NTCIP Publication Formt

https://ite-org.github.io/NTCIP-8002/latest/

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Front Matter

Working Group Draft

NTCIP 8002 v2.0.0-a.2

National Transportation Communications for ITS Protocol

NTCIP Standards Publication Format

June 21, 2025

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June 21, 2025

Acknowledgements

This document was prepared though an open-source standards development process with the following active contributors:

`contributors` `1`

Check out the full list of contributors here.

In addition, the following submitted comments during the process:

- k-vaughn

The resultant document is maintained by the NTCIP Open-Source Process (OPS) Working Group (WG), a subdivision of the Joint Committee on the NTCIP. The Joint Committee on the NTCIP 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 development organizations (SDOs) and provides guidance for NTCIP development.

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Foreword

Overview

This document is an NTCIP Open-Source NTCIP Process, Control, and Information Management document provided as Interim for Field Release (IFR).

Open-source documents are developed using the ITS Open-Source Process, as defined in NTCIP 8008. This process provides an open standards development process that accepts issues reported by the community and resolved by peer-reviewed contributions from the community. The open source process concludes with the resultant material being approved by the defined approval process.

IFR documents are approved through a streamlined process focused on the technical experts of the community (e.g., those participating in the open-source development process) rather than through a formal ballot of industry managers.

NTCIP Process, Control, and Information Management documents define the practices and policies used by the NTCIP Joint Committee and its working groups in developing and maintaining NTCIP publications.

This document defines the general rules for the content and format of NTCIP standards publications.

This publication was developed to ensure that NTCIP documents are well organized and have a consistent style both within a given document as well as among all NTCIP documents. The style rules used are largely based on the rules governing NEMA documents (as defined in NEMA NS 1), with modifications to meet the needs of the NTCIP effort. There are two normative annexes to this document.

Approvals

IFRs are peer reviewed within the open-source process with final approval by an associated WG established by the NTCIP Joint Committee.

Approval information is provided within the online environment.

For more information about NTCIP standards, visit the NTCIP Web Site at www.ntcip.org.

User Comment Instructions

Comments can be submitted at any time. In preparation of this NTCIP standards publication, input of users and other interested parties was sought and evaluated.

Comments on open-source projects can be submitted either on the discussions or issues tab of the project.

Discussions can be initiated at any time and anyone in the community can respond, all within a public environment. Responses to discussion comments are strictly informative and may not be accurate. Discussion comments can lead to the submittal of issues that need to be resolved to clarify the standard.

Issues can be submitted at any time. Issues are triaged by the project maintainer, who will evaluate their merit, classify them (e.g., as a bug, documentation issue, omission), and in most cases respond to the submitter. Once ready, issues will be available for contributors to volunteer to address. When a volunteer has a proposed solution, it can be submitted to the project and approved in a relatively short period (when compared to the traditional standards approval process). However, updates to the projects are still version controlled so that users can reference a specific version of the project without fear of it changing.

Comments should use the templates provided on the website; otherwise they may be ignored.

History

For a history of the project, see the projects releases page.

🕔 June 21, 2025

Introduction

This publication defines the content, organization, and format of NTCIP documents. It is developed and maintained by the NTCIP Editorial Committee under the guidance of the NTCIP Joint Committee. This publication is authorized for publication by AASHTO, ITE, and NEMA based on the recommendation of the NTCIP Joint Committee.

This document contains mandatory requirements that are always applicable and optional and conditional requirements, which may be applicable, for the specification of transportation management information.

This document contains two informative annexes. Annex B is normative.

The following keywords apply to NTCIP 8002: AASHTO, ITE, NEMA, NTCIP, format, style, guide, process and control standard.

This document only uses metric units.

June 21, 2025

Section 1 General

Scope

This publication defines the content, organization, and format of NTCIP documents. It is developed and maintained by the NTCIP Editorial Committee under the guidance of the NTCIP Joint Committee. This publication is authorized for publication by AASHTO, ITE, and NEMA based on the recommendation of the NTCIP Joint Committee.

References

Normative References

Normative references contain provisions that, through reference in this text, constitute provisions of this NTCIP document. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this NTCIP document

are encouraged to investigate the possibility of applying the most recent editions of the standards listed.

Document #	Reference
NEMA NS 1-2005	*Guide for Preparation of NEMA Standards Publications*
ISO/IEC Directives Part 2	*Principles and rules for the structure and drafting of ISO and IEC documents*, Ninth edition, 2021, https://www.iso.org/sites/directives/current/part2/index.xhtml

1.2.2 Contact Information

ISO, IEC, and ISO/IEC Standards

1.2.3.3 ISO, IEC, and ISO/IEC Standards ISO, IEC, and ISO/IEC standards can be purchased online in print or electronic format from:

https://webstore.ansi.org

NEMA Standards

Copies of NEMA standards can be obtained from:

National Electrical Manufacturers Association
1300 North 17th Street, Suite 900
Rosslyn, VA 22209-3801

1.3 General Statements

The remainder of this document is broken into the following chapters:

- General
- Document Numbering
- Parts of Documents
- Formats
- Management of Intellectual Property
- Front Matter
- Content Outlines

1.4 Terms

For the purposes of this document, the following terms and definitions apply. Terms not defined here are used in accordance with their definitions in ISO/IEC/IEEE 24765. Words not defined

here or in ISO/IEC/IEEE 24765 are used in accordance with their definitions in *Webster's New Collegiate Dictionary*.

Advanced Transportation Controller (ATC)	**The ATC family of standards that defines a transportation field devices designed for traffic control. The ATC family includes the standards for the traffic signal controller, application programming interface (API) and the field cabinet system.**
Informative	Information that is considered to be useful to readers but does not constitute a requirement that must be conformed to
Intelligent Transportation Systems (ITS)	The application of advanced information processing and communications, sensing, and control technologies to surface transportation with the objective of promoting more efficient use of the existing highway and transportation network, increasing safety and mobility, and decreasing the environmental cost of travel.
National Transportation Communications for ITS Protocol (NTCIP)	The NTCIP is a family of protocols that provide common control and data collection services as well as accommodating various system topologies and data routing duties. The NTCIP will support not only currently deployed systems, but new systems and technologies as they become available.
Normative	That which must be conformed to. "Normative References" are those references which are considered an integral part of the standards publication and by inclusion therein are adopted by the standards publication. "Normative Annexes" are those annexes which are considered an integral part of the standards publication, but most appropriately organized separate from the main body of the standards publication. [Definition from NEMA NS_1-2005, Clause 1.3 Definitions]
NTCIP base standard	NTCIP standards publication that specifies a significant number of requirements directly within the text of the standard; it can also include normative references where additional requirements are defined.
NTCIP document	Any document that has been approved by the NTCIP Joint Committee
NTCIP policy	NTCIP document that provides information on the development and maintenance of NTCIP documents
NTCIP process, control, and information policy	NTCIP policy that defines management policies for processing, controlling, and/or managing the information standardized by NTCIP
NTCIP profile	NTCIP standards publication that specifies requirements by primarily referencing requirements from other standards typically to combine multiple standards into a useful composite solution; additional requirements can be specified directly as needed to properly join the multiple standards
NTCIP registry	NTCIP policy that assigns identifiers to managed items
NTCIP report	NTCIP document that only contains informative information for the ITS community
NTCIP standards publication	NTCIP document that contains normative information for the ITS community

