

**Kansas Statewide Intelligent Transportation System Architecture
KDOT Project No. 106 KA-0380-01**

Volume III

ARCHITECTURE MAINTENANCE PLAN

Version 1.00

Prepared for:



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1. Introduction

The Kansas Statewide Intelligent Transportation System (ITS) Architecture has been created as a consensus view of what ITS systems the stakeholders within the architecture boundary have implemented and what systems they plan to implement in the future. By its nature, the architecture is not a static set of outputs. The architecture should be modified as plans and priorities change, ITS projects are implemented, and the ITS needs and services evolve in the state. There are many actions that may cause a need to update the architecture, including:

- **Changes in Project Definition.** When actually defined, a project may add, subtract or modify elements, interfaces, or information flows of the Statewide ITS Architecture. Because the architecture is meant to describe not only ITS planned, but also the current ITS implementations, it should be updated to correctly reflect the deployed projects.
- **Changes due to Project Addition/Deletion.** Occasionally a project will be added, deleted or modified during the planning process. When this occurs, the aspects of the Statewide ITS Architecture associated with the project should be added, deleted or modified.
- **Changes in Project Status.** As projects are deployed, the status of the architecture elements, services and flows that are part of the projects will have to be changed from planned to existing. Elements, services and flows should be considered to exist when they are substantially complete.
- **Changes in Project Priority.** Due to funding constraints, technological changes or other considerations, a project planned may be delayed or accelerated. Such changes should be reflected in the Statewide ITS Architecture.
- **Changes in Statewide/Regional Needs.** Transportation planning is done to address both statewide and regional transportation needs. Over time these needs change and the corresponding aspects of the Statewide ITS Architecture that addresses these needs should be updated.
- **Changes in Participating Stakeholders.** Stakeholder involvement can also change over time. The Statewide ITS Architecture should be updated to reflect the participating stakeholder roles in the statewide view of ITS elements, interfaces, and information flows.
- **Changes in Other Architectures.** The Statewide ITS Architecture includes not only elements and interfaces within the architecture boundary, but also interfaces to elements in the Metropolitan Planning Organization (MPO) areas in Kansas and adjacent states. Changes in the ITS Architectures in MPO areas or adjacent states may necessitate changes in the Statewide ITS Architecture to maintain consistency. A MPO Regional ITS Architecture may overlap with the Statewide ITS Architecture and a change in one architecture may necessitate a change in the other.
- **Changes in National ITS Architecture.** The National ITS Architecture will be expanded and evolved from time to time to include new user services or refine existing services. These changes should be considered as the Statewide ITS Architecture is updated. Updates to the National ITS Architecture and Turbo will be publicized on the ITS Joint Program Office (JPO) Architecture web site: <http://www.its.dot.gov/arch/index.htm>.

The following sections define the key aspects of the process for the maintenance of the Kansas Statewide ITS Architecture:

- Who is responsible for architecture maintenance?
- What will be maintained?
- How will it be maintained (i.e. what configuration control process will be used)?

2. Who Is Responsible for Architecture Maintenance?

Responsibility for maintaining the Statewide ITS Architecture will lie within the Kansas Department of Transportation (KDOT) ITS Unit and Bureau of Transportation Planning. Members of the existing ITS Steering Committee that oversees all ITS activities in Kansas, including policy, planning, architecture, design, implementation, operations, and maintenance, etc., will serve as a policy board to evaluate and approve proposed changes to the Architecture.

The Statewide ITS Steering Committee consists of representatives from Federal Highway Administration Kansas Division, Kansas Highway Patrol, and various KDOT Office and Bureaus including Construction, Maintenance, Traffic Engineering, Material and Research, Public Affairs, Transportation Planning and ITS Unit, and field staff representatives of KDOT Districts.

The KDOT ITS Unit will be responsible for reviewing and evaluating changes proposed by stakeholders and providing recommendations to the ITS Steering Committee for review and approval. The KDOT Bureau of Transportation Planning will be responsible for making approved changes to the Statewide ITS Architecture, and reporting the results back to the KDOT ITS Unit, who will in turn, notify stakeholders of the changes made to the Architecture.

The KDOT ITS Unit will be responsible for overseeing and guiding the maintenance effort. The KDOT ITS Unit should coordinate the maintenance activities and be the point of contact for all maintenance activities, including collecting, reviewing and evaluating change requests, tracking change requests, requesting additional information from stakeholders, distributing documentation, as well as calling meetings, making meeting arrangements, assembling an agenda, leading the meetings, and approving minutes.

