



Division of Mass Transportation

Intelligent Transportation Systems (ITS)
Rural/Non-Urban Transit Statewide Plan

Implementing Rural/Non-Urban ITS: What You Need to Know

System Metrics Group, Inc.



Purpose of this Document

- ▶ To better understand how to meet Federal requirements when implementing Intelligent Transportation System (ITS) projects.
 - FTA National ITS Architecture Policy on Transit Projects requires that ITS projects funded with Mass Transit Funds from the Highway Trust Fund conform to the National ITS Architecture and applicable standards.
- ▶ Primary audience:
 - Federal Transit Administration (FTA) rural/non-urban transit grant subrecipients
 - Caltrans Division of Mass Transportation (DMT) staff.
- ▶ More details on the FTA National and Regional ITS Policy can be found at http://www.ops.fhwa.dot.gov/its_arch_imp/policy_2.htm

- ▶ DMT is responsible for implementing and administering five FTA grant programs for rural transit:
 - ▶ Section 5310 (Elderly and Disabled Specialized Transit)
 - Section 5311 (Rural and Small Urban Transit)
 - Section 5316 (Job Access and Reverse Commute)
 - Section 5317 (New Freedom)
 - American Recovery & Reinvestment Act (ARRA) of 2009 – Non-Urbanized Area Formula (Section 5311) program.
- ▶ FTA grant subrecipients must conform to their regional ITS architecture, which must conform to the National ITS Architecture.

What is ITS?

- ▶ Integration of advanced wireless and wire line communications-based information and electronics technologies into transportation infrastructure and vehicles.
- ▶ ITS improves:
 - Safety
 - Mobility
 - Productivity.
- ▶ The following websites provide more information on ITS for rural/non-urban transit:
 - FTA ITS: http://www.fta.dot.gov/12351_7639.html
 - <http://www.fta.dot.gov/documents/RuralITSTechnologyGuidebook.pdf>
 - Rural Planning Organizations of America (RPO) ITS: http://www.ruraltransportation.org/pages/page.asp?page_id=62708

- ▶ The key characteristic of ITS is the integration and connectivity of systems to enhance data and information sharing.
- ▶ Transportation information sharing brings benefits:
 - **Travelers** benefit through improved safety and more efficient travel choices through better monitoring and real-time information.
 - **Transit providers** benefit by being able to see and respond dynamically to conditions as they evolve. Operators will have the tools to manage their operations more efficiently, saving fuel, improving transit system performance.

What is an ITS project? An ITS Architecture?

ITS Project

- Any project that includes one or more of the ITS User Services defined in the National ITS Architecture.
- User Services describe what ITS should do from the user's perspective. A broad range of users are considered, including the traveling public and different types of system operators.

ITS Architecture

- The National ITS Architecture is a framework to ensure compatibility and the ability to share information among ITS devices.
- The Regional ITS Architecture conforms to the National ITS Architecture and is a regional framework for ensuring institutional agreements and technical integration for the implementation of ITS projects or groups of projects.
- Other descriptive information about the National ITS Architecture and regional ITS architectures can be found at <http://www.its.dot.gov/arch/index.htm>.

- ▶ Typically, ITS projects exchange information, such as security images or vehicle location data.

Examples of Common Rural/Non-Urban ITS Projects

- ▶ Examples of transit related projects that may be considered ITS and that have recently been implemented by California rural/non-urban transit providers include:

- Accounting Software
- Automated Passenger Counter
- Automated Stop Announcement
- Automatic Vehicle Locator (AVL)
- Demand-Response Management Software
- Fixed-Route Management Software
- Maintenance Software
- Mobile Data Terminal (MDT)
- Transit Security
- Transit Traveler Information

- ▶ The *California ITS Rural/Non-Urban Transit Statewide Plan* provides specific examples of common ITS Projects and includes the *Technology in Rural Transit: Linking People with their Community* guidebook.

