
Project Management Plan

Connected Work Zone Implementation Guidance Standardization (“CWZ Standard”)

October 27, 2022

PMP in support of: Task Order No. 693JJ322F00209N

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CHANGE HISTORY

Date	Version	Note
08/30/22	v0.1	Initial Draft Project Management Plan (PMP)
09/01/22	v0.2	QA by Chan and Benison
09/09/22	v1.00	Delivered to ITE
	v1.01	Delivered to USDOT
9/12/22	Draft v1.00 (003)_rev.TR	Tatiana Richey – Corrected Appendix D
9/12/22	Draft v1.00 (003)_rev.TR	Patrick Chan – Corrected Task Order number on cover and first paragraph of Chapter 1.
10/27/22	Draft v1.00 (004)_rev.MI	Manny Insignares – Addressed FHWA Comments.

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1 PURPOSE OF THE PROJECT MANAGEMENT PLAN

This document defines a Project Management Plan (PMP) for the project Connected Work Zone Implementation Guidance Standardization (hereafter, "CWZ Standard"), under the United States Department of Transportation (USDOT) Task Order No. 693JJ322F00209N, awarded to the Institute of Transportation Engineers (ITE). This PMP establishes a common understanding of the management of the project for:

- a) The USDOT Intelligent Transportation Systems (ITS) Joint Program Office (JPO) who is sponsoring the work;
- b) The Standard Development Organizations (SDOs) overseeing the development, specifically ITE, the National Electrical Manufacturers Association (NEMA) and the American Association of State Transportation and Highway Officials (AASHTO);
- c) The consulting team contracted to perform the work; and
- d) The consultants, manufacturers, and public transportation professionals who participate in the CWZ Working Group which will use the deliverable items specified in this PMP.

This PMP conforms to the Project Management Plan Template found in Technical Exhibit 4 of the Performance Work Statement (PWS) for the project. It includes plans for scope management, communications, deliverables and milestones, quality management, and human resource management. Portions of this PMP may be updated during the course of the project if the management team or the USDOT determines that modification would significantly facilitate the project management functions. The PMP is not intended to be a progress tracking tool or to be modified for minor changes in schedule once the project has started.

1.1 Background of Project

Work zone safety is of utmost concern to transportation agencies. According to the National Highway Traffic Safety Administration, in 2020, there were 857 fatalities and an estimated 102,000 work zone crashes in the United States. There have been numerous Connected Vehicle (CV) research projects, deployments and standards development to support work zone safety, but there have been inconsistencies with the interpretations and implementation of the existing standards, and inconsistencies with the use and expectations of the data exchanged between the infrastructure devices (e.g., mobile dynamic message signs) and the CV devices such as the roadside units (RSUs) and on-board units (OBUs) on vehicles. There are also inconsistencies between deployments, such as usage of different data and data formats across interfaces, and security requirements. Another discovery was that most infrastructure owner operators (IOOs) do not have the manpower or technical knowledge to properly deploy and operate these CV-enabled work zones. These deployment issues highlight a need for an industry standard that enables national interoperability and provides guidance to IOOs on how to deploy, operate and maintain the CV-enabling devices.

USDOT is sponsoring this project to develop, publish, verify, and validate a Connected Work Zone (CWZ) Standard that defines the data elements, capabilities, and interfaces a connected work zone must support to ensure interoperability for state/local infrastructure owner/operators (IOO) and vehicle operators. A connected work zone is defined as a set of technologies that generates or collects work zone information (whether automatically or manually) as well as the infrastructure that broadcasts/distributes this information to the public and to vehicles.

1.2 Objective

The primary objective of this project is to publish a non-proprietary, industry-based consensus standard that defines the key data elements, capabilities, and interfaces for a CWZ Standard, utilizing the USDOT-chartered WZDx Specification version 4.1 as a starting point, if available, otherwise we shall follow version 4.0.

A connected work zone is defined as a set of technologies that generates or collects work zone information (whether automatically or manually), and the infrastructure that broadcasts/distributes this information to the public and to vehicles. The CWZ Standard will:

- address ambiguities and gaps identified by early deployers, and consolidate multiple independent implementation and standards efforts, to lead to the interoperability of future CWZ deployments across the United States; and
- be published as a Connected Transportation Interoperability (CTI) document.

The outputs of this project may include implementation guides, validation reports, reference implementations, presentations, and recommendations to other referenced standards, to support the developed CWZ Standard as determined by a consensus process.

1.3 Purpose of the Scope Management Plan

This Scope Management Plan establishes the scope management approach and processes as they pertain to scope description, verification and control measures. It establishes the processes which ensure that the CWZ Standard Project includes all of the work required to complete the project while excluding all work that is unnecessary.

2 SCOPE STATEMENT

2.1.1 Project Scope Description

The subsections below describe the project activities listed in the Gantt Chart in Section 4.3, Project Schedule. The project follows a systems engineering process and explicitly incorporates layers of review and modification of the deliverable documents corresponding to the NTCIP Standards consensus process. Each of the major project tasks are listed below with the objectives, approach and deliverables identified. Specific TOPR tasks are identified in brackets (i.e. [TOPR Task #]). Specific formal TOPR deliverables are identified as such (i.e. [TOPR Deliverable – Task #]), as described in Technical Exhibit 2 Deliverables Schedule. These formal TOPR deliverables are also identified in the Project Schedule, see Section 4.2 Deliverable Summary.

2.1.1.1 Task 1: Project Management [TOPR Task 1]

Task Objective

Provide project management and administrative services of all tasks described in this PWS. ITE and our selected subcontractor(s) shall participate in a “kick off” meeting with the USDOT and its representatives to be held within 45 working days of the Authorization to Proceed (ATP) unless otherwise agreed to by the Government.

2.1.1.1.1 Task 1.1: Monthly Progress Report [TOPR Task 1.1]

Approach

ITE will provide a Monthly Progress report (including a Microsoft Excel Risk Register), with an updated project schedule (provided in both Microsoft Project 2010 and Adobe PDF format) to reflect base-lined task start and end dates and actual start and end dates for each task performed during each month of the period of performance, in both Microsoft Word and Adobe PDF format.

Deliverables

- Monthly Progress Reports [TOPR Deliverable – Task 1.1]

2.1.1.1.2 Task 1.2: Project Management Plan (PMP) [TOPR Task 1.2]

Approach

ITE will to:

- a) Provide a Project Management Plan (PMP) based Project Management Institute (PMI) Guide and modified as needed and, detailed project schedule and System Engineering Master Schedule (SEMS) in Microsoft Project 2010 and Adobe Acrobat format, listing all milestones and project milestones. The detailed project schedule shall reflect a work breakdown structure (WBS) comprise of at least three levels. It is understood that the project schedule should be delivered a minimum of 30 working days after the authorization to proceed (ATP).
- b) Provide a Quality Management Plan that describes how ITE will ensure all deliverables contain suitable material for the target audience; contain proper work use and detailed illustrations; are comprehensive, complete and correct; and has been edited for grammatical and editorial errors.
- c) Provide a Human Resources Management Plan that includes team resumes, explain roles and responsibilities of all key individuals and the reporting relationship among the team. The Human Resources Management Plan is subject to USDOT approval as part of the overall approval of the PMP.

Deliverables

- Kick-off Meeting
- Draft PMP
- Final PMP [TOPR Deliverable – Task 1.2]
- System Engineering Master Schedule
- Quality Management Plan
- Human Resources Management Plan

2.1.1.1.3 Task 1.3: Systems Engineering Management Plan (SEMP) [TOPR Task 1.3]

Approach

ITE intend to provide a SEMP based IEEE Std. 1220-2005 guidance and modified as needed.

- a) Risk Management Plan shall document risks that might affect the project and the characteristics of the risk. Types of risks that must be considered include risks potentially impacting: technical, project schedule, scope, and costs. A Risk Management Log must be maintained on an on-going basis during the entire period of performance to track risks, mitigation plans and status. Each risk will have a unique number, probability of occurrence and impact of occurrence rating.
- b) Configuration Management Plan shall have revised version of each contract deliverable (including the detailed project schedule) under document configuration control, with version numbers assigned to each document. All documents submitted to, and approved by, USDOT shall be assigned a unique version number.

Deliverables

- Draft SEMP
- Final SEMP [TOPR Deliverable – Task 1.3]
- Configuration Management Plan
- Risk Management Plan

2.1.1.2 Task 2: Develop Connected Work Zone Standard [TOPR Task 2]

Task Objectives

ITE and the selected subcontractor(s) shall develop a Connected Work Zone Standard that builds on the guidance, use cases and user stories provided in the *Work Zone Data Exchange (WZDxFeed and SwzDeviceFeed)*, *SAE J2945/4 Road Safety Applications SAE J2945/A standard for Lane-Level and Road Furniture Mapping for Infrastructure-based V2X Applications*, and *TMDD (as well as any other relevant work zone-related activities)*.

Figure 1 shows the interfaces between the entities that are involved in a CWZ, and the standards that addresses those interfaces.

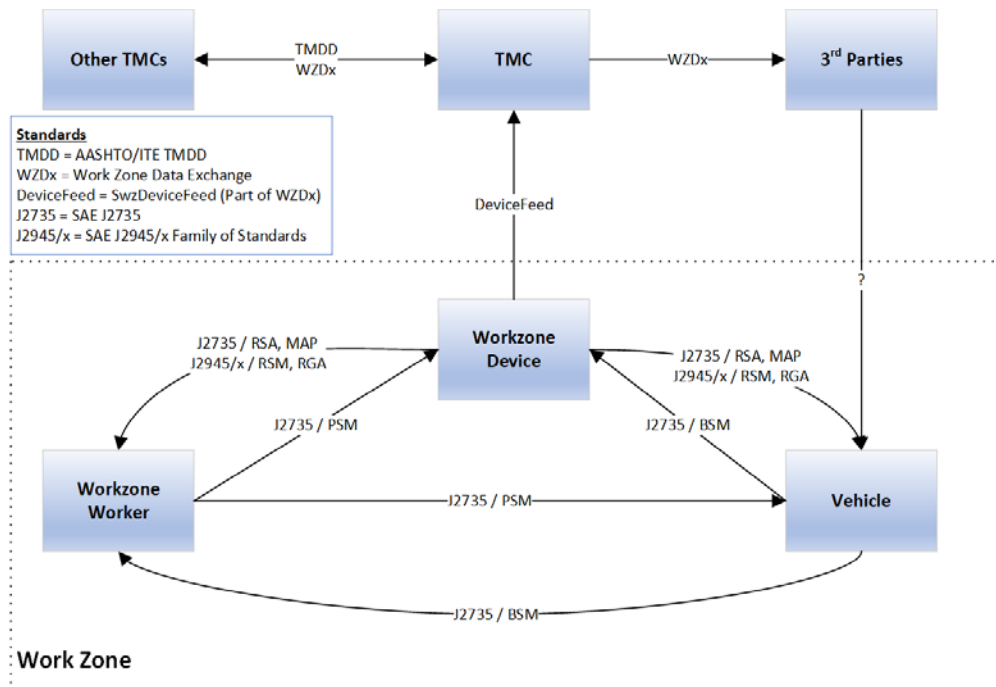


Figure 1. Connected Work Zone Standards

2.1.1.2.1 Task 2.1: Develop Connected Work Zone ConOps [TOPR Task 2.1]

Subtask Objectives

ITE and the selected subcontractor(s) shall develop a Connected Work Zone Concept of Operations (ConOps) following the guidance of NTCIP 8002 Annex B-1 and IEEE Std. 1362-1998. After the draft ConOps is complete the ITE and their selected subcontractor(s) shall hold a walkthrough based on IEEE Std. 1028-1997.

