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Standard Specification for Archiving ITS-Generated Traffic Monitoring Data[1]

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1. Scope

1.1 This specification describes data elements and schema for an archived data management system for intelligent transportation system (ITS)-generated traffic monitoring data, including conventional traffic monitoring data, data collected directly from ITS systems, and travel-time data from probe vehicles. It establishes the names of the data elements, their interrelationships, and their procedural definitions. These procedural definitions include data collection instrumentation and methodology as well as recommended procedures for calculating traffic statistics.

1.2 This specification is intended for primary use by archived data management system (ADMS) developers and administrators. It also can be used by traffic operations and planning stakeholders who need to understand the contents of the ADMS. ITS systems exist across a variety of governmental levels, and the data archived in such a system would be available to all levels of government and the private sector, making this specification applicable to all levels of government and the private sector.

1.3 Many users might wish to develop integrated archived traffic data management systems that include both ITS-generated data and data collected from conventional traffic-monitoring programs. The latter use requires a superset of data elements to meet the articulated nature of a conventional traffic-monitoring program. This specification will describe a basic set of data elements applicable to ITS-generated traffic data and the additional data elements required for conventional traffic-monitoring programs. In the following discussion, the specification for the system for ITS-generated data will be referred to as the "basic system," and the one for ITS plus conventional traffic-monitoring data will be denoted the "extended system." Travel-time data from probe vehicles are stored in separate tables that can be linked through the roadway link identifiers.

1.4 This specification is applicable to traffic data collected by ITS and stored in an ADMS. Similarly, this specification also can be used with other types of historical and monitored traffic data collected and stored in an ADMS, including travel-time data from probe vehicles.

1.5 The applications of "near-real-time" traffic data, such as an automated transit information system (ATIS), are not addressed in this specification. In many cases, traffic data to be archived will be provided by a real-time system, but these systems are considered data sources rather than data repositories.

1.6 This specification specifies a logical data structure for an archived traffic data management system.

1.7 Metadata requirements are specified for these systems. Actual metadata are provided for the elements defined in this specification. Placeholders are included for the metadata elements that are specific to a given installation. All metadata specifications follow the requirements of Practice E2468.

1.8 This specification assumes the existence of quality-checked data. The quality checks to be applied should be, at a minimum, those specified in the AASHTO Guidelines for Traffic Data Programs (**1**),[2] where applicable. As quality checks are developed for ITS-generated traffic data, they should be used. All checks used should be specified in the metadata for the archive.

1.9 The summary statistics stored in the archive are assumed to have been calculated in a standard way by the software that "feeds" the archive. These standard calculations should be those specified in the AASHTO Guidelines for Traffic Data Programs (**1**). Any exceptions to these computational methods should be defined in the metadata for the archive.

1.10 This specification assumes the existence of a road network database but does not specify the nature of this database. Both traffic and travel-time measurements occur on a road network, but the specification of that network is outside the scope of this specification. The entities defined in this specification will specify a "link location" or "link description" entity that will contain foreign keys to an unspecified road network entity.

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[2] The boldface numbers in parentheses refer to the list of references at the end of this standard.

1.11 This specification assumes the existence of a location-referencing system and does not specify a standard for location referencing.

1.12 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.13 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[3]

E867 Terminology Relating to Vehicle-Pavement Systems

E2259 Guide for Archiving and Retrieving Intelligent Transportation Systems-Generated Data

E2468 Practice for Metadata to Support Archived Data Management Systems

2.2 *IEEE Standard:*[4]

IEEE 1489 Standard for Data Dictionaries for Intelligent Transportation Systems

2.3 *ITE Standard:*[5]

TM 1.03 Standard for Functional Level Traffic Management Data Dictionary (TMDD)

2.4 *ISO Standard:*[6]

ISO 14817 Transport Information and Control Systems—Requirements for an ITS/TICS Central Data Registry and ITS/TICS Data Dictionaries

2.5 *NTCIP Standards:*[7]

NTCIP 1206 Object Definitions for Data Collection

NTCIP 1209 Data Element Definitions for Transportation Sensor Systems (TSS)

3. Terminology

3.1 *Definitions*—For definitions relating to vehicle-pavement systems, see Terminology E867.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *aggregate, v*—to process or combine like items into a category, for example, adding together 30-s traffic volume counts or averaging speeds from lane-by-lane detectors that are parts of the traffic data-counting station to be the total traffic volume or average speed at that traffic-counting station for a 5-min time period.

3.2.2 *aggregation, n*—resultant set of aggregated data associated with an aggregating process.

3.2.3 *archived data management subsystem, n*—subsystem of the National ITS architecture that provides a means for several organizations to collect, store, and subsequently, analyze and retrieve data from ITS data sources, usually by way of one or more ITS centers.

3.2.4 *archived data management system, n*—specific implementation of an archived data management subsystem within the context of a local, regional, or statewide ITS architecture.

3.2.5 *archived data user service (ADUS), n*—one of the ITS user services that defines the scope of the National ITS architecture with regard to archiving and retrieving ITS-generated data.

3.2.6 *attribute, n*—defined property or characteristic; subset of an entity.

3.2.6.1 *Discussion*—In common terms, an attribute is typically a column in a relational database or a property in an object-oriented environment.

3.2.7 *compound element, n*—group or combination of groups of metadata elements.

3.2.7.1 *Discussion*—All compound elements are described by metadata elements either directly or through intermediate compound elements. Compound elements represent higher-level concepts that cannot be represented by individual metadata elements.

3.2.8 *data, n*—quantitative or qualitative representation that is observed, measured, collected, or gathered that characterizes some static or dynamic attribute of the physical world or the use of it by individuals or groups of people and is suitable for communication, interpretation, or processing by humans or machines.

3.2.9 *data dictionary, n*—information construct that describes the particular data stored in a database typically in terms of a common set of attributes that include the meaning, concept, and use; see IEEE 1489.

3.2.10 *data element, n*—data item that is a basic building block of a data dictionary which is a formal representation of some single unit of information of interest with a singular instance value at any time about some entity of interest.

3.2.11 *data quality, n*—fitness of data for all purposes that require them.

3.2.11.1 *Discussion*—Examples of data quality measures include accuracy, completeness, coverage, and timeliness.

3.2.12 *data set, n*—logical collection of data that supports a user function and could include one or more data tables, files, or sources.

3.2.13 *database, n*—collection of related data typically organized in a computerized record-keeping system that is part of a system whose purpose is to maintain the data and information derived from it so it can be made available for use.

3.2.14 *entity, n*—existing or real thing.

3.2.14.1 *Discussion*—In relation to a database, an entity is a single person, place, or thing about which data can be stored.

[3] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[4] Available from IEEE, Publications Office, 10662 Los Vaqueros Circle, P.O. Box 3014, Los Alamitos, CA 90720-1264.

[5] Available from the Institute of Transportation Engineers, 1099 14th St., NW, Suite 300 West, Washington, DC 20005-3438.

[6] Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, http://www.ansi.org.

[7] Available from the National Transportation Communications for ITS Protocol (NTCIP), www.ntcip.org.

In common terms, an entity can be represented by one or more tables in a relational database or an object in an object-oriented environment.

3.2.15 *expired data, n*—status assigned to a set of data, summary statistics, or information that is no longer current or valid and needs to be replaced.

3.2.16 *imputation, n*—act of putting onto a data set estimated values for that data to fill in for missing values or replace erroneous values.

3.2.17 *integration, n*—result of blending compatible data sources into a composite data set has a unity or wholeness for purposes of analysis, summarization, and retrieval of specific data or information.

3.2.18 *intelligent transportation systems (ITS), n*—systems that apply modern sensing, communication, computing, analysis, or display technologies, or a combination thereof, to one or more aspects of the operations, management, and use of transportation systems.

