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Appendix 2 – Detailed Review of KDOT and State of Kansas Initiatives

This section will detail several categories of initiatives that will impact the GE of KDOT’s enterprise. Among the initiatives reviewed were efforts by KDOT and the State of Kansas.

1.1 KDOT Initiatives

This section will highlight other KDOT initiatives and initiatives undertaken by the State of Kansas that will impact GE effort.

Among these factors are:

1. KDOT Strategic Information Technology Plan, 2003
2. KDOT Strategic Management Plan, 2003

1.1.1 KDOT Strategic Information Technology Plan (SITP), 2003

This section will provide a synopsis of the KDOT SITP. Focus areas will be those that directly impact the GE effort.

KDOT’s IT department provides 5 major products to the enterprise. These are listed below:

1. **Infrastructure** – telecommunications and network connectivity to all KDOT employees.
2. **Data** – collection, storage and retrieval of critical KDOT data.
3. **Applications** – the systems and programs that are used by KDOT.
4. **Support** – support for the hardware, network and software used by KDOT personnel, KDOT’s business partners and traveling public.
5. **Expertise** – staff to support the specification, development and maintenance of KDOT applications.

There are several major strategies in the SITP. The following are some of the strategies that have been identified to meet the IT objectives:

1. Move closer to real time.
2. Move workflow out to all end users.
3. Design in ability to change components.
4. Phase out obsolete or inefficient technologies.
5. Consolidate databases to enterprise view - KDOT estimates at least 30-50% of this data across the enterprise is redundant. Making copies of data that exists in one of the operational databases creates too many user applications.
7. Fully utilize infrastructure capabilities.

These strategies become foundational in evaluating the current and future technology initiatives KDOT undertakes.

KDOT has 110 applications that were identified by IT as being ‘most critical’. These represent the most critical applications identified by IT. Several of these applications contain multiple programs and others are simply a spreadsheet. These are the applications that are primarily used in the deployment of the Comprehensive Transportation Program (CTP).

As mentioned earlier, KDOT’s IT department went through an exhaustive inventory of the most pertinent business applications. KDOT’s IT department has constructed a “value chain” to classify the various systems and data structures. This projects these elements onto the major business processes undertaken by KDOT. Figure 1 conveys the KDOT Value Chain with application assignment.

**Figure 1 The KDOT Value Chain with Applications**

This graphic helps to strategically locate where the most critical applications lie within the major categorical business layers within the KDOT enterprise. In addition,
the value chain allows each application to be distinguished as either a business management or transportation system process.

While KDOT maintains an extremely large amount of data there are a few major classifications critical to the central business processes. Figure 2 illustrates KDOT’s Enterprise data architecture.

Figure 2 KDOT’s Enterprise Data Architecture

Over the course of time KDOT should to consolidate a good percentage of these applications. KDOT’s IT department have overlain these major data categories onto the KDOT Value Chain (Figure 3). This illustrates the correlation between data classes and business process.
These are critical factors that can help identify the opportunities to geospatially enable KDOT’s enterprise.

1.1.2 KDOT Strategic Management Plan, 2003

The KDOT Strategic Management Plan (SMP) was also reviewed to have a fundamental understanding of how high-level management policies can impact the geospatial enablement effort. This document consists of KDOT’s Strategic Plan and Management Plan.

The SMP is designed to function as a directional tool for KDOT. It attempts to answer the following relevant questions pertaining to KDOT:

1. Where is KDOT now?
2. Where does KDOT want to be?
3. When does it want to be there?
4. How does KDOT get to where it wants to be?
5. How does KDOT tell if it’s getting where it wants to be? Overviews of both the Strategic and Management Plan will be provided in the following subsections.

