I101
Using ITS Standards:
An Overview

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RITA Intelligent Transportation Systems
Joint Program Office

I101: Using ITS Standards: An Overview

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Frequently Asked Questions

Taken from FHWA Office of Operations Web pages

General Questions

Q: *Why did the USDOT issue this Rule?*
A: This Rule specifies how to implement language in the Transportation Equity Act for the 21st Century (TEA-21), requiring that ITS projects conform to the National ITS Architecture and Standards. This Rule establishes a process for implementing the legislation through the existing planning and project development processes. The Final Rule requirements can be found in 23 CFR 940.

Q: *Does this Rule introduce new or unproven concepts?*
A: Many locations have been developing system architectures to guide the implementation of ITS in their areas because of the effective transportation planning benefits the development process provides. These early examples were instrumental in developing this Rule by providing proven approaches and validating the proposed concepts. So while for particular locations these concepts may be new, they are based upon successful, proven approaches.

Q: *Who at the USDOT has the role/responsibilities of making the conformity determination?*
A: The FHWA Division or FTA Regional office has the primary role in determining whether a project complies (or where there is limited direct oversight, whether a recipient of Highway Trust Fund monies has established procedures to ensure compliance) with the requirements of the ITS Architecture and Standards Rule/Policy. The FHWA Resource Centers and FHWA/FTA Headquarters are available to the Division and Regional offices for technical assistance in reviewing procedures or materials for compliance.

Q: *When do I have to comply with this Rule?*
A: The project development requirements take effect April 8, 2001. Regions that have deployed ITS have until April 8, 2005 to develop and document their Regional ITS architecture. Regions that have not yet deployed ITS will have four years from the date their first ITS project advances to final design. It is recommended that State and local agencies work with their FHWA and FTA field offices to determine the best schedule for implementation.

Q: *What will be the consequence of non-conformity with the Final Rule (23 CFR 940)?*
A: Federal funds from the Highway Trust Fund, including the Mass Transit Account, will be withheld for ITS projects.

Q: *How can I find out more about the ITS Architecture and Standards Final Rule?*
A: All information as it becomes available will be posted on the FHWA
Office of Operations website at
http://www.ops.fhwa.dot.gov/its_arch_imp/index.htm.

Q: *How can I find out more about the National ITS Architecture?*
A: Check out the architecture web site at www.its.dot.gov/arch/index.htm or request
a copy of the National ITS Architecture on CD-ROM from the USDOT. The USDOT also
provides training classes on use of the National ITS Architecture. Training is available
through your FHWA Division Office or FTA Regional Office.

FTA

Q: *Why are there an FHWA Rule and an FTA Policy and how are they different?*
A: The FTA and FHWA have different processes and procedures for project
development. Therefore, the FHWA has issued a Regulation, and FTA has issued a
Policy. The policy language in each document is consistent and will be carried out in a
coordinated fashion, as applicable under FTA and FHWA project management and
oversight procedures.

ITS Projects

Q: *What is an ITS project?*
A: An ITS project, as spelled out in the Final Rule, is any project in whole or in part that
funds the acquisition of technologies or systems of technologies, that provide or
significantly contribute to the provision of one or more ITS user services as defined in the
National ITS Architecture. In other words, an ITS project is any project that may provide
an opportunity for integration at any point during its life.

Q: *To which federally funded projects does this Rule apply?*
A: This Rule applies to any ITS project receiving funding in whole or in part from the
Highway Trust Fund, including the Mass Transit Account.

Q: *Does this Rule or the National ITS Architecture tell me which technology to buy?*
A: No. Using the National ITS Architecture helps define requirements for what the
technology should do to ensure information exchange and interface compatibility. Use
of specific technology is not required.

Q: *Do I have to replace all my existing equipment to conform with the National ITS
Architecture?*
A: No. The proposed Rule does not require replacement of existing systems or
equipment. Applicable ITS standards would be used as new features and system upgrades
are planned with the use of the National ITS Architecture.

Q: *Is the USDOT mandating a particular system design?*
A: No. The USDOT is mandating that states and regions follow a process of systems engineering, use USDOT adopted standards, and work with all relevant stakeholders in their area. The outcome of the process is a regional ITS architecture, which guides system design. The National ITS Architecture supports a variety of system designs and is flexible enough to support both distributed and centralized systems.

Q: *How should agencies deal with work zones that use temporary ITS for traffic control on projects without ITS (i.e. pavement reconstruction)? Will project architectures be needed for these types of projects?*
A: Project-level ITS architectures are only required for major ITS projects until a regional ITS architecture is developed. If the ITS project being implemented as part of a construction effort meets the requirements for regional integration or major regional initiative, then it will need a project-level ITS architecture. From a practical point of view, ITS activities related to construction projects may become permanent installations, and as such, should be examined for fitting into the larger regional ITS perspective. If a regional ITS architecture exists, incorporating ITS elements into a construction project may be a method of implementing elements identified in the regional ITS architecture in a more efficient manner than using separate ITS projects after the construction activities. A regional ITS architecture would allow an area to have this "vision" and be able to identify these opportunities.

Q: *Do small urban area systems owned by local agencies need to conform to the Final Rule?*
A: Yes, if the region had ITS deployed on April 2001, or if a region wants to spend Federal funds on ITS projects. Generally, for small areas, if it has a computerized signal system, or AVL or DMSs, then they have ITS and must have a regional ITS architecture by April 8, 2005. If a region does NOT currently have any ITS, it will need to create a regional ITS architecture when it advances it's first ITS project for Federal funding.

Q: *What is a major ITS project?*
A: Any ITS project that affects regional integration of ITS systems. This terminology is relevant only for projects advancing to final design during the development of the Regional ITS Architecture.

Q: *What are some examples of major ITS projects?*
A: Some examples include various transportation operations centers such as a traffic management center or transit management center; a major new integrated traffic signal system; an automatic vehicle location system for a large transit fleet; a traveler information service; or a freeway surveillance and control system.

Q: *Is any single traffic signal upgrade project an "ITS project"?*
A: FHWA anticipates this will probably be the most difficult judgment regarding ITS projects that will have to be made. There are so many variations on how and when traffic signals were installed, that the answer may be yes or no. This decision must be made at the FHWA Division office level with considerable input from the affected State and local agencies. As a rule of thumb, consider the following:

If the project entails upgrading a majority of the signals in a system or in a geographic area, then yes, it's an ITS Project. For instance, upgrading the hardware of 200 of 250 intersections would probably count as an ITS project. But so would upgrading 1 of 3 intersections, if that is all you have in your town. Consider asking yourself, "what is the percentage of the total intersections being upgraded?" If the answer is a high percentage, then it probably is an ITS project.

It should be noted that the systems engineering (SE) process must be applied to all ITS projects or projects with ITS elements. However, as each of the steps in the SE process is applied, it is likely that only a few details will need to be addressed on most projects and, quite often, standards will probably be the only step considered in detail. The real test is experience. Consider the scope of the project and use good judgment as to whether it should be considered an ITS project or not.

Q: *How will agencies address projects already in the "pipeline?"*
A: The Rule/Policy does not apply to projects that reached final design by April 8, 2001. For other ITS projects, activities related to the Rule/Policy will likely depend upon what stage of development the projects have reached. During the regional ITS architecture development, major ITS projects will have to satisfy the requirements for a project-level ITS architecture which will require examining them for integration opportunities per the National ITS Architecture. Other ITS projects should be reviewed to see if there may be some additional opportunities for linking with other regional efforts or engaging other stakeholder groups. It may be unpractical to alter a project's design because of the maturity of the design or other factors. However, opening the project up for reexamination may reveal ways for improving a project's implementation with additional resources or broader acceptance by stakeholders.

Q: *I'm just planning one ITS project for my region. Do I have to develop a regional ITS architecture? If so, when?*
A: As stated in section 940.9(c) of the FHWA Rule and section V(c) of the FTA Policy, once an area advances its first ITS project to final design it must develop a regional ITS architecture within four years of that date. If there truly are no other ITS projects planned for addressing the transportation needs in a region, then practically speaking, whatever project-level architecture is developed for that lone ITS project is the region's ITS architecture. It should be recognized and documented as such so that, if at some time in the future, the region does consider further ITS deployment, the regional ITS architecture will be updated reflect the new ITS projects. This can be accomplished by updating of the regional ITS architecture as provided in section 940.11(d) of the Rule or section VI(d) of the FTA Policy.

Q: *For ITS projects that don't use Highway Trust Funds, how should these be identified as opportunities for integration?*
A: The Rule/Policy does not apply to ITS projects that are not funded by the Highway Trust Fund. However, in order for a regional ITS architecture to be the most useful, it should contain all ITS activities and projects in a region. The stakeholders need to decide how the documentation that is developed as part of the regional ITS architecture should indicate projects that are funded outside of the Highway Trust Fund, and to what level of detail may be appropriate so that the integration opportunities can best be identified.

Q: How are earmarks treated under the Final Rule? Does the regional ITS architecture need to be updated for earmark projects (ITS integration projects)? Do earmark projects need to be in the regional ITS architecture? Do they need to follow a systems engineering process?
A: By definition, earmark projects are integration projects, so they must meet the requirements of the Final Rule, i.e. must follow a systems engineering process and be reflected in a regional ITS architecture. Per the earmark guidance package, earmark funds can be used to develop a regional ITS architecture if there isn't one in the region already. Whether or not a regional ITS architecture is updated because of an earmark project is up to the region. In other words, just because there is an earmark doesn't mean a region MUST update its regional ITS architecture at that time. However, if an earmark project will have a significant impact on the ITS systems in a region, or involves a large number of stakeholders, then that may be a reason to update the regional ITS architecture.

Q: What is the relationship of projects with Homeland Security funding to the regional ITS architecture?
A: The Final Rule applies to ITS projects that are funded in part or in whole with the Highway Trust Fund, including the Mass Transit Account. Therefore, ITS projects that are funded with Homeland Security funding, or any other Federal funds, don't need to be part of the regional ITS architecture. However, much like ITS projects that are fully funded with State and local money, if they are part of the transportation system and will have an impact on the region, it is strongly encouraged to include them all in the regional ITS architecture.

Q: *What is a project-level architecture? How and when is it developed in the planning process?*
A: Until a region has a regional ITS architecture in place, any major ITS projects that are advanced in that region require the development of a project-level architecture. This project-level architecture focuses on the possible information exchanges between the ITS system(s) being planned as part of the project with other known existing or planned systems in the region.

Regional Architecture Development

Q: *What it is a regional ITS architecture?*
A: A regional ITS architecture is a tailored version of the National ITS Architecture, including only the subsystems and functions that are planned for implementation in the local area or state.

Q: *What is a region? How are the boundaries determined? Is there a minimum size?*
A: The defining parameter in determining what constitutes a region is the availability of integration opportunities for existing or planned ITS systems amongst and between stakeholders. Sometimes this might constitute a governmental boundary (i.e. a county or state), an agency boundary (i.e. an MPO region), or a service boundary (i.e. a transit service area). The Final Rule states that, in metropolitan areas, the metropolitan planning area be considered (but not required) as a minimum size for a region. The ultimate decision must be made by the participating agencies and stakeholders, but should be based on the desired integration of ITS systems in those jurisdictions.

Q: *Who is responsible for developing regional ITS architectures?*
A: The proposed Rule provides flexibility to local areas in determining what agencies or organizations develop the regional ITS architecture. However, because of the linkages to existing planning processes, the states and metropolitan planning organizations are ultimately responsible for ensuring that the proposed Rule's conditions are met for using federal funds.

Q: *How much does developing a regional ITS architecture cost?*
A: The benefits of reduced retrofit and upgrade expenses should outweigh the costs of doing a regional ITS architecture. Before this Rule was issued, many local areas were already developing regional ITS architectures because of the benefits to effective transportation planning and project development. As a rough estimate, it would probably cost about $300,000–$500,000 to develop a regional ITS architecture and strategic deployment plan for a large metropolitan area. For a small urban area, a regional ITS architecture and strategic deployment plan can be roughly estimated at $100,000 to $200,000.

Q: *What do the taxpayers get for spending money on a regional ITS architecture?*
A: More efficient intelligent transportation systems, deployed more quickly and effectively. Less money wasted trying to retrofit incompatible systems.

Q: *Who should be involved in the development of a regional architecture? Is a regional architecture in nonconformance if key stakeholders are not present? How should States get nontraditional players who are deploying ITS technologies involved?*

A: The development of a regional architecture is a collaborative process. To make it work, the participation of key stakeholders is critical. However, it may be impossible at times to fully engage certain stakeholders, either traditional (e.g., local transit property) or nontraditional (e.g., public safety). There is no "conformance test" of regional architectures called for in the Rule/Policy, so a lack of participation of certain stakeholders would not affect that. Nevertheless, it is important to make every effort to engage all stakeholders. The USDOT understands agencies cannot be forced to participate. Having said that, if the champion cannot get their participation at stakeholder meetings, it may be necessary to go to these agencies to determine their needs, their existing and planned ITS systems and their interest in integrating with other regional systems. It may be possible to work through an intermediary who represents the interests of a group of stakeholders. An example may be a state transit authority representing local transit authorities in the development of a statewide architecture.

Q: *While a formal "agreement" between stakeholders is desirable, when is it actually required?*

A: The regional ITS architecture called for in this Rule/Policy must include, among other things, "an operational concept that identifies the roles and responsibilities of the participating agencies...," and, "any agreements (existing or new) required for operations..." For practical purposes, a list of the required agreements needed to implement the operational concept will meet the requirements of the Final Rule. However, once the agreements are developed, the stakeholders should consider including them in the regional ITS architecture documentation for reference purposes. To ease future maintenance issues, the agreements can be included as an appendix. There is no discussion within the Final Rule/Policy of the necessary formality of those agreements but it is expected that those agreements would be documented in writing somehow as part of the regional ITS Architecture. This could be with something as simple as a letter between affected agencies. Where there is an implied sharing of staff or budgets or a transfer of authority, those affected jurisdictions will likely require more formal documentation than is required by the Rule/Policy before proceeding with actual project implementation.