3.2.19 *market package, n*—service-oriented perspective to the National ITS architecture including subsystems (with applicable equipment packages) and architecture flows.

3.2.20 *metadata, n*—data about data, or more precisely, definitional and descriptive data that provide information about or documentation of other data managed within an application or environment.

3.2.21 *metadata element, n*—logically primitive item of metadata that forms the basic building block for this metadata specification.

3.2.22 *missing data, n*—one or more fields in a data record that have no valid values because of a variety of reasons such as improper functioning of the data collection device, failed communications, or shortcomings in subsequent processing programs.

3.2.23 *National ITS architecture, n*—document prepared through the sponsorship of the U.S. Department of Transportation (DOT) that provides a common structure for the design of intelligent transportation systems giving a framework around which multiple design approaches can be developed by defining: (*a*) the functions that shall be performed to implement a given user service; (*b*) the physical entities or subsystems in which these functions reside; (*c*) the interfaces/information flows between the physical subsystems; and (*d*) the communication requirements for the information flows.

3.2.24 *near-real-time data, n*—data that is collected, processed, aggregated very close in time, usually within seconds or just a few minutes, to the actual time period or instance when the phenomenon being measured or observed actually occurred.

3.2.25 *original source data, n*—data as received by a center that is a source for an archive.

3.2.26 *probe vehicle, n*—vehicle equipped with equipment that allows detection of the vehicle in time and space.

3.2.27 *quality control, n*—system or process for obtaining, maintaining, and verifying a desired level of quality in a data set, process, or service by careful planning and design, the use of proper equipment, continued inspections, and taking corrective actions where and when required.

3.2.28 *resolution, n*—level of spatial or temporal detail or administrative classification at which a particular data element is collected, archived retrieved, or both, from an ADMS; that is, lane-by-lane versus detector station or intersection approach; a 20-s versus a 15-min time period; or a particular named city versus the generic term of city.

3.2.29 *spot speed, n*—speed measured by roadway detection devices as vehicles traverse a short longitudinal length of highway.

3.2.30 *stakeholder, n*—person, party, or private or public agency or organization that is interested in one or more aspects of how ITS-generated data is collected, archived, analyzed, or retrieved from an existing or proposed ADMS.

3.2.31 *storage media, n*—systems upon which the archive or data set, summaries, or displays extracted from it are kept for use by the ADMS or for distribution to various users or stakeholders.

3.2.32 *terminators, n*—functions that basically take place outside of the National ITS architecture but that interfere with one or more subsystems of the National ITS architecture by sharing data or information or both with them.

3.2.33 *traffic management center (TMC), n*—location equipped with roadway surveillance technology that is used to detect traffic problems and implement traffic control strategies.

3.2.34 *transformed data, n*—values created by combining data with other data or subjected to a methodology or mathematical process such as logarithmic transformation, averaging; for example, annual average daily traffic, average speed by segment, congestion indices, or equivalent single-axle loads.

3.3 *Acronyms:*

3.3.1 *AADT*—annual average daily traffic

3.3.2 *AASHTO*—American Association of State Highway and Transportation Officials

3.3.3 *AAWDT*—average annual weekday traffic

3.3.4 *AAWET*—average annual weekend traffic

3.3.5 *ADD*—Archived Data Dictionary

3.3.6 *ADMS*—archived data management system

3.3.7 *ADUS*—Archived Data User Service

3.3.8 *AHDT*—average hourly daily traffic

3.3.9 *AQ*—air quality

3.3.10 *ATIS*—Advanced Traveler Information Systems

3.3.11 *AWDDT*—average weekday daily traffic

3.3.12 *AWEDT*—average weekend daily traffic

3.3.13 *DMS*—dynamic message sign

3.3.14 *DOT*—Department of Transportation

3.3.15 *EPA*—Environmental Protection Agency

3.3.16 *FHWA*—Federal Highway Administration

3.3.17 *GPS*—global positioning system

3.3.18 *HOV*—high-occupancy vehicle

3.3.19 *HPMS*—Highway Performance Monitoring System
3.3.20 *ITS*—intelligent transportation system
3.3.21 *MPO*—Metropolitan Planning Organization
3.3.22 *NEMA*—National Emergency Management Agency
3.3.23 *OID*—object identifiers
3.3.24 *QC*—quality control
3.3.25 *SIP*—State Implementation Plan
3.3.26 *TDF*—travel demand forecasting
3.3.27 *TMC*—Traffic Management Center
3.3.28 *TMDD*—Traffic Management Data Dictionary
3.3.29 *TMG*—Traffic Monitoring Guide
3.3.30 *VHT*—vehicle hours of travel
3.3.31 *VMT*—vehicle miles of travel

4. Archived Data User Service (ADUS) History

4.1 Several early "pioneers" were archiving and analyzing operations data from traffic control sensors and detectors for 20 or more years before the creation of ADUS. As early as the 1970s, the Illinois Department of Transportation (DOT) was saving aggregated loop detector data in Chicago to report "minute-miles" of congestion (**2**). In 1968, the Texas Highway Department and the Texas Transportation Institute (TTI) were using an IBM 1800 computer to save and analyze loop detector data along the Gulf Freeway in Houston (**3**). The archived Houston data were used to support level of service and merging research studies, as well as to demonstrate and quantify the effects of incidents on the freeway corridor. The Washington State DOT (WSDOT) and the University of Washington have been archiving loop detector data from Seattle's freeway traffic management system since 1981 with researchers and planning agencies being the primary users (**4**). Loop detector data from Highway 401 in Toronto, Ontario (Canada) also have been used extensively since the 1980s for traffic flow theory and capacity research.

4.2 The first organized efforts to create ADUS began in 1997 subsequent to the first release (Version 1.0) of the National intelligent transportation system (ITS) architecture. ADUS was formalized when it was added to the National ITS architecture (Version 3.0) in 1999. As a user service (that is, a description of an ITS function from a user perspective), the common vision for ADUS is to "improve transportation decisions through the archiving and sharing of ITS-generated data" (**5**). The addition of ADUS to the National ITS architecture did not require ITS deployments to archive their operational data for analytical purposes; however, it did provide greater visibility and legitimacy for the data-archiving function in traditional traffic management and control activities. As a result of its inclusion in the National ITS architecture, as well as efforts originating from the U.S. DOT's ADUS program plan, ITS data archiving has become a more prominent feature in ITS deployments.

4.3 Since 1999, there have been various efforts to promote and advance the deployment of ADUS. Some of the early efforts focused on documenting the state of practice and identifying relevant technologies and procedures for ADUS. Other early efforts promoted the ADUS concept to the ITS community, who were encouraged to archive real-time data streams that were being gathered for operational purposes. A major ADUS field operational test has been completed by the Virginia DOT, the purpose of which was to use archived data to effect transportation planning, operations, and management decisions (**6**). More recent efforts have focused on promoting the integration of archived ITS data within traditional traffic data programs (typically managed by a transportation planning entity). The development of ADUS standards is ongoing. There are two published ADUS standards (Guide E2259 and Practice E2468) with this specification representing the third. Future standards development activities for ADUS will likely include harmonization efforts with other ITS standards.

5. Current State of ITS Data Archiving

5.1 The value of saving ITS-generated data for applications beyond real-time control strategies has led to the development of data archives by transportation agencies. Current archives are associated primarily with traffic management centers (TMC), and TMC operating software is increasingly incorporating the archiving function. Many types of data are being archived at TMCs, including traffic surveillance data from roadside detectors (the subject of this specification), incident and other event data, operating status of TMC equipment, and the timing and nature of control strategies that have been implemented (for example, ramp meter timing and messages sent to dynamic message signs). However, the degree to which the data are actively managed is highly variable and their structure is not consistent across TMCs. Also, the integration of the archived data with legacy data is problematic.