Abbreviations

AASHTO	American Association of State Highway and Transportation Officials
ATC	Advanced Transportation Controller
ITE	Institute of Transportation Engineers
ITS	Intelligent Transportation Systems
MIB	Management Information Base
NEMA	National Electrical Manufacturers Association
NTCIP	National Transportation Communications for ITS Protocol
PDF	Portable Document Format
TRF	Testing Requirements Form
TMDD	Transportation Management Data Dictionary

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DOCUMENT NUMBERING AND CONFIGURATION MANAGEMENT

Terminology Hierarchy

The NTCIP defines the following hierarchy of terms when making collective reference to NTCIP documents. In the figure below, the term above collects the terms below the higher term.
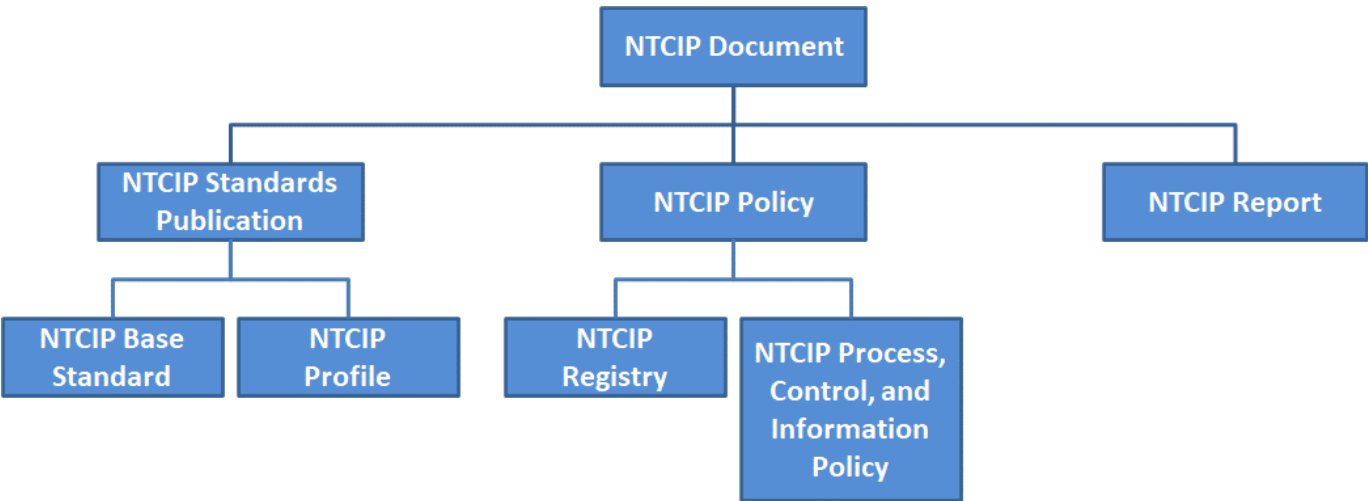

Figure 1 NTCIP Document Terminology Hierarchy

The collection on NTCIP documents is also called the "NTCIP family of documents" to show the association of the NTCIP trademark and to differentiate the NTCIP from other standards publications of AASHTO, ITE, and NEMA.

Document Numbering Scheme

The NTCIP documents, as well as the Advanced Transportation Controller (ATC) documents, are assigned four-digit numbers from the following reserved ranges of numbers, based on the expected content of the proposed work item to which the number is assigned. The assigned number series is defined in Table 1. The NTCIP Coordinator serves as the document number registrar.

Table 1 NTCIP Document Number Series Assignments

Number Series	Description
1000	NTCIP foundational standards (Base Standards).
1100	NTCIP protocol base standards define the basic details of data handling.
1200	NTCIP object definitions for transportation management devices.
1400	Formerly used for Transit Communications Interface Profile (TCIP) standards. This standards development activity has been transferred to the American Public Transportation Association (APTA). Status is to be determined.
2000	NTCIP profiles are standards that reference one or more other standards to define the details of implementation, or to express a higher-level view of the major functional aspects of communications. In general, profiles are used to define how to combine a set of base standards to achieve a specific set of functionality. The profiles will often require the implementation of certain optional features of base standards to ensure interoperability of the desired features. Profiles are useful as they provide an unambiguous definition of how to implement base standards. The only standard published in this series was NTCIP 2001 which has been rescinded. It was a rename rename of TS 3.3:1996 under the previous NEMA standards identification method. There are three other series of profiles for subnetwork, transport, and application.
2100	NTCIP subnetwork profiles define the standard combinations of Data Link and Physical Layer protocols as used within NTCIP systems.
2200	NTCIP transport profiles define the standard combinations of Transport and Network Layer protocols as used within NTCIP systems.
2300	NTCIP application profiles define the standard combinations of application, presentation and session layer protocols as used within NTCIP systems.
2500	NTCIP Center-to-Center (C2C) information profiles. Need input from Center-to-Center WG if this series should still be maintained. Status of this series is to be determined. Old Notes: 2500 work item withdrawn by the C2C WG in October 1999; other profiles drafted] Center Information Profiled define how to implement a Center-to-Center Message Set (e.g., NTCIP 1301) over an Application Profile (e.g., for DATEX, NTCIP 2303).
5100	Reserved for Transportation Management Data Dictionary (TMDD) use. Values 5100 through 5199 are reserved for TMDD and related standards publication designation. Currently, TMDD is under a different numbering system. Input is required from the Center-to-Center WG. Status of this series is to be determined.
5200	Reserved for ATC standards use. This series is for ATC traffic signal controller documents.
5300	Reserved for ATC standards use. This series is for ATC transportation field cabinet system documents.
5400	Reserved for ATC standards use. This series is for application programming interface documents.
7000	Registries list identification numbers, parameter values, keywords, etc. that are used to identify and distinguish various features and options within the protocols.
8000	NTCIP Process, Control, and Information Management Policy documents for the NTCIP standards program.
9000	NTCIP informational reports including tutorials, studies, and guides that help with the adoption and advancement of NTCIP communications.

