Appendix D

New York State ITS Standards Specification Development Guide

Key ITS Standards

Prepared for

New York State Department of Transportation

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Revision History

Filename	Version	Date	Author	Comment
NYStateSpecDevGuide – ApD – Key ITS Standards.doc	0.3	11/22/06	M. Insignares / P. Chan	Initial Draft

1 Introduction

This section discusses the methodology used for identifying Key ITS Standards for the State of New York, and summary information about Key ITS Standards, and its applicability for deployment.

1.1 Identification and Assessment Methodology

The methodology used to determine whether an ITS Standard is "key" for the State of New York is, to some extent, based on experience and engineering judgment. Therefore, the list of Key ITS Standards may expand or shrink over time depending on what makes sense and lessons learned from deployment experience. Given the evolving nature and relative recent emergence of the ITS standards, this represents a reasonable approach.

It is noteworthy that deployments of neighboring regional transportation agencies that operate within New York were also considered, in addition to those of the NYSDOT. This includes other New York State transportation agencies, such as New York State Thruway, New York State Bridge Authority, and the Metropolitan Transportation Authority; bi-state agencies such as the NITTEC and the Port Authority of New York and New Jersey, and city agencies such as New York City DOT.

Three factors were used to help identify whether an ITS standard is a "key" ITS Standard for New York. The criteria include:

- **ITS Architecture Assessment.** Identifies whether the standard is included in the regional ITS architectures of New York State
- **Maturity and Stability of Standard.** Gauges whether the ITS Standard is stable (after having gone through several revisions), or is still under development
- **Deployment Experience.** Assesses whether the ITS Standard has been previously deployed in New York State or by other transportation agencies.

1.2 ITS Architecture Assessment

The National ITS Architecture is a reference framework that spans all of ITS standards activities and provides a means of detecting gaps, overlaps, and inconsistencies between the standards. The Logical and Physical Architecture provide a starting point for the standards development activities by identifying the applicable architecture flows and data flows to be standardized in the National ITS Architecture and the way in which the information is exchanged across those interfaces. The National ITS Architecture databases provide a mapping of architecture flows to individual ITS standards. Since the architecture flows of the National ITS Architecture form the basis for information exchanges of regional or statewide ITS architectures, this mapping of interfaces to standards is available for these architectures as well.

As part of the Key ITS Standards assessment, the consultants 1) reviewed the ITS Standards currently deployed and under development in the United States, and 2) reviewed the list of applicable ITS Standards based on the existing regional ITS architectures in New York. While this analysis did not include a review of every regional ITS architecture in New York, it does represent a comprehensive review of regions with significant ITS deployment (both existing and planned).

The list of New York State regional ITS architectures reviewed is shown in the table below.

Table 1-1. Regional ITS Architectures In New York State

NYSDOT Region	Regional ITS Architecture	National ITS Architecture	Included for Analysis
New York Statewide	New York Statewide ITS Services	Version 3	Yes
Region 1	Capital District Region	Version 4	Yes
Region 2	Utica Region		No
Region 3	Syracuse Region		No
Region 4	Rochester Region		No
Region 5	Buffalo-Niagara Bi-National Region	Version 5.1	Yes
Region 6	Region 6 – Hornell		No
Region 7	North County Region		No
Region 8	Hudson Valley		Yes
Region 9	Binghamton Region		No
Region 10	Nassau / Suffolk Counties	Version 4.0	Yes
Region 11	New York City Sub-Region	Version 4.0	Yes

2 Key ITS Standards for New York State

This subsection presents a list of the Key ITS Standards organized by level of the ITS Standards framework.