5.2 Also, as of this current time, the private sector is assuming a larger role in the collection and dissemination of traffic conditions data (travel times, speeds, volumes, and events). While the primary use of these data is for sale to consumers as traveler information, archived applications also can make use of the data; the data are essentially the same as that being collected by TMCs. Also, such as TMC-generated data, privately collected data are inconsistent in structure and processing.

6. Overview

6.1 There are many ITS systems that generate traffic data on a routine basis, and many of these retain the data in some format for later use. The systems that do retain the data have, of necessity, developed their own data formats and storage mechanisms. A standard allows users of traffic data to access any archive and interpret the resulting data correctly or can facilitate the operators of the archive sharing the data with potential users.

6.2 Data archive definition and implementation can be a labor-intensive process. In the past, since no standards were available, this process usually resulted in "reinventing the wheel." Each development team had to develop its own data definitions and schema. This specification will save archive designers much work by specifying standard data elements and definitions.

6.3 Many, if not most or all, users of ITS-generated traffic data will need to integrate data from one archive with that of another. This kind of integration is greatly facilitated if the various archives have consistent data definitions and database schema. The primary motivation of this specification is to encourage consistency in the design and implementation of ITS-generated traffic data archives. This consistent approach will greatly enhance the usability and, as a result, the usage of these archives.

6.4 The primary goal of this specification is to provide as complete a guide as possible for developers and users of these archives. This requires the specification of many elements. These include a data dictionary that defines the various entities, measures, and statistics to be incorporated into an archive. Both metadata requirements and metadata examples will be provided, including the metadata for the data dictionary described in this specification. These will follow the format specified in ISO 14817.

7. Concept of Operations

7.1 *Overview:*

7.1.1 In practice, this specification will be implemented as part of an archived data management system (ADMS). An ADMS is essentially an information management system—it is a store of information compiled over time that can be put to use in a variety of real-time, near real-time, and historical applications. It contains data from both ITS and non-ITS sources. Because the purpose of an ADMS is to provide information for these applications, this specification deals only with the processing, storage, and retrieval of the traffic-monitoring data used to support these applications; the specifications for the various applications themselves are not included in this specification and many of them are subject to their own standards, for example, Advanced Traveler Information Systems (ATIS) or Incident Management Systems. Further, the support functions required to implement an ADMS successfully are not covered by this specification (for example, security and administration).

7.1.2 However, the data requirements (equivalent to "user needs" in other forms of ITS standards) for these applications are critical to the construction of this specification. Table 1 is compilation of these data requirements.

7.2 *Operational Scenarios for an ADMS:*

7.2.1 *Overview*—An ADMS can be used to support the following transportation agency functions.

7.2.2 *Incident Management Support:*

7.2.2.1 *Develop Response Plan*—This function is a query of the Traffic Management Center (TMC) control software for predetermined response plans. The responses can include automated orientation of surveillance cameras, messages on specific dynamic message signs (DMS), and alerts to stakeholder agencies and staff.

7.2.2.2 *Coordinate Response*—This function is a query on the effects on incidents by different incident characteristics.

7.2.3 *Disseminate Traveler Information*—The traveler information dissemination function is a query of the historical speeds and travel times for specific roadway segments. The query may be stratified by time of day, day of week, weather, and incident type. The query will allow TMC operators to compare historical speeds and travel times with current speeds and travel times for a certain roadway segment. Information such as delay or time savings for high-occupancy vehicle (HOV) lanes can be calculated and delivered to the traveling public or the media.

7.2.4 *Performance Measure Support*—The mobility performance measure function is a query of the speed and volume obtained continuously through the ITS detectors (for both freeway and arterial systems). Archived ITS data provide a rich source to use in deriving mobility measures for a region. The purpose of this service is to derive a number of defined mobility measures from the ITS data archive and present these measures in different forms.

7.2.5 *ITS Program Planning*—This function provides a query of the mobility performance measure information for use in assessing ITS program performance and future needs.

7.2.6 *Traffic-Monitoring Program*—This function supports statewide traffic-monitoring programs.

7.2.7 *Corridor Planning*—The ongoing, frequent, and periodic monitoring of information on average speeds, delays, travel times, traffic density or lane occupancy, and traffic volumes from ITS provides a rich source of data useful in corridor-planning activities. This function will provide a query of speed and volume data that enables detailed evaluation and assessment of corridor traffic operations. This function also provides a query on the roadway capacity.

7.2.8 *Evacuation and Detour Planning*—Evacuation plans prepare for relatively major disasters such as terrorist attack, floods, hurricane, and so forth, while detour plans are designed for local events such as work zone, lane or ramp closing, and so forth. The use of archived traffic data would enhance the development and implementation of these evacuation or detour plans or both. For example, historical traffic data during emergency conditions will be useful in preparing emergency evacuation or detour plans. To provide historical traffic counts under various conditions, a data dictionary of such events will be created. The events include hurricane evacuation, flood evacuation, work zone (new construction, maintenance, ramp closure, and so forth), other special events, and so on. This support will provide a distribution of traffic counts under various events as desired by evacuation/detour planners.

7.2.9 *Safety Planning Support*—This function will provide cross-referencing to weather and work zone information as well as incident information, which will enable more detailed analysis of crash causes and impacts.

7.2.10 *Operations Planning:*

7.2.10.1 *Work Zone Management Support:*

(1) Work Zone Evaluation—Planners use this information to assess the impacts of work zones, evaluate the performance of specific work zone layouts and devices, and assess the need for work zone improvements.

(2) Work Zone Planning—This function will provide information on where and when to implement work zone strategies.

7.2.11 *Travel Demand Forecasting and Simulation Support*—A number of public and private sector governmental or business-planning activities can benefit from an effective ability to forecast short-, mid-, and longer-term demands for

TABLE 1 Application Requirements

Stakeholder Group	Application	Input Data Requirement	Traffic Monitoring Data Needed	Temporal Resolution	Spatial Resolution
Transportation Planning	Air Quality Conformity Analysis	VMT by vehicle class by highway type by hour	Volume by vehicle classification and associated section lengths.	Hourly	Freeways, ramps, arterials, locals; measurements taken between interchanges or major intersections
		VMT by hour by speed range	Volume and associated section lengths. Spot speed or travel time.	Hourly	Freeways, ramps, arterials, locals; measurements taken between interchanges or major intersections
	Demand Forecasting for Long-Range Planning	AADT, AAWDT, AAWET	Volume	Hourly	Generally all highways classified higher than "local;" by individual link in network
		Peak-Hour/Peak-Period volumes			
		Percentage single unit trucks Percentage combination unit trucks	Volume by vehicle classification.	Hourly	
		Free flow speed	Spot speed.	Hourly during off-peak hours	
		Capacity	Volume.	Hourly during peak hours	
		Congested speed	Spot speed or travel time.	Hourly during peak hours	
	Traffic Simulation	Traffic demand.	Volume.	5-Minute	Links
		Free flow speed.	Spot speed.	Hourly during off-peak hours	Links
		Congested link speeds and delay statistics	Spot speed or travel time. Lane occupancy.	5-Minute	Links
		Queue length	Spot speed.	5-Minute	Links
	Congestion Management and Performance Reporting	Network congestion statistics	Volume. Spot speed or travel time. Lane occupancy	5-Minute	Extended segments (1-5 miles)
		Trip-based congestion statistics	Travel times.	5-Minute	Origin-Destination pairs
	Highway Performance Monitoring System	AADT	Volume.	Hourly	Generally all highways classified higher than "local;" by individual link in network
		K-factor D-factor	Volume.	Hourly by direction; continuous data needed	Representative locations
		Percent combination and single-unit trucks	Volume by vehicle classification.	Hourly	Representative locations
		VMT	Volume and associated section lengths.	Hourly	Generally all highways classified higher than "local;" by individual link in network
	Monthly Count Station Volume Reports	Hourly volumes for seven consecutive days each month	Volume.	Hourly	Representative locations
		AVC stations: Hourly volumes by vehicle class category	Volume by vehicle classifications.	Hourly	

travel that depend upon an ability to simulate such future travel demands. The use and effectiveness of various types of simulation models can be improved by the availability of data and information from archived data so as to better calibrate or validate or both such simulation activities.

