

WORK ZONE
DATA INITIATIVE

**Work Zone Activity
Data (WZAD)**

**Data
Dictionary
Report**

Version 2

Publication No. **FHWA-XXX-XX-XXXX**

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16. Abstract This document is the Work Zone Data Dictionary (WZDD) Report, developed as the primary deliverable for Task 4 under the Federal Highway Administration (FHWA's) Work Zone Data Initiative (WZDI) Project. It describes the methodology and components included within Work Zone Activity Data (WZAD). This document supports the desired WZAD elements identified during stakeholder outreach discussions under Task 2 of the WZDI and documented in <i>Work Zone Activity Data Needs and Opportunities</i> (FHWA-XXX-XX-XXXX). It also includes traceability to data flows detailed under the Task 3 companion document, <i>Framework for Work Zone Activity Data Collection and Management</i> (FHWA-XX-XXXX). It is not meant as a prescriptive database nor does it profess to contain all the data that are needed by each individual data provider or consumer. Rather, it is composed of work zone-related data concepts driven by industry needs. It attempts to specify consistent data with respect to meaning and enumerated values. Its contents may serve as a reference to organizations developing their own Work Zone Data Systems (WZDS) particularly in areas that vary significantly from organization to organization such as assignment of locations (e.g., begin / end locations), temporal states, and impacts. Additionally, this document is set up to enable WZDS to adopt data concepts as they are ready or as specific stakeholder groups are incorporated into the data environment. The migration and rollout approach is described in the <i>Work Zone Activity Data (WZAD) Guidance Document</i> (FHWA-XXX-XX-XXXX).			
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PREFACE

This Work Zone Data Dictionary (WZDD) Report, developed as the primary deliverable for Task 4 under the Federal Highway Administration (FHWA's) Work Zone Data Initiative (WZDI) Project, is not meant as a prescriptive database nor does it profess to contain all the data that are needed by each individual data provider or consumer. Rather, the WZDD Report is composed of work zone-related data concepts driven by industry needs that were identified during stakeholder outreach discussions that occurred during Task 2 of the WZDI.

While meeting stakeholder needs, the WZDD Report attempts to specify consistent data with respect to meaning and enumerated values. Its contents may serve as a reference to organizations developing their own Work Zone Data Systems (WZDS),¹ particularly in areas that vary significantly from organization to organization such as assignment of locations (e.g., begin / end locations), temporal states, and impacts. The WZDD Report attempts to address the heterogeneous descriptions currently used by State, regional and local organizations by:

- Clearly defining geometric and temporal concepts;
- Building a framework for classification topics that enable data providers to categorize local details;
- Applying scenarios to the data; and
- Grouping data to mitigate ambiguity.

Additionally, the WZDD Report is set up to enable WZDS to adopt data concepts as they are ready or as specific stakeholder groups are incorporated into the data environment. The migration and rollout approach is described in the *Work Zone Activity Data (WZAD) Guidance Document* (FHWA-XXX-XX-XXXX) (currently under development).

¹ A WZDS supports the collecting, editing, storing, disseminating, and archiving of WZAD over the work zone life cycle. For the purposes of this document it is illustrated (in Figure 2) as a single “black box” data repository with WZAD inputs and outputs. However, an actual WZDS may be distributed across multiple agency data systems.

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1 INTRODUCTION

1.1 SCOPE

This document is the Work Zone Data Dictionary (WZDD) Report, developed as the primary deliverable for Task 4 under the Federal Highway Administration (FHWA's) Work Zone Data Initiative (WZDI) Project. It describes the methodology and components included within WZAD. This document supports the desired WZAD elements identified during stakeholder outreach discussions under Task 2 of the WZDI and documented in *Work Zone Activity Data Needs and Opportunities* (FHWA-XXX-XX-XXXX) [1]. It also includes traceability to data flows detailed under the Task 3 companion document, *Framework for Work Zone Activity Data Collection and Management* (FHWA-XX-XXXX) [2].

1.2 AUDIENCE

The WZAD described in this document are intended to provide clear and unambiguous meaning to data concepts for organizations collecting, storing, disseminating and consuming work zone data. This document uses terminology developed for Intelligent Transportation Systems (ITS) standards and explained in ISO 14817 [3] including data concept, element, frame, and schema. Definitions for these terms are found in this document under Appendix A. Terms and Acronyms.

1.3 DOCUMENT ORGANIZATION

This document includes the following sections:

- **Section 2. WZDD Report Overview.** Describes the traceability between this Report and the preceding foundational tasks. It also provides an overview the report organization.
- **Section 3. WZDD Components.** Provides detailed tables for the WZDD components summarized in the section above.
- **Appendix A. Terms and Acronyms.** Contains a glossary of technical terms and acronyms used in this document.
- **Appendix B. Traceability to WZAD Framework.** Maps the Framework use cases and data content with the work zone data concepts described in this document.
- **Appendix C. ITS Standards Applied to the WZDD.** Contains a mapping of ITS standard data concepts to the WZ data concepts.

2 WZDD REPORT OVERVIEW

2.1 TRACEABILITY TO USE CATEGORIES AND FRAMEWORK

The work zone data concepts included in this document are driven by: (1) needs and requirements derived from stakeholder discussions [1]; (2) use categories and associated use cases [1]; and (3) data content and flows outlined in the WZDS Framework [2]. Mapping of these needs, requirements, use cases, and data flows to the data dictionary elements is essential to “right-size” the WZDD. This information not only focuses on current capabilities and data collection needs, but also on desired data collection and management needs to support future technologies, performance measures and analytics.

Traceability to preceding tasks can be viewed through the following four-step process (Figure 1). This process is used to organize the following sub-sections.

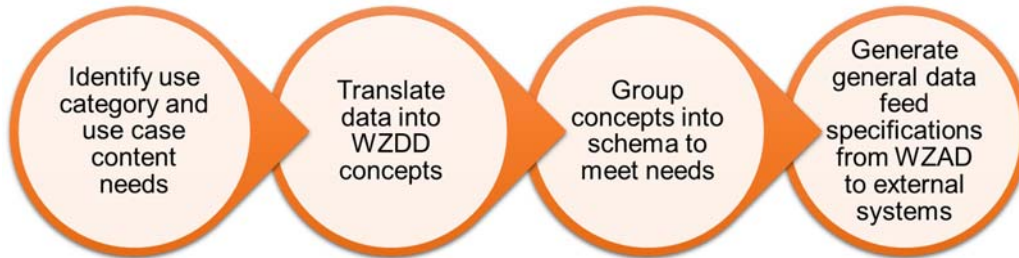


Figure 1. WZAD Traceability to Stakeholder Needs and Requirements

2.1.1 Mapping identified WZDS Framework Content to WZAD concepts

The WZAD Framework identified 59 WZAD data concepts. The industry standard defines a **data concept** as “an abstraction or thing in the natural world that can be identified with explicit boundaries and meaning and whose properties and behavior all follow the same rules.” A data concept may reference a single, discrete **data element** or it may refer to a grouping of several data elements (i.e., a **data frame**)². These terms are defined as follows:

- **Data Element** – Discrete data concept that cannot be broken down into smaller units.
- **Data Frame** - Data concept that describes a portion of a message or data feed that may contain other data elements or data frames.

A consolidated list of data derived from the Framework use cases was used to generate WZDD concepts. From the 59 data concepts identified, 147 WZDD concepts were generated. The

² Definitions for data concept, data element, and data frame are adapted from [3] the ISO ITS Data Dictionary standard.

mapping table between the Framework needs and Work Zone Data Dictionary is detailed in Appendix B: Traceability to WZAD Framework.

2.1.2 Mapping External Data Sources to WZDD Concepts

The Framework Document [1] also describes WZDS external data needed to meet user objectives. Stakeholder input recommended that external data not be defined by the WZDD and not be stored in the WZAD. However, linkages should be identified to specific stakeholder systems. The external systems are depicted as arrows between the WZDS and other systems as shown in Figure 2. The specific data needs are detailed in the 50 Use Cases included in that document. From the 50 use cases, a consolidated set of 25 external data needs were identified with an additional 6 data concepts derived from WZAD content. For example, signal timing plans and devices affected by work zone activities. Although the external sources and their data descriptions are out of scope for this dictionary, the specific data may be referenced by this document. Alignment of the external data needs and the WZDD Data Concept Model (Figure 3) are described in Section 2.2.4.2.

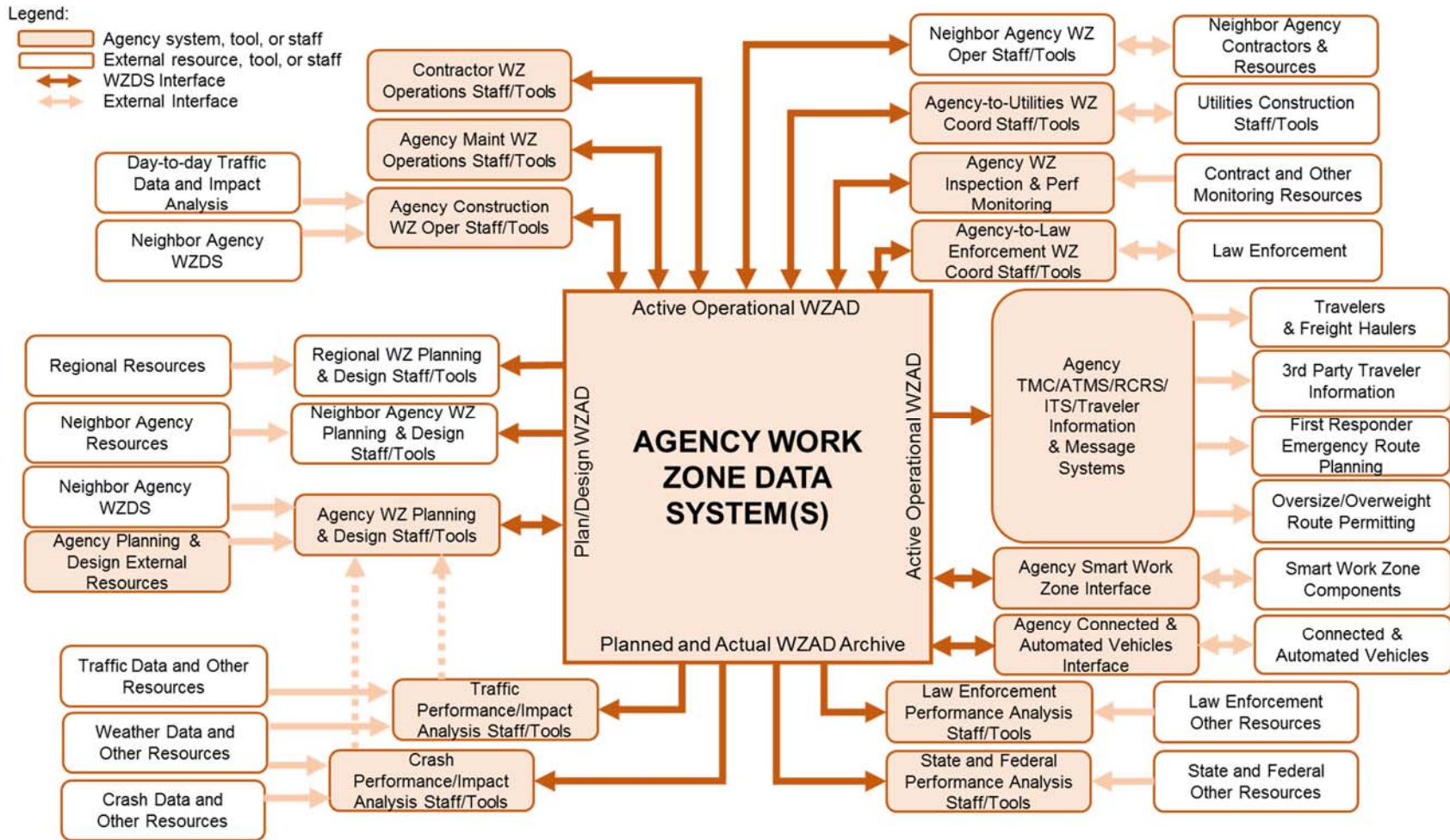


Figure 2: Comprehensive View of the WZDS Conceptual Architecture [1]

2.2 WZDD COMPONENTS OVERVIEW

The WZDD Report is composed of work zone-related data concepts that meet stakeholder needs for consistent data with respect to their meaning and enumerated values. In developing unambiguous geometric and temporal concepts, building a framework for classification schemes, and grouping data to mitigate ambiguity, the WZDD includes several elements including: Data Dictionary, Data Frames, Enumerated Values, and Data Schema. These elements are summarized in the sub-sections below and described in further detail in Section 3.

2.2.1 Data Dictionary

The WZDD is a consolidated tabular list of all the data concepts (i.e., data frames, data elements, and enumerated values) that were identified under this effort. For each discrete data concept, the tabular list includes the following information:

- Name of the data concept
- Data concept designator (data frame (DF), data element (DE), or enumerated type (Enum))
- Data concept description
- Used by (lists the schema table and/or data frame table that includes the data concept)
- Related notes

For the comprehensive data dictionary see Table 6.

2.2.2 Data Frames

As noted earlier, a data frame groups data elements and data frames by concept. The groups may be constructed using similar types of data such as location referencing methods (spherical, linear), data that are meaningful only when referenced together such as latitude and longitude, or a combination. Each data frame included in the WZDD (Table 6) is detailed in its own separate tabular list in Section 3.1 that provides the following information:

- Data frame name
- Associated data concepts
- Concept descriptions
- Conformance (required, optional or conditional)

The data frames identified under this effort are grouped as follows:

- **Section 3.1.1. Project Event Identifiers.** Data frames used to describe unique identifiers for project events.
- **Section 3.1.2. Geometry and Spatial Features.** Data frames used to describe geometry and spatial features, including location aggregate domains and groupings of associated data such as work zone geometry.

- **Section 3.1.3. Date and Time** . Data frames used to describe date, time, and time periods.
- **Section 3.1.4. Other Data Frames**. Data frames used to describe work, the roadway, and restrictions.

2.2.3 Enumerated Types

The enumerated types described in Section 3.2 contain a data element, data definition, and associated formalized data values (i.e., a list of related data). Many of the values identified are adapted from existing industry sources. For example the data element facilityType is derived from an enumerated list specified in the Traffic Management Data Dictionary [4]. An example of the facilityType definition:

- Data Element – facilityType
- Definition – A type of road facility
- Enumerated Values – mainline, shoulder, ramp, connector

2.2.4 Data Schema

A data schema organizes data concepts into logical groupings to meet business needs and objectives. In the case of the WZAD, these needs were derived from the information received from stakeholders in Task 2 and generated into use cases in the Task 3 Framework document. For example, the following bulleted list provides needs for structuring the components of a work zone project:

- A **Work Zone Project** is composed of one or more **Phases**.
- A **Phase** may be composed of one or more **WZ-Tasks** (or events).
- A **WZ-Task** may be composed of zero or more **WZ-Subtasks** (or subevents) or **WZ-Lane Activity(ies)**.
- A **WZ-Subtask** may be composed of zero or more **WZ-Lane Activity(ies)**.

These groupings are shown either through a visual data model (i.e., a diagram) and/or a table. For this report, the project team developed a visual data model that depicts the relationship among data concepts (Figure 3). This model provides the reader with information on:

- **Schema tables**. Groupings of data elements and data frames that meet user needs. Tables define core project events and their relationship to each other (e.g., a WZ task may be composed of zero or more WZ subtasks) as well as other characteristics that distinguish or impact the event activities (e.g., Roles or Project Coordination List)
- **Data Lists/Logs**. Include WZAD information collected through a file/list entry
- **Databases**. WZAD information gathered from external data sources that feed into various data schema tables and/or data lists/logs
- **External Data Services**. Such as APIs and data feeds that provide necessary WZAD content to external stakeholders

Additionally, the model includes information on relationships and data flows. The dark blue lines with circular end points represent a one (or zero)-to-many relationship in which the abstraction described by a table may be characterized by zero or more instances of a related table. For example “a phase may be composed of one or more WZ tasks.” Arrows in the model provide the reader with information on data flows between one system and another. For example, crash data, stored in an external source, flows into the impact analysis schema table. Lastly, light blue boxes in the model represent data schema tables which resolve many-to-many relationships. For example, a state department of transportation (Organization) may have multiple roles in a work zone project (e.g., capital planning, construction & engineering, safety, maintenance) and each may have a different role associated with a different phase or task. The schema method, depicted by the light blue, resolves the ambiguity.

