Geographic Information Systems Cadastral Standard</u> from 1998.

5.5 Organizational Needs

While Kansas has a solid, multi-party organizational framework in place for geospatial governance (see section 3.2.1), this model has failed to deliver the kind of sustainable support that is required to plug existing gaps and advance new initiatives. In some ways, the current Kansas geospatial community is a victim of its own previous successes as there is acceptance that "Kansas has a good GIS", but there has been neither urgency nor a focused effort to make further gains. Rather, based on hard work at DASC, KITO, and elsewhere Kansas is "making due" in an environment of level or decreasing funding and ever increasing demands to address some of the geospatial weaknesses and challenges that are cataloged above.

5.5.1 Executive Support

One of the largest challenges that Kansas currently faces is the absence of strong, executive champion. It is possible that the division of GIS coordination activity across the GIS Policy Board, KITO and KGS (i.e. DASC) has hindered the emergence of a strong advocate that can articulate the resource requirements as well as the benefits of making geospatial investments. Nevertheless, such an executive champion – whether a department head or legislator - will be necessary to help generate the resources necessary to carry out the recommendations of this plan.

The completion of this strategic planning process offers the opportunity to help recruit this type of champion. Ultimately, this plan describes the challenges that are faced, the opportunities for improvement and a specific program of initiatives to realize the vision. What is needed now is support and advocacy.

5.5.2 Coordination & Oversight Procedures

The GIS Policy Board was established expressly to coordinate the implementation of GIS across the many state agencies that utilize the technology, and it remains and active and important coordination and oversight vehicle. That said, while the board was established with senior executive membership, over time most agencies have delegated attendance to staff that are directly involved in GIS activities. While perfectly appropriate for a variety of issues, the number of senior staff directly involved has decreased significantly and this may contribute to the current inability of the Policy Board to successfully advocate for expanded geospatial resources.

In addition to in-state coordination, the federal government is an important coordinating partner in Kansas. Just as Kansas can do better on some elements of GIS coordination it should be noted that, from the state's perspective, the federal government could also do a better job coordinating its geospatial programs that interface with Kansas. Coordination is a two-way street and as Kansas makes an earnest effort to be a better, collaborating partner, so too should the federal government. Many separate federal agencies interact with the state via a variety of programs with geospatial components (e.g. FSA, DHS and US-DOT). While each of these agencies has a legitimate "vertical" connection to a partner state agency, these federal agencies should be encouraged to connect with the state's lead geospatial coordination entity on matters pertaining to geospatial technology

and data. Just as the states need to re-examine their internal coordination, the federal government has opportunities to improve its state coordination activities.

5.5.3 Staffing

As described earlier, DASC has been level funded at a time when geospatial utilization has been expanding rapidly. While acknowledging that under the current fiscal climate any expansions of staff would be extremely difficult, it would be highly desirable to add at least two full-time equivalents (FTE) to the DASC GIS coordination team. The first new DASC person would likely serve as the lead for the expanded county and local government technical assistance and outreach program described above (see section 4.2.3). The second new DASC person would serve as the data custodian for the situs address, road centerline and tax unit data layers that are under development and will require ongoing maintenance (see section 4.2.5).

Equally, in an environment where there is increased GIS activity at all levels of government, the KITO GIS coordination staff has been reduced from 2.5 FTE to 1 FTE since 2003. Restoring KITO's GIS staffing to 2003 levels would increase both the reach and effectiveness of the state's coordination program.

5.5.4 Outreach & Community Development

As documented throughout, the core challenge that Kansas faces is generating the budgetary resources that are necessary to move the state forward. As such, it will become increasingly important that the GIS Policy Board and other geospatial actors in Kansas work actively and in concert to advocate for the resources that are necessary to carry out the initiatives described in this plan. The efforts to find and recruit an executive level champion described above are a starting point for this outreach, and they should be accompanied by further efforts to identify interested legislators.

Complementary to this senior level outreach is further grass-roots community building such as the work completed by the Kansas Collaborative's GIS Breakthrough team. As more and more local governments pursue GIS initiatives it is important that they recognize they are part of a broad community of local government GIS practitioners. Ultimately, this community can be an important ally in advocating for the elements of this plan – for example, enhanced elevation data – that will directly support them.

Last, the Kansas geospatial community needs to commence further outreach to other state agencies that might become more deeply involved in geospatial matters. A key example of this is the recommended outreach to the Kansas Department of Revenue to foster the development of a statewide parcel data set.

5.5.5 Assessing Risk

While the approach presented in this plan was intentionally crafted to be a low risk strategy, there remains the overarching risk that the improvements described within the plan will not be funded. And, some of these initiatives require significant investments. For instance, the priority elevation improvement initiative alone has a baseline cost of

over $7,000,000 with the possibility of potentially needing to double that amount to produce all required deliverables.