1.1.2.1 Strategic Plan

The Strategic Plan establishes the direction KDOT is moving toward. It consists of the following goals:

1. **Completion of the Comprehensive Transportation Program (CTP) on time and within budget.** Objectives to include:
   - CTP Implementation - Develop the programs, schedules, and performance measures required for achieving success of the CTP. Strategies to include:
     1. Define Success Indicators.
     2. Establish transportation Revolving Fund.
     3. Local Railroad Crossing for non-state system.
     4. Enhance public transit.
     5. Establish aviation program.
   - CTP Completion – Identify program deficiencies and progress variance that would prohibit completion of CTP. Strategies to include:
     1. Success indicator review.
     2. Annual review of SMP.
     3. Review of project noise abatement procedures.
   - CTP Revenues – Properly plan and manage financial resources needed to complete CTP. Strategies to include:
     1. Issue 20-year bonds for CTP.
     2. Seek legislation to maximize federal aid.
     3. Ensure adequate funding from State General Fund.
     4. Maximize revenue from future federal transportation programs.

2. **KDOT will continually improve as an organization.** Objectives to include:
   - Managers Core Values – Identify improvement areas from 2000 internal survey. Strategies to include:
     1. Managers must implement core value initiatives.
     2. Management must evaluate core values.
     3. Identify and implement department-wide core value initiatives.
   - Manager Leadership Priorities – Improvement of KDOT’s organization culture. Strategies to include:
     1. Implement leadership initiatives that improve overall leadership.
     2. Evaluate leadership initiatives to communicate successful efforts department wide.
     3. Implement specific successful leadership initiatives department wide.
   - Improve organizational effectiveness. Strategies to include:
     1. Review of SMP with department managers.
     2. Publish SMP throughout the department.
3. Periodic review of Strategic and Management goals, objectives and strategies to ensure compliance.
4. Review key issues to determine new actions.

3. **KDOT will build relationships with all of its nongovernmental customers and partners.** Objectives to include:
   - Determine external customer expectations. Strategies to include:
     1. Management will strive to implement external customer initiatives.
     2. Communicate external customer initiatives department wide.
     3. Successful external customer initiatives will be implemented department wide.
   - Cultivate public trust through external communications. Strategy includes:
     1. Public involvement liaison to each district.
   - Develop business relationships with KDOT’s private sector partners. Strategies to include:
     1. Initiatives that foster more coordinated relationships with business partners.
   - Develop and promote initiatives to reduce fatalities and injuries on Kansas’s roadways. Strategy includes:
     1. Legislative measures to support safety initiatives.

4. **KDOT will maximize the effectiveness of its workforce.** Objectives to include:
   - Develop strategy to replace experienced personnel losses. This includes:
     1. Establishment of career ladder.
   - Stimulate efforts to hire qualified personnel. Strategies include:
     1. Enhance recruiting at campuses, tech schools and job fairs.
     2. Improve minority and female hiring and retention.
   - Privatization where necessary to effectively utilize state resources. To include:
     1. Development of SOP’s for privatizing decisions.
   - Improve workforce by Headquarters consolidation into one location. To include:
     1. Preparation of new facility.
   - Disaster recovery plan with department specific elements.

5. **KDOT will optimize technology to improve overall department operations.** Objectives to include:
   - Strengthen the information infrastructure. This includes:
     1. Update all telecommunications media.
     2. Enhance statewide 800 Megahertz radio system.
     3. IT contingency plans to minimize service disruptions.
   - Develop specific infrastructure solutions. To include:
1. Investigate new financial management process – state accounting system.
2. Standard record and workflow management system.
3. Develop information warehousing system.
4. Update GIS Strategic Plan.
5. Roll out integrated design environment to the districts.
   o Integrate applications. To include:
     1. Enhancement of CPMS.
     2. Enhancement of CANSYS.
     3. Enhancement of PMS.
     4. Conversion of CMS to a new platform.
     5. Develop and enhance TRIS.
     6. Develop an access permit database.
     7. Develop LIMS.
     8. Develop and enhance a Right of Way tracking system.
    10. Enhance TSIMS.
   o Continue to research and develop new technologies to strengthen KDOT.

6. KDOT will enhance its relationship with all of its intergovernmental customers and partners. Objectives to include:
   o Influence national transportation issues via participation in outside associations.