Q: *Do I have to have a completed regional ITS architecture before I can develop any new ITS projects?*

A: No, you can advance ITS projects in your region while you develop your regional ITS architecture. However, major ITS projects that advance during this period require a project-level ITS architecture.

Q: *How does the regional ITS architecture relate to the transportation planning process?*
A: The development of the regional ITS architecture is not meant to compete with the formal transportation planning process. They must work together to provide the best "plan" for the region. Key ITS projects and initiatives are targeted early in the planning process in order to facilitate more effective integration with other projects in the region. For instance, the architecture can support and help define the goals and objectives of a Long Range Transportation Plan since it provides a vision of ITS in the future as seen by the stakeholders. Operational concepts, market packages, and agency/subsystem interfaces can all provide more clarity to the Long Range Transportation Plan components for better scoping and allocating costs. In the case of the Transportation Improvement Program (TIP), the application of regional architecture products can generate more accurate cost estimates for projects in the TIP, a better understanding of the agencies involved in each project, and synergies among projects that might be taken advantage of to better plan and sequence projects. For information on ITS and the planning process, please refer to the Planning for Transportation System Management and Operations website (http://plan4operations.dot.gov) maintained by the Office of Planning. Also the electronic document library (EDL) on the ITS webpage (www.its.dot.gov) contains references on ITS and planning.

Q: *The National ITS Architecture contains subsystems my region is not planning to deploy. Do I have to have a plan for all these subsystems and interfaces?*
A: No. The regional ITS architecture should be tailored to local needs and problems, as it should be a natural extension of the existing transportation planning process.

Q: *What types of funds are being used by States when developing architecture documents? What are the funding eligibility criteria for the development of the architecture documents?*
A: There are many sources of funding that can be used to develop regional ITS architectures. Project funding from the NHS, STP, and CMAQ programs may all be used to craft regional ITS architectures, based upon the federal-aid eligibility provided by TEA-21 of ITS and operations and management expenditures. Planning funds may also be used, but like the constraints of the other federal-aid programs, all eligibility criteria for the selected funding source must be met.

Q: *Should consultants be hired to aid in the development of the regional ITS architectures and be employed to provide maintenance to the document upon completion?*
A: Whether or not stakeholders should use consultants in developing and maintaining a regional ITS architecture depends on a number of factors. These factors include the knowledge, skill, and availability of stakeholder agencies' staffs related to regional ITS architecture development, and the complexity of the transportation system of a region. A number of larger regions employed consultant help in developing their regional ITS

architectures and have retained those consultants' services in maintaining and updating the regional ITS architecture. Even if an area chooses to use consultants to develop and maintain a regional ITS architecture, the stakeholders' staffs should be aware of and knowledgeable about the processes used by the consultant so that they can be assured of compliance with the provisions of the Rule/Policy.

Q: *How should States engage the private sector in the development of the regional architecture?*
A: In many areas around the country, activities by private sector firms play a significant role in the implementation of ITS across a region. This is especially true in traveler information services. How States and other regional stakeholders interact with these private ventures will depend upon current and emerging business arrangements of the public agencies and the private firms. For example, many public agencies provide data or video information to private firms that may resell or reconvey the information to the general pubic or to specialized travelers. These sharing arrangements provide an excellent opportunity to engage the private firms in developing a regional ITS architecture. If there are no arrangements currently in place, the developers of a regional ITS architecture may wish to craft an initial version of their architecture that can be used to begin discussion with private sector firms. These discussions should include exploring ways that the private sector firms can enhance the regional ITS architecture or provide services indicated in the regional ITS architecture.

Q: *What is a "complete" architecture?*
A: A regional ITS architecture is never really complete. By definition it is a "living document" that must be revisited and revised as the requirements of the region change. In fact, the Rule has a requirement that a process be put in place for maintaining and updating the regional ITS architecture as necessary. For the purposes of using the regional ITS architecture to influence project design, once the stakeholders have developed an initial architecture, and all the key stakeholders have reached consensus, then they can say "it's complete for now." When something major changes in the region, or when the scheduled review time occurs, the stakeholders will need to maintain and update the regional architecture. So at any given time beyond this initial "completion date," the region should have a "complete" regional architecture, with the understanding it might change tomorrow.

Q: *What do you mean by a sequence of projects required for implementation?*
A: The "sequence of projects" noted in section 940.9(d)(8) of the Federal Highway Administration's Final Rule on Intelligent Transportation System (ITS) Architecture and Standards refers to the scheduling of projects necessary to implement the regional ITS architecture. The intent is to recognize that in order to initiate some projects, other projects may have to be completed. An example in building a house would be that the electrical wiring and the plumbing need to be completed before the interior walls can be finished. This identification of the projects' sequencing helps the stakeholders visualize how a region's ITS projects will "fit together" over time and their interdependencies.

Q: *What if the regional ITS architecture development steps and intent have been undertaken earlier but simply not called regional ITS architecture?*
A: The Final Rule doesn't dictate form. The different parts of the regional ITS architecture may exist in different forms in different places or documents. As long as all parts of the Final Rule requirements can be demonstrated, conformity has been met. However, if the requirements of the Final Rule are scattered throughout several documents or locations, then maintenance will certainly become an issue.

Q: *For any given region within a State, will an existing statewide ITS architecture also satisfy the regional ITS architecture requirement of the Final Rule?*
A: Just because a region (city, county, etc) is located within a State, that doesn't mean the regional ITS architecture requirements for that region are automatically met within the statewide ITS architecture. If the stakeholders within that region participated in the development of the statewide ITS architecture, and their specific systems and related interfaces in the region are part of it, then the Final Rule requirements for that region have been met. These stakeholders must also be part of the statewide ITS architecture maintenance process to ensure accurate reflection of their regional systems. If at some point, the stakeholders choose to have their own regional ITS architecture, their elements can be "pulled out" of the statewide ITS architecture and put in their own documentation. However, there must be consistency between both the statewide and any regional ITS architectures.

Q: *What if the statewide ITS architecture is at odds or conflicts with the regional ITS architecture, e.g. project prioritization is not the same?*
A: Project prioritization is a local/regional decision. The regional and/or statewide ITS architecture should only consider sequencing of projects, not their priority for deployment. Statewide and regional ITS architectures should be consistent with each other. In fact, any regional ITS architectures that overlap should be consistent with each other. As a suggestion, the operational concepts, functional requirements, interconnects, information flows, project sequencing, agency agreements and ITS standards sections should be compared for compatibility. If there is a gap or an unnecessary overlap, the stakeholders can agree to change one or both architectures as needed. The changes can occur then or at the next maintenance cycle, as appropriate.

To address the issues of prioritization in a regional vs. statewide ITS architecture, perhaps an implementation plan that all stakeholders can agree upon would be useful. If however, a "shared" deployment, such as a fiber optic backbone, is a priority for the statewide ITS architecture stakeholders, and passes through a region for which the backbone is NOT a priority, then maybe the statewide stakeholders can agree to pay the full amount of deployment. In this case, since the region stakeholders don't have to provide funding, then they can agree to the deployment now vs. later and adjust their regional ITS architecture accordingly. In fact, the deployment of the fiber optic backbone may change the sequencing of the region's projects and change the region's project prioritization.

Q: *Will a regional ITS architecture and systems engineering analysis be required when "off-the-shelf projects" come up for funding?*
A: Yes, these projects must be included in the regional ITS architecture, and will need to follow a systems engineering analysis if to be funded with Federal funds. This is also a good idea because of the current state and progress of technology. However, the local/regional people and others involved should be informed as early as possible before planning to fund shelved projects.

Q: *How often should the regional ITS architecture be updated?*
A: A regional ITS architecture can be updated two ways, on a predetermined time cycle, or on an as-needed basis. For the predetermined time cycle, we recommend using the TIP or STIP timeframe. For the as-needed update, it can be triggered by a major change or addition the architecture, or after several smaller changes have been collected. Either strategy has impacts on cost and resources. For an extensive discussion of what should be considered in updating a regional ITS architecture, please refer to the "Regional ITS Architecture Maintenance White Paper" found on the Architecture implementation webpage and on the EDL as document #13957. It should also be noted that while a regional ITS architecture is technology independent, updates may be driven by improvements or developments in technology, especially in telecommunications.

Q: *How will the maintenance of the regional ITS architecture be funded?*
A: Regional ITS architecture maintenance can be funded with Federal, State or local funds. All Federal funds are eligible, but perhaps SPR or PL funds would be most applicable. Some regions may choose to do their regional ITS architecture maintenance in house using stakeholder staff.

Q: *Are there security implications of posting the regional ITS architecture on the Internet?*
A: Many regions have put their regional ITS architecture on the Internet as an effective stakeholder outreach and data gathering tool. A few in the public safety and homeland security community have expressed a concern that posting the regional ITS architecture on the Internet poses a security issue. While there is still discussion about this, and it's not clear what will happen with this issue, there are a few thoughts that can be shared. While a regional ITS architecture does show the information flows between systems, and sometimes the method of the exchange (i.e. fiber, cellular, microwave, etc), the specific locations of the equipment is usually not specified. In a large metropolitan area, the specific locations of every detector, camera, DMS, etc would be onerous to show. However, for a regional ITS architecture that covers a smaller geographic area, showing the locations of specific equipment may be more possible, and could be an issue for the homeland security and public safety community. Another perspective is that many maps and other sources show the locations of critical infrastructure (i.e. bridges, power stations, hospitals, etc), so the regional ITS architecture doesn't provide any more information than can be garnered from other sources. However, the stakeholders will ultimately make the decision on what, if anything will be displayed on the Internet.

Standards

Q: *Elaborate on Section 940.9(d)(7)–Identification of ITS Standards supporting regional and national interoperability.*
A: A key component of a regional ITS architecture is the determination of interface requirements and information exchanges with planned and existing systems and subsystems. It is this part of the architecture development process that focuses on integration opportunities among the various existing and planned ITS systems in a region. There are over 115 ITS standards either developed or under development that are intended to facilitate these information exchanges. Once interfaces and information exchanges are agreed upon in the region, the ITS standards must be reviewed to see which will fulfill the regional requirements. The standards identified as absolutely necessary for the region will be the ones that define regional interoperability.

Interoperability is the ability of systems to: (1) provide services; (2) accept services from other systems; and (3) use the services exchanged to operate effectively together. Interoperability is important because it simplifies developing ITS systems and procedures and allows ITS tasks to be performed consistently. Examples of interoperability are being able to use the same toll tag on multiple toll roads, being able to use one computer system to operate different variable message signs, and being able to send information and data from one traffic management center to another without multiple translation tables.

ITS standards bring about interoperability by specifying consistency and compatibility of the interconnects and interfaces, both hardware and software, between ITS systems and components. The stakeholders in a region must decide which ITS standards will achieve regional interoperability based on the ITS systems and components being deployed in the region and the ITS standards available. The use of standards is a first step toward achieving interoperability, although full interoperability will likely require agreements among the different agencies and organizations that provide the systems and the information to be shared. The level of formality of the agreements will be the stakeholders' choice.

Q: *Is the use of any standard mandated by this proposed Rule?*
A: No, not at this time. Standards and interoperability tests are mandated only when they become officially adopted by the USDOT; at this point the USDOT has not adopted any ITS standards. The USDOT encourages the use of applicable ITS standards prior to their official adoption, however, as appropriate.

Q: *What does it take to have a standard adopted by the USDOT?*
A: Currently there are no ITS Standards that have been adopted by the USDOT. However there are several standards that have been developed via industry consensus and are approved for use by the standards development organizations (SDOs). FHWA and FTA encourage the appropriate use of these standards.

A formal Rulemaking process will precede any USDOT ITS standard adoption. Formal adoption will take some time after approval of the standard by an SDO. The USDOT has developed a set of criteria to determine when a standard could be considered for formal adoption. These criteria include, at a minimum, the following elements:

- A Standard Development Organization (SDO) has approved the standard.
- The standard has been successfully tested in real world applications as appropriate.
- The standard has received some degree of acceptance by the community served by the standard.
- Products exist to implement the standard.
- There is adequate documentation to support the use of the standard.
- There is training available in the use of the standard where applicable.

Q: *Does conformity with the National ITS Architecture ensure interoperability?*
A: No. That's why there is the additional requirement for standards and interoperability tests, after they have been adopted by the USDOT. Even with the use of standards and interoperability tests, interoperability with other regions can only be ensured through detailed interjurisdictional discussions and agreements. The National ITS Architecture does provide a framework for determining the requirements for interoperability.

Q: *Does interoperability testing apply to all ITS projects?*
A: The only interoperability tests that are currently contemplated by the USDOT are those associated with the Commercial Vehicle Operations (CVO) program. These tests are currently being used by States deploying CVO systems and will follow a similar set of criteria for adoption as those defined for standards. Again, as with standards, should the USDOT consider the adoption of these or any other interoperability tests, a formal Rulemaking process would be required.

Q: *On what projects should I use ITS standards?*
A: ITS standards should be used on all transportation projects that involve ITS technologies. The Turbo Architecture tool, an interactive software program developed to assist in regional ITS architecture and project architecture development, can be used to determine which standards are appropriate for an ITS project. One feature of Turbo Architecture is the identification of information flows that can be selected for the regional ITS architecture based upon the functions and services selected by the stakeholders. Each of the information flows has the appropriate ITS standards identified, so the stakeholders can select which ITS standards should be pursued as individual projects are developed. More information on the Turbo Architecture tool can be found on the Architecture Implementation website.

Q: *Where can I get more information on ITS standards?*
A: The USDOT ITS Standards website at www.standards.its.dot.gov/standards.htm has the latest information on ITS standards development, use, testing, training and technical assistance.