Any assigned numbers shall not be re-used until the end of the range or series is reached.

Version and Edition Configuration Management

All NTCIP documents have the same basic naming convention. The full title of any NTCIP approved or published document is of the following format, with explanations as below:

NTCIP NNNN version MMA *Title in Italics*

The full title of any NTCIP draft or recommended document is of the following format, with explanations as below:

NTCIP NNNN vMMA.RRa Stage *Title in Italics*

Where:

NNNN = the four digit number of the standard. See the document numbering scheme in Section 2.2.

vMMA = the lower case letter "v" for version, followed by a two digit major version number. If the major version number is v01 to v09, a leading zero is used as a placeholder. "A" represents an optional letter where a standard is published with the same major version number that was previously published.

.RR = the character "." followed by a two digit minor revision number.

a = the publication edition, which may include revision to the front matter and formatting to prepare the document for publication.

Stage = the stage of development. The development stage shall be the stage spelled out, or a letter code as the suffix. The letter codes shall be Working Group Draft (WGD), User Comment Draft (UCD), and Recommended Standard (RS). If the document is being submitted for ballot to a new stage, the proposed document stage shall be preceded by the word "PROPOSED." For the various minor version numbers within the WGD stage, the Stage text or document filename may also include notes on the revision date, author or reviewer's initials, or other differentiating text.

The standard number is a number assigned by the NTCIP Assigned Numbers Authority (NANA) after the Joint Committee approves the proposal to develop the standard. The NEMA NTCIP Coordinator is the NANA. The major version number is the next most important component of the identifier for an NTCIP document. When referring to NTCIP documents within text, the document identifier can be presented in any of the following syntaxes: NTCIP NNNN version MM, or NTCIP NNNN vMM, or version vMM, or version MM. The following are not proper references: "version 1", nor "version v1", nor "Version One".

As of 2008, the year of Joint Approval was removed from the document identifier to focus attention on the major version number and to avoid confusion with the month and year of publication.

The minor version revision number is used to unambiguously reference a specific minor version of the body of the document during the development process.

The major and minor version numbers shall be incremented according to the following rules.

a. The major version number shall be incremented (and the minor version reset to "01") upon commencement of an effort to revise a previously published version when:

b. the WG plans to revise normative content beyond what can be considered as a maintenance update (e.g., clarification, editorial corrections, etc);

c. the WG plans to significantly re-organize the existing content.

d. The minor version number shall be incremented (and any publication edition letter removed) during the development and maintenance of any numbered NTCIP document when:

e. any change is made to normative or informative text in the body of the document, and after a previous version of the document had been distributed to others, even if the distribution was only to one other person;

f. twelve months have elapsed, and the document is still being developed, and has not yet been accepted at the next development stage;

g. text from an approved amendment is incorporated into the body of the document.

h. The publication edition letter is added/incremented when:

i. Any change is made to the document other than to the body of the document (e.g., changes to the title page, front matter, or header/footer text).

Final edits during the publication process can result in updates to the minor version number and/or edits to the publication edition due to multiple reviews.

Use of Amendments Discontinued

As of 2008, drafting an Amendment to NTCIP standards publications is not recommended. The NTCIP standard shall be revised by drafting the next major version number. This section is here as a historical reference only.

a. Amendments to NTCIP standards publications have consecutive numeric Amendment numbers as a suffix to the four-digit document number, plus a single, two-digit minor version numbers for configuration management, e.g., "1205 Amendment 1 v10". There would never be a new "major" version number of an amendment; the next amendment number, like Amendment 2, would be assigned.

b. When an amendment is offered for any of the stages of User Comment review or acceptance or ballot and approval, the amended portion can either be presented as a separate document with notes to "replace the text at subclause 9.9.9 with the following amended text," or if the amendment covers a larger scope and multiple subclauses, the amendment can be presented in the context of a revised document.

c. The Title Page shall show "Amendment 1 v00 to NTCIP 0000 v01.11" to indicate the last Jointly Approved standard that is being amended.

d. When the amendment is also Jointly Approved, the amended standard shall have the minor version incremented, and the title page shall show that the Amendment is incorporated. To help avoid confusion with only a single digit change, the minor version can be incremented to the next tens-place. For example, 1299 v02.15 has been Jointly Approved and published; Amendment 3 v07 to v02.15 achieves Joint Approval; then 1299 v02.21 is published that "includes Amendment 3."

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PARTS OF NTCIP DOCUMENTS

Major Parts

This section specifies the major organizational parts to be included in NTCIP documents. This section has the greatest application to NTCIP standards publications but can be used to define the organization and outline of other NTCIP documents.

The major parts of an NTCIP publication are listed below in the order in which they should appear. Not all parts are required in all publications (see Section 3.2).

a. Document Soft Cover Page

b. Title Page

c. Notices

d. Acknowledgements

e. Foreword

f. Introduction

g. Table of Contents

h. (Normative Standards) See Annex B for a detailed outline and example of the main body of NTCIP 1200-series normative standards publications.

i. General section listing references, terms, abbreviations, and context figures

j. Section(s) of normative specifications

k. Section(s) of informative guidance

l. Annexes, with normative first and informative after, or greatest longevity first and least longevity last

m. Index

Guidance on Major Parts

Soft Cover Page

The publishing agent shall add the cover page. Working groups shall leave the cover page off of draft documents.

The cover shall contain the same information as specified in NEMA NS-1 subclause 3.5.1 but shall use the NTCIP cover design with the logos of AASHTO, ITE, and NEMA.

Title Page

All NTCIP publications, whether draft or final, shall include a title page.

The title page shall be consistent with NEMA NS 1 subclause 3.5.2, except as follows:

a. The page shall indicate the status of the document by including one of the following captions at the top of the page:

b. "Proposed Draft"

c. "Working Group Draft"

d. "Proposed User Comment Draft to the Joint Committee on the NTCIP"

e. "User Comment Draft"

f. "Revised Working Group Draft"

g. "Proposed Recommended Standard Draft to the Joint Committee on the NTCIP"

h. "A Recommended Standard of the Joint Committee on the NTCIP"

i. "A Joint Standard of AASHTO, ITE, and NEMA"

j. The date, including the month, date, and year shall appear below the title for draft documents. For final published documents the date shall have the form "Published *Month Year*."

k. If the document may be known as some other standard number (e.g., TS 3.6), the alias numbers shall be listed below the date.