3. What Will Be Maintained?

The following should be reviewed and updated at regular intervals:

- Description of the region
- Participating agencies and other stakeholders, including key contact information
- Inventory of existing and planned ITS systems in the region
- Operational concept that identifies the roles and responsibilities of participating agencies and stakeholders in the operation and implementation of the systems
- Agreements for operations and interoperability
- System functional requirements
- Interface requirements and information exchanges with planned and existing systems and subsystems
- Applicable ITS standards supporting regional and national interoperability
- Sequence of projects for implementation

There are several different components that make up the Statewide ITS Architecture. Some may require more frequent updates than others, but the entire architecture will need periodic review to ensure that it is consistent with statewide and regional goals. The current version (version 1.00) of the Kansas Statewide ITS Architecture shall be the baseline architecture upon which future revisions are conducted as necessary. The maintenance timeframe identified in this document will become effective upon completion of this Kansas Statewide ITS Architecture.

The Kansas Statewide ITS Architecture was created based on the National ITS Architecture Version 5.1 using Turbo Architecture Software Version 3.1. The Architecture was documented and stored in the following forms:

- Kansas Statewide ITS Architecture Plan
- Kansas Statewide ITS Architecture Integration and Implementation Plan
- An electronic Turbo Architecture database

Regarding the Statewide ITS Architecture Plan and the Statewide ITS Architecture Integration and Implementation Plan, the original source documents in Microsoft Word format are held by the KDOT ITS Unit, while a PDF version of the documents are posted on the KDOT Web Site and available for general distribution. A version number and date are included on the cover page of each document. Each document will use a versioning scheme to identify the baseline version and revision number. For example, the documents release at the conclusion of this effort will be version 1.00. Upon the completion of the first minor revision, the documents will be version 1.01. The second minor revision will be version 1.02. The next comprehensive revision to the document will be version 2.00.

The Statewide ITS Architecture database is held by the KDOT ITS Unit and available for general distribution at the KDOT Web Site. To aid the architecture version control, the filename of the database should contain the version number and date on which the architecture is updated. The database also includes a version number and a change log which can be entered and modified using Turbo Architecture. When updating the architecture database, the date, name of the maintainer, version number, and a description of the nature of the revision should be recorded in the database using the change log in Turbo Architecture.

The Turbo Architecture database can generate a set of outputs including various reports and diagrams. Such outputs include interconnect and architecture flow diagrams, inventory lists, stakeholders lists, market package lists, functional requirements, and other diagrams and reports. Collectively these outputs can be used to prepare a general ITS architecture document. At a minimum, the architecture should be maintained through updates in the database using Turbo Architecture.

4. What Configuration Control Will be Used?

Once the architecture baseline is defined, the process for making changes to this baseline must be established. The configuration control (change management) process specifies how changes are identified, how often changes are made, and how the changes will be reviewed, implemented, and released.

How Changes Are Identified

Changes to the Kansas Statewide ITS Architecture may be identified by two channels. One is that stakeholders submit a formal request to KDOT, and the second channel is actively soliciting changes from each stakeholder on an annual basis.

Stakeholders can use the Change Request Form to propose changes to the Statewide ITS Architecture. A Change Request Form can be found in Appendix A. The changes to the architecture, the reasons for the proposed modifications and the stakeholder contact should be clearly defined in the request. Upon receiving a Change Request form, the KDOT Unit will perform an initial assessment of the proposed change for the impact to the Statewide ITS Architecture and/or the affected documentation. If the proposed change has an impact on other stakeholders, the KDOT ITS Unit should contact the stakeholders to confirm their agreement with the proposed modification.

The second channel is for the KDOT ITS Unit to distribute an annual survey to stakeholders to actively solicit the need for updating the architecture. This survey will contain a few basic questions for stakeholders to answer. This annual survey can be distributed to stakeholders in conjunction with the annual solicitation of the KDOT ITS Set-Aside Program. A sample survey can be found in Appendix B. If

additional information is needed, the KDOT ITS Unit will contact the stakeholder to identify the need for updating the architecture. Based on the information gathered, the KDOT ITS Unit can work with the stakeholders to complete the Change Request Form.

How Often Changes Are Made

A comprehensive, formal update of the Kansas Statewide ITS Architecture Baseline should be performed concurrently with the Kansas Long Range Transportation Plan (LRTP) updates to ensure the architecture continues to accurately represent statewide and regional goals. It is recommended that a comprehensive update of the architecture baseline is performed within 6 months prior to the LRTP update.

