
DRAFT

Standard Development Report

for

NTCIP 2301 v03.04

Simple Transportation Management

Framework Application Profile

January 9, 2025

The following Standard Development Report (SDR) is made in accordance with the Institute of Transportation Engineers (ITE) procedures for the National Transportation Communications for ITS Protocol.

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1 Latest Version of the Draft Proposed Standard

This Standards Development Report (SDR) references Recommended Standard (RS) NTCIP 2301 v03.04 *Simple Transportation Management Framework Application Profile*. When Jointly Approved, NTCIP 2301 v03.04 will be a major update to the current NTCIP 2301 v02.19, dated July 2010. Jointly Approved means that the standard is formally balloted and approved separately by the three cooperating standard development organizations (SDOs): the American Association of State Highway and Transportation Officials (AASHTO), the Institute of Transportation Engineers (ITE), and the National Electrical Manufacturers Association (NEMA).

2 Summary Status

NTCIP 2301 v03.04 has been accepted as a Recommended Standard of the Joint Committee on the NTCIP. The standard was updated as a part of the Infrastructure Standards Security Implementation (ISSI) project, which is intended to improve the security of NTCIP communications. The standard contains the detailed specifications for the implementation of SNMPv3 application layer to provide a secure environment.

NTCIP 2301 v03.04 is now distributed to the members of AASHTO, ITE, and NEMA for balloting and approval. After all three standards development organizations (SDOs) have individually approved RS NTCIP 2301 v03.04, it is a Jointly Approved Standard and published with the designation (and to be cited as) NTCIP 2301 v03.

3 Status Report

NTCIP 2301 v02 was published as a Jointly Approved standard of the Joint Committee on the NTCIP in July 2010. The effort to produce NTCIP 2301 v03 is based on the results of the prior effort to define a path to secure NTCIP communications, which resulted in a set of recommendations published in NTCIP 9014. The Infrastructure Standards Security Implementation (ISSI) project was initiated in June 2022 to begin implementing the recommendations in NTCIP 9014; the update to NTCIP 2301 is one of the foundational standards that are first to be updated by this project.

The BSP2 WG held a series of fourteen meetings between October 14, 2022 and December 16, 2024 to discuss the proposed changes to NTCIP 1201, 2202, 2301, and 8007, as well as updates to related standards, including RFC 6353, ISO 15784-2, and ISO 26048-1. During these meetings, proposed revisions were explained, and questions were raised to the group on topics of questionable direction. The feedback from the group was incorporated into the subsequent revisions of the document. In addition, comments (written inputs) were solicited during the User Comment Draft (UCD) stage. Review of the input received during each phase of development led to a successful vote accepting the recommended standard during RS Stage.

A summary of the significant technical changes included in NTCIP 2301 v03.04 as compared to NTCIP 2301 v02 is provided below:

- The details of the document have been moved to ISO 15784-2, which acts as a normative reference and aligns with the international market.
- Replacing SNMPv1 with SNMPv3 coupled with the Transport Layer Security Transport Model (TLSTM)
- Withdrawal of support for the Simple Transportation Management Protocol (STMP) and the Simple Fixed Message Protocol (SFMP) due to inadequate security

NTCIP 2301 v03.04 was accepted as a Recommended Standard via a vote that closed on **May 3, 2024 with a vote of 8 yeas, 0 nays, and 0 abstention out of 13 total members.**

4 Comments Listing

No comments were received on NTCIP 2301 v03.04 during the public comment period known as the User Comment Draft (UCD) stage.

5 Committee Objectives

The objective of the BSP2WG in this project is to produce a new version of the NTCIP 2301 standard that implements the security recommendations contained in NTCIP 9014. The distribution of NTCIP 2301 v03.04 for formal balloting is a step in this process to ensure consensus among the members of the SDOs.

6 Committee Members

This standard has been developed under the oversight of the Joint Committee on the NTCIP which is made up of representatives from the American Association of State Highway and Transportation Officials (AASHTO), the Institute of Transportation Engineers (ITE), and the National Electrical Manufacturers Association (NEMA). The work in developing this standard was performed by the Base Standards, Protocols, and Profiles (BSP2) Working Group (WG), a technical subcommittee of the Joint Committee.

BSP2 Working Group

- Washington State DOT: Michael Forbis (Co-Chair)
- Caltrans: Patrick Leung (alternate: Mohammad Iraki, David Guan, Jay Schultz, or Mike Robinson)
- Florida DOT: Robert Lopes (alternate Derek Vollmer)
- Georgia DOT: Justin Hatch (alternate: Alan Davis)
- Michigan DOT: Joe Gorman
- Minnesota DOT: Terry Haukom (alternate: Mike Manning)
- Nevada DOT: Rodney Schilling (alternate: Gary Molnar, Jacob Grivette)
- Q-Free: Doug Crawford (Co-chair) (alternate: Douglas Tarico)
- AECOM: Alex Mousadi
- Applied Information: Walt Townsend (alternate: Alan Luchuk)
- Daktronics: Steve Bostrom (alternate: Denver Kruse)
- Econolite: Dustin DeVoe (alternate: Shea Tomsin or Dan Brandesky)
- KLD Corporation: Satya Muthuswamy
- Transcore: Bob Rausch (alternate: Keith Patton)
- Yunex Traffic: Wolfgang Buckel (alternate: Andrew Valdez)

Joint Committee on the NTCIP

- Doug Crawford, Intelight
- Alan Davis, Georgia DOT
- Ray Deer, Peek Traffic
- Kleinjan Deetlefs, McCain
- Gary Duncan, Econolite
- Scott Evans, Eberle Design
- Daniel Farley, Pennsylvania DOT
- Matt Luker, Utah DOT
- Andrew Mao, Texas DOT
- Dave Miller, Siemens
- Robert Rausch, TransCore
- Edward Seymour, Texas Transportation Institute
- Mohamed Talas, New York City DOT
- John Thai, City of Anaheim
- Lei Wang, Louisiana DOTD
- Henry Wickes, Texas DOT
- Jon Wyatt, Parsons
- Derek Vollmer, Florida DOT

7 Other Material of Interest

Normative and other documents cited in NTCIP 1201 v04.08 are as follows.