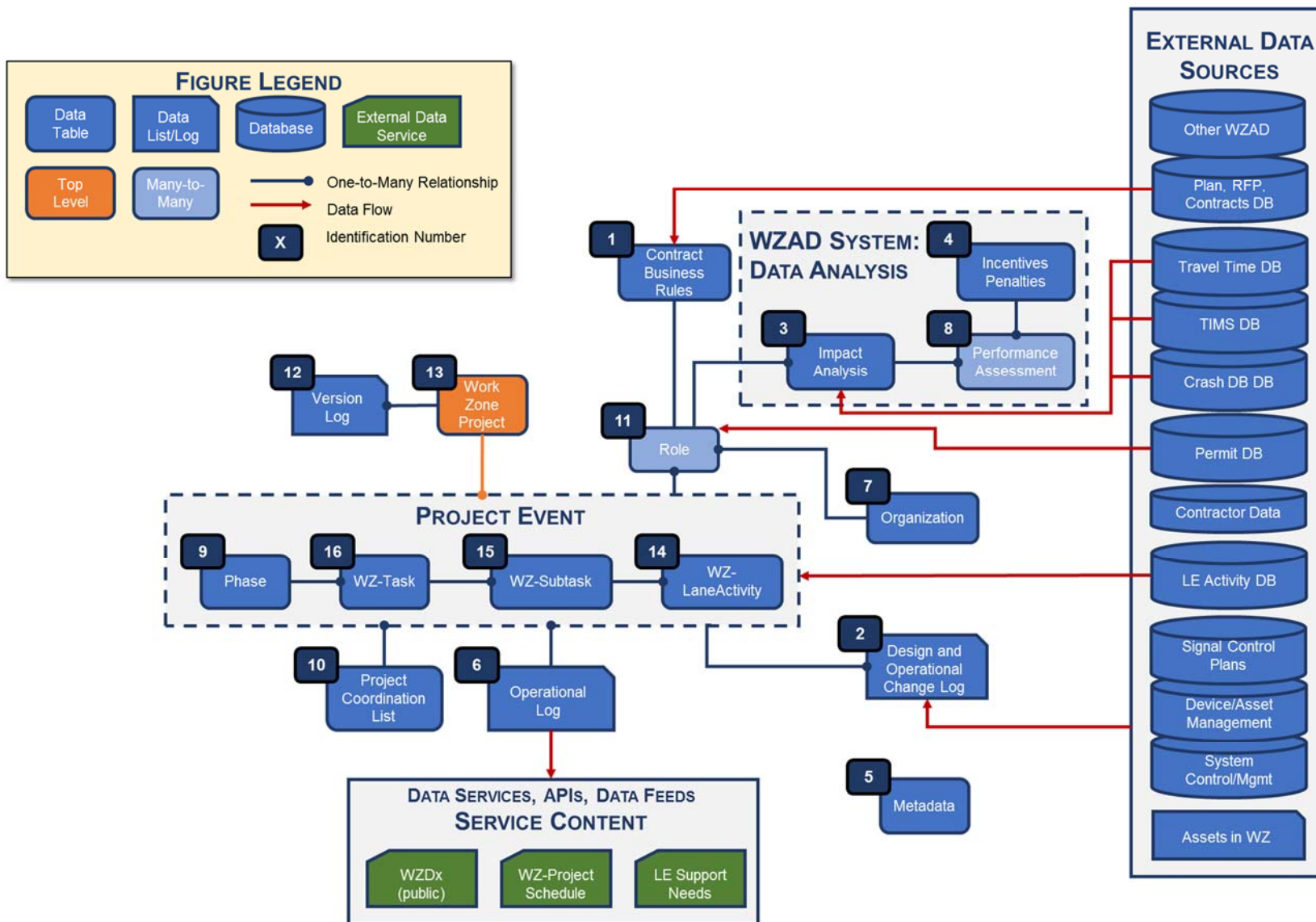


Figure 3: WZAD Concept Data Model

The following tables provide additional information on each data schema table (noted by the identification number box at the top left of each rectangle in the model). Table 1 provides a detailed description of each data schema table. Table 2 lists out the data concepts that are included in each data schema table. The definitions provided for each data concept correlate directly to the WZDD.

Table 1. Data Schema Table Description

TABLE NAME	TABLE DESCRIPTION	CONFORMANCE
1. Contract Business Rules	Roles and responsibilities including performance measures, penalties and incentives by contract	Optional
2. Design and Operational Change Log	A set of changes to the design or operational elements that impact the project phase, task, subtask or lane activity such as a change to a phase plan (no left turn) or disruption such as a broken drill.	Optional
3. Impact Analysis	Association between incentive/penalty and performance/provision compliance for each period	Optional
4. Incentives Penalties	Describes the value of a Role meeting its performance and compliance goals over specified periods	Optional
5. Metadata	A detailed description of quality methods and metrics associated with time and location information.	Required
6. Operational Log	A list of actions or events triggered by requests for information by external sources (e.g., WZDx data feed or Law Enforcement Activity Data)	Optional
7. Organization	An organization that participates or is associated with the work zone project.	Required
8. Performance Assessment	Each instance of a Role meeting its performance and compliance goals	Optional
9. Phase	A stage of a project that requires a work zone (e.g., construction, maintenance, or other)	Required
10. Project Coordination List	A set of project and project liaisons that require coordination based on specific coordination needs.	Optional
11. Role	The role associated between and organization and their involvement in a work zone project (phase, task, subtask, or lane activity). The role may require a permit or be assigned specific contract provisions (or business rules).	Required
12. Version Log	A list of all the changes, actions and events associated with the WZDS	Required

TABLE NAME	TABLE DESCRIPTION	CONFORMANCE
	including editor, timestamp, attribute change and reason for change.	
13. Work Zone Project	The general description of a work zone project.	Required
14. WZ-LaneActivity	A detailed description of a work zone project event by individual lanes within the task or subtask geometry.	Optional
15. WZ-Subtask	Detailed description of a work zone project that details a specific event associated with a task. The WZ-Subtask inherits the characteristics of its parent project phase and task but may identify an exception by date to its parent task.	Optional
16. WZ-Task	A description of a work zone project tasks. Each task is described by a single road segment in a single direction.	Required

Table 2. Data Schema Attribute Descriptions

DATA NAME	DATA DESCRIPTION	CONFORMANCE
Table 1. Contract Business Rules		
a) contractURL	A link (URL) to a contract or contract provisions associated with a contractor's contract to perform specified work.	required
b) projectName	The name of the project as published.	required
c) ProjectEventID	A unique identifier associated with one or more project event identifier types and other associated references identifier such as contract number.	required
d) businessRuleConformance	An instance of requirement or business rule which will be measured for impact, compliance or performance	optional
e) descriptionCBR	A concise description of the business rule	optional
Table 2. Design and Operational Change Log		
a) timestamp	A timestamp that identifies the time and date the change was made, a request was sent or data was collected.	required
b) changeLogNumber	An automated log number that uniquely identifies the entry.	required

DATA NAME	DATA DESCRIPTION	CONFORMANCE
c) projectName	The name of the project as published.	required
d) ProjectEventID	A unique identifier associated with one or more project event identifier types and other associated references identifier such as contract number.	required
e) design-opsChangeType	The type of design or operational change that impacts a project task. For example, the change may include signal timing changes, schedule changes, location or geometry changes.	required
f) attributeName	The attribute name wherein the change was made	conditional (if design-opsChangeType is an attribute change – add, remove, edit)
g) fromValue	The original or last value which was changed.	conditional (if the design-opsChangeType is an attribute value change – original value)
h) toValue	The new value inserted in the database	conditional (if the design-opsChangeType is an attribute value change – new value)
i) reason	The reason for the change such as safety, operational, or coordination with other projects	optional

Table 3. Impact Analysis

a) contractRole	The organization's role with respect to the project event.	required
b) businessRuleConformance	An instance of requirement or business rule which will be measured for impact, compliance or performance	required
c) targetValue	The requirement value under review	required
d) actualValue	The actual value measured during period	required

DATA NAME	DATA DESCRIPTION	CONFORMANCE
e) timestamp	A timestamp that identifies the time and date the change was made, a request was sent or data was collected.	required
f) performancePeriod	The compliance period	required
g) ProjectEventID	A unique identifier associated with one or more project event identifier types and other associated references identifier such as contract number.	required

Table 4. Incentives Penalties

a) contractURL	A link (URL) to a contract or contract provisions associated with a contractor's contract to perform specified work.	required
b) incentiveValue	The amount of incentive or penalty for the requirement	required
c) businessRuleConformance	An instance of requirement or business rule which will be measured for impact, compliance or performance	required
d) performancePeriod	The compliance period	required
e) ProjectEventID	A unique identifier associated with one or more project event identifier types and other associated references identifier such as contract number.	required

Table 5. Metadata

a) issuingOrganization	The name of the issuing organization. This name should match the name of the owner of the Work Zone Activity Database.	required
b) ProjectEventID	A unique identifier associated with one or more project event identifier types and other associated references identifier such as contract number.	required
c) location-verify-method	The method used to verify the accuracy of the location information.	optional
d) wz-location-method	The typical method used to locate the begin and end of a work zone impact area. An explanation should be included in the metadata when this value is assigned.	optional
e) lrs-Type	Describes the type of linear referencing system used for the milepost measurements.	optional
f) lrs-URL	A URL where additional information on the LRS information and	optional

DATA NAME	DATA DESCRIPTION	CONFORMANCE
	transformation information is stored.	
g) mapService-URL	Location where web mapping services such as OGC Web Map Services (WMS) or Web Feature Services (WFS) are stored that were used to determine work zone or feature locations.	optional
h) roadName-URL	A URL where the official guide to names and spelling of road names and ramp identifiers are located.	optional
i) datafeed-frequency-update	The frequency at which the data feed is updated and made available through the data feed. Format shall include value+ units such as 30s, 15m, or 24h where: <ul style="list-style-type: none"> • s = seconds • m = minutes • h = hours 	optional
j) timestamp-Metadata-Update	The time and date when this file was last updated.	optional
k) contact-name	The name of a contact responsible for the data feed.	optional
l) contact-email	The contact's email address.	optional

Table 6. Operational Log

a) msgID	A unique identifier for a data feed or message.	required
b) timestamp	A timestamp that identifies the time and date the change was made, a request was sent or data was collected.	required
c) destination	The URL or stakeholder name that receives the log file.	required
d) serviceType	The data service name, for example LE Support Needs	required
e) description	A concise description of the purpose of the service content	optional

Table 7. Organization

a) orgName	The name of an organization associated with a project that requires a work zone.	required
b) orgType	A type of organization that is associated with an organization.	optional

DATA NAME	DATA DESCRIPTION	CONFORMANCE
c) orgTelephone	A contact telephone number associated with related organization.	optional
d) orgAddress	A business address associated with related organization.	optional
e) region	A known jurisdiction, area or corridor. Also used to describe an organization's address.	optional
f) orgURL	The web address for the organization. This may specify a file storage site.	optional
g) orgContactName	The organization's contact person for the project.	optional
h) orgContactEmail	The email address for the organization's contact.	optional
i) orgContactTelephone	The phone number for the organization's contact.	optional

Table 8. Performance Assessment

a) contractRole	The organization's role with respect to the project event.	required
b) performancePeriod	The compliance period	required
c) businessRuleConformance	An instance of requirement or business rule which will be measured for impact, compliance or performance	required
d) markValue	The difference between target and actual values	required
e) incentiveValue	The amount of incentive or penalty for the requirement	required
f) targetValue	The requirement value under review	optional
g) actualValue	The actual value measured during period	optional
h) ProjectEventID	A unique identifier associated with one or more project event identifier types and other associated references identifier such as contract number.	required

Table 9. Phase

a) phaseID	A unique identifier for a project phase.	required
b) ProjectEventID	A unique identifier associated with one or more project event identifier types and other associated references identifier such as contract number.	optional
c) descriptionPhase	A concise description of the phase	optional
d) WZ-Geometry	A set of attributes associated with the work zone geometry including but	required

DATA NAME	DATA DESCRIPTION	CONFORMANCE
	not limited to begin and end locations.	
e) StartDateTime	The date and time starts.	required
f) EndDateTime	The date and time the work zone ends.	required
g) wz-Status	The status of the work zone.	required
h) Recurring	Description for a daily or weekly recurring time period from the StartDateTime to the EndDateTime.	optional
i) RoadType	The type of road classification and facility type where the work zone is located and the traffic is impacted.	optional
j) workersPresent	Designation that workers are present in the work zone. [yes / no]	optional
k) reasonCancel	The reason for a cancellation.	conditional when wz-status = cancelled
l) WorkType	The class and type of work that will be performed during the project or a designated event period and location.	required
m) RoadRestrictions [*]	One or more roadRestriction types that apply to the work zone road segment bounded by the begin / end locations.	optional

Table 10. Project Coordination List

a) timestamp	A timestamp that identifies the time and date the change was made, a request was sent or data was collected.	required
b) StartDateTime	The date and time starts.	required
c) EndDateTime	The date and time the work zone ends.	required
d) region	A known jurisdiction, area or corridor. Also used to describe an organization's address.	required
e) coordinationOrgCount	The number of organizations identified in the list.	required
f) ProjectCoordination [*]	Description of organizations that require coordination.	required
g) coordinationStatus	The status of coordination including whether the coordination is active, planned, closed, not initiated.	optional

DATA NAME	DATA DESCRIPTION	CONFORMANCE
Table 11. Role		
a) orgName	The name of an organization associated with a project that requires a work zone.	required
b) projectName	The name of the project as published.	required
c) ProjectEventID	A unique identifier associated with one or more project event identifier types and other associated references identifier such as contract number.	required
d) permitID	A unique identifier for a permit issued to the Organization performing specific work. The identifier will reference a unique identifier found in an external Permit data set.	optional
e) contractURL	A link (URL) to a contract or contract provisions associated with a contractor's contract to perform specified work.	optional
f) roleType	The role of the organization with respect to the project event (task, subtask or activity).	required
Table 12. Version Log		
a) timestamp	A timestamp that identifies the time and date the change was made, a request was sent or data was collected.	required
b) changeLogNumber	An automated log number that uniquely identifies the entry.	required
c) tableName	The table name wherein the change was made	required
d) attributeName	The attribute name wherein the change was made	optional
e) action	The action taken associated with the change including delete, update, create.	required
f) fromValue	The original or last value which was changed.	optional
g) toValue	The new value inserted in the database	optional
h) editor	The name or reference to the editor making the change.	required
i) comment	A comment inserted by the editor describing the change.	optional
Table 13. Work Zone Project		

DATA NAME	DATA DESCRIPTION	CONFORMANCE
a) projectName	The name of the project as published.	required
b) projectDescription	A concise description of the project purpose and scope.	required
c) totalPhases	The number of phases in the project	optional
d) totalWZTasks	The total number of work zone project tasks.	optional
e) allocationType	The type of financial allocation associated with this project, e.g., planned, requested, pending, partially allocated, fully allocated, etc.	optional
f) allocationValue	The funding requirements to complete the project	optional
g) WorkType	The class and type of work that will be performed during the project or a designated event period and location.	required

Table 14. WZ-LaneActivity

a) wZ-LaneActivityID	A unique identifier for a lane activity event.	required
b) ProjectEventID	A unique identifier associated with one or more project event identifier types and other associated references identifier such as contract number.	required
c) laneID	An unique identifier for a lane	required
d) laneType	The type of lane associated with the road segment.	optional
e) laneStatus	The status of the lane. Values include: open, closed, open w/o restriction (e.g., driving on shoulder)	optional
f) laneRestriction	The type of restrictions associated with the referenced lane.	optional
g) travelPathEffect	The type of travel path effect implemented leading up to or from a work zone. Where lt indicates left (e.g., merge left) and rt indicates right (e.g., merge right)	optional
h) LaneGeometryPath	A path that defines the change in curvature of the lane.	optional
i) laneDescription	A text description or link (URL) for the lane along the segment of road geometry identified in WZ-Subtask and or LaneGeometryPath.	optional

Table 15. WZ-Subtask

DATA NAME	DATA DESCRIPTION	CONFORMANCE
a) wZ-SubtaskID	A unique identifier for a subtask event.	required
b) ProjectEventID	A unique identifier associated with one or more project event identifier types and other associated references identifier such as contract number.	required
c) descriptionSubtask	A text description or link (URL) for a segment of road identified in WZ-Subtask event.	optional
d) WZ-Geometry	A set of attributes associated with the work zone geometry including but not limited to begin and end locations.	required
e) StartDateTime	The date and time starts.	required
f) EndDateTime	The date and time the work zone ends.	required
g) wZ-Status	The status of the work zone.	required
h) RoadType	The type of road classification and facility type where the work zone is located and the traffic is impacted.	optional
i) Recurring	Description for a daily or weekly recurring time period from the StartDateTime to the EndDateTime.	optional
j) reducedSpeedLimit	The posted speed limit in the work zone	optional
k) workersPresent	Designation that workers are present in the work zone. [yes / no]	conditional (if not included in WZ-Task)
l) RoadRestrictions [*]	One or more roadRestriction values associated with the work zone and bounded by the begin / end locations.	optional
m) travelPathEffect	The type of travel path effect implemented leading up to or from a work zone. Where lt indicates left (e.g., merge left) and rt indicates right (e.g., merge right)	optional
n) wZ_SeparationType	The type of separation or divider used in the work zone.	optional
o) wZTTCType	Temporary traffic control (TTC) strategy associated with work zone Phase, WZ-task or WZ-subtask	optional
p) DetourPath	The path for a detour that directs traffic around a work zone. This value is typically added when all lanes are closed.	optional

DATA NAME	DATA DESCRIPTION	CONFORMANCE
q) reasonCancel	The reason for a cancellation.	conditional when wz-status = cancelled
Table 16. WZ-Task		
a) wZ-TaskID	A unique identifier for a task event.	required
b) ProjectEventID	A unique identifier associated with one or more project event identifier types and other associated references identifier such as contract number.	required
c) descriptionTask	A concise description of the task activities.	optional
d) WZ-Geometry	A set of attributes associated with the work zone geometry including but not limited to begin and end locations.	required
e) StartDateTime	The date and time starts.	required
f) EndDateTime	The date and time the work zone ends.	required
g) wz-Status	The status of the work zone.	optional
h) Recurring	Description for a daily or weekly recurring time period from the StartDateTime to the EndDateTime.	optional
i) RoadType	The type of road classification and facility type where the work zone is located and the traffic is impacted.	optional
j) reducedSpeedLimit	The posted speed limit in the work zone	optional
k) workersPresent	Designation that workers are present in the work zone. [yes / no]	conditional (if not included in WZ-Subtask)
l) RoadRestrictions [*]	One or more roadRestriction values associated with the work zone and bounded by the begin / end locations.	optional
m) travelPathEffect	The type of travel path effect implemented leading up to or from a work zone. Where lt indicates left (e.g., merge left) and rt indicates right (e.g., merge right)	optional
n) wz-SeparationType	The type of separation or divider used in the work zone.	optional

DATA NAME	DATA DESCRIPTION	CONFORMANCE
o) wzTTCType	Temporary traffic control (TTC) strategy associated with work zone Phase, WZ-task or WZ-subtask	optional
p) DetourPath	The path for a detour that directs traffic around a work zone. This value is typically added when all lanes are closed.	optional
q) reasonCancel	The reason for a cancellation.	conditional when wz-status = cancelled

2.2.4.1 Service Content - Data Services, APIs, and Data Feeds

The schema includes work zone services. These are data feeds, queries, and other information flows that flow from the WZDS to outside sources. When working with stakeholders, it was observed that many stakeholders require similar data. For example, a schedule of the planned and updated work zone projects – their location, timing and impact. Based on the information received, the project team grouped data exchange requirements into the following data services: (1) WZ Project Schedule, (2) Law Enforcement Needs and (3) WZDx v.1. These data services are tracked through the Operational Log schema table. This table captures the requirements associated with tracking and distributing the information sets.



