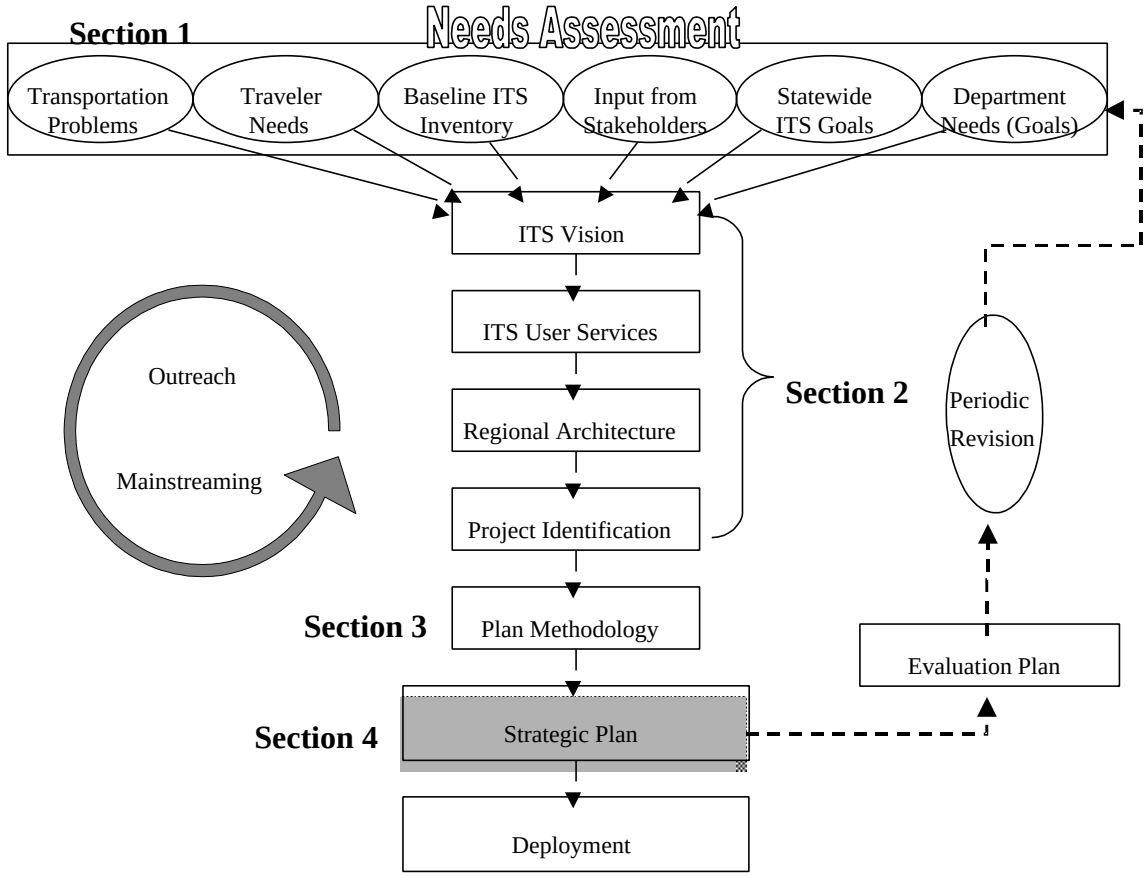
Section 4: Strategic Deployment Plan

4.0 Introduction

Objective

The objective of the Strategic Deployment Plan is to develop implementation strategies and near-, medium- and long-term deployment plans for ITS in Kansas with a focus on rural applications. Figure 4.1 shows a flow chart of the process that has been used to develop the Statewide ITS Plan for Kansas. Sections 1 through 3 of the Statewide Plan have already been completed. Section 4, shown shaded in the figure, presents the Strategic Plan for deploying ITS in Kansas. The Strategic Plan is followed by actual deployment of ITS technologies.

Figure 4.1: Kansas Statewide ITS Plan Methodology



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 discussed include funding strategies, implementation strategies and operational strategies. The recommendations given in this document build on the recommendations given in the Analysis of ITS Elements and the Plan Methodology.

The rest of section 4 includes 1) funding, implementation, and ITS Unit management strategies, 2) the project deployment plan, and 3) conclusions and recommendations for the entire Kansas Statewide ITS Plan.