Systems Engineering

Q: *How does following a systems engineering process help me?*
A: As an interdisciplinary approach to procurement and implementation, systems engineering (SE) enables you to identify and document all of the project requirements, to effectively manage the technical complexity of the resulting developments, and to verify that the requirements are thoroughly and correctly implemented. The use of an SE methodology assures that all phases of a system's lifecycle are addressed, from conception through design, installation and testing, and operations and maintenance. With early identification and control over your requirements, considerable costs—in an order of magnitude—can be avoided compared to otherwise unmanaged changes during the design and implementation phases of the project. SE gives you the toolset AND drives the mindset for achieving successful operations at reduced cost.

As an SE methodology is followed, the seven minimum criteria mentioned in 940.11(c) will be addressed. The degree to which they are addressed will be commensurate with the project scope and its complexity.

Q: *Define "system functional requirements".*
A: The system functional requirements noted in Section 940.9(d)(5) of the FHWA Final Rule on ITS refers to a reasonably complete description of the high-level tasks, actions or activities that must be performed by the ITS components to address the needs or problems of the region. The level of detail is up to the stakeholders, but some of the market packages and equipment packages of the ITS National Architecture could be used as a resource.

Q: *What is the cost of conducting a systems engineering analysis as described in the Final Rule?*
A: Based on an analysis of large software projects, a rule of thumb is that 15% of the project cost should be used for a full systems engineering analysis. While this may seem a lot, the cost of not following a systems engineering process is an increased chance of cost and schedule overruns, and possibly project failure. It's very important to note that the systems engineering analysis needs to be commensurate with the scope of the ITS project. As transportation projects of all sizes gather information on using a systems engineering process, this rule of thumb will become more accurate.

Q: *What is the difference between an Operational Concept and a Concept of Operations?*
A: Within the context of regional ITS architectures and systems engineering analyses, the difference between an operational concept and a concept of operations is one of scope and level of detail. Whereas an operational concept is regionwide, and part of the regional ITS architecture, a concept of operations is project specific, and part of a systems engineering analysis.

An operational concept describes the roles and responsibilities of the stakeholders as they relate to systems and transportation operations within a region. It's intended to be a high-level document, because the number and complexity of systems, and stakeholders' roles

and responsibilities in a region may be large. In fact, the depth of information of an operational concept will be decided upon by the stakeholders, and will likely rely very heavily on the quantity and variety of systems in a region. To that end, many regional ITS architectures use "high-level operational scenarios" to engage stakeholders and better describe their roles and responsibilities within the region. For instance, these scenarios might describe what happens during a large weather incident, hazardous material spill, or long-term construction project. As stakeholders walk through these scenarios, and document their operational concept, the significance of understanding roles and responsibilities is quickly highlighted and gaps or challenges in regional operations can be identified and addressed. The resulting documentation can be a series of statements that are binding (shall), simply stated facts (will), or establish a goal or direction (should).

A concept of operations, also referred to as a "conops," describes more detailed operational characteristics of a particular system or project, and provides a common understanding of the system's goals and expectations for project stakeholders to track as the system is implemented or enhanced. It also defines the roles and responsibilities of the stakeholders specifically impacted by the project or system. The concept of operations provides overall operational issues from which design and implementation criteria will be taken. It is not a detailed design document, but an overview of how the system or project shall operate and the interactions among the stakeholders. These are binding user requirements within the SE process and will be documented as predominantly mandatory (shall) statements. Identification of these project requirements may also help determine the most effective procurement methods early in the project development.
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ITS Standards Background

What Is ITS | What Are Standards | What Are ITS Standards | How Standards Facilitate Interoperability

What is ITS?

ITS (Intelligent Transportation Systems) improve transportation safety and mobility and enhance productivity through the use of advanced communications technologies. ITS encompasses a broad range of wireless and wire line communications-based information and electronics technologies. When integrated into the transportation system's infrastructure, and in vehicles themselves, these technologies relieve congestion, improve safety and enhance American productivity.

Learn More . . . .

- ITS Joint Program Office website
- ITS Benefits, Costs and Lessons Learned Databases
- ITS Technology Overview

What Are Standards?

Standards define an architecture of interrelated systems that work together to deliver transportation services. An ITS architecture defines how systems functionally operate and the interconnection of information exchanges that must take place between these systems to accomplish transportation services. An architecture is functionally oriented and not technology-specific which allows the architecture to remain effective over time. It defines "what must be done," not "how it will be done."

Most standards are **voluntary, consensus-based**, and **open**:

- Voluntary, meaning their use is not mandated by law
- Consensus-based, meaning that a published standard has attained general agreement through cooperation and compromise in a process that is inclusive of all interested parties
- Open, meaning that they are not proprietary and are available for anyone to use

The use of standards encourages industry growth by minimizing development costs, increasing compatibility and interoperability, and increasing buyer and seller confidence in products.

Learn More . . . .

- American National Standards Institute (ANSI)
- Why Standards Matter (e-learning course; registration required)
- International Organization for Standardization (ISO)

What Are ITS Standards?

There are hundreds of standards used across all different types of transportation, such as vehicle safety standards, road and pavement standards, and rail standards. *ITS standards* define how ITS systems, products, and components can interconnect, exchange information and interact to deliver services within a transportation network. ITS standards are open-interface standards that establish communication rules for how ITS devices can perform, how they can connect, and how they can exchange data in order to interoperate. It is important to note that ITS standards are not design standards: They do not specify specific products or designs to use. Instead, the use of standards gives transportation agencies confidence that components from different manufacturers will work together, without removing the incentive for designers and manufacturers to compete to provide products that are more efficient or offer more features.

Although stand-alone ITS applications create benefits, the integration of ITS devices and center-based systems results in the greatest efficiencies and improves mobility and safety. ITS standards are an important element in the integration of advanced technologies and systems. ITS standards allow both like and different ITS devices and equipment to *exchange* and *interpret* data directly through a common communications interface. This exchange and recognition of data can take place between devices located within a *single system* or between devices operating in *different systems*. By using standards-based ITS, agencies can join forces to extend the reach and capabilities of their ITS infrastructure investments. An example of this integration is a road weather data collection system using pavement sensors that can communicate with nearby dynamic message signs so that the appropriate warning messages can be automatically displayed based on pavement condition data sent by the pavement sensor.

ITS standards cover different "communications layers" in their description of how data is communicated between the relevant transportation systems. These layers start with the description of how bits of data are combined and transmitted and extend to the meaning of the entire message sent over the communications path. ITS standards specify consistency and compatibility of the interconnects and interfaces, both hardware and software, within an advanced transportation system.

How Standards Facilitate Interoperability

The ability of different ITS devices and components to exchange and interpret data directly through a common communications interface, and to use the exchanged data to operate together effectively, is called *interoperability*. Interoperability is key to achieving the full potential of ITS. Seamless data exchange would allow an emergency services vehicle to notify a traffic management center to trigger a change in the timing of the traffic signals on the path to a hospital, in order to assist the responding ambulance.

Interoperability is defined as the ability of ITS systems to:

- Provide information and services to other systems
- Use exchanged information and services to operate together effectively.

A standards-based approach to integration helps to facilitate the exchange of transportation data as well as more easily accommodate future equipment replacements, systems upgrades, and system expansions.

...dot.gov/learn_WhatAre.asp

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Standards Development Process

ITS standards are developed using an established, industry-standard process. Each step involves discussion and consensus-building among a varied group of technical experts, deployers, and systems integrators, representing both the private and public sector. This process produces ITS standards that are:

- **Consensus based**
- **Open**
- **Voluntary**

This process is led by **standards development organizations** (SDOs). SDOs are professional or industry associations, and most are accredited by the American National Standards Institute (ANSI). Their development process is open to all interested parties, characterized by due process, and consistent with internationally-accepted procedures. Agreement is reached through cooperation and compromise. It is difficult work, requiring harmonization of conflicting vested interests, trust-building, and concessions to be made, and it is often a volunteer effort. The rigorous process results in robust, durable, well-accepted standards.

Development of ITS standards is performed by **working groups**. Working groups consist of professionals with domain expertise in the specific ITS component to which the standard is expected to apply. Working groups are open to any party who will be directly and materially affected by the standard, including public sector transportation agency representatives, vendors, technical consultants, and SDO staff. A working group is formed and convened under the direction of the sponsoring SDO.

The development process can vary slightly from SDO to SDO, but the process is essentially the same. The process begins with a proposed work item that must be approved by the SDO. Once approved, the working group develops a Working Group Draft of the standard. When the draft is ready, the User Comment Draft (UCD) is then balloted. The working group addresses and resolves the comments received at this stage by revising the standard. If comments have been satisfactorily resolved, the standard is then approved. An additional step — **Jointly Approved Standard** — is included for cases in which a standard is a joint project between several SDOs. The standard is Jointly Approved when it has been successfully balloted by all of the sponsoring SDOs. For example, National Transportation Communications for ITS Protocol (NTCIP) standards are joint standards, and therefore are Jointly Approved by American Association of State Highway and Transportation Officials (AASHTO), Institute of Transportation Engineers (ITE), and National Electrical Manufacturers Association (NEMA).

Following approval, the standard is published.
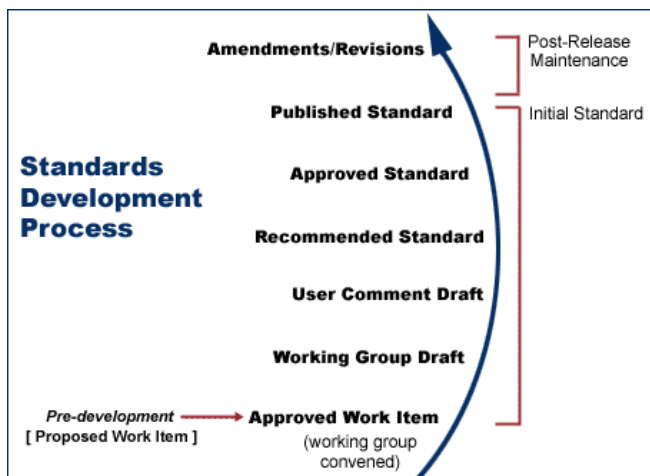
Once published, time is needed for the market to adopt the standard. Manufacturers will then incorporate the standard into devices and systems, making this standards-based technology readily available to deployers. Deployers can choose to build standards-based systems directly from the standards themselves and/or incorporate standardized components from vendors.

The standard continues to evolve as lessons are learned during its deployment. To incorporate changes, the working group amends the standard using a streamlined version of the development process that typically takes only a fraction of the time required for the original effort. Amendments are approved by ballot and published.

The ITS Standards Search on this website allows you to view the current development status of standards whose development has been supported by the USDOT ITS Standards Program.

Learn More . . . .

- IEEE Standards Development Online
- ANSI website
- U.S. Standards — Today and Tomorrow (e-learning course; registration required).

Life Cycle of ITS Standards

From Initial Development to USDOT Application

SDO develops, approves, and publishes standard

Standards development organizations (SDOs) coordinate the development of standards:

1. During **development**, an SDO committee writes and documents the technical aspects of standards.
2. Standards then go through a **balloting** process, where committee or working group members review the technical merits of the standards. A standard may or may not pass balloting.
3. Standards that have passed all necessary ballots are **approved**. At this stage the standard can be used but is not yet published.
4. Approved standards are **published** by the SDO and are available for purchase.

Learn More . . . .

- Standards Development Process

Standard is tested

Testing measures the operation, correctness, and completeness of a standard under realistic transportation operating conditions. It also measures the degree of interoperability among standards and provides information about the performance of a standard to the ITS community.

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- Standards Testing

Standard matures and ITS products are developed

As standards **mature**, competition develops among vendors to provide a range of equipment with differing levels of functionality. This gives transportation managers greater flexibility in choosing products that best suit their particular project requirements.

Standardized components lead to **interoperability** (the capacity of a device to communicate with different types of ITS devices) and **interchangeability** (the capacity to substitute one manufacturer's device for another).

ITS devices, based on open standards, lead to cost savings, as well as to easier and more efficient systems maintenance and operations.

Adoption of standard through USDOT rulemaking

Not all ITS standards reach this stage.

The USDOT will only consider adopting an ITS standard through **rulemaking** if the standard meets, at a minimum, certain established criteria. These criteria are defined in the *Final Rule/Policy on the National ITS Architecture and ITS Standards* and are intended to produce technically and commercially viable ITS standards and equipment.

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- Final Rule/Policy: ITS Architecture and Standards

Systems Engineering

ITS Standards in the Systems Engineering Process

ITS Standards are primarily used in the design stage of the systems engineering process, after a high-level design (project architecture) has been developed. During the detailed design phase, specific messages, data elements, communications profiles, and design options are defined.

Systems Engineering is a process-oriented means of deploying a system that leads to reduced risk, controlled cost and schedule, improved system quality, and a resultant system that meets user needs.

There are multiple ways to represent the systems engineering process. One way, the Systems Engineering "V" Diagram (see figure below), represents the typical life cycle of any system or project. Whether the system being deployed consists of a basic computer-aided dispatch (CAD) system for a transit agency, or a more complex interface between a traffic management center and a public safety agency, all systems will follow some variation of this life cycle.
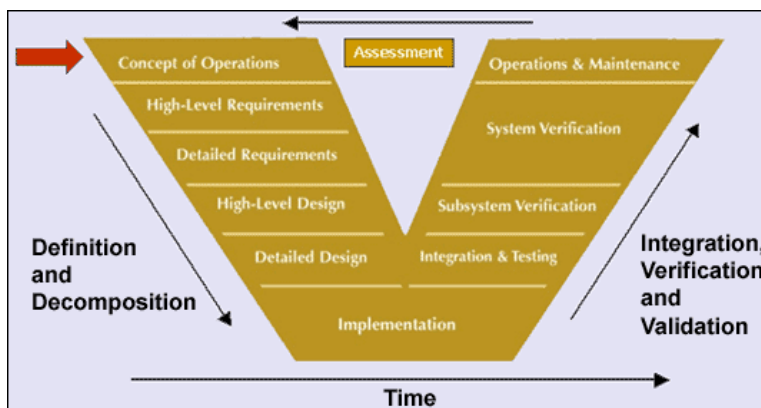
Stage 1: Concept of Operations — The manner in which the system will be used is defined.