Deliverables

- Draft Connected Work Zone ConOps [TOPR Deliverable – Task 2.1.2]
- Conduct ConOps Walkthrough

2.1.1.2.2 Task 2.1.1: Connected Work Zone Working Group [TOPR Task 2.1.1]

ITE will convene a Connected Work Zone Working Group (CWZ WG) to guide the development of the proposed document, consistent with the standards development process. The WG will consist of members

with experience relevant to either the development and/or deployment of work zone information as well as the development and deployment of OBUs and Automated Vehicles (AV). This will include public agency stakeholders and contractors involved with work zone operations and safety; work zone device industry representatives and industry suppliers; connected and automated vehicle original equipment manufacturers (OEMs); Traveler information providers, such as vehicle OEMs, mapping and navigation companies, and traffic data brokers; Telecommunications, and transportations service industry; Relevant participants from other Standards Development Organizations (SDOs) and/or working groups (including members of the Work Zone Data Exchange subgroups groups); WZDx Demonstration Grant awardees; and the WZDx Demonstration Grant Coordinating Contractor. ITE also has experts with appropriate subject matter expert (SME) of SAE standards and will ensure that SAE and /or its representative has the opportunity to participate in all of the CWZ WG activities and document reviews. The composition of this WG will reflect balanced representation across stakeholder groups.

ITE shall document the CWZ WG membership in the **Connected Work Zone Working Group Roster**.

Deliverables

- Connected Work Zone Working Group Roster [TOPR Deliverable – Task 2.1.1]

2.1.1.2.3 Task 2.1.2: Develop Draft Concept of Operations [TOPR Task 2.1.2]

Approach

ITE shall review the *WZDx Specification (WZDxFeed and SwzDeviceFeed)*, *SAE J2945/4 Road Safety Applications and SAE J2945/A Standard for Lane-Level and Road Furniture Mapping for Infrastructure-based V2X Applications* to identify existing use cases and user needs. ITE shall interview key stakeholders (subject matter experts) as part of the research process to gain an understanding and develop additional use cases (scenarios) and user needs. A stakeholder list shall be developed by ITE and must be approved by USDOT prior to conducting the interviews.

ITE shall develop a questionnaire to be used during stakeholder interviews. ITE shall deliver a draft version of the questionnaire to USDOT for review and comment. ITE shall modify the questionnaire within 10 working days of receiving comments from the USDOT. After the questionnaire is approved by the USDOT, it shall be used in the Stakeholder interviews.

ITE shall develop a draft Concept of Operations (ConOps) for the CWZ using IEEE Std. 1362-1998 for guidance in this area. As part of the effort to develop a ConOps, ITE shall develop the user needs for the CWZ. These user needs shall be derived from the research and interview activities. The needs developed shall meet the test of being “well-written”.

The ConOps shall describe expected technical, environmental, and institutional constraints for the system of interest. The ConOps shall provide system concepts (including a high-level discussion of technical and non-technical requirements), operational scenarios, and the rationale for key concept decisions. ITE shall also develop a context diagram as part of the ConOps that shows the environment the CWZ will work in and any possible options in the high-level architecture.

ITE shall deliver a **Connected Work Zone ConOps Draft** to the CWZ WG and USDOT to be used during the walkthrough defined in the following subtask.

Deliverables

- Stakeholder List
- Draft Interview Questionnaire
- Stakeholder Interviews

- Draft Connected Work Zone ConOps [TOPR Deliverable – Task 2.1.2]

2.1.1.2.4 Task 2.1.3: Walkthrough on Draft Concept of Operations [TOPR Task 2.1.3]

Approach

In consultation with the TOCOR, ITE shall prepare a list of knowledgeable Subject Matter Experts (SMEs) comprised of stakeholders from public agencies and contractors involved with work zone operations and safety; work zone device industry representatives and industry suppliers; connected and automated vehicle OEMs; traveler information providers, such as vehicle OEMs, mapping and navigation companies, and traffic data brokers; telecommunications, and transportations service industry; other relevant SDOs and/or working groups (including members of the Work Zone Data Exchange subgroups groups); WZDx Demonstration Grant awardees, and the WZDx Demonstration Grant Coordinating Contractor. The SMEs shall provide comments on the ConOps from a functional, technical, management and implementation perspective.

Also, in consultation with USDOT, ITE shall arrange for a time and facility where the walkthrough shall take place. ITE shall be responsible for invitations, distributing advance material including the draft ConOps, registrations, travel reimbursement, note taking, and coordination of the walkthrough.

ITE shall prepare a **ConOps Walkthrough Plan** based on IEEE Std. 1028-1997. ITE shall implement the walkthrough plan once approved by USDOT. As part of this task, ITE shall deliver a **ConOps Walkthrough Comment Resolution Report** which details each walkthrough comment and the Contractor's recommended resolution as SME.

Deliverables

- Draft ConOps Walkthrough Plan
- Final ConOps Walkthrough Plan [TOPR Deliverable – Task 2.1.3]
- Conduct face-to-face ConOps Walkthrough
- ConOps Walkthrough Comment Resolution Report [TOPR Deliverable – Task 2.1.3]

2.1.1.2.5 Task 2.2: Develop Connected Work Zone System Requirements [TOPR Task 2.2]

Subtask Objectives

ITE and their selected subcontractor(s) shall develop a CWZ System Requirements Specification (SRS) Document following the guidance of NTCIP 8002 Annex B-1 and IEEE Std. 1362-1998. The draft SRS shall have full traceability between user needs and requirements. After the draft SRS is complete ITE and their selected subcontractor(s) shall hold a walkthrough based on IEEE Std. 1028-1997.

2.1.1.2.6 Task 2.2.1: Develop Draft Connected Work Zone System Requirements Specification [TOPR Task 2.2.1]

Approach

ITE shall develop a System Requirements Specification (SRS) document based on the ConOps, following the guidance of IEEE Std. 830-1998. The SRS shall contain a Protocol Requirements List (PRL) that is conformant to NTCIP 8002 Annex B1. The PRL is a table that provides a mapping from each need to its associated requirement. The requirements documented in the SRS shall meet the test of being "well-formed" requirements. The requirements for the interface shall consist of the following.

- Functional requirements
- Performance requirements

- Security requirements*
- Reliability requirements

*Note: The security requirements may be required to be conformant to connected vehicle security requirements.

ITE shall ensure that relevant requirements identified in *WZDx Specification (WZDxFeed and SwzDeviceFeed)*, *SAE J2945/4 Road Safety Applications* and *SAE J2945/A Standard for Lane-Level and Road Furniture Mapping for Infrastructure-based V2X Applications* exist within this draft and have the proper traceability to user needs.

ITE shall deliver a **Draft Connected Work Zone SRS** to the CWZ WG and USDOT to be used during the walkthrough defined in the following subtask.

Deliverables

- Draft Connected Work Zone System Requirements Specification (SRS) containing a PRL [TOPR Deliverable – Task 2.2.1]

2.1.1.2.7 Task 2.2.2: Walkthrough on Draft System Requirements Specification [TOPR Task 2.2.2]

Approach

In consultation with the TOCOR, ITE shall prepare a list of knowledgeable SMEs comprised of stakeholders (USDOT, State and local transportation agencies, center-to-field experts, Transit, CVO) and sub-contractors involved with SPaT research; traffic signal controller industry representatives and industry suppliers; telecommunications, and transportations service industry; public sector representatives, the connected vehicle program, and relevant other Standards Development Organizations and/or Committees) to invite to attend a face-to-face review of the draft SRS. The SMEs shall provide comments on the requirements from a functional, technical, management and implementation perspective.

Also, in consultation with the TOCOR, ITE shall arrange for a time and facility where the walkthrough shall take place. ITE shall be responsible for invitations, distributing advance material including the current ConOps, draft SRS, registrations, note taking, and coordination of the walkthrough.

IEEE Std. 1028-1997 is the document that shall be used for guidance in planning the walkthrough. An **SRS Walkthrough Plan** shall be prepared and provided to USDOT for approval at least 30 days prior to the scheduled walkthrough. As part of this task, ITE shall deliver a **SRS Walkthrough Comment Resolution Report** which details each walkthrough comment and the ITE's recommended resolution within 10 working days after the completion of the SRS Walkthrough.

Deliverables

- SRS Walkthrough Plan [TOPR Deliverable – Task 2.2.2]
- Conduct SRS face-to-face Walkthrough
- SRS Walkthrough Comment Resolution Report [TOPR Deliverable – Task 2.2.2]

2.1.1.2.8 Task 2.3: Develop Connected Work Zone System Design Details [TOPR Task 2.3]

Subtask Objectives

ITE and their selected subcontractor(s) shall develop a Connected Work Zone System Design Details (SDD) Document following the guidance of NTCIP 8002 Annex B-1 and IEEE Std. 1362-1998. The draft SDD shall have full traceability between user needs, requirements and design elements. After the draft SDD is complete ITE and their selected subcontractor(s) shall hold a walkthrough based on IEEE Std. 1028-1997.

2.1.1.2.9 Task 2.3.1: Develop Draft Connected Work Zone System Design Details [TOPR Tasks 2.3.1]

Approach

ITE shall develop a SDD document based on the ConOps and SRS. IEEE Std. 1016-1998 is the document that shall be used for guidance in this area. ITE shall document the design solution for each requirement developed in the previous tasks. The SDD shall specify the content, constraints on formats, timing, and other factors needed. ITE shall include a Requirements Traceability Matrix (RTM) in the SDD. The RTM is a table that provides a mapping from each requirement to its associated design content. The RTM shall be conformant with NTCIP 8002 Annex B1.

ITE shall ensure that relevant design elements identified in *WZDx Specification (WZDxFeed and SwzDeviceFeed)*, *SAE J2945/4 Road Safety Applications* and *SAE J2945/A Standard for Lane-Level and Road Furniture Mapping for Infrastructure-based V2X Applications* exist within this draft and have the proper traceability to requirements and user needs.

ITE shall conduct verification and validation checks as per the SEMP. In addition, ITE will use the latest version of the Standards Verification Tool (SVT) to verify traceability and perform logical consistency checks between the requirements and the design content prior to releasing the draft document for review for the SDD Walkthrough.

ITE shall deliver a **Draft Connected Work Zone SDD** with the rest of the document (ConOps and SRS) to the CWZ WG and USDOT to be used during the walkthrough defined in the following subtask.

Deliverables

- Draft Connected Work Zone SDD with RTM [TOPR Deliverable – Task 2.3.1]
- Conduct verification and validation check

2.1.1.2.10 Task 2.3.2: Walkthrough on Connected Work Zone System Design Details [TOPR Task 2.3.2]

Approach

In consultation with the TOCOR, ITE shall prepare a list of knowledgeable SMEs comprised of stakeholders (USDOT, State and local transportation agencies, center-to-field experts, Transit, CVO) and subcontractors involved with SPaT research; traffic signal controller industry representatives and industry suppliers; telecommunications, and transportations service industry; public sector representatives, connected vehicle program representatives, and relevant other Standards Development Organizations and/or Committees) to invite to attend a face-to-face review of the draft SDD. ITE shall submit the stakeholder list to USDOT for approval prior to organizing the SDD Walkthrough. The SMEs shall provide comments on the design from a functional, technical, management and implementation perspective.

Also, in consultation with the TOCOR, ITE shall arrange for a time and facility where the face-to-face walkthrough shall take place. ITE shall be responsible for invitations, distributing advance material including the final ConOps, final SRS, draft SDD, registrations, travel reimbursement, note taking, and coordination of the walkthrough.