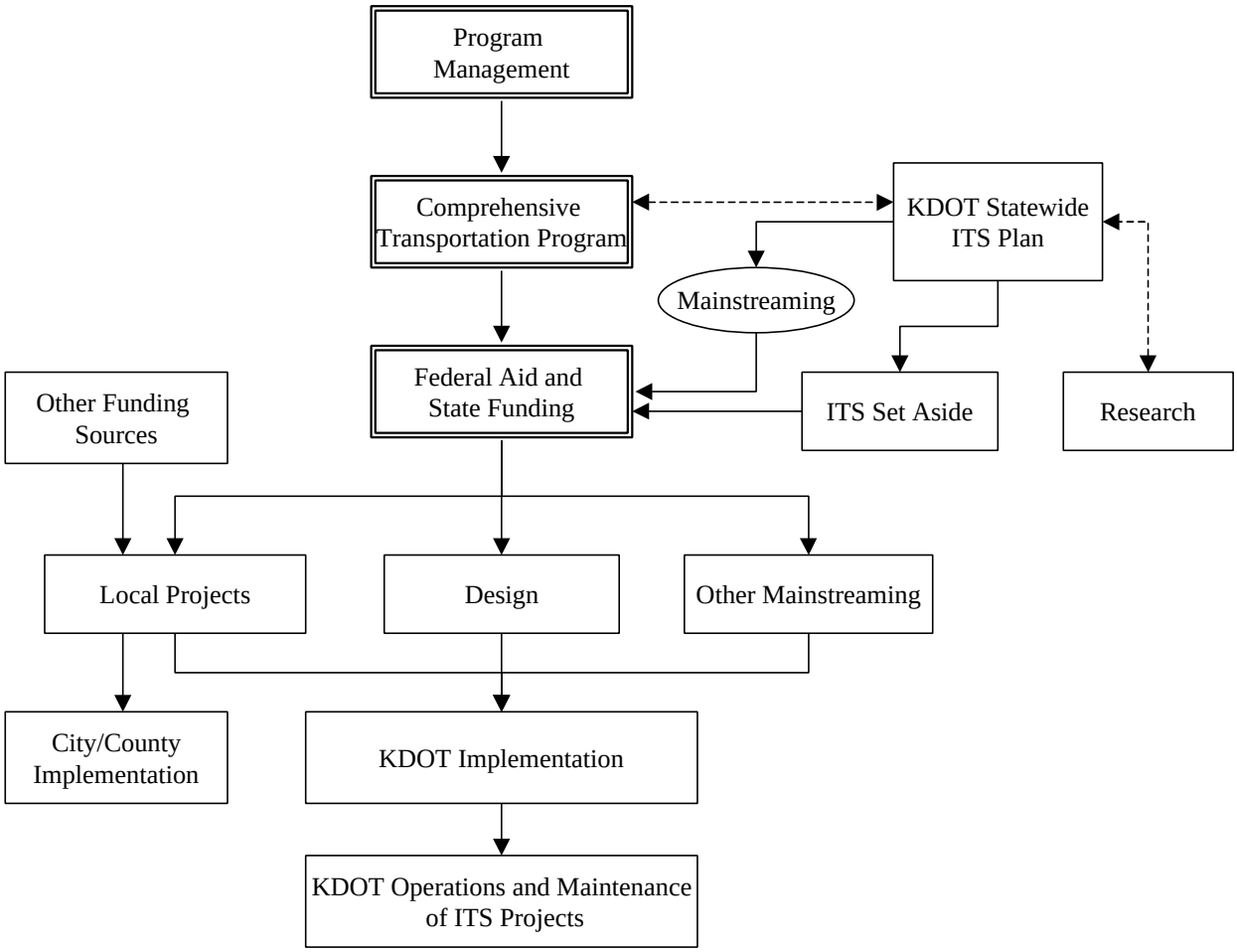
4.1 Deployment Strategies

This section recommends a number of different strategies for the KDOT ITS Unit to consider when deploying ITS. The strategies are grouped into the following three areas: funding strategies, implementation strategies, and operational strategies.

Funding Strategies

As with any crosscutting program, funding for ITS projects will come from a wide variety of sources. The major sources of funding will be federal-aid funds, state funds, ITS set-aside funds, and research funds. Figure 4.2 shows how the funding and project implementation process occurs in Kansas. Note the important role of the Kansas Statewide ITS Plan in the process. Mainstreaming and ITS set-aside funds are two ways to initiate ITS related projects into the process. Another way to get ITS projects started is through research programs such as K-TRAN, ENTERPRISE or other pooled fund studies. Strategies for using these funding sources are given below.