7.2.11.1 *Travel Demand Modeling*—Urbanized areas in the United States with populations of 50 000 or more are required to have a long-range transportation planning process in place if federal funds are to be used for transportation improvement projects. Since the early 1960s, metropolitan planning organizations (MPOs) and state departments of transportation (DOTs) have developed and applied transportation planning models to assist in analysis of short- and long-range planning needs. Data pertaining to speed, traffic volumes, and vehicle classification are generally available in the TMC data archives. The schematic in Fig. 1 represents a framework for making these data items available for transportation-planning needs.

7.2.11.2 *Air Quality (AQ) Modeling Support*—It is anticipated that one of the user services to be offered by this project is to support AQ analysis needs. The Environmental Protection Agency (EPA) requires that the macroscopic emission factors

TABLE 1 Application Requirements *(continued)*

Stakeholder Group	Application	Input Data Requirement	Traffic Monitoring Data Needed	Temporal Resolution	Spatial Resolution
Transportation Operations	Program and Technology Evaluations	Congestion and delay statistics	Volume. Spot speed or travel time.	5-Minute	Link
	Predetermined Ramp and Signal Coordination	Traffic demand Turning movements	Volume.	5-Minute	Link
	Traveler Information	Travel times for entire trips or portions of trips over multiple links (e.g., travel time to popular destinations from a point)	Travel time.	1–5-Minute	Extended segments (1–5-mile)
	Predictive Traffic Flow Methods (still under research)	Traffic demand Queue lengths Congestion statistics	Volume. Spot speed or travel times.	1–5-Minute	Link
	Congestion Pricing	Congestion statistics	Volume. Spot speed or travel times.	1–5-Minute	Extended segments (1–5-mile)
	Traffic Engineering Analyses	Time mean speed Space mean speed Median speed 85th percentile speed Travel time Lane distribution Traffic density	Spot speed. Spot speed or travel times. Spot speed or travel times. Spot speed or travel times. Spot speed or travel times. Volume. Volume and occupancy.	15-Minute 15-Minute 15-Minute 15-Minute 15-Minute 1-Hour 15-Minute	Link Link Link Link Link Link Link
Highway Safety	Exposure for Safety Analysis	AADT and VMT by segment Truck counts	Volume by vehicle classification and associated section lengths.	Hourly	Link
		Traffic volumes and flow characteristics at times of specific crashes	Volume. Spot speed or travel time.	1–5-Minute	Link
Pavement Management	Historical and Forecasted Loadings	Traffic demand by vehicle classification	Volume by vehicle classification and associated section lengths.	Hourly	Link

Sources:
Office of Highway Information Management, Federal Highway Administration, *ITS as a Data Resource: Preliminary Requirements for a User Service*, March 13, 1998.
Battelle Memorial Institute, *Traffic Data Quality Measurement, Final Report*, prepared for Office of Highway Policy Information, Federal Highway Administration, June 15, 2004.

model MOBILE6 be used for many regional emissions inventory studies. Regional AQ analysis for the state implementation plan (SIP) purposes as well as for conformity analysis needs require the data on these traffic variables.

7.3 *Reference Physical Architecture*—This specification addresses the archiving requirements for traffic-monitoring data from ITS sources. However, one should realize that the actual physical arrangement of these components may vary from deployment to deployment.

8. Archived Data Dictionary (ADD)

8.1 *Introduction:*

8.1.1 This section introduces the Archived Data Dictionary (ADD). The documentation of the ADD in ISO 14817 format is presented in Annex A1 – Annex A3 for object classes, data elements, and data frames, respectively. Appendix X2 presents a summary of the data elements and their associated data frames. The remainder of this section provides users of this specification an explanation of the ADD and its development.

8.2 *ADD ASN.1 Object Identifiers:*

8.2.1 ADD object identifiers (OID) are defined branching from the National Emergency Management Agency (NEMA) OID naming tree. This is shown in Fig. 2.

8.2.2 The ADD root node is: {iso (1) org (3) dod (6) internet (1) private (4) enterprise (1) nema (1206) astmDdArchiveItsTravMonData (5)}. ADD data concepts are further subdivided based on type. This is shown in the following with the OID representation next to the data concept type.

8.2.2.1 *Object Classes*—OID: {add object-classes 1)}.

8.2.2.2 *Data Elements*—OID:{add data-elements 2)}.

8.2.2.3 *Data Frames*—OID:{add data-frames 3)}.

8.3 *Discussion of ADD Object Identifiers:*

8.3.1 *Object Classes (Mandatory)*—The definition of object classes is the starting point for the more detailed contents of a data dictionary. The ADD object classes are as follows:

8.3.1.1 *Organization*—The agency or firm responsible for the data that resides in the archive.

8.3.1.2 *Cross Section*—Relates to physical and traffic conditions at a specific location (point) along a roadway. The cross section is defined as a transverse line perpendicular to the movement of traffic flow, and conditions are documented for various subsections across this line. The cross section is the level of geography at which most traditional forms of traffic data exist. These data are collected by detectors on, in, or near the roadway and are based on the passage of vehicles past a

