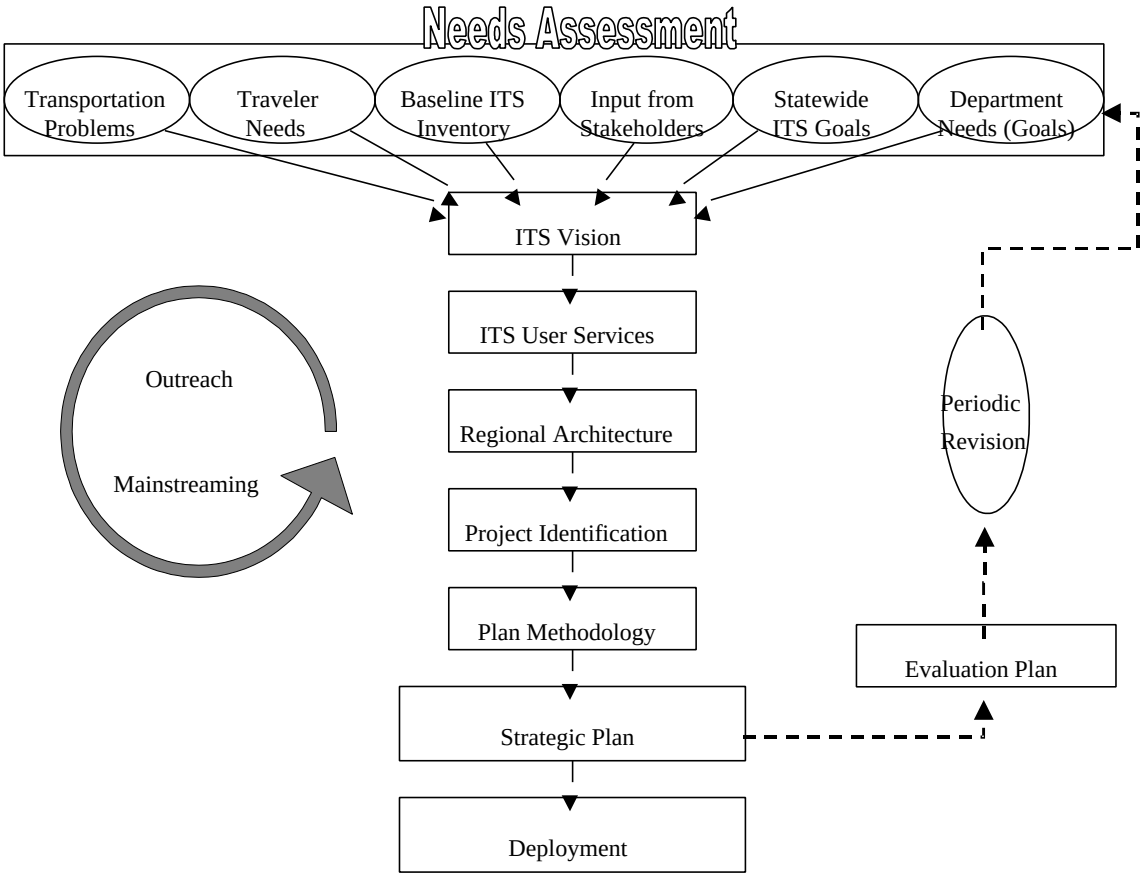
INTRODUCTION

The Kansas Statewide ITS Plan is a strategic plan to deploy Intelligent Transportation System (ITS) technologies throughout the state. Currently, the Kansas Department of Transportation (KDOT) has several ITS initiatives and technologies at various stages of deployment. The next step was to develop a coordinated strategic plan to integrate these existing technologies with new deployments to avoid duplication of efforts and to use existing and future infrastructure wisely. This plan assesses the needs of Kansas for ITS and develops both short-term and long-term strategies for addressing those needs. Further, the Statewide ITS Plan defines the direction KDOT will want to take, identifies ITS projects and develops a strategy for integrating and mainstreaming ITS into the KDOT structure. Ultimately, this plan will establish the blueprint for a successful statewide ITS system.

Figure 1 shows a flow chart of the process that was used to develop the Statewide ITS Plan for Kansas. The detailed results of this process are documented in the full version of the Kansas Statewide ITS Plan. The full version of the plan includes four sections: Baseline Condition Report, Analysis of ITS Elements, Plan Methodology and Strategic Deployment Plan. This document presents a summary of the full plan.

Figure 1: Kansas Statewide ITS Plan



BASELINE

In Kansas, rural areas account for 97% of the total road mileage, 54% of the vehicle-miles traveled, and 78% of the total number of fatal accidents in Kansas. Due to the high percentage of fatal accidents in rural areas, it is imperative that efforts be made to improve safety in the rural environment. ITS can help in those efforts. Rural ITS encompasses seven critical program areas:

- Emergency Services
- Tourism Traveler Information Services
- Public Mobility Services
- Commercial Vehicle Operations
- Fleet Operations and Maintenance
- Travel Safety and Security
- Infrastructure Operations and Maintenance

These program areas are the basis for the federal rural ITS program. They were used to develop similar program areas for KDOT. The completed Baseline Condition Report illustrates the existing foundation of ITS in rural and urban areas of Kansas. Completing this needs assessment was the first step in preparing a Statewide ITS Plan for Kansas. The statewide ITS goals resulting from the Baseline were the basis for developing a regional architecture and strategic deployment plan for ITS in Kansas.

The baseline conditions were derived from a number of sources, including a review of existing documentation, ITS Awareness Seminars at the six KDOT district offices, interviews and meetings with KDOT personnel, and analysis of existing survey information. This input was used to define goals and a vision for a statewide ITS system in Kansas.