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p. The names and addresses for AASHTO, ITE and NEMA shall be provided.

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This front matter section shall only be present for draft documents. The title shall be title case, bold and centered on the page and will indicate the document identifier (e.g., **"Minor Version Revision History for NTCIP 8002 v02** "). The content of this section shall be a table listing the revision number, date, author, and description of change with the latest change on top.

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The title of this front matter section shall be uppercase, bold and centered on the page (i.e., **"NOTICES"**). It shall begin on the first odd page (right side of a book) following the title page and consist of the subparts described below. There are no numbered headings used in the construction of the Notices section, Subparts can be omitted if the document does not contain relevant material.

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d. the description field may be modified but only to the extent that: 1) the more restrictive subrange is defined; and 2) only those bit values or enumerated values that are supported are listed.

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c. if the PRL or RTM excerpt is made from an unapproved draft, add to the citation "PRL (or RTM) excerpted from a draft standard containing preliminary information that is subject to change."

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a. 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.";

b. you may not modify the logical flow of any test procedure, without clearly noting and marking any such modification; and

c. 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 title of this subpart of the Notices section shall be capitalized, bold and left justified on the page (i.e., "**Content and Liability Disclaimer**"). The following text shall be included:

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 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

The title of this subpart of the Notices section shall be capitalized, bold and left justified on the page (i.e., "**Trademark Notice**"). The following text shall be included:

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

See Annex A for further specifications and examples.

Acknowledgements

NTCIP standards publications with document numbers in the 1000-range and 2000-range shall contain an acknowledgement page. An acknowledgements page is optional in other NTCIP publications, such as 9000-series information reports, or amendments.

The acknowledgements page shall recognize the individuals and organizations that contributed to the development of the most recent major version of the document. The contributors shall be grouped and arranged in general order of importance, with the most important group (e.g., the

individual WG members, researchers, authors, drafters, editors) first. Within each group, the names shall be listed alphabetically. The chair(s) shall be identified. Doctoral degrees and professional license suffixes may be included. Other job titles and employer names should not be included.

Other lower-order groups of contributors and reviewers may include: agencies providing funding used to develop the standard (e.g., the U.S. DOT / Federal Highway Administration), organization names that contributed but where individuals are not known or wish anonymity, standard development organizations, the NTCIP Joint Committee, and any other participants that the WG may wish to recognize.

In the event of a change in membership, change in chairperson, or death of a contributor, the individual's name shall continue to be listed if they contributed to the most recent major version, and their change in status occurred between the prior and recent versions. The prior chair can be identified (e.g., past Chair). Other symbols (e.g., the dagger symbol) or dates or references shall not be used to indicate a former status or a change in status. The purpose of the acknowledgements is to provide a simple "thank you;" we do not wish to confuse the publication's users.

In the event of the death of an important contributor, a single dedication sentence may be added as the last paragraph of the acknowledgements (e.g., This publication and version is dedicated to the memory of FirstName LastName).

Foreword

All NTCIP publications, except amendments, shall contain a foreword.

The foreword shall consist of the following parts:

a. The address to which to send comments

b. A definition of how the document relates to other standards. Where possible, this should be supplemented by a graphic indicating its position in the ISO seven-layer model

c. A listing of any annexes included in the document

d. A listing of any aliases of the document (e.g., formerly known as…)

e. An identification of the document type (e.g., standard, guide, etc.) and a map to AASHTO/ITE/NEMA document types (See NTCIP 8001 Clause 3.6)

f. A reference to the NTCIP website with an alternate way to get a dated hardcopy of the website information

g. A reference of how to obtain a copy of the standard electronic MIB (for Data Dictionaries only)

h. List of Revisions. When an NTCIP standard is revised, a list of Clauses containing edits from the previous version shall be provided along with the page number where the change can be found.

Introduction

All NTCIP publications, except amendments, shall contain an introduction.

The introduction shall consist of the following components:

a. A metrification statement

b. An abstract

c. A keyword list

d. A brief history of the document development, including the first meeting date but not the number of meetings.

Table of Contents

All NTCIP documents, except for amendments, shall have a table of contents. The table of contents shall be consistent with NEMA NS 1 subclause 3.5.4.

Main Body

The body of the document shall be contained in the main section(s). Each section shall be independently numbered.

General Section

The first numbered section (Section 1) of all NTCIP standards and profiles shall be the general information section.

The general information section shall contain the same information as specified in NEMA NS-1 subclause 3.5.9.

The treatment and syntax for Normative and Informative references is specified in the subclause below.

The terms section shall list terms in a table with the first column set at 1.75 inches.For DEFINITIONS, a word or term shall be defined in only a single NTCIP standards publication. When the same word or term appears in other NTCIP standards publication, the definition(s) in the other standards publications shall preferably be a reference, such as "See NTCIP 0000 MM.NN, subsection 1.X.;" or be excerpted and reprinted with the attribution "Reprinted from NTCIP 0000 MM.NN, subsection 1.X." Working Groups shall harmonize the appearance of definitions to locate or relocate a definition in the most appropriate and logical type of NTCIP standards publication, and then to make reference to the new home location in the next

edition(s) of the other standards publications. [Added 071026 per BSP2 WG recommendation to the JC regarding "deprecation."]

Annex

NTCIP documents may contain annexes as appropriate. Annexes shall conform to the requirements as specified in NEMA NS-1 clause 3.6.

Index

NTCIP documents may include an index if it would significantly aid the reader.

Treatment of Normative References

The rules concerning normative references are given in ISO/IEC Directives Part 2, Clauses 10 and 15, except as described below.

Policy

The subclause on "Normative References" should list all standards publications, including all available configuration management information (document numbers, version numbers, approval year, etc.) from which the referenced specifications are made or excerpted in other normative subclauses.

For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

3. No standards publication shall be elevated to an approval stage higher than the lowest stage of any normative reference made in the standard. [Vince -- does NEMA or ANSI explicitly state this in their P&P?] [em061213] See NTCIP 8001 draft Annex C2, QC Checklist, row C2.03.

Form

The list shall be introduced by the following wording:

"Normative references contain provisions that, through reference in this text, constitute provisions of this NTCIP document. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this NTCIP document are encouraged to investigate the possibility of applying the most recent editions of the standards listed."

The correct form for the normative reference is the complete and unambiguous syntax to be used in the citation of the reference. [Vicki -- Any good examples?] After selecting a normative reference, the draft author shall explicitly indicate what parts are included, to comply with the "... in whole or in part AS INDICATED, ..." part of the instruction. [em061213]

For dated references, each shall be given with its full version number and year of Joint Approval. In the case of drafts or Recommended documents, give the latest full version number together with a suffix "To be published.", and full title.

