

# **NTCIP 1202 Version 04**

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## **System Design Details (SDD)**

### **Walkthrough Plan**

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**October 6, 2024**

**In support of:** Task Order No. 693JJ322F00212N

**For approval by:** Deborah Curtis, Highway Research Engineer  
Federal Highway Administration

**For use by:** Siva Narla, Senior Director, Transportation Technology  
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## 1 Purpose

This document is the Draft SDD Walkthrough Plan (WP) to review the Draft System Design Details (SDD) for NTCIP 1202 v04.

The SDD WP is submitted as a required deliverable, *SDD Walkthrough Plan*, for Performance Work Statement (PWS) Task 4.2, Walkthrough on Draft System Design Description [Task 4.2 in the Project Management Plan] for Task Order No. 693JJ322F00212N.

A formal walkthrough is a proven method to validate a product, in this case, the user needs, requirements, and system design concepts for a proposed standard. This document is the WP to be used to review the NTCIP 1202 v04 SDD at a virtual meeting with the NTCIP Actuated Signal Controllers (ASC) Working Group along with additional stakeholders and interested parties. The ASC Working Group is made up of subject matter experts including those from public agencies, manufacturers, software providers, and consulting firms. The working group members may not provide stakeholder representation in all subject areas, so additional stakeholders, as subject matter experts (SMEs), will be invited as necessary.

The purpose of the walkthrough is to allow the ASC Working Group, additional stakeholders, and interested parties to:

- a) Find anomalies
- b) Improve the SDD Content
- c) Consider alternatives
- d) Ensure conformance to standards and specifications
- e) Ensure completeness
- f) Gain a consensus on the user needs and the other materials within SDD

The walkthrough will consist of a presentation of the SDD to attendees who may provide comments that may be resolved during the walkthrough or in subsequent activities of the ASC Working Group.

## 2 Walkthrough

### 2.1 Time and Location

The walkthrough will be a web-conference of the ASC Working Group, invited stakeholders, SMEs, and association/government liaisons. The walkthrough will be arranged by the Institute of Transportation Engineers (ITE) on Microsoft Teams.

The walkthrough will take place over three days. The walkthrough dates and times are as follows:

- Friday November 01, 2024. 11:00 AM – 3:00 PM EST
- Tuesday November 05, 2024. 11:00 AM – 3:00 PM EST
- Thursday November 14, 2024. 11:00 AM – 3:00 PM EST

### 2.2 Participants

The participants include the ASC Working Group, additional stakeholders, and other interested parties. The table below lists the voting members of the ASC Working Group

No	Name	Organization	Role
1	Douglas Tarico	Econolite	Co-Chair
2	John Thai	City of Anaheim	Co-Chair
3	Rami Khashashina	New York City Department of Transportation	Voting Mbr
4	Matt DeWitt	Florida Department of Transportation	Voting Mbr

No	Name	Organization	Role
5	Michael Robinson	California Department of Transportation	Voting Mbr
6	Derek Lehrke	Minnesota Department of Transportation	Voting Mbr
7	Christopher Primm	Oregon Department of Transportation	Voting Mbr
8	Roy Goudy	Nissan	Voting Mbr
9	Ralph Boaz	Pillar Consulting	Voting Mbr
10	Robert Rausch	Transcore	Voting Mbr
11	Jonathan Grant	Yunex Traffic	Voting Mbr

### 2.3 Walkthrough Materials

The NTCIP 1202 v04 SDD walkthrough materials include:

- a) **Presentation:** The presentation, in PowerPoint/pdf format, includes the agenda for the meeting, a summary of the project and project status, a review of the systems engineering process used for the proposed standard, a review of the draft SDD document and a review of the walkthrough process. This will be provided to the invitees before the walkthrough.
- b) **Draft SDD Document:** Provided at least 10 working days prior to the SDD walkthrough, the SDD includes the Draft ConOps and the Draft SDD requirements derived from the ConOps. In addition to Sections 1 (General information) and 2 (Concept of Operations), the SDD document adds Section 4, containing Dialogs, Section 5 containing the Management Information Base (MIB), Section 6 containing Block Object Definitions, and Annex A Requirements Traceability Matrix (RTM).
- c) **Walkthrough Workbook (WTWB):** Provided 10 working days prior to the walkthrough, the WTWB guides the walkthrough/review of the draft SDD document. The WTWB contains all sections to be reviewed during the walkthrough, with space provided to capture participants' comments, proposed comment resolution (if provided), action items, and a summary of next steps.

