



# **West Virginia ITS Architecture Development: Executive Summary**

**State Project T699-ARC/HI-1**

**Federal Project CMAQ-2005(016)E**

**ITS Architecture Development**

November 20, 2006

**Submitted By:**

**ConSysTec** 

**Consensus Systems Technologies Corporation**

**17 Miller Avenue, PO Box 517**

**Shenorock, NY 10587-0517**

**914-248-8466**

**[rsj@consystec.com](mailto:rsj@consystec.com)**

**[www.consystec.com](http://www.consystec.com)**

### Revision History

Filename	Version	Date	Author	Comment
WV Statewide Exec SummaryV07.doc	0.07	10/30/06	B.Eisenhart	Final Draft
WV Statewide Exec SummaryV1.doc	1.0	11/20/06	B. Eisenhart	Initial Baseline Version

# Executive Summary

## ***Introduction***

The *West Virginia ITS Architecture Development* Project was undertaken to provide West Virginia Department of Transportation (WVDOT) with a comprehensive, statewide Intelligent Transportation System (ITS) plan and architecture that will enable WVDOT and other agencies in West Virginia to deploy and integrate ITS technologies as a regular component of their transportation planning and design process. This ITS plan and architecture will:

- Assist in the maintenance and operations of the statewide transportation network;
- Provide WVDOT and other West Virginia agencies with tools to ensure that the planning, deployment and integration of ITS systems throughout the state is done with a common framework through ITS architecture and standards development; and
- Bring the State into compliance with requirements defined by the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) for development of ITS projects.

## ***Vision for ITS in West Virginia***

The following vision has been developed to guide the deployment of ITS in the state:

***“Create an improved quality of life for residents and travelers by providing more efficient and safer movement of people and goods through the judicious application of advanced ITS technologies.”***

## ***Goals***

To meet this vision, the following goals have been identified for the ITS program in West Virginia:

1. Ensure safe transportation for residents, visitors and travelers
2. Enhance Mobility
3. Improve efficiency of the existing transportation network
4. Provide a transportation system that supports economic development
5. Enhance West Virginia’s special environment, preserve community values and reduce energy consumption
6. Create widespread understanding via awareness seminars and technical training
7. Coordinate ITS efforts throughout the State of West Virginia
8. Continue regional cooperation and coordination

### ***Summary of the Statewide ITS Architecture***

The West Virginia Statewide ITS Architecture represents a consensus roadmap for the deployment of ITS Investments in the state over the next 20 years. The architecture defines possible integration opportunities between agencies within the state and identifies how cooperation between the agencies in the deployment of ITS systems can be used to satisfy transportation needs. By defining what currently exists in the area of ITS deployments, the Statewide ITS architecture can be used to identify gaps in needed ITS services and can identify how these gaps might be addressed. The architecture can then be used to efficiently structure implementations of ITS technologies. By creating a long range plan for the implementation of these systems and technologies, agencies can:

- Prepare for future expansion
- Leverage funding
- Identify standard interfaces

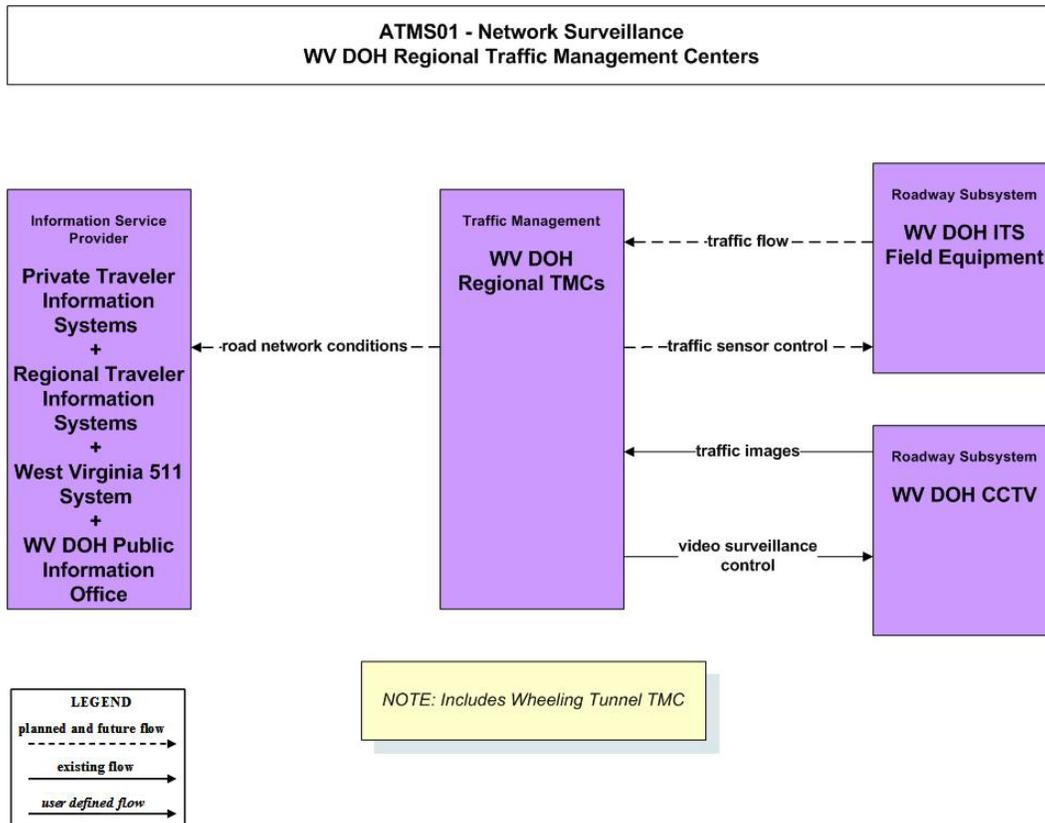
Finally, development of the West Virginia Statewide ITS Architecture allows West Virginia to comply with the FHWA Rule/FTA Policy on Architecture and Standards. The FHWA Final Rule (and corresponding FTA policy) to implement Section 5206(e) of the TEA-21 requires that Intelligent Transportation Systems (ITS) projects funded through the Highway Trust Fund conform to the National ITS Architecture and applicable standards. The Rule/Policy requires creation of a “regional ITS architecture” to guide ITS deployment. The development of this statewide ITS architecture will make the entire state of West Virginia fully compliant with this Rule/Policy, which will facilitate the approval of federal funds to support ITS projects in the state.