- 1. WZ Project Schedule.** A Work Zone Project Schedule describes WZ projects and project events for downstream systems.

Table 3. WZ Project Schedule Data Feed Description

DATA CONCEPT	DESCRIPTION	CONFORMANCE
a) projectName	The name of the project as published.	required
b) ProjectEventID	A unique identifier associated with one or more project event identifier types and other associated references identifier such as contract number.	required
c) WZ-Geometry	A set of attributes associated with the work zone geometry including but not limited to begin and end locations.	required
d) StartDateTime	The date and time starts.	required
e) EndDateTime	The date and time the work zone ends.	required
f) wz-Status	The status of the work zone.	optional
g) WorkType	The class and type of work that will be performed during the project or a designated event period and location.	optional
h) lastUpdate	The date of the last update.	optional

2. **Law Enforcement Needs.** The Law Enforcement Support Need service lists the law enforcement coverage, timing and type of service as requested by work zone staff.

Table 4. Law Enforcement (LE) Support Needs Data Feed Description

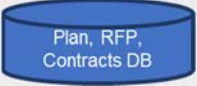
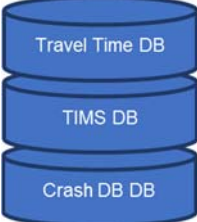



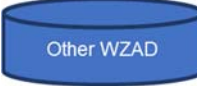

DATA CONCEPT	DESCRIPTION	CONFORMANCE
a) projectName	The name of the project as published.	required
b) ProjectEventID	A unique identifier associated with one or more project event identifier types and other associated references identifier such as contract number.	required
c) leType	The type of law enforcement needed: continuous, swing, periodic patrol	required
d) startDateTime-est	The estimated start time and date when a work zone status = planned, pending, active estimated or active spatial verified (i.e., not cancelled, completed or time verified)	required
e) endDateTime-est	The estimated end time and date when a work zone status = planned, pending, or active (i.e., not cancelled, completed)	required
f) Area	The area for enforcement (geofence, region or point location if stationary)	optional
g) wz-description	A description of the work to be performed	optional

3. **WZDx V1.1 – Common Core Data Specification.** The USDOT’s Work Zone Data Exchange (WZDx) effort was developed, in conjunction with the WZDI, to jumpstart the voluntary adoption of a basic work zone data specification through collaboration with data producers and users. The specification developed will continue to be updated as additional information is gathered. The specification and associated reference documents can be found on its [GitHub page](#).

2.2.4.2 External Data Sources

Another component of the data schema are external data sources. These external sources are described in the WZDS Framework [2] and contain data sets referenced and consumed by the WZDS. General description of the information contained in those data sets is below. A detailed mapping of the WZDD and Framework external data needs is found in Appendix B.

Table 5: Description of External Data Sources Traceability to WZAD Framework

DATA TYPE	DESCRIPTION	FIGURE 3
Planned Data	This data consists of plans, designs, contracts, specifications, and drawings that estimate parameters for the work zone project, phases, and activities related to geometry, timing and impacts. The contract business rules, performance targets, organizational contacts and roles are described in these documents.	
Operational / Performance Data Sets	The travel time, traffic incident management system (TIMS) and crash data sets store operational data on the event locations by time and date. When related to the location and timing of work zone data, these data show the impact of the work zone activity relative to the typical travel times, crashes, and other incidents.	
Permit Data	The permit data is the collection of permits issued to projects by specific organizations. The permit may be associated with a single project phase, task, or subtask.	
Law Enforcement Activity Data	Law enforcement activity data contain information on the activities of law enforcement around the work zone, and in many cases track the requests of construction organizations (like DOTs) for specific enforcement activities.	
Device and Asset Management Data / System Control and Management Data	The typical asset management system stores information about the location, configuration, and operations of assets that may be placed in a work zone – like a portable variable message sign, or one that resides in the zone like a street lamp, overhead variable message sign, or local signal controller and its related intersection phase plans. When impacted by a work zone, critical asset attributes may need to be shared with the work zone.	
Other WZAD	Other jurisdictions, from local to National organizations will manage and disseminate information on their work zone projects including planned, design, active, and historic information.	
Contractor Systems	Contractors, subconsultants, utilities and other external entities will exchange information related proposed, permitted, and actual work performed.	

3 WZDD COMPONENTS

This section provides the detailed tables for the WZDD components summarized in Section 2. Examples of the artifacts detailed in this section are implemented in [Attachment A: Guidelines on Applying WZDD](#).

The WZDD (Table 6) includes the following information:

- **No.** A unique reference for each record
- **Data Name.** The name of the data concept (listed in the table in alphabetical order)
- **Type.** The type of data concept describing the data
 - Data element (DE)
 - Data frame (DF)
- **Data Description.** A description for the data concept
- **Used by Table.** Schema tables which reference the data concept
- **Used by Data Frame.** Data frame which references the data concept

Table 6. Work Zone Data Concept Dictionary

NO. AND DATA CONCEPT	TYPE	DATA DESCRIPTION	USED BY (SCHEMA TABLE)	USED BY (DATA FRAME)
1. action	DE	The action taken associated with the change including delete, update, create.	<ul style="list-style-type: none"> Version Log 	N/A
2. actualValue	DE	The actual value measured during period	<ul style="list-style-type: none"> Impact Analysis Performance Assessment 	N/A
3. AdvancedWarning	DF	The location of types of work zone assets such as signs or barriers located in or near a work zone.	N/A	<ul style="list-style-type: none"> WZ-Geometry
4. AdvWarningLocation	DF	A location associated with work zone asset that serves to alert vehicle / drivers of work zone characteristics.	N/A	<ul style="list-style-type: none"> AdvancedWarning
5. advWarningType	DE	The type of advanced warning assets that are located in or near a work zone.	N/A	<ul style="list-style-type: none"> AdvancedWarning
6. allocationType	DE	The type of financial allocation associated with this project, e.g., planned, requested, pending, partially allocated, fully allocated, etc.	<ul style="list-style-type: none"> Work Zone Project 	N/A
7. allocationValue	DE	The funding requirements to complete the project	<ul style="list-style-type: none"> Work Zone Project 	N/A
8. altitude-est	DE	Estimated height above sea level measured in feet.	N/A	<ul style="list-style-type: none"> Spherical
9. altitude-ver	DE	The height above sea level measured in feet.	N/A	<ul style="list-style-type: none"> Spherical

NO. AND DATA CONCEPT	TYPE	DATA DESCRIPTION	USED BY (SCHEMA TABLE)	USED BY (DATA FRAME)
10. Area	DF	The area for enforcement (geofence, region or point location if stationary)	N/A	<ul style="list-style-type: none"> Used by external services (i.e., LESupportNeeds)
11. atStreet	DE	The name of a road for which the work zone impacts.	N/A	<ul style="list-style-type: none"> IntersectionLocation
12. attributeName	DE	The attribute name wherein the change was made	<ul style="list-style-type: none"> Design and Operational Change Log Version Log 	N/A
13. BeginActivityLocation	DF	The beginning location of the activity area of a work zone.	N/A	<ul style="list-style-type: none"> WZ-Geometry
14. BeginLocation	DF	The beginning location of the impact area of the work zone such as the beginning of the reduced speed zone or the travel path effect area (taper).	N/A	<ul style="list-style-type: none"> WZ-Geometry
15. businessRuleConformance	DE	An instance of requirement or business rule which will be measured for impact, compliance or performance	<ul style="list-style-type: none"> Contract Business Rules Impact Analysis Incentives Penalties Performance Assessment 	N/A
16. changeLogNumber	DE	An automated log number that uniquely identifies the entry.	<ul style="list-style-type: none"> Design and Operational Change Log Version Log 	N/A
17. city	DE	Designation of a municipal boundary.	N/A	<ul style="list-style-type: none"> Area

NO. AND DATA CONCEPT	TYPE	DATA DESCRIPTION	USED BY (SCHEMA TABLE)	USED BY (DATA FRAME)
18. comment	DE	A comment inserted by the editor describing the change.	<ul style="list-style-type: none"> Version Log 	N/A
19. contact-email	DE	The contact's email address.	<ul style="list-style-type: none"> Metadata 	N/A
20. contact-name	DE	The name of a contact responsible for the data feed.	<ul style="list-style-type: none"> Metadata 	N/A
21. contractRole	DE	The organization's role with respect to the project event.	<ul style="list-style-type: none"> Impact Analysis Performance Assessment 	N/A
22. contractNo	DE	A reference to a contract associated with the event.	N/A	<ul style="list-style-type: none"> ProjectEventID
23. contractURL	DE	A link (URL) to a contract or contract provisions associated with a contractor's contract to perform specified work.	<ul style="list-style-type: none"> Contract Business Rules Incentives Penalties Role 	N/A
24. coordinationOrgCount	DE	The number of organizations identified in the list.	<ul style="list-style-type: none"> Project Coordination List 	N/A
25. coordinationStatus	DE	The status of coordination including whether the coordination is active, planned, closed, not initiated.	<ul style="list-style-type: none"> Project Coordination List 	<ul style="list-style-type: none"> ProjectCoordination
26. coordinationType	DE	The type of coordination and with what orgType triggered by the work classification.	N/A	<ul style="list-style-type: none"> ProjectCoordination
27. crossStreet	DE	The cross street (road name) associated with the BeginLocation, BeginActivityLocation, AdvancedWarning, EndLocation, EndActivityLocation or	N/A	<ul style="list-style-type: none"> AdvWarningLocation BeginActivityLocation BeginLocation EndActivityLocation

NO. AND DATA CONCEPT	TYPE	DATA DESCRIPTION	USED BY (SCHEMA TABLE)	USED BY (DATA FRAME)
		IntersectionLocation. This value is used for arterials.		<ul style="list-style-type: none"> • EndLocation • IntersectionLocation
28. datafeed-frequency-update	DE	<p>The frequency at which the data feed is updated and made available through the data feed. Format shall include value+ units such as 30s, 15m, or 24h where:</p> <ul style="list-style-type: none"> • s = seconds • m = minutes • h = hours 	<ul style="list-style-type: none"> • Metadata 	N/A
29. dayOfWeek	DE	The day of week that a recurring time occurs. The value is a seven bit field that is masked by [SMTWTFS]. For example, weekdays would be designated as [0111110] while weekends would appear as [1000001].	N/A	<ul style="list-style-type: none"> • Recurring
30. description	DE	A concise description of the purpose of the service content	<ul style="list-style-type: none"> • Operational Log 	N/A
31. descriptionCBR	DE	A concise description of the business rule	<ul style="list-style-type: none"> • Contract Business Rules 	N/A
32. descriptionPhase	DE	A concise description of the phase	<ul style="list-style-type: none"> • Phase 	N/A
33. descriptionSubtask	DE	A text description or link (URL) for a segment of road identified in WZ-Subtask event.	<ul style="list-style-type: none"> • WZ-Subtask 	N/A
34. descriptionTask	DE	A concise description of the task activities.	<ul style="list-style-type: none"> • WZ-Task 	N/A

NO. AND DATA CONCEPT	TYPE	DATA DESCRIPTION	USED BY (SCHEMA TABLE)	USED BY (DATA FRAME)
35. design-opsChangeType	DE	The type of design or operational change that impacts a project task. For example, the change may include signal timing changes, schedule changes, location or geometry changes.	<ul style="list-style-type: none"> Design and Operational Change Log 	N/A
36. destination	DE	The URL or stakeholder name that receives the log file.	<ul style="list-style-type: none"> Operational Log 	N/A
37. DetourPath	DF	The path for a detour that directs traffic around a work zone. This value is typically added when all lanes are closed.	<ul style="list-style-type: none"> WZ-Subtask WZ-Task 	N/A
38. editor	DE	The name or reference to the editor making the change.	<ul style="list-style-type: none"> Version Log 	N/A
39. EndActivityLocation	DF	The end location of the activity area of a work zone.	N/A	<ul style="list-style-type: none"> WZ-Geometry
40. EndDateTime	DF	The date and time the work zone ends.	<ul style="list-style-type: none"> Phase Project Coordination List WZ-Subtask WZ-Task 	<ul style="list-style-type: none"> ProjectCoordination Used by external services (i.e., WZ-ProjectSchedule)
41. endDateTime-cancelled	DE	The end time and date when a work zone is cancelled, i.e., when status = cancelled	N/A	<ul style="list-style-type: none"> EndDateTime
42. endDateTime-complete	DE	The end time and date when a work zone is completed i.e., when status = completed	N/A	<ul style="list-style-type: none"> EndDateTime
43. endDateTime-est	DE	The estimated end time and date when a	N/A	<ul style="list-style-type: none"> EndDateTime

NO. AND DATA CONCEPT	TYPE	DATA DESCRIPTION	USED BY (SCHEMA TABLE)	USED BY (DATA FRAME)
		work zone status = planned, pending, or active (i.e., not cancelled, completed)		<ul style="list-style-type: none"> Used by external services (i.e., LESupportNeeds)
44. endDateTime-ver	DE	The actual end time and date when a work zone time and date is verified (either by electronic signal or manual input)	N/A	<ul style="list-style-type: none"> EndDateTime
45. EndLocation	DF	The end location of the impact area of a work zone.	N/A	<ul style="list-style-type: none"> WZ-Geometry
46. endPeriod	DE	The end time in a 24 hour period for a recurring time period.	N/A	<ul style="list-style-type: none"> Recurring
47. facilityType	DE	A type of road facility.	N/A	<ul style="list-style-type: none"> RoadType
48. fromValue	DE	The original or last value which was changed.	<ul style="list-style-type: none"> Design and Operational Change Log Version Log 	N/A
49. identifierTypeNo	DE	A unique identifier, user defined, to relate the project event to another database or file.	N/A	<ul style="list-style-type: none"> ProjectEventID
50. incentiveValue	DE	The amount of incentive or penalty for the requirement	<ul style="list-style-type: none"> Incentives Penalties Performance Assessment 	N/A
51. IntersectionLocation	DF	The description of an intersection location.	N/A	<ul style="list-style-type: none"> WZ-Geometry
52. IssuingOrganization	DE	The name of the issuing organization. This name should match the name of the owner of the Work Zone Activity	<ul style="list-style-type: none"> Metadata 	<ul style="list-style-type: none"> ProjectCoordination

NO. AND DATA CONCEPT	TYPE	DATA DESCRIPTION	USED BY (SCHEMA TABLE)	USED BY (DATA FRAME)
		Database.		
53. laneDescription	DE	A text description or link (URL) for the lane along the segment of road geometry identified in WZ-Subtask and or LaneGeometryPath.	<ul style="list-style-type: none"> WZ-LaneActivity 	N/A
54. LaneGeometryPath	DF	A path that defines the change in curvature of the lane.	<ul style="list-style-type: none"> WZ-LaneActivity 	N/A
55. laneID	DE	An unique identifier for a lane	<ul style="list-style-type: none"> WZ-LaneActivity 	N/A
56. laneRestriction	DE	The type of restrictions associated with the referenced lane.	<ul style="list-style-type: none"> WZ-LaneActivity 	N/A
57. lanesClosed	DE	The laneType that is closed due to the work zone on the road segment designated by the BeginLocation and EndLocation.	N/A	<ul style="list-style-type: none"> WZ-Geometry
58. lanesOpen	DE	The laneType that is opened on the road segment designated by the work zone BeginLocation.	N/A	<ul style="list-style-type: none"> WZ-Geometry
59. laneStatus	DE	The status of the lane. Values include: open, closed, open w/o restriction (e.g., driving on shoulder)	<ul style="list-style-type: none"> WZ-LaneActivity 	N/A
60. laneType	DE	The type of lane associated with the road segment.	<ul style="list-style-type: none"> WZ-LaneActivity 	N/A
61. lastUpdate	DE	The date of the last update.	N/A	<ul style="list-style-type: none"> Used by external services (i.e., WZ-ProjectSchedule)
62. latitude-est	DE	Estimated latitude measurement of the World Geodetic System (WGS) 84	N/A	<ul style="list-style-type: none"> Spherical

