

*A Joint Information Management Policy of AASHTO, ITE, and NEMA*

# NTCIP 8007 version v01

---

## National Transportation Communications for ITS Protocol Testing and Conformity Assessment Documentation within NTCIP Standards Publications

---

published in May 2008

*Published by*

**American Association of State Highway and Transportation Officials (AASHTO)**

444 North Capitol Street, N.W., Suite 249  
Washington, D.C. 20001

**Institute of Transportation Engineers (ITE)**

1099 14th Street, N.W., Suite 300 West  
Washington, D.C. 20005-3438

**National Electrical Manufacturers Association (NEMA)**

1300 North 17th Street, Suite 1752  
Rosslyn, Virginia 22209-3806

## NOTICES

### Copyright Notice

© 2008 by the American Association of State Highway and Transportation Officials (AASHTO), the Institute of Transportation Engineers (ITE), and the National Electrical Manufacturers Association (NEMA). All intellectual property rights, including, but not limited to, the rights of reproduction, translation and display are reserved under the laws of the United States of America, the Universal Copyright Convention, the Berne Convention, and the International and Pan American Copyright Conventions. Except as licensed or permitted, you may not copy these materials without prior written permission from AASHTO, ITE, or NEMA. Use of these materials does not give you any rights of ownership or claim of copyright in or to these materials.

Visit [www.ntcip.org](http://www.ntcip.org) for other copyright information, for instructions to request reprints of excerpts, and to request reproduction that is not granted below.

### PDF File License Agreement

To the extent that these materials are distributed by AASHTO / ITE / NEMA in the form of an Adobe® Portable Document Format (PDF) electronic data file (the "PDF file"), AASHTO / ITE / NEMA authorizes each registered PDF file user to view, download, copy, or print the PDF file available from the authorized Web site, subject to the terms and conditions of this license agreement:

- (a) you may download one copy of each PDF file for personal, noncommercial, and intraorganizational use only;
- (b) ownership of the PDF file is not transferred to you; you are licensed to use the PDF file;
- (c) you may make one more electronic copy of the PDF file, such as to a second hard drive or burn to a CD;
- (d) you agree not to copy, distribute, or transfer the PDF file from that media to any other electronic media or device;
- (e) you may print one paper copy of the PDF file;
- (f) you may make one paper reproduction of the printed copy;
- (g) any permitted copies of the PDF file shall retain the copyright notice, and any other proprietary notices contained in the file;
- (h) the PDF file license does not include (1) resale of the PDF file or copies, (2) republishing the content in compendiums or anthologies, (3) publishing excerpts in commercial publications or works for hire, (4) editing or modification of the PDF file except those portions as permitted, (5) posting on network servers or distribution by electronic mail or from electronic storage devices, and (6) translation to other languages or conversion to other electronic formats;
- (i) other use of the PDF file and printed copy requires express, prior written consent.

### TRF Distribution Permission

To the extent that these materials are distributed by AASHTO / ITE / NEMA in the form of a Testing Requirements Form ("TRF"), AASHTO / ITE / NEMA extend the following permission:

- (i) you may make and/or distribute unlimited electronic or hard copies, including derivative works of the TRF, provided that each copy you make and/or distribute contains the citation "Based on NTCIP 0000 [insert the standard number] TRF. Used by permission. Original text © AASHTO / ITE / NEMA.";
- (ii) you may not modify the logical flow of any test procedure, without clearly noting and marking any such modification; and
- (iii) if the TRF excerpt is made from an unapproved draft, add to the citation "TRF excerpted from a draft standard containing preliminary information that is subject to change."

## **Content and Liability Disclaimer**

The information in this publication was considered technically sound by the consensus of persons engaged in the development and approval of the document at the time it was developed. Consensus does not necessarily mean that there is unanimous agreement among every person participating in the development of this document.

AASHTO, ITE, and NEMA standards and guideline publications, of which the document contained herein is one, are developed through a voluntary consensus standards development process. This process brings together volunteers and/or seeks out the views of persons who have an interest in the topic covered by this publication. While AASHTO, ITE, and NEMA administer the process and establish rules to promote fairness in the development of consensus, they do not write the document and they do not independently test, evaluate, or verify the accuracy or completeness of any information or the soundness of any judgments contained in their standards and guideline publications.

