

National ITS Architecture

Turbo Architecture

What's New

ARCHITECTURE



Version 4.0

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What's New in Turbo Architecture 4.0

This document highlights the changes in Turbo Architecture Version 4.0. It is written for users of previous versions of Turbo Architecture who are interested in a quick overview of the enhanced features of the new software. This document does not provide a detailed explanation of Turbo Architecture operation. The reader is referred to the User's Manual for these details.

In addition to the new features and enhancements described below, Turbo Architecture Version 4.0 also corrects all known software issues from previous versions. The National ITS Architecture web site (<http://www.its.dot.gov/arch/index.htm>) is the best resource for current information on Turbo Architecture. Visit this web site and click on the "Turbo Architecture" link for more information.

User Interface Enhancements

The user interface for Turbo Architecture Version 4.0 will look familiar to Version 3.0 and Version 3.1 users. On closer inspection, you will see a few key enhancements to the familiar tabbed interface.

- **All Turbo Windows Are Now Scalable.** In Turbo V4.0, all of the tabs can be expanded to fill your display so you can see more of your long lists of stakeholders, inventory elements, roles and responsibilities, etc. The amount of architecture information that you can see at once in Turbo is now limited only by the size of your display.
- **Current Architecture Information is Prominently Displayed.** Turbo V4.0 shows the current architecture at the top of every tab, so there is no longer any doubt about which architecture you are working on. In previous versions, users would have to visit the Start Tab to double-check that the correct architecture was selected.

New Capabilities

- **Identify related architectures.** As you define the boundary of your regional ITS architecture, it is important to identify and consider adjacent and overlapping architectures that may impact your architecture. Almost every regional architecture has one or more neighboring regional architectures. Many states have defined overlapping architectures for statewide, county or district, and metropolitan area transportation systems. In Turbo V4.0, you can identify these related architectures and specify the inventory elements that are shared between the architectures to improve continuity between architectures and facilitate architecture maintenance.
- **Control the number of flows on the Interfaces tab.** A large regional ITS architecture can have 100,000 or more flows on the Interfaces tab, only a small fraction of which may be relevant to your integration needs. Turbo V4.0 provides a new "Include on the Interfaces Tab" build setting that gives you the ability to reduce the flows that are shown on the Interfaces tab, saving you time and improving software performance.
- **Batch Produce Market Package Diagrams.** The batch diagram generation function has been enhanced so that you can save or print one diagram for every market package in your architecture with a single button click.
- **Define Replacement Flows Using Local Terminology.** In Turbo V4.0, you can define a user defined flow that captures exactly the information that you wish to exchange and use this flow in place of a more general National ITS Architecture flow. This allows you to define flows in terms your users understand without losing the linkage to the National ITS Architecture and relevant ITS standards. For example, using Turbo V4.0 you can define a flow called "snowplow status" and use this in place of the National ITS Architecture flow "maint and constr vehicle operational data"

Project Architecture Support

Previous releases of Turbo Architecture focused on regional ITS architecture development. Version 4.0 is the first release to focus on regional ITS architecture use, more specifically, regional ITS architecture use to support project definition.

- **Quickly define your projects.** In Turbo V4.0, you can quickly define your projects by selecting a subset of the items that are included in the regional ITS architecture. Inventory elements, stakeholders, market packages, and more can all be selected with a single mouse click per item, making identifying the subset of the regional architecture that is included in your project quicker and easier.
- **Use reports to verify and document your projects.** The Turbo reports have been upgraded to focus on the current project when a project architecture is selected. You no longer have to wade through reports covering all architectures in a file, so it is easier to document your project and identify any problem areas in your project definition. A new family of Region to Project Comparison Reports check all aspects of a project against the regional ITS architecture definition.
- **Bridge Between High-Level Regional ITS Architecture and Detailed Projects.** Using previous versions of Turbo, it was a constant challenge to create a regional ITS architecture that was detailed enough to support project definition and high-level enough to facilitate planning and architecture maintenance. In Turbo V4.0, you can use *Element Instances* to define detailed project architectures that are still traceable to a higher-level regional ITS architecture. For example, a single “State DOT Field Equipment” element in the regional ITS architecture can be related to specific Element Instances for CCTV camera projects, signal system upgrades, etc. This allows you to maintain a relatively high-level regional ITS architecture and detailed project architectures that are traceable to each other – the best of both worlds.
- **Import all Aspects of a Project Architecture.** Users have been able to import project architectures from one file to another since Version 1.0, but Version 4.0 is the first version to import every aspect of a project architecture. In addition to all the project information that was imported by Version 3.1, Turbo V4.0 imports roles and responsibilities, agreements, and standards tailoring that is associated with the imported project.
- **More status value flexibility.** A single status value is not enough to model a complex transportation system deployment. For example, a single signal control system might have an existing core system, extensions that are planned in the next three years, and future expansions that are anticipated in the next ten years. In Turbo V4.0, you can define different status values for the same element in the regional architecture and different projects, allowing incremental expansion of coverage and services over time to be included in the architecture.

Windows Vista Compatibility

Turbo V4.0 has been tested for compatibility with all current Microsoft Windows Operating Systems, including Microsoft Vista. The Turbo Help system has been upgraded specifically for compatibility with Microsoft Vista. The Help system used in earlier versions of Turbo Architecture is not compatible with Windows Vista.