Stage 2: Requirements — High level and detailed requirements define what the system will do.

Stage 3: Design — High-level and detailed specifications define how the system will meet the requirements.

Stage 4: Implementation — The components are built or deployed.

Stage 5: Integration & Testing — As each component of the system is completed, it is integrated into the overall system and tested to ensure that the specifications are satisfied.

Stage 6: System Verification — Also called acceptance testing, this step ensures that the overall system is consistent with the design, and that it meets the requirements.

Stage 7: Operations & Maintenance — This stage represents the ongoing process of using the system in the manner in which it was intended (and validating that it can be used in this way) and maintaining the system.

The systems engineering process is used during the development of ITS standards, as well. Some standards include sections which document this process to help ITS deployers with interpreting and using the standard. For example, the concept of operations developed for an ITS standard may help ITS project designers to conceptualize how messages might be exchanged between systems, such as the order in which control information is sent to a field device and the type of status returned. Additionally, the high-level and detailed requirements developed for an ITS standard might be used to create system functional requirements that could also be used later during system verification.

Learn More . . . .

- CITE Introduction to Systems Engineering – Instructor-led, Web–based ("Blended") Version
- CITE Advanced Systems Engineering for Advanced Transportation Projects web-based course
- ITS T3 (Talking Technology and Transportation) archives. Includes past T3 webinar on subject of Systems Engineering.

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Monday,

January 8, 2001

Part IV

Department of Transportation

Federal Highway Administration

23 CFR Parts 655 and 940
Intelligent Transportation System Architecture and Standards; Final Rule

Federal Transit Administration

Federal Transit Administration National ITS Architecture Policy on Transit Projects; Notice

DEPARTMENT OF TRANSPORTATION

Federal Highway Administration

23 CFR Parts 655 and 940

[FHWA Docket No. FHWA–99–5899]

RIN 2125–AE65

Intelligent Transportation System Architecture and Standards

AGENCY: Federal Highway Administration (FHWA), DOT.

ACTION: Final rule.

SUMMARY: The purpose of this document is to issue a final rule to implement section 5206(e) of the Transportation Equity Act for the 21st Century (TEA–21), enacted on June 9, 1998, which required Intelligent Transportation System (ITS) projects funded through the highway trust fund to conform to the National ITS Architecture and applicable standards. Because it is highly unlikely that the entire National ITS Architecture would be fully implemented by any single metropolitan area or State, this rule requires that the National ITS Architecture be used to develop a local implementation of the National ITS Architecture, which is referred to as a ''regional ITS architecture.'' Therefore, conformance with the National ITS Architecture is defined under this rule as development of a regional ITS architecture within four years after the first ITS project advancing to final design, and the subsequent adherence of ITS projects to the regional ITS architecture. The regional ITS architecture is based on the National ITS Architecture and consist of several parts including the system functional requirements and information exchanges with planned and existing systems and subsystems and identification of applicable standards, and would be tailored to address the local situation and ITS investment needs.

EFFECTIVE DATE: February 7, 2001.

FOR FURTHER INFORMATION CONTACT: *For technical information:* Mr. Bob Rupert, (202) 366–2194, Office of Travel Management (HOTM–1) and Mr. Michael Freitas, (202) 366–9292, ITS Joint Program Office (HOIT–1). *For legal information:* Mr. Wilbert Baccus, Office of the Chief Counsel (HCC–32), (202) 366–1346, Federal Highway Administration, 400 Seventh Street, SW., Washington, DC 20590. Office hours are from 8 a.m. to 4:30 p.m., e.t., Monday through Friday, except Federal holidays.

SUPPLEMENTARY INFORMATION:

Electronic Access and Filing

You may submit or retrieve comments online through the Docket Management System (DMS) at: *http//dmses.dot.gov/submit.* Acceptable formats include: MS Word (versions 95 to 97), MS Word for Mac (versions 6 to 8), Rich Text Format (RTF), American Standard Code Information Interchange (ASCII) (TXT), Portable Document Format (PDF), and WordPerfect (version 7 to 8). The DMS is available 24 hours each day, 365 days each year. Electronic submission and retrieval help and guidelines are available under the help section of the web site.

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Background

A notice of proposed rulemaking (NPRM) concerning this rule was published at 65 FR 33994 on May 25, 2000, and an extension of the comment period to September 23, 2000, was published at 65 FR 45942 on July 26, 2000.

In the NPRM on this rule, the FHWA had proposed that the regional ITS architecture follow from the ITS integration strategy proposed in another NPRM entitled ''Statewide Transportation Planning; Metropolitan Transportation Planning'' published at 65 FR 33922 on May 25, 2000. That rule is being developed according to a different schedule and will be issued separately. For this reason, all references to the proposed integration strategy have been removed from this rule. However, it is still the intent of this rule that regional ITS architectures be based on established, collaborative transportation planning processes. The other major changes to the final rule relate to options for developing a regional ITS architecture and the time allowed to develop such an architecture. Additional changes to the final rule largely deal with clarification of terms, improved language dealing with staging and grandfathering issues, and clarification of use of ITS standards.

Intelligent Transportation Systems represent the application of information processing, communications technologies, advanced control strategies, and electronics to the field of transportation. Information technology in general is most effective and cost beneficial when systems are integrated and interoperable. The greatest benefits in terms of safety, efficiency, and costs are realized when electronic systems are systematically integrated to form a whole in which information is shared with all and systems are interoperable.

In the transportation sector, successful ITS integration and interoperability require addressing two different and yet fundamental issues; that of technical and institutional integration. *Technical integration* of electronic systems is a complex issue that requires considerable up-front planning and meticulous execution for electronic information to be stored and accessed by various parts of a system. *Institutional integration* involves coordination between various agencies and jurisdictions to achieve seamless operations and/or interoperability.

In order to achieve effective institutional integration of systems, agencies and jurisdictions must agree on the benefits of ITS and the value of being part of an integrated system. They must agree on roles, responsibilities, and shared operational strategies. Finally, they must agree on standards and, in some cases, technologies and operating procedures to ensure interoperability. In some instances, there may be multiple standards that could be implemented for a single interface. In this case, agencies will need to agree on a common standard or agree to implement a technical translator that will allow dissimilar standards to interoperate. This coordination effort is a considerable task that will happen over time, not all at once. Transportation organizations, such as, transit properties, State and local transportation agencies, and metropolitan planning organizations must be fully committed to achieving institutional integration in order for integration to be successful. The transportation agencies must also coordinate with agencies for which transportation is a key, but not a primary part of their business, such as, emergency management and law enforcement agencies.

Successfully dealing with both the technical and institutional issues requires a high-level conceptual view of the future system and careful, comprehensive planning. The framework for the system is referred to as the *architecture.* The architecture defines the system components, key functions, the organizations involved, and the type of information shared

between organizations and parts of the system. The architecture is, therefore, fundamental to successful system implementation, integration, and interoperability.

Additional background information may be found in docket number FHWA–99–5899.

The National ITS Architecture

The Intermodal Surface Transportation Efficiency Act of 1991, Public Law 102–240, 105 Stat. 1914, initiated Federal funding for the ITS program. The program at that time was largely focused on research and development and operational tests of technologies. A key part of the program was the development of the National ITS Architecture. The National ITS Architecture provides a common structure for the design of ITS systems. The architecture defines the functions that could be performed to satisfy user requirements and how the various elements of the system might connect to share information. It is not a system design, nor is it a design concept. However, it does define the framework around which multiple design approaches can be developed, each one specifically tailored to meet the needs of the user, while maintaining the benefits of a common approach.

The National ITS Architecture, Version 3.0 can be obtained from the ITS Joint Program Office of the DOT in CD–ROM format and on the ITS web site *http://www.its.dot.gov*. The effort to develop a common national system architecture to guide the evolution of ITS in the United States over the next 20 years and beyond has been managed since September 1993 by the DOT. The National ITS Architecture describes in detail what types of interfaces should exist between ITS components and how they will exchange information and work together to deliver the given ITS user service requirements.

The National ITS Architecture and standards can be used to guide multi-level government and private-sector business planners in developing and deploying nationally compatible systems. By ensuring system compatibility, the DOT hopes to accelerate ITS integration nationwide and develop a strong, diverse marketplace for related products and services.

It is highly unlikely that the entire National ITS Architecture will be fully implemented by any single metropolitan area or State. For example, the National ITS Architecture contains information flows for an Automated Highway System that is unlikely to be part of most regional implementations.

However, the National ITS Architecture has considerable value as a framework for local governments in the development of regional ITS architectures by identifying the many functions and information sharing opportunities that may be desired. It can assist local governments with both of the key elements: technical interoperability and institutional coordination.

The National ITS Architecture, because it aids in the development of a high-level conceptual view of a future system, can assist local governments in identifying applications that will support their future transportation needs. From an institutional coordination perspective, the National ITS Architecture helps local transportation planners to identify other stakeholders who may need to be involved and to identify potential integration opportunities. From a technical interoperability perspective, the National ITS Architecture provides a logical and physical architecture and process specifications to guide the design of a system. The National ITS Architecture also identifies interfaces where standards may apply, further supporting interoperability.

Transportation Equity Act for the 21st Century

As noted above, section 5206(e) of the TEA–21, Public Law 105–178, 112 Stat. 457, requires ITS projects funded from the highway trust fund to conform to the National ITS Architecture, applicable or provisional standards, and protocols. One of the findings of Congress in section 5202 of the TEA–21, is that continued investment in systems integration is needed to accelerate the rate at which ITS is incorporated into the national surface transportation network. Two of the purposes of the ITS program, noted in section 5203(b) of the TEA–21, are to expedite the deployment and integration of ITS, and to improve regional cooperation and operations planning for effective ITS deployment. Use of the National ITS Architecture provides significant benefits to local transportation planners and deployers as follows:

1. The National ITS Architecture provides assistance with technical design. It saves considerable design time because physical and logical architectures are already defined.

2. Information flows and process specifications are defined in the National ITS Architecture, allowing local governments to accelerate the process of defining system functionality.

3. The architecture identifies standards that will support

interoperability now and into the future, but it leaves selection of technologies to local decisionmakers.

4. The architecture provides a sound engineering framework for integrating multiple applications and services in a region.

ITS Architecture and Standards NPRM

Discussion of Comments

The FHWA received 105 comments on this docket from a wide range of stakeholders, including major industry associations, State departments of transportation, Metropolitan Planning Organizations (MPOs), and local agencies. The comments were generally favorable about the scope and content, but requested additional clarification and guidance on implementation of specific items. On many issues, some commenters wanted more specific requirements, while others wanted more flexibility. Most commenters, including major industry associations and public sector agencies, agreed with the overall scope, but some felt that the specifics might be difficult to implement and asked for clarification of key terms. A few commenters wanted the FHWA to reduce the number of requirements or convert the rulemaking into a guidance activity until more ITS deployment experience is gained.

In summary, the FHWA received a large number of generally favorable comments about the NPRM that suggested minor specific changes and expressed a need for further guidance on implementation. Since the general tenor of the comments was positive, the FHWA has kept the scope of the NPRM and made appropriate clarifications to the text of the final rule to address concerns raised in comments. In response to the many comments requesting it, starting in early 2001, the FHWA will also provide a program of guidance, training, and technical support to assist with the implementation of this rule. The following is a detailed discussion of the comments and their disposition, organized by subject matter.

Section 940.3 Definitions

ITS Project. There were 34 comments submitted to the docket concerning the definition of an ITS project. Many of the commenters felt the definition was not clear enough, was too broad, or was too subject to interpretation. Some comments questioned how much of a project's budget would have to be spent on ITS before a project would be considered an ITS project. Some suggested specific language to more narrowly define an ITS project by

focusing on the portion of the overall project that is actually ITS or by suggesting language that would narrow the definition of an ITS project to only include projects which introduce new or changed integration opportunities.

Since the intent of this rule and the supporting legislation is to facilitate the deployment of integrated ITS systems, it is the position of the FHWA that the definition of an ITS project must be fairly broad to include any ITS system being funded with highway trust fund dollars. It is only by properly considering all planned ITS investments in the development of a regional ITS architecture that the integration opportunities and needs can even be identified. This consideration should be carried out in the development of an architecture prior to the specific project being advanced. If, in the development of a regional ITS architecture, it is determined that a specific planned project offers no real integration opportunities for the region, then the impact of this rule on that specific project is minimal.

As a response to the comments concerning the clarity of the definition, the definition of an ITS project has been slightly modified to remove the examples since they were considered misleading. The FHWA recognizes that any definition will be subject to interpretation by the stakeholders and acknowledges the need for guidance in this area to ensure clear and consistent interpretation of this rule. Guidance on what constitutes an ITS project (including examples) will be developed to assist the various stakeholders, including the FHWA Division Offices, to better understand what projects should be considered ITS projects.

Region. There were 26 comments submitted related to the definition of a region. Seven comments supported the open definition provided in the NPRM, arguing that the possible integration opportunities in an area should define the region and that there were too many possible variations to allow a restrictive definition. Six commenters who expressed concern over varying conditions interpreted the definition to mean Metropolitan Planning Area (MPA). Five comments suggested an MPA was too restrictive. Eight other comments indicated that the proposed definition of a region did not clearly identify what entity would have the lead in developing a regional ITS architecture or thought the definition implied the MPO should have the lead. Nine comments suggested various limits or boundaries to fit specific situations. Ten comments expressed a need for

greater clarification of the definition for a region.

The intent of the proposed definition was to allow considerable flexibility on the part of the stakeholders in defining the boundaries of a region to best meet their identified integration opportunities. While there was no intent to generally restrict the definition to MPAs or States, the FHWA determined that regional ITS architectures should be based on an integration strategy that was developed by an MPO or State as part of its transportation planning process.