Between major updates of the architecture, minor or informal modifications may be made at the discretion of the KDOT ITS Unit. The KDOT ITS Unit will solicit changes from stakeholders of needed updates. The KDOT ITS Unit will contact stakeholders, via e-mail, written correspondence, and/or by telephone, and inquire if the stakeholder has any changes to the Statewide ITS Architecture. The change requests will be collected and reviewed by the KDOT ITS Unit for consideration in the next minor update.

In addition, this Maintenance Plan should also be reviewed and evaluated periodically for required changes to the maintenance process. The actual maintenance process and procedures may differ from those anticipated during the initial development of this Maintenance Plan. Revising the Maintenance Plan will ensure both an effective architecture maintenance process and change management process.

Change Review, Implementation and Release

The general steps in the change management process are:

1. Stakeholders identify changes, complete Architecture Change Request Form (or the annual survey), and submit it to KDOT ITS Unit. If the initial information is gathered via the annual survey, the KDOT ITS Unit contacts the stakeholder for more information or work with the stakeholder to complete the Architecture Change Request Form.
2. The KDOT ITS Unit reviews the proposed changes, offers comments, and/or asks for additional information.
3. The KDOT ITS Unit, in coordination with the stakeholders affected by the proposed changes as necessary, evaluate the changes and determine what impact they may have on the Architecture and/or associated documentation.
4. Upon its evaluation, the KDOT ITS Unit provides recommendations on the requested changes to the ITS Steering Committee for approval.
5. The ITS Steering Committee makes decisions to accept the change, reject it, or ask for additional information.
6. The KDOT ITS Unit implements the decisions. If the decision is to accept the change, then the appropriate portions of the architecture baseline are updated by the KDOT Bureau of Transportation Planning.
7. Once the Statewide ITS Architecture has been modified, the KDOT Bureau of Transportation Planning reports the results and provides updated architecture documentation and database to the KDOT ITS Unit.
8. The KDOT ITS Unit records changes in the Statewide ITS Architecture Configuration Status Report. An example of the Configuration Status Report is provided in Appendix C.
9. The KDOT ITS Unit notifies all stakeholders of architecture updates and provides information on how to obtain the latest version of the Architecture.

Figure 1 illustrates the Change Management Process.

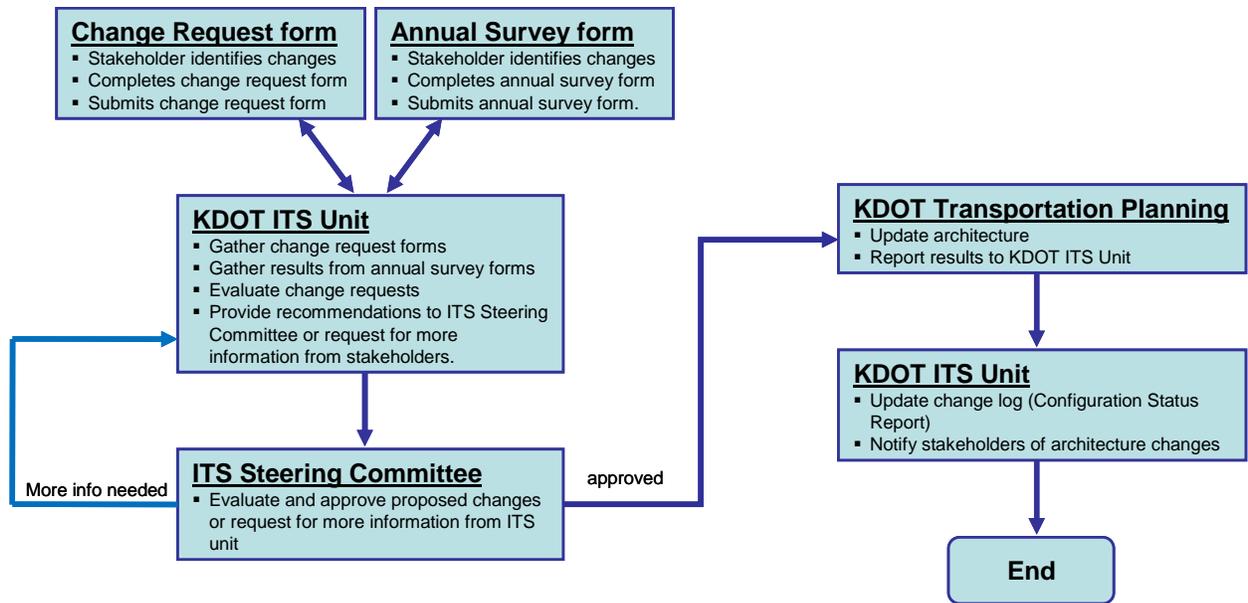


Figure 1. Kansas Statewide ITS Architecture Maintenance Process

The time required to perform this configuration control process will be a direct function of the number of changes suggested to the Architecture, which will be driven by how much the Architecture is being used. It is suggested that this process be reviewed periodically and fine-tuned to most appropriately address the level of change that has occurred.