NO. AND DATA CONCEPT	TYPE	DATA DESCRIPTION	USED BY (SCHEMA TABLE)	USED BY (DATA FRAME)
		coordinate system associated with a Location.		
63. latitude-ver	DE	Actual latitude measurement of the World Geodetic System (WGS) 84 coordinate system associated with a Location.	N/A	<ul style="list-style-type: none"> Spherical
64. leType	DE	The type of law enforcement needed: continuous, swing, periodic patrol	N/A	<ul style="list-style-type: none"> Used by external services (i.e., LSupportNeeds)
65. locationAccuracy	DE	Describes the variance (+/-) accuracy of the LOCATION measurements.	N/A	<ul style="list-style-type: none"> Milepost Spherical
66. locationConfidence	DE	Describes the % confidence that the locations will be placed at these positions.	N/A	<ul style="list-style-type: none"> Milepost Spherical
67. location-verify-method	DE	The method used to verify the accuracy of the location information.	<ul style="list-style-type: none"> Metadata 	
68. longitude-est	DE	Estimated longitude measurement of the World Geodetic System (WGS) 84 coordinate system associated with a Location.	N/A	<ul style="list-style-type: none"> Spherical
69. longitude-ver	DE	Actual longitude measurement of the World Geodetic System (WGS) 84 coordinate system associated with a Location.	N/A	<ul style="list-style-type: none"> Spherical
70. lrs-Type	DE	Describes the type of linear referencing system used for the milepost measurements.	<ul style="list-style-type: none"> Metadata 	N/A

NO. AND DATA CONCEPT	TYPE	DATA DESCRIPTION	USED BY (SCHEMA TABLE)	USED BY (DATA FRAME)
71. lrs-URL	DE	A URL where additional information on the LRS information and transformation information is stored.	<ul style="list-style-type: none"> Metadata 	N/A
72. mapService-URL	DE	Location where web mapping services such as OGC Web Map Services (WMS) or Web Feature Services (WFS) are stored that were used to determine work zone or feature locations.	<ul style="list-style-type: none"> Metadata 	N/A
73. markValue	DE	The difference between target and actual values	<ul style="list-style-type: none"> Performance Assessment 	N/A
74. milemarker-est	DE	Estimated distance relative to a physical or virtual marker measured along a roadway.	N/A	<ul style="list-style-type: none"> Milepost
75. milemarker-ver	DE	Actual distance relative to a physical or virtual marker measured along a roadway.	N/A	<ul style="list-style-type: none"> Milepost
76. Milepost	DF	The milepost or milemarker (projection) associated with a Location.	N/A	<ul style="list-style-type: none"> AdvWarningLocation BeginActivityLocation BeginLocation EndActivityLocation EndLocation IntersectionLocation PointLocation
77. msgID	DE	A unique identifier for a data feed or message.	<ul style="list-style-type: none"> Operational Log 	N/A
78. orgAddress	DE	A business address associated with related organization.	<ul style="list-style-type: none"> Organization 	N/A

NO. AND DATA CONCEPT	TYPE	DATA DESCRIPTION	USED BY (SCHEMA TABLE)	USED BY (DATA FRAME)
79. orgContactEmail	DE	The email address for the organization's contact.	<ul style="list-style-type: none"> Organization 	N/A
80. orgContactName	DE	The organization's contact person for the project.	<ul style="list-style-type: none"> Organization 	N/A
81. orgContactTelephone	DE	The phone number for the organization's contact.	<ul style="list-style-type: none"> Organization 	N/A
82. orgName	DE	The name of an organization associated with a project that requires a work zone.	<ul style="list-style-type: none"> Organization Role 	N/A
83. orgTelephone	DE	A contact telephone number associated with related organization.	<ul style="list-style-type: none"> Organization 	N/A
84. orgType	DE	A type of organization that is associated with an organization.	<ul style="list-style-type: none"> Organization 	N/A
85. orgURL	DE	The web address for the organization. This may specify a file storage site.	<ul style="list-style-type: none"> Organization 	N/A
86. Path	DF	A Path is defined as an ordered sequence of points.	N/A	<ul style="list-style-type: none"> LaneGeometryPath WzGeometryPath DetourPath
87. performancePeriod	DE	The compliance period	<ul style="list-style-type: none"> Impact Analysis Incentives Penalties Performance Assessment 	N/A
88. permitID	DE	A unique identifier for a permit issued to the Organization performing specific work. The identifier will reference a unique identifier found in an external Permit data set.	<ul style="list-style-type: none"> Role 	N/A

NO. AND DATA CONCEPT	TYPE	DATA DESCRIPTION	USED BY (SCHEMA TABLE)	USED BY (DATA FRAME)
89. phaseID	DE	A unique identifier for a project phase.	<ul style="list-style-type: none"> Phase 	<ul style="list-style-type: none"> ProjectEventID
90. PointLocation	DF	A set of points that is associated with a path, line or polyline.	N/A	<ul style="list-style-type: none"> Area Sequence
91. ProjectCoordination	DF	Description of organizations that require coordination.	<ul style="list-style-type: none"> Project Coordination List 	
92. projectDescription	DE	A concise description of the project purpose and scope.	<ul style="list-style-type: none"> Work Zone Project 	N/A
93. ProjectEventID	DF	A unique identifier associated with one or more project event identifier types and other associated references identifier such as contract number.	<ul style="list-style-type: none"> Contract Business Rules Design and Operational Change Log Impact Analysis Incentives and Penalties Metadata Performance Assessment Phase Role WZ-LaneActivity WZ-Subtask WZ-Task 	<ul style="list-style-type: none"> ProjectCoordination Used by external services (i.e., WZ-ProjectSchedule and LESupport Needs)
94. projectName	DE	The name of the project as published.	<ul style="list-style-type: none"> Contract Business Rules Role 	<ul style="list-style-type: none"> ProjectCoordination Used by external services (i.e., WZ-

NO. AND DATA CONCEPT	TYPE	DATA DESCRIPTION	USED BY (SCHEMA TABLE)	USED BY (DATA FRAME)
			<ul style="list-style-type: none"> • Work Zone Project • Design and Operational Change Log 	ProjectSchedule and LESupportNeeds)
95. ramp	DE	The ramp associated with a Location. This value is typically used for restricted highways to designate a from or to location.	N/A	<ul style="list-style-type: none"> • BeginLocation • EndLocation
96. reason	DE	The reason for the change such as safety, operational, or coordination with other projects	<ul style="list-style-type: none"> • Design and Operational Change Log 	N/A
97. reasonCancel	DE	The reason for a cancellation.	<ul style="list-style-type: none"> • Phase • WZ-Subtask • WZ-Task 	N/A
98. Recurring	DF	Description for a daily or weekly recurring time period from the StartDateTime to the EndDateTime.	<ul style="list-style-type: none"> • Phase • WZ-Subtask • WZ-Task 	N/A
99. reducedSpeedLimit	DE	The posted speed limit in the work zone	<ul style="list-style-type: none"> • WZ-Subtask • WZ-Task 	N/A
100. region	DE	A known jurisdiction, area or corridor. Also used to describe an organization's address.	<ul style="list-style-type: none"> • Organization • Project Coordination List 	• Area
101. roadBoundaries	DF	The border of an area bounded by three or more roads that form an enclosed area	N/A	• Area
102. roadClassification	DE	A type of classification for a road.	N/A	• RoadType
103. roadDirection	DE	The road direction associated with the	N/A	• BeginActivityLocation

NO. AND DATA CONCEPT	TYPE	DATA DESCRIPTION	USED BY (SCHEMA TABLE)	USED BY (DATA FRAME)
		road.		<ul style="list-style-type: none"> • BeginLocation
104. roadName	DE	The name of a road for which the work zone impacts.	N/A	<ul style="list-style-type: none"> • AdvWarningLocation • BeginActivityLocation • BeginLocation
105. roadName-URL	DE	A URL where the official guide to names and spelling of road names and ramp identifiers are located.	<ul style="list-style-type: none"> • Metadata 	N/A
106. roadRestriction	DE	A type of restriction that applies to the work zone road segment which is bounded by the begin / end locations.	N/A	<ul style="list-style-type: none"> • RoadRestrictions
107. RoadRestrictions	DF	One or more roadRestriction values associated with the work zone and bounded by the begin / end locations.	<ul style="list-style-type: none"> • Phase • WZ-Subtask • WZ-Task 	N/A
108. RoadType	DF	The type of road classification and facility type where the work zone is located and the traffic is impacted.	<ul style="list-style-type: none"> • Phase • WZ-Subtask • WZ-Task 	<ul style="list-style-type: none"> • ProjectCoordination
109. roleContact	DE	The work zone project liaison and contact information	N/A	<ul style="list-style-type: none"> • ProjectCoordination
110. roleType	DE	The role of the organization with respect to the project event (task, subtask or activity).	<ul style="list-style-type: none"> • Role 	N/A
111. seqNum	DE	The order number of points.	N/A	<ul style="list-style-type: none"> • Sequence
112. Sequence	DF	An ordered set of point locations that compose a path or polyline.	N/A	<ul style="list-style-type: none"> • Path
113. serviceType	DE	The data service name, for example LE Support Needs	<ul style="list-style-type: none"> • Operational Log 	N/A

NO. AND DATA CONCEPT	TYPE	DATA DESCRIPTION	USED BY (SCHEMA TABLE)	USED BY (DATA FRAME)
114. shouldersClosed	DE	The shoulder(s) that are closed within the begin / end activity location (or if not identified, within the begin/end location).	N/A	<ul style="list-style-type: none"> WZ-Geometry
115. Spherical	DF	A latitude and longitude measurement of the World Geodetic System (WGS) 84 coordinate system associated with a Location.	N/A	<ul style="list-style-type: none"> AdvWarningLocation BeginActivityLocation BeginLocation EndActivityLocation EndLocation IntersectionLocation PointLocation
116. StartDateTime	DF	The date and time starts.	<ul style="list-style-type: none"> Phase ProjectCoordinationList WZ-Subtask WZ-Task 	<ul style="list-style-type: none"> ProjectCoordination Used by external services (i.e., WZ-ProjectSchedule)
117. startDateTime-cancelled	DE	The start time and date when a work zone is cancelled, i.e., when status = cancelled	N/A	<ul style="list-style-type: none"> StartDateTime
118. startDateTime-est	DE	The estimated start time and date when a work zone status = planned, pending, active estimated or active spatial verified (i.e., not cancelled, completed or time verified)	N/A	<ul style="list-style-type: none"> StartDateTime Used by external services (i.e., LESupportNeeds)
119. startDateTime-ver	DE	The actual start time and date when a work zone status = active time verified or active verified (both time and spatial)	N/A	<ul style="list-style-type: none"> StartDateTime

NO. AND DATA CONCEPT	TYPE	DATA DESCRIPTION	USED BY (SCHEMA TABLE)	USED BY (DATA FRAME)
120. startPeriod	DE	The start time in a 24 hour period for a recurring time period.	N/A	<ul style="list-style-type: none"> Recurring
121. state	DE	Designation of one of the fifty states.	N/A	<ul style="list-style-type: none"> Area
122. tableName	DE	The table name wherein the change was made	<ul style="list-style-type: none"> Version Log 	N/A
123. targetValue	DE	The requirement value under review	<ul style="list-style-type: none"> Impact Analysis Performance Assessment 	N/A
124. timeConfidence	DE	Describes the % confidence that the time and date will be occur when specified. Verified indicates that the confidence level is 100%.	N/A	<ul style="list-style-type: none"> EndDateTime StartDateTime
125. timeStamp	DE	A timestamp that identifies the time and date the change was made, a request was sent or data was collected.	<ul style="list-style-type: none"> Design and Operational Change Log Impact Analysis Operational Log Project Coordination List Version Log 	N/A
126. timestamp-Metadata-Update	DE	The time and date when this file was last updated.	<ul style="list-style-type: none"> Metadata 	N/A
127. totalLanes	DE	The total number of lanes in a roadway. The road name is part of the BeginLocation data frame.	N/A	<ul style="list-style-type: none"> WZ-Geometry
128. totalPoints	DE	The total number of points in the	N/A	<ul style="list-style-type: none"> Path

NO. AND DATA CONCEPT		TYPE	DATA DESCRIPTION	USED BY (SCHEMA TABLE)	USED BY (DATA FRAME)
			sequence of Point Locations.		
129.	totalPhases	DE	The number of phases in the project	<ul style="list-style-type: none"> Work Zone Project 	N/A
130.	totalWZTasks	DE	The total number of work zone project tasks.	<ul style="list-style-type: none"> Work Zone Project 	N/A
131.	toValue	DE	The new value inserted in the database	<ul style="list-style-type: none"> Design and Operational Change Log Version Log 	N/A
132.	travelPathEffect	DE	The type of travel path effect implemented leading up to or from a work zone. Where lt indicates left (e.g., merge left) and rt indicates right (e.g., merge right)	<ul style="list-style-type: none"> WZ-LaneActivity WZ-Subtask WZ-Task 	N/A
133.	workClassificationDetail	DE	Detailed work type grouped under the work classification type	N/A	<ul style="list-style-type: none"> WorkType
134.	workClassificationType	DE	The type of work	N/A	<ul style="list-style-type: none"> WorkType
135.	workersPresent	DE	Designation that workers are present in the work zone. [yes / no]	<ul style="list-style-type: none"> Phase WZ-Subtask WZ-Task 	N/A
136.	WorkType	DF	The class and type of work that will be performed during the project or a designated event period and location.	<ul style="list-style-type: none"> Phase Work Zone Project 	<ul style="list-style-type: none"> ProjectCoordination Used by external services (i.e., WZ-ProjectSchedule)
137.	wz-activityType	DE	The type of activity associated with the work zone configuration. Examples include warning zone, buffer zone, taper zone.	N/A	<ul style="list-style-type: none"> BeginActivityLocation

NO. AND DATA CONCEPT	TYPE	DATA DESCRIPTION	USED BY (SCHEMA TABLE)	USED BY (DATA FRAME)
138. wz-description	DE	A description of the work to be performed	N/A	<ul style="list-style-type: none"> Used by external services (i.e., LESupportNeeds)
139. WZ-Geometry	DF	A set of attributes associated with the work zone geometry including but not limited to begin and end locations.	<ul style="list-style-type: none"> Phase WZ-Subtask WZ-Task 	<ul style="list-style-type: none"> ProjectCoordination Used by external services (i.e., WZ-ProjectSchedule)
140. WzGeometryPath	DF	The path (polyline) of a work zone. The path is a series of points that describe the direction (by order) and curvature of the line.	N/A	<ul style="list-style-type: none"> WZ-Geometry
141. wZ-LaneActivityID	DE	A unique identifier for a lane activity event.	<ul style="list-style-type: none"> WZ-LaneActivity 	<ul style="list-style-type: none"> ProjectEventID
142. wz-location-method	DE	The typical method used to locate the begin and end of a work zone impact area. An explanation should be included in the metadata when this value is assigned.	<ul style="list-style-type: none"> Metadata 	N/A
143. wz-SeparationType	DE	The type of separation or divider used in the work zone.	<ul style="list-style-type: none"> WZ-Subtask WZ-Task 	N/A
144. wz-Status	DE	The status of the work zone.	<ul style="list-style-type: none"> Phase WZ-Subtask WZ-Task 	<ul style="list-style-type: none"> Used by external services (i.e., WZ-ProjectSchedule)
145. wZ-SubtaskID	DE	A unique identifier for a subtask event.	<ul style="list-style-type: none"> WZ-Subtask 	<ul style="list-style-type: none"> ProjectEventID
146. wZ-TaskID	DE	A unique identifier for a task event.	<ul style="list-style-type: none"> WZ-Subtask WZ-Task 	<ul style="list-style-type: none"> ProjectEventID

NO. AND DATA CONCEPT	TYPE	DATA DESCRIPTION	USED BY (SCHEMA TABLE)	USED BY (DATA FRAME)
147. wzTTCType	DE	Temporary traffic control (TTC) strategy associated with work zone Phase, WZ-task or WZ-subtask	<ul style="list-style-type: none"> • WZ-Subtask • WZ-Task 	N/A

3.1 DATA FRAMES

This section details the data frames summarized in Section 2.2.2. It includes the data elements within each data frame along with associated data descriptions and conformance.

The data frames are organized as follows:

- **Section 3.1.1. Project Event Identifiers.** Data frames used to describe unique identifiers for project events.
- **Section 3.1.2. Geometry and Spatial Features.** Data frames used to describe geometry and spatial features, including location aggregate domains and groupings of associated data such as work zone geometry.
- **Section 3.1.3. Date and Time .** Data frames used to describe date, time, and time periods.
- **Section 3.1.4. Other Data Frames.** Data frames used to describe work, the roadway, and restrictions

3.1.1 Project Event Identifiers

Table 7. Project Event ID Data Frame Description

DATA FRAME	DATA ELEMENT	DESCRIPTION	CONFORMANCE
ProjectEventID	a) phaseID	A unique identifier for a project phase.	Conditional upon at least one data element is included
ProjectEventID	b) wZ-TaskID	A unique identifier for a task event.	Conditional upon at least one data element is included
ProjectEventID	c) wZ-SubtaskID	A unique identifier for a subtask event.	Conditional upon at least one data element is included
ProjectEventID	d) wZ-LaneActivityID	A unique identifier for a lane activity event.	Conditional upon at least one data element is included
ProjectEventID	e) contractNo	A reference to a contract associated with the event.	Optional
ProjectEventID	f) identifierTypeNo	A unique identifier, user defined, to relate the project event to another database or file.	Optional

3.1.2 Geometry and Spatial Features

- **Location Referencing (Table 8).** Data concepts used to describe various methods for referencing location.
- **Path and Point Features (Table 9).** Data concepts used to describe path and point features.
- **Area Features (Table 10).** Data concepts used to describe a jurisdiction or physical area.
- **Work Zone Geometry Features (Table 11).** Data concepts associated with work zone geometry.
- **Begin Location and End Location (Table 12).** Data concepts describing the impact area where work begins and ends.
- **Begin Activity Location and End Activity Location (Table 13).** Data concepts identifying the area where work zones occur.
- **Intersection Location (Table 14).** Data concepts describing an intersection.
- **Advanced Warning (Table 15).** Data concepts describing the location of work zone assets located in or near a work zone.