### 3 Meeting Agenda

A Draft SDD Walkthrough agenda follows.

**Table 1 Draft Meeting Agenda**

	Item
1	Welcome/Call to Order (Co-Chairs)
2	Introductions (Narla)
3	Antitrust Guidance & Logistics (Narla)
4	Review Agenda (Co-Chairs)
5	Purpose (Co-Chairs) Purpose: Solicit input from attendees on the SDD, Systems Engineering Process (SEP) and implementation perspective.
6	Review Process, Ground Rules, Roles/Responsibilities Review SDD walkthrough process, ground rules, SEP, roles/responsibilities, as well as entry criteria/inputs, and exit criteria/outputs.
6	Walkthrough of Draft SDD Walkthrough Workbook Marking up the Draft SDD Walkthrough Workbook in real-time
7	Next Steps Review the next steps, schedule, and deliverables
8	Adjourn

### 3.1 Meeting Rules

The following general meeting rules apply to the conduct of an SDD walkthrough.

- a) Show up on time and come prepared
  - i. Be prompt in arriving to the meeting and in returning from breaks
  - ii. Be prepared to contribute to achieving the meeting goals
- b) Contribute to meeting goals
  - i. Participate 100% by sharing ideas, asking questions, and contributing to discussions
  - ii. Share your unique perspectives and experience, and speak honestly
  - iii. If you state a problem or disagree with a proposal, try to offer a solution
- c) Stay on point and on time
  - i. Respect the groups' time and keep comments brief and to the point
  - ii. When a topic has been discussed fully, do not bring it back up
  - iii. Do not waste everyone's time by repeating what others have said
  - iv. To manage discussion, it might be appropriate on some issues to use a one minute per person per SDD element rule. Following this 'round' of discussion on a particular SDD element, the Co-Chair(s) effectively 'call the question' (a process adapted from Robert's Rules of Order Newly Revised for walkthrough purposes). Essentially, the Co-Chair(s) announce the end of discussion on a particular SDD element, summarize the walkthrough input concerning that SDD element (or refer to the language reflected in the WTWB (on-screen)), and move discussion to the next SDD element in the WTWB.
- d) Close decisions and follow up
  - i. Make sure decisions are supported by the group, otherwise they won't be acted on
  - ii. Note pending issues and schedule follow up actions/meetings as needed
  - iii. Identify actions based on decisions made, and follow up actions assigned to you
- e) Record outcomes and share
  - i. Record issues discussed, decisions made, and tasks assigned

### 3.2 Walkthrough Process

The following procedure will be used:

- 1) Review any comments received prior to the walkthrough
  - Identify resolutions or defer the comments to the appropriate place in the WTWB.
- 2) Perform a review of Draft SDD Document using the SDD WTWB
  - Read sections of the Draft SDD Document identified for review, capturing comments in real-time to reflect inputs from walkthrough participants in the SDD WTWB.
  - Review each new functional requirement proposed for NTCIP 1202 v04 to ensure that it meets the criteria identified in Section 3.5 and, if revisions are necessary, that they are captured in the Draft SDD WTWB.
  - Review the RTM to verify each requirement traces to design elements, such as a dialog and data elements in the MIB.
  - Review each section of the MIB to verify that the functional requirements are fulfilled, and, if revisions are necessary, that they are captured in the Draft SDD WTWB.
  - Review the PRL to verify the appropriate User Needs trace to each Functional Requirement.
  - Collect and document new functional requirements as well as user needs proposed by participants as agreed upon by the ASC Working Group.

### 3.3 Roles and Responsibilities

The roles and responsibilities for the participants during the SDD walkthrough follow.

- a) Walkthrough Leader (Consultant): Lead walkthrough/guide discussion
- b) Recorder (Consultant): Record all revisions with basis of revisions (anomalies)

- c) "Author" (Consultant): Subject Matter Expert on standard details with overview of Standard
- d) Review Team (All others): Identify anomalies, discuss, propose and agree to appropriate resolutions

### 3.4 Entry Inputs

The inputs to be used during the walkthrough follow.

- a) Draft SDD Document
- b) Inputs (proposed revisions) on the draft SDD document (if any)
- c) Draft SDD WTWB

### 3.5 Walkthrough Criteria

#### 3.5.1 Well-Written User Need Criteria

The criteria used to determine if a need is well-written follow.