IEEE Std. 1028-1997 is the document that shall be used for guidance in planning the walkthrough. A **SDD Walkthrough Plan** shall be prepared and provided to USDOT for approval at least 30 days prior to the scheduled walkthrough. As part of this task, ITE shall deliver a **SDD Walkthrough Comment Resolution Report** which details each walkthrough comment and the ITE's recommended resolution within 10 working days of the completion of the SDD Walkthrough.

Deliverables

- List of knowledgeable Subject Matter Experts
- SDD Walkthrough Plan [TOPR Deliverable – Task 2.3.2]
- Conduct SDD face-to-face Walkthrough
- SDD Walkthrough Comment Resolution Report [TOPR Deliverable – Task 2.3.2]

2.1.1.2.11 Task 2.4: Publish Connected Work Zone Standard [TOPR Task 2.4]

Subtask Objectives

ITE and their selected subcontractor(s) shall publish a fully balloted and approved Connected Work Zone Standard that meets the systems engineering documentation guidance in NTCIP 8002 Annex B-1 and IEEE Std. 1362-1998.

2.1.1.2.12 Task 2.4.1: Develop Recommended Connected Work Zone Standard [TOPR Task 2.4.1]

Approach

ITE shall develop the CWZ Standard containing the Systems Engineering content defined in this PWS. The CWZ Standard shall be based on the ConOps, SRS, and SDD developed herein, and contain a PRL and an RTM. ITE shall circulate a Working Group draft to the CWZ WG for comments. ITE shall conduct/support the SDO User Comment Draft (UCD) process and prepare a response sheet for the UCD comments. ITE shall conduct CWZ WG meetings to finalize agreements on the resolution of the UCD comments.

Following the process established for the development of ITE standards (See Figure 2), each draft (Working Group Draft, User Comment Draft, Proposed Recommended Standard, Recommended Standard, Ballot Version, Published Version), will be circulated to the CWZ WG and SMEs for comments.

ITE will address the comments, and a technical editor will review the document before ITE submits a draft for approval by the CWZ WG.

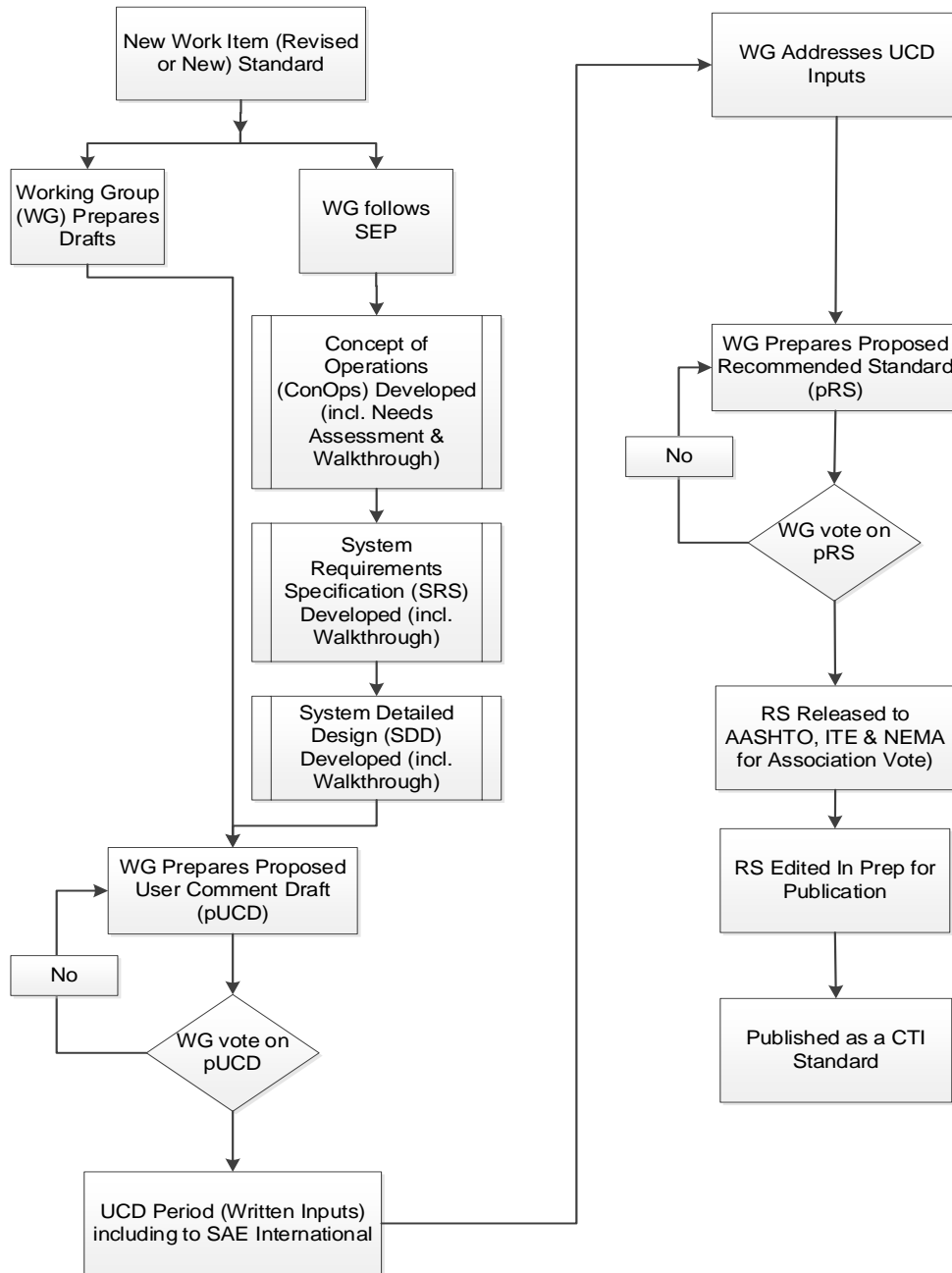


Figure 2 Consensus Process used by the CTI Standards

ITE shall prepare responses and resolve said responses to the satisfaction of the SDOs involved and USDOT.

ITE shall revise the draft UCD CWZ Standard to address the comments and resolution approved by USDOT. A proposed Ballot ready Recommended Standard will be prepared by ITE and submitted to the CWZ WG for ballot. After CWZ WG approval, ITE shall submit the **Recommended Connected Work Zone Standard** for official SDO balloting. ITE shall support comment resolution and updates of the Ballot version of the standard until all ballot comments have been resolved to the satisfaction of the SDOs and USDOT.

Deliverables

- Recommended Connected Work Zone Standard for SDO balloting
- Committee Comment and response form for UCD Comments
- Connected Work Zone Working Group Draft
- Conduct (web based) UCD WG Meetings
- Proposed Recommended Connected Work Zone Standard
- Proposed Ballot Ready Recommended Standard for Connected Work Zone WG Ballot [TOPR Deliverable – Task 2.4.1]

2.1.1.2.13 Task 2.4.2: Publish Connected Work Zone Standard. [TOPR Task 2.4.2]

Approach

At the completion of ballot, ITE shall prepare the publication ready **Final Connected Work Zone Standard** and publish the standard once all SDOs have approved it. As part of the publication process ITE shall generate a **Connected Work Zone Standard MIB and/or ASN.1** from the approved version of the standard and verify that the MIB and/or ASN.1 will compile correctly and report on the compiler results as part of the publication process. The final MIB and/or ASN.1 shall be delivered with the final Connected Work Zone standard.

Deliverables

- Final Connected Work Zone Standard [TOPR Deliverable – Task 2.4.2]
- Connected Work Zone Standard MIB and/or ASN.1 [TOPR Deliverable – Task 2.4.2]

2.1.1.3 Task 3: Verify and Validate Connected Work Zone Standard and Draft Connected Work Zone Implementation Guidance [TOPR Task 3]

Overall Objectives

ITE shall draft the Connected Work Zone Standard Test Documentation to guide verification and validation that the Standard supports interoperable deployment of connected work zone information.

2.1.1.3.1 Task 3.1: Test Documentation

Approach

ITE shall draft the Connected Work Zone Standard Test Documentation to guide verification and validation that the Standard supports for the interoperable deployment of connected work zone information.

Test documentation is required to guide the set of activities related to testing, as follows.

- **Requirements Verification Overview.** Based on prior experience, certain themes recur regarding testing of ITS Standards-based specifications, such as the Connected Work Zone Standard. The bullets below identify typical categories of requirements that can be verified, followed by a brief description.
 - **Message Exchanges.** Verification that all message sequences specified in the Standard are covered and correct. This may include message sequences between centers (C2C), centers and field equipment, field equipment and field equipment, and vehicle to any (V2X).
 - **Mandatory versus Optional Messages and Data.** Verification that all mandatory elements, as specified in the Standard are included as valid content.

- **Data Structure.** Verification that the hierarchical layout of the information/data is correct.
- **Data Content.** Verification that the content of messages matches the data element definitions contained in the Standard.
- **Referential Integrity.** Verification that there is consistency between data element values contained in message. For example, a valid reference between vehicle-type and number-of-axles might be: vehicle-type = large-truck and number-of-axles = 5. While an invalid reference might be: vehicle-type = car and number-of-axles = 4.
- **Performance Requirements.** Verification that data is processed or communicated within the time constraints specified in the Standard.
- **Positive Testing.** Verification that the system responds as predicted with no errors and expected correct output message, given valid and correct input message.
- **Negative Testing.** Verification that the system handles errors as expected and responds appropriately given an erroneous or invalid input.
- **Validate Needs.** Validation of needs is done using the Protocol Requirements List (PRL). The PRL identifies which needs are satisfied for a given set of requirements that have been verified. A need is valid when corresponding requirements have been verified to be true.
- **Develop Test Plan.** The test plan will follow the outline as described in IEEE 829-2008. In addition, the Test Plan will include the following.
 - **Requirements to Test Case Traceability Matrix (RTCTM)**
 - **Test Reports.** Content and outline as described in IEEE 829-2008.
- **Develop Test Cases, and Test Procedures.** Test Cases and Test Procedures will be developed in accordance with IEEE 829-2008.
 - **Test Cases.** Developed to verify the expected inputs and outputs of system that has implemented the requirements. These specify data (inputs and outputs).
 - **Test Procedures.** Developed to specify the sequence of steps required to verify one or more requirements.

Deliverables

- **Test Plan**
 - **Summary of Needs.** This will be summarized from the Protocol Requirement List.
 - **Summary of Requirements to be verified.** This will be summarized from the Requirements to Test Case Traceability Matrix.
- **Test Cases and Test Procedures**
- **Summary of Validation Site Requirements.** This will be provided to help guide actual Validation Site Testing.

2.1.1.3.2 Task 3.2: Validation Site Test

Subtask Objective

ITE shall accomplish validation site testing, working with deployment agencies, to verify whether the guidance and standard developed (and data collected at sites) demonstrate that CWZ information generated and distributed is interoperable between deployments.

2.1.1.3.3 Task 3.2.1: Validation Site Selection

Approach

ITE shall conduct validation site selection as follows:

- **Identification of Potential Validation Sites.** ITE will work with the CWZ Standard participants to

identify whether there are early volunteers that want to be validation sites. Note there are 13 deployment sites have received Work Zone Data Exchange (WZDx) Demonstration Grants, so there are several potential validation sites.