When a reference is to all parts of a document, the publication number shall be followed by the indication "(all parts)" and the general title of the series of parts (i.e. the introductory and main elements). When a reference is to certain parts, sections, or clauses, the publication number shall be followed by the indication of which parts "(Subclause 2.2)." [based on ISO/IEC Dir 2001 Part 2, 6.2.2]

Configuration Management of Reference Notices and Agreements

Configuration Management practice should be applied to the normative references on "both sides" of the subject standards publication. That is, the policy in the above subclauses shall be applied to the Normative References listed in the subject standard.

The NTCIP WG shall send a notice to the authoring committee or publishing SDO for all listed Normative References, and notes shall be recorded of the agreements made.

Notices shall be received by the authoring NTCIP WG, and agreements issued by NEMA, to have the authoring WG's standard included as a Normative Reference in the document of the other body. Notes shall be recorded of the agreements made, such as in an annex.

An optional, informative annex should be considered which lists the other documents known to include the subject standard as a normative reference. Then when any maintenance or approval actions are taken with the subject standard, there will be a convenient list of the other WGs, committees, or SDOs which may be affected by the maintenance action. The other WGs, committees, or SDOs should be notified to seek their input, or to inform them that a new version will be available for them to consider an update or revision in their own document.

Following the configuration practice of notices and agreements allows the chain of dependencies to be more clearly identified, and thus schedules can be coordinated and revisions planned.

Sample annex title:

ANNEX N
List of Other Known Standards Publications Citing NTCIP 0000 as a Reference

The creation and maintenance of a citation annex depends somewhat on the knowledge of the WG members, and the known agreements obtained by the authors or publishers of the citing documents.

Guidance

There are four steps in creating well-documented and explicit normative references, which include:

a. Explicit reference to SDO, document number, version, edition, and last known approval stage when draft written.

b. Coordination of approval stages, for either "Other SDOs" or "In house / Within the Family" documents.

c. Reference with limits and amendments. Exactly which subclauses of the normative reference apply? And where do those subclauses apply in the subclauses of the referencing document? And how is the norm ref amended in its application to the target / referencing doc?

d. Has the owner of the norm reference been notified of the dependency, or permission requested to excerpt material?

Treatment of Informative References

The list shall be introduced by the following wording:

"The following documents and standards may provide the reader with a more complete understanding of this NTCIP document. However, these documents do not contain direct provisions that are required by this NTCIP document. "

On-Line References

Registries are the only on-line reference currently defined by the NTCIP effort. On-line references shall consist of a home page containing the following links:

- Acknowledgements
- Foreword
- Introduction
- Registry Tables (one for each major category)

In addition, the home page shall also include the copyright statement defined in Clause 4.2.

The acknowledgements, foreword, and introduction shall be as defined in Clause 3.2.3 – 3.2.6.

The registry tables shall define the appropriate information for each entry.

June 21, 2025

FORMATS

General

This section specifies the formatting of the text, tables, and figures within the major parts of NTCIP documents. This section has the greatest application to NTCIP standards publications, but it can be used to define the format of other NTCIP documents.

Specifications for Title Page

See Annex A1 for Title Page layout and font specifications.

Pagination

NTCIP standards publications shall be published in two media—hardcopy, soft-covered, saddle-stapled format, and Adobe PDF™ electronic format. Because of the hardcopy format, pagination shall specify odd and even pages. When a saddle-stapled hardcopy document is open to interior pages, the even page shall be on the left, and the odd page shall be on the right.

The electronic format shall use the same even and odd pages and numbering of the hardcopy format.

The front matter NOTICES shall begin on the next page after the Title Page. In the hardcopy format, the NOTICES will be printed on the reverse of the Title Page.

The page numbering shall be consecutive lower case Roman numerals for the front matter ACKNOWLEDGEMENTS and subsequent pages. The page numbering shall be consecutive Arabic numbers for the sections and annexes. Consecutive numbering of all pages is considered to aid the document users. The "1-1" and "A-1" page numbering shall not be used.

Blank pages. Blank pages shall be inserted so that only the following content is placed on an odd page: CONTENTS, Section 1.

Specification for Front Matter

Annex A2 specifies the templates for the organization and content of the Front Matter for NTCIP standards publications. The front matter includes the Notices, Acknowledgements, Foreword, Introduction, and Table of Contents. Reference the Annex A1, A2, or other A-numbered annex for

the content and organization the front matter of the different numbered series of NTCIP standards publications.

Headers. There shall be no header on the pages with NOTICES. There shall be odd and even page headers with lower case Roman numeral page numbers for the pages with ACKNOWLEDGEMENTS, FOREWARD, INTRODUCTION, and CONTENTS. All front matter major headers shall be capitalized.

Footers. There shall be odd and even page footers on all the front matter pages.

Header and Footer Content

All 1000-, 2000-, and 8000-series NTCIP standards publications shall include a header and footer on all pages with normative and informative text, figures or tables, or pages intentionally left blank.

The header text is set in 10 point Arial. The document number, version, and page number should be as readable as the text.

The footer text is set in 9 point Arial. The copyright and duplication statement typically repeats for many pages and should not distract from the text.

The header and footer text shall be placed as follows:

- Headers. On odd pages, right justified, on the first line — the NTCIP document number plus the major.and minor version number. On the second line — Page and the page number. On even pages, the document number and Page number are left justified.
- Footers. On odd pages, the copyright "© YYYY ORG / ORG / ORG" shall be left justified, and the duplication warning or permission shall be right justified. On even pages, the copyright "© YYYY ORG" shall be right justified, and the duplication warning or permission shall be left justified. Therefore, on facing, hardcopy pages, the copyright is close to the gutter, and the duplication warning or permission is more visible on the outside edge

General Specifications for Headings

The document section headings shall be as shown in Table 2.