1.1.2.2 Management Plan

The Management Plan provides the rationale for day-to-day operations by management at KDOT. It furnishes performance measures to gauge KDOT’s progress to reaching management objectives. The following section provides an overview of the objectives.

1. To provide the direction, planning, coordination, communication, and administrative support that fosters an integrated, multimodal transportation system meeting the needs of Kansas. To be done through:
   o To provide strategic direction through the Comparison Report/CTP.
     Strategies include:
     1. The Strategic management planning elements are completed.
     3. Support policies to guide KDOT toward its mission.
   o Provide a vital information link between KDOT and its customers. To be done through:
     1. Two-way communication with employees.
     2. Effective dissemination of information to the public and media.
     3. Accurate and effective communication with government partners.
4. Clear communication with business partners.
   o Ensure projects are managed to maximize KDOT’s resources. Achieved through:
     1. Project control and system monitoring.
     2. Ensure compliance with federal guidelines.
   o Accurately analyze information needed to determine Kansas’s long-range transportation needs. To be done through:
     1. Long range plan based on public needs, transportation data and future projections.
     2. Gather and maintain accurate data on traffic and roadway conditions.
     3. Report system need findings via plans, reports and maps.
     4. Coordinate development of technologies that enhance safety management.
     5. Utilize GIS technology to achieve KDOT’s mission.
   o Use the most accurate highway data to identify priority construction and maintenance needs.
   o Attract, train and develop a quality workforce. Done through:
     1. Effective human resource plan.
     2. Solid employee relations.
     3. Strengthened recruiting process.
     4. Facilitate employee development to maximize performance.
     5. Evaluate compensation classifications.
     6. Ensure positions properly classified.
   o Provide financial services support to KDOT’s objectives. This includes:
     2. An Accounting Transaction process.
     3. Produce GAAP basis financial statements to internal and external participants.
     4. An effective procurement process that produces goods and services at the lowest possible cost.
     5. Manage financial instruments for maximum return without unreasonable risk.
     6. Effective deployment of the Transportation Revolving Fund to provide needed assistance to local governments.
   o Provide optimal information technology to effectively help KDOT achieve objectives. Done through:
     1. Strategic IT Plan.
     2. Strengthened Information Infrastructure.
     3. Integration of KDOT information systems.
     4. Standards for application development.
   o Strengthen support services needed to achieve objectives of the CTP. To include:
     1. Quality production of presentations and reports.
     2. High quality photographs for reporting.
     3. Streamline and effective material duplication.
     4. Adequate facilities to material generation.
Effective resource management to support construction and maintenance. Achieved through:
1. Proper inventory levels of people and equipment.
2. A Capital Improvement Program that provides the needed facilities.
3. Ensure new technologies are utilized in the construction and maintenance processes.

Ensure transportation plans meet the highest modal needs. To be accomplished through:
1. Incorporation of public input into Public Transportation strategies.
2. Distribute available federal funding and provide technical assistance for safety projects.
3. Provide urban planning assistance and funds as needed.
4. Improve reliability and safety of public-use airports.
5. Incorporate rail into state modal plans.

2. **To provide assistance for safe, efficient and reliable local multimodal transportation system.** This will be supported by the following objectives:
   1. Assist local entities in developing road construction projects that maximize state and federal aid. To include:
      1. Development of a 5-year plan for cities and counties to leverage available funding.
      2. Deploy a strategy to aid local engineers in maximizing financial aid.
   2. KDOT will work with local entities to help them develop a comprehensive transportation system. This includes:
      1. Define programs to help local government provide adequate public transportation to all Kansas citizens.
      2. Utilize National Highway Traffic Safety Administration funds to ensure safety of local road systems.
      3. Assist local government with city connecting links, geometric improvements and economic development projects.
      4. Provide support for airport safety inspections and adequate runways.
      5. State Rail Plan that utilizes federal and state loans for new projects and rehabilitation efforts.