AASHTO, ITE, and NEMA disclaim liability for any personal injury, property, or other damages of any nature whatsoever, whether special, indirect, consequential, or compensatory, directly or indirectly resulting from the publication, use of, application, or reliance on this document. AASHTO, ITE, and NEMA disclaim and make no guaranty or warranty, express or implied, as to the accuracy or completeness of any information published herein, and disclaims and makes no warranty that the information in this document will fulfill any of your particular purposes or needs. AASHTO, ITE, and NEMA do not undertake to guarantee the performance of any individual manufacturer or seller's products or services by virtue of this standard or guide.

In publishing and making this document available, AASHTO, ITE, and NEMA are not undertaking to render professional or other services for or on behalf of any person or entity, nor are AASHTO, ITE, and NEMA undertaking to perform any duty owed by any person or entity to someone else. Anyone using this document should rely on his or her own independent judgment or, as appropriate, seek the advice of a competent professional in determining the exercise of reasonable care in any given circumstances. Information and other standards on the topic covered by this publication may be available from other sources, which the user may wish to consult for additional views or information not covered by this publication.

AASHTO, ITE, and NEMA have no power, nor do they undertake to police or enforce compliance with the contents of this document. AASHTO, ITE, and NEMA do not certify, test, or inspect products, designs, or installations for safety or health purposes. Any certification or other statement of compliance with any health or safety-related information in this document shall not be attributable to AASHTO, ITE, or NEMA and is solely the responsibility of the certifier or maker of the statement.

## **Trademark Notice**

NTCIP is a trademark of AASHTO / ITE / NEMA. All other marks mentioned in this standard are the trademarks of their respective owners.

< This page is intentionally left blank. >

## ACKNOWLEDGEMENTS

NTCIP 8007 v01 was prepared by the Indefinite Quantities Contract (IQC) Project Team under a contract to the Federal Highway Administration (FHWA) and reflecting input provided by the NTCIP Testing and Conformity Assessment Working Group (TCA WG), a subdivision of the Joint Committee on the NTCIP. The Joint Committee is organized under a Memorandum of Understanding among the American Association of State Highway and Transportation Officials (AASHTO), the Institute of Transportation Engineers (ITE), and the National Electrical Manufacturers Association (NEMA). The Joint Committee on the NTCIP consists of six representatives from each of the standards organizations, and provides guidance for NTCIP development.

At the time that NTCIP 8007 v01 was prepared, the following individuals were active members of the NTCIP TCA WG:

- Steve Dellenback (Co-Chair)
- Joe Stapleton (Co-Chair)
- Alan Clelland
- Bob De Roche
- Ted Hancock
- Martin Knopp
- Jim Mahugh
- Gene Martin
- Jeff Morgan
- Bryan Mulligan
- Mel Partee
- Farhad Pooran
- Bob Rausch
- Lester Yoshida

In addition to the many volunteer efforts, recognition is also given to those organizations who supported the efforts of the working groups by providing comments and funding for the standard, including:

- U.S. Department of Transportation /  
Research and Innovative Technology  
Administration
- Battelle
- Caltrans
- Federal Highway Administration
- Florida Department of Transportation (DOT)
- Intelligent Devices, Inc.
- NET
- PB Farradyne, Inc.
- Peek Traffic Systems, Inc.
- Robert De Roche Consulting
- Quixote Corporation
- Siemens ITS
- SimpleSoft, Inc.
- Southwest Research Institute
- Texas DOT
- Texas Transportation Institute
- TKstds Management
- TransCore
- Trevilon Corporation
- URS Corporation
- Utah DOT
- Virginia DOT
- Washington State DOT

## FOREWORD

NTCIP 8007 v01 defines the content requirements for the testing documentation for NTCIP standards.

NTCIP 8007 v01 uses only metric units, and NTCIP 8007 v01 includes three informative annexes.

This NTCIP policy is designated, and should be cited as NTCIP 8007 v01. NTCIP 8007 v01 is an adopted and published NTCIP Management Information Policy, reflecting the resolution of comments received during the development and approval process, when drafts were designated using a major and minor version number (v01.01 through v01.21). To distinguish NTCIP 8007 v01 from previous drafts, NTCIP 8007 v01 also includes NTCIP 8007 v01.21 on each page header.

For more information about NTCIP standards, visit the NTCIP Web site at <http://www.ntcip.org>.