Table 2-1. Key ITS Standards – Information Level Standards

Standards Usage	Standard	Status / Maturity	Deployment / Comment	Testing and Deployment Opportunity
Center-to-Field Device Communications	NTCIP 1201 – Global Objects	Stable	Widely Deployed.	
	NTCIP 1202 – Actuated Traffic Signal Controllers	Stable	Limited Deployment. Early versions of standard deployed in Arizona and North Carolina with challenges. Portions of standard deployed in New York City.	Yes
	NTCIP 1203 – Dynamic Message Signs	Stable	Widely Deployed. Standard is being specified and deployed in NYSDOT Regions 5, 11, and others.	Yes
	NTCIP 1204 – Environmental Sensor Stations	Stable	Limited Deployment.	Yes
	NTCIP 1205 – CCTV Cameras	Stable	Limited Deployment. Standard is being deployed in Florida.	Yes

Standards Usage	Standard	Status / Maturity	Deployment / Comment	Testing and Deployment Opportunity
	NTCIP 1206 – Data Collection	Requires Further Evaluation	Limited Deployment.	Yes
	NTCIP 1207 – Ramp Meter	Stable	Limited Deployment. Standard is being deployed in Salt Lake City, Utah.	
	NTCIP 1208 – Video Switches	Requires Further Evaluation	None	
	NTCIP 1209 – Transportation Sensor System	Requires Further Evaluation	None	
	NTCIP 1210 – Signal System Masters	Under Development	None	
	NTCIP 1211 – Signal Control Priority	Requires Further Evaluation	Limited Deployment	
	NTCIP 1212 – Network Camera Operation	Requires Further Evaluation	None	
Roadway Weather Information Systems	NTCIP 1301 – Weather Report Message Set	Under Development	None	
Advanced Public Transportation Systems	APTA TCIP-S-001 – Transit Communications Interface Profiles	Under Development	Limited Deployment. Portions of standard being deployed as part of NYSDOT TSDEA project.	Yes
Archived Data Management	ASTM WK7604 – Archiving ITS-Related Traffic Monitoring	Requires Further	None	Yes

Standards Usage	Standard	Status / Maturity	Deployment / Comment	Testing and Deployment Opportunity
Systems	Data	Evaluation		
Incident Management Systems	IEEE 1512.x – Incident Management Message Sets.	Stable	Limited Deployment. Portions of standard being deployed as part of NYSDOT IEN and IIMS projects. 1512.BASE, 1512.1 through 1512.3 version 2.0 balloted or ready for ballot. 1512.4 under development.	Yes
Highway Rail Intersection Systems (At Grade Crossings)	IEEE 1570 – Standard for the Interface Between the Rail Subsystem and the Highway Subsystem at the Highway Rail Intersection	Requires Further Evaluation		Yes
Advanced Traffic Management Systems	ITE/AASHTO – Traffic Management Center-to-Center Communications {Advanced Traffic Management Data Dictionary (TMDD) and Message Sets (MS)} version 2.1	Stable	Widely Deployed.	Yes
Advanced Traveler Information Systems	SAE-J2354 – Message Sets for Advanced Traveler Information Systems (ATIS) Revision 2.0	Stable	Limited Deployment.	Yes

Standards Usage	Standard	Status / Maturity	Deployment / Comment	Testing and Deployment Opportunity
WAVE/DSRC Systems	SAE-J2734 – Standard for Data Dictionary and Message Sets for DSRC	Under Development	None. WAVE/DSRC Roadside to Vehicle Alerts.	Yes
	OmniAir Consortium – Electronic Payment Systems.	Under Development	None. WAVE/DSRC Electronic Payment Systems.	Yes
Support Standard	SAE-J2266 – Location Referencing Message Specification		This standard is referenced by other Information Level standards.	
	SAE-J2529 – Rules for Standardizing Street Names and Route IDs		This standard is referenced by other Information Level standards.	
	SAE-J2540-2 - ITIS (International Traveler Information Systems" Phrase List		This standard is referenced by other Information Level standards.	
	NTCIP 1104 – C2C Naming Convention		This standard is referenced by other Information Level standards.	
Guidance Document	ASTM WK7592 – Practice for Metadata to Support ADMS			

Standards Usage	Standard	Status / Maturity	Deployment / Comment	Testing and Deployment Opportunity
	ASTM E2259-03 – Standard Guide for Archiving and Retrieving ITS-Generated Data			
	IEEE 1512 Guide			
	NTCIP 9001 – NTCIP Guide			
	NTCIP 9010 – XML in ITS Center-to-Center Communications			
	NTCIP 9012 – Testing Guide for Users			

