Federal Report
On Select Activities Within the
ITS Joint Program Office
And
FHWA Operations Core Business Unit

Contains Information on:

1. National ITS Architecture Implementation
2. ITS Standards Implementation
3. ITS Integration Program – FY 1999 Status of Integration Levels
4. ITS Professional Capacity Building Courses
5. Procurement Guidance
6. National Telephone Number for Traveler Information (N11)
8. HOV Conference
9. Incident Management Workshop
10. TMC Pooled-Fund Study
11. Winter and Weather Mobility
12. Freight Management and Operations
1. National ITS Architecture and Standards Implementation

Legislative Provision in TEA-21:

“The Secretary shall 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).”

-TEA-21 Title V, Sec. 5206(e)

U.S. DOT Approach:

Interim Guidance
• First step towards incremental implementation of TEA-21 conformity requirement – issued October 1998

Final Policy
• Developed through formal rule-making

Major Policy Objectives:

Implement TEA-21
• Support key Federal priorities:
  • Integration
  • Interoperability
  • Use of the National ITS Architecture and applicable standards
  • Incorporate ITS into existing transportation planning and project design procedures

Federal Register Publication:

Notices of Proposed Rulemaking
• Metropolitan and statewide planning (FHWA and FTA), (includes ITS architecture and standards)
• Intelligent Transportation System Architecture and Standards (FHWA)
• Request for comment on proposed changes in FTA circulars (FTA)
• Will replace Interim Guidance (issued in October 1998) if adopted as a final rule
• Publication expected in Feb/March 2000
• 90-day comment period
• Six outreach sessions around the country (during comment period)
Architecture Training & Workshops:

- 2 & 3-day architecture training courses – still being offered for free
- Advanced architecture training – open to Federal staff now; opening to stakeholders in the spring
- Tier I and Tier II workshops - available to Metro areas through Service Plan program; provides a head start on developing a regional architecture

ITS Project Eligibility

- Broad definition based on ITS User Services
- Emphasizes need to develop Regional ITS Architectures
- uncover nontraditional ITS projects, e.g., police vehicles equipped with communications for improved coordinated incident response
- Besides ITS Architecture and Standards, may apply to Design-Build provision [TEA-21, section 1307(a)(3)]

Operating Costs for TMS

- TEA-21 clarified & reiterated flexibility of Title 23 (Federal-aid) funding for operations
- NHS, STP, CMAQ explicitly allow operating costs
- Broad definition of operating costs that includes certain system maintenance activities
- e.g., efforts to assure system performance, replacement of damaged traffic control equipment

2. ITS Standards Implementation

Standards Development Status (as of 22 December 1999):

- 30 Approved by Standards Development Organizations
- 32 in ballot
- 18 under development

DSRC Rulemaking:

The notice of proposed rule-making was published in the December 30, 1999 edition of the Federal Register. The notice applies to CVO applications.

Testing:

Formal standards testing and complete documentation of test results for the use of the ITS
community is being carried out by FHWA using the Battelle Memorial Institute as the support contractor. At least 10 standards are expected to go through formal testing this year. These apply to NTCIP Dynamic message signs, actuated signal controllers, center to center communications, and CVO safety and credentialing. The first formal test is expected to take place in February 2000.

Case Studies involving testing

An experience-based case study of a dynamic message sign implementation by the Virginia Department of Transportation (VDOT) was carried out by AASHTO, ITE and NEMA. Formal testing described in the case study includes factory demonstration and acceptance tests, software tests, system acceptance tests, an operational test period, and specific NTCIP testing. The testing procedures provide step-by-step instructions using the NTCIP Exerciser, which is a software program that simulates NTCIP communications and devices. The specifications required use of the NTCIP Exerciser to test NTCIP-compliance.

A case study of a dynamic message sign implementation by the Washington State Department of Transportation (WSDOT) was also carried out by AASHTO, ITE and NEMA. The testing procedures were developed as a cooperative effort between the sign vendor and WSDOT. The vendor developed a field device simulator compatible with the central system. The signs were tested using the NTCIP Exerciser and the NTCIP Field Device Simulator. Final acceptance was based on the functionality of the signs within the central system.

A third NTCIP case study on actuated signal controller object definition involved a City of Phoenix project that included the replacement of the central traffic control system and the upgrade and purchase of additional traffic signal controllers. The NTCIP was the communications protocol for both. During testing the vendor defined a set of objects and developed the testing software code. Integration testing followed testing of the individual components. The vendor and the system integrator developed the testing procedures collaboratively and worked together to develop an acceptable integrated system.