- **Develop Self-Assessment Form.** A self-assessment form (similar to what was developed for the Connected Intersections Validation Sites) will gather information so participants and committee members have an overview of the rationale, equipment, and complexity of validation site work zones. The information gathered from the self-assessment form becomes a basis for site comparisons: what CWZ elements do the sites have in common, what are the differences, what problems exist with standards and interoperability. Typical information requested includes:
 - Use Cases / Objectives / What was the agency trying to accomplish. We anticipate that there should be significant commonality between the needs documented in the ConOps and information from the self-assessment form. If there are differences between what is in the ConOps and what validation site agencies are reporting, we will track these new or different needs and be prepared to update the ConOps that is part of the guidance.
 - Locations / Maps where WZDx and Connected Vehicle (Work Zone) Solution is Deployed
 - Type of Equipment Deployed
 - Messages Deployed. This includes center-to-center messages, Connected Vehicle Environment messages, center-to-field equipment messages.
- **Develop Letter of Solicitation.** ITE will develop, together with the Chairs of the CWZ Committee, a solicitation letter to additional potential validation sites. The Self-Assessment Form to be filled out by agencies will be an attachment for those validation sites interested in participating during the validation phase.
- **Summary/roll-up of Self-Assessment Information and Validation Sites Map.** Based on the information received from Validation Sites, and documented in the Self-Assessment Form, ITE will develop a summary of the responses and a high-level map showing the locations of the validation sites.

Deliverables

- Validation Site List
- Letter of Solicitation including Self-Assessment Form
- Summary of Self-Assessment Information

2.1.1.3.4 Task 3.2.2: Validation Site and Testing Coordination

Approach

Once validation sites have been selected, ITE will coordinate several meetings with the Validation Sites and Test Group, as follows:

- Initial Validation Site Meeting to Discuss Process
- Recurring (e.g., bi-weekly) Meetings to Discuss Issues, Training, Support, and Validation Testing Progress
- Conduct Surveys/Interviews for Security, Equipment, Standards Applied

Deliverables

- Meeting Presentations and Minutes from Meetings
- Survey Forms
- Summary of Survey Information

2.1.1.3.5 Task 3.2.3: Data Collection and Testing

Approach

- **Perform Testing and Collect and Archive Data.** This step will be guided by the test document developed (Test Plan, Test Cases, and Test Procedures).
- **Conduct Data Analysis / Verification.** Data collected will be archived and shared with the validation site that generated the information. Analysis will be guided by the test plan, test cases, and test procedures.
- **Generate Test Reports.** Test reports (e.g., test logs, and summary reports) will document the results of the executed tests.

Deliverables

- Test Data Collected
- Preliminary Report on Verification and Data Analysis
- Test Reports (per Test Plan)

2.1.1.3.6 Task 3.3: Open-Source Test Tools

Approach

ITE and its subcontractors may develop software test tools to support these activities if necessary, however if US DOT funding is utilized in the development of these test tools, those tools shall be open source and available to download at no cost. Tools may include:

- Tools to test the interfaces (i.e., list of bullets under Task 3.1)
 - Message Capture
 - Message Analysis
- Tools to show maps of message content that have geographic parameters
- Place on Open-Source Software Project Repository (such as Github)

Deliverables

- Technical Memorandum on Open-Source Tools and Approached Available to be Used in Testing

2.1.1.3.7 Task 3.4: Validation Report

Approach

After completion of this verification and validation phase, ITE shall deliver a CWZ Validation Report that provides the results and analysis of the test activities accomplished.

- Identifies Solution Gaps and potential way forward to alleviate problems related to gaps
- Identify Gaps in the Standard and potential areas
- Identification of Testing Tools Applied
- Identify and document Variations in Technical Approaches between Validation Sites that may lead to non-interoperability
- Identify Mandatory versus Optional Portions of Specifications that should be revisited by Standards/Specification Development Organizations
- Provide a Summary of Test Results
- Provide a Summary of Interviews/Surveys

Deliverables

- Connected Work Zone Validation Report [TOPR Deliverable – Task 3.0]

2.1.1.3.8 Task 3.5: Updated Connected Work Zone Standard and Implementation Guidance based on Validation Test

Approach

If verification and validation activities result in any changes to the CWZ Standard, ITE shall make those updates as part of a maintenance update and publish an Amended Connected Work Zone Standard.

Deliverables

- Amended Connected Work Zone Standard [TOPR Deliverable – Task 3.0]

2.1.1.3.9 Task 3.6: Control Gate for Approval to Start Task 4 Effort

Approach

Work on Task 4 shall only begin after the Government (CO) exercises the option for the activity through a task order modification; such approval is expected to be contingent upon funding availability and successful completion of all Task 2 subtasks and initial activities of Task 3 indicate no major issues with the CWZ Standard.

Deliverables

- Minutes from Control Gate Meeting. Minutes shall include a summary of the approval decision, rationale, and next steps (if any).

2.1.1.4 Task 4 (Government Option): Develop a Connected Work Zone Reference Implementation

Approach

ITE will sponsor a consultant to develop an open-source software reference implementation (RI) for the CWZ that implements the key interfaces, messages and protocols defined/referenced in the CWZ Standard. The purpose of the CWZ RI is to create a design based on the CWZ Standard that the industry can interface with and test against for interoperability. The CWZ RI will meet all of the mandatory requirements of the CWZ Standard and implement all of the standard's mandatory design elements. The CWZ RI will also fulfill a subset of the optional requirements and design elements that are agreed to by both ITE and the TOCOR. The CWZ RI will utilize an open-source license and will be freely available to the standards community. The CWZ RI may include the Open-Source Software for Intelligent Transportation Systems (OSS4ITS) suite of tools, the Work Zone Data Collection Toolset, and any open-source software developed by the participants in the Work Zone Data Exchange Demonstration Grant projects.

ITE expects to begin the process to acquire a consultant to begin the buildout of the CWZ RI shortly after Task 2.2.2, Walkthrough on Draft Systems Requirements Specifications, is completed. Task 2.2.2 will result in a complete set of consensus-based requirements for the proposed CWZ Standard that ITE can then include in a Scope of Work and to determine the required qualifications for the consultant. It is expected that the consultant will be acquired and in place before the publication of the CWZ Standard. This allows the consultant to begin the development of those aspects of the CWZ RI that are not controversial and are stable with minimal risk.

ITE will consider using a hybrid agile development process combining systems engineering with agile development but staying within the overall period of performance for the development of the CWZ RI. This hybrid agile development process will allow the consultant to develop the CWZ RI incrementally, providing the industry with a method to give feedback as the CWZ RI is developed. It is expected that one of the first tasks for the consultant is to set up an interface to allow other vendors/developers to interface with the CWZ RI. This interface will allow the industry to access the CWZ RI as functionality is incrementally built and to agree upon the implementation and interpretation of the CWZ Standard in a consensus manner if any interoperability issues is encountered.

Upon completion of CWZ RI software development ITE will work with deployment agencies and other CWZ users to validate that the CWZ RI software correctly implements the mandatory requirements in the CWZ Standard. ITE will develop and present documentation of the CWZ RI to guide future implementations of the CWZ Standard. ITE will develop documentation of any limitations of the CWZ Standard that might inhibit consistent implementation and propose revisions to the Standard to resolve the limitations. The documentation will also identify any necessary modifications to the National ITS Architecture to incorporate the Standard. Finally, ITE will develop a presentation to future implementers summarizing the CWZ Standard and CWZ RI as part of knowledge transfer.

Deliverables

- CWZ RI Software

2.1.2 Performance Requirements Summary

The ITE service requirements are summarized into performance objectives that relate directly to mission essential items. The performance threshold briefly describes the minimum acceptable levels of service required for each requirement. These thresholds are critical to mission success.

Table 1. Performance Requirements Summary

Performance Objective	Performance Standard	Performance Threshold	Method of Surveillance
PRS # 1 The Contractor shall provide plans and background materials as required.	The Contractor provided plans listed in Task 1 and background materials as required. Zero deviation from standard and no grammatical/spelling errors TOCOR Review	Zero deviation from standard and no grammatical/spelling errors TOCOR Review	TOCOR Review
PRS # 2 The Contractor shall provide the PMP.	The Contractor provided a final PMP that followed the PWS guidance, contained the required sections, delivered on time.	Zero deviation from standard and no grammatical/spelling errors.	100%, FHWA will review upon receipt
PRS # 3 The Contractor shall provide the Draft CWZ ConOps.	The Contractor provided a final document that followed the PWS guidance, contained the required sections, delivered on time.	Zero deviation from standard and no grammatical/spelling errors.	100%, FHWA will review upon receipt
PRS #4 The Contractor shall provide the Draft CWZ SRS.	The Contractor provided a final document that followed the PWS guidance, contained the required sections, delivered on time.	Zero deviation from standard and no grammatical/spelling errors.	100%, FHWA will review upon receipt

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Performance Objective	Performance Standard	Performance Threshold	Method of Surveillance
PRS # 5 The Contractor shall provide the Draft CWZ SDD The Contractor provided a final document that followed the PWS guidance, contained the required	PRS # 5 The Contractor shall provide the Draft CWZ SDD The Contractor provided a final document that followed the PWS guidance, contained the required	Zero deviation from standard and no grammatical/spelling errors.	100%, FHWA will review upon receipt
PRS # 6 The Contractor shall provide a Recommended CWZ Standard.	The Contractor provided a final document that followed the PWS guidance, contained the required se	Zero deviation from standard and no grammatical/spelling errors.	100%, FHWA will review upon receipt
PRS # 7 The Contractor shall provide a Final CWZ Standard with Implementation Guidance.	The Contractor provided a final document that followed the PWS guidance, contained the required sections, delivered on time.	The Contractor provided a final document that followed the PWS guidance, contained the required sections, delivered on time.	100%, FHWA will review upon receipt
PRS #8 The Contractor shall provide a Connected Work Zone Validation Report	The Contractor provided a final document that details the results and analysis of CWZ Standard Implementation Guidance verification and validation activities.	The Contractor provided a final document that followed the PWS guidance, contained the required sections, delivered on time.	100%, FHWA will review upon receipt
PRS #9 The Contractor shall provide an open source Connected Work Zone Reference Implementation	The Contractor provided final open-source software that meets the mandatory requirements of the CWZ Standard.	The Contractor provided final open-source software that followed the PWS guidance, meets mandatory requirements, delivered on time.	100%, FHWA will review upon receipt
PRS #10 The Contractor shall provide documentation on the Connected Work Zone Reference Implementation	The Contractor provided documentation of the steps taken during the RI for future deployers.	The Contractor provided a final document that followed the PWS guidance, contained the required sections, delivered on time.	100%, FHWA will review upon receipt
PRS #11 The Contractor shall provide a presentation on the Connected Work Zone Reference Implementation	The Contractor provided final presentation that outlines the steps taken during the RI for future deployers.	The Contractor provided a final document that followed the PWS guidance, contained the required sections, delivered on time.	100%, FHWA will review upon receipt

2.1.3 Project Exclusions

No exclusions have been identified.

2.1.4 Project Constraints

The following constraints have been established for the CWZ IG Project:

- a) The project schedule end date is August 14, 2025.
- b) Capital expenditures are contractually limited and must be preapproved by ITE.
- c) Project travel costs are contractually limited and must be preapproved by ITE.

2.1.5 Project Assumptions

The following assumptions are being made for the CWZ Standard Project:

- a) Additional teleconferences will be used as needed to meet the project goals.
- b) Time has been built into many of the tasks due to the need for CWZ WG and USDOT reviews.
- c) ITS JPO will have a representative participating in the CWZ WG as a non-voting member.
- d) Documents produced for this project are to be suitable for their defined purpose as determined by the CWZ WG.
- e) Throughout the project, there will be various versions of the project schedule produced to take advantage of economies discovered or to account for anomalies unforeseen. As long as there is no change in scope, this PMP does not need to be modified.