The other principal risk is that several of the programmatic goals call for increased collaboration and outreach to other state agencies. As such, there is some risk that the overtures aimed at developing these collaborations may not be successful.
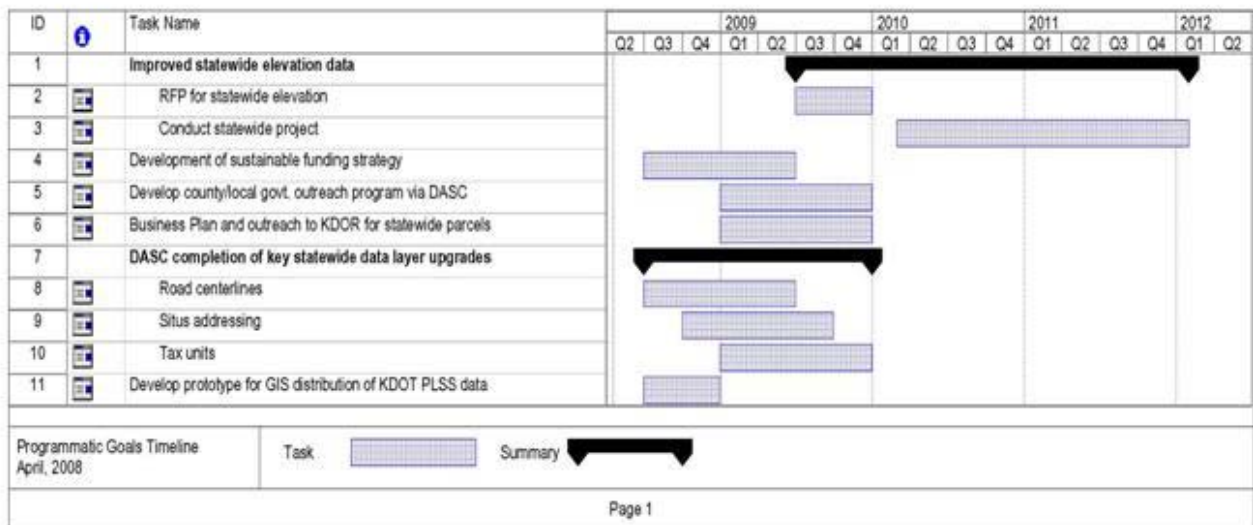
6 Implementation Program

6.1 Implementation of Initiatives & Projects

The following presents four priority sub-projects that can be initiated immediately to commence work on the broader and more expansive programmatic goals described above:

1. **Completion of Business Plans for key data sets:** Both the elevation data improvement and statewide parcel initiatives are large and complex. As such, the first step would be completing detailed planning studies aimed at fully understanding the processes, costs and business case for these efforts.

2. **Development of a long-term funding strategy:** Since almost all of the programmatic goals contained in this plan involve new expenditures, it is critical there be a focused and concerted effort across the geospatial stakeholder community to develop and then advocate for a feasible funding strategy. This effort should be led by the GIS Policy Board.

3. **Development of work plans for expanded DASC activity:** The programmatic goals aimed at developing an active local government outreach program and the completion of the road centerline improvements, situs addressing and tax unit data sets would involve significant increases in activity at DASC. In the short term, and until the funding to complete this work is secured, DASC should develop work plans for these initiatives that will identify the specific levels of staff and money necessary to complete them.

4. **Initiation of a project to make KDOT PLSS data more readily available:** Given that KDOT is already scanning many of the documents that contain the surveyed PLSS data, this type of project may be relatively easy to initiate and could yield immediate, short-term benefits. While KDOT effort will remain focused on meeting KDOT internal needs, there is an opportunity to initiate a pilot project with DASC that would take the KDOT raw data and develop useful GIS products that could be housed in the DASC database.

6.2 Phasing & Milestones

The following presents a graphic timeline showing the programmatic goals described above implemented a series of projects and initiatives.

ID	ⓘ	Task Name		2009									2010				2011				2012	
			Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
1		Improved statewide elevation data																	
2		RFP for statewide elevation																	
3		Conduct statewide project																	
4		Development of sustainable funding strategy																	
5		Develop county/local govt. outreach program via DASC																	
6		Business Plan and outreach to KDOR for statewide parcels																	
7		DASC completion of key statewide data layer upgrades																	
8		Road centerlines																	
9		Situs addressing																	
10		Tax units																	
11		Develop prototype for GIS distribution of KDOT PLSS data																	

Programmatic Goals Timeline
April, 2008   Task [   ]   Summary [◣▬▬▬◢]

Page 1

6.3 Budget

The spreadsheet below provides the estimated costs for completing the programmatic goals that are described above (see section 4.2). Since not all of the programmatic goals imply new spending (e.g. development of a sustainable funding strategy), there is not necessarily a row for each and every goal. The cost estimates below are presented as a range that reflects both uncertainties in the marketplace as well as options that the state has in how it formulates each project. The cost estimates are also divided between one-time capital expenditures and ongoing, recurring operational expenditures.