Support for National ITS Architecture Version 6.0

Turbo Architecture Version 4.0 is compatible with Version 6.0 of the National ITS Architecture (released in April 2007) which incorporated the following high-level changes:

- **VII Initiative:** One of the key aspects of the National ITS Architecture has always been the integration of intelligent vehicles and intelligent infrastructure using short range communications. In Version 6.0, this aspect of the Architecture was updated to increase consistency with the Vehicle Infrastructure Integration (VII) initiative. Version 6.0 of the National ITS Architecture provides the same services that are covered by the VII USDOT Day-1 Use Cases to support regional ITS architectures that may be addressing VII as a future service. The terminology used

in many subsystem, terminator, equipment package, and architecture flow descriptions was updated to be consistent with VII terminology. Incorporation of VII applications resulted in several new market packages (ATIS10 VII Traveler Information, MC11 Environmental Probe Surveillance, and MC12 Infrastructure Monitoring). The existing in-vehicle signing capability in the architecture was revised, resulting in the removal of one market package (ATMS12 Virtual TMC and Smart Probe Data) and revision to ATIS09: In Vehicle Signing.

- **Clarus Initiative:** The Clarus Initiative was incorporated into Version 6.0 through a modification to the Weather Service terminator description (to indicate it performs the Clarus functions) and through changes in architecture flows to and from this terminator. Market Package MC03 Road Weather Data Collection was modified to emphasize the collection of environmental sensor data and provision of quality-checked sensor data from the Clarus function within the Weather Service terminator.
- **EMO Initiative:** The Emergency Management Operations (EMO) Initiative developed a Conops for the use of traveler information and traffic information dissemination during No-Notice Disasters and how to respond to BioHazards. Version 6.0 of the National ITS Architecture incorporated appropriate aspects of the Conops, including addition of a new Public Health System terminator and new architecture flows.
- **Architecture support for Additional DSRC Applications:** Safety-related messages from the new ITS DSRC Standard, SAE J2735, were added to the vehicle-to-other vehicle interfaces in the architecture. To reflect the new functionality, a new Market Package, AVSS12 Cooperative Vehicle Safety Systems and a new equipment package Vehicle Warning System were also added.
- **Expanded CVISN:** Recently, the Commercial Vehicle Information Systems and Networks (CVISN) program updated their system architecture. While the existing Architecture was already consistent with CVISN, the National ITS Architecture in Version 6.0 was updated to address these Expanded CVISN capabilities by adding a new Driver Identification Card terminator and new architecture flows to exchange commercial vehicle repair status, driver records, and driver credentials. New USRs addressed the functionality of Expanded CVISN smart roadside capability and new functionality was added for FMS Maintenance Management.
- **Transit-Related Updates:** To better synchronize the National ITS Architecture with the most recent ITS TCIP standards, the transit vehicle assignment function was separated from the scheduling system function. Market Package APTS6 Transit Maintenance was renamed to APTS06 Transit Fleet Management to highlight the added functionality to support management of garage operational activities. The equipment package Transit Center Fare Management was revised to focus its functionality to fare management while creating two new equipment packages, Transit Center Passenger Counting and On-board Passenger Counting, to provide passenger counting functionality. Market Package APTS10 Transit Passenger Counting was created to provide the service. The definitions of the terms 'stop point', 'transfer point', and 'schedule' were also revised to better reflect the TCIP standards.
- **Updated Standards to Architecture Relationships and Added Application Areas:** The ITS standards area was updated to reflect changes in standards document numbers and standards titles and several standards were added/removed to match current ITS standards activities. All architecture flows added due to version 6.0 updates were mapped either to ongoing standards development work or identified as future standards candidates. Interface-based Application Areas were added to the Standards area of the hypertext to identify the ITS Standards relevant to deployment of key applications.
- **Border Information Flow Architecture (BIFA):** A recent project with FHWA's Office of Freight Management and Transport Canada led to the definition of a Border Information Flow Architecture (BIFA). Version 6.0 of the National ITS Architecture incorporated the BIFA terminators and services that are connected with the existing scope of the National ITS Architecture. Border Inspection Administration replaces the Trade Regulatory Agencies terminator with the Border Inspection Administration terminator to represent the back-office

systems of federal (US, Canada, or Mexico) agencies that address customers, immigration, and trade issues, and the Border Inspection Systems terminator to represent the field equipment of those agencies located at the border crossing. Market Package CVO05 International Border Electronic Clearance was significantly re-scoped to capture the processing and interfaces in the BIFA International Border Registration, Pre-Processing, and Inspection services.

- **Electrical Lighting & Management Systems (ELMS):** Functionality was added to the architecture to manage electrical and lighting systems for transportation facilities and infrastructure based on a new user service requirement. This change included addition of a new Market Package ATMS12 Roadside Lighting System Control, new equipment packages, Roadside Lighting System Control and TMC Lighting System Control, and new architecture flows.
- **Integrated Justice Information Systems (IJIS) Incident Management Standards Efforts:** To ensure consistency of the architecture with ITS Standard IEEE 1512 and IJIS, architecture flows were added between EM and TMS following review of the Information Exchange Package produced by the joint DOT/DOJ Public Safety/Transportation Data Exchange project.

To see read detailed descriptions go to the What's New section of the Architecture website – go to <http://www.its.dot.gov/arch/index.htm> and click on the “National ITS Architecture web site” link.