2.2 Scope Verification

The scope description found in Section 2 has been developed using the scope provided in the TOPR / PWS ensuring that all tasks and deliverables identified in the TOPR are included in this PMP. Project tasks in the scope description are mapped to TOPR tasks using the form “[TOPR Task].” Deliverable items in the scope description are mapped to TOPR deliverables using the form “[TOPR Deliverable].” Acceptance of this PMP by the ITS JPO verifies the initial scope of the CWZ Standard Project.

It is the responsibility of the Project Manager to verify interim project deliverables against the scope as defined in the scope description (see Section 2.1.1). If there is a proposed change of scope (see Section 2.3), ITS JPO must formally accept the change prior to its incorporation into the project.

2.3 Scope Control

The Project Manager and the ITE Team will work together to control of the scope of the project. The ITE Team will leverage the project scope description (see Section 2.1.1) and the project schedule (see Section 4.3) as a statement of work for each task. The ITE Team will ensure that they perform only the work described in the project scope description and generate the deliverables identified. The Project Manager will oversee the ITE Team and the progression of the project to ensure that this scope control process is followed.

A change in scope is defined by a change in the overall budget, a change that extends the overall schedule, or a change in the work to be performed. Any member of the Project Management Team, the ITE Team, the CWZ Working Group, or the ITS JPO may propose a change in scope. The proposed change is assessed by the Project Management Team and ITE Team. If the Project Management Team and ITE Team determine that a change in scope is warranted, formal approval from ITS JPO is required. This PMP is to be updated in the case of an approved change in scope.

3 COMMUNICATIONS PLAN

3.1 Purpose of the Communications Plan

This Communications Management Plan sets the communications framework for the administration of the CWZ Standard Project. It identifies representatives of the key stakeholders for the project, their roles, and contact information.

3.2 Stakeholder Points of Contact

ITS JPO Task Order Contracting Officer's Representative (TOCOR)

Acts on behalf of the Contracting Officer (CO).

Steve Sill, ITS Architecture & Standards Program Manager
RITA ITS JPO
United States Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590
Phone: 202-366-1603
Email: steve.sill@dot.gov

Deborah Curtis
Highway Research Engineer
Turner Fairbank Highway Research Center
6300 Georgetown Pike
McLean, VA 22101-2296
Phone: 202-493-3267
Email: Deborah.Curtis@dot.gov

Project Administrator/Coordinator

(Primary)
Siva R. K. Narla, Senior Director, Transportation Technology
Institute of Transportation Engineers
1627 I ("Eye") Street, NW, Suite 550 Washington, DC 20006
Phone: 202-464-6219
Email: snarla@ite.org

(Deputy)
Nicola Tavares, Technical Projects Specialist
Institute of Transportation Engineers
1627 I ("Eye") Street, NW, Suite 550 Washington, DC 20006
Phone: 202-464-6208
Email: ntavares@ite.org

Project Manager

Manny Insignares, Project Manager
Consensus Systems Technologies
200 East 89th Street, Unit 34A
New York, NY 10128
Phone: 917-971-6962
Email: manny.insignares@consystec.com

Connected Work Zone Working Group Co-Chairs

TBD.

3.3 Communications with ITS JPO

Communications between the project team and ITS JPO will formally take place once monthly and deliverables occur as described in Section 3. It is anticipated that ITS JPO will have one or more technical staff participating in the CWZ WG where they will have extemporaneous and informal communication with the project team. Official

communications between ITS JPO and the Project Team should be made through the Project Administrator/Coordinator and the TOCOR (see Section 2.3).

3.4 Communications with SAE International

The PWS requires that the CWZ WG receives input and supports with SAE International, who owns the SAE J2735 standard, which is a key standard for connected vehicles. Official communications between SAE International and the Project Team should be made through the Project Administrator/Coordinator and the TOCOR (see Section 2.3). It is anticipated that SAE International and its representatives will be invited to participate in the walkthroughs. SAE International will also be invited to review the UCD version of the CWZ Standard.

4 DELIVERABLES AND MILESTONES

4.1 Monthly Progress Reports

On a monthly basis, the Project Administrator/Coordinator will provide a progress report to the CO. This report will contain the following:

- a) Project Schedule
- b) Deliverables Status
- c) Red Flags
- d) Budget
 - i) Limitation of Funds Analysis
 - ii) Chart 1: Current /Cumulative Expenditures by Month vs. Planned Expenditures
 - iii) Chart 2: Cumulative Expenditures vs. Funds Obligated by Month of Task Order
 - iv) Chart 3: Current Month Expenditures, Cumulative Expenditures vs. Total Budget, by Budget Line Item

The project schedule will reflect the baseline task start and end dates and the actual start and end dates for each task in the project schedule and the percentage of project completion. The project schedule will be provided in both Microsoft Project and Adobe Acrobat.

4.2 Deliverable Summary

Documents and software deliverables are to be sent electronically to the CO. Table 3 identifies the deliverables based on the project tasks described in Technical Exhibit 2 of the TOPR – Deliverables Schedule, reproduced below in Table 2.

Table 2. Reproduction of TOPR Deliverables Schedule Technical Exhibit 2

**TECHNICAL EXHIBIT 2
DELIVERABLES SCHEDULE**

This technical exhibit lists any reports or documentation that are required as a deliverable to include the frequency, # of copies, medium/format and who/where it is to be submitted. A deliverable is anything that can be physically delivered but may include non-physical things such as meeting minutes. The Contractor shall build in ten business day response times from the Government for all deliverables.

<u>Deliverable</u>	<u>Task</u>	<u>Print Ready</u>	<u>Frequency</u>	<u># of Copies</u>	<u>Medium/Format</u>	<u>Submit To</u>
Deliver Progress Reports	1.1	No	In accordance with the IDIQ contract	One	Email/MS Word	CO COR TOCOR
Deliver Project Management Plan (PMP)	1.2	No	30 days after task order start date	One	Email/MS Word	TOCOR
Deliver System Engineering Management Plan (SEMP)	1.3	No	30 days after task order start date	One	Email/MS Word	TOCOR
Deliver Connected Work Zone Working Group Roster	2.1.1	No	Per Schedule in PMP	One	Email/MS Word	TOCOR
Deliver Draft Connected Work Zone ConOps	2.1.2	No	Per Schedule in PMP	One	Email/MS Word	TOCOR
Deliver ConOps Walkthrough Plan	2.1.3	No	Per Schedule in PMP	One	Email/MS Word	TOCOR
Deliver ConOps Walkthrough Comment Resolution Report	2.1.3	No	Per Schedule in PMP	One	Email/MS Word	TOCOR
Deliver Draft Connected Work Zone SRS	2.2.1	No	Per schedule in PMP	One	Email/MS Word	TOCOR
Deliver SRS Walkthrough Plan	2.2.2	No	Per schedule in PMP	One	Email/MS Word	TOCOR
Deliver SRS Walkthrough Comment Resolution Report	2.2.2	No	Per schedule in PMP	One	Email/MS Word	TOCOR
Deliver Draft Connected Work Zone SDD	2.3.1	No	Per schedule in PMP	One	Email/MS Word	TOCOR
Deliver SDD Walkthrough Plan	2.3.2	No	Per schedule in PMP	One	Email/MS Word	TOCOR
Deliver SDD Walkthrough Comment Resolution Report	2.3.2	No	Per schedule in PMP	One	Email/MS Word	TOCOR
Deliver Recommended Connected Work Zone Standard	2.4.1	No	Per schedule in PMP	One	Email/MS Word	TOCOR

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<u>Deliverable</u>	<u>Task</u>	<u>Print Ready</u>	<u>Frequency</u>	<u># of Copies</u>	<u>Medium/Format</u>	<u>Submit To</u>
Deliver Final Connected Work Zone Standard	2.4.2	No	Per schedule in PMP	One	Email/MS Word	TOCOR
Deliver Connected Work Zone Standard MIB and/or ASN.1	2.4.2	No	Per schedule in PMP	One	Email/MS Word	TOCOR
Deliver Connected Work Zone Validation Report	3	No	Per schedule in PMP	One	Email/MS Word	TOCOR
Deliver Updated Connected Work Zone Standard and Implementation Guidance	3	No	Per schedule in PMP	One	Email/MS Word	TOCOR
Deliver Open Source Connected Work Zone Reference Implementation	4	No	Per schedule in PMP	One	Open-Source Software Repository	TOCOR
Deliver Documentation on Connected Work Zone Reference Implementation	4	No	Per schedule in PMP	One	Email/MS Word	TOCOR
Deliver Presentation on Connected Work Zone Reference Implementation	4	No	Per schedule in PMP	One	Email/MS PowerPoint	TOCOR

Table 3. Deliverables by Project Task

Task	Deliverable Item	Delivery Date
1.1	Progress Reports [TOPR Deliverable – Task 1.1]	Monthly
1.2	Kickoff Meeting	9/6/22
	Draft PMP	9/19/22
	Final PMP [TOPR Deliverable – Task 1.2]	10/10/22
1.3	Draft SEMP	9/19/22
	Final System Engineering Management Plan (SEMP) [TOPR Deliverable – Task 1.3]	10/10/22
2.1	CWZ Working Group Roster [TOPR Deliverable – Task 2.1.1]	10/04/22
	Stakeholder List	10/18/22
	Draft Interview Questionnaire	10/4/22
	Final Interview Questionnaire	10/25/22
	Stakeholder Interviews	11/15/22
	Draft CWZ Standard ConOps [TOPR Deliverable – Task 2.1.2]	12/6/22
	Draft ConOps Walkthrough Plan	11/15/22
	Final ConOps Walkthrough Plan [TOPR Deliverable – Task 2.1.3]	12/7/22
	Conduct face-to-face ConOps Walkthrough	12/27/22
	ConOps Walkthrough Comment Resolution Report [TOPR Deliverable – Task 2.1.3]	1/18/23
2.2	Draft CWZ Standard SRS [TOPR Deliverable – Task 2.2.1]	3/2/23
	SRS Walkthrough Plan [TOPR Deliverable – Task 2.2.2]	3/3/23
	Conduct face-to-face SRS Walkthrough	3/23/23

Task	Deliverable Item	Delivery Date
	SRS Walkthrough Comment Resolution Report [TOPR Task – Task 2.2.2]	4/13/23
2.3	Draft CWZ Standard SDD [TOPR Deliverable – Task 2.3.1]	7/10/23
	SDD Walkthrough Plan [TOPR Deliverable – Task 2.3.2]	7/11/23
	SDD Walkthrough Comment Resolution Report [TOPR Deliverable – Task 2.3.2]	8/21/23
	Proposed Recommended CWZ Standard for SDO Balloting	11/27/23
2.4	Deliver Recommended CWZ WG Standard [TOPR Deliverable 2.4.1]	12/11/23
	Final CWZ Standard MIB and/or ASN.1 [TOPR Deliverable – Task 2.4.2]	4/4/23
	Final CWZ Standard MIB [TOPR Deliverable – Task 2.4.2]	4/18/23
3.1	Test Plan	5/16/24
	Test Cases and Test Procedures	6/28/24
	Summary of Validation Site Requirements	7/8/24
	Validation Site List	7/29/24
3.2	Letter of Solicitation incl. Self-Assessment Form	7/31/24
	Summary of Self-Assessment Information	8/26/24
	Test Data Collected	1/22/25
3.3	Technical Memorandum on Open-Source Tools and Approaches Available to be Used in Testing	10/22/24
3.4	Validation Report [TOPR Deliverable – Task 3.0]	11/19/24
3.5	Deliver Updated Connected Work Zone Standard and Implementation Guidance [TOPR Deliverable – Task 3.0]	6/12/25
3.6	Minutes from Control Gate Meeting.	6/26/25
4.0	Government Option: Connected Work Zone Reference Implementation [TOPR Deliverable Task 4.0]	TBD

4.3 Project Schedule

The Gantt Chart in Figures 2 through 6 provides the CWZ Standard project schedule. Project tasks and deliverables that correspond to an explicit task included in the TOPR are identified. Deliverables are identified by a diamond shape (◆). Teleconferences are identified by a diamond shape within a circle (◈). Face-to-face meetings are identified by solid circle (●).