Standards Deployments

The following ITS Standards are already being used at various levels by deployment sites. In some cases, these deployments involve using draft standards. As the equipment is deployed and used in day to day operations, experienced based test results will become available.

NTCIP Dynamic Message Signs (DMS)

- Santa Monica, CA
- Lakewood, CO
- ISHTA (Chicago, IL)
- Minneapolis/St. Paul, MN
- Rochester, NY
- Long Island, NY
Work has been completed on Sections 1-4 covering traffic data, incidents, construction, traffic control and external devices such as CCTV, DMS and HAR. These sections contain new data elements which were developed in close coordination with other related standards development activities such as NTCIP, TCIP, and IEEE and SAE standards. Sections 1-4 have been sent to the approval boards of ITE and AASHTO for final approval.

Work on the Message Sets for External Traffic Management Center Communications (MS/ETMCC) has also been completed. This work has been coordinated with the IEEE
Incident Management Message Sets development. Work is now underway on an Event Report Message (ERM) for reporting highway events to Information Service Providers (ISPs) and to other agencies not closely involved in managing the event. The new data elements which were created for the ERM have either been incorporated in Sections 1-4 where appropriate or will be placed in a new Section 5. The ERM work will also necessitate an amendment to the MS/ETMCC.

Information on the TMDD is available on the ITE web site at www.ite.org under Standards on the index.

**Incident Management Message Sets - IEEE**

The development of the P1512 Base Standard Common Incident Management Message Sets for Use By Emergency Management Centers has been completed. The standard was successfully balloted in November 1999. Comments received in the ballot process are now being resolved. It is anticipated that this standard will receive final approval by IEEE in February 2000.

The Incident Management Working Group (IMWG) which developed the standard is now reviewing the project plan for Phase II of this standards effort. Phase II will include the following standards in the P1512 family:

- P1512.1 - Traffic Incident Management Message Sets for Use by Emergency Management Centers
- P1512.2 - Public Safety Incident Management Message Sets for Use by Emergency Management Centers
- P1512.3 - Hazardous Material Incident Management Message Sets for Use by Emergency Management Centers
- P1512.a - Emergency Management Data Dictionary

The Phase II work should start early in 2000 and be completed by mid to late 2001.


### 3. ITS Integration Program – FY 1999 Status of Integration Levels

Of the 64 FY 1999 earmark projects, all 64 projects will result in ITS integration at the following levels:
Heavy activity (11-17 projects) is planned to integrate:
• Arterial management among neighboring jurisdictions
• Between Arterial and Freeway management
• Between Incident Management and Arterial and Freeway Management

Moderate activity (6-9 projects) is planned to integrate:
• Incident and Freeway Management with Traveler Info Systems
• Emergency Management with arterial and incident management
• Transit management across neighboring transit agencies and transit management with Freeway and Arterial management

Light activity (1 to 4 projects) is planned to integrate:
• Arterial and Transit Management with Traveler Info Systems
• Electronic Toll Collection with arterial and freeway management or other neighboring toll agencies
• Arterial systems with Highway-Rail intersections

No projects plan to integrate:
• Electronic Fare payment among neighboring transit agencies or between transit and electronic toll agencies
• Highway-Rail intersections and incident management

4. Professional Capacity Building Courses

The ITS PCB Web Page is Now Available:

www.its.dot.gov or www pcb.volpe.dot.gov

The ITS PCB Program was formed to assist transportation professionals in developing the knowledge, skills, and abilities required to deploy, operate and manage ITS projects. The Program is comprehensive and multi-modal in nature, addressing the needs of professionals at all levels of government and within academia, professional associations, and public and private sector transportation agencies.

This web site provides a comprehensive description of ITS PCB Program offering available to transportation professionals. It also includes links to other relevant web sites and names of individuals who can assist in further building ITS professional capacity. Four PCB elements are incorporated:

Training
This section includes all the ITS PCB courses and seminars available at your fingertips. Search through the database of the ITS PCB Program, National Highway Institute, National Transit Institute, the Motor Carrier Safety Administration, and ITS America for training in critical ITS subjects. This function provides course objectives, contact names and schedule information. Course slides and instructor notes are available for download on selected courses. These courses can then be tailored to meet the needs of your local audience.

**Education**

Colleges and universities offer undergraduate, graduate, and extension programs to prepare current and future transportation professionals to deploy ITS projects. The ITS Education and Training catalog for U.S. Universities documents courses offered at higher education institutions.