Given that the final rule does not require or reference an integration strategy, the FHWA feels a need to provide more specific guidance on the definition of a region. As such, the definition of a region has been revised to indicate that the MPA should be the minimum area considered when establishing the boundaries of a region for purposes of developing a regional ITS architecture within a metropolitan area. This should not be interpreted to mean that a region must be an MPA, or no less than an MPA, but the MPA and all the agencies and jurisdictions within the MPA should be at least considered for inclusion in the process of developing a regional ITS architecture within a metropolitan area. This rule is silent on other possible limits or minimum areas for defining a region, relying on the flexible nature of this rule to accommodate those special circumstances. The FHWA also acknowledges it is possible that overlapping regions could be defined and overlapping regional ITS architectures be developed to meet the needs of the regions.

Other Definitions. There were 20 comments suggesting that other terms used in the NPRM be defined. These included ''interoperability,'' ''standards,'' ''concept of operations,'' ''conceptual design,'' and ''integration strategy.'' Several of these are no longer used in the final rule and, therefore, were not defined. Other terms, such as ''interoperability'' and ''standards,'' were determined to be common terms whose definition did not effect the implementation of the final rule. Furthermore, language regarding standards conformity has been clarified in the body of the final rule.

Section 940.5 Policy

Twenty-eight commenters addressed the issue of consistency between the two related FHWA notices of proposed rulemaking (23 CFR parts 940 and 1410) and the Federal Transit Administration's (FTA) notice (FTA Docket No. FTA–99–6417) on National ITS Architecture published at 65 FR

34002 on May 25, 2000. The comments revealed a lack of understanding about the relationship between the regional ITS architecture and the integration strategy proposed as part of the revisions to FHWA's transportation planning rules. There were five comments suggesting a single DOT rule addressing how all ITS projects would meet the National ITS Architecture conformance requirements of the TEA–21 instead of an FHWA rule for highway projects and an FTA policy for transit projects. Four other comments acknowledged the need for two policies, but recommended they articulate the same process.

A final transportation planning rule is being developed on a different schedule than this rule, and comments regarding the portions of the National ITS Architecture conformity process included in the transportation planning rule will be addressed as it proceeds toward issuance. The FHWA and FTA have chosen to go forward with policies that have been developed cooperatively to implement the National ITS Architecture conformance process. This FHWA rule and the parallel FTA policy have been developed without reference to the proposed changes to the transportation planning process, including no mention of the development of an integration strategy. However, the policy statement of this rule notes a link to established transportation planning processes, as provided under 23 CFR part 450. This rule fully supports these collaborative methods for establishing transportation goals and objectives, and does not provide a mechanism for introducing projects outside of the transportation planning processes.

This final rule on National ITS Architecture conformance and the FTA policy on the same subject have been developed cooperatively and coordinated among the agencies to ensure compatible processes. Any differences between this rule and the parallel FTA policy are intended to address differences in highway and transit project development and the way the FHWA and the FTA administer projects and funds.

Fifteen commenters questioned the need for an integration strategy, and the relationship between the strategy and the regional ITS architecture.

Given the fact that proposed revisions to the FHWA's transportation planning rules are being developed according to a different schedule, this rule has been revised to remove any references to an integration strategy. Comments regarding the integration strategy will be addressed in the final transportation

planning rule, and the discussion of the regional ITS architecture in § 940.9 has been revised to clarify its content.

Section 940.7 Applicability

A few commenters noted that the proposed rule had not addressed the TEA–21 language that allows for the Secretary to authorize certain exceptions to the conformity provision. These exceptions relate to those projects designed to achieve specific research objectives or, if three stated criteria are met, to those intended to upgrade or expand an ITS system in existence on the date of enactment of the TEA–21. The legislation also included a general exemption for funds used strictly for operations and maintenance of an ITS system in existence on the date of enactment of the TEA–21.

The FHWA acknowledges this omission and has included the appropriate language in this section of the rule.

Section 940.9 Regional ITS Architecture

Several comments were received related to the way the proposed rule referred to developing regional ITS architectures. Eight comments, from State agencies and metropolitan planning organizations, supported an incremental approach to developing regional ITS architectures, starting with project ITS architectures and building them together. Four other comments, from metropolitan planning organizations and industry associations, noted that an ad hoc regional ITS architecture developed incrementally through projects would result in an architecture less robust than if there were a single, initial effort to develop it.

Also, thirteen comments from the Association of American State Highway and Transportation Officials (AASHTO) and a number of States recommended extending the time for developing regional ITS architectures, as the proposed two year implementation would be too short. Ten of the commenters preferred four years in order to acquire the necessary resources for developing regional ITS architectures.

Most commenters were in agreement with the content of the regional ITS architecture as defined in the proposed rule. However, there were 19 comments that dealt with confusion over the definition of both ''conceptual design'' and ''concept of operations.'' In addition, there were 17 other comments on the makeup of the stakeholders, involvement of the private sector, and the need and desirability of ''agreements'' between stakeholders.

The comments indicated confusion regarding the development of regional ITS architectures, and especially so in discussing the period of time for their development. Therefore, the final rule has clarified the time period for developing regional ITS architectures by adopting the proposed extension to four years subsequent to beginning to deploy ITS projects (§ 940.9(c)), or four years from the effective date of this rule for those areas that are currently deploying ITS projects (§ 940.9(b)). In clarifying the time for development, this rule has eliminated any references to specific methods for developing regional ITS architectures. By not prescribing any methods, the rule provides flexibility to a region in deciding how it should develop its regional ITS architecture. Guidance and information related to developing regional ITS architectures is available from FHWA Division Offices and from the ITS web site, *http://www.its.dot.gov*, and will be expanded to provide assistance in meeting the intent of the rule.

Both the terms ''conceptual design'' and ''concept of operations'' have been deleted from the final rule. In their stead are descriptions of the content that is expected to form the basis for a regional ITS architecture. This content has not significantly changed from that defined in the NPRM but is now contained in § 940.9(d). The level of detail required is to the architecture flow level as defined in the National ITS Architecture. The regional ITS architecture must identify how agencies, modes, and systems will interact and operate if the architecture is to fulfill the objective of promoting ITS integration within a region.

The relevant stakeholders for a region will vary from region to region. The list articulated in § 940.9(a) is representative only and not meant to be inclusive or exclusive. On the specific issue of private sector participation, if the private sector is deploying ITS systems in a region or otherwise providing an ITS-based service, it would be appropriate to engage them in the development of a regional ITS architecture. Because of these variations from region to region, the FHWA felt it inappropriate to attempt to define an all inclusive list of stakeholders. The group of relevant stakeholders will be a function of how the region is defined and how transportation services are provided to the public. Section 940.9(d)(4) specifies that in the development of the regional ITS architecture, it shall include ''any agreements (existing or new) required for operations.'' The formalization of these types of agreements is at the discretion of the region and participating stakeholders.

There were 14 comments from a broad range of organizations questioning how existing regional ITS architectures, strategic plans or ITS Early Deployment Plans would be treated under this rule. It is the intent of the FHWA that any existing ITS planning documents should be used to the extent practical to meet the requirements of this rule. If a regional ITS architecture is in place, is up to date, and addresses all the requirements of a regional ITS architecture as described in this rule, there is no requirement to develop a ''new'' one. If the existing regional ITS architecture does not address all the requirements of the rule, it may be possible to update it so that it meets the regional ITS architecture requirements of this rule. What is necessary is that the end result is an architecture that meets the requirements of this rule and properly addresses the ITS deployments and integration opportunities of that region. This issue is specifically addressed in § 940.9(e) of this rule.

There were five comments related to the impact of this rule on legacy systems (*i.e.*, ITS systems already in place) and requesting some sort of ''grandfathering'' for them. The language in § 940.11(g) of the final rule clarifies the grandfathering or staging aspects of the process. The final rule does not require any changes or modifications to existing systems to conform to the National ITS Architecture. It is very likely that a regional ITS architecture developed by the local agencies and other stakeholders would call for changes to legacy systems over time to support desired integration. However, such changes would not be required by the FHWA; they would be agreed upon by the appropriate stakeholders as part of the development of the regional ITS architecture.

There were 15 comments dealing with the maintenance process and status of the National ITS Architecture. Two comments suggested the need for the FHWA to formally adopt the National ITS Architecture. Four other comments also supported the formalization of a process for maintaining or updating it with the full opportunity for public input.

Conformance with the National ITS Architecture is interpreted to mean the use of the National ITS Architecture to develop a regional ITS architecture, and the subsequent adherence of all ITS projects to that regional ITS architecture. This rule requires that the National ITS Architecture be used as a resource in developing a regional ITS architecture.

As a technical resource, it is important that the National ITS Architecture be maintained and updated as necessary in response to user input or to add new user services, but formal adoption of the National ITS Architecture is not necessary. However, the FHWA recognizes the need to maintain the National ITS Architecture and to establish an open process for configuration control that includes public participation. The process currently used by the DOT to maintain the National ITS Architecture is very rigorous and involves significant public participation. That process is currently being reviewed by the DOT with the intent of establishing a configuration management process that engages the public at key stages and ensures a consensus for updating the National ITS Architecture.

Four comments suggested that this rule should not be implemented until the National ITS Architecture was complete. The National ITS Architecture will never stop evolving since there always is a potential need to regularly update it as more is learned about ITS deployment. The FHWA believes the National ITS Architecture is developed to a stage where it can be used as a resource in developing regional ITS architectures, as required by this rule.

Seventeen comments asked the FHWA to define the agency that is responsible for the development and maintenance of the regional ITS architecture; specifically MPOs and/or the State as those entities that are already responsible for the planning process.

The FHWA did not define the responsibility for either creating or maintaining the regional ITS architecture to a specific entity because of the diversity of transportation agencies and their roles across the country. It is recognized that in some regions traditional State and MPO boundaries may not meet the needs of the traveling public or the transportation community. This is also why the FHWA did not rigidly define a region. The FHWA encourages MPOs and States to include the development of their regional ITS architectures as part of their transportation planning processes. However, the decision is best left to the region to determine the approach that best reflects their needs, as indicated in § 940.9. It is clear that the value of a regional ITS architecture will only be realized if that architecture is maintained through time. However, in accepting Federal funds under title 23, U.S.C., the State is ultimately responsible for complying with Federal

requirements, as provided in 23 U.S.C. 106 and 133.

Four commenters noted that the proposed rule did not adequately address planning for, or committing to, a defined level of operations and maintenance.

The final rule addresses this concern on two primary levels, in the development of the regional ITS architecture and the development of individual projects. Section 940.9(d)(4) specifies that in the development of the regional ITS architecture, it shall include ''any agreements (existing or new) required for operations.'' The formalization of these types of agreements is at the discretion of the region and participating stakeholders.

Also, relative to operations and management at a project level, § 940.11(c)(7) specifies that the systems engineering analysis (required of all ITS projects) includes ''procedures and resources necessary for the operations and management of the system.''

Section 940.11   Project Implementation

In addition to the comments on regional ITS architecture development noted above, the docket received 86 comments on systems engineering and project implementation. These comments revealed that the structure of the NPRM in discussing regional ITS architecture development, project systems engineering analysis, and project implementation was confusing and difficult to read.

To clarify these portions of the rule, the systems engineering and project implementation sections of the NPRM have been combined into § 940.11, Project Implementation. Also, paragraphs that were in the regional ITS architecture section of the NPRM that discussed major ITS projects and the requirements for developing project level ITS architectures have been rewritten to clarify their applicability. Since these paragraphs deal with project development issues, they have been moved to § 940.11(e). A definition for ''project level ITS architecture'' was added in § 940.3 and a description of its contents provided in § 940.11(e).

The docket received 33 comments regarding systems engineering and the systems engineering analysis section of the proposed rule. Most of the comments related to the definition, the process not being necessary except for very large projects, and confusion as to how these requirements relate to existing FHWA policy.

In response to the docket comments, the definition of systems engineering in § 940.3 has been clarified and is more consistent with accepted practice. In

order to provide consistency in the regional ITS architecture process, the systems engineering analysis detailed in §§ 940.11(a) through 940.11(c) must apply to all ITS projects regardless of size or budget. However, the analysis should be on a scale commensurate with project scope. To allow for the greatest flexibility at the State and local level, in § 940.11(c), a minimum number of elements have been clearly identified for inclusion in the systems engineering analysis. Many of those elements are currently required as provided in 23 CFR 655.409, which this rule replaces. Recognizing the change in some current practices this type of analysis will require, the FHWA intends to issue guidance, training, and technical support in early 2001 to help stakeholders meet the requirements of the final rule.

Fifty-three comments were submitted regarding ITS standards and interoperability tests. The commenters expressed concern about requiring the use of ITS standards and interoperability tests prematurely, the impact on legacy systems of requiring ITS standards, and confusion regarding the term ''adopted by the DOT.''

In response to the comments, the FHWA has significantly modified the final rule to eliminate reference to the use of standards and interoperability tests prior to adoption in § 940.11(f). Section 940.11(g) addresses the applicability of standards to legacy systems. It is not the intent of the DOT to formally adopt any standard before the standard is mature; and also, not all ITS standards should, or will, be formally adopted by the DOT. Formal adoption of a standard means that the DOT will go through the rulemaking process, including a period of public comment, for all standards that are considered candidates for adoption.

The DOT has developed a set of criteria to determine when a standard could be considered for formal adoption. These criteria include, at a minimum, the following elements:

1. The standard has been approved by a Standard Development Organization (SDO).

2. The standard has been successfully tested in real world applications as appropriate.

3. The standard has received some degree of acceptance by the community served by the standard.

4. Products exist to implement the standard.

5. There is adequate documentation to support the use of the standard.

6. There is training available in the use of the standard where applicable.

Therefore, the intent of the rule is to require the use of a standard only when these criteria have been met, and there has been a separate rulemaking on adoption of the standard.

The only interoperability tests that are currently contemplated by the DOT are those associated with the Commercial Vehicle Operations (CVO) program. These tests are currently being used by States deploying CVO systems and will follow a similar set of criteria for adoption as those defined for standards.

Section 940.13 Project Administration

There were nine comments related to how conformity with the final rule would be determined, and by whom. There were 11 comments about how conformity with the regional ITS architecture would be determined, and by whom. Six comments specifically suggested methods for determining conformance, including a process similar to current Federal planning oversight procedures. Six other commenters suggested that determination be made by the MPO or State. For either case, the comments reflected a lack of clarity as to what documentation would be necessary. There were six related comments suggesting the level of documentation be commensurate with the scale of the planned ITS investments in the region.