Configuration Status

In addition to updating the documentation, database, or other outputs, the Statewide ITS Architecture Configuration Status Report should be updated. This process is known as Configuration Status Accounting in the discipline of Configuration Management. This process provides a methodology for updating all relevant documentation and database to ensure that the most current configuration information is reflected in the Configuration Status Report. The Configuration Status Report should be created during the first architecture update and subsequently maintained throughout the entire life of the architecture. A primary goal of this report is to repose information necessary to support existing and future architecture maintenance and change management efforts.

For each architecture maintenance activity (regardless if it is a major or minor update), the Configuration Status Report will document the following information:

- Document or database title
- Revision number
- Date of revision
- File name
- A list of changes made with brief descriptions
- Person or entity who performed the revision
- KDOT ITS Unit point of contact

Periodically, the information in the various outputs (i.e. documentation and database) of the architecture baseline should be audited to assure that the different representations of the architecture are synchronized. Preferably this should be performed by someone independent of the staff or resources used to actually implement the changes in the architecture.

Appendix A. Kansas Statewide ITS Architecture Change Request Form

Originator Name:		Date Submitted:
Originator Agency:		
Originator Telephone:	Originator Fax:	Originator E-Mail:
Agency Authorized Signature:		Signature Date:

Description of Proposed Change:		
Rationale for Proposed Change:		
Impacted Agency:	Authorized Signature:	Signature Date:
Impacted Agency:	Authorized Signature:	Signature Date:
Impacted Agency:	Authorized Signature:	Signature Date:
List of Attachments:		

To Be Completed By KDOT ITS Unit		
Change Request No.:	Date Received:	Date Logged:
Date Initially Discussed:	Disposition: <input type="checkbox"/> Accepted <input type="checkbox"/> Rejected <input type="checkbox"/> More Information	Comments:
Data Discussed:	Disposition: <input type="checkbox"/> Accepted <input type="checkbox"/> Rejected <input type="checkbox"/> More Information	Comments:
Date Approval by ITS Steering Committee:		
Baseline Documents Affected/Version Implemented:		
<input type="checkbox"/> Turbo Architecture	Date: _____	Version: _____
<input type="checkbox"/> Architecture Report	Date: _____	Version: _____
<input type="checkbox"/> _____	Date: _____	Version: _____

Please submit this form to: ITS Program Manager, KDOT ITS Unit, Email: ITSunit@ksdot.org, Phone: 785-296-5652, Fax: 785-296-0963

Appendix B. Sample Architecture Maintenance Survey Questionnaire

1. Did your agency implement (including upgrade) any technology and communications related projects for transportation systems or emergency management in the past 12 months? (*A list of sample projects is provided at the end of this survey for your reference.)

Yes No

If YES, please describe the project(s) and/or provide project name(s) and available documentation source(s).

2. Do you plan to implement any technology or communications related projects in the next 5 years?

Yes No

If YES, please describe the project(s) and/or provide project name(s) and available documentation source(s).

3. Please provide your contact information:

Name: _____

Agency: _____

Phone: _____

Email: _____

Please submit this form to: ITS Program Manager, KDOT ITS Unit, Email: ITSunit@ksdot.org, Phone: 785-296-5652, Fax: 785-296-0963. Thank you!

Examples of ITS Projects:

- Cameras to monitor traffic or transportation facilities
- Dynamic message boards
- Traffic signal interconnects
- New or upgraded traffic signal controllers
- Traffic signal coordination
- Automatic traffic counters/recorders or speed detectors
- Automated road/weather information collection system
- Automated roadway/bridge de-icing system
- Emergency vehicle preemption
- Communications with emergency vehicles, maintenance vehicles, or transit vehicles (e.g. radio systems, mobile data terminals)
- Computer aided dispatch
- Vehicle or equipment tracking using global positioning system
- Fiber optics installation
- Wireless communications
- Internet Web Sites or information kiosks providing traffic conditions, road construction information, trip planning, etc.
- Electronic fare box on transit vehicles
- Automated transit passenger counters