Kansas ITS Awareness Seminars

Two rounds of ITS Awareness Seminars were held in each KDOT district and at headquarters. Attendees included:

- KDOT personnel,
- city and county public works officials,
- transit and paratransit providers,
- EMS/law enforcement, and
- farming and business interests.

Each seminar was concluded with a question and answer session during which participants were encouraged to share their thoughts on ITS in general, to discuss applications specific to their work, and to help the project team develop an effective statewide plan. The discussions at the seminars were focused on:

- weather related applications of ITS and sharing of this information,
- where severe snowstorms are most likely to cause travel related problems,
- ITS applications that could help meet the challenge of getting travelers off the road before they are in danger or in areas where accommodations are inadequate, by providing real-time weather information,
- presenting the technology in terms of its capability to improve safety and efficiency, and
- technologies for maintenance personnel including automated vehicle location and road weather information systems.

Interviews with KDOT Personnel

Interviews were held with key personnel from the following KDOT Bureaus: Design, Traffic Engineering, Planning, Construction and Maintenance, Program Management, Computer Services, and the KDOT Metro Engineers in both Wichita and in Kansas City. The purpose of these interviews centered on three objectives:

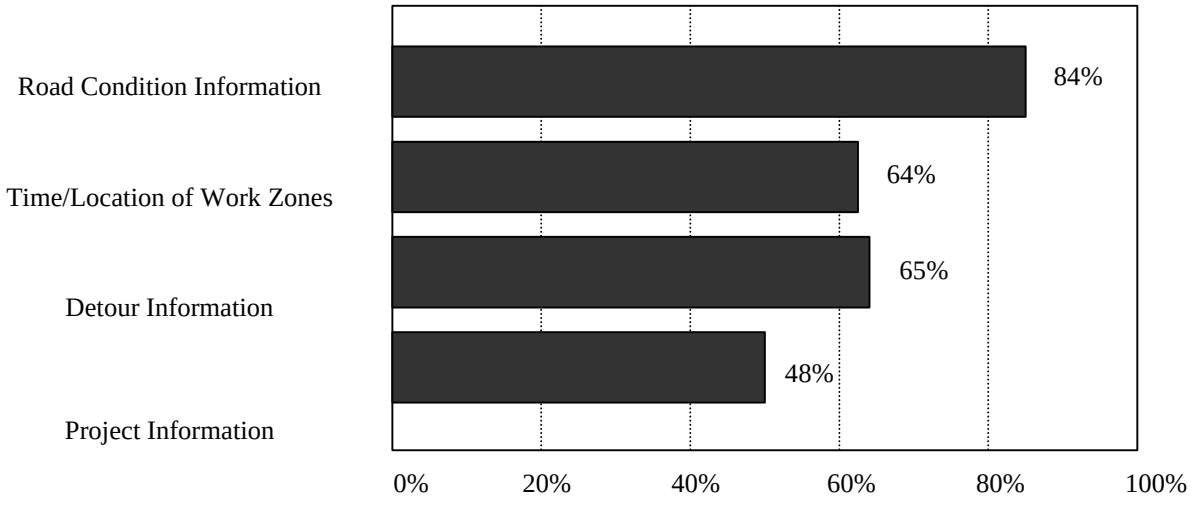
1. Learn what the bureau does and where it sees ITS fitting into the way it does business.
2. Find out its level of understanding about ITS.
3. Learn what ITS projects each bureau currently has and what potential projects exist in the short, medium, and long term.

Analysis of Survey Information

The consumer's response to KDOT was evaluated most notably in the area of traveler information. The chart in figure 2 shows some of the results from a survey conducted for KDOT related to consumer priorities for traveler information.

Figure 2: Information KDOT Should Supply to the Public

By Percentage of Respondents (total exceeds 100% because respondents were allowed to mention more than one type of information)



Statewide ITS Goals

A focus area of the Statewide ITS Plan is rural applications. Also, in order to have a successful Statewide ITS Plan, this plan must be structured around goals for the statewide ITS system. These goals will complement KDOT's primary goal of increasing safety, security, mobility, and efficiency. From analysis of the baseline conditions, the five major statewide ITS goals are to:

- Mainstream ITS into standard KDOT business procedures,
- Integrate existing ITS programs into the KDOT system,
- Continue to educate KDOT and the Kansas public on ITS alternatives and benefits,
- Identify potential ITS projects and funding sources, especially for rural areas, and
- Prioritize ITS project areas.

ITS Vision for Kansas

The Kansas ITS Vision was developed based in part on the results of the Baseline Condition Report. The vision defines what the statewide ITS system will look like in 20 years. The vision states that Kansas ITS will be an open, integrated and cost effective system that ensures safer, more secure and efficient movement of people and goods across Kansas through the use of advanced technologies and management strategies. This vision will guide the Kansas ITS planning process for the next 20 years.

PROJECT DEVELOPMENT

Projects involving ITS in Kansas will start with an ITS Project Sheet and will be stored in an Access database, called the Kansas ITS (KITS) Project Database. This database provides easy sorting and querying capabilities and can be used to track the status of all Kansas projects involving ITS. It will be maintained and updated as new projects are identified or existing ones are modified. The project sheets will play an important role in assessing each project's conformance with the statewide ITS architecture.

ITS Architecture

An ITS architecture provides the framework of a system outlining how the individual components, whether an element or an agency, communicate together and work with the other components of a transportation system. The purpose of developing a Kansas Statewide ITS architecture is to define the coordination of ITS applications in Kansas and their fit within KDOT organizational structure and physical infrastructure.

Standards

Developing an ITS architecture provides a sound basis for identifying where ITS standards are needed. The USDOT has undertaken a large effort to facilitate

development of standards for communication between different ITS components. A number of standards have already been completed that will enable users to purchase ITS products and services from a range of competitive providers. ITS standards allow for system integration and interoperability.