In § 940.13 of the final rule, the FHWA has attempted to clarify the process for determining conformance. Conformance of an ITS project with a regional ITS architecture shall be made prior to authorization of funding for project construction or implementation as provided in 23 U.S.C. 106 and 133. We do not intend to create new oversight procedures beyond those provided in 23 U.S.C. 106 and 133, but in those cases where oversight and approval for ITS projects is assumed by the State, the State will be responsible for ensuring compliance with this regulation and the FHWA's oversight will be through existing processes.

There were 14 comments concerning the documentation requirements of the proposed rule and generally suggesting they be reduced. Certainly the development of a regional ITS architecture and evidence of conformance of a specific project to that regional ITS architecture implies some level of documentation be developed. However, to allow flexibility on the part of the State or local agency in demonstrating compliance with the final rule, no specific documentation is required to be developed or submitted to the FHWA for review or approval. The FHWA recognizes the need to be able to scale the regional ITS

architecture and the associated documentation to the needs of the region. Section 940.9(a) of the final rule contains specific language allowing such scaling.

Summary of Requirements

I. The Regional ITS Architecture

This final rule on the ITS Architecture and Standards requires the development of a local implementation of the National ITS Architecture referred to as a regional ITS architecture. The regional ITS architecture is tailored to meet local needs, meaning that it does not address the entire National ITS Architecture and can also address services not included in the National ITS Architecture. The regional ITS architecture shall contain a description of the region and the identification of the participating agencies and other stakeholders; the roles and responsibilities of the participating agencies and other stakeholders; any agreements needed for operation; system functional requirements; interface requirements and information exchanges with planned and existing systems; identification of applicable standards; and the sequence of projects necessary for implementation. Any changes made in a project design that impact the regional ITS architecture shall be identified and the appropriate revisions made and agreed to in the regional ITS architecture.

Any region that is currently implementing ITS projects shall have a regional ITS architecture within four years of the effective date of this rule. All other regions not currently implementing ITS projects shall have a regional ITS architecture within four years of the first ITS project for that region advancing to final design. In this context, a region is a geographical area that is based on local needs for sharing information and coordinating operational strategies among multiple projects. A region can be specified at a metropolitan, Statewide, multi-State, or corridor level. Within a metropolitan area, the metropolitan planning area should be the minimum area that is considered when establishing the boundaries of a region for purposes of developing a regional ITS architecture. A regional approach promotes integration of transportation systems. The size of the region should reflect the breadth of the integration of transportation systems.

II. Project Development

Additionally, this rule requires that all ITS projects be developed using a systems engineering analysis. All ITS

projects that have not yet advanced to final design are required to conform to the system engineering requirements in § 940.11 upon the effective date of this rule. Any ITS project that has advanced to final design by the effective date of this rule is exempt from the requirements of § 940.11. When the regional ITS architecture is completed, project development will be based on the relevant portions of it which the project implements. Prior to completion of the regional ITS architecture, major ITS projects will develop project level ITS architectures that are coordinated with the development of the regional ITS architecture. ITS projects will be required to use applicable ITS standards and interoperability tests that have been officially adopted by the DOT. Where multiple standards exist, it will be the responsibility of the stakeholders to determine how best to achieve the interoperability they desire.

Rulemaking Analyses and Notices

Executive Order 12866 (Regulatory Planning and Review) and DOT Regulatory Policies and Procedures

The FHWA has determined that this action is not a significant regulatory action within the meaning of Executive Order 12866 or significant within the meaning of the Department of Transportation's regulatory policies and procedures. It is anticipated that the economic impact of this rulemaking will be minimal. This determination is based upon preliminary and final regulatory assessments prepared for this action that indicate that the annual impact of the rule will not exceed $100 million nor will it adversely affect the economy, a sector of the economy, productivity, jobs, the environment, public health, safety, or State, local, or tribal governments. In addition, the agency has determined that these changes will not interfere with any action taken or planned by another agency and will not materially alter the budgetary impact of any entitlements, grants, user fees, or loan programs. Copies of the preliminary and final regulatory assessments are included in the docket.

Costs

The FHWA prepared a preliminary regulatory evaluation (PRE) for the NPRM and comments were solicited. That analysis estimated the total costs of this rule over 10 years to be between $38.1 million and $44.4 million (the net present value over 10 years was between $22.3 million and $31.2 million). The annual constant dollar impact was estimated to range between $3.2 million and $4.4 million. We believe that the

cost estimates as stated in the PRE are negligible. The FHWA received only one comment in response to the PRE. That commenter, the Capital District Transportation Committee of Albany, New York suggested that our cost estimates were too low, but provided no further detail or rationale which would cause us to reconsider or increase our cost estimates in the initial regulatory evaluation.

These 10-year cost estimates set forth in the PRE included transportation planning cost increases, to MPOs ranging from $10.8 million to $13.5 million, and to States from $5.2 million to $7.8 million associated with our initial requirement to develop an ITS integration strategy that was proposed as part of the metropolitan and statewide planning rulemaking effort. The agency now plans to advance that proposed ITS integration strategy in the planning rule on a different time schedule than this final rule. Thus, the costs originally set forth in the PRE for the ITS integration strategy have been eliminated from the final cost estimate in the final regulatory evaluation (FRE) for this rule.

In the FRE, the agency estimates the cost of this rule to be between $1 million an $16 million over ten years, which are the estimated costs of this rule to implementing agencies for the development of the regional ITS architectures. These costs do not include any potential additional implementation costs for individual projects which are expected to be minimal and were extremely difficult to estimate. Thus, the costs to the industry are less than that originally estimated in the agency's NPRM.

Benefits

In the PRE, the FHWA indicated that the non-monetary benefits derived from the proposed action included savings from the avoidance of duplicative development, reduced overall development time, and earlier detection of potential incompatibilities. We stated that, as with project implementation impacts, the benefits of the rule are very difficult to quantify in monetary terms. Thus, we estimated that the coordination guidance provided through implementation of the rule could provide savings of approximately $150,000 to any potential entity seeking to comply with the requirements of section 5206(e) of the TEA–21 as compared with an entity having to undertake compliance individually. The costs may be offset by benefits derived from the reduction of duplicative deployments, reduced overall

development time, and earlier detection of potential incompatibilities.

In developing a final regulatory evaluation for this action, we did not denote a significant change in any of the benefits anticipated by this rule. This is so notwithstanding the fact that our planning costs for the ITS integration strategy have been eliminated from the final cost estimate. The primary benefits of this action that result from avoidance of duplicative development, reduced overall development time, and earlier detection of potential incompatibilities will remain the same.

In sum the agency believes that the option chosen in this action will be most effective at helping us to implement the requirements of section 5206(e) of the TEA–21. In developing the rule, the FHWA has sought to allow broad discretion to those entities impacted, in levels of response and approach that are appropriate to particular plans and projects, while conforming to the requirements of the TEA–21. The FHWA has considered the costs and benefits of effective implementation of ITS through careful and comprehensive planning. Based upon the information above, the agency anticipates that the economic impact associated with this rulemaking action is minimal and a full regulatory evaluation is not necessary.

Regulatory Flexibility Act

In compliance with the Regulatory Flexibility Act (5 U.S.C. 601–612), the FHWA has evaluated, through the regulatory assessment, the effects of this action on small entities and has determined that this action will not have a significant economic impact on a substantial number of small entities. Small businesses and small organizations are not subject to this rule, which applies to government entities only. Since § 940.9(a) of this rule provides for regional ITS architectures to be developed on a scale commensurate with the scope of ITS investment in the region, and § 940.11(b) provides for the ITS project systems engineering analysis to be on a scale commensurate with the project scope, compliance requirements will vary with the magnitude of the ITS requirements of the entity. Small, less complex ITS projects have correspondingly small compliance documentation requirements, thereby accommodating the interest of small government entities. Small entities, primarily transit agencies, are accommodated through these scaling provisions that impose only limited requirements on small ITS activities. For these reasons, the FHWA certifies

that this action will not have a significant impact on a substantial number of small entities.

Unfunded Mandates Reform Act of 1995

This action does not impose unfunded mandates as defined by the Unfunded Mandates Reform Act of 1995 (Pub. L. 104–4, March 22, 1995, 109 Stat. 48). This rule will not result in an expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of $100 million or more in any one year.

Executive Order 13132 (Federalism)

This action has been analyzed in accordance with the principles and criteria contained in Executive Order 13132, dated August 4, 1999, and the FHWA has determined that this action does not have sufficient federalism implications to warrant the preparation of a federalism assessment. The FHWA has also determined that this action does not preempt any State law or State regulation or affect the State's ability to discharge traditional State governmental functions.

Executive Order 12372 (Intergovernmental Review)

Catalog of Federal Domestic Assistance Program Number 20.205, Highway planning and construction. The regulations implementing Executive Order 12372 regarding intergovernmental consultation on Federal programs and activities apply to this program.

Paperwork Reduction Act of 1995

This action does not contain information collection requirements for the purposes of the Paperwork Reduction Act of 1995, 44 U.S.C. 3501– 3520.

Executive Order 12988 (Civil Justice Reform)

This action meets applicable standards in sections 3(a) and 3(b)(2) of Executive Order 12988, Civil Justice Reform, to minimize litigation, eliminate ambiguity, and reduce burden.

Executive Order 13045 (Protection of Children)

We have analyzed this action under Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks. This rule is not an economically significant rule and does not concern an environmental risk to health or safety that may disproportionately affect children.

Executive Order 12630 (Taking of Private Property)

This rule does not effect a taking of private property or otherwise have taking implications under Executive Order 12630, Government Actions and Interference with Constitutionally Protected Property Rights.

National Environmental Policy Act

The agency has analyzed this action for the purposes of the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321–4347), and has determined that this action will not have any effect on the quality of the environment.

Regulation Identification Number

A regulation identification number (RIN) is assigned to each regulatory action listed in the Unified Agenda of Federal Regulations. The Regulatory Information Service Center publishes the Unified Agenda in April and October of each year. The RIN contained in the heading of this document can be used to cross reference this proposed action with the Unified Agenda.

List of Subjects

23 CFR Part 655

Design standards, Grant programs-transportation, Highways and roads, Incorporation by reference, Signs and symbols, Traffic regulations.

23 CFR Part 940

Design standards, Grant programs-transportation, Highways and roads, Intelligent transportation systems.

Issued on: January 2, 2001.

Kenneth R. Wykle,

Federal Highway Administrator.

In consideration of the foregoing, the FHWA amends Chapter I of title 23, Code of Federal Regulations, as set forth below:

PART 655—[AMENDED]

1. The authority citation for part 655 continues to read as follows:

Authority: 23 U.S.C. 101(a), 104, 109(d), 114(a), 217, 315, and 402(a); 23 CFR 1.32, and 49 CFR 1.48(b).

Subpart D—[Removed and reserved]

2. Remove and reserve subpart D of part 655, consisting of §§ 655.401, 655.403, 655.405, 655.407, 655.409, 655.411.

3. Add a new subchapter K, consisting of part 940, to read as follows:

Subchapter K—Intelligent Transportation Systems

PART 940—INTELLIGENT TRANSPORTATION SYSTEM ARCHITECTURE AND STANDARDS

Sec.
940.1   Purpose.
940.3   Definitions.
940.5   Policy.
940.7   Applicability.
940.9   Regional ITS architecture.
940.11   Project implementation.
940.13   Project administration.

Authority: 23 U.S.C. 101, 106, 109, 133, 315, and 508; sec 5206(e), Public Law 105–178, 112 Stat. 457 (23 U.S.C. 502 note); and 49 CFR 1.48.

§ 940.1   Purpose.

This regulation provides policies and procedures for implementing section 5206(e) of the Transportation Equity Act for the 21st Century (TEA–21), Public Law 105–178, 112 Stat. 457, pertaining to conformance with the National Intelligent Transportation Systems Architecture and Standards.

§ 940.3   Definitions.

Intelligent Transportation System (ITS) means electronics, communications, or information processing used singly or in combination to improve the efficiency or safety of a surface transportation system.

ITS project means any project that in whole or in part funds the acquisition of technologies or systems of technologies that provide or significantly contribute to the provision of one or more ITS user services as defined in the National ITS Architecture.

Major ITS project means any ITS project that implements part of a regional ITS initiative that is multi-jurisdictional, multi-modal, or otherwise affects regional integration of ITS systems.

National ITS Architecture (also "national architecture") means a common framework for ITS interoperability. The National ITS Architecture comprises the logical architecture and physical architecture which satisfy a defined set of user services. The National ITS Architecture is maintained by the United States Department of Transportation (DOT) and is available on the DOT web site at *http://www.its.dot.gov.*

Project level ITS architecture is a framework that identifies the institutional agreement and technical integration necessary to interface a major ITS project with other ITS projects and systems.

Region is the geographical area that identifies the boundaries of the regional ITS architecture and is defined by and based on the needs of the participating agencies and other stakeholders. In metropolitan areas, a region should be no less than the boundaries of the metropolitan planning area.

Regional ITS architecture means a regional framework for ensuring institutional agreement and technical integration for the implementation of ITS projects or groups of projects.

Systems engineering is a structured process for arriving at a final design of a system. The final design is selected from a number of alternatives that would accomplish the same objectives and considers the total life-cycle of the project including not only the technical merits of potential solutions but also the costs and relative value of alternatives.

§ 940.5   Policy.

ITS projects shall conform to the National ITS Architecture and standards in accordance with the requirements contained in this part. Conformance with the National ITS Architecture is interpreted to mean the use of the National ITS Architecture to develop a regional ITS architecture, and the subsequent adherence of all ITS projects to that regional ITS architecture. Development of the regional ITS architecture should be consistent with the transportation planning process for Statewide and Metropolitan Transportation Planning.

§ 940.7   Applicability.