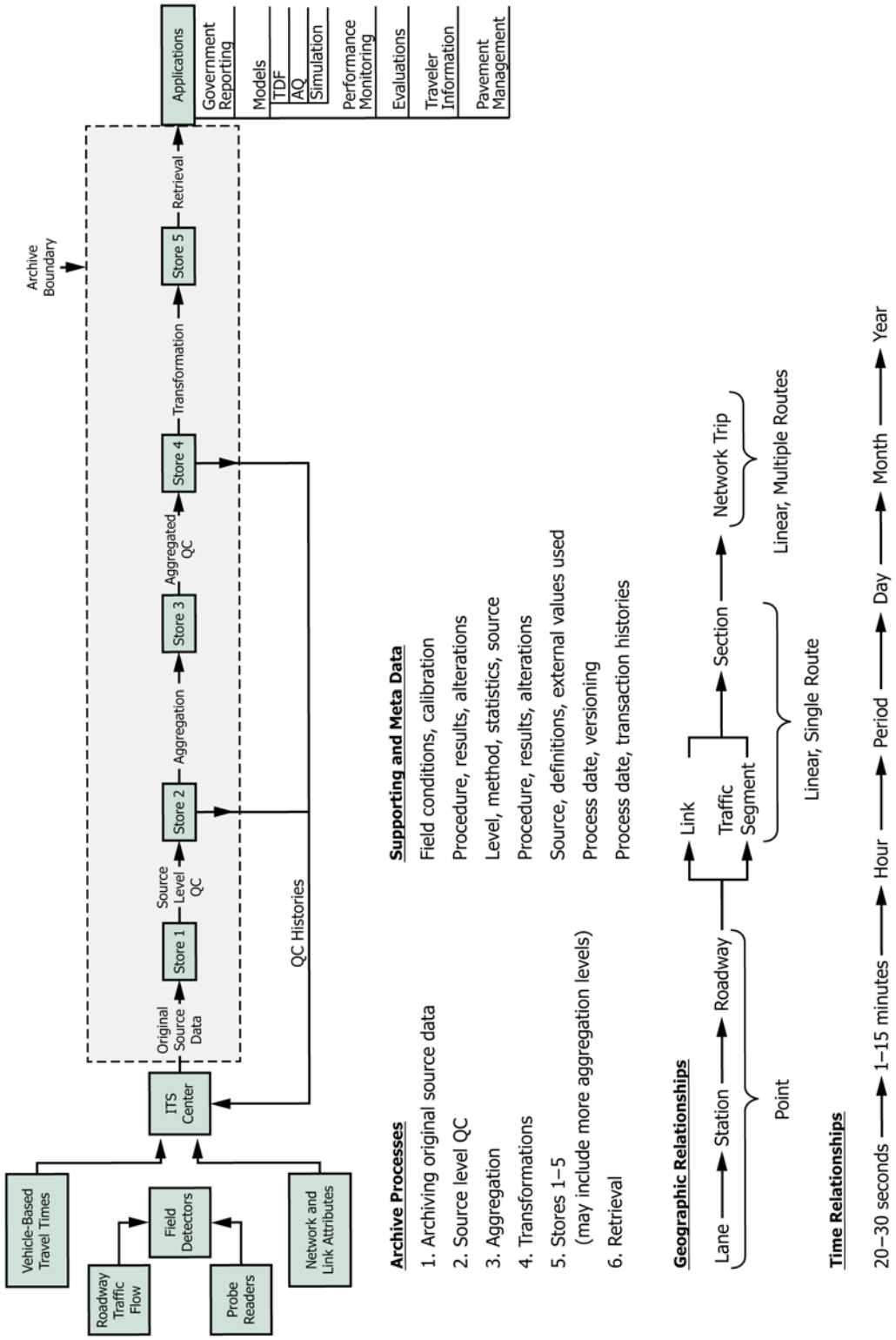

FIG. 1 Reference Architecture for ITS Traffic Monitoring Data Processing

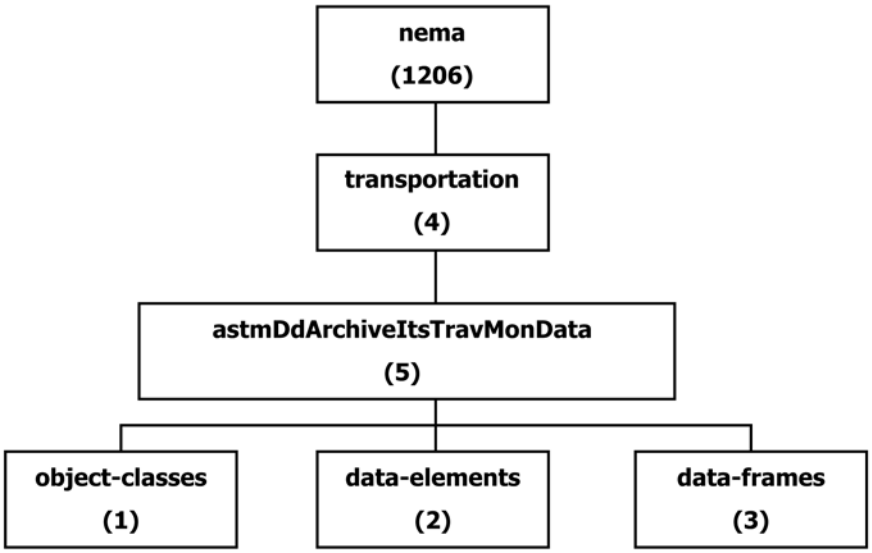

FIG. 2 TMDD Object Identifier (OID) Tree Structure

very small longitudinal distance of roadway. The ADD considers a hierarchical structure for the collection of traffic data at a cross section as shown in Fig. 3:

(1) Lane—Individual traffic lanes,

(2) Station—Multiple lanes in a single direction of traffic flow, and

(3) Roadway—All lanes in both directions of traffic at a cross section.

8.3.1.3 *Intersection*—Locations where two or more roadways intersect at grade.

8.3.1.4 *Detector Context*—Relates to the physical and situational characteristics of roadway-based detectors.

8.3.1.5 *Traffic Segment*—This is a generic term representing a longitudinal distance of roadway. Both the physical and traffic conditions along this distance are captured. Traffic segment includes the more specific longitudinal distances; detector sections, links, sections, and network trips are specific instances of a traffic segment. Links and detector sections are the smallest of these instances and are used to define sections and network trips.

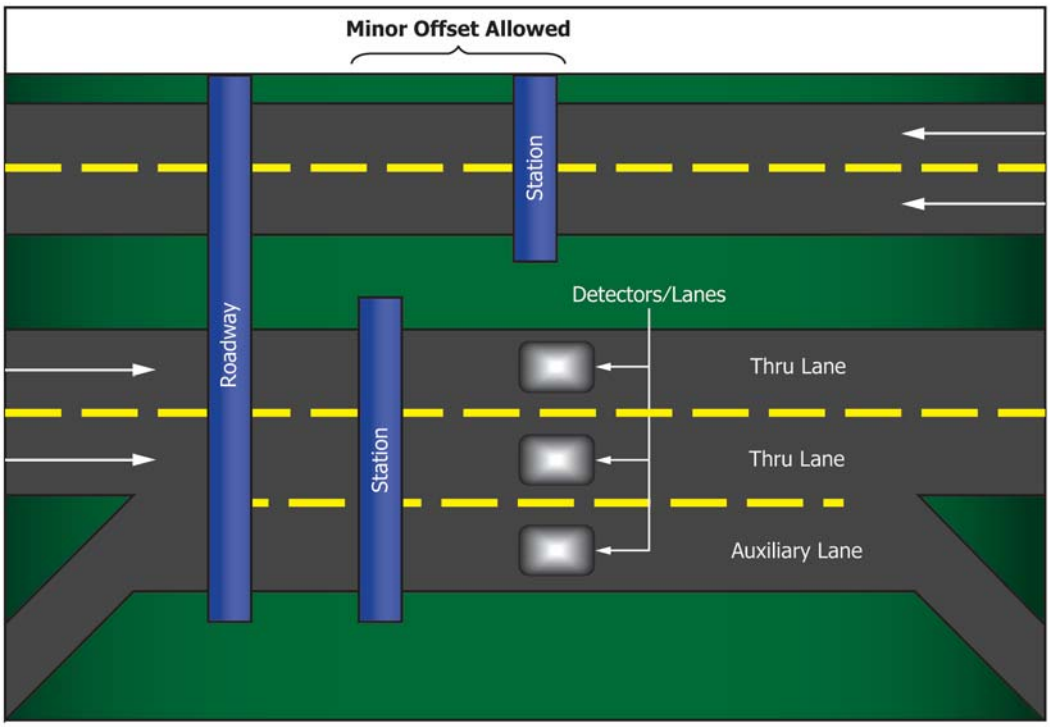

FIG. 3 Cross-Section Subdivisions

8.3.1.6 *Detector Section*—A user-defined longitudinal highway distance between two adjacent roadway detectors in a direction of traffic flow.

8.3.1.7 *Link*—A user-defined longitudinal highway distance between two adjacent nodes in which nodes are defined by major locations where traffic can enter or leave the highway.

8.3.1.8 *Section*—A user-defined longitudinal highway distance between two highway locations or landmarks along a single named route that encompass two or more detector sections or links.

8.3.1.9 *Network Trip*—A user-defined longitudinal highway distance between two highway locations or landmarks along multiple named routes and used to measure major point-to-point travel within an area.

8.3.1.10 *Probe Vehicle*—Relates to information about vehicles used to capture traffic condition data.

8.3.1.11 *Global*—An object class representing ADD global data content management.

8.3.2 *Data Elements*—The ADD data elements have been defined with the intent to provide developers with a starting point for developing an ADMS based on an analysis of user requirements (see Section 7). Developers are free to expand the list of data elements as dictated by local needs provided that adequate metadata are provided to users (see Section 9).