STATE TO STATE COORDINATION

A key issue that should be considered in the development of the Kansas Statewide ITS Plan is the value of cooperation with other states. Significant benefits can be achieved by forming multi-state alliances for the deployment and operation of ITS. Consistency and integration across state lines is critical for some applications, particularly commercial vehicle applications and advanced traveler information systems (ATIS).

Commercial Vehicle Operations	Kansas agencies responsible for enforcing commercial vehicle operations (CVO) must be able to communicate with similar agencies from other states to enable nationwide access to credentials and safety information for administration and enforcement functions. It is important for neighboring states to use compatible ITS/CVO systems, which is being accomplished by a national initiative, Commercial Vehicle Information Systems and Networks (CVISN).
Advanced Traveler Information Systems	Traveler information regarding road and weather conditions is an ITS service that can benefit from state to state coordination. Another information sharing activity would be having a link on the KDOT traveler information web site to the Colorado DOT traveler information web site (and vice versa) to allow easy access to multi-state traveler information.
Traffic Management System in Kansas City	Kansas City is a major metropolitan area that includes areas on both sides of the Missouri-Kansas state border. Currently, there is a bi-state partnership between Kansas and Missouri to develop a shared Traffic Management System (TMS) called Scout. The Traffic Operations Center (TOC) building will be located in Lee's Summit, Missouri, and will be operated and maintained by MoDOT personnel. It will be used to monitor and manage traffic conditions on freeways in both Missouri and Kansas. Ongoing cooperation and information sharing between Kansas and Missouri are keys to the success of this project.
ITS Heartland	ITS Heartland is a regional chapter of ITS America that is made up of the states Kansas, Missouri, Iowa and Nebraska. The purpose of this organization is to increase interregional coordination between the member states on ITS-related projects and research. This includes conducting pooled fund studies, sharing ITS data, and ensuring interoperability between ITS systems.

KANSAS ITS PROGRAM AREAS

Since many of the Kansas ITS projects are similar in nature and scope, it makes sense to group "like" projects into program areas so that they can be analyzed together and recommendations developed. The program areas were created to encourage a more integrated approach to ITS deployment in Kansas.

Five program areas were used to analyze Kansas ITS projects.

- Priority Corridors
- CVO
- Maintenance
- Traffic Operations
- Rural Safety and Mobility

Some of the potential issues addressed in these program areas include:

1. Interagency coordination,
2. System architecture,
3. Telecommunications needs,
4. Operating cost analysis,
5. Benefit/cost analysis, and
6. Opportunities for public/private partnerships.

Priority Corridors Program Area

This program area includes rural ITS projects that are being deployed on a specific corridor. One priority corridor in Kansas is the I-70 corridor, and some of the ITS applications that are being considered for this corridor include advanced traveler information systems (ATIS), weigh-in-motion (WIM), and fiber optic communications.

Interagency coordination	The agencies involved in the priority corridor program include: KDOT, KHP, Kansas Dept. of Commerce and Housing (Tourism Division), Kansas Turnpike Authority (KTA), local transportation agencies, emergency service providers, National Weather Service (NWS), television and radio stations, and other state agencies. Agencies such as KDOT, KTA, KHP, NWS and Kansas Department of Commerce and Housing would gather traveler and tourism information and send it to a Statewide Traffic Operations Center where it can be processed. KDOT could then process the data at the Center and send it on to the traveling public and other agencies.
System architecture	Developing a good ITS architecture can eliminate redundant, stand-alone systems and provide a more integrated system. The development of a central ATIS Center as part of the Statewide Operations Center is one of the potential ITS projects being considered in the Kansas ITS Statewide Plan.
Telecommunications needs	A variety of telecommunications resources will be required to connect the Kansas ATIS Center to information sources, information users, and dissemination devices. These telecommunications resources may include optical fiber, leased telephone lines, 800 MHz and microwave radio, cellular/PCS, WAN/LAN, or satellite systems.
Operating cost analysis	Currently, the ATIS elements being planned along corridors contain stand-alone systems. By integrating these systems, several cost advantages can be gained that would minimize the operating costs of such a system. Costs of maintaining the communication infrastructure can be shared among the various projects comprising the various priority corridors. This cost sharing serves to lower the incremental cost for each additional component as it is added to the system.
Benefit/cost analysis	The magnitude of benefits for the types of projects being considered under this program area varies greatly depending on many deployment factors. These factors include the location of components, quantity of components deployed, how the components will be used, and the characteristics of travel on the transportation facilities. Many of the projects planned, such as VMS and HAR deployments, provide the greatest level of benefits when deployed on facilities with non-recurring congestion and weather related closures. The benefits resulting from the Priority Corridors deployments would vary depending on the market sector using the capabilities of the system.
Public/private opportunities	One of the main reasons for seeking a partnership with the private sector is that ITS demands large financial investments (which can be eased by private investment) but it depends on access to state-owned or controlled transportation infrastructure. The Priority Corridor program area provides many opportunities for public/private partnerships. For example, KDOT could contract with a private entity that would provide value added traveler information such as touch-tone telephone services, Internet web sites and kiosks. KDOT would still be in charge of providing the basic traveler information services of VMS and HAR, which will be available to everybody.

Commercial Vehicle Operations (CVO) Program Area

This program includes the ITS/CVO projects being deployed in Kansas. The state is currently developing an ITS/CVO Business plan that will define an architecture for CVO/ITS as part of the Commercial Vehicle Information Systems and Networks (CVISN) project sponsored by FHWA.