- ▶ As a general rule, if a project involves a wireless or wire-line communications-based information and electronics technology, and it will interact with other systems upon implementation **or** in the future, then it may be an ITS project.

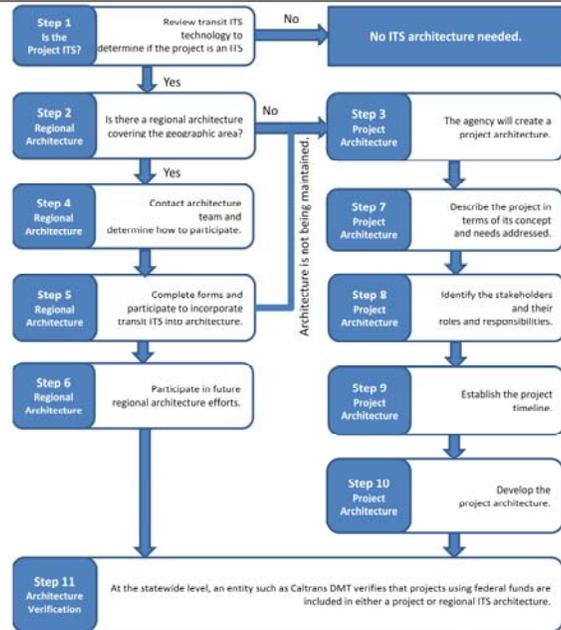
What do I need to know about implementing ITS?

- With few exceptions, if current or planned ITS projects receive funds through a U.S. DOT grant program, those projects must meet Federal Policy requirements.
- Participation in a regional ITS architecture plan is a requirement for ITS projects that receive **ANY** federal funding.
- Getting involved in the regional ITS architecture development process can be beneficial for rural/non-urban transit providers:
 - Brings together stakeholders
 - Helps transit providers learn of other regional plans
 - Gives transit agencies access to ITS experts.

- The architecture development process brings regional stakeholders together to identify their individual and collective needs
- The process can provide a forum for transit providers to learn of other activities planned for the region to consider how those plans may impact them

Steps to Implementing Rural/Non-Urban ITS Projects

- ▶ The *California Intelligent Transportation Systems (ITS) Rural/Non-Urban Statewide Plan* has an eleven step flowchart to implement Rural/Non-Urban ITS Projects.
- ▶ The following slides describe each step in the flowchart.



- ▶ If there is an **active** regional ITS architecture, it is critical that any agency planning or implementing ITS projects participate in the regional plan.

Step 1: Is the Project an ITS Project?

- ▶ Review the project description. If the project:
 1. Involves wireless or wire-line communications-based information and electronics technology; and
 2. Interacts with other systems upon implementation **or** in the future.

Then it is likely to be an ITS project.

- ▶ The Caltrans "Information Technology / Intelligent Transportation Systems Compliance Plan" form contains useful questions to determine if a project is an ITS Project.

- ▶ The compliance form can be found in Appendix C of the *California ITS Rural/Non-Urban ITS Statewide Plan*.

Step 2: Identify the Regional Architecture

- Locate the appropriate Regional ITS Architecture(s) and make contact with responsible implementing agency.
- The *California ITS Rural/Non-Urban ITS Statewide Plan* contains details on Regional Architectures including contact information.
- If there is an active Regional Architecture in place, then Step #4 is the next step in the process.



- ▶ This information can be found in Section 4 of the Plan.

Step 4: Participate in Regional ITS Architecture Planning (If a Regional ITS Architecture is in Place from Step 2)

- ▶ If there is a regional ITS architecture, contact the regional ITS architecture team and tell them what your plans are.
- ▶ Ask or find out how your agency can participate in the regional ITS architecture process.
- ▶ It is important to become a “stakeholder” agency in the architecture as a first step.
- ▶ Get involved!

- ▶ Each region is different in what information they will want and what their process is to have your projects represented in the regional architecture. The team can provide support in filling out forms and learning when meetings are scheduled.
- ▶ Being a stakeholder in the architecture means your agency will be represented in the architecture. Any projects you have planned can be clearly shown as being owned by you.