Table 2 Section Heading Specifications

Heading Type	Style Name	Arrangement	Typography
Section	Heading 1	Section 2 SectionName	Arial Bold, 12pt, centered
Subsection Level 1	Heading 2	1.1 SubsectionName	Arial Bold, 10pt, left-aligned
Subsection Level 2	Heading 3	1.1.1 SubsectionName	Arial Bold, 10pt, left-aligned
Subsection Level 3	Heading 4	1.1.1.1 SubsectionName	Arial Bold, 10pt, left-aligned
Subsection Level 4	Heading 5	1.1.1.1.1 SubsectionName	Arial Bold, 10pt, left-aligned
Additional minor section levels done in a similar fashion.			
Major Annex	Currently done different ways	Annex A AnnexName	Arial Bold, 12pt, centered
Sub Annex Level 1	TBD	A.1 SubAnnexName	Arial Bold, 10pt, left-aligned
Sub Annex Level 2	TBD	A.1.1 SubAnnexName	Arial Bold, 10pt, left-aligned
Sub Annex Level 3	TBD	A.1.1.1 SubAnnexName	Arial Bold, 10pt, left-aligned
Sub Annex Level 4	TBD	A.1.1.1.1 SubAnnexName	Arial Bold, 10pt, left-aligned
Additional sub annex levels done in a similar fashion.			

General Specifications for Text

The presentation (fonts, sizes, etc.) of text shall conform with NEMA NS 1 Section 4 and NS 1 Annex A, with the following exceptions:

a. Font. All text (headers, text, section titles, table titles, and figure titles) shall use the Arial font. The Title Page text shall use a combination of Arial and Arial Black as specified on the design template. MIB text shall use the Courier New font to set the MIB apart from the subclause headings and other sections.

Indenting. The first line of each paragraph shall not be indented.

Justification. All paragraph text in subclauses shall be Left Justified. All MIB text shall be Left Justified. Distribution Notices and sidebars and pull quotes can be Left-and-Right Justified to set these text blocks apart from the body of the document. The headings and footers shall be justified as above.

Tabs. There shall not be a tab stop at 0.25 inches.

Figure Title. The figure title shall be set in Arial, bold, 10 point type, with initial capitalization of each word except articles.

Table Title. The table title shall be set in Arial, bold, 10 point type, with initial capitalization of each word except articles.

Style Guidance

Writing styles shall be consistent with NEMA NS 1 Section 5, except as noted.

Dashes

Dashes are of three increasing lengths: the hyphen, the en-dash, and the em-dash. The intended use for each type of dash is described in Table 3. In the case of MIB modules, use care when selecting the type of dash, and whether the type of dash is located outside the MIB module text or is part of the MIB module.

Microsoft Word has AutoCorrect options that are enabled by default that may change a hyphens into en dashes.

The AutoFormat rule assumes that spaces are used either before or on both sides of dashes, and that text appears after or on both sides of hyphens. Therefore, if a space appears before a hyphen, Word replaces the hyphen with an en dash. If text appears before a hyphen, Word makes no change.

To work around this issue, use one of the following methods:

- If you want to use hyphens before and after your text, click AutoCorrect Options. This appears when you move the pointer over the corrected hyphen. Then, click Undo Dash.
- When you use AutoCorrect Options, you can also click Stop Automatically Creating Dashes, or click Control AutoCorrect Options to open the AutoCorrect dialog box.
- If you want to use en dashes instead of hyphens, insert a space before the hyphen. Word will automatically convert the hyphen into an en dash.

[Source: https://support.microsoft.com/]

Table 3 Specifications for Dashes

Form of Dash and Glyph	Use	Examples
hyphen -	a minus sign, a dash in ASCII computer files, to form compound words and adjectives; to form section and sequence numbers of figures and tables.	anti-inflation, self-motivated, e-mail Figure 1-2
two adjacent hyphens --	to start a comment in the MIB module, which is then terminated by an End Of Line (EOL).	-- The MIB compiler ignores this.
en-dash – one-half the width of an em-dash	a closed range of values; use without spaces if there is no confusion; compound adjectives of hyphenated words; instead of a colon to introduce a list, and to separate an introductory label in a heading or title (use with spaces to avoid confusion or an odd look). (spaced en-dashes are preferred in NTCIP documents over em-dashes)	pp. 38–55 Allowed Values 0–255 post–MS-DOS era Scenario 2 – Showing the System Components July 3 – August 15
em-dash — the width of the typeset letter "M"	a sudden break in thought, or to separate a parenthetical statement; to separate a NOTE, or NOTES, or other ALL UPPER CASE WORD, and the text that follows. (if using an em-dash, use a spaced em-dash)	The main idea of the sentence — in spite of the interruption — continues outside the em-dashes. NOTE — Notes should be avoided when possible, but when used include a spaced em-dash.

The en-dash and em-dash shall only be used in the clause, table, and figure text of NTCIP documents. Do not use en-dash and em-dash hyphens in the MIB section text of NTCIP documents. MIB compiling syntax errors occur with using two adjacent hyphens to end a comment, or to "comment-out" parts of an object definition, or when a line of hyphens is used to separate a MIB module section, or hyphens are used to draw an ASCII box figure.

There are other conflicting rules for the use of hyphens, such as hyphens being disallowed in MIB module identifiers. See NTCIP 8004 for additional guidance.

Here are other examples of hyphens forming compound adjectives. It's long-distance service, but it is a long distance to Tipperary. [from Dan Bart, TIA, email 2007]

Next-Generation Networks (NGN) that will affect the next generation. Dedicated Short-Range Communications technologies are done in IEEE.

Hearing-impaired services to benefit the hearing impaired.

If adjectives can independently modify the associated noun, like small, red, sports car, not compound; but if they only make sense coupled together since independently they do not make

sense, like small, red, low-cost sports car, then a hyphen should be used. Neither "low car" nor "cost car" make sense.

Electronic Format

Final electronic versions of NTCIP documents shall be in Microsoft Word™ format. Electronic MIB files shall be distributed in ASCII text format. All other NTCIP documents that are distributed electronically to the public shall be in Adobe PDF™ format.

June 21, 2025

MANAGEMENT OF INTELLECTUAL PROPERTY

Original contributions to NTCIP Documents

The writers and publishers of NTCIP standards publications shall comply with all U.S. and international copyright law. See the NTCIP Web site for additional information.

AASHTO, ITE, and NEMA have agreed on the terms and conditions for rights and procedures as specified in the MOU on Copyright, Trademark, and Publishing Administration.

The NTCIP Joint Committee members, WG members, expert consultants, and document editors are all instructed that in accordance with AASHTO, ITE, NEMA, and NTCIP policy, their contributions to NTCIP documents are the intellectual property of AASHTO, ITE, and NEMA, unless otherwise provided.

Claiming NTCIP Copyrights

All NTCIP standards publications shall include a copyright statement as shown in Annex A or Annex B.

Data Dictionary Standards (1200 series) shall include a MIB distribution statement as shown in Annex A and all Profiles (2000 series) shall include a PICS distribution statement as shown in Annex A.

Registries (7000 series) and Process, Control, and Information Management Policies (8000 series) shall be posted on the NTCIP Web site, but shall include a copyright statement shown in Annex B.