Interagency coordination	The CVO Program requires a great deal of interagency coordination within Kansas. The primary agencies outside of KDOT are the Department of Revenue (KDOR), the Kansas Highway Patrol (KHP), the Kansas Corporation Commission (KCC) and the Kansas Motor Carriers Association (KMCA). These groups, together with KDOT, make up the CVO Executive Working Group for Kansas.
System architecture	The system architecture for the CVO program is anticipated to contain new deployments to the administrative center, roadside, and vehicle systems that will allow improved CVO processes. These improvements potentially include electronic credentialling, electronic data transfer, electronic roadside screening, and improved data record access.
Telecommunications needs	To be determined in the Kansas CVO Business Plan
Operating cost analysis	The CVO program area will incur significant deployment costs. However, the ongoing costs required to operate and maintain the systems will be offset by the reduction in processes that must now be performed manually.

Benefit/cost analysis	ITS projects deployed to improve commercial vehicle operations have been estimated as having some of the greatest promised returns on investment of any ITS improvement type. By improving CVO compliance processes, the speed at which goods may be delivered can be increased while improving the safety of those movements. ITS/CVO deployments produce various benefits for different market sectors including motor carriers, government regulatory agencies, and the traveling public.
Public private opportunities	The involvement of private sector carriers in the commercial vehicle arena provides many tangible opportunities for forging public/private partnerships. The involvement of the private sector in this program area is critical to the success of any ITS/CVO deployments. It is critical that the public sector and the carrier industry work together to not only minimize the costs of the deployment, but also coordinate the processes to maximize the utility of the system.

Maintenance Program Area

The maintenance program area includes ITS-related projects that fall under the domain of the KDOT Bureau of Construction and Maintenance. Examples of these projects include road/weather information systems (RWIS), the road condition reporting system (RCRS), installation of automatic vehicle location (AVL) and mobile data terminals (MDT) in maintenance vehicles and automated anti-icing systems for bridges.

Interagency coordination	The majority of information collected and disseminated with these types of maintenance projects will be used internally by the Bureau of Construction and Maintenance. There may be advantages to coordinating with, and sharing information with other agencies responsible for roadway maintenance. Other agencies responsible for public safety, such as KHP, could also use the information generated by the maintenance systems.
System architecture	Since the National Architecture has not yet defined subsystems for Maintenance Vehicles or Maintenance Centers, these subsystems have to be added. RWIS, RCRS, and AVL are all elements of the Maintenance Center Subsystem. This subsystem receives road condition information from the maintenance vehicle, emergency vehicle and roadway subsystems. The personal information access, remote traveler support, traffic management and emergency management subsystems all use the road condition information.
Telecommunications needs	The following telecommunication methods will be tailored to meet the telecommunications needs of the Maintenance Program area. These include Optical Fiber, Telephone Lines, 800 MHz Radio, Cellular and Satellite, WAN/LAN, and the integration of RWIS, RCRS, and AVL.
Operating cost analysis	Operating costs for the identified maintenance projects will consist primarily of equipment replacement/upkeep and training for maintenance vehicle operators. No additional staff should be required to operate the planned systems. The evaluation of technologies may require some staff time during the initial phases of the projects. The modest operating costs for these projects should be partially offset by the cost efficiencies provided by the automated collection of road maintenance data.
Benefit/cost analysis	The benefits from projects under the Maintenance program area typically accrue to those agencies deploying the projects. These benefits result from more efficient management of resources and labor, and the elimination of redundant processes. Benefits are also experienced by highway users and include improved roadway safety and travel conditions brought about by improved maintenance.
Public private opportunities	Few short-term opportunities exist to forge public/private partnerships with the maintenance projects. Legal and institutional issues block the potential to directly provide the collected data to the traveling public. However, the opportunity to share the collected data with an information service provider remains a narrow possibility. Potential long-term opportunities include equipping private vehicles with the data collection sensors to act as probe vehicles.