Step 5a: Complete Forms and Participate

- ▶ Work with the regional ITS architecture team to include your project in the regional architecture.
- ▶ Typically, this involves following the regional architecture's Maintenance Plan and completing Architecture Change Request (ACR) forms. ACR forms typically require the following inputs:
 - Name of the System
 - Contact information for the subrecipient
 - Descriptive Title of the Project
 - Project Status.
- ▶ At the end of this step, there should be formal recognition of the project in regional ITS documentation.

- ▶ The transit agency, led by the ITS champion, will participate in the regional ITS architecture update or change management process. This is how the regional ITS team will learn about your project and be able to include it in the regional architecture.

Step 5b: Complete Forms and Participate

- ▶ An ITS project does not meet federal requirements simply by requesting that it be included in a regional architecture.
- ▶ Federal requirements are only satisfied for an ITS project when a regional architecture formally includes a project, or when an individual project architecture is developed.
- ▶ If the regional ITS architecture team is non-responsive or is no longer maintaining a regional architecture, the transit agency will need to develop a project-level ITS architecture.

- ▶ You will know when you contact the regional ITS architecture contact person whether the architecture is actively being updated. Ask them specifically what the frequency is and what the timeframe is for receiving your information. They often deal with many stakeholders, so you may have to be proactive in contacting and making sure you have the right forms completed.
- ▶ Document the process to show who, what, when, and where, why, and how. This documentation will help to support your project level ITS Architecture as you go through this process.
- ▶ A discussion of Project-level ITS Architecture development will be presented in subsequent slides.



Step 5c: Sample Architecture Change Request Forms

Central Coast Intelligent Transportation Systems (CCITS) Strategic Deployment Plan

San Joaquin Valley ITS Architecture and System Plan Change Request (CR) Form		
Originator Name	Date Submitted	
Originator Telephone	Originator Fax	Originator Email
Originator Agency	Revision Type <input type="checkbox"/> Major <input type="checkbox"/> Minor	
Agency Authorized Signature	Signature Date	
Planning Region Representative	Signature Date	
Planning Region Representative Signature	Signature Date	
Description of Proposed Changes:		
Rationale for Proposed Change:		
Affected Agency #1:	Authorized Signature	Signature Date
Affected Agency #2:	Authorized Signature	Signature Date
Affected Agency #3:	Authorized Signature	Signature Date
Affected Agency #4:	Authorized Signature	Signature Date
List Attachments:		
Stakeholder Document Affected <input type="checkbox"/> Vehicle <input type="checkbox"/> Tele Arch <input type="checkbox"/> Connected <input type="checkbox"/> Disconnected <input type="checkbox"/> Other		
To Be Completed By Maintenance Manager		
Change Request Number	Date CR Received	CR Legend
Date Initially Discovered:	Dispositions: <input type="checkbox"/> Accept <input type="checkbox"/> Reuse <input type="checkbox"/> Miss Info	Comments
Date Discovered:	Dispositions: <input type="checkbox"/> Accept <input type="checkbox"/> Reuse <input type="checkbox"/> Miss Info	Comments
Date Approved by STV Stakeholders:	Dispositions: <input type="checkbox"/> Accept <input type="checkbox"/> Reuse <input type="checkbox"/> Miss Info	Comments
Stakeholder Document Affected/Version Implemented:		
<input type="checkbox"/> Tele Arch	Date/Version:	<input type="checkbox"/> Vehicle
<input type="checkbox"/> Connected	Date/Version:	<input type="checkbox"/> Other