Figure 4.2: Funding and Implementation Process for KDOT Projects



Federal Aid and State Highway Funds

Whenever possible, the cost of roadside ITS elements should be included in budgets for highway maintenance and reconstruction projects. Potential roadside elements include conduit, vehicle detectors, VMS, HAR CCTV, and RWIS stations. The process described in section 3.1 ensures that ITS applications are given consideration during the discovery phase of every project. This will allow for ITS enhancements to be funded as part of typical design projects. ITS applications that are not be eligible for federal aid or state highway funding may be funded with ITS set-aside funds, research funds or public/private partnerships.

ITS Set-Aside Funds

Set-aside funds will be managed by the ITS Unit. Uses of the funding is open to projects that apply technology such as advanced sensor, computer, electronics, and communications and management strategies to increase the safety and efficiency of the transportation system. The funding is available to state agencies in FY 2000 and state and local agencies in FY 2001 and FY 2002. The ITS set-aside funds will be allocated to various projects based on the criteria described in section 3.2. The project selection and fund allocation will be determined by the ITS Unit. It should be noted that projects funded through the ITS set-aside money are still required to go through the 883 process. ITS set-aside funding can be maximized by seeking the alternative funding sources first, and by leveraging the funds to obtain matches from federal sources, local sources, and other areas within KDOT.

Research Funds

Research is an effective method for funding new deployments, especially pilot projects or operational tests. Many ITS applications require changes to the way work is done. Consequently, a deployment is often preceded by an operational test or pilot project in which the application is implemented on a small scale and properly evaluated to determine its merit and to foster support. Studies of this type often do not qualify for funding through the conventional process. However, the evaluations may be funded through KDOT research programs such as K-TRAN, or through external sources such as the ENTERPRISE Consortium, FHWA Priorities Technologies Program, pooled fund studies or the ITS set-aside program.

Other Funding Strategies

An internal process for promoting awareness of ITS issues is a vital part of the ITS funding strategies. As described elsewhere in this document, mainstreaming ITS into KDOT is a process that depends heavily on the knowledge of potential applications extending beyond the ITS unit and throughout the agency. Mainstreaming is essential to maximizing the effectiveness of ITS technologies. Special funding of ITS projects

through mechanisms such as federal discretionary funds or Surface Transportation Plan Safety Funds is appropriate and even necessary in some cases, and an effective awareness process will help to maximize the utility of the available special funding.

Cost-recovery of maintenance and operations expenditures is a key issue. These costs will vary widely from one program area to another, and in some cases from one project to another. Funding the continued maintenance and operation of each ITS project or component should be established prior to deployment. Deploying an application without continued operational funding in place could result in a net loss for the overall ITS program in terms of support within and outside KDOT. Applications that can eventually be self-supporting or else privatized could be given a high priority.

Implementation Strategies

A significant consideration in the implementation of the Statewide ITS Strategic Deployment Plan is that many, if not most, ITS applications are new to KDOT. The newness of ITS in many areas of KDOT may be an obstacle to budgeting ITS into the mainstream funding and to the mainstreaming of ITS in general. The following implementation strategies are suggested for ITS deployment. The strategies are grouped under the following headings:

- scheduling projects,
- evaluating projects,
- integrating ITS into the design process,
- ITS awareness,
- using the ITS architecture,
- telecommunications infrastructure,
- state to state coordination, and
- partnerships.

Scheduling Projects

Schedule projects with critical elements first. This involves identifying those projects which will provide infrastructure necessary for the deployment of further projects. It also involves evaluating the proposed phasing of the projects to identify those that are on the critical path and should be assigned high-priority in their deployment.

Identify related projects and factor them into the schedule. Related projects are those that may influence or be influenced by the deployment schedule of the project being considered. Document these links in the KITS database so the full impact of any future phasing changes can be easily assessed and evaluated.

Take advantage of stepwise deployment whenever practical. In other words, deploy new technologies at a local level first, then expand deployment district-wide and eventually statewide. However, in some cases, it may be necessary to forgo stepwise deployment

such as when a good funding opportunity arises, or when a construction project provides a window for efficient installation of equipment.

Carefully analyze each new project against existing and proposed projects. Seek out integration opportunities and recognize cost sharing opportunities with other projects.

Evaluating Projects

Always evaluate new technologies (unless appropriate evaluation has already occurred, perhaps by other state DOT's). Evaluations will serve to justify future expenditures, garner support for future deployments, and enhance the credibility of the ITS program which, in turn, will help to fuel the mainstreaming process.