Table 8. Location Referencing Method Data Frames Descriptions

DATA FRAME	DATA ELEMENT	DESCRIPTION	CONFORMANCE
Milepost	a) milemaker-est	Estimated distance relative to a physical or virtual marker measured along a roadway.	conditionally required when at least on milemarker (-ver or -est) is included
Milepost	b) milemarker-ver	Actual distance relative to a physical or virtual marker measured along a roadway.	conditional when at least one milemarker (-ver or -est) is included
Milepost	c) locationConfidence	Describes the % confidence that the locations will be placed at these positions.	optional
Milepost	d) locationAccuracy	Describes the variance (+/-) accuracy of the LOCATION measurements.	optional
Spherical	a) latitude-est	Estimated latitude measurement of the World Geodetic System (WGS) 84 coordinate system associated with a Location.	conditionally required when at least on latitude (-ver or -est) is included
Spherical	b) longitude-est	Estimated longitude measurement of the World Geodetic System (WGS) 84 coordinate system associated with a Location.	conditionally required when at least on longitude (-ver or -est) is included
Spherical	c) altitude-est	Estimated height above sea level measured in feet.	Conditional for no more than one altitude (-ver or -est) is included
Spherical	d) latitude-ver	Actual latitude measurement of the World Geodetic System (WGS) 84 coordinate system associated with a Location.	conditionally required when at least on latitude (-ver or -est) is included
Spherical	e) longitude-ver	Actual longitude measurement of the World Geodetic System (WGS) 84 coordinate system associated with a Location.	conditionally required when at least on longitude (-ver or -est) is included
Spherical	f) altitude-ver	The height above sea level measured in feet.	Conditional for no more than one altitude (-ver or -est) is included
Spherical	g) locationConfidence	Describes the % confidence that the locations will be	optional

DATA FRAME	DATA ELEMENT	DESCRIPTION	CONFORMANCE
		placed at these positions.	
Spherical	h) locationAccuracy	Describes the variance (+/-) accuracy of the LOCATION measurements.	optional

Table 9. Path and Point Feature Data Frames Descriptions

DATA FRAME	DATA ELEMENT	DESCRIPTION	CONFORMANCE
Path	a) totalPoints	The total number of points in the sequence of Point Locations.	required
Path	b) Sequence	An ordered set of point locations that compose a path or polyline.	required
Sequence	a) seqNum	The order number of points.	required
Sequence	b) PointLocation	A set of points that is associated with a path, line or polyline.	required
PointLocation	a) Spherical	A latitude and longitude measurement of the World Geodetic System (WGS) 84 coordinate system associated with a Location.	required
PointLocation	b) Milepost	The milepost or milemarker (projection) associated with a Location.	optional
LaneGeometryPath	a) Path	A Path is defined as an ordered sequence of points.	optional
WzGeometryPath	a) Path	A Path is defined as an ordered sequence of points.	optional
DetourPath	a) Path	A Path is defined as an ordered sequence of points.	optional

Table 10. Area Feature Data Frame Description

DATA FRAME	DATA ELEMENT	DESCRIPTION	CONFORMANCE
Area	a) city	Designation of a municipal boundary.	optional
Area	b) state	Designation of one of the fifty states.	optional
Area	c) region	A known jurisdiction, area or corridor. Also used to describe an organization's address.	optional
Area	d) roadBoundaries	The border of an area bounded by three or more roads that form an enclosed area	conditional (either roadBoundaries or PointLocation)
Area	e) Point Location	A set of points that is associated with a path, line or polyline.	conditional (either roadBoundaries or PointLocation)

Table 11. Work Zone Geometry Data Frame Description

DATA FRAME	DATA ELEMENT	DESCRIPTION	CONFORMANCE
WZ-Geometry	a) BeginLocation	The beginning location of the impact area of the work zone such as the beginning of the reduced speed zone or the travel path effect area (taper).	required
WZ-Geometry	b) BeginActivityLocation	The beginning location of the activity area of a work zone.	optional
WZ-Geometry	c) EndLocation	The end location of the impact area of a work zone.	required
WZ-Geometry	d) EndActivityLocation	The end location of the activity area of a work zone.	optional
WZ-Geometry	e) IntersectionLocation	The description of an intersection location.	Optional
WZ-Geometry	f) AdvancedWarning	The location of types of work zone assets such as signs or barriers located in or near a work zone.	optional
WZ-Geometry	g) WzGeometryPath	The path (polyline) of a work zone. The path is a series of points that describe the direction (by order) and curvature of the line.	optional
WZ-Geometry	h) shouldersClosed	The shoulder(s) that are closed within the begin / end activity location (or if not identified, within the begin/end	required

DATA FRAME	DATA ELEMENT	DESCRIPTION	CONFORMANCE
		location).	
WZ-Geometry	i) totalLanes	The total number of lanes in a roadway. The road name is part of the BeginLocation data frame.	required
WZ-Geometry	j) lanesOpen	The laneType that is opened on the road segment designated by the work zone BeginLocation.	required
WZ-Geometry	k) lanesClosed	The laneType that is closed due to the work zone on the road segment designated by the BeginLocation and EndLocation.	required

Table 12. Begin and End Location Data Frames Descriptions

DATA FRAME	DATA ELEMENT	DESCRIPTION	CONFORMANCE
BeginLocation	a) Spherical	A latitude and longitude measurement of the World Geodetic System (WGS) 84 coordinate system associated with a Location.	required
BeginLocation	b) roadName	The name of a road for which the work zone impacts.	required
BeginLocation	c) roadDirection	The road direction associated with the road.	required
BeginLocation	d) Milepost	The milepost or milemarker (projection) associated with a Location.	optional
BeginLocation	e) crossStreet	The cross street (road name) associated with the BeginLocation, BeginActivityLocation, AdvancedWarning, EndLocation, EndActivityLocation or IntersectionLocation. This value is used for arterials.	conditional when road class = arterial
BeginLocation	f) ramp	The ramp associated with a Location. This value is typically used for restricted highways to designate a from or to location.	conditional when lanesClose=TotalLanes (e.g., road closed) and roadClass = highway
EndLocation	a) Spherical	A latitude and longitude measurement of the World Geodetic	required

DATA FRAME	DATA ELEMENT	DESCRIPTION	CONFORMANCE
		System (WGS) 84 coordinate system associated with a Location.	
EndLocation	b) Milepost	The milepost or milemarker (projection) associated with a Location.	optional
EndLocation	c) crossStreet	The cross street (road name) associated with the BeginLocation, BeginActivityLocation, AdvancedWarning, EndLocation, EndActivityLocation or IntersectionLocation. This value is used for arterials.	optional
EndLocation	d) ramp	The ramp associated with a Location. This value is typically used for restricted highways to designate a from or to location.	conditional when lanesClose=TotalLanes (e.g., road closed) and roadClass = highway

Table 13. Begin and End Activity Location Data Frames Descriptions

DATA FRAME	DATA ELEMENT	DESCRIPTION	CONFORMANCE
BeginActivityLocation	a) Spherical	A latitude and longitude measurement of the World Geodetic System (WGS) 84 coordinate system associated with a Location.	required
BeginActivityLocation	b) roadName	The name of a road for which the work zone impacts.	optional
BeginActivityLocation	c) roadDirection	The road direction associated with the road.	optional [required when the direction differs from the BeginLocation]
BeginActivityLocation	d) Milepost	The milepost or milemarker (projection) associated with a Location.	optional
BeginActivityLocation	e) crossStreet	The cross street (road name) associated with the BeginLocation, BeginActivityLocation, AdvancedWarning, EndLocation, EndActivityLocation or IntersectionLocation.	optional

DATA FRAME	DATA ELEMENT	DESCRIPTION	CONFORMANCE
		This value is used for arterials.	
BeginActivityLocation	f) wz-activityType	The type of activity associated with the work zone configuration. Examples include warning zone, buffer zone, taper zone.	optional
EndActivityLocation	a) Spherical	A latitude and longitude measurement of the World Geodetic System (WGS) 84 coordinate system associated with a Location.	optional
EndActivityLocation	b) Milepost	The milepost or milemarker (projection) associated with a Location.	optional
EndActivityLocation	c) crossStreet	The cross street (road name) associated with the BeginLocation, BeginActivityLocation, AdvancedWarning, EndLocation, EndActivityLocation or IntersectionLocation. This value is used for arterials.	optional

Table 14. Intersection Location Data Frame Description

DATA FRAME	DATA ELEMENT	DESCRIPTION	CONFORMANCE
IntersectionLocation	a) atStreet	The name of a road for which the work zone impacts.	required
IntersectionLocation	b) crossStreet	The cross street (road name) associated with the BeginLocation, BeginActivityLocation, AdvancedWarning, EndLocation, EndActivityLocation or IntersectionLocation. This value is used for arterials.	required
IntersectionLocation	c) Milepost	The milepost or milemarker (projection) associated with a Location.	optional
IntersectionLocation	d) Spherical	A latitude and longitude measurement of the World Geodetic System (WGS) 84 coordinate system associated with a Location.	optional

Table 15. Advanced Warning Data Frames Descriptions

DATA FRAME	DATA ELEMENT	DESCRIPTION	CONFORMANCE
AdvWarning	a) AdvWarningLocation	A location associated with work zone asset that serves to alert vehicle / drivers of work zone characteristics.	required
AdvWarning	b) advWarningType	The type of advanced warning assets that are located in or near a work zone.	required
AdvWarningLocation	a) Spherical	A latitude and longitude measurement of the World Geodetic System (WGS) 84 coordinate system associated with a Location.	required
AdvWarningLocation	b) roadName	The name of a road for which the work zone impacts.	required
AdvWarningLocation	c) Milepost	The milepost or milemarker (projection) associated with a Location.	optional
AdvWarningLocation	d) crossStreet	The cross street (road name) associated with the BeginLocation, BeginActivityLocation, AdvancedWarning, EndLocation, EndActivityLocation or IntersectionLocation. This value is used for arterials.	optional

3.1.3 Date and Time Data frames

Table 16. Data, Time, and Recurring Time Data Frames Descriptions

DATA FRAME	DATA CONCEPT	DESCRIPTION	CONFORMANCE
StartDateTime	a) startDateTime-est	The estimated start time and date when a work zone status = planned, pending, active estimated or active spatial verified (i.e., not cancelled, completed or time verified)	Conditional for startDateTime must be included with at least one for the following status (-cancelled, -ver, -est)
StartDateTime	b) startDateTime-ver	The actual start time and date when a work zone status = active time verified or active verified (both time and spatial)	Conditional for startDateTime must be included with at least one for the following status (-cancelled, -ver, -est)
StartDateTime	c) startDateTime-cancelled	The start time and date when a work zone is cancelled, i.e., when status = cancelled	Conditional for startDateTime must be included with at least one for the following status (-cancelled, -ver, -est)
StartDateTime	d) timeConfidence	Describes the % confidence that the time and date will be occur when specified. Verified indicates that the confidence level is 100%.	optional
EndDateTime	a) endDateTime-complete	The end time and date when a work zone is completed i.e., when status = completed	Conditional for endDateTime must be included with at least one for the following status (-complete, -cancelled, -ver, -est)
EndDateTime	b) endDateTime-est	The estimated end time and date when a work zone status = planned, pending, or active (i.e., not cancelled, completed)	Conditional for endDateTime must be included with at least one for the following status (-complete, -cancelled, -ver, -est)
EndDateTime	c) endDateTime-ver	The actual end time and date when a work zone time and date is verified (either by electronic signal or manual input)	Conditional for endDateTime must be included with at least one for the following status (-complete, -cancelled, -ver, -est)

DATA FRAME	DATA CONCEPT	DESCRIPTION	CONFORMANCE
EndDateTime	d) endDateTime-- cancelled	The end time and date when a work zone is cancelled, i.e., when status = cancelled	Conditional for endDateTime must be included with at least one for the following status (-complete, -cancelled, -ver, -est)
EndDateTime	e) timeConfidence	Describes the % confidence that the time and date will be occur when specified. Verified indicates that the confidence level is 100%.	optional
Recurring	a) dayOfWeek	The day of week that a recurring time occurs. The value is a seven bit field that is masked by [SMTWTFS]. For example, weekdays would be designated as [0111110] while weekends would appear as [1000001].	required
Recurring	b) startPeriod	The start time in a 24 hour period for a recurring time period.	required
Recurring	c) endPeriod	The end time in a 24 hour period for a recurring time period.	required

3.1.4 Other Data Frames

Table 17. Other Data Frames Descriptions

DATA FRAME	DATA CONCEPT	DESCRIPTION	CONFORMANCE
RoadType	a) roadClassification	A type of classification for a road.	required
RoadType	b) facilityType	A type of road facility.	optional
WorkType	a) workClassificationType	The type of work	required
WorkType	b) workClassificationDetail	Detailed work type grouped under the work classification type	optional
RoadRestrictions	a) roadRestriction	A type of restriction that applies to the work zone road segment which is bounded by the begin / end locations	required
ProjectCoordination	a) projectName	The name of the project as published.	required
ProjectCoordination	b) IssuingOrganization	The name of the issuing organization. This name should match the name of the owner of the Work Zone Activity Database.	required
ProjectCoordination	c) WZ-Geometry	A set of attributes associated with the work zone geometry including but not limited to begin and end locations.	required
ProjectCoordination	d) StartDateTime	The date and time starts.	required
ProjectCoordination	e) EndDateTime	The date and time ends.	required
ProjectCoordination	f) WorkType	The class and type of work that will be performed during the project or a designated event period and location.	optional
ProjectCoordination	g) RoadType	The type of road classification and facility type where the work zone is located and the traffic is impacted.	optional
ProjectCoordination	h) roleContact	The work zone project liaison and contact information	optional
ProjectCoordination	i) ProjectEventID	A unique identifier associated with one or more project event identifier types and other associated references	optional

DATA FRAME	DATA CONCEPT	DESCRIPTION	CONFORMANCE
		identifier such as contract number.	
ProjectCoordination	j) coordinationStatus	The status of coordination including whether the coordination is active, planned, closed, not initiated.	optional
ProjectCoordination	k) coordinationType	The type of coordination and with what orgType triggered by the work classification.	required

3.2 ENUMERATED TYPES

An enumerated type is a fixed set of allowed values. Table 15 lists the enumerate type data concepts that are used by data frames and tables.

Table 18. Enumeration Type Value Description

ENUMERATED TYPE	ALLOWED VALUES		DEFINITION
action	<ul style="list-style-type: none"> • add • delete 	<ul style="list-style-type: none"> • edit 	The action taken associated with the change including delete, update, create.
allocationType	<ul style="list-style-type: none"> • funded • pending • planned 	<ul style="list-style-type: none"> • programmed • requested 	The type of financial allocation associated with this project, e.g., planned, requested, pending, partially allocated, fully allocated, etc.
advWarningType	<ul style="list-style-type: none"> • advWarningSign • beginWZ 	<ul style="list-style-type: none"> • endWZ • reducedSpd 	The type of advanced warning assets that are located in or near a work zone.
contractRole	TBD – update based on stakeholder input		The organization's role with respect to the project event.
coordinationStatus	<ul style="list-style-type: none"> • active • closed 	<ul style="list-style-type: none"> • not initiated • planned 	The status of coordination including whether the coordination is active, planned, closed, not initiated.
coordinationType	TBD – update based on stakeholder input		The type of coordination and with what orgType triggered by the work classification.
design-opsChangeType	<ul style="list-style-type: none"> • geometry • location • schedule 	<ul style="list-style-type: none"> • phase • timing-phase 	The type of design or operational change that impacts a project task. For example, the change may include signal timing changes, schedule changes, location or geometry changes.
facilityType	<ul style="list-style-type: none"> • connector • mainline 	<ul style="list-style-type: none"> • ramp • shoulder 	A type of road facility.
laneRestriction	<ul style="list-style-type: none"> • bike-lane • HOV-2 • HOV-3 • parking 	<ul style="list-style-type: none"> • maximum-weight • minimum-width 	The type of restrictions associated with the referenced lane.