3. **Preserve the State Highway System as built or in an improved condition.** To be accomplished through the following objectives:
   1. Identify areas to perform proper maintenance of the State System. To include:
      1. Road Maintenance Plan to address comprehensive and routine maintenance needs of the system.
      2. Bridge Management Plan that includes inspection of bridges on the State System to identify maintenance needs.
4. **Develop and construct projects that provide a quality state highway network to meet the needs of the public.** This will be done by the following objectives:

- Develop specific scope, schedule and plan for construction and rehabilitation projects. This includes:
  1. Collection of appropriate background data to form project plans.
  2. Preparation of proper plans for projects.

- Ensure projects are ready for construction letting. To be done by:
  1. Effective Right-Of-Way clearance strategy.
  2. Ensure utility related concerns are settled prior to construction.

- Award cost effective bids for highway projects. To include:
  1. Ensure contractors have clear contract specifications.
  2. Conduct constructability reviews to ensure accurate proposals.
  3. Evaluation of project costs through comparison of bids to KDOT’s estimates.

- An effective Construction Project Administration Plan to ensure projects are completed on time and according to specifications. This includes:
  1. Address change orders so that changes are cost effective.
  2. Construction cycle inspections of projects to ensure compliance with KDOT standards.
  3. Final approval processes to ensure projects are completed according to contract.

The Strategic Management Plan is the wrapper around all of the other initiatives undertaken by KDOT Stakeholders. Several of the objectives have a direct impact on lower level IT and Planning initiatives. These over-riding objectives must frame the GE effort. The GE effort will add value to all of the state transportation system’s life cycle.

### 1.1.3 Kansas Long Range Transportation Plan (LRTP), December 2002

The LRTP is a policy document that functions as a basis for the State of Kansas transportation planning process. It provides direction for the future. The Plan encompasses a 20-year planning horizon. It encompasses all modes of transportation in Kansas. The LRTP was written with the cooperation of local, state, and federal agencies and the Indian Nations of Kansas. The LRTP reviews trends in demographics, travel, and transportation funding to provide a vision for transportation in Kansas. In addition to the road network the plan attempts to look at all modes of transportation within the state of Kansas that are required to deliver a complete transportation system. The needs of rail, airport services and public transit are addressed in the plan.

The major categorical areas the plan addresses are as follows:

1. KDOT’s Decision Making Process
2. Trends Affecting Transportation
3. Road, Streets and Highways—Conditions and Needs. To include:
4. Other Transportation Modes. Including:
   - Aviation
   - Bicycle and Pedestrian
   - Rail
   - Public
   - Water
   - Intermodal

5. Integration of Transportation Modes and Technologies. To include:
   - KDOT’s Role and Partners
   - Transportation and Land Use Correlation
   - Making Things Work Together

6. Other Factors for Consideration. These includes:
   - Safety
   - Research
   - Security and Emergency Response
   - Social Impacts
   - Air Quality Standards
   - Environmental Issues
   - Advances in Alternative Fuels
   - Transportation and Tourism

These are the overall areas the plan addresses in significant detail. Almost every element of this plan deals with data that is spatially enabled in one form or another. The largest technology content in the plan deals with the integration of ITS into KDOT’s mainstream business practices.

1.2 State of Kansas Initiatives

The state of Kansas has several information management technology plans in place that will impact the GE effort undertaken at KDOT. Among those are:

2. State Geographic Information and Related Technology (GI/GIT) Profile

1.2.1 Kansas Strategic Information Management Plan (SIMP), January 2002

The SIMP was reviewed because of KDOT’s participation in statewide IT initiatives. The state of Kansas has an Information Technology Advisory Board (ITAB) that all Kansas Agency IT Directors participate on. This board is an integral piece of the
Kansas Consolidated IT Governance Model. Policy planning under this model is overseen by:

1. Information Technology Council (ITEC)
2. Chief Information Technology Architect (CITA)
3. Kansas Information Technology Office (KITO)

The overall structure of the Governance Model is illustrated in Figure 4. This figure is courtesy of the Kansas SIMP.