Traffic Operations Program Area

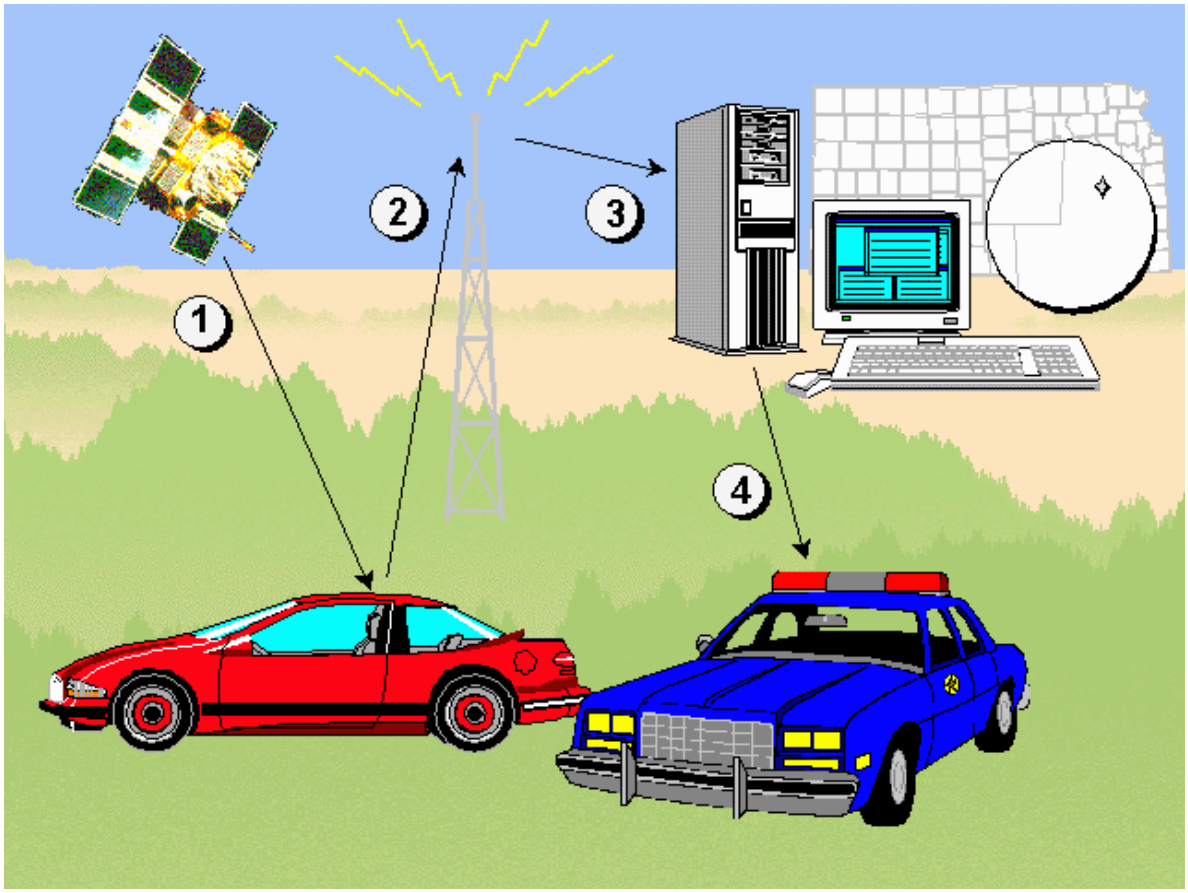
This program area primarily refers to projects aimed at improving traffic operations in metropolitan areas. Examples include the design of the Wichita Traffic Operations Center (TOC) and the Kansas City Scout Project. This area also includes the planning and design of a statewide operations center that would link the metropolitan TOCs and house a statewide TOC and regional traveler information center.

Interagency coordination	Traffic Operations Centers (TOC) require a great deal of interagency coordination. Large metropolitan areas such as Kansas City and Wichita are currently planning the deployment of TOCs, which will monitor incidents and manage the flow of traffic on freeways. These systems will require coordination between KDOT, KTA, local transportation agencies, KHP, emergency services, transit agencies, and the local media.
System architecture	This architecture is very similar to the Priority Corridor Architecture except that it is more focused on the traffic operations and less on road and weather conditions. The key subsystems in this program area are the traffic management subsystem and the statewide traffic operations center. The other subsystems in the architecture represent the systems that will convert the operations data to traveler information.
Telecommunications needs	The following telecommunication methods will be tailored to meet the telecommunications needs of the Operations Program area. These include Optical Fiber, Telephone Lines, Cellular and Satellite, and WAN/LAN. The availability of the optical fiber backbone is crucial for this program area since its bandwidth will be needed for transmitting video images across the state.
Operating cost analysis	Traffic operations projects require substantial expenditures for deployment and operation. The characteristics of these projects can result in the on-going operating costs greatly exceeding the capital deployment costs of the projects. These projects require significant dedication of staff and training. These projects can incur significant costs for the maintenance and operation of various components, such as communication links.

Benefit/cost analysis	The operations improvements that will result from the deployment of TOCs in Wichita and the Kansas City metropolitan area offer the potential for significant benefits. Similar deployments in various cities have been evaluated and provide relevant examples of the types and level of benefits that can be anticipated from these types of deployments. By providing the basic infrastructure needed to operate many potential future ITS deployments, the TOC project deployments should be able to reduce the incremental costs of adding new components. It is likely that the system expansion will result in greater benefits at lower incremental costs, raising the benefit/cost ratio over time.
Public private opportunities	TOCs serve several interrelated functions, one of which is to disseminate information collected from various systems (e.g., traffic detectors, RCRS, and RWIS) to drivers both before they begin their trip and while they are en route. Partnerships with the media could offer an effective means of disseminating this information at little or no cost to KDOT.

Rural Safety and Mobility Program Area

This program area includes all safety-related projects affecting the rural traveler, as well as rural transit. Examples include projects related to automatic collision notification (ACN), or Mayday Systems, work zone applications, rural transit applications, at-grade rail crossings and the Intelligent Vehicle Initiative (IVI). Characteristics of projects in this program area are very diverse. In the following table, ACN is used as an example of a predominantly rural application.