Informational Reports (9000 series) shall be posted on the NTCIP Web site. However, in order to ensure that the information is not used out of context, the title page shall display the following copyright statement:

[2003 Revision for 9000 series] © 2003 AASHTO / ITE / NEMA. All rights reserved. Permission to copy without fee all or part of this Information Report is granted for the following noncommercial use, without editing or modification: (a) downloading the electronic file, and making up to 30 copies of the file by electronic mail distribution or disk reproduction; (b) printing one copy, and reproducing and distributing up to 30 printed copies; and (c) excerpts limited to 5 or fewer pages. Provided that all the foregoing use includes the © AASHTO / ITE / NEMA

copyright notice; along with a notice that the copy is reprinted with permission; and along with the title, document number, and date; all of which appear on each copy. Permission is not granted for the following use: (i) republishing in compendiums or anthologies; (ii) publishing excerpts in commercial publications or works for hire; (iii) display in electronic storage devices or methods on networks; and (iv) in translations to other languages. Other use requires prior written consent; see the Request form in the www.ntcip.org Library.

The Copyright Date

The year of copyright ("© 20YY") included in the Copyright Statement in the front matter and in the document footers, shall be:

- for stages WGD and UCD, the year the draft was last authored or revised. This draft then shows the year that copyright may be claimed. Alternatively for drafts, no year need be listed, only "© AASHTO / ITE / NEMA."

- for stage RS or for Recommended Information Reports, the year the proposed document was accepted as Recommended by the Joint Committee. Again, this document then shows the year that copyright may be claimed. If a Form TX is filed for a Recommended Information Report, the year shall be the year of filing Form TX.

- for Jointly Approved standards, the year of filing Form TX with the U.S. Copyright Office.

For WGD and UCD documents undergoing multi-year development, only the single, most recent year of authorship or revision shall be shown. Multi-year ranges, such as "200X-200Y," shall not be used.

For documents with new major versions, the copyright shall list two or more years, including the first year of Form TX filing for the first major version, and the single most recent year of authorship or revision. When the new major version is Jointly Approved, the additional copyright year shall be the year of filing Form TX.

For example, 120N v01.17 was Jointly Approved in 1998, and a new major version WGD was started in 2002. The copyright line would list "© 1998 and 2002 AASHTO / ITE / NEMA." If the revision work continued from 2002 into 2003 and 2004, the drafts in each of those years would list "© 1998 and 2003" and "© 1998 and 2004" when each minor version was authored in that year.

For another example, 120N v03.09 was Jointly Approved in 2007. The copyright line in v03.09 would list "© 1997, 2003, 2007 AASHTO / ITE / NEMA" for the three Form TX filing dates of the Jointly Approved and published major versions.

Permission to Excerpt and Reuse in NTCIP Documents

To be drafted.

Permission to Excerpt Or Reprint From NTCIP Documents

To be drafted.

June 21, 2025

Annex A Title Page and Front Matter

A.1 Title Page
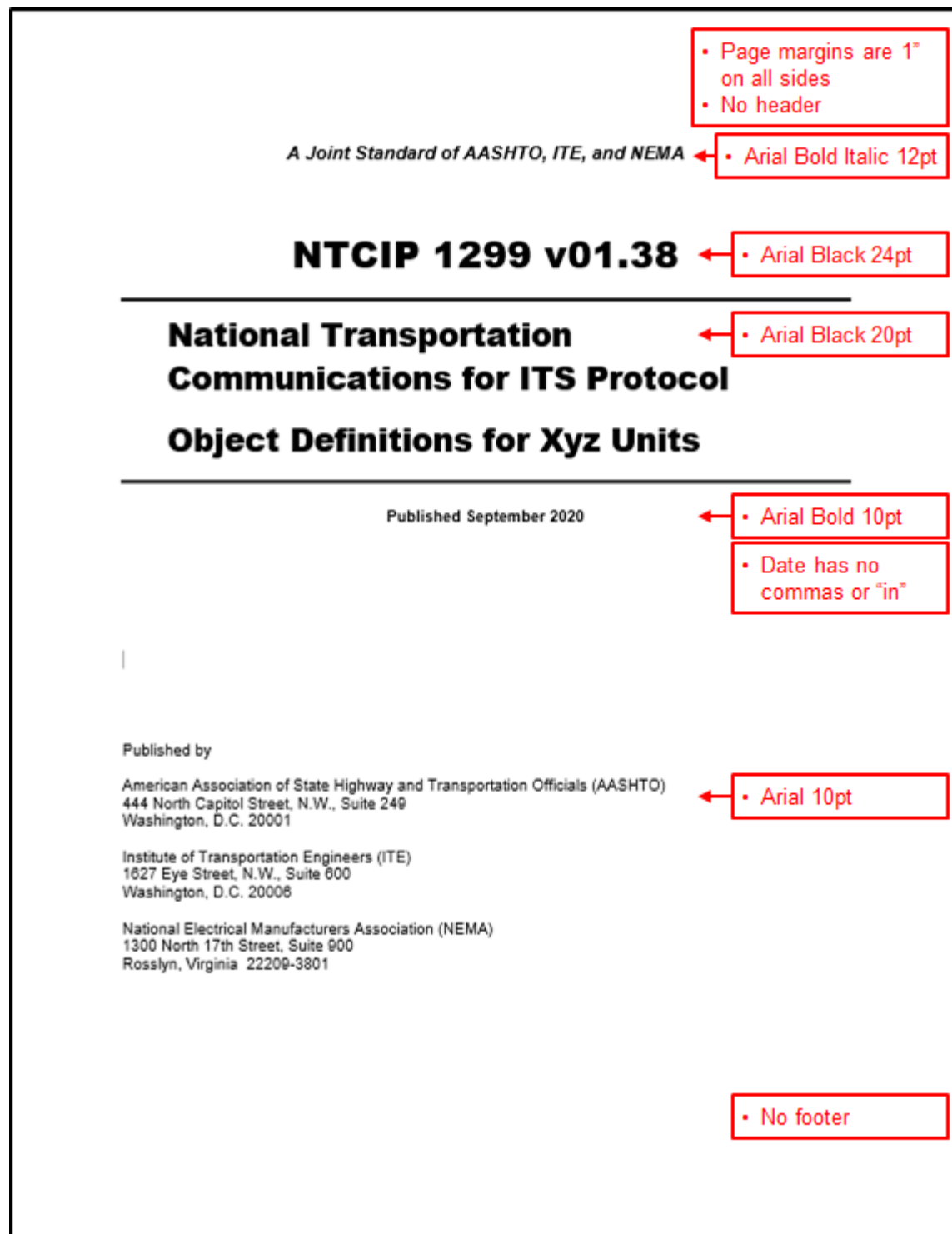
Figure 2 Example Title Page (Front)

- Page margins are 1" on all sides
- No header
- Blank page for published documents.