Plan for the project evaluations in parallel with the overall project development. Integrating the evaluation into the project design process is a critical element in maintaining the usefulness and relevance of the evaluation.

Use evaluations as an awareness tool. An effective ITS solution will sell itself, if the potential users witness the effectiveness first hand.

Integrating ITS into the Design Process

Integrate ITS checklists into the design process. Evaluate the ITS checklists completed during the 883 process and evaluate the potential for including ITS in the projects. Schedule meetings with the project owners to discuss the application and benefits of including ITS in the project. Conduct follow-up discussions with project owners to ensure that planned ITS elements are properly integrated in the project plans as they develop over time.

Continue to update the mainstreaming process. Develop and periodically review and revise the policies through which ITS applications are introduced into the 883 process. The identification of candidate ITS projects is key.

Develop and adopt design standards and detail sheets for roadside ITS elements as they are being incorporated into design projects. Examples of roadside ITS elements are conduit, vehicle detectors, video cameras, VMS, and RWIS stations. If possible, take advantage of standards that have already been developed in other states. Incorporate the use of ITS design standards and detail sheets in design projects whenever it is appropriate.

ITS Awareness

Develop a continuing process of education for KDOT personnel. Separate plans may be necessary for upper management, middle management, and field personnel. Each of these groups has a valuable perspective on KDOT's responsibilities and operations.

Diverse participation will maximize the effectiveness of the processes through which potential applications are identified.

Involve the media with publicly visible projects (e.g., work zone traffic control applications or web-based traveler information dissemination). Good press will help to generate public support, but perhaps more importantly, it is an effective and efficient means of educating all levels of KDOT personnel.

Obtain buy-in from the ITS Steering Committee on important decisions relating to ITS. Involving the Steering Committee in ITS decisions will help develop ITS champions and spread awareness of ITS projects throughout KDOT.

Using the ITS Architecture

Evaluate how future projects fit into the Statewide ITS Architecture (and also the National Architecture). For projects not complying with the architecture, explore reasons for non-compliance and either suggest changes to projects to provide better conformance or consider updates to the architecture when justified.

Establish a schedule for periodically reviewing and updating the ITS Architecture. Maintaining the architecture will better allow the efficient incorporation of new technologies and projects, and will better insure the relevance of the architecture.

Conform to ITS communications standards. Research each project to ensure that the appropriate standards are considered during the design and implementation process. This evaluation should include a comparison with federal standards as well as informal and local standards, such as the K-Tag DSRC transponder.

Telecommunications Infrastructure

Make efficient use of the fiber resources. The DTI-provided bandwidth, conduit, and dark optical fiber (or optical fiber backbone) will provide the majority of the telecommunications infrastructure KDOT needs to implement its urban ITS projects. When the rural ITS projects will be implemented, the DTI-provided optical fiber backbone will already be installed. This installation is scheduled to be complete by September 2000.

Make efficient use of the 800 MHz and 6 GHz radio networks. Another telecommunications resource is the KDOT 800 MHz radio and associated 6 GHz microwave backbone. This combined system is in the eighth year of a ten-year implementation, and is scheduled to be complete by the end of June 2002. The amount of available resources outside of the radio network will not be known until completion.

Interconnect the fiber network with the microwave network where feasible. There are two locations, Oakley and Salina, where the optical fiber backbone and 6 GHz microwave are physically close enough to one another that interconnection is practical technically and financially. It is in these locations that there may be some co-efficiency

of the two networks. Each network could interface with the other and serve as an extension or a back up to the other.

Expand the optical fiber backbone throughout Kansas. The optical fiber backbone will provide the high bandwidth and/or high speed telecommunications pipeline. Unfortunately, most counties in Kansas are not near the optical fiber backbone. Once the backbone is constructed, it will be important to extend that backbone, whether by laying more optical fiber or installing high bandwidth wireless systems.

State-to-State and State-to-Local Coordination

Learn what other state and local agencies are doing before deploying ITS applications. For instance, contact other agencies to see if they have already established design standards or detail sheets for a particular ITS application.

Encourage the establishment of multi-state working groups. Use these working groups to facilitate coordination on projects requiring multi-state involvement (e.g., Scout project).

Establish a guidebook for facilitating state-to-state and state-to-local coordination. Include samples of working agreements and memoranda of understanding from established multi-state groups that may be used as examples in developing agreements.