Table 2-2. Key ITS Standards – Application Level Standards

Standards Usage	Standard	Status / Maturity	Deployment	Testing and Deployment Opportunity
Center-to-Field Device Communications	NTCIP 1101 – STMF	Stable	Widely Deployed. Defined SNMP-based Communications between a manager (typically a center) and agent (typically a device).	Yes
	NTCIP 1102 – OER	Stable	Limited Deployment. Recently Approved.	Yes
	NTCIP 1103 – STMP	Stable	Limited Deployment. Recently Approved. Extension of SNMP, developed primarily to support traffic signal controllers and devices that communicate using event-driven communications initiated by a subscription.	Yes
	NTCIP 2301 – STMF	Stable	Widely Deployed	Yes
	NTCIP 2302 – TFTP	Stable	Limited Deployment.	
	NTCIP 2303 – FTP	Stable	Limited	

Standards Usage	Standard	Status / Maturity	Deployment	Testing and Deployment Opportunity
			Deployment	
Center-to-Center Communications	NTCIP 2304 – Application Profile for DATEX Communications	Stable	Limited Deployment. Deployed by TRANSCOM. Interface being deployed by NYSDOT as part of the IEN project.	
	NTCIP 2306 – Applications Profile for XML Center-to-Center Communications	Version 1.0 Ready for Ballot.	Limited Deployment. Being deployed by NYSDOT as part of the IEN project, and possibly TSDEA.	Yes
WAVE/DSRC	IEEE P1609.1 – WAVE Application Resource Manager	Version 1.0 Ready for Ballot.	U.S. 5.9 GHz Prototype Program	Yes
	IEEE 1609.2 – WAVE Application Services Manager (Radio Security Service)	Under Development	None	Yes

Table 2-3. Key ITS Standards – Transport Level Standards

Standards Usage	Standard	Status / Maturity	Deployment	Testing and Deployment Opportunity
Center-to-Field Device Communications	NTCIP 2201 – Transportation Transport Profile	Yes	Widely Deployed.	Yes
Center-to-Field Device Communications	NTCIP 2202 – Internet Profile	Yes	Limited Deployment. References IETF TCP, UDP, and IP standards. Being specified and deployed by NYSDOT in Regions 5, 11, and others.	Yes
Center-to-Center Communications	IETF TCP and IP Standards	Yes	Widely Deployed. Being specified and deployed by NYSDOT as part of the IEN project, and possibly TSDEA.	Yes
Wide Area Wireless Communications	IETF TCP and IP Standards	Yes	Limited Deployment. Being specified and deployed by NYSDOT as part of the IIMS project.	Yes
WAVE/DSRC	IEEE P1609.3 – WAVE Network Services Manager	Under Development	U.S. 5.9 GHz Prototype Program	Yes

Table 2-4. Key ITS Standards – Subnetwork Level Standards

Standards Usage	Standard	Status / Maturity	Deployment	Testing and Deployment Opportunity
Center-to-Field Device Communications	NTCIP 2101 – PMPP/RS232	Stable	Widely Deployed.	Yes
	NTCIP 2102 – PMPP/FSK	Stable	Limited Deployment.	Yes
	NTCIP 2103 – PPP/RS232	Stable	Limited Deployment.	Yes
	NTCIP 2104 - Ethernet	Stable	Limited Deployment.	Yes
Center-to-Center Communications	Various Non-ITS Industry and Telecommunications Standards may apply.	Stable	Widely Deployed. Possible Non-ITS Standards Applicable.	Yes
Wide Area Wireless Communications	Various Non-ITS Industry and Telecommunications Standards may apply.	Stable	Limited Deployment. Non-ITS Standards Applicable.	Yes
WAVE/DSRC	IEEE P1609.4 – WAVE Media Access Control (MAC) Extension Service	Under Development	U.S. 5.9 GHz Prototype Program	Yes
	IEEE 802.11 p	Under Development		Yes