**Figure 4 Kansas IT Governance Model**

The overriding goals with particular objectives of the SIMP that influence KDOT’s GE initiative are as follows:

1. **(Customer Perspective): Provide broad access to public information and services.**
   - **Initiative #1-A-2:** Develop an integrated one-stop Trucking portal for the state of Kansas incorporating services from the Kansas Corporation Commission, the Kansas Department of Revenue, and the Kansas Department of Transportation.
   - **Initiative #1-A-3:** Publish standards for Website development for integration into the Kansas Statewide Technical Architecture.
o **Initiative #1-C-1**: Survey existing locator services and search engines to identify “best of breed” for implementation of a Kansas Government Information Locator Service (KGILS).

o **Initiative #1-C-2**: Define metadata standards for a KGILS.

KDOT currently has a Truck Routing Information System (TRIS) for the routing of oversize/overweight vehicles. This initiative should be leveraged by the State of Kansas. KDOT has already performed the design and testing of this type of system and this would give KDOT the opportunity to provide technical leadership to the state of Kansas. KDOT should play a key role in the formulation of standards for website development. KDOT has invested a great deal of funding and developed domain expertise the state of Kansas could benefit from. The existing locator service correlates to the ability to identify good information sources. KDOT has expertise in this realm via the design of the KGATE. In addition, KDOT should play a central role in the development of metadata standards based on the research and acceptance of FGDC metadata.

2. **(Financial Perspective): Use public and private resources effectively and efficiently.**
   
o **Initiative #2-C-6**: Implement Geographic Information System (GIS) interface capability for state agencies’ applications, to allow ortho-imagery displays of geo-referenced application data.

   KDOT’s should take an active role in this initiative. KDOT has already established a framework the state of Kansas can leverage in meeting this objective. KDOT should take advantage of the opportunity to drive policy with regards to GIS applications within the state of Kansas.

3. **(Internal Business Perspective): Manage government IT resources effectively and efficiently.**
   
o **Initiative #3-B-3**: Designate lead agencies for multi-agency system development projects; lead agencies shall retain responsibility and authority for project management and cross-agency coordination.

o **Initiative #3-B-4**: Designate specific agencies as Centers of Expertise for particular technologies with widespread use in state government, or labeled as an “emerging technology”.

   This is a perfect initiative to market and leverage all the TerraShare work that has been done at KDOT to the State as well as its web design knowledge (KGATE, KanRoad, TRIS).

4. **(Learning and Growth Perspective): Promote economic development and citizen awareness in Kansas, and IT proficiency within Kansas state government.**
o **Initiative #4-B-1**: Provide network connectivity to Kansas schools, libraries and hospitals through the KAN-ED network.

o **Initiative #4-B-2**: Expand the KAN-REN network among institutions of post-secondary education to provide Internet2 access by KAN-ED network nodes.

KDOT will need to tie into this initiative to get a larger presence in the education system. This will allow KDOT to have greater influence over the skill sets that are developed at the post-secondary educational level.

These are the major salient points of the SIMP that KDOT should attempt to exploit.

### 1.2.2 State Geographic Information and Related Technology (GI/GIT) Profile, February 2000.

The state maintains a fulltime State GIS Director to provide staff support to the GIS Policy Board. Additional support is provided by the Data Access and Support Center (DASC), a state-funded center located at the Kansas Geological Survey with the purpose of providing archival and distribution services for digital GI to many users of GI/GIT in Kansas.

The GIS Policy Board is tasked to:

1. Establish a strategic management plan to guide the development and implementation of GIS technology to benefit the citizens of Kansas, and update the plan biennially.
2. Develop and maintain policies, standards, guidelines, and strategies, which emphasize cooperation and coordination among government entities developing and implementing GIS in order to maximize the cost effectiveness and value of GIS to the state.
3. Establish public and private partnerships throughout Kansas to maximize value, minimize cost, and avoid redundant activities in the development and implementation of GIS.
4. Coordinate, review, and provide recommendations on GIS programs and investments and provide assistance with dispute resolution among GIS partners.