(a) All ITS projects that are funded in whole or in part with the highway trust fund, including those on the National Highway System (NHS) and on non-NHS facilities, are subject to these provisions.

(b) The Secretary may authorize exceptions for:

(1) Projects designed to achieve specific research objectives outlined in the National ITS Program Plan under section 5205 of the TEA–21, or the Surface Transportation Research and Development Strategic Plan developed under 23 U.S.C. 508; or

(2) The upgrade or expansion of an ITS system in existence on the date of enactment of the TEA–21, if the Secretary determines that the upgrade or expansion:

(i) Would not adversely affect the goals or purposes of Subtitle C (Intelligent Transportation Systems Act of 1998) of the TEA–21;

(ii) Is carried out before the end of the useful life of such system; and

(iii) Is cost-effective as compared to alternatives that would meet the conformity requirement of this rule.

(c) These provisions do not apply to funds used for operations and maintenance of an ITS system in existence on June 9, 1998.

§ 940.9 Regional ITS architecture.

(a) A regional ITS architecture shall be developed to guide the development of ITS projects and programs and be consistent with ITS strategies and projects contained in applicable transportation plans. The National ITS Architecture shall be used as a resource in the development of the regional ITS architecture. The regional ITS architecture shall be on a scale commensurate with the scope of ITS investment in the region. Provision should be made to include participation from the following agencies, as appropriate, in the development of the regional ITS architecture: Highway agencies; public safety agencies (*e.g.,* police, fire, emergency/medical); transit operators; Federal lands agencies; State motor carrier agencies; and other operating agencies necessary to fully address regional ITS integration.

(b) Any region that is currently implementing ITS projects shall have a regional ITS architecture by February 7, 2005.

(c) All other regions not currently implementing ITS projects shall have a regional ITS architecture within four years of the first ITS project for that region advancing to final design.

(d) The regional ITS architecture shall include, at a minimum, the following:

(1) A description of the region;

(2) Identification of participating agencies and other stakeholders;

(3) An operational concept that identifies the roles and responsibilities of participating agencies and stakeholders in the operation and implementation of the systems included in the regional ITS architecture;

(4) Any agreements (existing or new) required for operations, including at a minimum those affecting ITS project interoperability, utilization of ITS related standards, and the operation of the projects identified in the regional ITS architecture;

(5) System functional requirements;

(6) Interface requirements and information exchanges with planned and existing systems and subsystems (for example, subsystems and architecture flows as defined in the National ITS Architecture);

(7) Identification of ITS standards supporting regional and national interoperability; and

(8) The sequence of projects required for implementation.

(e) Existing regional ITS architectures that meet all of the requirements of paragraph (d) of this section shall be considered to satisfy the requirements of paragraph (a) of this section.

(f) The agencies and other stakeholders participating in the development of the regional ITS architecture shall develop and implement procedures and responsibilities for maintaining it, as needs evolve within the region.

§ 940.11 Project implementation.

(a) All ITS projects funded with highway trust funds shall be based on a systems engineering analysis.

(b) The analysis should be on a scale commensurate with the project scope.

(c) The systems engineering analysis shall include, at a minimum:

(1) Identification of portions of the regional ITS architecture being implemented (or if a regional ITS architecture does not exist, the applicable portions of the National ITS Architecture);

(2) Identification of participating agencies roles and responsibilities;

(3) Requirements definitions;

(4) Analysis of alternative system configurations and technology options to meet requirements;

(5) Procurement options;

(6) Identification of applicable ITS standards and testing procedures; and

(7) Procedures and resources necessary for operations and management of the system.

(d) Upon completion of the regional ITS architecture required in §§ 940.9(b) or 940.9(c), the final design of all ITS projects funded with highway trust funds shall accommodate the interface requirements and information exchanges as specified in the regional ITS architecture. If the final design of the ITS project is inconsistent with the regional ITS architecture, then the regional ITS architecture shall be updated as provided in the process defined in § 940.9(f) to reflect the changes.

(e) Prior to the completion of the regional ITS architecture, any major ITS project funded with highway trust funds that advances to final design shall have a project level ITS architecture that is coordinated with the development of the regional ITS architecture. The final design of the major ITS project shall accommodate the interface requirements and information exchanges as specified in this project level ITS architecture. If the project final design is inconsistent with the project level ITS architecture, then the project level ITS architecture shall be updated to reflect the changes. The project level ITS architecture is based on the results of the systems engineering analysis, and includes the following:

(1) A description of the scope of the ITS project;

(2) An operational concept that identifies the roles and responsibilities of participating agencies and stakeholders in the operation and implementation of the ITS project;

(3) Functional requirements of the ITS project;

(4) Interface requirements and information exchanges between the ITS project and other planned and existing systems and subsystems; and

(5) Identification of applicable ITS standards.

(f) All ITS projects funded with highway trust funds shall use applicable ITS standards and interoperability tests that have been officially adopted through rulemaking by the DOT.

(g) Any ITS project that has advanced to final design by February 7, 2001 is exempt from the requirements of paragraphs (d) through (f) of this section.

§ 940.13 Project administration.

(a) Prior to authorization of highway trust funds for construction or implementation of ITS projects, compliance with § 940.11 shall be demonstrated.

(b) Compliance with this part will be monitored under Federal-aid oversight procedures as provided under 23 U.S.C. 106 and 133.

[FR Doc. 01–391 Filed 1–5–01; 8:45 am]
BILLING CODE 4910–22–P

DEPARTMENT OF TRANSPORTATION

Federal Transit Administration

Federal Transit Administration National ITS Architecture Policy on Transit Projects

AGENCY: Federal Transit Administration (FTA), DOT.

ACTION: Notice.

SUMMARY: The Federal Transit Administration (FTA) announces the FTA National ITS Architecture Policy on Transit Projects, which is defined in this document. The National ITS Architecture Policy is a product of statutory changes made by the Transportation Equity Act for the 21st Century (TEA–21) (Pub. L. 105–178) enacted on June 9, 1998. The National ITS Architecture Policy is also a product of the Request for Comment on the National ITS Architecture Consistency Policy for Project Development that was published in the **Federal Register** on May 25, 2000. Because it is highly unlikely that the entire National ITS Architecture would be fully implemented by any single metropolitan area or State, this policy requires that the National ITS Architecture be used to develop a local implementation of the National ITS Architecture, which is referred to as a ''regional ITS architecture.'' Therefore, conformance with the National ITS Architecture is defined under this policy as development of a regional ITS architecture within four years after the first ITS project advancing to final design, and the subsequent adherence of ITS projects to the regional ITS architecture. The regional ITS architecture is based on the National ITS Architecture and consists of several parts including the system functional requirements and information exchanges with planned and existing systems and subsystems and identification of applicable standards, and would be tailored to address the local situation and ITS investment needs.

DATE: *Effective Date:* This policy is effective from February 7, 2001.

ADDRESSES: For FTA staff, Federal Transit Administration, Department of Transportation (DOT), 400 Seventh Street, SW., Washington, DC 20590.

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the Chief Council (202) 366–1936. The policy is posted on the FTA website on the Internet under http:// www.fta.dot.gov.

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Internet users may access all comments received by the U.S. DOT Dockets, Room PL–401, for the Request for Comment that was issued on May 25, 2000 which were used to clarify this Policy, by using the universal resource locator (URL): *http://dms.dot.gov.* It is available 24 hours each day, 365 days each year. Please follow the instructions online for more information and help. The docket number for the Request for Comment was FTA–99–6417.

SUPPLEMENTARY INFORMATION:

I. Background

The Federal Transit Administration (FTA) published a Request for Comment on May 25, 2000, to implement section 5206(e) of the Transportation Equity Act for the 21st Century (TEA–21) (Pub.L. 105–178), which was enacted on June 9, 1998.

Section 5206(e) of TEA–21 requires that the Secretary of the DOT must

Ensure that intelligent transportation system projects carried out using funds made available from the Highway Trust Fund, * * * conform to the national architecture, applicable standards or provisional standards, and protocols developed under subsection(a).

The objectives for the FTA's National ITS Architecture Policy for Transit Projects are to:

• Provide requirements for ITS project development for projects implemented wholly or partially with highway trust funds.

• Achieve system integration of ITS projects funded through the highway trust fund with other transportation projects planned for the region, which will thereby enable electronic information and data sharing for advanced management and operations of the ITS infrastructure.

• Engage stakeholders (state DOT's, transit agencies, public safety agencies, other transportation operating agencies) in the project development and implementation process.

• Facilitate future expansion capability of the ITS infrastructure.

• Save design time through use of the National ITS Architecture requirements definitions and market packages.

FTA has developed this policy to meet the TEA–21 requirement contained in Section 5206(e) and the DOT/FTA goal to encourage effective deployment of ITS projects. Additionally, DOT and FTA encourage the coordination of local ITS strategies and projects to help meet national and local goals for mobility, accessibility, safety, security, economic growth and trade, and the environment.

The National ITS Architecture documents were developed by the US DOT, and are updated on an as-needed basis. Current work to update the National ITS Architecture is the Archive Data User Service, which provides the ability to store and process data over an extended period of time. FTA is pursuing the addition of a Rail ITS program for travel management, vehicles, and users. New versions of the documents, when they are issued, will be available from the US DOT on the DOT website at *www.its.dot.gov.* Version 3.0 is the latest version of the National ITS Architecture.

The first section of this policy contains a complete analysis of and response to the comments provided to the docket. The remainder of the Notice contains the FTA National ITS Architecture Policy for Transit Projects.

II. Public Comments

Eighteen comments were submitted to the FTA National ITS Architecture Consistency Policy for Project Development docket by the September 23, 2000, close of the comment period. Comments were submitted by transit operators (3), state and local governments (5), metropolitan planning organizations (4), industry associations (3), and consultants (3). As indicated earlier, a complete analysis and response to the docket comments is provided. In order to facilitate focused comments, FTA asked a series of questions about the policy. The public comment section is organized first by analysis and response to the specific questions asked; second by responses to comments not specifically related to one of the nine questions; and finally by an explanation of other changes. In general, the comments received were positive. Therefore, the FTA has kept the scope of the policy and made appropriate clarifications to the text of the policy to address concerns raised in comments. In response to the many comments requesting it, the FTA, in association with the ITS Joint Program Office, in the Federal Highway Administration (FHWA) will also provide a program of guidance, training, and technical

support to assist with the implementation of this policy.

Questions

1. Do reviewers understand the definition of a major ITS investment as defined in Section IV, "Regional ITS Architecture," or is more clarification needed, and if so please explain?

Comments: Nine commenters submitted responses to this question. In general, commenters found the definition confusing, and did not understand why major ITS projects need to be called out over other ITS projects. One commenter noted that small dollar projects can have a major impact on future development, while an expensive system may have no impact. Another commenter was unclear about the term "supporting national interoperability."

Response: Of specific concern to the agency is the timing in which requirements for this policy are enacted. As such, the terms "major ITS investment" and "major ITS project" were provided so as to distinguish between projects that will require immediate correlation to the regional ITS architecture and those that do not. The term "major ITS investment" was also found to be redundant to "major ITS project" and was removed from the policy. Guidance on the classification of "ITS projects" and "major ITS projects" will be provided upon enactment of the policy.

2. Do reviewers understand the definition of an ITS project, or is more clarification needed, and if so please explain?

Comments: Nine commenters submitted responses to this question. Commenters found this term less confusing than "major ITS investments," but requested more clarification. Some commenters proposed alternative language or asked for clarification on particular examples.

Response: The agency has clarified the definition by deleting the potentially ambiguous examples provided and will develop guidance material that provides examples of projects that will be considered ITS projects and those that will not be considered ITS projects. In general, unless a technology project is implementing one of the ITS user services defined in the National ITS Architecture, it would not be considered an ITS project.

3. Do reviewers understand the difference between a "major ITS investment," and an "ITS project", or is more clarification needed, and if so please explain?

Comments: Eight commenters submitted responses to this question. Commenters had mixed responses, as

some commenters found the differences to be clear, while others requested that guidance material be provided to further explain the differences. Commenters did suggest that a "project" is a "project" and should not be quantified in terms of dollar amounts.

Response: As described in the response to question 1, the agency has removed the term "major ITS investment" and will provide guidance on the term "ITS project."

4. Are the requirements for development of a Regional ITS Architecture clear? If not, what is not clear about the requirement?

Comment: Nine commenters provided responses to the question. Most commenters found the requirements to be unclear and/or did not agree with the requirements. One commenter suggested that a region will have different definitions. One commenter noted that a concept of operations and conceptual design are normally conducted at the project level. One commenter requested clarification as to the appropriate place to program projects, in the regional ITS architecture, or in the planning process.

Response: Of specific concern to the agency is providing a flexible policy that allows the transportation stakeholders to define their region and the roles and responsibilities of each stakeholder during the development of a regional ITS architecture. As such, the agency has clarified the requirements of a regional ITS architecture and also removed the specific requirements for a Concept of Operations and a Conceptual Design. Instead, the agency has listed the specific requirements for a regional ITS architecture and has left the development, documentation, and maintenance of the regional ITS architecture to the stakeholders involved. Also, the region is defined as "a geographical area that is based on local needs for sharing information and coordinating operational strategies among multiple projects." A region can be specified at a metropolitan, Statewide, multi-State, or corridor level. Additional guidance on this topic will be provided after enactment of the policy.

5. What additional guidance, if any, is required to explain how to implement this proposed policy?

Comments: Ten commenters provided responses to this question. All the comments called for additional guidance on the specifics of implementing this policy. Commenters requested guidance on the definition of a "region," the ownership of the regional ITS architecture, determination of stakeholders, regional ITS architecture maintenance, certification

and simplification of definitions. One commenter requested that the policy be limited to only the ITS Integration Requirements defined in the Metropolitan and Statewide Planning NPRM.

Response: The agency will provide guidance materials to address the comments suggested. The ITS Integration Strategy, as defined in the NPRM, is part of the planning process and as such does not satisfactorily address project level requirements.