Partnerships

Take necessary steps to ensure successful public/private partnerships. In cooperative projects involving entities external to KDOT (public or private), care should be given to ensure that all participants have a vested interest in the successful completion of the project. Participants should make a formal commitment to the project before substantial work is undertaken. In other deployments, informal agreements have allowed participants to withdraw easily causing the project to terminate prematurely.

Clearly define the roles and responsibilities of each partner. Public/private partnerships should be a cooperative effort with clear division of responsibility between public and private sectors for each aspect of the operation. Project costs and revenues should be shared.

Special Considerations for Safety-Oriented Applications

The implementation strategies for this plan with respect to safety-oriented applications mirrors the overall strategies stated above. Two key characteristics of safety-oriented applications are (1) they frequently do not fit cleanly into a typical highway construction project and must be funded separately, and (2) their safety-oriented nature implies the potential for some manner of legal liability. The second of these two characteristics suggests that for any safety-related application careful consideration should be given to liability risk management as early in the project development process as possible.

Many safety-oriented applications will be new to KDOT or will be used as part of a new process. As a result, resistance to change will typically be an obstacle to be overcome. In addition to emphasizing the benefits of a particular application in the continual process of educating KDOT personnel, a pilot project or small-scale deployment will typically be a prudent first step. Allow the technology to be experienced.

If the technology is truly effective, the pilot project will garner support for a wider scale deployment. An example of this strategy is the Midwest Smart Work Zone Deployment Initiative, in which several technologies were deployed, each at only one site, in order to evaluate their effectiveness. The technologies that *are not* effective are dropped. Those that *are* effective are examined more closely to consider their proper uses within KDOT's construction operations.

ITS Unit Management Strategies

Increasing the number of ITS projects and deployments is only one-half of the picture when it comes to creating a successful ITS program. An equal effort must be put forth in operational strategies such as maintaining the efficiency of deployed components, promoting the efficient use of ITS applications, and maintaining conformity with the longer term ITS vision. Failure to incorporate these operational strategies can result in the ineffective deployment of ITS, redundant systems with unnecessary costs, and limited opportunities for interoperability.

The strategies presented in this section are intended to provide guidance in continuing the success of the ITS Unit to promote ITS within and outside of KDOT. The strategies address issues concerning the continued operation and maintenance of the ITS program within the State. The primary function of these strategies is to help KDOT realize its goal of increasing the scope of ITS applications in the State, while simultaneously increasing the level of benefits resulting from existing ITS deployments. A second function served by this set of management strategies is to facilitate the continued updating, and thus relevance, of the Statewide ITS Strategic Plan and ITS Architecture. The following recommendations represent the suggested operational strategies for the KDOT ITS Unit.

Establish a process for maintaining the project database. The KITS database provides a valuable tool for tracking ITS projects and the deployment of ITS infrastructure in the State. Processes are described in earlier sections that will update the database as new projects are identified. Additional effort should be undertaken to update and maintain the database periodically to ensure the status update of existing database projects. This maintenance process should include the following:

1. Identify a secure location for the database.
2. Establish backup procedures for the database. Additionally, mirroring the database on a separate physical drive is recommended. Backup sites and media should also be secure.

3. Identify an existing position to be responsible for inputting and editing project information in the project database.
4. Identify an existing position to be responsible for approving changes to the project database. This should be a permanent position, and may or may not be the same as the individual identified for 3, above.
5. Document procedures used for maintaining the database. Keep the procedure documentation current to provide continuity in the event of staffing changes.
6. Review and update the database at least once quarterly, even if no new projects are to be added. Pay special attention to the status of database projects.

Inventory ITS components as they are deployed in the State. As projects are completed, document the infrastructure deployed and its location. This will allow for the tracking of deployment progress and will provide the improved ability to identify equipment and cost sharing opportunities as additional projects are planned. The KITS database provides a tool for performing this inventory, however, some ITS elements, particularly communication infrastructure, need to be tracked with greater detail than provided by the database. Wireless coverage maps and GIS tracking of telecommunication infrastructure would prove useful tools. These inventory efforts also involve the identification of staff with specialized skills that may be used as resources.

Continue to strengthen the role of the ITS Steering Committee. The authority represented in the members of the committee is an important asset. Involving the committee in the decision-making process will foster a sense of importance in the members, encouraging consistent participation. This forum should be used to garner support from decision-makers.

Continually perform assessment of ITS Unit activities to internally track progress and provide planning data. Performing periodic performance reviews are a useful tool for tracking progress and comparing performance over time. The ITS Unit manager should prepare a quarterly progress report. This report should contain quantitative and qualitative information that may be used for performance tracking and long-term planning. A sample format for the progress report is presented in Appendix J.

