# A315a: Understanding User Needs for Actuated Traffic Signal (ASC) Controllers Based on NTCIP 1202 Standard

Table of Contents

# A315a: Understanding User Needs for Actuated Traffic Signal Controllers (ASC) Based on NTCIP 1202 Standard

STANDARDS ITS TRAINING

STUDENT SUPPLEMENT

RITA Intelligent Transportation Systems Joint Program Office

## Module Description

This module is a part of the acquisition curriculum path with I101, A101, A102, A201, A202, A103, A203and C101 being the prerequisites and A315b: Specifying Requirements for Actuated Traffic Signal Controllers Based on NTCIP 1202 Standard following this module. The logical next step for the participant after taking A315a and A315b is to consider modules in the testing life cycle, which are T101, T201, and T202, which lead up to the potential T315 Applying Your Test Plan to the NTCIP 1202 Standard.

## 1. Introduction/Purpose

This module provides participants with information on how to identify their user needs for an actuated traffic signal controller (ASC).

ASC user need identification is based on what the user is seeking to accomplish; thus, each user will need to consider their needs before embarking on this task. This document provides supplemental materials that the user may find helpful when developing their user needs.

## 2. History of the Standard

- NTCIP 1202 v01: Approved in 1996
- NTCIP 1202 Amendment 1: Drafted in 1999; rolled into version 2
- NTCIP 1202 v02: Approved 2005

## 3. Reference to Other Standards

Actuated Traffic Signal Controllers

- **NEMA Standards Publication TS 2-2003: Traffic Controller Assemblies with NTCIP Requirements,** NEMA, version 2.06, May 2003.

NTCIP

- **NTCIP 1202:2005, National Transportation Communications for ITS Protocol: Object Definitions for Actuated Traffic Signal Controller (ASC) Units – version 02**, AASHTO/ITE/NEMA, v02.19f, November 2005.
- **NTCIP 9001 Version v04, National Transportation Communications for ITS Protocol, The NTCIP Guide,** AASHTO/ITE/NEMA, July 2009.

Systems Engineering

- **IEEE Std 1362-1998, IEEE Guide for Information Technology - System Definition - Concept of Operations (ConOps) Document**, IEEE, 1998.

## 4. Glossary

| Term | Definition |
|---|---|
| ASC | Actuated Traffic Signal Controller |
| Agency Specification | A document that has been prepared by an agency to define requirements for a subject item or process when procured by the agency. |
| Compliance | A condition that exists when an item meets all of the requirements of an agency specification. |
| Concept of Operations | A document that describes the purpose for a system project, including a description of the current and proposed system, as well as key user needs that the new system is required to address. |
| Conformance | A condition that exists when an item meets all of the mandatory requirements as defined by a standard. It can be measured on the standard as a whole, which means that it meets all mandatory (and applicable conditional) requirements of the standard or on a feature level (i.e., it conforms to feature X as defined in section X.X.X), which means that it meets all mandatory (and applicable conditional) requirements of the feature. |
| Dialogs | A sequence of information or message exchanges. |

## 5. Issues to be considered when developing user needs

**Response Times and Bandwidth:** Signal controllers are often monitored frequently on circuits with limited bandwidth. If signals do not respond in a timely manner, the polling cycle can be delayed, which can adversely impact the overall system. When developing your user needs, you should consider what information the users need to know and the timeliness of this data. You also need to document the administrative needs that may place restraints on enhancing the communications network so that later phases of the process can properly design solutions that balance these competing needs.

**Security:** Traffic signal controllers are safety-critical devices that should be protected from unauthorized access. The default NTCIP protocol does not provide any real security and the user should specify what level of security is needed for their equipment and the communications environment that it will use (e.g., a protected private network, the open Internet, etc.).

**Interoperability and Interchangeability:** The NTCIP 1202 standard does not provide the complete definition of requirements and dialogs; as a result, some manufacturers may impose certain rules and restrictions on data exchanges that may interfere with interoperability and interchangeability. Users should explicitly state what their goals are related to these objectives and clearly identify any products (i.e., makes and models) that the user expects to work with the new controllers.

# 6. References

Systems Engineering


- **Systems Engineering Guidebook for Intelligent Transportation Systems Version 3.0,** United States Department of Transportation, November 2009.
- **Building Quality Intelligent Transportation Systems through Systems Engineering prepared for Intelligent Transportation Systems**, Joint Program Office U.S. Department of Transportation by Mitretek Systems, Inc., FHWA-OP-02-046, April 2002. Available online at: http://ntl.bts.gov/lib/jpodocs/repts_te/13620.html Accessed March 23, 2011.


## 7. Study Questions

**Question 1: Which item is not a part of NTCIP 1202?**

a) Consistency checks
b) Information profile
c) User needs
d) Object (data) definitions

**Question 2: Which of the following can be used to discover operational needs?**

a) Regional architecture
b) Operational scenarios and stakeholder input
c) ITS standards
d) All of the above

**Question 3: Which of the following components is not part of a well-defined user need?**

a) Unique Identifier
b) Major capability
c) "Shall" statement
d) Rationale

**Question 4: Which is the best way to complete this user need? UN 5.1: Operator needs the central system to _____.**

a) Work with Manufacture X Model 1 controllers that are currently deployed as these are too costly to update.
b) Support dbErrorType, dbErrorID, dbTransactionID and dbMakeID.
c) Support backwards compatibility for older controllers.
d) Support NTCIP v01 and NTCIP v02 so that it can work with older controllers that are too costly to update.

**Question 5: The benefit of the needs to requirements table is that it:**

a) Maps needs to requirements.
b) Provides a high-level summary of the features.
c) Provides a convenient checklist during deployment.
d) All of the above.