### User Comment Instructions

The term “User Comment” includes any type of written inquiry, comment, question, or proposed revision, from an individual person or organization, about any part of this standard publication’s content. A “request for interpretation” of this standard publication is also classified as a User Comment. User Comments are solicited at any time. In preparation of this NTCIP standards publication, input of users and other interested parties was sought and evaluated.

All User Comments will be referred to the committee responsible for developing or maintaining this standards publication. The committee chairperson, or their designee, may contact the submitter for clarification of the User Comment. When the committee chairperson or designee reports the committee’s consensus opinion related to the User Comment, that opinion will be forwarded to the submitter. The committee chairperson may report that action on the User Comment may be deferred to a future committee meeting and/or a future revision of the standards publication. Previous User Comments and their disposition may be available for reference and information at [www.ntcip.org](http://www.ntcip.org).

A User Comment should be submitted to this address:

NTCIP Coordinator  
National Electrical Manufacturers Association  
1300 North 17th Street, Suite 1752  
Rosslyn, Virginia 22209-3806  
e-mail: [ntcip@nema.org](mailto:ntcip@nema.org)

A User Comment should be submitted in the following form:

**Standard Publication number and version:**  
**Page:**  
**Section, Paragraph, or Section:**  
**Comment:**  
**Editorial or Substantive?:**  
**Suggested Alternative Language:**

Please include your name, organization, and address in your correspondence.

## Approvals

This standards publication was separately balloted and approved by AASHTO, ITE, and NEMA after recommendation by the Joint Committee on the NTCIP. Each organization has approved this standard as the following standard type, as of the date:

AASHTO—Standard Specification; April 2006  
ITE—Software Standard; October 2005  
NEMA—Standard; October 2005

## History

In October 2002, the TCA WG began development of NTCIP 8007 v01. The policy was derived from a Federal Highway Administration report that documented how test procedures might be developed for a specific project. In January 2003, the Federal Highway report was distributed to the TCA WG for review and then became the basis for this policy.

NTCIP 8007 v01.09. August 2003—Accepted as a User Comment Draft by the Joint Committee on the NTCIP. October 2003—NTCIP Standards Bulletin B0084 distributed for user comment.

NTCIP 8007 v01.19. May 2004—Accepted as a User Comment Draft by the Joint Committee on the NTCIP. August 2004—NTCIP Standards Bulletin B0099 distributed for user comment.

NTCIP 8007 v01.20. July 2005—Accepted v01.20 as a Recommended Standard by the Joint Committee on the NTCIP. July 2005—NTCIP Standards Bulletin B0108 referred v01.20a for balloting. Approved by AASHTO in April 2006, approved by ITE in October 2005, and approved by NEMA in October 2005. Jointly Approved in 2006. May 2008—NTCIP 8007 v01.21 formatted and edited for publication.

## Compatibility of Versions

All NTCIP Standards Publications have a major and minor version number for configuration management. The version number syntax is "v00.00a," with the major version number before the period, and the minor version number and edition letter (if any) after the period.

Anyone using NTCIP 8007 v01 should seek information about the version number that is of interest to them in any given circumstance. The MIB, the PRL, and the PICS should all reference the version number of the standards publication that was the source of the excerpted material.

Compliant systems based on later, or higher, version numbers MAY NOT be compatible with compliant systems based on earlier, or lower, version numbers. Anyone using NTCIP 8007 v01 should also consult NTCIP 8004 v01 for specific guidelines on compatibility.

## INTRODUCTION

NTCIP 8007 v01 defines requirements that are applicable to all NTCIP environments, and it also contains optional and conditional sections that are applicable to specific environments for which they are intended.

The following keywords apply to this document: AASHTO, ITE, NEMA, NTCIP, testing.

In 1992, the NEMA 3-TS Transportation Management Systems and Associated Control Devices Section began the effort to develop the NTCIP. The Transportation Section's purpose was to respond to user needs to include standardized systems communication in the NEMA TS 2 standard, Traffic Controller Assemblies. Under the guidance of the Federal Highway Administration's NTCIP Steering Group, the NEMA effort was expanded to include the development of communications standards for all transportation field devices that could be used in an Intelligent Transportation Systems (ITS) network.

In September 1996, an agreement was executed among AASHTO, ITE, and NEMA to jointly develop, approve, and maintain the NTCIP standards.

