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## NTCIP Holds Strategic Planning Meeting; Looks to the Future of Traffic Standards

Three action teams, composed of volunteers from AASHTO, ITE, NEMA, and USDOT, met on October 20 in Crystal City, Virginia, to recommend those steps that would help AASHTO, ITE, NEMA, and FHWA/JPO to reach those goals and objectives as laid out in the approved “A Strategic Plan for ITS Standards Development, Maintenance, and Deployment.” The teams met for the day to propose strategies and actions for guiding the development, enhancement, and deployment of ITS standards during the period 2004 through 2006. They addressed various aspects of the strategic planning activity: prioritization of standards-based applications, the standards development process, and deployment.

FHWA’s objective is to fund application packages that establish the framework to produce ready-to-use standards, as well as actual deployments and the necessary support elements. The teams met on December 10, and will submit recommended action plans to AASHTO, ITE, NEMA, and FHWA/JPO by December 31. Many of the recommendations are likely to be accepted. This will lead to project plans being developed, proposals for funding being submitted, and requests for volunteers to serve being announced in March or April 2004.

Team 1, the Priorities Team, was led by Raman Patel of R.K. Patel and Associates of New York City. The team, with volunteers from as far away as

Southern California, Texas, and Georgia, attempted to prioritize the publication of ITS standards for the coming three years. They sought to address user and vendor needs and provide perspective on what research would be helpful to move their agenda forward. Following a brainstorming session, their list of top criteria for determining the most important standards included:

- Would completion of standards spur development?
- What are the risks?
- What do all agencies need?



*Ed Seymour and the Priorities Team prioritize standards.*

- How many vendors are willing to support deployment of standards?
- Which standards are the most beneficial in terms of operational benefits?

After much discussion, the team deter-

## Center-to-Center Working Group Releases White Paper on XML Communications

The NTCIP Center-to-Center Working Group (C2C WG) recently completed a new NTCIP Information Report, *XML in ITS Center-to-Center Communications*, in response to the number of ongoing or planned efforts that will implement XML for data exchange between transportation centers.

The information report, NTCIP 9010, provides an overview of the issues involved in using XML-based technologies for Intelligent Transportation Systems (ITS) data exchange. It was developed to identify the opportunities and needs XML (eXtensible Markup Language) creates for the National Transportation Communications for ITS Protocol (NTCIP) effort.

NTCIP 9010 outlines two approaches for implementation of XML-based communication in center-to-center systems. The first is an approach to support robust command and control leveraging the existing standards of the World Wide Web Consortium (W3C). The second is a file-based sharing approach with a focus on information sharing and aggregation, which the C2C WG calls "XML Direct."

Center-to-center communications refers to data exchanged between computers, whether in a traffic or transit management center, a traveler information center, or an incident or emergency management center. XML, a standard of the World Wide Web Consortium (W3C), is a means by which one computer can encode data so that another computer receiving it will be able to understand the contents and act on it. Unlike most computer encoding standards, there is no single set of encoding rules for XML. Instead, XML encoding rules are customized for differ-

ent applications, and they include a mechanism for identifying each element of an XML document or message.

NTCIP C2C WG's core mission is to develop and maintain standards, develop application guidance for open systems, non-proprietary-based product development, and facilitate the procurement, implementation, and testing of integrated ITS center systems.

The report, written for the technical transportation system professional, includes an appendix of technical information regarding XML intended for a purely technical audience. It is not a tutorial on XML or XML-based standards, but rather provides sufficient background to support the discussion related to the development of an XML-based center-to-center standard that is consistent with the working group's mission.

According to the paper, there are several reasons for standardization of ITS communications:

- Centers exchange different types and amounts of data.
- Data can be intended for human consumption or used by a computer to perform automated functions.
- Different types of centers exchange data (for example, a traffic management system center has information about congestion and service delays of value to a traveler information system).
- A small group of centers exchanging data grows because of sprawl that compresses separate urban areas into one large region.

The report includes an appendix of technical information regarding XML intended for a purely technical audience.

## NTCIP 8007 Completes User Comment Period

The NTCIP Joint Committee recently accepted the user comment draft of NTCIP 8007 v01, *Testing and Conformity Assessment Documentation within NTCIP Standards Publications*. NTCIP 8007, created as a joint standards publication for NEMA, AASHTO, and ITE, is a process, control, and informational document providing detailed rules and guidelines on how to develop test documentation for NTCIP standards. The approved draft document was circulated for a 30-day comment period to individuals who are most familiar with and concerned about traffic management and NTCIP standards.