6. The proposed rule allows regions to develop a Regional Architecture as a separate activity, or incrementally, as major ITS investments are developed within a region. Do reviewers anticipate particular difficulties with implementing and documenting either approach?

Comments: Nine commenters provided responses to this question. Commenters largely did not favor one approach over the other. One commenter suggested that a regional ITS architecture with a twenty year time horizon is impractical and infeasible. One commenter suggested that either approach would require additional staff resources.

Response: The agency was concerned about the time horizon and development process needed to create a regional ITS architecture within the time period required and as a result suggested both an incremental and initial comprehensive approach. Based on the responses, the agency has modified the policy to be silent on the approach used to develop the regional ITS architecture. Instead, the agency focused on the products included in the regional ITS architecture, the effective date of the requirements, and the catalyst for requiring the development of a regional ITS architecture.

7. Do reviewers understand the relationships between the Integration Strategy, the Regional ITS Architecture, and the ITS Project Architecture?

Comment: Seven commenters provided a response to this question. In general, commenters did not understand the relationship between the Integration Strategy, regional ITS architecture, and the ITS Project Architecture. One commenter suggested that flexibility in application of project architecture must be maintained to accommodate legacy systems and to take advantage of technological innovation, while maintaining the outcome of interoperability, where applicable.

Response: The Agency is concerned with linkage between the planning process and the project development process. However, this policy only deals with the project level requirements.

Planning level requirements, including the Integration Strategy, will be explained as the Metropolitan and Statewide Planning Process rulemaking process is advanced. This policy only requires that the regional ITS architecture should be consistent with the transportation planning process. A definition for a project level ITS architecture has been added to the policy.

8. What additional guidance, if any, is required regarding phasing of this rule?

Comments: Six commenters submitted responses to this question. In general, the commenters stated that the phasing was clear. However, one commenter requested a three-year phase-in period. Several commenters requested that existing projects be exempt from the policy.

Response: The agency has clarified the policy statements that refer to the project status and the applicability of this policy. Projects that have reached final design by the date of this policy are exempt from the policy requirements. The agency has extended the time period for regional ITS architecture development to four years. Any region that is currently implementing ITS projects shall have a regional architecture within four years of the effective date of the final policy. All other regions not currently implementing ITS projects shall have a regional ITS architecture in place within four years of the first ITS project for that region advancing to final design.

9. Are the oversight and documentation requirements clear? If not, what is not clear about the requirements?

Comments: Eight commenters submitted responses to this question. Commenters in general requested more guidance from FTA on oversight and documentation requirements, but few provided suggestions to clarify the requirements. One commenter suggested that checklists to verify consistency requirements will be needed. Other commenters suggested that self-certification should be allowed, but also needs to be clearly defined.

Response: The agency will continue to use normal existing oversight procedures to review grantee compliance with FTA policies and regulations. Normal oversight procedures include the annual risk assessment of grantees performed by regional office staff, triennial reviews, planning process reviews, and project management oversight reviews, as applicable. In TEA–21, FTA was granted authority to use oversight funds to provide technical assistance to grantees in which oversight activities suggested

non-compliance with agency policies and regulations. FTA is using oversight funds to specifically hire contractors with ITS experience who will monitor and assist grantees who are at risk of NOT meeting the National ITS Architecture Policy requirements. Additional guidance on oversight and documentation requirements will be provided.

Additional Comments

One commenter suggested that the proposed guidance circular requires that all of the agencies in a region agree before a project can be implemented, thus conferring ''veto'' power over the project. The agency does not intend for the policy to halt ITS deployment in areas where agencies cannot agree on project designs. As part of the regional ITS Architecture development, the agencies can agree to disagree, however, the regional ITS architecture should include a representation of the stand-alone ITS deployments.

One commenter suggests that the proposal infers that existing agreements between agencies will now need to be amended or redone, which would result in a halt in operations of successful ITS projects and prevent the completion of other ITS projects. In response to the comment, the agency has clarified the regional ITS architecture requirements to specify that existing agreements that address the regional ITS architecture requirements are sufficient and that new agreements are not necessarily required.

One commenter noted that a definition of ITS was not included in the policy. The commenter suggested that the definition provided in TEA–21 section 5206(e) should be included in the policy. The agency agrees and has added the definition of ITS to the list of definitions. However, the legislative definition of ITS is broad and other commenters have suggested that if the policy is written to include every new piece of electronics or hardware, then the policy would be too limiting. As a result, the policy is intended to apply only to projects meeting the definition of an ''ITS project'' listed in the ''Definitions'' section of the policy.

One commenter suggested that DOT should ensure that the Federal Highway Administration's (FHWA's) regulation and the FTA policy have the same statutory standing and that their requirements in ITS planning and deployment be consistent if not identical. The FTA and FHWA have different processes and procedures for project development. Therefore, the FHWA has issued a regulation, and FTA has issued the policy. The policy language in each document is consistent

and will be carried out in a coordinated fashion, as applicable under FTA and FHWA project management and oversight procedures. FTA and FHWA planning procedures are a joint regulation and as such will be identical.

FTA received some comments regarding the use of standards. Several comments concern the premature use of required standards and interoperability tests, their impact on legacy systems, and confusion regarding the term ''adopted by the USDOT.''

In response to the comments, FTA has significantly modified the final policy to eliminate reference to the use of standards and interoperability tests prior to adoption through formal rulemaking. It is not the intent of the USDOT to formally adopt any standard before the standard is mature; also, not all ITS standards should, or will, be formally adopted by the USDOT. The only interoperability tests that are currently contemplated by the USDOT are those associated with the Commercial Vehicle Operations (CVO) program. These tests are currently being used by States deploying CVO systems and will follow a similar set of criteria for adoption as those defined for standards.

Other Changes

Several commenters expressed concern about linkages to the planning rule and the integration strategy. Comments regarding the portions of the National ITS Architecture conformity process included in the proposed transportation planning rule will be addressed as that rule proceeds to its issuance. The FHWA rule and the parallel FTA policy have been developed without direct reference to the proposed changes to the transportation planning process, including no mention of the development of an integration strategy. However, the policy statement of this guidance notes a link to transportation planning processes, and fully supports those collaborative methods for establishing transportation goals and objectives.

Policy Contents

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I. Purpose

This policy provides procedures for implementing section 5206(e) of the Transportation Equity Act for the 21st

Century, Public Law 105–178, 112 Stat. 547, pertaining to conformance with the National Intelligent Transportation Systems Architecture and Standards.

II. Definitions

Intelligent Transportation Systems (ITS) means electronics, communications or information processing used singly or in combination to improve the efficiency or safety of a surface transportation system.

ITS project means any project that in whole or in part funds the acquisition of technologies or systems of technologies that provide or significantly contribute to the provision of one or more ITS user services as defined in the National ITS Architecture.

Major ITS project means any ITS project that implements part of a regional ITS initiative that is multi-jurisdictional, multi-modal, or otherwise affects regional integration of ITS systems.

National ITS Architecture (also ''national architecture'') means a common framework for ITS interoperability. The National ITS Architecture comprises the logical architecture and physical architecture which satisfy a defined set of user services. The National ITS Architecture is maintained by U.S. DOT (Department of Transportation) and is available on the DOT web site at *http:// www.its.dot.gov.*

Project level ITS architecture is a framework that identifies the institutional agreement and technical integration necessary to interface a major ITS project with other ITS projects and systems.

Region is the geographical area that identifies the boundaries of the regional ITS architecture and is defined by and based on the needs of the participating agencies and other stakeholders. A region can be specified at a metropolitan, Statewide, multi-State, or corridor level. In metropolitan areas, a region should be no less than the boundaries of the metropolitan planning area.

Regional ITS architecture means a regional framework for ensuring institutional agreement and technical integration for the implementation of ITS projects or groups of projects.

Systems engineering is a structured process for arriving at a final design of a system. The final design is selected from a number of alternatives that would accomplish the same objectives and considers the total life-cycle of the project including not only the technical

merits of potential solutions but also the costs and relative value of alternatives.

III. Policy

ITS projects shall conform to the National ITS Architecture and standards in accordance with the requirements contained in this part. Conformance with the National ITS Architecture is interpreted to mean the use of the National ITS Architecture to develop a regional ITS architecture in support of integration and the subsequent adherence of all ITS projects to that regional ITS architecture. Development of the regional ITS architecture should be consistent with the transportation planning process for Statewide and Metropolitan Transportation Planning (49 CFR part 613 and 621).

IV. Applicability

(a) All ITS projects that are funded in whole or in part with the Highway Trust Fund (including the mass transit account) are subject to these provisions.

(b) The Secretary may authorize exceptions for:

1. Projects designed to achieve specific research objectives outlined in the National ITS Program Plan under section 5205 of the Transportation Equity Act for the 21st Century or the Surface Transportation Research and Development Strategic Plan developed under section 5208 of Title 23, United States Code; or

2. The upgrade or expansion of an ITS system in existence on the date of enactment of the Transportation Equity Act for the 21st Century if the Secretary determines that the upgrade or expansion—

a. Would not adversely affect the goals or purposes of Subtitle C (Intelligent Transportation Systems) of the Transportation Equity Act for the 21st Century and

b. Is carried out before the end of the useful life of such system; and

c. Is cost-effective as compared to alternatives that would meet the conformity requirement of this rule

(c) These provisions do not apply to funds used for Operations and Maintenance of an ITS system in existence on June 9, 1998.

V. Regional ITS Architecture

(a) A regional ITS architecture shall be developed to guide the development of ITS projects and programs and be consistent with ITS strategies and projects contained in applicable transportation plans. The National ITS Architecture shall be used as a resource in the development of the regional ITS architecture. The regional ITS architecture shall be on a scale

commensurate with the scope of ITS investment in the region. Provision should be made to include participation from the following agencies, as appropriate, in the development of the regional ITS architecture: Highway agencies; public safety agencies (*e.g.,* police, fire, emergency/medical); transit agencies; federal lands agencies; state motor carrier agencies; and other operating agencies necessary to fully address regional ITS integration.

(b) Any region that is currently implementing ITS projects shall have a regional ITS architecture February 7, 2005.

(c) All other regions not currently implementing ITS projects shall have a regional ITS architecture within four years of the first ITS project for that region advancing to final design.

(d) The regional ITS architecture shall include, at a minimum, the following:

(1) A description of the region;

(2) Identification of participating agencies and other stakeholders;

(3) An operational concept that identifies the roles and responsibilities of participating agencies and stakeholders in the operation and implementation of the systems included in the regional ITS architecture;

(4) Any agreements (existing or new) required for operations, including at a minimum those affecting integration of ITS projects; interoperability of different ITS technologies, utilization of ITS-related standards, and the operation of the projects identified in the regional ITS architecture;

(5) System functional requirements;

(6) Interface requirements and information exchanges with planned and existing systems and subsystems (for example, subsystems and architecture flows as defined in the National ITS Architecture);

(7) Identification of ITS standards supporting regional and national interoperability;

(8) The sequence of projects required for implementation of the regional ITS architecture.

(e) Existing regional ITS architectures that meet all of the requirements of section V(d) shall be considered to satisfy the requirements of V(a).

(f) The agencies and other stakeholders participating in the development of the regional ITS architecture shall develop and implement procedures and responsibilities for maintaining the regional ITS architecture, as needs evolve within the region.

VI. Project Implementation

(a) All ITS projects funded with mass transit funds from the highway trust

fund shall be based on a systems engineering analysis.

(b) The analysis should be on a scale commensurate with the project scope.

(c) The systems engineering analysis shall include, at a minimum:

(1) Identification of portions of the regional ITS architecture being implemented (or if a regional ITS architecture does not exist, the applicable portions of the National ITS Architecture).

(2) Identification of participating agencies' roles and responsibilities;

(3) Requirements definitions:

(4) Analysis of alternative system configurations and technology options to meet requirements;

(5) Analysis of financing and procurement options;

(6) Identification of applicable ITS standards and testing procedures; and

(7) Procedures and resources necessary for operations and management of the system;

(d) Upon completion of the regional ITS architecture required in section V, the final design of all ITS projects funded with highway trust funds shall accommodate the interface requirements and information exchanges as specified in the regional ITS architecture. If the final design of the ITS project is inconsistent with the regional ITS architecture, then the regional ITS architecture shall be updated as per the process defined in V(f) to reflect the changes.

(e) Prior to completion of the regional ITS architecture, any major ITS project funded with highway trust funds that advances to final design shall have a project level ITS architecture that is coordinated with the development of the regional ITS architecture. The final design of the major ITS project shall accommodate the interface requirements and information exchanges as specified in this project level ITS architecture. If the project final design is inconsistent with the project level architecture, then the project level ITS architecture shall be updated to reflect the changes. The project level ITS architecture is based on results of the systems engineering analysis, and includes the following:

(1) A description of the scope of the ITS project

(2) An operational concept that identifies the roles and responsibilities of participating agencies and stakeholders in the operation and implementation of the ITS project;

(3) Functional requirements of the ITS project;

(4) Interface requirements and information exchanges between the ITS project and other planned and existing systems and subsystems; and

(5) Identification of applicable ITS standards

(b) All ITS projects funded with Mass Transit Funds from the Highway Trust Funds shall use applicable ITS standards and interoperability tests that have been officially adopted through

rulemaking by the United States Department of Transportation (US DOT).

(c) Any ITS project that has advanced to final design by (effective date of policy) is exempt from the requirements of VI.

VII. Project Oversight

(a) Prior to authorization of Mass Transit Funds from the Highway Trust Fund for acquisition or implementation of ITS projects, grantees shall self-certify compliance with sections V and VI. Compliance with this policy shall be monitored under normal FTA oversight procedures, to include annual risk assessments, triennial reviews, and program management oversight reviews as applicable.

(b) Compliance with the following FTA Circulars shall also be certified:

• C5010.1C, Grant Management Guidelines

• C6100.1B, Application Instructions and Program Management Guidelines

VIII. FTA Guidance

FTA will develop appropriate guidance materials regarding the National ITS Architecture Consistency Policy.

Issued on: January 2, 2001.

Nuria I. Fernandez,

Acting Administrator.

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