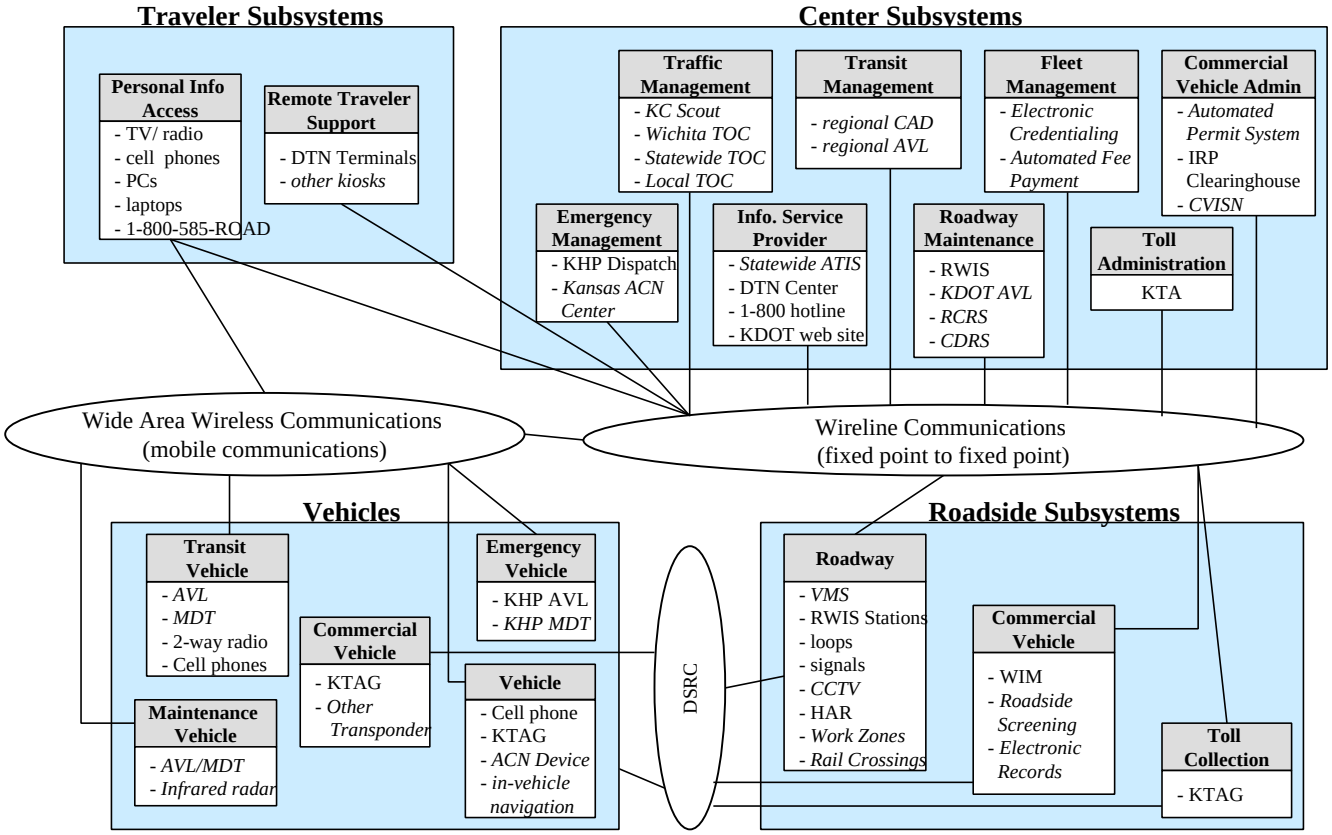


Interagency coordination	Predominantly rural projects require significant effort to be expended in the coordination of multiple agencies and jurisdictions. In the case of ACN, there are two primary areas where the operation of the system depends on the coordination between agencies. These areas are between the ACN Center and the responding agency(s) and between responding agency(s) and trauma centers.
System architecture	The system architecture for an ACN system currently includes three entities and two communication paths. An in-vehicle device contacts a national service provider over a wireless telephone link, most commonly analog cellular. The national service provider then interprets the location of the vehicle, determines the appropriate response agency, and contacts that agency directly, communicating all crash information verbally over a landline call.
Telecommunications needs	The following telecommunication methods will be tailored to meet the telecommunications needs of the Rural Safety and Mobility Program area. These include: Optical Fiber, Telephone Lines, 800 MHz Radio, Cellular and Satellite, and WAN/LAN. The 800 MHz radio, cellular and satellite communications are all critical links to the ACN system.
Operating cost analysis	Currently, ACN calls are handled through the existing emergency response facilities. Thus, there is no increase in the incremental operating costs. The establishment of a statewide ACN center would require certain operating costs, including the maintenance of computer hardware and software, ongoing training for operators, and possibly additional staffing.
Benefit/cost analysis	The primary benefit from ACN is reduced emergency response times when accidents occur. The reduced response time allows lives to be saved and the severity of some injuries to be reduced. The extent of the benefits depends on market penetration of the in-vehicle devices, the coverage of the service, and baseline notification time required to initiate an emergency response.
Public private opportunities	Public-private opportunities fall into two categories. The first is directly related to the establishment of a statewide ACN center. The second area that presents excellent opportunities for public-private partnerships is that of providing wireless communications services to remote areas, increasing ACN coverage.

KANSAS STATEWIDE ITS ARCHITECTURE

The role of the statewide architecture is to tie each of these program areas together and provide a framework for ensuring an interoperable statewide ITS system. The long-term ITS architecture includes existing and future ITS implementations and is consistent with the National ITS Architecture. Aside from the subsystems and agencies that are a part of the Kansas Statewide ITS Architecture, there are also a number of external interfaces. External interfaces are related systems and agencies that interface with the Kansas ITS system. Examples of these include other states, local agencies, media, emergency personnel, rail operators and metropolitan planning organizations. Figure 3 shows a high level depiction of the Kansas ITS Architecture.

Figure 3: Kansas Statewide ITS Architecture



INTEGRATING AND MAINSTEAMING ITS INTO KDOT

One of the keys to having a successful ITS program in Kansas is integrating or mainstreaming ITS into the KDOT business process. In order for this to happen, funding, contracting, planning, design, operations and maintenance of ITS needs to be a consideration in all bureaus of KDOT.

Institutional Barriers

Mainstreaming ITS into other projects will require working with what some might consider institutional barriers within KDOT. One institutional barrier could be that ITS is new and not a traditional part of day to day business in KDOT. KDOT design projects follow strict guidelines laid out in manuals and standards that have been used for many years. Currently within KDOT, ITS standards do not exist and many of their elements have not yet been defined. Designers need to be encouraged to include ITS as a part of their plans if mainstreaming is to happen.

In order to achieve the mainstreaming of ITS into KDOT, key recommendations were outlined, and they include:

- Checklists should be developed for projects and bureaus to help identify potential ITS elements in KDOT projects. These checklists should be implemented on every project during the discovery phase or scoping.