ENUMERATED TYPE	ALLOWED VALUES		DEFINITION
	<ul style="list-style-type: none"> • maximum-height 	<ul style="list-style-type: none"> • no-trucks • reduced-speed • travel-peak-only 	
laneStatus	<ul style="list-style-type: none"> • open • open-wo-restriction 	<ul style="list-style-type: none"> • close 	The status of the lane. Values include: open, closed, open w/o restriction (e.g., driving on shoulder)
laneType	<ul style="list-style-type: none"> • bike-lane • inside-shoulder • mainline-lane 	<ul style="list-style-type: none"> • outside-shoulder • pedestrian-lane 	The type of lane associated with the road segment.
leType	<ul style="list-style-type: none"> • continuous • periodic-patrol 	<ul style="list-style-type: none"> • swing 	The type of law enforcement needed: continuous, swing, periodic patrol
region	based on standard list		A known jurisdiction, area or corridor. Also used to describe an organization's address.
roadClassification	<ul style="list-style-type: none"> • arterial • connector 	<ul style="list-style-type: none"> • highway • ramp 	A type of classification for a road.
roadDirection	<ul style="list-style-type: none"> • eastbound • northbound 	<ul style="list-style-type: none"> • southbound • westbound 	The road direction associated with the road.
roadRestriction	<ul style="list-style-type: none"> • no- trucks • travel- peak- hours- only • hov-3 • hov-2 • no-parking • bike-lane • ramp • reduced-width • reduced-height • reduced-length 	<ul style="list-style-type: none"> • reduced-weight <ul style="list-style-type: none"> ○ axle-load-limit ○ gross-weight-limit • towing-prohibited • permitted-oversize-loads-prohibited (applies to annual oversize load permits) 	A type of restriction that applies to the work zone road segment which is bounded by the begin / end locations
roleType	<ul style="list-style-type: none"> • Agency Congestion and 		The role of the organization

ENUMERATED TYPE	ALLOWED VALUES	DEFINITION		
	Performance Manager <ul style="list-style-type: none"> • Agency Construction Operations Manager and Inspector • Agency Design and Engineering • Agency Oversize/Overweight Permitting Function • Agency Roadway Maintenance Manager Function • Agency Work Zone Data Systems Development and Operations • Agency Work Zone Planning and Coordination • ATMS Operator Function • Connected and Automated Vehicles • Construction Contractors • Freight Haulers • ITS/DMS/Traveler Information Systems • Law Enforcement • Law Enforcement Coordination • Neighbor and Regional Partner Agencies • State and Federal Transportation Agencies • Third-Party Traveler Information Providers • Travelers • Utilities • Utilities Construction Work Zone Coordination 	with respect to the project event (task, subtask or activity).		
shouldersClosed	See enumerated values in ITS Standards Applied to the WZDD	The shoulder(s) that are closed within the begin / end activity location (or if not identified, within the begin/end location).		
travelPathEffect	<table border="0" style="width: 100%;"> <tr> <td style="vertical-align: top;"> <ul style="list-style-type: none"> • alternating-one-way • merge • merge-lt </td> <td style="vertical-align: top;"> <ul style="list-style-type: none"> • shift • shift-lt • shift-rt • unknown </td> </tr> </table>	<ul style="list-style-type: none"> • alternating-one-way • merge • merge-lt 	<ul style="list-style-type: none"> • shift • shift-lt • shift-rt • unknown 	The type of travel path effect implemented leading up to or from a work zone. Where lt indicates left (e.g., merge left) and rt indicates right (e.g.,
<ul style="list-style-type: none"> • alternating-one-way • merge • merge-lt 	<ul style="list-style-type: none"> • shift • shift-lt • shift-rt • unknown 			

ENUMERATED TYPE	ALLOWED VALUES		DEFINITION
	<ul style="list-style-type: none"> merge-rt 		merge right)
workClassification Detail	TBD -- developed by each region		Detailed work type grouped under the work classification type
workClassification Type	<ul style="list-style-type: none"> Construction Contract-Maintenance In-House-Maintenance-Operations Special -Event-Traffic-Control Utility Vertical-Construction 		The type of work
wz-location-method	<ul style="list-style-type: none"> channel-device-method sign-method junction-method unknown – when method for locating the begin and end locations of the work zone is not known other – when the method for locating the begin and end locations do not closely match any of the alternatives. An explanation should be included in the metadata when this value is assigned. 		The typical method used to locate the begin and end of a work zone impact area. An explanation should be included in the metadata when this value is assigned.
wz-SeparationType	<ul style="list-style-type: none"> channelizing portable-concrete 	<ul style="list-style-type: none"> steel-barrier 	The type of separation or divider used in the work zone.
wz-Status	<ul style="list-style-type: none"> active canceled completed 	<ul style="list-style-type: none"> pending planned 	The status of the work zone.
wzTTCType	<ul style="list-style-type: none"> alternating-one-way continuously-moving intermittent-moving-operations lane-closure lane-shifts 	<ul style="list-style-type: none"> ramp-closure road-closure shoulder-closure traffic-splits 	TTC strategy associated with work zone Phase, WZ-task or WZ-subtask

4 REFERENCES

This section lists relevant references cited in this report.

- [1] Work Zone Activity Data Needs and Opportunities (FHWA-XXX-XX-XXXX)
- [2] Framework for Work Zone Activity Data Collection and Management (FHWA-XX-XXXX)
- [3] ISO 14817-1:2015 Intelligent Transport Systems -- ITS central data dictionaries -- Part 1: Requirements for ITS data definitions.
- [4] *Traffic Management Data Dictionary Standard for Traffic Management Center-to-Center Communications*. Institute of Transportation Engineers, 2013.
[https://www.standards.its.dot.gov/Content/documents/advisories/TMDD_2013.aspx]

APPENDIX A. TERMS AND ACRONYMS

APPENDIX A-1. TERMS FOR ITS DATA DICTIONARY

Table 19. Terms Defined

TERM	DEFINITION FROM ISO 14817-1:2015	WZ PROJECT USAGE GUIDE
aggregate domain	data concept that defines a grouping of [value domains]	Use this term to describe general categories of data such as “location” which may refer to a variety of value domains: latitude, longitude, milepost, mile marker, road.
data concept	item that may be stored in a data dictionary that refers to an abstraction or thing in the natural world that can be identified with explicit boundaries and meaning and whose properties and behavior all follow the same rules	This refers to any of the terms below.
data dictionary	listing of data concepts and their meta-attributes in a consistent format	
data element	data concept represented by a specific value domain and that describes a single atomic property about an object class	Use this term to describe a discrete attribute that is described by a single value domain or data type such as begin date, permit number
data frame	data concept represented by a specific aggregate domain and that describes information of interest through a useful grouping of more atomic properties about one or more object classes	Use this term to group similar
data model	graphical and/or lexical representation of data, specifying their properties, structure, and inter-relationships [SOURCE: ISO 11179-1:2004, 3.2.7]	Not used in this document. The WZ DD model is a conceptual model describing data concepts, explicit rules for organizing the data concepts into a relational or other formal database model.
data type	set of distinct values, characterized by properties of those values and by operations on those values [SOURCE: ISO/IEC 11404:2007, 3.12]	Use this term to describe the format of data – integer, string, long date, short date, etc.

TERM	DEFINITION FROM ISO 14817-1:2015	WZ PROJECT USAGE GUIDE
object class	description of a set of objects that share the same properties, relationships, and semantics	Not included in the WZ data dictionary
value domain	data concept that defines a set of permissible values	Use this term to define features or terms such as latitude. Note: Date is a value domain and it can be formatted using different data types.
Reference: https://www.iso.org/obp/ui/#iso:std:iso:14817:-1:ed-1:v1:en		

APPENDIX A-2. WZ-STATUS ENUMERATED VALUE DEFINITIONS

Planned. General information Project associated with overall project or phase timing and locations. Typically, this information is estimated during planning or early design stages.

Pending. Used to alert stakeholder that work is planned and scheduled for the near future (e.g., 2-3 weeks). The certainty of starting at this time is greater than 90% (barring weather and other unforeseen circumstances).

- Time horizon: approximate begin / end dates
- Location: coverage area and main road name; polyline (or geofence) around zone area

Active. Specific information about a Work Zone that is in place and operating. The precision of the duration and location are identified by the suffix on the respective project event fields.

Cancelled. Reported cancellation of a proposed or active WZ; the coverage applies to all work zone activities (tasks, subtasks and/or lane activities) inherited by the following:

- When a proposed WZ is cancelled, the dates should correspond to the proposed report
- The date time suffix for estimated or verified determine the certainty of the cancellation duration.

Completed. Work Zone is closed or is assigned a date for completion when all work zone activities are completed.

APPENDIX A-3. LIST OF ACRONYMS

API	Application Programming Interface
ATMS	Advanced Traffic Management System
DE	Data Element
DF	Data Frame
Enum	Enumerated Type
est	estimated
FHWA	Federal Highway Administration
HOV	High Occupancy Vehicle
ISO	International Organization for Standardization
ITS	Intelligent Transportation Systems
LE	Law Enforcement
LRS	Linear Referencing System
lt	Left
MOU	Memorandum of Understanding
OGC	Open Geospatial Consortium
OSOW	Oversize/Overweight
RFP	Request for Proposal
rt	Right
SAE	Society of Automotive Engineers
TIMS	Traffic Incident Management System
TMDD	Traffic Management Data Dictionary
TTC	Temporary Traffic Control
WFS	Web Feature Services
WGS	World Geodetic System
WMS	Web Map Services
WZ	Work Zone

WZAD	Work Zone Activity Data
WZDD	Work Zone Data Dictionary
WZDI	Work Zone Data Initiative Project
WZDS	Work Zone Data Systems
WZDx	Work Zone Data Exchange
URL	Uniform Resource Locator
USDOT	United States Department of Transportation
ver	verified

APPENDIX B. TRACEABILITY TO WZAD FRAMEWORK

APPENDIX B-1. DETAILED TRACE TO USE CASE CONTENT AND WZDD DATA CONCEPTS

The WZAD Framework document identified 59 WZAD content data concepts and 25 “external data [concepts] needed for user objectives.” Industry standard [3] defines a **data concept** as may reference a single, discrete **data element** or it may refer to a grouping of several data elements (i.e., a **data frame**)³. These terms are defined as follows:

- Data Element – Discrete data concept that cannot be broken down into smaller units.
- Data Frame - Data concept that describes a portion of a message or data feed that may contain other data elements or data frames.

A consolidated list of data derived from the Framework’s use cases was used to generate WZDD concepts. From the 59 data concepts identified, 147 WZDD concepts were generated and several external data sources were defined with respect to the WZDS Conceptual Framework (Figure 2). The mapping table between the Framework needs and Work Zone Data Dictionary includes the following information:

- **No.** – Unique identifier for each row of data
- **Framework Data Content** – Desired data elements derived from stakeholders.
- **Schema Table** – (If applicable), a table that includes a collection of data elements and frames which is logically related by work zone state, time, geometry and impact, or a group of data concepts that characterize activities related to a work zone. The schema tables used in this document refer to abstract group of data concepts rather than a physical or logical representation defined to a model database. Additional information on the schema tables can be found in Section 2.2.4.
- **Data Frame/Element** – (If applicable), data concepts which house data elements and/or data frames. Additional information on the data frames can be found in Section 2.2.2.
- **Framework Use Case** – the use case numbers which reference the data content
- **Notes** – Additional information provided for context and clarity.

³ Definitions for data concept, data element, and data frame are adapted from [3] the ISO ITS Data Dictionary standard.

Table 20. Trace from Framework Data Concept to Work Zone Data Dictionary Data Concept

NO	FRAMEWORK DATA CONTENT	SCHEMA TABLE	DATA FRAME/ELEMENT OR SERVICE	FRAMEWORK USE CASE	NOTES
1	Activity - Actual number of lanes to be closed	<ul style="list-style-type: none"> WZ-Subtask WZ-Task 	<ul style="list-style-type: none"> lanesClosed lanesOpen shouldersClosed totalLanes WZ-Geometry 	<ul style="list-style-type: none"> 4.1.1, 4.1.2, 4.2.1, 4.3.1, 4.3.2 7.1.1, 7.2.1, 7.3.1 	N/A
2	Activity - Change made to feature	<ul style="list-style-type: none"> Design and Operational Change Log 	N/A	<ul style="list-style-type: none"> 3.3.1 	Information is received and logged from external system
3	Activity - Description of actual lanes to be closed	<ul style="list-style-type: none"> WZ-LaneActivity 	<ul style="list-style-type: none"> laneDescription 	<ul style="list-style-type: none"> 4.1.1, 4.1.2, 4.2.1, 4.3.1, 4.3.2 7.1.1, 7.2.1, 7.3.1 	N/A
4	Activity - Description of planned lanes to be closed	<ul style="list-style-type: none"> WZ-LaneActivity 	<ul style="list-style-type: none"> laneDescription 	<ul style="list-style-type: none"> 1.3.1, 1.4.1, 1.4.2, 1.4.3, 1.5.2 2.1.3 4.1.1 4.1.2 4.2.1 	N/A
5	Activity - Description of signal timing change	<ul style="list-style-type: none"> Design and Operational Change Log 	N/A	<ul style="list-style-type: none"> 3.4.2 	Information is received and logged from external system
6	Activity - Detour Route information	N/A	<ul style="list-style-type: none"> DetourPath 	<ul style="list-style-type: none"> 4.1.2, 4.2.1 	N/A
7	Activity - Devices affected	<ul style="list-style-type: none"> Operational Log 	N/A	<ul style="list-style-type: none"> 3.4.1 	Imported from Asset Management System
8	Activity - Enforcement presence	<ul style="list-style-type: none"> Operational Log 	N/A	<ul style="list-style-type: none"> 6.3.1, 6.3.2 	Law Enforcement activities are received

NO	FRAMEWORK DATA CONTENT	SCHEMA TABLE	DATA FRAME/ELEMENT OR SERVICE	FRAMEWORK USE CASE	NOTES
					and logged from external system
9	Activity - Expected effect on travel time/delay/queuing	<ul style="list-style-type: none"> Operational Log 	N/A	<ul style="list-style-type: none"> 1.3.1, 1.4.2, 1.4.3, 1.5.2 2.1.3 4.1.1, 4.1.2, 4.2.1, 4.3.1 7.1.1, 7.2.1, 7.3.1 	Stakeholders identified that traffic performance and impact should be referenced from external system.
10	Activity - Expected geometrics associated with each event/subevent	<ul style="list-style-type: none"> Phase WZ-LaneActivity WZ-Subtask WZ-Task 	<ul style="list-style-type: none"> LaneGeometryPath WzGeometryPath 	<ul style="list-style-type: none"> 2.1.1 	N/A
11	Activity - Expected traffic control device(s) associated with each event/subevent	<ul style="list-style-type: none"> WZ-Subtask WZ-Task 	<ul style="list-style-type: none"> WzTTCType 	<ul style="list-style-type: none"> 2.1.1 	“Expected” is indicated when wz-status is planned or pending
12	Activity - Feature that is modified relative to project plans	<ul style="list-style-type: none"> Design and Operational Change Log 	N/A	<ul style="list-style-type: none"> 3.3.1 	Information is received and logged from external system
13	Activity - General description about Maintenance of Traffic approach	<ul style="list-style-type: none"> Phase 	<ul style="list-style-type: none"> WorkType 	<ul style="list-style-type: none"> 1.1.2 	N/A
14	Activity - General description of event/subevent	<ul style="list-style-type: none"> Phase WZ-Subtask WZ-Task 	<ul style="list-style-type: none"> descriptionTask 	<ul style="list-style-type: none"> 1.1.1, 1.1.2, 1.2.1, 1.2.2, 1.3.2 	N/A

NO	FRAMEWORK DATA CONTENT	SCHEMA TABLE	DATA FRAME/ELEMENT OR SERVICE	FRAMEWORK USE CASE	NOTES
15	Activity - Indication that the Maintenance of Traffic requires coordination between the projects	<ul style="list-style-type: none"> Project Coordination List 	N/A	<ul style="list-style-type: none"> 1.2.1, 1.2.2 2.2.1, 2.2.2 3.2.3 	N/A
16	Activity - Indicator that signal timing has changed	<ul style="list-style-type: none"> Design and Operational Change Log 	N/A	<ul style="list-style-type: none"> 3.4.2 	Information is received and logged from external system
17	Activity - Indicator that the work involves cutting or otherwise affecting the pavement	N/A	<ul style="list-style-type: none"> workClassificationDetail workClassificationType WorkType 	<ul style="list-style-type: none"> 1.4.3, 1.5.2 	N/A
18	Activity - Lane closure permit number	<ul style="list-style-type: none"> Role 	<ul style="list-style-type: none"> permitID 	<ul style="list-style-type: none"> 1.4.1 	N/A
19	Activity - List of changes to notify travelers	<ul style="list-style-type: none"> Operational Log 	N/A	<ul style="list-style-type: none"> 4.2.2 	WZDx is a public data feed specification
20	Activity - Number of activities requiring Law Enforcement support OR flag indicating event/subevent needs Law Enforcement support	<ul style="list-style-type: none"> Operational Log 	<ul style="list-style-type: none"> LESupportNeeds 	<ul style="list-style-type: none"> 6.4.1 	LE Support Needs is the set of WZ activities that require law enforcement support