8.3.3 *Data Frames:*

8.3.3.1 In the construction of other ITS, data dictionary standards, messages, and dialogs for communicating information back and forth between centers is the desired outcome. In doing so, data frames are commonly used. ISO 14817 defines a data frame as "… a grouping of data elements primarily for the purpose of referring to a group with a single name to efficiently reuse such groups of data elements that commonly appear together in a message specification." This concept is applicable for the ADD as data frames can be thought of as the basis for constructing database structures (for example, data tables) when an ADMS is developed.

8.3.3.2 Fig. 4 shows how the ADD data frames shall be linked together in an ADMS implementation. As with data elements, ADMS developers have the freedom to extend this basic structure provided that adequate metadata are included. In the case of storing data collected by roadway-based detectors, developers can choose how to represent measurements either by:

(1) Allowing one record for each type of metric with an indicator of what metric is being counted (*CrossSectionMetric* and *CrossSectionMetricAggregated* data frames); or

(2) Defining each metric as a separate data element (*CrossSectionMetric2* and *CrossSectionMetricAggregated2* data frames).

9. Input and Processing Procedures for an ADMS

9.1 Practice E2468 shall be used to document metadata for an ADMS including the extensions specified in the following sections.

9.2 An ADMS for traffic- and travel-monitoring data shall accept inputs from sources that are compatible with ITS standards and legacy sources that have not specified using ITS standards.

9.2.1 ITS standards that apply to traffic data sources include NTCIP 1206, NTCIP 1209, and ITE TM 1.03.

9.2.2 Legacy sources shall include traffic- and travel-monitoring data that have been developed using the non-ITS standards that include the Traffic Monitoring Guide (**7**) and AASHTO Guidelines for Traffic Data Programs (**1**).

9.3 All incoming original source data shall be read into computer programs for further processing and storage within an ADMS.

9.3.1 "Format readers" shall be developed by individual ADMS deployments to translate the source data formats into internal computer representations.

9.3.1.1 The format readers shall accommodate data directly from roadway detectors or data streams generated by TMC systems, which accumulate data from the roadway detectors.

9.3.2 As specified in Guide E2259, all original source data shall be stored online for a length of time determined for each ADMS deployment.

9.4 Imputation procedures shall be based on formal and objective estimation procedures as determined for each ADMS deployment.

9.4.1 Subjective estimates of traffic measurements shall not be included in an ADMS.

9.4.2 When data are imputed, ADMS data records shall indicate that imputation has taken place.

9.5 Data collected by point-based roadway devices shall be aggregated and stored in the ADMS.

9.5.1 Aggregation shall be done spatially for the station and roadway elements and optionally by lane.

9.5.1.1 Traffic volume shall be aggregated as the simple sum of all measurements.

9.5.1.2 Lane occupancy shall be aggregated as the volume-weighted average of lower-level lane-occupancy measurements.

9.5.1.3 Detector speed measurements shall be aggregated as the volume-weighted average of lower-level speed measurements.

9.5.1.4 When volume measurements are a zero or missing at the lower level, lane-occupancy and speed measurements shall be set to a missing value before applying the aggregation procedure.

9.5.1.5 The number of direct measurements (nonedited, nonimputed values) that were used in the aggregation procedures shall be specified as part of the aggregated record.

9.6 Original source data collected by point-based roadway devices on the main lines of uninterrupted flow facilities shall be converted to travel time estimates and associated statistics subject to the following rules:

9.6.1 A traffic segment (either a detector section or a link) over which it is assumed that the spot (detector-based) speed is valid shall be established for each point-based roadway device.

9.6.1.1 The length of traffic segments shall be defined by ADMS developers in one of four ways:

(1) The distance to either the nearest upstream or downstream device (detector section),

(2) Half the distance to the nearest upstream and downstream devices (detector section),

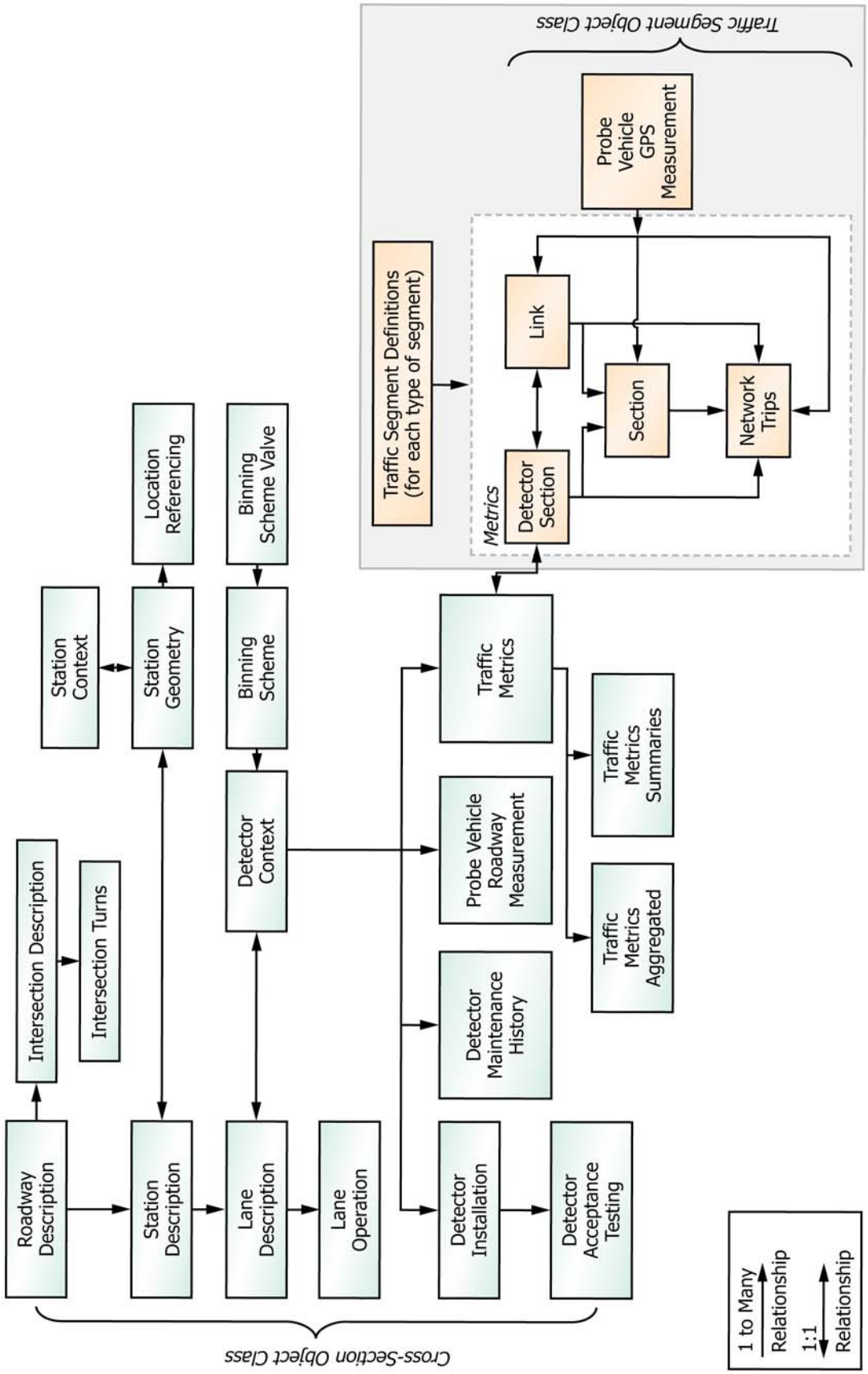

FIG. 4 Recommended Structure for Selected ADD Data Frames

(3) User-defined distances when the mainline device is in the vicinity of an interchange (detector section), and

(4) The distance between two network nodes (link).