<This page intentionally left blank.>

- No footer
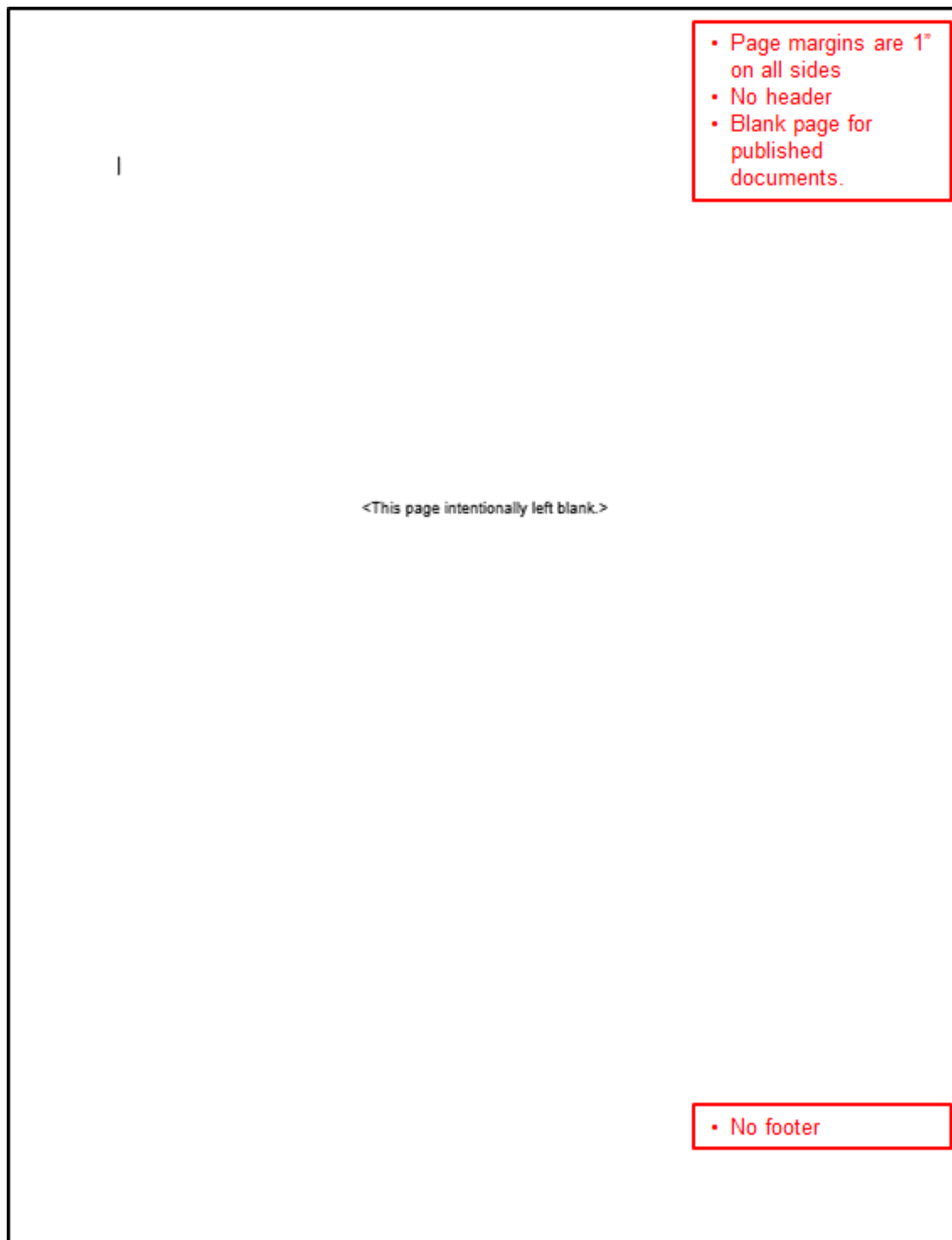
Figure 3 Example Title Page (Back) − Used for Published Documents

- Page margins are 1"
  on all sides
- No header

Recent Minor Version Revision History

Revision	Date	Author	Description (latest on top)
NTCIP 1299 v01.37	05/25/2020	Tatis	Recommend Standard (RS) accepted by NTCIP Joint Committee. Minor changes for dates and cover page.
NTCIP 1299 v01.36	05/05/2020	Machado	Proposed Recommend Standard (pRS) submitted to the NTCIP Joint Committee by the Xyz Working Group.
NTCIP 1299 v01.35	08/25/2021	Chronenworth	Working Group Draft (WGD) for review within the Xyz WG.

- For unpublished
  draft documents,
  this page may be
  used for a list of
  recent changes

- No footer

Figure 4 Example Title Page (Back) - Option for Listing Recent Changes in Unpublished Documents

A.2 Notices

Figure 5 Example Notices Pages

· Arial Bold 10pt

b) the copies or derivative works are not made part of the standard publications or works offered by other standard developing organizations or publishers or as works-for-hire not associated with commercial hardware or software products intended for field implementation;

c) use of the DD or MIB is restricted in that the SYNTAX fields may only be modified to define: 1) a more restrictive subrange; or 2) a subset of the standard enumerated values; or 3) a set of retired and defined enumerated values for systems supporting multiversion interoperability;

d) the description field may be modified but only to the extent that: 1) the more restrictive subrange is defined; and 2) only those bit values or enumerated values that are supported are listed. [from 8002 A2 v04]

These materials are delivered "AS IS" without any warranties as to their use or performance.

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Some states or jurisdictions do not allow the exclusion or limitation of incidental, consequential, or special damages, or the exclusion of implied warranties, so the above limitations may not apply to a given user.

Use of these materials does not constitute an endorsement or affiliation by or between AASHTO, ITE, or NEMA and the user, the user's company, or the products and services of the user's company.

If the user is unwilling to accept the foregoing restrictions, he or she should immediately return these materials.

PRL and RTM Distribution Permission

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Figure 6 Example Notices Pages (cont.)

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Figure 7 Example Notices Pages (cont.)

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Figure 8 Example Notices Pages (cont.)

A.3 Acknowledgements

Figure 9 Example Acknowledgements Pages

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Figure 10 Example Acknowledgements Pages (cont.)

A.4 Foreword

A.5 Introduction

June 21, 2025

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