7.1 Normative References

Normative References

Normative references contain provisions that, through reference in the document, constitute provisions of the document.

AASHTO / ITE / NEMA NTCIP 8004 v03	Structure and Identification of Management Information (SMI) published (Pending)
IETF RFC 2578	Structure of Management Information Version 2 (SMIv2), April 1999
IETF RFC 2579	Textual Conventions for SMIv2, April 1999
IETF RFC 3418	Management Information Base (MIB) for the Simple Network Management Protocol (SNMP), December 2002
ISO/IEC/IEEE 24765:2017	Systems and software engineering – Vocabulary

7.2 Other References

Other references are included to provide a more complete understanding of this document and its relationship to other documents.

AASHTO / ITE / NEMA NTCIP 2301 v03	Simple Transportation Management Framework Application Profile (Pending)
AASHTO / ITE / NEMA NTCIP 8005 v02	Procedures for Creating Management Information Base (MIB) Files published (Pending)
IETF RFC 854	Telnet Protocol Specification
IETF RFC 3411	An Architecture for Describing Simple Network Management Protocol (SNMP) Management Framework, December 2002
IETF RFC 3412	Message Processing and Dispatching for the Simple Network Management Protocol (SNMP), December 2002
IETF RFC 3413	Simple Network Management Protocol (SNMP) Applications, December 2002
IETF RFC 3415	View-based Access Control Model (VACM) for the Simple Network Management Protocol (SNMP), December 2002
IETF RFC 3416	Version 2 of the Protocol Operations for the Simple Network Management Protocol (SNMP) , December 2002
IETF RFC 3417	Transport Mappings for the Simple Network Management Protocol (SNMP)
IETF RFC 4181	Guidelines for Authors and Reviewers of MIB Documents, September 2005
IETF RFC 5591	Transport Security Model for the Simple Network Management Protocol (SNMP), June 2009
IETF RFC 6353	Transport Layer Security (TLS) Transport Model for the Simple Network Management Protocol (SNMP), July 2011
IETF RFC 6933	Entity MIB (Version 4), May 2013
IETF RFC 9456	Updates to the TLS Transport Model for SNMP, November 2023
ISO 15784-2:2024	Intelligent transport systems — Data exchange involving roadside equipment communication — Part 2: Centre to field device communications using SNMP
ISO 21217:2020	Intelligent transport systems — Station and communications architecture

ISO 26048-1:-1	Intelligent transport systems – Field device SNMP data interface – Part 1: Global objects
NEMA TS 2-2016	Traffic Controller Assemblies with NTCIP Requirements

7.3 Contact Information

7.3.1 IAB and IETF Documents

For Internet Architecture Board (IAB) and Internet Engineering Task Force documents, contact:
Internet Architecture Board (IAB)
www.rfc-editor.org

7.3.2 NTCIP Documents

Copies of NTCIP documents may be obtained from:

NTCIP Coordinator
National Electrical Manufacturers Association
1300 N.17th Street, Suite 1752
Rosslyn, Virginia 22209-3801

www.ntcip.org

e-mail: ntcip@nema.org

Draft amendments, which are under discussion by the relevant NTCIP Working Group, and amendments recommended by the NTCIP Joint Committee are available.

7.3.3 National Electrical Manufacturers Association (NEMA) Standards

Obtain NEMA standards from:

National Electrical Manufacturers Association
1300 North 17th Street, Suite 1752
Rosslyn, Virginia 22209
www.nema.org

8 Declaration Regarding Other Known National and International Standards

This statement confirms that other known national and international standards have been examined with regard to harmonization and duplication of content, and no significant conflicts with other known standards have been identified.

9 Abstract of the Standard

This section is excerpted from Section 1 of NTCIP 1201 v04.08.

Scope

The NTCIP 1200 series defines standardized data elements that can be exchanged between a traffic management center (or any other management station) and a field device. This document identifies and defines data elements that can be supported by multiple types of devices (e.g., actuated signal controllers, dynamic message signs, connected vehicle roadside units).

All data elements defined in this document have been deprecated. Current data elements to fulfill a similar set of user needs can be found in ISO 26048-1.

The data defined in this standard was originally defined using the Structure of Management Information Version 1 (SMIv1) format, as defined in RFC 1212, and intended for implementations using the Simple Network Management Protocol Version 1 (SNMPv1). This document migrates the original data element

¹ Publication of this document is expected in late 2024 or early 2025; drafts for commenting purposes are available upon request

definitions to use SMIv2, as defined by RFC 2578, to enable its unambiguous exchange when using SNMPv3.

This document does not apply to interfaces using SNMPv1 and the continued use of SNMPv1 is discouraged. New implementations should use data elements defined in ISO 26048-1. This document is intended to allow the data originally developed for SNMPv1 devices to be exchanged via an SNMPv3 interface. Specifically, this document is envisioned to address the interface between a management station and a proxy agent, as shown in Figure 1, and similar environments.

APPENDIXES

Appendix I
Recommended Standard NTCIP 1202 v04.08