9.6.1.2 Travel time (in minutes) shall be computed for traffic segments using the following formula:

$$Travel\ Time = 60 \cdot \frac{Length_{traffic\ segment}}{Spot\ Speed} \quad (1)$$

9.6.1.3 Vehicle hours of travel (VHT) shall be computed for traffic segments using the following formula:

$$VHT = \frac{Volume \cdot Travel\ Time}{60} \quad (2)$$

9.6.1.4 Vehicle miles of travel (VMT) shall be computed for traffic segments using the following formula:

$$VMT = Volume \cdot Length_{traffic\ segment} \quad (3)$$

9.6.1.5 Delay, measured in vehicle hours, shall be computed for traffic segments using the following formula:

$$Delay = VHT - \left(Volume \cdot \left(Length_{traffic\ segment}/Free\ Flow\ Speed\right)\right) \quad (4)$$

9.7 QC checks for validity shall be applied to the original source data, statistics, and aggregated data.

9.7.1 The QC checks specified in AASHTO Guidelines for Traffic Data Programs **(1)** for traffic volume shall be implemented in an ADMS.

9.7.2 The data validity checks specified in Quality Control Procedures for Archived Operations Traffic Data: Synthesis of Practice and Recommendations **(8)** shall be implemented in an ADMS.

9.7.3 Each ADMS deployment shall consider additional QC procedures as appropriate.

9.7.3.1 Additional QC procedures shall be documented in A2.5.2 (“Process Step”) of the metadata in Practice E2468.

9.7.4 If statistics are calculated and stored within an ADMS and the underlying values change because of decisions about data quality, new statistics shall be calculated and the old statistics expired as required by Guide E2259.

9.8 Documentation of data quality information and other processing of the traffic data contained in an ADMS shall conform to Practice E2468 with the following extensions and rules. Note that this requirement pertains to data quality and processing performed at the dataset level; the results of QC tests on individual or groups of records are handled within the data dictionary.

9.8.1 All data quality attributes specified in this section shall be reported in the metadata on an annual basis.

9.8.2 The metadata shall maintain a complete history of the annual reporting of data quality attributes.

9.8.3 *Attribute Accuracy (from Practice E2468)*—Either the “Attribute Accuracy Report” or the “Quantitative Attribute Accuracy Assessment” shall be mandatory, at the ADMS developer’s choice.

9.8.3.1 A description of all known tests of data accuracy that have been conducted on traffic data measurements and their results shall be reported.

9.8.3.2 Parameters of the test shall be documented, including:

(1) Location:

(a) State,

(b) County,

(c) Route name and number, and

(d) Travel direction.

(2) Date.

(3) Equipment:

(a) Type, and

(b) Identification (tied to equipment inventory).

(4) Times tested.

(5) Description of the independent method used to generate comparison measurements.

(6) Number of comparisons made.

9.8.3.3 When tests have been performed, the following statistics shall be reported:

$$Mean\ Absolute\ Percent\ Error,\ MAPE\ (\%) = \left(\frac{1}{n}\right) \times \left(\sum_{i=1}^{n} \left| \frac{x_i - x_{reference}}{x_{reference}} \right|\right) \quad (5)$$

where:

x_i = observed data value,
$x_{reference}$ = reference value, and
n = total number of observed data values.

$$Signed\ Error\ (\%) = \left(\frac{1}{n}\right) \times \left(\sum_{i=1}^{n} \frac{x_i - x_{reference}}{x_{reference}}\right) \quad (6)$$

where:

x_i = observed data value,
$x_{reference}$ = reference value, and
n = total number of observed data values.

$$Root\ Mean\ Squared\ Error,\ RMSE = \sqrt{\left(\frac{1}{n}\right) \times \left(\sum_{i=1}^{n} \left(x_i - x_{reference}\right)^2\right)} \quad (7)$$

where:

x_i = observed data value,
$x_{reference}$ = reference value, and
n = total number of observed data values.

9.8.3.4 If no formal assessments of accuracy have been made, then there shall be statement to this effect.

9.8.4 The Logical Consistency Report (from Practice E2468) shall be specified and updated at least annually.

9.8.4.1 The temporal and spatial levels of the original source data shall be specified.

9.8.4.2 If no QC procedures are applied to the traffic measurements, then a simple statement to that effect shall be made.

9.8.4.3 If QC procedures are applied, then the following shall be ascertained and reported on an annual basis:

(1) Validity of the data shall be reported for all volume, speed, and roadway occupancy data originating from roadway detectors and for direct measurements of travel time. Validity is defined as “the degree to which data values satisfy acceptance requirements of the validation criteria or fall within the respective domain of acceptable values.”

(2) The validity statistic shall be computed and reported as the percentage of data passing validity criteria:

$$Percent\ Valid\ (\%) = \frac{n_{valid}}{n_{total}} \times 100 \quad (8)$$

where:

n_{valid} = number of records or rows with values meeting validity criteria, that is, those data that passed all quality control checks, and

n_{total} = total number of records or rows subjected to validity criteria.

9.8.5 The Completeness Report (from Practice E2468) shall be specified and updated at least annually. In addition to the mandatory and mandatory-if-applicable meta-attributes, the following sections also shall be completed:

9.8.5.1 A history of all statistics specified for the Completeness Report shall be maintained.

9.8.5.2 Completeness shall be ascertained for all volume, speed, and roadway occupancy data originating from roadway detectors and for direct measurements of travel time. Completeness for traffic data is defined as "the degree to which data values are present in the attributes that require them."

(1) The completeness statistic shall be computed and reported annually as:

$$Percent\ Complete\ (\%) = \frac{n_{available\ values}}{n_{total\ expected}} \times 100 \quad (9)$$

where:

$n_{available\ values}$ = number of records or rows with available values present in the original source data without regard to QC results, and

$n_{total\ expected}$ = total number of records or rows expected.

(2) The completeness statistic is defined to include all "values present" annually. In this respect, completeness is defined as including both valid and invalid data values.

(3) The number of records expected shall be based on the total number of records that are theoretically possible to be derived from traffic-monitoring equipment deployed in the area covered by the ADMS at the temporal level that data are initially received by the ADMS. It shall be reported as a separate item in the Completeness Report on an annual basis.

(a) For roadway-based point detectors of traffic flow, the number of records expected shall be based on the combined temporal and spatial aggregation levels of the original source data. For example, if the original source data is received in 1-min increments by lane and three lanes of traffic are monitored, the number of records expected in a year is: 525 600 min per year × 3 lanes = 1 576 800.

(b) For roadway-based detectors of vehicle passage (for example, probe readers), the number of records expected shall be based on an estimate of the total number of vehicles passing over the section computed as the average directional AADT for all individual sections on the segment times the number of days in the year. AADT estimates may be derived from short-term traffic counts in accordance with AASHTO procedures.

(c) For vehicle-based measurements of travel time not involving roadside communication, the completeness statistic shall not be computed. Rather, an estimate of the number of vehicles reporting travel time information on an average or typical weekday shall be reported instead.

9.8.5.3 Timeliness for all volume, speed, and roadway occupancy data originating from roadway detectors and for direct measurements of travel time shall be reported. Timeliness is defined as "the degree to which data values or a set of values are provided at the time required or specified."

(1) The timeliness statistic shall be computed and reported as:

$$Percent\ Timely\ Data\ (\%) = \frac{n_{on-time}}{n_{total}} \times 100 \quad (10)$$

where:

$n_{on\text{-}time}$ = the number of data messages or packets received within acceptable time limits, and

n_{total} = the total number of data messages or packets received.

(2) Acceptable time limits shall be determined locally by ADMS developers and reported in the Completeness Report.

9.8.5.4 Coverage for all volume, speed, and roadway occupancy data originating from roadway detectors and for direct measurements of travel time shall be reported in the Completeness Report. For these data, coverage is defined as "the spatial extent of highways for which continuously collected data are obtained."

(1) Coverage data shall be reported by highway segment in the Completeness Report.