Identify and develop design standards for commonly deployed elements. Identify common roadside elements that will likely be deployed as part of ongoing projects identified through the design process. Research the activities of other states regarding the development of design standards (design sheets) for these elements. If warranted, the ITS Unit could initiate the development and approval process for KDOT design standards for these elements to standardize their deployment throughout the state and ease the design burden. Likely candidates for the development of design standards include commonly deployed roadside elements such as:

- Vehicle detectors,
- Surveillance cameras,
- Camera towers,
- Variable message signs,

- Weigh in motion facilities, and
- CVO electronic screening equipment.

Hire additional staff trained to operate, administer, manage, and provide support for ITS field devices and the optical fiber backbone. DTI will be providing some functions for the bandwidth provided under its contract with KDOT, but will not provide support for the conduit or dark optical fiber after installation and acceptance by KDOT. Currently, KDOT is planning to outsource the necessary functions. However, as technology advances and is further deployed along the roadways, KDOT will need additional staff trained specifically to support these technologies.

Provide training for staff who will be involved with ITS deployment and operation. Identify areas where specialized skills need to be enhanced in order to deploy particular ITS technologies. Encourage staff to attend training and educational sessions in order to gain necessary skills/knowledge. Cross-train staff on multiple systems, where applicable, to provide technology coverage in the event of staff changes. In the long term, technology is converging. KDOT should consider establishing a cross-functional technology organization. Currently, each technology specialty (computers, networking, radio, ITS, etc.) operates separately from each other and some stop at District boundaries. As technologies continue to converge, a group of people cross-trained in all of the deployed technologies could run the integrated systems instead of the highly specialized functions they now perform.

Evaluate ITS deployments and disseminate findings. Document and distribute benefits information in the case of successful deployments. For less successful deployments, document the project lessons learned so future projects can avoid the identified pitfalls.

Increase public and agency awareness of ITS projects through outreach campaigns. Promote ITS internally within KDOT through the continued use of seminars, training, and newsletters. Encourage press coverage of high-profile ITS project openings to increase the public's awareness/support of ITS.

Periodically review proposed ITS projects to identify potential cost sharing opportunities and minimize unnecessary system redundancies. Proposed projects should be compared with other proposed projects and existing deployments to identify situations that may allow system integration and cost sharing. The KITS project database provides a useful tool for performing this review.

Update the Kansas Statewide ITS Architecture. Periodically revisit the statewide architecture and assess its ongoing ability to provide suitable guidance. Variances may be granted to individual projects that do not conform to the architecture in the short-term. These identified variances can be used to evaluate deficiencies in the architecture and develop enhancements.

Periodically update the Statewide ITS Plan. This plan is intended to be a living document that is periodically updated. Given the pace at which technology changes in the ITS arena, this is the only way to ensure the continued relevance of the document.

Periodically review proposed ITS projects to identify potential data sharing opportunities. Identify opportunities for sharing data among various agencies and stakeholders. Revisit existing projects to identify opportunities to use archived data for planning purposes. The increased data use will increase the usefulness of the ITS deployment.

Encourage interagency coordination. Support the coordination and cooperation between agencies involved in the deployment of ITS. Form interagency project committees and more permanent working groups, whenever appropriate. The ITS Unit may serve as a liaison between groups to support coordination.

Encourage interstate coordination. Review the list of appropriate contacts in bordering states identified in other sections of this document. Update this list when appropriate to provide a resource for agencies seeking to develop multi-state coordination. Encourage agencies to research other state's ITS activities when considering deployments and investigate interoperability potential.

Develop guidelines for agencies and individuals considering ITS deployments in the state. These guidelines will assist agency staff and local planners in properly considering and planning for ITS. An example of this guidance is a description of roadway/traffic conditions that provide opportunities for ITS deployments. Other useful guidelines might include suggestions for facilitating public/private partnerships, or overcoming legal and institutional barriers.

These operational strategies should be completed a regular frequency whenever possible. Table 4.1 summarizes the operational strategies and presents suggestions for the frequency that the activities should be performed. Those strategies with the frequency of "opportunistic" should be completed whenever the appropriate opportunity presents itself.