In December 2001, the Testing and Conformity Assessment Working Group (TCA WG) was formed to investigate the issues surrounding conformance testing. NTCIP 8007 was identified as one of the group's highest priority items. The purpose of this document is to help develop test documentation and promote a consistent look and feel throughout the NTCIP family of standards.

NTCIP 8007 is not intended for direct use by manufacturers or public agencies; however, it will ultimately benefit these organizations by supplying a common baseline approach to testing for all NTCIP devices.

“As the NTCIP standards have been developed, the testing component of the standards has not typically been addressed,” said Steven W. Dellenback, institute scientist, Southwest Research Institute, and co-chair of the TCA WG. “The 8007 document defines a set of rules for developing testing documentation within the NTCIP standards. It targets the NTCIP standards development community, and we expect that a

number of the NTCIP standards will need to be updated to include the testing documentation specified in 8007.”

Although there are numerous conformity standards that provide test documentation, these standards are often based on project-specific—rather than standards-based—test documentation, and must be modified in order to fit the organization. The National Institute of Standards and Technology (NIST) defines conformity assessment as “a means of ensuring that the products, services, or systems produced or operated have the required characteristics, and that these characteristics are consistent from product to product, service to service, or system to system.”

NTCIP 8007 defines how to measure conformance, but it will not replace project-specific test documentation. Each project still requires compliance testing to identify which standardized requirements apply, the value of each variable for every test procedure referenced, and the test tools that should be used. Project-specific documentation also identifies how to test non-standard requirements such as additional features and hardware characteristics. In addition to the details outlined in NTCIP 8007, a separate user's guide will also be available to supply further guidance for testing.

The documentation recommended by NTCIP 8007 has been customized to better reflect the needs of the NTCIP project and is patterned after the principles of IEEE 829-1998—a proven, well known, and widely used standard for software test documentation. Using IEEE 829 as a foundation helps to ensure that the major elements of test

**NTCIP 8007 will ultimately benefit manufacturers and public agencies by supplying a common baseline approach to testing.**

The BSP2 WG is seeking volunteer members and a chairman. Those who are familiar with the underlying details of communications protocols are asked to contact Bob De Roche at (850) 894-1600 or [rderoche@earthlink.net](mailto:rderoche@earthlink.net). "They need to know all about the bits and the bytes," said De Roche.

## BSP and Profiles Working Groups Merge

The Joint Committee on the NTCIP recently approved the merging of the Base Standards and Protocols Working Group and the Profiles Working Group. The result is the Base Standards and Profiles Working Group (BSP2), responsible for communications standards that deal with the exchange of information, as opposed to the definition of information. These include NTCIP 1103, *Transportation Management Protocols TMP*, and NTCIP 8004, *Structure and Identification of Management and Information*.

In the early 1990s, there was a single NEMA group that handled low-level

protocols, covering the aspects of base standards and protocols (formulating individual protocols) and profiles (combining various groups of protocols into a package). When working groups were reorganized under the NTCIP, the group was split in two because of the apparently distinct functions.

It turned out that most of the same people were members of both groups, so the decision was made to merge the groups once again into a single working group, the BSP2. "The logistics just did not seem worthwhile to keep them separate," said Bob De Roche, BSP2 chair pro tem. ▼

*XML White Paper, continued from page 2*

- A single ITS project may use the same software at multiple centers and create a center-to-center communications network between those centers. Other centers or networks using different software may want to merge, in which case a comprehensive, expensive effort would be needed.

The goal of C2C ITS communications standards is to allow transportation-related centers to exchange information with other centers in any of these cases without having to modify its software or support multiple interfaces to communicate with different centers or groups of centers in different ways.

Successful data exchange between centers, the report says, requires the centers to agree on several key items, including (1) the mechanism, or message patterns, by which a message is triggered; (2) the definition of data elements in the requested message; (3) the structure of the message; (4) the rules used to encode the data into computer readable format; and (5) the transmission protocol used to transmit the message between computers. A standards-

based approach can help system applications communicate, regardless of the operating system or programming language, using simple encoded messages that both applications understand. Specifically, the report states that the goal related to development of an XML-based C2C standard is to support the communication of information and control commands between ITS centers.

The WG concludes the report by stating two recommended approaches for standardization, a technical approach based on the World Wide Web's Web Services Architecture, and an XML file-based messaging approach.

Manny Insignares, chairman of the C2C WG, says "Our goal is to develop a standard that allows a center to expose its capabilities to other centers without having to replace a center's existing technology infrastructure."