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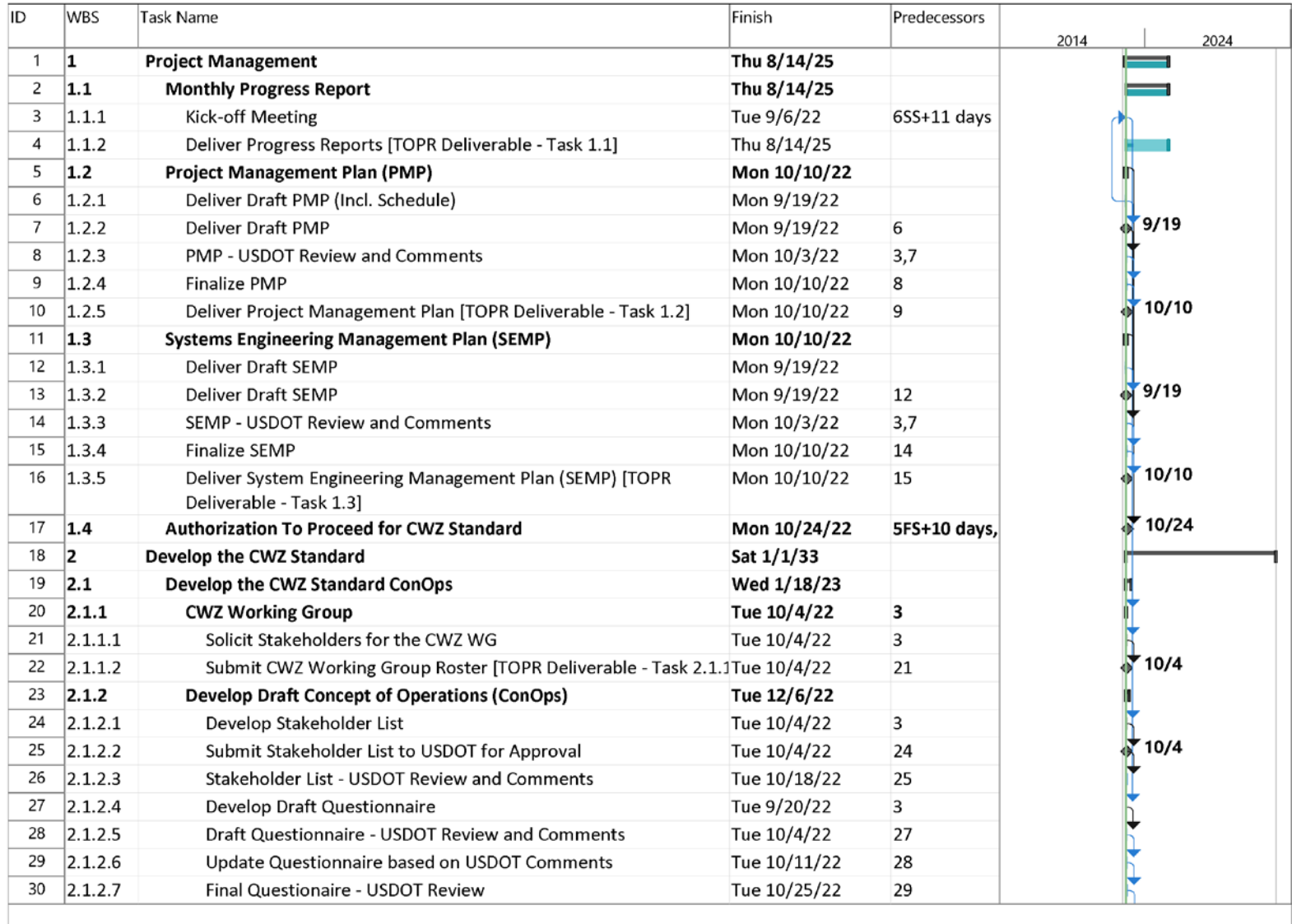


Figure 2. CWZ Standard Project Schedule (Part 1 of 4)

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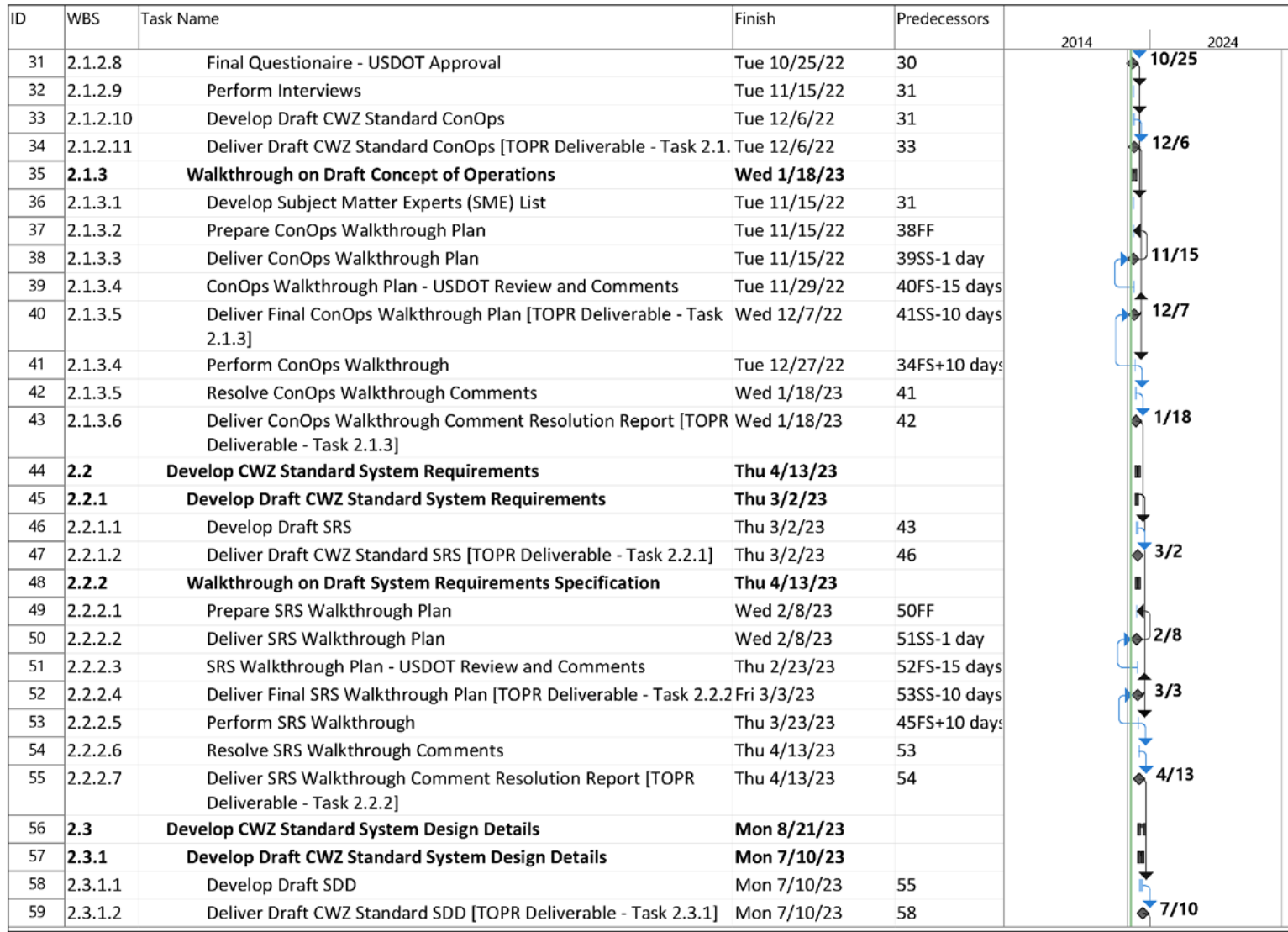


Figure 3. CWZ Standard Project Schedule (Part 2 of 4)

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ID	WBS	Task Name	Finish	Predecessors	Resource Names	Gantt Chart (2023-2024)	
60	2.3.2	Walkthrough on CWZ Standard Systems Design Details	Mon 8/21/23			[Gantt bar for 60]	
61	2.3.2.1	List of Knowledgeable Subject Matter Experts	Tue 6/20/23	63FF		[Gantt bar for 61]	
62	2.3.2.2	Prepare SDD Walkthrough Plan	Fri 6/16/23	63FF		[Gantt bar for 62]	
63	2.3.2.3	Deliver Draft SDD Walkthrough Plan	Fri 6/16/23	64SS-1 day		[Gantt bar for 63]	
64	2.3.2.4	SDD Walkthrough Plan - USDOT Review and Comments	Fri 6/30/23	65FS-15 days		[Gantt bar for 64]	
65	2.3.2.5	Deliver Final SDD Walkthrough Plan [TOPR Deliverable - Task Task 2.3.2]	Tue 7/11/23	66SS-10 days		[Gantt bar for 65]	
66	2.3.2.6	Perform SDD Walkthrough	Mon 7/31/23	59FS+10 days		[Gantt bar for 66]	
67	2.3.2.7	Resolve SDD Walkthrough Comments	Mon 8/21/23	66		[Gantt bar for 67]	
68	2.3.2.8	Deliver SDD Walkthrough Comment Resolution Report [TOPR Deliverable - Task 2.3.2]	Mon 8/21/23	67		[Gantt bar for 68]	
69	2.4	Publish CWZ Standard	Thu 4/18/24			[Gantt bar for 69]	
70	2.4.1	Develop Recommended CWZ Standard Document	Thu 3/21/24			[Gantt bar for 70]	
71	2.4.1.1	Develop proposed User Comment Draft (pUCD)	Tue 9/5/23	68		[Gantt bar for 71]	
72	2.4.1.2	Deliver pUCD to CWZ WG	Tue 9/5/23	71		[Gantt bar for 72]	
73	2.4.1.3	CWZ WG Review and Comment on pUCD	Tue 9/19/23	72		[Gantt bar for 73]	
74	2.4.1.4	Convene CWZ WG Web Conference on pUCD and Adjudicate Comments	Tue 9/26/23	73		[Gantt bar for 74]	
75	2.4.1.5	CWZ WG accepts pUCD	Tue 9/26/23	74		[Gantt bar for 75]	
76	2.4.1.6	UCD Period	Thu 10/26/23	75		[Gantt bar for 76]	
77	2.4.1.7	Resolve UCD Comments	Mon 11/27/23	76		[Gantt bar for 77]	
78	2.4.1.8	Deliver proposed Recommended Standard (pRS) to CWZ WG	Mon 11/27/23	77		[Gantt bar for 78]	
79	2.4.1.9	CWZ WG Ballot Period	Mon 12/11/23	78		[Gantt bar for 79]	
80	2.4.1.10	CWZ WG Accept RS	Mon 12/11/23	79		[Gantt bar for 80]	
81	2.4.1.11	Deliver Recommended CWZ WG Standard [TOPR Deliverable - Task 2.4.1]	Mon 12/11/23	79		[Gantt bar for 81]	
82	2.4.1.11	Prepare SDR and NOI	Wed 1/10/24	80		[Gantt bar for 82]	
83	2.4.1.12	Distribute RS to SDOs / Final Ballot	Thu 1/18/24	82		[Gantt bar for 83]	
84	2.4.1.13	SDO Ballot Period	Thu 3/21/24	83		[Gantt bar for 84]	
85	2.4.2	Publish CWZ Standard	Thu 4/18/24			[Gantt bar for 85]	
86	2.4.2.1	Deliver Publish Ready Approved CWZ Standard	Thu 4/4/24	84		[Gantt bar for 86]	
87	2.4.2.2	Prepare Compilable CWZ MIB/ASN.1	Thu 4/4/24	84		[Gantt bar for 87]	