NO	FRAMEWORK DATA CONTENT	SCHEMA TABLE	DATA FRAME/ELEMENT OR SERVICE	FRAMEWORK USE CASE	NOTES
21	Activity - Planned number of lanes to be closed	<ul style="list-style-type: none"> Phase WZ-Subtask WZ-Task 	<ul style="list-style-type: none"> lanesClosed WZ-Geometry 	<ul style="list-style-type: none"> 1.3.1, 1.4.1, 1.4.2, 1.4.3, 1.5.2 2.1.3 4.1.1, 4.1.2, 4.2.1 	N/A
22	Activity - Planned number of lanes to be open	<ul style="list-style-type: none"> Phase WZ-Subtask WZ-Task 	<ul style="list-style-type: none"> lanesOpen WZ-Geometry 	<ul style="list-style-type: none"> 1.3.1, 1.4.1, 1.4.2, 1.4.3, 1.5.2 2.1.3 	N/A
23	Activity - Planned number of short-term lane closures	<ul style="list-style-type: none"> Phase WZ-Subtask WZ-Task 	<ul style="list-style-type: none"> lanesClosed WZ-Geometry 	<ul style="list-style-type: none"> 2.1.3 	N/A
24	Activity - Reduce Speed Limit	<ul style="list-style-type: none"> WZ-Subtask WZ-Task 	<ul style="list-style-type: none"> reducedSpeedLimit 	<ul style="list-style-type: none"> 5.1.3, 5.2.1 6.1.2 	N/A
25	Activity - Reference to projects that need to be coordinated with (Project IDs?)	<ul style="list-style-type: none"> Project Coordination List 	<ul style="list-style-type: none"> ProjectEventID 	<ul style="list-style-type: none"> 1.2.1, 1.2.2 2.2.1, 2.2.2 3.2.3 	related data element: <ul style="list-style-type: none"> projectName
26	Activity - Temporary restrictions in place	<ul style="list-style-type: none"> WZ-Subtask WZ-Task 	<ul style="list-style-type: none"> laneRestriction wz-SeparationType 	<ul style="list-style-type: none"> 1.5.1, 1.6.1 4.1.1, 4.3.1 7.1.1, 7.2.1, 7.3.1 	N/A
27	Activity - Total number of lanes	<ul style="list-style-type: none"> Phase WZ-Subtask WZ-Task 	<ul style="list-style-type: none"> totalLanes WZ-Geometry 	<ul style="list-style-type: none"> 1.3.1, 1.4.1, 1.4.2, 1.4.3, 1.5.2 2.1.3 	N/A
28	Activity - TTC used to make feature change	<ul style="list-style-type: none"> WZ-LaneActivity 	<ul style="list-style-type: none"> travelPathEffect WZ-Geometry 	<ul style="list-style-type: none"> 3.3.1 	Change to project is logged

NO	FRAMEWORK DATA CONTENT	SCHEMA TABLE	DATA FRAME/ELEMENT OR SERVICE	FRAMEWORK USE CASE	NOTES
		<ul style="list-style-type: none"> WZ-Subtask WZ-Task 			
29	Activity - Warning notifications	<ul style="list-style-type: none"> Phase WZ-Subtask WZ-Task 	<ul style="list-style-type: none"> AdvancedWarning WZ-Geometry 	<ul style="list-style-type: none"> 4.2.1 	Data Frame that includes location, notification type and message.
30	Actual geometrics associated with each event/subevent	<ul style="list-style-type: none"> Phase WZ-LaneActivity WZ-Subtask WZ-Task 	<ul style="list-style-type: none"> LaneGeomteryPath Path WZGeometryPath 	<ul style="list-style-type: none"> 5.1.1, 5.1.2, 5.2.2, 5.2.3, 5.3.1, 5.3.2 	These are part of WZ-Geometry
31	Actual number of phases	<ul style="list-style-type: none"> Work Zone Project 	<ul style="list-style-type: none"> totalPhases 	<ul style="list-style-type: none"> 5.1.1, 5.1.2, 5.2.2, 5.2.3, 5.3.1, 5.3.2 	When Project is completed
32	Actual traffic control device(s) associated with each event/subevent	<ul style="list-style-type: none"> WZ-Subtask WZ-Task 	<ul style="list-style-type: none"> wzTTCType 	<ul style="list-style-type: none"> 5.1.1, 5.1.2, 5.2.2, 5.2.3, 5.3.1, 5.3.2 	N/A
34	Contractor/subcontractors	<ul style="list-style-type: none"> Role 	<ul style="list-style-type: none"> contractRole roleType 	<ul style="list-style-type: none"> 1.2.1, 1.2.2, 1.3.1, 1.3.2, 1.4.1, 1.4.2, 1.4.3, 1.5.2 3.1.2, 3.1.3, 3.2.1, 3.2.2, 3.2.3, 3.3.1, 3.4.1, 3.4.2 5.1.1, 5.1.2, 5.2.2, 5.2.3, 5.3.1, 5.3.2 6.5.1 	N/A
35	Date/Time Advance Notice Received	<ul style="list-style-type: none"> Operational Log 	<ul style="list-style-type: none"> timeStamp 	N/A	Notice received by WZAD when

NO	FRAMEWORK DATA CONTENT	SCHEMA TABLE	DATA FRAME/ELEMENT OR SERVICE	FRAMEWORK USE CASE	NOTES
					contractor (utility, contractor, subcontractor) sends an Advanced Notice
36	Event ID	<ul style="list-style-type: none"> WZ-Task 	<ul style="list-style-type: none"> wz-TaskID 	<ul style="list-style-type: none"> 1.1.1, 1.1.2, 1.2.1, 1.2.2, 1.3.1, 1.3.2, 1.4.1, 1.4.2, 1.4.3, 1.5.1, 1.5.2, 1.6.1 2.1.1, 2.1.2, 2.1.3, 2.2.1, 2.2.2 3.1.1, 3.1.2, 3.1.3, 3.2.1, 3.2.2, 3.2.3, 3.3.1, 3.4.1, 3.4.2 4.1.1, 4.1.2, 4.2.1, 4.2.2, 4.3.1, 4.3.2 5.1.1, 5.1.2, 5.1.3, 5.2.1, 5.2.2, 5.2.3, 5.3.1, 5.3.2 6.1.1, 6.1.2, 6.2.1, 6.3.1, 6.3.2, 6.4.1, 6.5.1, 6.6.1 7.1.1, 7.2.1, 7.3.1 	Second level project event is a TASK
37	Expected number of phases	<ul style="list-style-type: none"> Work Zone Project 	<ul style="list-style-type: none"> totalPhases 	<ul style="list-style-type: none"> 1.1.2 2.1.2, 2.1.1 	When Project is planned, pending or active
38	Expected phase durations	<ul style="list-style-type: none"> Phase 	<ul style="list-style-type: none"> EndTime StartTime 	<ul style="list-style-type: none"> 1.1.2 	Based on a query of end - start date/times endTime-est – startTime-est
39	Funding allocation	<ul style="list-style-type: none"> Work Zone 	<ul style="list-style-type: none"> allocationValue 	<ul style="list-style-type: none"> 1.1.1, 1.1.2 	N/A

NO	FRAMEWORK DATA CONTENT	SCHEMA TABLE	DATA FRAME/ELEMENT OR SERVICE	FRAMEWORK USE CASE	NOTES
		Project			
40	Location - Actual begin location of event/subevent	<ul style="list-style-type: none"> Phase WZ-Subtask WZ-Task 	<ul style="list-style-type: none"> BeginActivityLocation BeginLocation 	<ul style="list-style-type: none"> 1.2.1, 1.2.2, 1.3.2, 1.4.1 3.1.2, 3.1.3, 3.2.1, 3.2.2, 3.3.1, 3.4.1, 3.4.2 4.1.1, 4.1.2, 4.2.1, 4.2.2, 4.3.1, 4.3.2 5.1.1, 5.1.2, 5.2.2, 5.2.3, 5.3.1, 5.3.2 6.1.1, 6.1.2, 6.2.1, 6.3.1, 6.3.2, 6.5.1, 6.6.1 7.1.1, 7.2.1, 7.3.1 	WZ-Geometry contains two data frames with actual begin locations.
41	Location - Direction of travel of event/subevent	<ul style="list-style-type: none"> Phase WZ-Subtask WZ-Task 	<ul style="list-style-type: none"> BeginActivityLocation BeginLocation roadDirection WZ-Geometry 	<ul style="list-style-type: none"> 1.1.1, 1.1.2, 1.2.1, 1.2.2, 1.3.1, 1.3.2, 1.4.1, 1.4.2, 1.4.3, 1.5.1, 1.5.2, 1.6.1 2.1.1, 2.1.2, 2.1.3, 2.2.1, 2.2.2 3.1.2, 3.1.3, 3.2.1, 3.2.2, 3.3.1, 3.4.1, 3.4.2 4.1.1, 4.1.2, 4.2.1, 4.2.2, 4.3.1, 4.3.2 5.1.1, 5.1.2, 5.1.3, 5.2.1, 5.2.2, 5.2.3, 5.3.1, 5.3.2 6.1.1, 6.1.2, 6.2.1, 6.3.1, 6.3.2, 6.4.1, 6.5.1, 6.6.1 7.1.1, 7.2.1, 7.3.1 	N/A

NO	FRAMEWORK DATA CONTENT	SCHEMA TABLE	DATA FRAME/ELEMENT OR SERVICE	FRAMEWORK USE CASE	NOTES
42	Location - Facility type of roadway where event/subevent is located	<ul style="list-style-type: none"> • Phase • WZ-Subtask • WZ-Task 	<ul style="list-style-type: none"> • RoadType • facilityType 	<ul style="list-style-type: none"> • 1.1.1, 1.1.2, 1.2.1, 1.2.2, 1.3.1, 1.3.2, 1.4.1, 1.4.2, 1.4.3, 1.5.1, 1.5.2, 1.6.1 • 2.1.1, 2.1.2, 2.1.3, 2.2.1, 2.2.2 • 3.1.1, 3.1.2, 3.1.3, 3.2.1, 3.2.2, 3.2.3, 3.3.1, 3.4.1, 3.4.2 • 4.1.1, 4.1.2, 4.2.1, 4.2.2, 4.3.1, 4.3.2 • 5.1.1, 5.1.2, 5.1.3, 5.2.1, 5.2.2, 5.2.3, 5.3.1, 5.3.2 • 6.1.1, 6.1.2, 6.2.1, 6.3.1, 6.3.2, 6.4.1, 6.5.1, 6.6.1 • 7.1.1, 7.2.1, 7.3.1 	N/A
43	Location - Name of roadway where event/subevent is located	<ul style="list-style-type: none"> • Phase • WZ-Subtask • WZ-Task 	<ul style="list-style-type: none"> • BeginLocation • roadName • WZ-Geometry 	<ul style="list-style-type: none"> • 1.1.1, 1.1.2, 1.2.1, 1.2.2, 1.3.1, 1.3.2, 1.4.1, 1.4.2, 1.4.3, 1.5.1, 1.5.2, 1.6.1 • 2.1.1, 2.1.2, 2.1.3, 2.2.1, 2.2.2 • 3.1.1, 3.1.2, 3.1.3, 3.2.1, 3.2.2, 3.2.3, 3.3.1, 3.4.1, 3.4.2 • 4.1.1, 4.1.2, 4.2.1, 4.2.2, 4.3.1, 4.3.2 • 5.1.1, 5.1.2, 5.1.3, 5.2.1, 5.2.2, 5.2.3, 5.3.1, 5.3.2 	Project event activity may be at any project event level: phase, task, subtask

NO	FRAMEWORK DATA CONTENT	SCHEMA TABLE	DATA FRAME/ELEMENT OR SERVICE	FRAMEWORK USE CASE	NOTES
				<ul style="list-style-type: none"> 6.1.1, 6.1.2, 6.2.1, 6.3.1, 6.3.2, 6.4.1, 6.5.1, 6.6.1 7.1.1, 7.2.1, 7.3.1 	
44	Location - Planned begin location of event/subevent	<ul style="list-style-type: none"> Phase WZ-Subtask WZ-Task 	<ul style="list-style-type: none"> BeginActivityLocation BeginLocation 	<ul style="list-style-type: none"> 1.1.1, 1.1.2, 1.2.1, 1.2.2, 1.3.1, 1.3.2, 1.4.1, 1.4.2, 1.4.3, 1.5.1, 1.5.2, 1.6.1 2.1.1, 2.1.2, 2.1.3, 2.2.1, 2.2.2 4.1.1, 4.1.2, 4.2.1, 4.2.2 6.4.1, 6.6.1 	WZ-Geometry contains two data frames with actual begin locations
45	Location - Planned end location of event/subevent	N/A	<ul style="list-style-type: none"> EndActivityLocation EndLocation 	<ul style="list-style-type: none"> 1.1.1, 1.1.2, 1.2.1, 1.2.2, 1.3.1, 1.3.2, 1.4.1, 1.4.2, 1.4.3, 1.5.1, 1.5.2, 1.6.1 2.1.1, 2.1.2, 2.1.3, 2.2.1, 2.2.2 4.1.1, 4.1.2, 4.2.1, 4.2.2 6.4.1, 6.6.1 	WZ-Geometry contains two data frames with planned end locations:
46	Location - Roadway classification of roadway where event/subevent is located	<ul style="list-style-type: none"> Phase WZ-Subtask WZ-Task 	<ul style="list-style-type: none"> RoadType WZ-Geometry 	<ul style="list-style-type: none"> 1.1.1, 1.1.2, 1.2.1, 1.2.2, 1.3.1, 1.3.2, 1.4.1, 1.4.2, 1.4.3, 1.5.1, 1.5.2, 1.6.1 2.1.1, 2.1.2, 2.1.3, 2.2.1, 2.2.2 3.1.1, 3.1.2, 3.1.3, 3.2.1, 3.2.2, 3.2.3, 3.3.1, 3.4.1, 3.4.2 4.1.1, 4.1.2, 4.2.1, 4.2.2, 	Project event activity may be at any project event level: phase, task, subtask

NO	FRAMEWORK DATA CONTENT	SCHEMA TABLE	DATA FRAME/ELEMENT OR SERVICE	FRAMEWORK USE CASE	NOTES
				4.3.1, 4.3.2 <ul style="list-style-type: none"> 5.1.1, 5.1.2, 5.1.3, 5.2.1, 5.2.2, 5.2.3, 5.3.1, 5.3.2 6.1.1, 6.1.2, 6.2.1, 6.3.1, 6.3.2, 6.4.1, 6.5.1, 6.6.1 7.1.1, 7.2.1, 7.3.1 	
47	Metadata - Indicator that a change to an event/subevent entry has been made	N/A	<ul style="list-style-type: none"> WZ-ProjectSchedule 	<ul style="list-style-type: none"> 1.1.1, 1.1.2, 1.2.1, 1.2.2, 1.3.1, 1.3.2, 1.4.1, 1.4.2, 1.4.3, 1.5.2 4.1.1, 4.1.2, 4.2.1, 4.2.2, 4.3.1, 4.3.2 7.1.1, 7.2.1, 7.3.1 	All data concept changes should be logged in the VersionLog.
48	Owner agency	<ul style="list-style-type: none"> Organization 	<ul style="list-style-type: none"> orgName orgTelephone orgType orgURL region 	<ul style="list-style-type: none"> 1.1.1, 1.1.2, 1.2.1, 1.2.2, 1.3.1, 1.4.2, 1.4.3, 1.5.1, 1.5.2, 1.6.1 2.1.1, 2.1.2, 2.1.3, 2.2.1, 2.2.2 3.2.3 5.1.1, 5.1.2, 5.2.2, 5.2.3, 5.3.1, 5.3.2 	N/A
49	Owner agency Project Manager	<ul style="list-style-type: none"> Organization 	<ul style="list-style-type: none"> orgName orgTelephone orgType orgURL region 	<ul style="list-style-type: none"> 1.2.1, 1.2.2, 3.2.3 	N/A
50	Project ID	<ul style="list-style-type: none"> Phase 	<ul style="list-style-type: none"> ProjectEventID 	<ul style="list-style-type: none"> 1.1.1, 1.1.2, 1.2.1, 1.2.2, 	N/A

NO	FRAMEWORK DATA CONTENT	SCHEMA TABLE	DATA FRAME/ELEMENT OR SERVICE	FRAMEWORK USE CASE	NOTES
		<ul style="list-style-type: none"> • Work Zone Project • WZ-Subtask • WZ-Task 		<ul style="list-style-type: none"> 1.3.1, 1.3.2, 1.4.2, 1.4.3, 1.5.2 • 2.1.1, 2.1.2, 2.1.3, 2.2.1, 2.2.2 • 3.1.1, 3.1.2, 3.1.3, 3.2.1, 3.2.2, 3.2.3, 3.3.1, 3.4.1, 3.4.2 • 4.1.1, 4.1.2, 4.2.1, 4.3.1, 4.3.2 • 5.1.1, 5.1.2, 5.1.3, 5.2.1, 5.2.2, 5.2.3, 5.3.1, 5.3.2 • 6.3.1, 6.3.2, 6.4.1, 6.5.1 • 7.1.1, 7.2.1, 7.3.1 	
51	Sub-event ID	<ul style="list-style-type: none"> • WZ-Subtask 	<ul style="list-style-type: none"> • wZ-SubtaskID 	<ul style="list-style-type: none"> • 1.2.1, 1.2.2, 1.3.1, 1.3.2, 1.4.2, 1.4.3, 1.5.2 • 2.1.1, 2.1.2, 2.1.3, 2.2.1, 2.2.2 • 3.1.2, 3.1.3, 3.2.1, 3.2.2, 3.3.1 • 4.1.1, 4.1.2, 4.2.1, 4.2.2, 4.3.1, 4.3.2 • 5.1.1, 5.1.2, 5.1.3, 5.2.1, 5.2.2, 5.2.3, 5.3.1, 5.3.2 • 6.1.1, 6.1.2, 6.2.1, 6.3.1, 6.3.2, 6.4.1, 6.6.1 • 7.1.1, 7.2.1, 7.3.1 	N/A