Stakeholder	Name	Title
	Agency	
Proposing Change	Email	
	Phone	Fax No
Date	Title	Short Description (up to 25 characters)
	Detailed Description	(What is to be added, deleted or modified? Attach additional documentation if necessary)
Description of Change	Type of Change	<input type="checkbox"/> New Project/System <input type="checkbox"/> Deleted Project/System <input type="checkbox"/> Modified Project/System <input type="checkbox"/> New/Changed Stakeholder <input type="checkbox"/> Change in Project Status <input type="checkbox"/> Change in Project Priority <input type="checkbox"/> Other
	Systems or Projects	Name of System(s) or Project(s) being implemented or modified (if applicable):
Project Status	<input type="checkbox"/> PLANNED (funding not yet secured) <input type="checkbox"/> PROGRAMMED (funding secured) <input type="checkbox"/> UNDER CONSTRUCTION (stakeholder is currently deploying system/project) <input type="checkbox"/> EXISTING	

These forms can typically be found in the Regional ITS Architecture Maintenance Plan.



Step 6: Participate in Future Regional ITS Architectures

- ▶ Once the transit ITS project has been added into the regional ITS Architecture, the transit provider should participate in future updates.
- ▶ Make sure that all appropriate approvals have been secured after each step, including FTA certifications and assurances by subrecipient agencies.

- ▶ Appropriate approvals and/or support documentation are required before the subrecipient can apply for transit grant funds for their proposed ITS project or purchase ITS equipment.
- ▶ See Appendix C of the Plan for the Caltrans ITS Compliance form.

Step 3: Develop a Project-Level ITS Architecture (If No Regional ITS Architecture in Place)

- ▶ The subrecipient needs to develop a project-level ITS architecture as part of the planning process.
- ▶ Before developing the project-level architecture, the subrecipient agency should involve the regional ITS planning agency so that efforts are coordinated in conjunction with overall regional ITS planning.
- ▶ A Regional Architecture team is better suited than the subrecipient to determine if a project requires an architecture because of their experience and understanding of regional plans.
- ▶ There are a number of tools and software applications available to help subrecipient agencies develop project level ITS architectures.
- ▶ Turbo Architecture is one tool developed on behalf of the Federal Highway Administration (FHWA). This free application can be downloaded from <http://www.iteris.com/itsarch/html/turbo/turbomain.htm>.

- ▶ The project-level ITS architecture insures that the project is consistent with the national ITS architecture and maximizes interoperability and uses open standards as much as possible.

Step 7: Project Level Architecture - Project Description

- ▶ At a high level, the transit agency will describe the project and the needs it addresses:
 - Brief concept of operations, which is a narrative description of how the system will work and how it will meet the stakeholders' needs.
 - Existing and planned project inventory, which is the physical elements that will exchange information (e.g. vehicles, dispatch centers, maintenance yards).
- ▶ This is **NOT** a project design and does not require extensive detail.
- ▶ It is important for the project description to describe the project as it will be deployed **AND** any future expansion the agency envisions.

- ▶ Needs should look at all the users. What do customers, drivers, dispatchers and administrators need that this project will provide? For example, for a vehicle location system, dispatchers may need better information about where buses are, drivers may need better feedback on schedule adherence, and customers may need improved on-time performance.
- ▶ Examples of transit ITS inventory are:
 - Vehicles
 - Dispatch and administrative offices
 - Maintenance yards
 - Regional traffic management centers
 - Regional emergency management centers
- ▶ Examples of current and future project plans:
 - Example: in-vehicle surveillance may not currently stream live video but if the agency would like to some day view real-time images, it should be included as a future possibility.
 - Example: electronic fareboxes may not currently link to a vehicle tracking system, but if the agency would like to some day link them, it should be included as a future possibility.

Step 8: Project Level Architecture – Identify Stakeholders

- ▶ The transit agency will identify the project stakeholders, particularly those whose devices will be exchanging data, such as:
 - Transit providers
 - Traffic management agencies
 - Emergency management responders.
- ▶ Every stakeholder should be engaged in the project so they understand the expectations and can define their capabilities. This will help to build a project that addresses each stakeholder's specific needs.
- ▶ The roles of each stakeholder must be defined by the project leader and the stakeholders. These are called the "Operational Concept" and describe high-level responsibilities for each stakeholder.