Figure 4. CWZ Standard Project Schedule (Part 3 of 4)

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ID	WBS	Task Name	Finish	Predecessors	Resource Names	
88	2.4.2.3	Deliver CWZ MIB/ASN.1	Thu 4/4/24	87		2034 01 4/4
89	2.4.2.4	Prepare for No Cost Distribution	Thu 4/18/24	88		2034 02 4/18
90	2.4.2.5	No Cost Distribution Approved CWZ	Thu 4/18/24	89		2034 03 4/18
91	2.4.2.6	Deliver Final CWZ Standard MIB and/or ASN.1 [TOPR Deliverable - Task 2.4.2]	Thu 4/18/24	89		2034 04 4/18
92	3	Verify and Validate Connected Work Zone Standard and Draft Implementation Guidance	Thu 6/12/25			2034 05 6/12/25
93	3.1	Test Documentation	Mon 7/8/24			2034 06 7/8/24
94	3.1.1	Develop Test Plan	Thu 5/16/24	90		2034 07 5/16/24
95	3.1.2	Develop Test Case and Procedures	Fri 6/28/24	94FS+10 days		2034 08 6/28/24
96	3.1.3	Summary of Validation Site Requirements	Mon 7/8/24	95		2034 09 7/8/24
97	3.2	Validation Site Test	Wed 1/22/25			2034 10 1/22/25
98	3.2.1	Validation Site Selection	Mon 8/5/24	96		2034 11 8/5/24
99	3.2.1.1	Validation Site List	Mon 7/29/24			2034 12 7/29/24
100	3.2.1.2	Letter of Solicitation and Self-Assessment Forma	Wed 7/31/24	99		2034 13 7/31/24
101	3.2.1.3	Summary of Self-Assessment Informatin	Mon 8/26/24	98FS+10 days		2034 14 8/26/24
102	3.2.2	Validation Site and Testing Coordination	Wed 1/22/25	101		2034 15 1/22/25
103	3.2.3	Data Collection and Testing	Wed 1/22/25	101		2034 16 1/22/25
104	3.3	Open-Source Test Tools	Tue 10/22/24	101		2034 17 10/22/24
105	3.4	Validation Report	Tue 2/28/23			2034 18 2/28/23
106	3.4.1	Develop Draft Validation Report	Thu 2/20/25	103		2034 19 2/20/25
107	3.4.2	Internal Review with CWZ Co-Chairs	Tue 11/5/24	106		2034 20 11/5/24
108	3.4.3	Final Validation Report	Tue 11/19/24	107		2034 21 11/19/24
109	3.5	Update Standard based on Validation Test	Thu 6/12/25			2034 22 6/12/25
110	3.5.1	Comment Resolution	Thu 3/6/25	103		2034 23 3/6/25
111	3.5.2	Internal Review with CWZ WG	Thu 3/20/25	110		2034 24 3/20/25
112	3.5.3	Final Amended Standard	Thu 4/10/25	111		2034 25 4/10/25
113	3.5.4	SDO Ballot Amendment	Thu 6/12/25	112		2034 26 6/12/25
114	3.6	Control Gate for AApproval to Start Task 4 Effort	Thu 6/26/25	113		2034 27 6/26/25

Figure 5. CWZ Standard Project Schedule (Part 4 of 4)

5 QUALITY MANAGEMENT PLAN

5.1 Purpose of the Quality Management Plan

This Quality Management Plan describes how quality will be managed throughout the life of the project. It includes processes and practices for ensuring quality planning, quality control and quality assurance.

5.2 Quality Planning

To be successful, this PMP has integrated a quality system into the project tasks, project schedule, project deliverables and project team. The project relies heavily on the CWZ Working Group to perform the role of a quality review team. The CWZ Working Group is made up of subject matter experts including those from public agencies, manufacturers, software providers, and consulting firms. The CWZ Working Group includes operational users who provide quality input from the user's perspective. The CWZ Working Group also includes one or more technical staff from ITS JPO. This allows the ITS JPO to have quality input early in the development of project deliverables. It is the responsibility of the CWZ Working Group Co-Chairs and the Project Manager to ensure that the CWZ Working Group is made up of individuals appropriate for the quality aspects of the project. The Project Manager and ITE team have been selected for their experience with the deployment of CWZ applications, their depth of knowledge concerning CWZ standards, their particular expertise applying the systems engineering process to the development of CWZ standards, and their track record producing quality TMDD products.

There are two types of "quality" addressed by this plan: "product quality" and "process quality." Product quality focuses on the project deliverables. The project scope description (see Section 2.1.1) identifies well-known industry standards for all document deliverables. Process quality focuses on how the project deliverables will be produced. The CWZ Standard Project employs a formal systems engineering process. The project scope description and schedule define task and process deliverables such as document walkthroughs and multiple cycles of CWZ Working Group review, comment and comment resolution periods all directed at the aspect of quality.

5.3 Quality Control

This section describes the process for monitoring and recording the results of executing the quality activities. It applies to the project's products as opposed to its processes.

It is intended that each document will be maintained through a document oriented process. Each document produced as a part of this PMP will maintain a Comment Matrix with a unique comment identifier, the name of the commenter, the date of the comment, the version of the document that the comment pertains to, the comment type (Editorial or Technical), the page number, the section number, the issue, the proposed solution, CWZ Working Group conclusions and the disposition (Open/Closed). For all software products of this PMP, issue/change tracking will be provided through the OSS.

The CWZ Working Group reviews of all project deliverables will be performed according to the project schedule. Additional reviews may be meet project needs. Documents will be compared to the industry standards from which they are based to ensure that critical information is not missing. Reviewers will verify that deliverable documents:

- a) contain suitable material for the target audience;
- b) are organized in presentation;
- c) contain proper word use and English diction;
- d) contain detailed illustrations;
- e) are comprehensive, complete and technically correct; and
- f) are edited for grammatical and editorial errors.

Project deliverables will be judged on a “suitable for purpose” basis. The CWZ Working Group may identify more items or make suggestions for changes to a document than are needed to meet the project goals. In some cases, gaining consensus on technical matters within the CWZ Working Group can be difficult and time consuming. If any undertaking by the CWZ Working Group may jeopardize the project schedule, the CWZ Working Group Co-Chairs will make decisions and recommendations on the WG’s behalf.

5.4 Quality Assurance

A Quality Checklist will be established and maintained by the Project Manager to assist in identifying specific items to be reviewed by the CWZ Working Group. A Project Issue Log will be established and maintained by the Project Manager to capture any issue regarding the project that should be addressed by the project management team including items that pertain to quality. Items for the Quality Checklist and Project Issue Log may be proposed by any member of the project team. It is up to the project management team to determine if these items should be included on these lists and if any action should be taken. The Project Management Team will discuss any quality items on a weekly basis.

6 HUMAN RESOURCES MANAGEMENT PLAN

6.1 Purpose of the Human Resources Management Plan

This Human Resources Management Plan is a tool which aides in the management of the Project Team throughout the CWZ Standard Project. It contains the team resumes, and explains the roles and responsibilities of all key individuals on the project and an organizational chart. Team Resumes can be found in Appendix C. Estimated work efforts for the team members, arranged by their organization, are found in Appendix D.

6.2 Roles, Responsibilities and Reporting

Project management responsibilities are jointly held by SDO staff and the CWZ Working Group co-chairs. SDO staff has administrative and fiscal responsibilities. CWZ Working Group co-chairs, with assistance from SDO staff, are responsible for managing the CWZ Working Group. SDO staff with assistance from CWZ Working Group co-chairs are responsible for managing the consulting team to produce the work item technical deliverables. Both parties are responsible for meeting the agreed schedule and the success of the work item. Table 4 identifies the work item management team. The following steps will be used to manage this work item:

- a) Monthly, consultants will report, via email, a summary of the hours expended and remaining by each subtask for which the consultant is assigned; and provide a brief report on the progress made on each ST during the reporting period, as well as an estimate of work to be accomplished in the subsequent reporting period (again, by subtask). The subtask number is used as identified in the work item schedule in Section 4.3. This Consultant Report is not an invoice (due separately) but a summary of work accomplished and hours logged. The Consultant Report is due the first week of the month for the preceding month's activities.
- b) ITE staff will provide an indication of the percentage of each subtask completed for the work item, as part of the Monthly Progress Report, or as a revision of MS Project Schedule (included in the Monthly Progress Report). The Project Schedule is due the second week of the month for the preceding month's activities.
- c) A CWZ Standard management teleconference will be scheduled, on a recurring basis, as needed, to review schedule/progress, financial status, and troubleshoot performance. The teleconference may include: SDO staff, between SDO staff, and the CWZ Working Group co-chairs. The recurring frequency and time of the teleconference will be agreed by the management team.

The CWZ Working Group co-chairs, in consultation with SDO staff, may create subgroups of the CWZ Working Group to focus on technical specialties or to expedite the resolution of unforeseen issues, particularly during the Design Task.

The CWZ Working Group co-chairs and SDO staff will use the CWZ email listserv reflector provided by ITE for communications with the CWZ Working Group members and interested parties. The CWZ Working Group co-chairs will use and maintain a CWZ Standard work area of the ITE website, and the email listserv reflector for meeting agendas, meeting minutes, work item documents and interim work item products

SDO staff will notify the paid work item consultants and those participants pre-approved for travel reimbursement of the ITE policies and procedures, and seek appropriate government approval for such travel.

Table 4 identifies the entire CWG Standard Project Team, their roles within the project, their project responsibilities and their reporting responsibilities

Table 4. CWZ Standard Project Team and Reporting

Name	Project Role	Responsibilities	Reporting
<p>Insignares, Manny ConSysTec Manny.insignares@consystec.com</p>	<p>Subject Matter Expert</p>	<ul style="list-style-type: none"> • Part of the Project Management Team. • Works with the ITE program manager to maintain project reporting required by the USDOT. • Prepares and maintains the PMP and MS Project schedule. • Plays a quality management function on deliverables. • Provides leadership for the rest of the consulting team. • Prepares project policies and procedures. • Organizes meetings and keeps records. • Coordinates with the Chairs of the CWZ Working Group Maintains communication and consensus building within the WG. 	<ul style="list-style-type: none"> • Provides weekly progress reports to the Project Administrator/Coordinator per Section 4.2 including an updated Microsoft Project Schedule.
<p>Chan, Patrick ConSysTec 718-767-5120 Patrick.chan@consystec.com</p>	<p>Systems Engineer</p>	<ul style="list-style-type: none"> • Provides the rigor required to verify that a complete and correct product is being developed. • Prepares and maintains the SEMP. • Develops ConOps, Requirements documents. • Develop systems engineering portions of design documents, including the traceability matrices. • Develops the ballot and published versions of the standard. • Leads walkthroughs of documents at various stages of the project. 	<ul style="list-style-type: none"> • Provides weekly progress reports to the Project Manager per Section 4.2.
<p>Benison, Douglas ConSysTec Doug.benison@consystec.com</p>	<p>Subject Matter Expert</p>	<ul style="list-style-type: none"> • Plays a quality management function on deliverables. • Develops ConOps, Requirements documents. • Develop systems engineering portions of design documents, including the traceability matrices. • Develops the ballot and published versions of the standard. 	
<p>TBD</p>	<p>Subject Matter Expert</p>	<ul style="list-style-type: none"> • Provides feedback on the ConOps, FRS, and SDD documents. • Participates in the walkthroughs 	<ul style="list-style-type: none"> •
<p>TBD</p>	<p>Application Developer</p>	<ul style="list-style-type: none"> • Provides feedback on the FRS document. • Develop the SDD document. • Participates in the walkthrough. 	<ul style="list-style-type: none"> • Provides weekly progress reports to the Project Manager per Section 4.2.
<p>Narla, Siva ITE 202-785-0060 x119 snarla@ite.org</p>	<p>SDO (Lead)</p>	<ul style="list-style-type: none"> • Part of the Project Management Team. • Official administration and coordination of the project from a contracts perspective. • Monitors project expenditures in labor, travel expenses and capital expenses. • Official project communications channel to the COR. 	<ul style="list-style-type: none"> • Provides monthly progress reports to the COR per Section 4.1 including an updated Microsoft Project Schedule.