In December 2001, the NTCIP Joint Committee agreed to include test documentation in the NTCIP standards and formed the TCA WG to further investigate conformance testing. In October 2002, the TCA WG held its first meeting and identified NTCIP 8007 v01 as a high priority work item.



## CONTENTS

	Page
<b>Section 1 INTRODUCTION</b> .....	<b>1</b>
1.1 Purpose .....	1
1.2 Scope .....	1
1.3 Applicability.....	1
1.4 References .....	1
1.5 Contact Information .....	2
1.5.1 RFC Documents.....	2
1.6 Definitions.....	2
1.7 Abbreviations.....	3
<b>Section 2 REQUIREMENTS FOR DEVELOPING TESTING REQUIREMENTS DOCUMENTATION</b> <b>[Informative]</b> .....	<b>4</b>
2.1 Field Device Test Environment .....	4
2.2 Requirements to Test Cases Traceability .....	4
2.3 Traceability .....	4
2.3.1 Well-Written Requirements .....	5
2.3.2 Number of Test Cases to Develop.....	5
2.3.3 Tests for Referenced Requirements.....	5
2.3.4 Example 1 .....	6
2.3.5 Example 2 .....	6
2.3.6 Performance and Stress Testing .....	6
2.3.7 Presentation .....	6
2.4 Test Procedure .....	6
2.4.1 General .....	6
2.4.2 Required Elements.....	6
2.4.3 Presentation .....	8
<b>Section 3 KEYWORDS</b> .....	<b>9</b>
<b>Annex A Sample Requirements [Informative]</b> .....	<b>15</b>
A.1 Explore Data.....	15
A.2 Component Information.....	15
A.3 NTCIP Community Names .....	15
A.3.1 Administrator Community Name .....	15
A.3.2 Other Community Names .....	15
<b>Annex B Sample Testing Requirements [Informative]</b> .....	<b>17</b>
B.1 Field Device Test Environment .....	17
B.2 Requirements to Test Case Traceability .....	17
B.3 Test Procedures .....	18
B.3.1 Walk the MIB.....	18
B.3.2 Retrieve Module Table.....	19
B.3.3 Test Visibility of Security Data with Administrator Community Name.....	20
B.3.4 Change Time with Administrator Community Name.....	20
B.3.5 Change Administrator Community Name .....	21
B.3.6 Change User Community Name .....	22

< This page is intentionally left blank. >

## Section 1 INTRODUCTION

### 1.1 PURPOSE

NTCIP standards are intended to promote the development of interoperable equipment within the Intelligent Transportation Systems (ITS) industry. Any component that does not fully follow the rules defined by the NTCIP standards will inhibit or preclude interoperability from being realized. As a result, industry needs a well-defined and consistent way to test equipment that claims conformance to the NTCIP standards.

NTCIP 8007 v01 is not intended to be used directly by manufacturers or public agencies that may procure NTCIP equipment; rather, it is intended to promote a consistent look and feel for testing documentation throughout various NTCIP standards. Thus, any user wishing to test an implementation of an NTCIP standard could use this subsequent documentation.

### 1.2 SCOPE

NTCIP 8007 v01 defines requirements to be used by NTCIP Working Groups in producing test documentation as a part of the NTCIP standards process.

### 1.3 APPLICABILITY

While NTCIP 8007 v01 has a similar scope to and is based on the principles defined in IEEE 829, NTCIP 8007 v01 has customized these principles for the NTCIP environment. Specifically, NTCIP 8007 v01 has refined the scope of IEEE 829 by:

- a) Defining a set of keywords, specific to the NTCIP environment, in order to ensure precise interpretations of what each term means.
- b) Allowing the definition of test variables in order to:
  - 1) Accommodate project-specific limitations (e.g., to define how many messages are supported by a sign or how many phases are supported by a signal controller).
  - 2) Allow for some level of variability in performing the tests so that a device cannot be hard-coded to a simple test.

### 1.4 REFERENCES

For revision information on this NTCIP standard, contact:

NTCIP Coordinator  
**National Electrical Manufacturers Association**  
1300 North 17th Street, Suite 1752  
Rosslyn, VA 22209-3806  
e-mail: [ntcip@nema.org](mailto:ntcip@nema.org)

For draft revisions to this document, and recommended revisions of the NTCIP Joint Committee, visit [www.ntcip.org](http://www.ntcip.org).