Table 4.1: Suggested Frequency of Operational Strategy Performance

Operational Strategy	Frequency
Establish a process for maintaining the project database.	Continuous/Quarterly Review at a Minimum
Inventory ITS components as they are deployed in the State.	Continuous
Continue to strengthen the role of the ITS Steering Committee.	Continuous
Continually perform assessment of ITS Unit activities to internally track progress and provide planning data.	Quarterly Progress Reports
Expand the fiber optic network throughout Kansas	Opportunistic
Consider hiring additional staff trained to operate, administer, manage, and provide the ITS field devices or the optical fiber backbone.	Opportunistic
Provide training for staff who will be involved with ITS deployment and operation.	Opportunistic
Identify and develop design standards for commonly deployed elements	Opportunistic
Evaluate ITS deployments and disseminate findings.	Opportunistic
Increase public and agency awareness of ITS projects through outreach campaigns.	Quarterly Newsletters/Brownbags
Periodically review proposed ITS projects to identify potential cost sharing opportunities and minimize unnecessary system redundancies.	Quarterly
Update the Kansas Statewide ITS Architecture.	Update Annually
Periodically update the Statewide ITS Plan.	Update Every 2 Years
Periodically review proposed ITS projects to identify potential data sharing opportunities.	Quarterly
Encourage interagency coordination.	Opportunistic
Encourage interstate coordination.	Opportunistic
Develop guidelines for agencies and individuals considering ITS deployments in the state.	Update Annually

4.2 Deployment Plan

This section presents the proposed deployment and phasing plan for the projects contained in the KITS project database. The projects were identified by their owners as having **Near-**, **Medium-**, or **Long-term** deployment horizons. These designations are defined below:

- **Near-term** 1 to 5 year deployment schedules
- **Medium-term** 6 to 10 year deployment schedules
- **Long-term** more than 10 year deployment schedules

Additionally, as part of the ITS Statewide Planning effort, each project was assigned a deployment priority of either **High**, **Medium** or **Low**. The purpose of this prioritization was to ensure that the deployment timelines given in the project sheets are consistent with their respective project priorities. For instance, if a high priority project is scheduled for either medium-term or long-term, then there would be a problem. The prioritization process was based on factors described in Section 3.2. The definitions of these prioritization terms are discussed below.

- **High Priority Projects** – These generally are projects that meet many of the following criteria: 1) currently under deployment, 2) provides backbone infrastructure for additional deployments, 3) contains critical path interfaces with other projects, 4) is fully funded in the current plan or has committed locally matched funds, 5) has necessary management support in order to succeed, 6) has high potential as a early deployment winner, 7) meets a critical safety need, or 8) has significant estimated benefits in excess of costs.
- **Medium Priority Projects** – These are projects that meet a few of the above listed criteria, or have other significant merits that warrant the consideration of the project. These could also include projects such as technology assessments that are necessary lead-ins to future deployment expansions.
- **Low Priority Projects** – These are projects that do not demonstrate any of the criteria listed above, but may nevertheless be warranted. These projects may include opportunistic deployments that do not otherwise fit into the step-wise deployment plan.

Table 4.2 summarizes the near-term projects segmented by the different program areas. As expected, most of the near-term projects have been assigned either high or medium priority with only two exceptions. Tables 4.3 and 4.4 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. Please refer to the individual project sheets (presented in Appendix G) for a more detailed description of any single project.

Table 4.2: 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
	1503-0	Traveler/Tourism Information Web Site	High
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 4.3: Medium-term Deployment Projects (6 to 10 years)

Program Area	KITS #	Project Name	Priority
Priority Corridor	1502-2	Kiosk-Based Traveler Information System, Phase III	Medium
	1502-3	Kiosk-Based Traveler Information System, Phase IV	Medium
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 4.4: 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

4.3 Conclusion

This section contains recommendations for the Kansas Statewide ITS Plan. The recommendations are organized according to the final three sections of the report: Analysis of ITS Elements, Plan Methodology, and Strategic Deployment Plan. These recommendations were developed to help the ITS Unit achieve its vision for a statewide ITS program.

Analysis of ITS Elements

The vision for what the Kansas Statewide ITS system will look like in 20 years guides the ITS planning process. In this vision, the system 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.

KDOT should encourage the establishment of multi-state working groups to facilitate coordination on projects requiring multi-state involvement (e.g., Scout project). KDOT should encourage the adoption of formal and informal standards in all Kansas deployments to maximize the capability for integration with other state's and national systems. Finally, it is recommended that the ITS Unit actively participate in ITS Heartland. This organization will be useful in aiding multi-state coordination and cooperation.

