Wisconsin DOT
Statewide ITS Architecture

Updates, Consolidation, and Applications
May 2011

This summary supplements the presentation made at the Wisconsin Department of Transportation (WisDOT) Statewide Traffic Operations Center (STOC) on May 9, 2011. The full statewide architecture is available at http://www.topslab.wisc.edu/its/architecture/. Feedback, comments, and questions should be directed to architecture@topslab.wisc.edu.

With the ongoing presence of traffic problems such as crashes and congestion, the use of Intelligent Transportation Systems is increasingly being used to mitigate these problems. In order to use resources efficiently and to receive maximum benefits out of a new system, it is crucial to have a current and functional regional ITS architecture. In this case the regional area of interest is the entire state of Wisconsin for which this architecture is being developed.

The Wisconsin ITS architecture was initially created for each of the WisDOT districts, and then in late 2005, it was modified to the five regions of Wisconsin using Turbo Architecture v3.1. To achieve a single functional statewide architecture, the first step was to convert the five region files into the current version of Turbo Architecture (v5.0) which uses the National ITS Architecture v6.1. An output of the changes that occurred in the conversion were generated and saved as a reference for how the new version of the architecture affected the Wisconsin ITS architecture.

After the files were converted to the current version of the National ITS Architecture, some maintenance had to be done on the files so that they could be combined into a single file. Since the previous files had been developed independent of each other, there existed many inconsistencies which needed to be corrected before a single file would be possible. A naming convention was adopted so that information would be organized and easily understood. Proper naming was also a way to identify overlap and duplicate elements and stakeholders which would be consolidated or removed depending on the situation. As part of the naming convention, the region prefix was dropped from stakeholders and elements names since it was no longer a region based architecture and since many of these spanned multiple regions. To make sure there was sufficient connection in the names of elements and stakeholders, elements would be prefixed with their stakeholder name with the exception of Terminators and elements which share the same name as the stakeholder. This naming convention helps to organize the information so that it may be more easily searched by users. Once the naming convention was applied to the five files, they were combined into a single file for the base of the statewide architecture.

At this point, the file was too large to properly function. To reduce the size and complexity, a few groupings had to take place. The largest grouping of elements occurred by summing up county department operations into a single element to represent the all the counties. Since each county is

assumed to have Emergency Management, Highway, Maintenance, and Sheriff Departments even if not represented in the original five files, a generic county department for each was created. Only the basic functionality and flows are assigned to the groups because it meant to apply to all counties. If one county plays a significant role outside of the basic functionality, it will be brought out separately to accurately portray the system.

One goal was to conform to the National ITS Architecture which required a few modifications. One step was to remove all user-defined subsystems/terminators and user-defined flows and replace them with entities and flows defined by the National ITS Architecture. This was done not only for conformity but also because the user-defined entities/flows lacked sufficient definition and detail. The update to the National ITS Architecture from the previous version of Turbo itself caused some discontinued flows which were removed as they were no longer relevant.

As a way to keep track of changes, all files have been archived in case they are needed as a reference. A file is dated and archived after any significant changes to the file. Along with archiving files, utilization of the change log feature to track changes in Turbo is being utilized. By recording and dating major changes made to the architecture, it is easier to track down a previous version of the file from the archive.

Once the baseline for the statewide architecture was established, the incorporation of systems as projects was performed for a more complete architecture. The first system to be introduced into the statewide architecture was the 511 Traveler Information project due to its prevalence throughout the state. Another large project that has been added to the statewide architecture was for the WisTransPortal. The two other projects currently part of the architecture include a dynamic message sign planned for the southwest region and a rural intersection crash avoidance system in the northwest region of Wisconsin.

To summarize, there was a need to make a statewide architecture to better organize the current Regional ITS Architecture and so that planning could be done and resources could be used more effectively. After deciding upon what information to represent and how to represent that information, the files were merged and cleaned up. Tracking of development of the architecture and adding new systems to the architecture is being done to further the completeness and usefulness of the architecture. Although there is still additional updating and verification to be done, the statewide architecture is currently a functional file with the capability to be used in the initial planning steps of future ITS projects.