Sec. No.	Programmatic Goal	Cost Est. High	Cost Est. Low	Cost Est. Avg.
One-time capital expenditures:				
4.2.1	Improved statewide elevation data	$14,000,000	$7,000,000	$10,500,000
4.2.4	Development of a business plan for statewide parcels and outreach to KDOR	$40,000	$20,000	$30,000
4.2.5.a**	Fund DASC statewide completion of road centerline improvements	$100,000	$70,000	$85,000
4.2.5.b**	Fund the development of a collaborative project between KDOR/PVD & DASC to establish a statewide program to collect and maintain situs address information within the CAMA database	$250,000	$150,000	$200,000
4.2.5.c**	Fund DASC statewide completion of tax units	$60,000	$40,000	$50,000
4.2.8	Develop prototype for converting KDOT PLSS data to GIS form and then distributing via the web (likely through DASC)	$100,000	$50,000	$75,000
	TOTAL	**$14,550,000**	**$7,330,000**	**$10,940,000**

Ongoing, operating expenditures:				
4.2.3	DASC staff member to manage local government outreach program	$60,000	$40,000	$50,000
4.2.5	Additional DASC staff member to provide data custodianship for situs addressing, centerlines and tax units	$60,000	$40,000	$50,000

**   It should also be noted that the activities that are listed for section numbers 4.2.5a, 4.2.5b, and 4.2.5c are ongoing initiatives that have been initiated with project funding and are proceeding as further project funds are found. As such, the costs for these line items represents the estimated cost of accelerating these initiatives to be completed within an approximate 1-year timeframe.

6.4 Marketing the Program

The strategic planning process has been designed to be open and inclusive and there was broad participation across the Kansas GIS stakeholder community. As such, there is widespread knowledge of this planning effort and increasing awareness of some of the challenges that Kansas GIS practitioners face. As thoroughly documented above, the primary challenge that Kansas faces has been resource availability after 16 years of level funding and additional staff decreases.

One of the core recommendations of this plan is the formulation for a sustainable funding strategy that will enable Kansas to once again *advance* geospatial programs and address identified weaknesses. Toward that end, the initial marketing of this program needs to be aimed at senior staff, decision makers and legislators who can **influence resource allocation decisions**. The GIS Policy Board should take the lead in advocating for the vision behind this plan and the individual recommendations within their own agencies and organizations. Ultimately, Kansas has made great strides in developing a strong geospatial foundation. Now, after several years of watching staff and funding erode, it is time for a renewed push to reinvigorate geospatial programs by adding to that foundation and addressing the weaknesses documented in this plan.

Thus, the marketing of this program needs to be aimed at those who are less familiar with GIS but are in positions to influence resource allocation. At the same time, the **GIS stakeholder community** needs to be fully engaged in helping educate those people as to the value of GIS and in presenting unified support for the vision that underpins this plan and slate of recommendations.

6.5 Measuring Success

The success of implementing the recommendations contained within this plan hinges on two key factors:

1. The ability to **gain funding** to carry out these recommendations, and

2. The ability to form **strong, collaborative interagency relationships to sustain the efforts.**

Thus, these two factors provide the yardstick against which success can be measured.

7 Appendix 1

GIS Strategic Planning Workshops Attending Organizations	
Topeka Session July 11, 2007	Salina Session September 19, 2007
Atchinson County	Allied Information Solutions
Barton County	Barton County
Couley County	Brown County
Douglas County	BWR Corp/GISPB
Fort Hays State University	City of Hutchinson
HSMM AECOM	City of Junction City
Kansas Adjutant General's Department	City of Ottawa
Kansas Department of Agriculture	Dickinson County
Kansas Department of Revenue	Ford County
Kansas Department of Transportation	Fort Hays State University
Kansas Information Technology Office	Harper County
Kansas Rural Water Association	Jackson County
Kansas Water Office	Kansas Data Access and Support Center
Natural Resources Conservation Service	Kansas Department of Transportation
Osborne County	Kansas Dept. of Health and Environment
R&S Digital	Kansas Geological Survey
Seward County	Kansas Information Technology Office
Team Tech	Lincoln County
United States Geological Survey	McPherson County
	Phillips County
	Russell County
	Saline County
	Sumner County
	U.S. Department of Agriculture
	U.S. Department of Homeland Security
	United States Geological Survey
	Westar
	Wilson and Company