- Establish informal working groups for interagency coordination. The working groups should be comprised of representatives from each of the agencies involved. An example of a current working group in Kansas is the CVO Executive Working Group, which is comprised of KDOT, KDOR, KCC, KHP and KMCA.

- The ITS Unit should contact other states to solicit ITS standards and detail sheets if they are available.

- KDOT bureaus should designate an ITS "champion" to help facilitate the mainstreaming of ITS into their work area.

- Identify those ITS projects that have a high potential for providing substantial benefits or projects with a high-level of visibility to the traveling public. Encourage the rapid deployment of these types of projects. Promote the advantages of these projects through internal and external publicity campaigns, press releases, etc.

Integrating Rural and Urban ITS Programs

Another consideration for mainstreaming ITS in Kansas is the integration of rural and urban ITS programs. These two areas of ITS are often treated separately with the urban focus being on reducing traffic congestion and the rural focus on increasing safety. One strategy for integrating the two program areas is to establish informal working groups to facilitate coordination between the two programs. Another strategy for integrating urban and rural ITS program areas is to develop a statewide operations center.

PLAN METHODOLOGY

A methodology has been developed to assist the KDOT ITS Unit in the identification, tracking, ranking and prioritization of ITS projects. ITS projects will come from a number of sources including: the KDOT Bureau of Design, other KDOT Bureaus, KDOT Districts, research, local agencies, and public/private partnerships. A formal procedure has been established to help mainstream ITS into the KDOT design process. The most significant change to the traditional design process is the addition of an ITS Checklist. The ITS checklist will be introduced during the Discovery Phase of the project. This Checklist will be developed by the ITS Unit and will contain criteria that when met would indicate an opportunity for ITS to be added to the project. For example, if a project is located on a priority corridor or in a high accident location, then ITS should be considered for that project.

Other bureaus within KDOT develop their projects differently. It is difficult to define a formal procedure for integrating ITS into the day to day business of these bureaus. Accomplishing this can be done in a number of ways:

1. By educating KDOT to get them thinking about ITS and its benefits.
2. Starting with a few proof of concept projects exploring the benefits of particular ITS applications (e.g. AVL).

Universities, other research institutions, local agencies, and the private sector may come up with ideas for new ITS projects. It is important that the ITS Unit be proactive in soliciting ideas for ITS projects through the use of the project form.

STRATEGIC DEPLOYMENT PLAN

This Strategic Deployment Plan presents both a phasing plan for the ITS projects and recommended strategies for successful ITS deployment. The different types of strategies developed for the ITS Unit include funding strategies, implementation strategies and management strategies.

Funding Strategies

As with any crosscutting program, the funding for ITS projects must come from a wide variety of sources:

- Existing funding sources (KDOT funding category)
- ITS Set-Aside Funds (KDOT funding category)
- Research Funds (Federal and State)
- Other Funding Strategies

Implementation Strategies

ITS deployment requires strategies under the following headings:

- Scheduling projects

  - Schedule projects with critical elements first
  - Identify related projects and factor them into the schedule
  - Take advantage of stepwise deployment whenever practical
  - Carefully analyze each new project against existing and proposed projects.

- Evaluating Projects

  - Always evaluate new technologies
  - Plan for the project evaluations in parallel with the overall project development
  - Use evaluations as an awareness tool

- Integrating ITS into the Design Process

  - Integrate ITS checklists into the design process
  - Continue to update the mainstreaming process
  - Develop design standards and detail sheets for roadside ITS elements as they are being incorporated into design projects

- Increasing ITS Awareness

  - Develop a continuing process of education for KDOT personnel
  - Involve the media with publicly visible projects
  - Obtain buy-in from the ITS Steering Committee on important decisions relating to ITS

- Using the ITS Architecture

  - Evaluate how future projects fit into the Statewide ITS Architecture
  - Establish a schedule for periodically reviewing and updating the ITS Architecture
  - Conform to ITS communications standards

- Investigating Telecommunication Infrastructure

  - Make efficient use of the fiber optic resources
  - Make efficient use of the 800 MHz radio network
  - Interconnect the fiber network with the microwave network where feasible
  - Expand the optical fiber backbone throughout Kansas
  - Create a telecommunications unit within KDOT

- Increasing Partnerships

  - Take necessary steps to ensure successful public/private partnerships
  - Clearly define the roles and responsibilities of each partner

- Defining Special Considerations for Safety-Oriented Applications

  - Midwest Smart Work Zone Deployment Initiative

ITS Unit Management Strategies

Guidance in the continued success of the ITS Unit could include strategies to address issues concerning the continued operation and maintenance of the ITS program. The primary function of these strategies is to help KDOT realize its goals of increasing the scope of ITS applications, increasing the level of benefits resulting from existing ITS deployments, and facilitating the continued updating of the Statewide ITS Strategic Plan

and ITS Architecture. The following recommendations represent the suggested management strategies for the KDOT ITS Unit.

- Establish a process for maintaining the project database.
- Continue the role of the ITS Steering Committee.
- Identify and develop design standards for commonly deployed elements.
- Consider hiring additional staff trained to operate, administer, manage, and provide the ITS field devices or the optical fiber backbone.
- Provide training for staff who will be involved with ITS deployment and operation.
- Evaluate ITS deployments and disseminate findings.
- Increase public agency awareness of ITS projects through outreach campaigns.
- Periodically review proposed ITS projects to identify potential cost sharing opportunities and minimize unnecessary system redundancies.
- Periodically update the Statewide ITS Architecture and the Statewide ITS Plan.
- Periodically review proposed ITS projects to identify potential data sharing opportunities.
- Encourage interagency, intra-agency and interstate coordination.
- Develop guidelines for agencies and individuals considering ITS deployments in Kansas.