- ▶ In many cases, rural transit ITS projects only exchange data internally among the agency's systems (such as between vehicles and a dispatch center), but if the information will be shared with a traffic management or emergency operations center, then their owners should be included as part of the project.
- ▶ Examples of Operational Concepts:
 - ▶ Example: Transit providers will track vehicle locations to monitor schedule adherence.
 - ▶ Example: Traffic management will view surveillance images from vehicles to monitor traffic conditions.
 - ▶ Example: Emergency responders view surveillance images from vehicles to enhance emergency response.

Step 9: Project Level Architecture - ITS Project Timeline

- ▶ The project may be existing, or it may be planned with funding, or planned but without funding.
 - The project may have different phases that are funded or unfunded.
 - Future phases should reflect what an agency wants to do, regardless of funding.
- ▶ The timeline establishes when the transit agency plans to implement the system.
 - Typically, the timeline has short-term, medium-term and long-term phases.
 - Short-term projects should be funded, feasible and address high-priority needs.
 - Medium-term are often projects without funding but that are a priority and feasible to an agency.
 - Long-term projects are usually not funded, rely on unproven technology or are feasible but address low-priority needs.

- ▶ Examples of projects with funded and unfunded phases
 - Example: Funded Vehicle Tracking project with future, unfunded, plans to add passenger counters.
 - Example: Funded In-vehicle surveillance project with future, unfunded, plans to transmit real-time images to the dispatch center.
- ▶ Examples of different phases:
 - Short-term may be zero-to-two years and represent funded projects.
 - Medium-term may be two-to-five years and represent unfunded but high-priority projects.
 - Long-term may be beyond five years and represent unfunded projects that are not high priorities but desirable.
- ▶ The timeline should include all future projected ITS projects, regardless of whether or not they currently have funding.

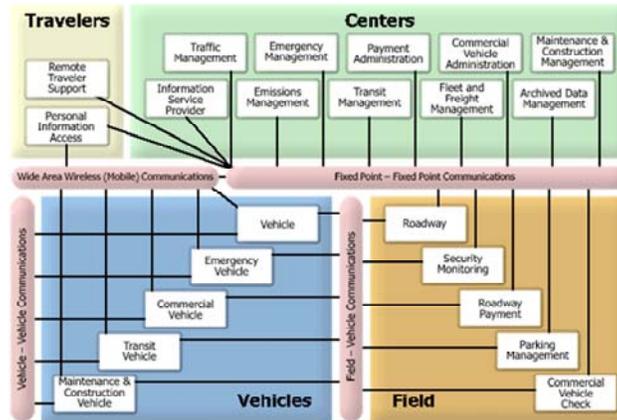
Step 10a: Develop the ITS Project Level Architecture

- ▶ Create an architecture following the regional ITS architecture guidelines.
- ▶ The Federal Highway Administration (FHWA) provides a primer on developing regional and project level architectures (see Appendix F).
- ▶ In addition to a project description, operational concepts and timeline, an architecture includes:
 - Project Inventory (the physical elements that will exchange information (e.g. vehicles, dispatch centers, maintenance yards).
 - ITS User Service Packages
 - ITS Process Specifications
 - ITS Information Flows
 - ITS Standards
 - Stakeholder agreements
- ▶ Use the ITS Project Architecture Checklist to make sure you include all elements.

- ▶ This primer is attached as Appendix F in the *California Intelligent Transportation Systems (ITS) Rural/Non-Urban Statewide Plan*, and can also be found at <http://ops.fhwa.dot.gov/publications/fhwahop12001/fhwahop12001.pdf>
- ▶ The ITS Project Checklist is based on the form FHWA uses to evaluate ITS architectures and if all elements are complete, then the architecture is complete.
- ▶ Project inventory is the devices and systems that will be connected. They are referred to within the architecture as “elements” and may include vehicles, dispatch centers, maintenance yards, cameras, emergency responders.