For more information, read the information report, available at [http://www.ntcip.org/new/NTCIP\\_9010\\_SB.pdf](http://www.ntcip.org/new/NTCIP_9010_SB.pdf). ▼

## Three Organizations Receive New Funding for the Continuation of NTCIP Standards

NEMA, along with AASHTO and ITE, has received financial support in the amount of \$1.466 million from the U.S. Department of Transportation (DOT), Federal Highway Administration (FHWA), for continued development of the NTCIP family of standards for priority application areas. AASHTO and ITE have each received funding for their part of the joint standards program.

Since 1996, these three organizations have been jointly developing the National Transportation Communications for Intelligent Transportation System (ITS) Protocol.

With sustained federal participation in the project, the DOT will have access to about 500 highly skilled transportation professionals associated with the NTCIP project.

One of the most recent additions to the NTCIP family is the Electrical and Lighting Management Systems, or ELMS, draft standard, which will provide remote control and monitoring of highway lighting. ELMS has the potential to save energy by turning off highway luminaires when not needed, yet maintain safety by turning them back on after an incident, or by monitoring lamp status for faster replacement.

“This is a quite an accomplishment,” said NEMA President Malcolm O’Hagan. “These three organizations will continue to provide the transportation industry with unsurpassed expertise for developing standards. By doing so, we are making a contribution to public safety and order on our nation’s highways.” ▼

**These three organizations have been jointly developing the NTCIP since 1996.**

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*NTCIP 8007, continued from page 3*

documentation are addressed, and allows those who are familiar with this standard to understand how NTCIP 8007 relates to more traditional documentation.

NTCIP 8007 defines three tasks that working groups should follow when developing test documentation: (1) develop requirements; (2) develop test cases; and (3) develop test procedures. Requirements are the items within the standard that define what a device must do in order to claim conformance to a given feature. Requirements are essential because they express the user’s preferences. Test cases identify the feature to be tested and the important conditions under which the test should be performed. The test procedure identifies a comprehensive series of steps,

which allow the tester to perform a given test case.

NTCIP 8007 provides user-friendly language for documenting NTCIP test procedures and requires no specific software tool to test the conformance of a device.

“The adoption of 8007 and its use by the various standards development working groups will provide consistency in developing unambiguous conformity statements and test procedures,” said Lawson P. Stapleton, Jr., principal engineer, URS Corporation, and co-chair of the TCA WG. “This will benefit all standards users and build user confidence in the standards over the long term.” ▼



[www.transportation.org](http://www.transportation.org)



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The publication is designed to provide an update of activities and future plans in the development of a set of communications standards for intelligent transportation system devices and systems.

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*Strategic Planning Meeting, continued from page 1*

mined that six general consolidated application areas were suitable: Traffic Management Systems, Freeway Management Systems, Incident Management, Center-to-Center Communications, ATIS, and ADUS.

Team 2, the Process and Partnerships Team, was led by Bill Russell, president of Eberle Design, Inc. The team was briefed on the NTCIP standards development process and discussed ways to shorten it, as well as the possibility for fast-track standards. Bruce Schopp, NTCIP coordinator, presented an overview of the process accompanied by a detailed flowchart. Hiring consultants, he said, has improved the speed and accuracy of the development process over using volunteers, and public-private WG members result in few user comments.

The group confirmed that there are very specific skills needed for ITS standards development, and that there is a delicate balance between the speed of development and the cost of standards. They stressed that planning from the beginning is very important, because it can shorten development cycles.

Group members agreed on several key points:

- Hiring consultants as chairpersons instead of using volunteers might improve the efficiency of committees. They agreed to explore the possibility.
- Training and orientation of new working group chairs is necessary. They will work to install training sessions.
- The standards development process needs to be formalized and better managed.

Team 2 ultimately produced a list of preliminary recommendations for process revision, including:

- Establish a new category of standards called “Suggested Standard for Future Design” with a dramatically abbreviated approval process.
- Streamline the user comment and balloting processes, especially within AASHTO.
- Improve the process for proposing work items.
- Substantially reduce bottlenecks in the process by improving management of meetings.
- Increase SDO staff resource levels in order to reduce administrative delays at SDOs.

The third team, Deployment, was led by Troy Peoples, the North Carolina Department of Transportation state traffic engineer.

Its mission was to recommend a deployment program for state and local organizations and develop recommended standards deployment initiatives for the next three years. “We want to provide to users good examples of programs that are working to show that the standards are beneficial,” explained Peoples. “They will then want to use them.”

The team discussed ways to identify incentives to accelerate high-priority development applications and strategies to encourage deployment of ITS standards-based technologies by public agencies.

“These meetings are the beginning of an important process,” said Peoples. “They will tell us which standards are needed, which standards are close to deployment, and which ones need work. The issue will be to make sure we deploy the standards that meet the most customer needs.” ▼