- a) **Uniquely Identifiable:** Each need must be uniquely identified, that is, each need shall be assigned a unique number and title.
- b) **Major Desired Capability (MDC):** Each need shall express a major desired capability (corridor level) in the system, regardless of whether the capability exists in the current system or situation or is a gap.
- c) **Solution Free:** Each need shall be solution free, thus giving designers flexibility and latitude to produce the best feasible solution.
- d) **Capture Rationale:** Each need shall capture the rationale or intent as to why the capability is needed in the system.

#### 3.5.2 Pattern for Well-Formed Requirements

Well-formed requirements should be:

- a) **Necessary:** Must be useful (traceable to needs)
- b) **Unambiguous:** Susceptible to only one interpretation
- c) **Concise:** Stated in declarative language ("shall statements")
- d) **Consistent:** Does not contradict itself, nor any other stated requirement
- e) **Complete:** The requirement is stated completely in one place. (Requirements may be grouped.)
- f) **Attainable:** Realistic to achieve within available resources and time
- g) **Testable:** Must be able to determine that the requirement has been met through one of four possible methods (inspection, analysis, demonstration, or test)

#### 3.5.3 Evaluation Criteria for SDD Walkthrough

During the SDD walkthrough, each design element (individually and as a group, where appropriate) is evaluated as follows, to determine whether the Functional Requirement is fulfilled by the proposed design elements (dialogs and objects):

- a) Verify design traceability: Are the dialogs and objects properly associated with the requirement?
- b) Verify design logical consistency: Are the dialogs and object logically consistent with the requirement?
- c) Verify design completeness: Does it fully fulfill the requirement?
- d) Verify design correctness: Are there any errors in the design elements presented.

During the SDD walkthrough, SDD elements are presented in a sequential manner, as are the preceding criteria. An SDD WTWB table includes the following:

- a) UN FR ID: the number assigned to the User Need or Functional Requirement. User Needs start with a '2,' because they are defined in Section 2, and Functional Requirements start with a '3,' because they are defined with Section 3.
- b) Name: a short descriptive UN or FR title, as well as the UN or FR itself.
- c) FR Text: The text of an FR itself.
- d) Design ID: the number assigned to the dialog (beginning with a '4' from Section 4), objects (beginning with a '5' from Section 5), or a letter (from an Annex) (or, in some cases, reference to an external document) to fulfill the Functional Requirement.
- e) Design Concept: a short descriptive title identifying the dialog or the data object description, as well as 'actual' dialog or object text.
- f) Conformance: For User Needs, indicates whether the user need is mandatory to conform to NTCIP 1202 v04. For Functional Requirements, indicates whether the Functional Requirements are mandatory to satisfy the User Need.
- g) Additional Specifications: Identifies other requirements to satisfy, including user selectable range values. The "Additional Specifications" column may (and should) be used by a procurement specification to provide additional notes and requirements for the product to be procured or may be used by an implementer to provide any additional details about the implementation. In some cases, default text already exists in this field, which the user should complete to fully specify the equipment. However, additional text can be added to this field as needed to fully specify a feature. In addition, during the SDD walkthrough, this column is used to capture notes identifying revisions to be made post-SDD walkthrough.

### 3.6 Walkthrough Procedures

The procedures to be used during the SDD walkthrough follow.

- a) Review any comments received prior to the walkthrough, and capture resolutions.
- b) Perform detailed review of draft SDD document by using the SDD WTWB:
  - i. Use the SDD WTWB to guide discussion and review during the walkthrough, specifically to ensure that each SDD element is revised against identified questions contained in the SDD WTWB, and those inputs resulting in revision to the draft SDD document are captured in the SDD WTWB.
  - ii. Read through each section of the draft SDD document identified in the SDD WTWB with the participants and answer the designated questions for each SDD element.
  - iii. Capture substantive inputs in 'real time' (during the SDD walkthrough) in the 'Master Copy' of the WTWB, and as needed/appropriate in the draft SDD document to reflect inputs from walkthrough participants, or to follow up post-SDD Walkthrough (where needed).

### 3.7 Exit Outputs

The outputs of the walkthrough follow.

- a) A marked-up SDD WTWB with inputs provided during the walkthrough that resulted in revisions.
- a) Following the SDD walkthrough, an updated SDD document reflecting revisions resulting from walkthrough input.
- b) Documented plan for completion of the updated SDD Document.

After the walkthrough, ITE will deliver an SDD Walkthrough Resolution Report which identifies inputs received during the SDD Walkthrough, using track changes in a copy of the Draft SDD Document. An updated Draft SDD Document will follow within 15 business days after the walkthrough.