Step 10b: Develop the ITS Project Level Architecture

- ▶ The architecture maps your project inventory (the physical elements) to ITS subsystems as shown in the following diagram.



▶ Examples of Transit Subsystems:

- Example: Buses and other transit vehicles (such as those used by supervisors or maintenance) map to *Transit Vehicle*
- Example: A Transit Dispatch Center maps to *Transit Management Center*
- Example: A Traffic Operation Center maps to *Traffic Management Center*

Step 10c: Develop the ITS Project Level Architecture

- ▶ Map the project to ITS User Service Packages, which describe what ITS should do from the user's perspective.
- ▶ There are eleven Transit ITS Service Packages.

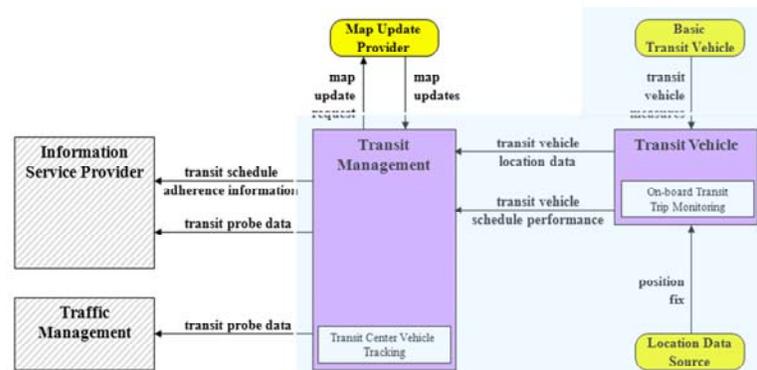
APTS01	Transit Vehicle Tracking
APTS02	Transit Fixed-Route Operations
APTS03	Demand Response Transit Operations
APTS04	Transit Fare Collection Management
APTS05	Transit Security
APTS06	Transit Fleet Management
APTS07	Multi-modal Coordination
APTS08	Transit Traveler Information
APTS09	Transit Signal Priority
APTS10	Transit Passenger Counting
APTS11	Multimodal Connection Protection

- ▶ By looking at the list of User Services, an agency can usually see which ones address their needs. For example, if an agency wants to improve on-time performance, it may require APTS01 and APTS02. If the agency wants to provide real-time vehicle location information to customers, it may require APTS01 and APTS08.

Step 10d: Develop the ITS Project Level Architecture

- ▶ An ITS Project may consist of one or more User Service Packages.
- ▶ An ITS Project does not have to use all of a User Service Package.

APTS01 – Transit Vehicle Tracking



- ▶ Example of one project with multiple user services: Passenger counting (APTS10) and vehicle tracking (APTS01) are deployed in one project to collect boarding and alighting data by stop and time.
- ▶ Example of not using all portions of a User Service: A Transit Vehicle Tracking Project may only exchange information between the vehicle and a Transit Management Center (as highlighted in light blue in the picture).

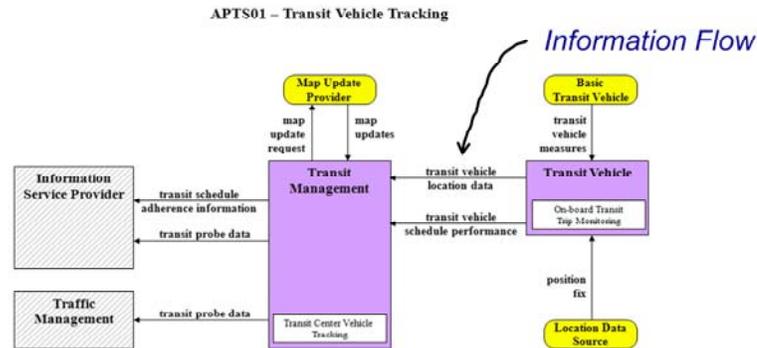
Step 10e: Develop the ITS Project Level Architecture

- ▶ Each User Service Package has User Service Process Specifications (also known as Pspecs):
 - Define what the ITS elements of the project “shall” do.
 - Most are defined at the national level and agencies can select those that best fit their needs.
 - Can be used to tell vendors what you expect the project to do.
 - Process Specifications can be viewed at the National Its Architecture web site: <http://www.iteris.com/itsarch/html/user/userserv.htm>.