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Name	Project Role	Responsibilities	Reporting
Rouse, Deborah ITE drouse@ite.org	Technical Editor	<ul style="list-style-type: none"> Ensures project documents contain suitable material for the target audience. Ensures project documents are organized in presentation. Reviews project documents for grammatical and editorial errors. Reviews project documents for proper word use and English diction. 	<ul style="list-style-type: none"> Provides weekly progress reports to the Project Manager per Section 4.2.
Tavares, Nicola ITE ntavares@ite.org	SDO (Liaisons)	<ul style="list-style-type: none"> Part of the Project Management Team. Ensure conformance with NTCIP Procedures. Ensure draft NTCIP 1218 v01 RSU content is developed in a manner consistent with other NTCIP standards, NTCIP 8002 Annex B1, and TPG format requirements to assure quality, consistency and clarity. 	<ul style="list-style-type: none"> Provides weekly progress reports to the Project Manager per Section 4.2.
Doherty, Brian NEMA Brian.Doherty@nema.org	SDO (Liaisons)	<ul style="list-style-type: none"> Part of the Project Management Team. 	<ul style="list-style-type: none"> Provides weekly progress reports to the Project Manager per Section 4.2.
White, Robert AASHTO rwhite@aaashto.org	SDO (Liaisons)	<ul style="list-style-type: none"> Part of the Project Management Team. 	<ul style="list-style-type: none"> Provides weekly progress reports to the Project Manager per Section 4.2.
Wilson, Keith SAE International Keith.Wilson@sae.org	SDO (Liaisons)	<ul style="list-style-type: none"> Part of the Project Management Team. 	<ul style="list-style-type: none"> Provides weekly progress reports to the Project Manager per Section 4.2.
TBD	CWZ Working Group Co-Chair	<ul style="list-style-type: none"> Part of the Project Management Team. Provides leadership of the CWZ WG to carry out the work items assigned by the CWZ WG. Presides over CWZ WG teleconferences and meetings. Focuses the effort of the CWZ WG to review documents and provide feedback to the ITE team in a timely fashion. Builds consensus with the WG members. 	<ul style="list-style-type: none"> Provides reporting on the progress of the CWZ Standard project (via CWZ Coordinator) to the CWZ Working Group. Makes requests for assistance from the CWZ WG Chair if there are CWZ WG issues that cannot be resolved.

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Name	Project Role	Responsibilities	Reporting
TBD	CWZ Working Group Co-Chair	<ul style="list-style-type: none"> • Part of the Project Management Team. • Provides leadership of the CWZ WG to carry out the work items assigned by the CWZ WG. • Presides over CWZ WG teleconferences and meetings. • Focuses the effort of the CWZ WG to review documents and provide feedback to the ITE team in a timely fashion. • Builds consensus with the WG members. 	<ul style="list-style-type: none"> • Provides reporting on the progress of the CWZ Standard project (via CWZ Coordinator) to the CWZ Working Group. • Makes requests for assistance from the CWZ WG Chair if there are CWZ WG issues that cannot be resolved.
		•	•

6.2 Management Tools and Reports

The following tools should be used for management of this work item:

Email for informal reports and messages;

- MS Word 2010 for general reports and documents;
- MS Project 2010 for schedule updates; and
- MS Access 2010 for maintaining a database of comments, their analysis and disposition.

6.3 Organizational Chart

Figure 7 shows an organizational chart for CWZ Standard Project. The chart shows the project team including the CWZ WG due to its critical role in providing industry expertise and quality control. The project management team consists of the Project Administrator/Coordinator(s), the Project Manager and the CWZ WG Co-Chairs.

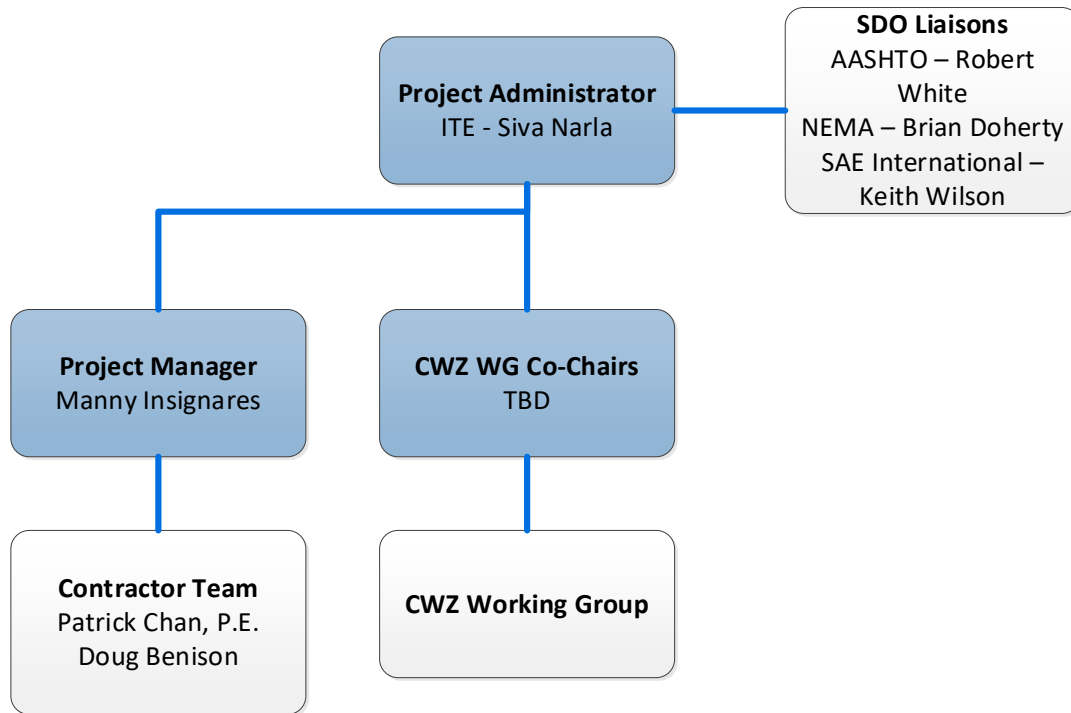


Figure 7. CWZ Standard Project Organization

APPENDIX A – REFERENCES

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APPENDIX B – GLOSSARY, ACRONYMS, AND ABBREVIATIONS

Term	Definition
AASHTO	American Association of State Highway and Transportation Officials
C2C	Center-to-center
ConOps	Concept of Operations
CO	Contracting Officer
CTI	Connected Transportation Interoperability
CVPFS	Connected Vehicle Pooled Fund Study
CWZ	Connected Work Zone
HTTP	Hypertext Transfer Protocol
IOO	Infrastructure Owner Operators
ITE	Institute of Transportation Engineers
ITS	Intelligent Transportation Systems
JPO	Joint Program Office
JSON	Javascript Object Notation
IG	Implementation Guide
NTCIP	National Transportation Communications for ITS Protocol
PMP	Project Management Plan
PRL	Protocol Requirements List
PWS	Performance Work Statement
REST	Representational State Transfer
RTCTM	Requirement to Test Case Traceability Matrix
RTM	Requirements Traceability Matrix
SDD	System Design Details
SDO	Standards Development Organization
SEMP	Systems Engineering Management Plan
SME	Subject Matter Expert
SRS	System Requirements Specification
SVT	Standards Verification Tool
TBD	To Be Determined
TIM	Traffic Incident Management
TMC	Traffic Management Center
TMDD	Traffic Management Data Dictionary
TOCOR	Task Order Contracting Officer's Representative
TOPR	Task Order Proposal Request
UCD	User Comment Draft

Term	Definition
USDOT	United States Department of Transportation
Walkthrough	A step-by-step presentation by the author of a document in order to gather information and to establish a common understanding of its content.
WBS	Work Breakdown Structure
WG	Working Group
WZDx	Work Zone Data Exchange
XML	eXtensible Markup Language

APPENDIX C – PROJECT TEAM RESUMES

This section will be updated

APPENDIX D – WORK EFFORT BY ORGANIZATION AND INVOICING TEMPLATES

1. Invoice Reporting

ITE shall submit monthly invoices addressing work completed. Each voucher will include a breakdown of ITE's and subcontractors' hours and labor costs in accordance with invoice guidance and Billing Instructions for Cost Reimbursable Orders as described in IDIQ Exhibit J. 5.

Invoices shall be submitted directly to the Delphi system or as otherwise specified. Additionally, ITE shall submit the contract and task order invoice (if applicable) concurrently to the COR, the TOCOR (if applicable), ITSPROJECTS@dot.gov, and other recipient(s) (if applicable) as directed by the COR.

Schedules and Performance Reporting

The Contractor shall provide:

- a) Monthly Status Reports – the Contractor shall submit monthly progress reports no later than 15 days after the end of the month being reported on in the format specified by the COR. The progress report shall describe work completed during the period, anticipated work, problems encountered and and/or anticipated as well as financial status including at least hours expended and other costs.
- b) Project Schedule – the Contractor shall submit, to the Government, an initial project schedule in Microsoft Project format within sixty (60) days after the effective date of the contract and updates showing the percent complete of major deliverables every thirty (30) days thereafter. The schedule shall include at a minimum, the major deliverables and milestones and adhere to the Microsoft Project template structure provided by the COR. Any changes to due dates after the initial project schedule baseline must be approved by the Government. The Contractor shall support the identification of schedule dependencies related to the project and in accordance with the Government defined process.
- c) Risk Register – the Contractor shall document risks that might affect the project and the characteristics of the risk defined by the ITS-JPO. The COR will provide a Microsoft Excel-based Risk Register template for the Contractor to populate and update as necessary. Each risk shall have a unique number, probability of occurrence and impact of occurrence rating. The risk log shall be updated monthly and submitted with monthly progress reports.

The costs incurred in the administrative reporting are unallowable direct costs under the contract and, therefore, cannot be charged as direct costs to the Government. Contractor is to handle such costs in accordance with their disclosure statements/cost accounting systems.

ITS-JPO templates are available at http://www.its.dot.gov/project_mang/index.htm

2. Deliverables

The Contractor shall submit Interim and Final Deliverables concurrently to the COR, the TOCOR (if applicable) and to ITSPROJECTS@dot.gov once these deliverables have been accepted by the Government. The Contractor shall include the contract number (and task order number if appropriate) in the email subject line for each deliverable. The Government may request the Contractor to include additional specified keywords in the subject line of emails containing deliverables. Additionally, the Government may request the Contractor to submit Deliverables to an electronic repository as specified by the COR.