Project Phasing Plan

The Strategic Deployment Plan categorizes all the projects and tries to capture at a moment in time the status of the projects according to two measures:

1. If it is a short, medium, or long term project.
2. If it is a high, medium or low priority project

The objective of the Phasing Plan is to consistently evaluate the current projects in the KITS Database with these measures. Tables 1, 2 and 3 show the near-, medium- and long-term ITS projects that have been identified for Kansas so far.

Table 1: Near-term Deployment Projects (1 to 5 years)

Program Area	KITS #	Project Name	Priority
Priority Corridor	1501-0	VMS on I-70 near Goodland	High
	1501-1	VMS on I-70 near Salina	High
	1501-2	HAR on I-70 west of Goodland and east of Salina	Medium
	1502-0	Kiosk-Based Traveler Information System, Phase I	High
	1502-1	Kiosk-Based Traveler Information System, Phase II	High
	1502-2	Kiosk-Based Traveler Information System, Phase III	Medium
CVO	3001-0	Electronic Credentialing (Renewal Processing) for KDOR	High
	3003-0	IRP Clearinghouse Participation	High
	3004-0	Electronic Screening Site Evaluations	High
	3005-0	Electronic Heavy Vehicle Use Tax (HVUT) Reporting	Medium
	3010-0	Document Scanning	Low
	3015-0	Integrated Access to CVO Information/Resources	High
Maintenance	1100-0	Install AVL and MDTs in KDOT winter maintenance fleet, Phase I, District 6	Medium
	1100-1	Expand AVL and MDT Statewide	Medium
	1102-0	Install AVL in KDOT paint trucks	Medium
	1103-0	Install Infrared Radar on Snowplows in a test District	Done
	1200-0	Integration of Weather Sensors on Maintenance Vehicles with RWIS, Phase I	Medium
	1201-0	Pagers for KDOT crews working near railroads	High
	1202-0	Automated Anti- / De-icing System on Bridge in Garden City	High
	4004-0	Conversion of 800 MHz radio system from conventional to trunked	Medium
	4005-0	Implementation of a mobile data channel	Medium
Traffic Operations	2101-0	Wichita Advanced Traffic Management System (ATMS)	High
	2102-0	Ramp Metering on US-54 (Kellogg Blvd.)	Medium
	2103-0	NASCAR ITS	High
	2801-0	Planning Study for Railroad Crossing on Johnson Drive	High
	2801-1	Deploy ITS at Railroad Crossing on Johnson Drive	Medium
	1500-0	Statewide Operations Center, Phase I	High
Rural Safety And Mobility	1001-0	Statewide Mayday System Development Plan	High
	1001-1	Statewide Mayday/ACN Response System	Medium
	1001-2	Mayday/ACN Service Provider Registration System	Medium
	1504-0	Deploy VMS or CCTV at trouble spots throughout Kansas	Medium
	4006-0	Statewide Cellular Coverage Map	High
	1400-0	Implement an AVL/MDT system for transit in North Central Kansas (NCK)	Medium
	1400-1	Implement a Computer Aided Dispatch System in NCK	Medium
	1401-0	Implement an AVL/MDT system for transit in Reno County	Medium
	1401-1	Implement a Computer Aided Dispatch System in Reno County	Medium
Other	4001-0	Last mile connection to District Offices	High
	4002-0	Last mile connection to the Area Offices	High
	4003-0	Barter KDOT's right-of-way to wireless service providers	Low
	4007-0	GIS database of KDOT telecommunications infrastructure	High

Table 2: Medium-term Deployment Projects (6 to 10 years)

Program Area	KITS #	Project Name	Priority
Priority Corridor	1502-3	Kiosk-Based Traveler Information System, Phase IV	Medium
	1503-0	Traveler/Tourism Information Web Site	High
CVO	3012-0	Streamline Property Tax and Insurance Verifications	Medium
	3014-0	Integrated Access to CVO Information/ Resources	Medium
Maintenance	1101-0	Snow Route Design Optimization Software	Medium
	1200-1	Integration of Weather Sensors on Maintenance Vehicles with RWIS (Phase II)	Medium
Traffic Operations	1500-1	Statewide Operations Center, Phase II	Medium
Other	1505-0	Agricultural Harvesting and Migration Information Services	Low

Table 3: Long-term Deployment Projects (more than 10 years)

Program Area	KITS #	Project Name	Priority
Rural Safety and Mobility	2300-0	Installing Cameras on the Inside of Rural Transit Vehicles	Low
Other	2104-0	Implementing Condition-based Variable Speed Limit Signs	Low

Table 1 summarizes the near-term projects segmented by the different program areas. Most of the near-term projects have been assigned either high or medium priority with only two exceptions. Tables 2 and 3 present the medium- and long-term projects, respectively. No medium and long-term projects were assigned a high priority, which would indicate the deployment horizons are consistent with their assigned priority. The KITS database and Appendix G of the Kansas Statewide ITS Plan include individual project sheets for each of the projects listed. These project sheets provide more detailed descriptions of the given projects.

CONCLUSION

The Kansas Statewide ITS Plan is intended to be a guidance document. Its role is to assist the ITS Unit in their management of the ITS Program in Kansas and to help them mainstream ITS into KDOT business. The success of the Statewide Plan depends on receiving quality input from stakeholders and the traveling public on the role ITS should play in Kansas. Furthermore, the Kansas Statewide ITS Plan is a living document. It will need to be updated on a regular basis as new projects are identified, funded and deployed. The Kansas Statewide Architecture will also need to be updated regularly as new projects are brought into the Plan. Finally, as KDOT policy changes, some of the strategies in the Plan will need to be revised to reflect those changes.