NO	FRAMEWORK DATA CONTENT	SCHEMA TABLE	DATA FRAME/ELEMENT OR SERVICE	FRAMEWORK USE CASE	NOTES
52	Time - Actual end date/time of event/subevent	<ul style="list-style-type: none"> Phase WZ-Subtask WZ-Task 	<ul style="list-style-type: none"> EndTime endTime-cancelled endTime-complete endTime-ver timeConfidence 	<ul style="list-style-type: none"> 1.2.1, 1.2.2, 1.3.2, 1.4.1 3.1.2, 3.1.3, 3.2.1, 3.2.2, 3.3.1, 3.4.1, 3.4.2 4.1.1, 4.1.2, 4.2.1, 4.2.2, 4.3.1, 4.3.2 5.1.1, 5.1.2, 5.2.2, 5.2.3, 5.3.1, 5.3.2 6.1.1, 6.1.2, 6.2.1, 6.3.1, 6.3.2, 6.5.1, 6.6.1 7.1.1, 7.2.1, 7.3.1 	N/A
53	Time - Actual start date/time of event/subevent	<ul style="list-style-type: none"> Phase WZ-Subtask WZ-Task 	<ul style="list-style-type: none"> StartTime 	<ul style="list-style-type: none"> 1.2.1, 1.2.2, 1.3.2, 1.4.1 3.1.2, 3.1.3, 3.2.1, 3.2.2, 3.3.1, 3.4.1, 3.4.2 4.1.1, 4.1.2, 4.2.1, 4.2.2, 4.3.1, 4.3.2 5.1.1, 5.1.2, 5.2.2, 5.2.3, 5.3.1, 5.3.2 6.1.1, 6.1.2, 6.2.1, 6.3.1, 6.3.2, 6.5.1, 6.6.1 7.1.1, 7.2.1, 7.3.1 	N/A
54	Time - Indicator for level of confidence in expected start date	<ul style="list-style-type: none"> Phase WZ-Subtask WZ-Task 	<ul style="list-style-type: none"> StartTime timeConfidence 	<ul style="list-style-type: none"> 1.1.1, 1.1.2 	N/A
55	Time - Planned end date/time of event/subevent	<ul style="list-style-type: none"> Phase WZ-Subtask WZ-Task 	<ul style="list-style-type: none"> WZ-Geometry EndLocation 	<ul style="list-style-type: none"> 1.2.1, 1.2.2, 1.3.1, 1.3.2, 1.4.1, 1.4.2, 1.4.3, 1.5.1, 1.5.2, 1.6.1 	N/A

NO	FRAMEWORK DATA CONTENT	SCHEMA TABLE	DATA FRAME/ELEMENT OR SERVICE	FRAMEWORK USE CASE	NOTES
				<ul style="list-style-type: none"> 2.1.1, 2.1.2, 2.1.3, 2.2.1, 2.2.2 4.1.1, 4.1.2, 4.2.1, 4.2.2 6.4.1, 6.6.1 	
56	Time - Planned project duration	<ul style="list-style-type: none"> Phase WZ-Subtask WZ-Task 	<ul style="list-style-type: none"> StartDateTime EndDateTime 	<ul style="list-style-type: none"> 1.1.1, 1.1.2 	Derived from the difference between start and end time/date
57	Time - Planned start date/time of event/subevent	<ul style="list-style-type: none"> Phase WZ-Subtask WZ-Task 	<ul style="list-style-type: none"> StartDateTime 	<ul style="list-style-type: none"> 1.2.1, 1.2.2, 1.3.1, 1.3.2, 1.4.1, 1.4.2, 1.4.3, 1.5.1, 1.5.2, 1.6.1 2.1.1, 2.1.2, 2.1.3, 2.2.1, 2.2.2 4.1.1, 4.1.2, 4.2.1, 4.2.2 6.4.1, 6.6.1 	When status = planned, pending or active (when timedata is estimated)
58	Time - Recurring flag	<ul style="list-style-type: none"> WZ-Subtask WZ-Task 	<ul style="list-style-type: none"> dayOfWeek endPeriod Recurring startPeriod 	<ul style="list-style-type: none"> 1.3.2, 1.4.1 4.1.1, 4.1.2, 4.2.1, 4.2.2, 4.3.1, 4.3.2 7.1.1, 7.2.1, 7.3.1 	N/A
59	Time - Status	<ul style="list-style-type: none"> Phase WZ-Subtask WZ-Task 	<ul style="list-style-type: none"> wz-Status 	<ul style="list-style-type: none"> 1.1.1, 1.1.2, 1.2.1, 1.2.2, 1.3.1, 1.3.2, 1.4.1, 1.4.2, 1.4.3, 1.5.1, 1.5.2, 1.6.1 2.1.1, 2.1.2, 2.1.3, 2.2.1, 2.2.2 3.1.1, 3.1.2, 3.1.3, 3.2.1, 3.2.2, 3.2.3, 3.3.1, 3.4.1, 3.4.2 	N/A

NO	FRAMEWORK DATA CONTENT	SCHEMA TABLE	DATA FRAME/ELEMENT OR SERVICE	FRAMEWORK USE CASE	NOTES
				<ul style="list-style-type: none"> • 4.1.1, 4.1.2, 4.2.1, 4.2.2, 4.3.1, 4.3.2 • 5.1.1, 5.1.2, 5.2.2, 5.2.3, 5.3.1, 5.3.2 • 6.1.1, 6.1.2, 6.2.1, 6.3.1, 6.3.2, 6.4.1, 6.5.1, 6.6.1 • 7.1.1, 7.2.1, 7.3.1 	

APPENDIX B-2. DETAILED TRACE BETWEEN FRAMEWORK EXTERNAL DATA AND WZDD EXTERNAL DATA SOURCES

The Framework document [2] identifies “external data needed for user objectives” in the detailed Use Cases. These data detail information flows between the WZDS and stakeholders. In this WZDD, the conceptual data model (Figure 3) identifies sets of external data sources. These data sources are derived from the Framework external data descriptions as well as WZDS content that is imported from external sources. The section below identifies the WZDD Data Concept Model external data sources to the artifacts identified in the Framework document.

In Section 2.1.2, the WZDD external data sources illustrated in the Figure 3: WZAD Concept Data Model was grouped into categories of data including:

- Planned Data
- Operational / Performance Data Sets
- Permit Data
- Law Enforcement Activity Data
- Device and Asset Management Data / System Control and Management Data
- Other WZAD
- Contractor Data

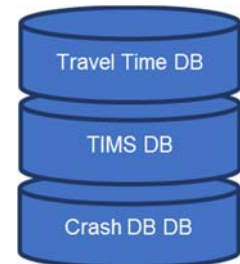
Each of these categories are mapped to specific data needs and use cases that reference them. The use case numbers reference the Framework document (see [2] for more information).

Planned Data. This data consists of plans, designs, contracts, specifications, and drawings that estimate parameters for the work zone project, phases, and activities related to geometry, timing and impacts. The contract business rules, performance targets, organizational contacts and roles are described in these documents.



External and Related Content	Referenced in Framework Use Case
Construction Contracts	3.1.1, 3.1.2, 3.1.3, 3.2.1, 3.2.2, 3.2.3, 3.3.1, 3.4.1, 3.4.2
Construction Plan	3.1.1, 3.1.2, 3.1.3, 3.2.1, 3.2.2, 3.2.3, 3.3.1, 3.4.1, 3.4.2
Construction RFP	3.1.1, 3.1.2, 3.1.3, 3.2.1, 3.2.2, 3.2.3, 3.3.1, 3.4.1, 3.4.2
Pre-Construction Mobility Data	2.1.1, 2.2.1, 2.2.2

Operational / Performance Data Sets. The travel time, TIMS and crash data sets store operational data on the event locations by time and date. When related to the location and timing of work zone data, these data show the impact of the work zone activity relative to the typical travel times, crashes, and other incidents.



External and Related Content	Referenced in Framework Use Case
Activity - Description of signal timing change	3.4.2
Activity - Expected effect on travel time/delay/queuing	1.3.1, 1.4.2, 1.4.3, 1.5.2, 2.1.3, 4.1.1, 4.1.2, 4.2.1, 4.3.1, 7.1.1, 7.2.1, 7.3.1
Agency or Third party connected vehicle and automated vehicle systems (in the cloud)	7.3.1, 7.1.1, 7.2.1
Agency OSOW Routing Plans	1.6.1
Corresponding local and regional crash data	5.1.2
Corresponding local and regional traffic data	5.1.1, 5.1.2
Corresponding regional crash data	5.2.1, 5.2.2, 5.2.3, 5.2.1, 5.2.2, 5.2.3
Daily Construction Plan Updates	6.4.1, 6.5.1
Pre-Construction Safety Data	2.1.2, 2.1.3
WZ Mobility Performance History Analysis	2.1.1, 2.2.1, 2.2.2

Permit Data. The permit data is the collection of permits issued to projects by specific organizations. The permit may be associated with a single project phase, task, or subtask.



External and Related Content	Referenced in Framework Use Case
Lane Closure/Right-of-Way Access Approval	6.2.1

Law Enforcement Activity Data. Law enforcement activity data contain information on the activities of law enforcement around the work zone, and in many cases track the requests of construction organizations (like DOTs) for specific enforcement activities.



External and Related Content	Referenced in Framework Use Case
Activity - Enforcement presence	6.3.1, 6.3.2
Law Enforcement Citation Database	6.3.1, 6.3.2
Law Enforcement Citations	6.1.1, 6.1.2
Law Enforcement WZ enforcement support MOU	6.3.1, 6.3.2, 6.4.1, 6.5.1

Device and Asset Management Data / System Control and Management Data. The typical asset management system stores information about the location, configuration, and operations of assets that may be placed in a work zone – like a portable variable message sign, or one that resides in the zone like a street lamp, overhead variable message sign, or local signal controller and its related intersection phase plans.



When impacted by a work zone, critical asset attributes may need to be shared with the work zone.

External and Related Content	Referenced in Framework Use Case
Activity - Devices affected	3.4.1
Activity - Expected traffic control device(s) associated with each event/subevent	2.1.1
Actual traffic control device(s) associated with each event/subevent	5.1.1, 5.1.2, 5.2.2, 5.2.3, 5.3.1, 5.3.2

Other WZAD. Other jurisdictions, from local to National organizations will manage and disseminate information on their work zone projects including planned, in design, active, and historic information.



External and Related Content	Referenced in Framework Use Case
Corresponding local, regional, and national safety and mobility performance data	5.3.1, 5.3.2
National WZAD	5.3.1, 5.3.2
Neighbor Agency Construction & WZ Operations Schedules	1.3.2
Neighbor Agency Temporary Traffic Control Designs	1.2.1
Neighbor Agency Temporary Traffic Control Plans	1.2.2
Neighbor Agency WZ Schedules	1.2.1, 1.2.2
Regional WZAD	5.2.1, 5.2.2, 5.2.3

Contractor Systems. Contractors, subconsultants, utilities and other external entities will exchange information related proposed, permitted, and actual work performed.



External and Related Content	Referenced in Framework Use Case
Utility Construction & Maintenance schedule	1.5.1, 1.5.2

APPENDIX C. ITS STANDARDS APPLIED TO THE WZDD

APPENDIX C-1. ENUMERATED VALUE DEFINITIONS DERIVED FROM TMDD STANDARD

The following tables show the translation from TMDD to the WZDD.

Example of data frame in the TMDD (specified in ASN.1 format)

```
DATA-TYPE "EventLane ::= SEQUENCE {
    lanes-type ITIS.LaneRoadway OPTIONAL,
    link-direction OPTIONAL,
    lanes-total-original Link-lanes-count OPTIONAL,
    lanes-total-affected Link-lanes-count OPTIONAL,
    event-lanes-affected SEQUENCE (SIZE(1..64)) OF Link-lane-number
OPTIONAL,
    lanes-status ITIS.Closures OPTIONAL,
    ... }"
```

C-1.1. openLanes and closedLanes (Derived from TMDD)

Note: LaneRoadway is imported into TMDD from SAE 2540 (ITIS Standard)

LaneRoadway enumerations [TMDD]	Used for laneOpen and laneClosed	Description
all-roadways (8192)	all	Indicates that road all lanes are open or closed. If all lanes are closed then road is effectively closed.
through-lanes (8193)		Not used
left-lane (8194)	left-lane	The left most lane (inside lane)
right-lane (8195)	right-lane	The right most lane (outside lane)
	left-2-lanes	The two most left lanes
	left-3-lanes	The three most left lanes
	right-2-lanes	The two most right lanes
	right-3-lanes	The 3 most right lanes
center-lane (8196)		Not used
middle-lanes (8197)	middle-lane	The center most lane where are a total of an odd number of lanes
middle-two-lanes (8198)	middle-two-lanes	The center most lane where are a total of an even number of lanes
right-turning-lanes (8199)	right-turning-lane	A right lane where right turns are permissible
left-turning-lanes (8200)	left-turning-lane	A left lane where left turns are permissible
upper-deck-lanes (8201)		Not used
lower-deck-lanes (8202)		Not used
reversible-lanes (8203)		Not used

LaneRoadway enumerations [TMDD]	Used for laneOpen and laneClosed	Description
right-exit-lanes (8204)	right-exit-lane	The right lane where the lane provides an egress with a ramp.
left-exit-lanes (8205)	left-exit-lane	The left lane where the lanes where the lane provides an egress with a ramp.
right-merging-lanes (8206)	right-merging-lane	The right lane where the lane ends with a gradual merge with the second most lane.
left-merging-lanes (8207)	left-merging-lane	The left lane where the lanes ends by a gradual merge with the second most left lane
right-exit-ramp (8208)	right-exit-ramp	The (first) exit ramp with an egress on the right in the direction of flow at an interchange
right-second-exit-ramp (8209)	right-second-exit-ramp	The second exit ramp with an egress on the right in the direction of flow at an interchange
right-entrance-ramp (8210)	right-entrance-ramp	The (first) entrance ramp with an ingress on the right in the direction of flow at an interchange
right-second-entrance-ramp (8211)	right-second-entrance-ramp	The second entrance ramp with an ingress on the right in the direction of flow at an interchange
left-exit-ramp (8212)	left-exit-ramp	The (first) exit ramp with an egress on the left in the direction of flow at an interchange
left-second-exit-ramp (8213)	left-second-exit-ramp	The second exit ramp with an egress on the left in the direction of flow at an interchange
left-entrance-ramp (8214)	left-entrance-ramp	The (first) entrance ramp with an ingress on the left in the direction of flow at an interchange
left-second-entrance-ramp (8215)	left-second-entrance-ramp	The second entrance ramp with an ingress on the left in the direction of flow at an interchange
escape-ramp (8216)		Not used
hard-shoulder (8217)		Not used
soft-shoulder (8218)		Not used
right-shoulder (8219)		Not used
left-shoulder (8220)		Not used
median (8221)		Not used
sidewalk (8222)	sidewalk	The sidewalk or pedestrian way
highways (8223)		Not used

LaneRoadway enumerations [TMDD]	Used for laneOpen and laneClosed	Description
right-hand-parallel-lanes (8224)		Not used
left-hand-parallel-lanes (8225)		Not used
connecting-lanes (8226)		Not used
express-lanes (8227)		Not used
local-lanes (8228)		Not used
toll-lanes (8229)		Not used
electronic-toll-lanes (8230)		Not used
toll-plaza (8231)		Not used
inspection-lane (8232)		Not used
hov-lanes (8233)		Not used
bus-lanes (8234)		Not used
carpool-lanes (8235)		Not used
truck-lanes (8236)		Not used
emergency-lanes (8237)		Not used
passing-lanes (8238)		Not used
climbing-lanes (8239)		Not used
slow-lane (8240)		Not used
service-road (8241)		Not used
cycle-lane (8242)		Not used
tracks (8243)		Not used
bridge (8244)		Not used
overpass (8245)		Not used
elevated-lanes (8246)		Not used
underpass (8247)		Not used
tunnel (8248)		Not used
all-exit-lanes (8249)		Not used
all-entry-lanes (8250)		Not used
either-shoulder (8251)		Not used
shoulder-work (8252)		Not used
	bike-lane	Bike lane
	none	No lanes (open or closed)
	unknown	Unknown which lane is referenced
	alternating-flow-lane	Signal or flagger controls lane flow
	left-shift-lanes	All open lanes shift to the left
	right-shift-lanes	All open lanes shift to the right

C-1.2. Shoulder Closed (Derived from TMDD)

Note: LaneRoadway is imported into TMDD from SAE 2540 (ITIS Standard)

LaneRoadway Enumerations [TMDD]	Used for shoulderClosed	Description
right-shoulder (8219)	outside	The outer lane or the right most lane.
left-shoulder (8220)	inside	The inner lane or the left most lane
	both	Both inside and outside shoulders
	none	Not needed if field is optional. This is the default value
	unknown	Unknown if shoulder is open, closed or not existing.

C-1.3. Road Direction (Derived from TMDD)

Note: Link-alignment is imported from TMDD

Link-alignment enumerations [TMDD]	Used for roadDirection	Description
northbound (1)	northbound	Road flow is in the northbound direction
eastbound (2)	eastbound	Road flow is in the eastbound direction
southbound (3)	southbound	Road flow is in the southbound direction
westbound (4)	westbound	Road flow is in the westbound direction
inner-loop (5)		Not used
outer-loop (6)		Not used

ATTACHMENT A: GUIDELINES ON APPLYING WZDD



U.S. Department of Transportation
Federal Highway Administration

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Federal Highway Administration

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