- ▶ Process specifications for each User Service can be viewed at the
- ▶ **Example: National ITS Architecture Specification 4.1.3 – Provide Transit Vehicle Location Data** (<http://www.iteris.com/itsarch/html/pspec/4851.htm>)
- ▶ This process shall provide the transit vehicle's current location with a high degree of accuracy. The location shall be computed by this process from data sent by other processes that provides basic vehicle location and on-board vehicle conditions, such as proximity to transit stop, vehicle doors opened or closed, etc. The data shall be output continuously by the process and sent to other processes for their use and for storage.

Step 10f: Develop the ITS Project Level Architecture

- Define the Information Flows:
 - Information flows describe the data that must flow among project elements to achieve the specifications
 - There are standard formats defined for most ITS information flows.



Step 10g: Develop the ITS Project Level Architecture

- ▶ Standards are fundamental to the establishment of an open ITS environment. Standards define formats and protocols for information exchange that are open and non-proprietary. They allow for interoperable systems at local, regional, and national levels. When you use the standards, you ensure current systems can work with other existing and future systems that also use the standards.
- ▶ Identify the Standards:
 - The National ITS Architecture maps information flows to corresponding standards. More information can be found at <http://www.iteris.com/itsarch/html/standard/standard.htm>.
 - By using standards, an agency ensures a project will be interoperable with other systems:
 - ▶ Future systems will have open, nonproprietary information flows to work with
 - ▶ Agencies have standards to specify in the project procurement.
- ▶ Without standards, projects can result in undesirable closed systems where devices only exchange data with a specific vendors' products. The agency is then stuck using a closed, proprietary system.

- ▶ **Example of a standard organization: APTA Transportation Interface Communication Profiles (TCIP)**
- ▶ TCIP is an APTA Standard that provides a library of information exchange building blocks, to allow transit agencies and transit suppliers to create standardized tailored interfaces. It defines the format of data exchange.
- ▶ An agency does not need to have detailed knowledge of every standard. They are complex and very specific. However, it is important to know which standards are applicable to different types of systems and require the system vendor to adhere to them.
- ▶ Turbo Architecture automatically identifies which standards apply to each project.

Step 10h: Develop the ITS Project Level Architecture

- ▶ Create Agreements:
 - If more than one stakeholder is involved, agreements may be needed to document each stakeholder's roles, responsibilities and expectations:
 - ▶ Document executive-level agreement to participate
 - ▶ Document operational or funding requirements of each stakeholder.
- ▶ If only one stakeholder is involved, then an agreement is rarely necessary.
- ▶ If existing agreements already cover the project, then new agreements are not necessary.

- ▶ The only case where an agreement is needed with a single stakeholder is when that stakeholder is large and several unrelated groups within it are working together. For example, an agreement may be necessary between the transit and IT groups within a city government for the ITS staff to maintain the transit group's computers and networks.



Step 11: Caltrans DMT Verifies the Project or Regional ITS architecture

- ▶ Caltrans DMT will verify that transit ITS projects have followed the appropriate steps and are accurately reflected in regional or project ITS architectures. (see Appendix C of the Plan for the Caltrans ITS Compliance Form)
- ▶ All subrecipient agencies must also comply with FTA ITS certifications and assurances.



- ▶ DMT staff will review the ITS compliance form as described in Step 1 (Slide 7).
- ▶ Appendix C of the Plan is the ITS compliance form.
- ▶ Certifications and assurances are described in the Federal Register Federal Register Volume 76, Number 211 (Tuesday, November 1, 2011) Group 14. Sections of the Federal Register Notice are included as Appendix D of the *California Intelligent Transportation Systems (ITS) Rural/Non-Urban Statewide Plan*.

