

5. USE AND MAINTENANCE OF THE REGIONAL ITS ARCHITECTURE

The Regional ITS Architecture developed for the Nashville Area addresses the Region's vision for ITS implementation at the time the plan was developed. With the growth of the Region, needs will change and as technology progresses new ITS opportunities will arise. Shifts in regional needs and focus as well as changes in the National ITS Architecture will necessitate that the Nashville Area Regional ITS Architecture be updated periodically to remain a useful resource for the Region. As projects are developed and deployed it will be important that those projects either conform to the Regional ITS Architecture so that they are consistent with both the Region's vision for ITS as well as the National standards described in the Regional ITS Architecture. In some cases if projects do not conform it may be necessary to modify the Regional ITS Architecture to reflect changes in the Region's vision for ITS rather than modify the project. In this Section, a process for determining architecture conformity of projects is presented and a plan for how to maintain and update the Regional ITS Architecture is described.

5.1 Incorporation into the Regional Planning Process

Stakeholders invested a considerable amount of effort in the development of the Regional ITS Architecture and Regional ITS Deployment Plan for the Nashville Area. The plans need to be incorporated into the regional planning process so that the ITS vision for the Region is considered when implementing ITS projects in the future, and to ensure that the Region remains eligible for federal funding. The FHWA and FTA require that any project that is implemented with federal funds conform to the Regional ITS Architecture. Many metropolitan or transportation planning organizations around the country now require that an agency certify that a project with ITS elements conforms to the Regional ITS Architecture before allowing the project to be included in the Transportation Improvement Program (TIP).

Stakeholders in the Nashville Area agreed that as projects are submitted for inclusion in the TIP each project should be evaluated by the submitting agency to determine if the project includes any ITS elements. If the project contains any ITS elements, then the project needs to be reviewed to determine if the ITS elements in the project are in conformance with the Regional ITS Architecture. The submitting agency will perform this examination as part of the planning process using the procedure outlined in Section 5.2 and the Nashville Area MPO will review each project to confirm it does conform to the Regional ITS Architecture.

5.2 Process for Determining Architecture Conformity

The Nashville Area Regional ITS Architecture documents the customized market packages that were developed as part of the ITS architecture process. To satisfy FHWA and FTA requirements and remain eligible to use Federal funds, a project must be accurately documented. The steps of the process are as follows:

- Identify the ITS components in the project;
- Identify the corresponding market packages(s) from the Regional ITS Architecture;
- Locate the component within the market package;
- Compare the connections to other agencies or elements documented in the ITS architecture as well as the information flows between them to the connections that will be part of the project; and
- Document any changes necessary to the Regional ITS Architecture or the project to ensure there is conformance.

The steps for determining ITS architecture conformity of a project are described in more detail below.

Step 1 – Identify the ITS Components

ITS components can be fairly apparent in an ITS focused project such as CCTV or DMS deployments, but could also be included in other types of projects where they are not as apparent. For example, an arterial widening project could include the installation of signal system interconnect, signal upgrades, and the incorporation of the signals in the project limits into a city's closed loop signal system. These are all ITS functions and should be included in the ITS Architecture.

Step 2 – Identify the Corresponding Market Packages

If a project was included in the projects identified in the Nashville Area Regional ITS Deployment Plan, then the applicable ITS market package(s) for that project are identified in a column of the tables. However, ITS projects are not required to be included in the ITS Deployment Plan in order to be eligible for federal funding; therefore, market packages might need to be identified for projects that have not been covered in the ITS Deployment Plan. In that case, the market packages selected and customized for the Nashville Area should be reviewed to determine if they adequately cover the project. Market packages selected for the Nashville Area Regional ITS Architecture are identified in **Table 5** of this document and detailed market package definitions are located in **Appendix A**.

Step 3 – Identify the Component within the Market Package

The customized market packages for the Nashville Area are located in **Appendix B**. Once the element is located within the appropriate ITS market package the evaluator should determine if the element name used in the market package is accurate or if a change to the name is needed. For example, a future element called the Metro Nashville Rail Notification System was included in the Nashville Area Regional ITS Architecture. Detailed planning for this system has not begun and it would not be unusual for Metro Nashville to select a different name for the system once planning and implementation is underway. Such a name change should be documented using the process outlined in Section 5.4.

Step 4 – Evaluate the Connections and Flows

The connections and architecture flows documented in the ITS market package diagrams were selected based on the information available at the time the Regional ITS Architecture was developed. As the projects are designed, decisions will be made on the system layout that might differ from what is shown in the market package. These changes in the project should be documented in the ITS market packages using the process outlined in Section 5.4.

Step 5 – Document Required Changes

If any changes are needed to accommodate the project under review, Section 5.4 describes how those changes should be documented. Any changes will be incorporated during the next Regional ITS Architecture update. Conformance will be accomplished by documenting how the ITS market package(s) should be modified so that the connections and data flows are consistent with the project.

5.3 Maintenance Process

The Nashville Area MPO will be responsible for leading the process to update the Nashville Area Regional ITS Architecture and Deployment Plan in coordination with the TDOT Long Range Planning Division. **Table 10** summarizes the maintenance process agreed upon by stakeholders in the Region.