In 2000 the policy board undertook the following initiatives:

1. Spatial data standards development, implementation, and maintenance
2. Development and coordination of foundational data for use with GIS
3. Metadata development, implementation, and discovery support
4. Geodetic Control Densification
5. 4,000 Scale National Hydrologic Database Development
6. Educational Activities through the MidAmerican Geographic Information Systems Consortium (MAGIC), the National States Geographic Information Council (NSGIC), and the K-12 Kansas Collaborative Research Network (KanCRN).
The GIS Policy Board annually funds database development projects of statewide importance, which become part of the state’s “core” database holdings, and then become available for distribution through DASC. KDOT should seek to influence any statewide database schema and policy statements that emanate from the policy board.


This plan was comprised of four separate strategic tracks. The four tracks consist of Database, Services, Management, and Information Access. All of these tracks consist of a series of task for successful deployment. The tracks will be discussed in the following paragraphs.

**Database Track**
The objectives of the database track are:
1. Develop clear and accepted data standards.
2. Involve end users in the technical standards process.
3. Develop a well-defined geospatial data framework.

These objectives will be met in the following manner:
1. GIS users will adopt standards related to the characteristics for geographic data sets, their maintenance, and the transfer of it among users.
2. Kansas GIS community will accept the geospatial data framework, which identifies the essential geographic databases and attributes necessary for the development of new databases. This will allow the seamless integration of databases for exchange and analysis of spatial data.

KDOT has been an active participant in carrying out these objectives. It makes available the major transportation content to the state clearinghouse. The non-state rural network will be posted to DASC when available (Q1, 2005).

**Services Track**
The objectives of this track are:
1. Support the application of GIS technologies by state agencies and local governments.
2. Continue DASC’s clearinghouse role for “core” (framework) databases, expand its role to include Kansas’ framework databases, and provide metadata and locational pointers for other spatial databases.
4. Define and establish mechanisms for user support.
5. Encourage the implementation of GIS technologies and the sharing of spatial data by all users.
These objectives will be supported by the following strategies:

1. DASC will serve as a clearinghouse for core (framework) databases and selected databases within the Kansas Geospatial Data Framework. DASC will also provide metadata information for other geospatial data from all Kansas sectors.
2. GIS databases will be shared at a minimal cost to the user.
3. DASC will provide support services for the application of GIS technologies for the geospatial community.
4. GIS technologies will increase in use within state, local, and private agencies. State and local government agencies will be exposed to the activities of the Policy Board.

**Management Track**
The objectives of this track will be to:

1. Spur the definition of responsibilities for government and private entities in the development of geospatial databases.
2. Establish procedures for partnerships among government and the private sector.
3. Encourage government and the private sector to include GIS funding as a budget item.

The following strategies will be applied to meet the management track objectives:

1. The Policy Board and spatial data developers will partner to delineate roles and responsibilities for data development. This will assure the adherence to standards, no duplication of data, promote the efficient use of financial and human resources, and assure the sharing of the developed GIS databases.
2. The State GIS Coordinator will lead efforts to expand, develop, and maintain GIS technologies and data themes.
3. The state GIS management structure will become institutionalized in Kansas.

KDOT has actively participated in partnerships with private sector and other state agencies. KDOT is represented on the GIS policy board to aid in shaping of policies that govern partner relationships.

**Information Access Track**
The objectives of the information access track are:

1. Provide guidance on the legal issues regarding the creation and the release of spatial data.
2. Begin the process of modernizing laws and regulations relating to digital information.

The following strategies will be applied to meet the information track objectives:
1. Citizens’ privacy rights and information relating to endangered species, historical sites, archeological finds, and other sensitive information, will be protected from unauthorized, unscrupulous and/or commercial abuse of spatial databases through legal restrictions and GIS community norms.

2. Developers of geospatial data will not have legal liability for unintentional human errors in their databases. Providers of the data will not have legal liability for the distribution of data with errors.

3. The GIS community will abide by laws and norms regarding the protection of privacy and sensitive information.

KDOT should play an active role in any legislation governing the legal climate surrounding spatial data.

In concluding, the State GIS Strategic plan is in the process of being revised. KDOT should seek to aid the GIS Policy Board in directional strategies for the revised plan.