**Technical Assistance**

Hands-on technical assistance helps professionals in solving transportation problems as they arise. For example the Peer-to-Peer Program provides at desk-reviews, telephone and documentation support, and site visits. ITS Specialists located at FHWA Resource Centers and FTA Regional Offices are also listed.

**Information Outreach and Dissemination**

Information about ITS events, projects, studies, and other publications is supplied by numerous organizations. The National Associations Working Group for ITS electronically distributes the newsletter of the ITS Cooperative Deployment Network monthly. ITS America also offers an electronic newsletter. The ITS Joint Program Office sponsors the Electronic Document Library where one can access ITS studies, lessons learned, and guidelines documents. A series of six PCB reports are available to download to your desktop computer or to view online. These reports discuss the training and education needs of transportation professionals, including a strategy to meet those needs both now and in the future.

**Other Links to Related Sites**

The related links for PCB training opportunities and additional educational and training resources are provided for universities and professional associations such as ITE and ITS America.

*Just-in-time training pilot courses for ITS training coming on-line*

Three, free web-based training opportunities are offered through the Intelligent Transportation Systems program.
Introduction to the National ITS Architecture
Length: 2½ hours equivalent in-classroom time and 2 hours problem solving
Availability: February 2000
Description: Provides an understanding of the ITS National Architecture and standards, and relationships to systems engineering principles.
Objectives: 1. Understand the fundamentals of systems engineering
2. Understand the relationship between systems engineering concepts and the National ITS Architecture.
3. Understand the various elements of the national ITS architecture.
Contact: Kathleen Frankle, CITe (410) 414-2925 or Kfrankle@cheapeake.net or www.citeconsortium.org.

Essential Competencies for the Transportation Professional of the Future
Length: Two semesters, one three hour module delivered each week
Availability: February, 2000
Description: Provides US DOT and other transportation professionals with a level of understanding and skills sufficient to help them guide planning, deployment, operation, and maintenance of ITS projects for state and local transportation agencies.

This course provides presentations and exercises on competencies that are essential for the transportation professional: Systems Engineering, Institutional Issues, Technology, Planning and Evaluation. The course will also address important cross-cutting competency areas.

Contact: Thomas B. Reed, University of Michigan (734) 936-7622, Tom.Reed@umich.edu.

Planning Regionally Integrated ITS: A Web-based learning network - The California Paradigm
Length: Variable; can be tailored according to student needs
Availability: March, 2000
Description: This course is based on two U.S. DOT Professional Capacity Building courses: ATS and the Planning Process and Planning for Deployment of Regionally Integrated ITS. The goal is to provide just-in-time training and support for mainstreaming ITS projects into the regular regional planning process.
Contact: Linda Howe, University of California Berkeley, Institute of Transportation Studies Technology Transfer Program, Lhowe@its.berkeley.edu.

New Courses to be developed in FY 2000

Based upon a comprehensive assessment of training and education needs, and after considerable peer reviews, at this time we have selected the following courses to be developed by the ITS Joint Program Office in conjunction with NHI and NTI in order to fill critical gaps.
(Other organizations will also be developing related courses for their constituents):

**Introduction to Systems Engineering**
Integrates principles of systems engineering to meet the needs of transportation professionals involved in ITS deployment.

**Regional Concept of Operations to include:**
- Life cycle considerations from planning through operations and maintenance
- Policy Issues
- National ITS Architecture as a tool
- Integration and system compatibility with other agencies’ systems

**Managing ITS Projects to include:**
- The life cycle of planning and deploying through operations and evaluation of ITS to ensure that all necessary stakeholders are involved in the planning process, including examples of lessons learned and best practices.
- ITS Project Management
- Managing ITS Contractors
- Managing Systems Integrators
- Software Engineering Elements

**ITS Data Management to include:**
- Management and analysis of the:
  - Type of data to be collected, how to store and archive data
  - How the data can be used for decision making and managing operations
  - The impact of data on transportation system management
  - Transit Applications
  - Highway Applications
  - Multi-Modal Applications

5. **Procurement Guidance**

**General ITS Procurement**

*Guidance letter to FHWA field (dated October, 6, 1999)*
- Traditional “low Bid” is never required
- Allows ITS projects to be separated from construction
- Options are available:
  - Special Project SEP-4
  - Local Procurement Rules 49CFR18
  - Engineering and Design Services
Software Procurement