This Plan has developed a statewide ITS architecture that accurately depicts the various components of the ITS system and its communication links. The Kansas Statewide ITS architecture conforms with the National Architecture. KDOT should establish a schedule for periodically reviewing and updating the ITS Architecture. Maintaining the architecture will allow the efficient incorporation of new technologies and projects, and will insure the relevance of the architecture.

KDOT should review the KITS database and the architecture for opportunities for increased private sector involvement. They should forward suggestions to deploying agencies on how these opportunities can be identified and facilitated. KDOT should identify state policies impacting the development of beneficial public/private partnerships and identify possible means to further develop these partnerships.

KDOT should concentrate on mainstreaming ITS into its business process and educating its internal organization on ITS and its benefits. This will require a great deal of work and may justify hiring additional staff. The ITS Unit should develop checklists for projects and bureaus to help identify ITS elements in KDOT projects. These checklists should be implemented on every design project during the discovery phase.

Finally, it would be beneficial for KDOT to 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. They should encourage the rapid deployment of these types of projects and promote the advantages of these projects through internal and external publicity campaigns and press releases.

Plan Methodology

A methodology for this Plan is presented here to allow the KDOT ITS Unit to identify, track, rank and prioritize ITS projects. This methodology also helps mainstream ITS into KDOT business. Instrumental to this process is the development of an ITS checklist and the use of the KITS database. 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 a given design project. Once an ITS project has been identified, it should immediately be added to the KITS database. This database should be used to track the status of the project as well.

Also key to a successful ITS program in Kansas is to integrate ITS into all bureaus within KDOT by education on ITS and its benefits. One recommended strategy is to start with a few proof of concept projects to showcase the benefits of particular ITS applications (e.g. AVL). Once the bureaus see that ITS is beneficial, then they will be willing to increase deployment of the application district-wide and eventually state-wide. Finally, it is important for the ITS Unit to be proactive in soliciting ideas for ITS projects from all available sources.

The ranking and prioritization process will be valuable to the ITS Unit staff and the owners of the ITS projects by helping them in developing and updating short-range plans and in determining the conformity to the longer-range ITS vision. Several outputs, such as consistency check with the architecture, have the added benefit of helping to identify when it may be appropriate to modify the long-term vision (as represented in the statewide architecture).

Strategic Deployment Plan

There are three different types of deployment strategies discussed in the Strategic Deployment Plan: funding strategies, implementation strategies and ITS Unit Management strategies.

The three main strategies for funding ITS projects are: 1) using the ITS set-aside funds, 2) funding projects through the conventional process and 3) funding projects through research programs like K-TRAN and ENTERPRISE. It should also be noted that promoting ITS awareness is a vital part of all ITS funding strategies.

There are also a number of different strategies for KDOT to consider when implementing ITS projects. Following these strategies will help ensure the future success of the ITS program in Kansas. Many of the strategies focus on gathering support for ITS. These include involving the media and using evaluations of new technologies as awareness tools. Some of the other implementation strategies recommended include developing ITS

design standards, following the National ITS Architecture and making efficient use of telecommunications resources.

The final group of deployment strategies addressed in this report are the strategies for the ITS Unit. These strategies address issues concerning the continued operation and maintenance of the ITS program within Kansas such as maintaining the efficiency of deployed components, promoting the efficient use of ITS applications, and maintaining conformity with the longer term ITS vision. Some of the key strategies recommended include tracking the progress of the ITS Statewide Plan with quarterly progress reports (see Appendix J), encouraging interagency and interstate coordination, providing training for staff who will be involved with ITS deployment and operation, and updating the Kansas ITS Statewide Architecture on a regular basis.

As part of the ITS Statewide Planning effort, each of the existing projects were assigned a deployment priority of either high, medium or low. This prioritization was based on factors described in the ranking and prioritization process presented in Section 3.2.

The telecommunications issues KDOT faces include establishing the last-mile connections, staffing, and preparing for the future. KDOT's optical fiber backbone is just that, a backbone. While necessary to provide the infrastructure for immediate ITS projects, the backbone must be extended to reach into local communities and at specific ITS project sites. This expansion may include burying more conduit with optical fiber cable or installing a wireless system.

KDOT has short-term and long-term staffing requirements. KDOT will need additional staff trained specifically to manage and support advanced technologies. In the long term, a cross-functional technology organization could be established. Currently, each technology specialty (computers, networking, radio, ITS, etc.) operates separately from each other and some stop at District boundaries. As technologies continue to converge, a group cross-trained in all of the deployed technologies could run the integrated systems.