Table 10 – Nashville Area Regional ITS Architecture and Deployment Plan Maintenance Summary

Maintenance Details	Regional ITS Architecture		Regional ITS Deployment Plan	
	Minor Update	Major Update	Minor Update	Major Update
Timeframe for Updates	As needed	Approximately every 4 years	As needed	Approximately every 4 years
Scope of Update	Review and update market packages to satisfy architecture compliance requirements of projects or to document other changes that impact the Regional ITS Architecture	Entire Regional ITS Architecture	Review and update project status and add or remove projects as needed	Entire Regional ITS Deployment Plan
Lead Agency	Nashville Area MPO		Nashville Area MPO	
Participants	Stakeholders impacted by market package modifications	Entire stakeholder group	Entire stakeholder group	
Results	Market package or other change(s) documented for next complete update	Updated Regional ITS Architecture document, Appendices, and Turbo Architecture database	Updated project tables	Updated Regional ITS Deployment Plan document

Stakeholders agreed that a full update of the Regional ITS Architecture and Deployment Plan should occur approximately every four years in the year preceding the Long Range Transportation Plan (LRTP) update. By completing a full update in the year prior to the LRTP update, stakeholders will be able to determine the ITS needs and projects that are most important to the Region and document those needs and projects for consideration when developing the LRTP. The Nashville Area MPO, in coordination with the TDOT Long Range Planning Division, will be responsible for completing the full updates. During the update process all of the stakeholder agencies that participated in the original development of the Regional ITS Architecture and Deployment Plan should be included as well as any other agencies in the Region that are deploying or may be impacted by ITS projects.

Minor changes to the Regional ITS Architecture should occur as needed between full updates of the plan. In Section 5.4 of this document the procedure for submitting a change to the Regional ITS Architecture is documented. Documentation of changes to the Regional ITS Architecture is particularly important if a project is being deployed and requires a change to the Regional ITS Architecture in order to establish conformity.

Stakeholders recommended that the Nashville Area MPO lead a meeting to review projects in the Regional ITS Deployment Plan to update project status, remove projects that were completed, add project detail when available, and add new projects on an as needed basis. Minor changes to the Regional ITS Deployment Plan should be noted by the Nashville Area MPO. Any corresponding changes to the Regional ITS Architecture will be documented and retained by the MPO for inclusion during the next complete update.

5.4 Procedure for Submitting ITS Architecture Changes Between Major Updates

Updates to the Nashville Area Regional ITS Architecture will occur on a regular basis as described in Section 5.3 to maintain the architecture as a useful planning tool. Between major plan updates smaller modifications will likely be required to accommodate ITS projects in the Region. Section 5.2 contains step by step guidance for determining whether or not a project requires architecture modifications to the Regional ITS Architecture.

For situations where a change is required, an Architecture Maintenance Documentation Form was developed and is included in **Appendix E**. This form should be completed and submitted to the architecture maintenance contact person identified on the form whenever a change to the Regional ITS Architecture is proposed. There are several key questions that need to be answered when completing the Architecture Maintenance Documentation Form including those described below.

Change Information: The type of change that is being requested can include an Administrative Change, Functional Change – Single Agency, Functional Change – Multiple Agency, or a Project Change. A description of each type of change is summarized below.

- **Administrative Change:** Basic changes that do not affect the structure of the ITS market packages in the Regional ITS Architecture. Examples include changes to stakeholder or element names, element status, or data flow status.
- **Functional Change – Single Agency:** Structural changes to the ITS market packages that impact only one agency in the Regional ITS Architecture. Examples include the addition of a new ITS market package or changes to data flow connections of an existing market package. The addition or change would only impact a single agency.
- **Functional Change – Multiple Agencies:** Structural changes to the ITS market packages that have the potential to impact multiple agencies in the Regional ITS Architecture. Examples include the addition of a new ITS market package or changes to data flow connections of an existing ITS market package. The addition or changes would impact multiple agencies and require coordination between the agencies.
- **Project Change:** Addition, modification, or removal of a project in the Regional ITS Deployment Plan.

Description of the requested change: A brief description of the type of change being requested should be included.

Market packages being impacted by the change: Each of the ITS market packages that are impacted by the proposed change should be listed on the ITS Architecture Maintenance Documentation Form. If the proposed change involves creating or modifying an ITS market package then the agency completing the ITS Architecture Maintenance Documentation Form is asked to include a sketch of the new or modified market package.

Impact of proposed change on other stakeholders: If the proposed change is expected to have any impact on other stakeholders in the Region, then those stakeholders should be listed on the

ITS Architecture Maintenance Documentation Form. A description of any coordination that has occurred with other stakeholders that may be impacted by the change should be also included. Ideally all stakeholders that may be impacted by the change should be contacted and consensus should be reached on any new or modified ITS market packages that will be included as part of the Regional ITS Architecture.

The Nashville Area MPO will review and accept the proposed changes and forward the form to the TDOT Long Range Planning Division for their records. When a major update is performed all of the documented changes should be incorporated into the Regional ITS Architecture.