Guidance
- The Road to Successful ITS Software

Resources
- ITS Software acquisition – Course available on request

NCHRP Report
- ITS Software: Effective Acquisition Practices

6. National Telephone Number for Traveler Information (N11)

- Petition with FCC for common 3-digit number nationwide for traveler information
- If approved, potential for significant demand for services
- Demand for and emergence of nationwide traveler information services, not just metropolitan based but intercity, interstate, rural


Post-Interstate Mission

The Federal Highway Administration is kicking off a national dialogue on the future of transportation operations and management in the United States. With the Interstate Highway System essentially complete, coupled with the advent of technological advances, a key factor in providing for future mobility will be optimizing performance of the existing infrastructure, along with modest infrastructure construction. In other words, the new challenge for transportation in the 21st century is managing the performance of transportation resources to deliver integrated transportation services to customers under varying conditions.

To this end, FHWA has established a national steering committee to recommend actions needed for a new operations mission to take hold, and become embraced as the legislative timing for the next transportation bill approaches. The steering committee has met and prioritized the key actions that must take place in order to be successful. The are: Setting the
vision; Building a constituency; Developing national benchmarks of system performance; identifying sources and levels of funding; facilitating institutional change; and setting a research agenda. White papers are currently being written and will be presented, along with an overall issues paper, at an Operations Conference in April in Irvine, California.

Operations Conference – April 2000

The Institute of Transportation Engineers is holding it’s mid-year meeting in Irvine, California from April 2-5, 2000. The conference, titled “Transportation Operations – Moving into the 21st Century” will bring together transportation professionals and stakeholders from across the country and around the world to learn about new tools for operating transportation systems; new planning and management approaches; and to give input to setting the direction for the future of transportation operations and management in the U.S. For more information on the conference and how to register, visit ITE’s web site at: www.ite.org

8. HOV Conference

TRB and FHWA will be cosponsoring the 10th International HOV Conference on August 28-30, 2000 in Dallas, Texas. The latest information on HOV system developments and topics of interest throughout the world will be highlighted on the conference agenda. A call for abstracts for the conference and additional information on the conference will be forthcoming in February. For additional information, contact jon.obenberger@fhwa.dot.gov.

9. Incident Management Workshop

The National Highway Institute’s Incident Management Workshop has been presented 35 times in 18 states over the last 14 months from November 1998 through December 1999. Seven additional workshops are presently scheduled for January and February 2000.

The workshops are presented to mid-management level persons in various response agencies consisting primarily of police, fire, emergency medical, emergency management, transportation, emergency communications and planning as well as private sector partners in towing and recovery, hazardous materials and traffic information media. The workshops have been followed up by high level executive sessions involving state transportation and public safety directors in four states with two others scheduled in early 2000.

Information on the Incident Management Workshop can be obtained from the NHI’s web site at www.nhi.fhwa.dot.gov. Click on the “Course Catalog & Schedules” index and search under
10. **TMC Pooled-Fund Study**

FHWA is in the process of initiating a national Traffic Management Center Pooled-Fund Study based on the positive response from State DOT’s to the July proposal soliciting their participation. This study will bring together regional, state, and local traffic management agencies to identify and address human centered and operational issues associated with transportation management centers. To date twelve states and the District of Columbia have agreed to participate in the study. The name of the TMC pooled fund study comes from the funding mechanism that supports it.

The National pooled-fund studies are funded by State planning and research funds. The study participants represent agencies with a variety of experiences with freeway and management and traffic signal system centered systems. The participants will identify their most pressing issues, they may choose to initiate research projects, development initiatives or technology transfer activities aimed at addressing problems of national significance. This study will be initiated in 2000, with the development of a charter as one of the first orders of business. For additional information, contact Thomas M. Granda, (202)493-3365 (thomas.granda@fhwa.dot.gov)

11. **Winter and Weather Mobility**

*Background:*

Weather has long been recognized as a critical factor in winter operations, and many State departments of transportation have developed snow and ice control programs to address the challenges of keeping the roads open and maintaining access to transportation services. The task before us is to build upon these successes and develop surface transportation weather information systems that meet the needs of **all** road users and operators.