The West Virginia Statewide ITS Architecture has been developed through a cooperative and consensus based effort led by the State’s transportation agency, WVDOT, with the participation of statewide, county, and municipal agencies, covering all surface transportation modes and all roads in the State. This architecture represents a shared vision of how each agency’s systems work together currently or will work together in the future, sharing information and resources to provide a safer, more efficient, and more effective transportation system for travelers in West Virginia.

Stakeholder coordination and involvement is one of the keys to the development of an ITS architecture. Who are the stakeholders? A stakeholder is any organization or agency that has a vested interest in the transportation systems within a region. Throughout the course of this project, the stakeholders at statewide, regional, and municipal levels have been brought together to develop, review, and comment on key aspects of the West Virginia Statewide ITS Architecture. A total of nine (9) stakeholder meetings have been held from February to May 2006. These meetings aided in the development of the Statewide ITS Architecture for West Virginia, the Strategic Deployment Plan for ITS, and the Standards Plan. In addition, these meetings helped the architecture team and other stakeholders develop an understanding of systematic

problems within the region, and allowed for open discussions between stakeholders to begin the process of developing institutional agreements between agencies.

To address the 8 goals identified above, ITS related systems (called “elements” in the architecture) in the State, both existing and planned, were identified. A total of 243 elements were defined to cover all the systems in West Virginia (and some in neighboring states that interface with West Virginia Systems). A total of 1,611 interconnections between these systems were defined to provide a set of customized ITS transportation services. Stakeholders throughout the state identified 49 ITS related transportation services in the Statewide ITS Architecture that are currently deployed or were desired over the next 20 years. These transportation services were then prioritized based on stakeholders’ inputs to be short term (0-5 years), medium term (5-10 years), or long term (10+ years) services. Of these 49 transportation services, 25 were identified as short-term needs by one or more stakeholder groups, while 21 were identified as medium-term services, and 3 as long-term services. Some of the short term services included incident management, freeway control, winter maintenance, broadcast traveler information, transit security, disaster response and recovery, and commercial vehicle weigh-in-motion. For each of these services a customized view of the interconnections between elements was created. Figure 1 is an example of one (out of a total of 324 diagrams) of these customized service diagrams, which documents the set of ITS elements and information flows between them used to provide the ITS service.



**Figure 1. Example Customized Market Package Diagram**

Another key result of the statewide ITS architecture effort was the definition of ITS projects, which, like the services were identified as short, medium, or long term. A total of 98 ITS projects were identified based on review of the regional TIPs, the STIP, the WVDOT 6 year plan, and on stakeholder interactions.

### ***Project Deliverables***

The *West Virginia ITS Architecture Development Project* is described by the following three documents:

- **West Virginia Statewide ITS Architecture Document.** Describes the stakeholders, elements, interfaces, services, and requirements that comprise the West Virginia Statewide ITS Architecture.
- **West Virginia Strategic Plan for ITS Deployment Document.** This plan contains the prioritization of ITS services, the definition of ITS projects, and a listing of current and needed agreements to implement the ITS projects. The document also contains the vision, goals, and objectives for the ITS program.
- **Standards Development Plan Document.** This document discusses the importance of ITS Standards, reviews the current status of some ITS Standards that should be considered for deployment in the State of West Virginia and makes recommendations on how to incorporate ITS Standards into an agency's project development process.

In addition, there are two other key deliverables from the project:

- **West Virginia Statewide ITS Architecture Website.** ConSysTec has developed and posted a website, which provides in an easy to access hyperlinked format the same detailed descriptions of stakeholders, elements, interfaces, and functional requirements found in the Turbo Architecture database, and where the project documentation can be found, including meeting minutes and stakeholder comments. The website currently resides at <http://www.consystem.com/westvirginia/web/regionhome.htm>.
- **West Virginia Statewide ITS Architecture Turbo Architecture Database.** This FHWA developed software tool captures the details of the architectures including definition of stakeholders, inventory, market packages, interconnects, interfaces, functional requirements, and standards.