ITS Implementation Success Factors

- ▶ There are two critical success factors that can greatly facilitate Federal grant subrecipient rural/non-urban providers' success in implementing ITS projects.
- ▶ Integrate with the Regional Transportation Planning Process:
 - Learn from others
 - Rely on the experts
 - Expand the impact of your projects beyond your agencies
 - Find project partners.
- ▶ Participate in Peer User Groups:
 - Share experiences
 - Identify similar issues and solutions
 - Build upon the work of others instead of starting from scratch.

- ▶ Why to integrate with regional processes:
 - The *California Intelligent Transportation Systems (ITS) Rural /Non-Urban Statewide Plan* describes the different ITS architectures and planning processes throughout the State and identifies key contacts for major plans
 - ITS Planning gives the rural/non-urban providers access to ITS experts and a forum to share their needs with other regional stakeholders
 - ITS Planning allows rural/non-urban providers to see the entire range of transit ITS capabilities and how components of various systems may interact
 - ITS Planning improves regional stakeholder coordination and provides transit providers an understanding of how the technologies they deploy now may complement future technologies, and how various components are dependent upon each other
 - ITS Planning enables providers to develop strategies that ensure the systems they procure to address current needs have the interoperability and capability to address other needs in the future.
- ▶ Why to participate in peer groups:
 - Peer user groups provide a forum to discuss common issues, but also to learn from the experiences of other rural/non-urban providers
 - A subcommittee of an existing group or a group that already meets regularly is a useful starting point for this type of user group
 - Examples of existing groups include the California Rural Transit Assistance Program (RTAP) of the California Association for Coordinated Transportation (CalACT).

Additional Training Resources

- ▶ There are several training opportunities to better understand regional and project level ITS architecture development.
- ▶ The U.S. DOT ITS Professional Capacity Building (PCB) Program provides comprehensive, accessible, and flexible ITS learning.
- ▶ The U.S.DOT National Highway Institute (NHI), with technical oversight by the U.S.DOT ITS Joint Program Office (JPO) offers a Turbo Architecture training courses in-person or web-based.
- ▶ A complete description of web-based and other training opportunities can be found at: <http://www.pcb.its.dot.gov>.

- ▶ Through PCB, public agencies can build and sustain a capable and technically proficient ITS workforce, and transportation professionals can develop their knowledge, skills, and abilities while furthering their career paths.
- ▶ Learn more about Turbo training: <http://www.iteris.com/itsarch/html/training/training.htm>.



Caltrans DMT Contact Information

DMT Contact	DMT Program	Phone	Email
Helen Louie, Branch Chief Elaine Houmani, ITS Liaison	Federal Grants Procurement Management Branch	(916) 654-6990 (916) 654-7205	Helen_Louie@dot.ca.gov Elaine_Houmani@dot.ca.gov
Chuck Gunter, Branch Chief	FTA Section 5310 Elderly and Disabled Transit Grant Program	(916) 657-3875	Chuck_Gunter@dot.ca.gov www.dot.ca.gov/hq/MassTrans/5310.html
James Ogbonna, Branch Chief	FTA Section 5311 & 5311(f) Rural Transit and Intercity Bus Program	(916) 651-6116	James_Ogbonna@dot.ca.gov www.dot.ca.gov/hq/MassTrans/5311.html
Scott Sauer, Branch Chief	FTA Section 5316 & 5317 Job Access/Reverse Commute & New Freedom Programs	(916) 657-3863	Scott_Sauer@dot.ca.gov www.dot.ca.gov/hq/MassTrans/5316.html www.dot.ca.gov/hq/MassTrans/5317.html



- ▶ If you have any questions or need assistance, please contact your DMT grant program liaison.
 - To find out who is assigned to your district for each program, please go to the program website shown on this slide.