*FHWA Vision:*

The program’s vision is of improved surface transportation outcomes under all types of adverse weather conditions through the development of better (meaning accurate, reliable, appropriate, and readily-available) road weather information for surface transportation, and improved maintenance technologies for winter mobility. Such improvements will affect the mobility, productivity, safety, and environmental conditions of the transportation system.
**Key Activities:**

**Transportation/Weather Coordination**
One way that we have made progress to achieve our vision has been to develop our relationship with the meteorological community. The primary achievement to date has been through the Office of the Federal Coordinator for Meteorology (OFCM). This office is responsible for coordinating all weather related activities across the Federal government. In order to address the weather-related needs of the surface transportation community, the OFCM initiated the Weather Information for Surface Transportation (WIST) Joint Action Group in June, 2000. The initial charter of this group is to consolidate all surface transportation requirements, and convey these requirements to the weather providers (i.e., the National Weather Service and the Department of Defense). It is anticipated that these providers will then be able to modify their products and services to better address the needs of the community.

**WIST Symposium.** As part of the groundbreaking efforts to bring the highway and weather communities together, FHWA and OFCM co-sponsored the Symposium on Weather Information for Surface Transportation (WIST). The conference was held November 30 - December 2, 1999, with the goal of determining what weather information is necessary for decision-makers to make the appropriate judgements concerning surface transportation. The conference concluded with the resounding agreement that more must be done to address the needs of the surface transportation community. Those attendees representing this community agreed to work together to define these needs. Conference proceedings are being developed.

**Drafting Surface Transportation Weather Requirements**
As described above, there is strong need to document the weather information requirements of surface transportation decision makers. In May, 1999, the FHWA initiated an effort to do so, with the goal of completing the first draft of requirements by June, 2000. This first draft will focus on the requirements of winter maintenance personnel, and will support the efforts described above, as well as additional R&D efforts to develop improved decision support systems.

**STWDSR V1.0.** The first version of the Surface Transportation Weather Decision Support Requirements (STWDSR) Version 1.0 was completed in November, 1999, and includes a thorough account of the weather information needs of all users and operators. Where users have needs, systems have requirements. And though the goal is to draft the requirements, this cannot be done until there is a clear understanding of the types of decisions that users make, and the information they need to make those decisions.

**STWDSR V2.0.** The next step in the process is to translate these needs into system requirements. Only after these requirements are defined can the appropriate decision
support systems be developed. This step to develop *Surface Transportation Weather Decision Support Requirements* (STWDSR) Version 2.0 is well underway, with an estimated completion date of June, 2000. This step is being conducted in an open manner so that all interested parties can participate. This includes holding two stakeholder workshops in the winter and spring, 2000.

**First Stakeholder Workshop - February 23 & 24.** The first workshop to document requirements is scheduled for the 23rd and 24th of February, in Boulder, Colorado. This workshop will bring together practitioners, system developers, and vendors, and will focus on this process of translating needs into requirements. Again, the audience for this first effort consists of winter maintenance personnel.

**Foretell Field Operational Test**
This test is a public-private partnership based in the upper Midwest, with the participating states being Iowa, Wisconsin, and Missouri, and the primary private partner being Castle Rock Services. It was initiated in 1997, and will become operational in January, 2000. The system brings high resolution weather forecasting to the surface transportation environment, and utilizes ITS principles to disseminate the information to a range of users and operators. Route specific road weather information will be available that predicts road conditions over the whole network. Ultimately, the information will be available via the Internet, pagers, and dial-up systems.

12. **Freight Management and Operations**

*Multi-Modal Freight Analysis Framework*

This project supports U.S. DOT’s efforts to develop an international/national-level strategic network and analytical framework for freight. This framework will provide conceptual and analytical support for evaluating current conditions, addressing future scenarios, and analyzing policies and/or strategic investments designed to improve freight productivity and mobility. This, in turn, will help stimulate sound economic growth and social development. This is an important undertaking, combining analytical efforts as well as ongoing support for FHWA and other DOT staff. It will help shape the national freight planning program for the FHWA Office of Freight Management and Operations and contribute to the Secretary's goal of a OneDOT freight planning program.

The research effort will:

- Clarify the essential function of the US freight system; its current condition, extent, and probable evolution; the risks and constraints to its continued productivity growth; and identify initiatives that could reduce the effect of these constraints and manage future
risks

- Improve the productivity and mobility of freight transportation, which is a stimulus to sustained economic growth and a key support of national competitiveness.

- Marshal freight analytical models, data sources, communication channels, and professional expertise to provide freight intelligence support for the U.S. DOT.

- Enhance the ability of U.S. DOT to guide and advocate policy and investment from the local through the national level and to enhance cooperation among nations, all with the objective of contributing to the framing of legislative re-authorization in 2002.