(a) Segments shall be contiguous unidirectional sections of highways with the same route-naming convention.

(b) Lengths of the segments shall be determined by the ADMS developer.

(c) For roadway sensors detecting point-based measurements of traffic flow and roadway sensors that detect the passage of individual vehicles, the following attributes shall be reported in table format by highway segment:

(i) Year of report,

(ii) Highway route number,

(iii) Direction of travel,

(iv) Type of data collected on this segment (repeat rows for detectors that report multiple types of data),

(v) Beginning linear reference number (for example, mile marker),

(vi) Beginning geocoordinate,

(vii) Ending linear reference number,

(viii) Ending geocoordinate,

(ix) Total length of segment,

(x) Number of mainline stations monitored (point-based roadway data only),

(xi) Percent of mainline general purpose lanes covered by detectors,

(xii) Percent of mainline HOV lanes covered by detectors,

(xiii) Percent of freeway entrance ramps covered by detectors,

(xiv) Average spacing of detectors, and

(xv) Standard deviation for spacing of detectors.

(d) For vehicle-based measurements of travel time not involving roadside communication, the following attributes shall be reported in table format by highway segment. Because vehicle-based measurements can theoretically apply to the

entire roadway network, these attributes shall be mandatory for only highways functionally classified as interstates, freeways, expressways, and principal arterials.

(i) Year of report,

(ii) Highway route number,

(iii) Direction of travel,

(iv) Type of data collected on this segment,

(v) Beginning linear reference number (for example, mile marker),

(vi) Beginning geocoordinate,

(vii) Ending linear reference number,

(viii) Ending geocoordinate,

(ix) Total length of segment,

(x) Percent of mainline general purpose lanes covered by the data, and

(xi) Percent of mainline HOV lanes covered by the data.

9.8.5.5 Lineage (from Practice E2468) shall be mandatory for traffic-monitoring data.

(1) All of the mandatory or mandatory-if-applicable meta-attributes from Practice E2468 shall be specified.

(2) Under Process Step (A2.5.2) in Practice E2468, a complete description of any type of processing performed on the data shall be specified.

(a) Processing performed between the original collection of the data and the first contact with the ADMS shall be described, including any processing performed by field devices.

(b) Validity criteria applied to the data shall be documented.

(i) These shall be text descriptions of the QC procedures that are applied to the traffic measurements and supporting data, as required under Practice E2468, A2.2.

(c) The aggregation procedures used and the aggregated data structure shall be documented (A2.5.1.2 in Practice E2468).

(d) Imputation procedures shall be documented.

(e) The definition of traffic segments for the purpose of computing travel times from point-based roadway devices shall be specified.

(f) The method(s) used to calculate free flow speed shall be specified.

(3) A2.5.1.4 in Practice E2468 shall be specified.

(a) The lengths of time that the original source data is maintained on-line shall be specified.

(b) The length of time that the original source data is maintained off-line shall be specified.

10. Keywords

10.1 intelligent transportation systems; traffic data; traffic statistics

ANNEXES

(Mandatory Information)

A1. OBJECT CLASSES

TABLE A1.1 Object Classes

Object Classes	
Organization	Same as TMDD.
Cross Section	Relates to physical and traffic conditions at a specific location (point) along a roadway. The cross section is defined as a tranverse line perpendicular to the movement of traffic flow and conditions are documented for various subsections across this line.
Intersection	Same as TMDD.
Detector Context	Relates to information about roadway-based detectors.
Traffic Segment	Relates to physical and traffic conditions along a distance of highway. “Traffic Segment” is a general term used to capture longitudinal aspects of the roadway; detector sections, links, sections, and network trips are special instances of a Traffic Segment.
Detector Section	A user-defined longitudinal highway distance between two adjacent roadway detectors in a direction of traffic flow.
Link	A user-defined longitudinal highway distance between two adjacent nodes in which nodes are defined by major locations where traffic can enter or leave the highway.
Section	A user-defined longitudinal highway distance between two highway locations or landmarks along multiple named routes and used to measure major point-to-point travel within an area.
Network Trip	A user-defined longitudinal highway distance between two highway locations or landmarks along a single named route.
Probe Vehicle	Relates to information about vehicles used to capture traffic condition data.

TABLE A1.1 *Continued*

Object Classes	
Global	Self-explanatory.

A2. DATA ELEMENTS

Beginning-latitude

DEFINITION
This is the longitude of the beginning point of a traffic segment

ASN.1 REPRESENTATION
beginning-latitude ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Beginning-latitude:qty”
ASN-NAME “Beginning-latitude”
ASN-OBJECT-IDENTIFIER { add-data-element beginning-latitude(1) }
DEFINITION This is the longitude of the beginning point of a traffic segment
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Beginning-latitude : : = IA5String (SIZE(1..10))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Hours/Minutes/Seconds”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Beginning-linear-reference-point

DEFINITION
Beginning milepoint of the traffic segment

ASN.1 REPRESENTATION
beginning-linear-reference-point ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Beginning-linear-reference-point:nbr”
ASN-NAME “Beginning-linear-reference-point”
ASN-OBJECT-IDENTIFIER { add-data-element beginning-linear-reference-point(1) }
DEFINITION Beginning milepoint of the traffic segment
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Beginning-linear-reference-point : : = IA5String (SIZE(1..99))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Beginning-longitude

DEFINITION
This is the latitude of the beginning point of a traffic segment

ASN.1 REPRESENTATION
beginning-longitude ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Beginning-longitude:qty”
ASN-NAME “Beginning-longitude”
ASN-OBJECT-IDENTIFIER { add-data-element beginning-longitude(1) }
DEFINITION This is the latitude of the beginning point of a traffic segment
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”

DATA TYPE “
Beginning-longitude : : = IA5String (SIZE(1..10))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Hours/Minutes/Seconds”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Beginning-nearest-node-description

DEFINITION
The nearest node (e.g., intersecting street) to the the beginning location of the linear roadway feature (e.g., link)

ASN.1 REPRESENTATION
beginning-nearest-node-description ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Beginning-nearest-node-description:txt”
ASN-NAME “Beginning-nearest-node-description”
ASN-OBJECT-IDENTIFIER { add-data-element beginning-nearest-node-description(1) }
DEFINITION The nearest node (e.g., intersecting street) to the the beginning location of the linear roadway feature (e.g., link)
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Beginning-nearest-node-description : : = IA5String (SIZE(1..128))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Beginning-nearest-node-offet

DEFINITION
The distance from the nearest node to the beginning point of the linear roadway feature. A positive number indicates that the nearest intersection is located within the linear roadway feature, a minus number indicates that the nearest intersection is loca

ASN.1 REPRESENTATION
beginning-nearest-node-offet ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Beginning-nearest-node-offet:qty”
ASN-NAME “Beginning-nearest-node-offet”
ASN-OBJECT-IDENTIFIER { add-data-element beginning-nearest-node-offet(1) }
DEFINITION
The distance from the nearest node to the beginning point of the linear roadway feature. A positive number indicates that the nearest intersection is located within the linear roadway feature, a minus number indicates that the nearest intersection is loca
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Beginning-nearest-node-offet : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Beginning-route-number

DEFINITION
(defined above)

ASN.1 REPRESENTATION
beginning-route-number ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Beginning-route-number:nbr”
ASN-NAME “Beginning-route-number”
ASN-OBJECT-IDENTIFIER { add-data-element beginning-route-number(1) }
DEFINITION (defined above)

DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Beginning-route-number : : = IA5String (SIZE(1..99))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Beginning-route-signing

DEFINITION
(defined above)

ASN.1 REPRESENTATION
beginning-route-signing ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Beginning-route-signing:cd”
ASN-NAME “Beginning-route-signing”
ASN-OBJECT-IDENTIFIER { add-data-element beginning-route-signing(1) }
DEFINITION (defined above)
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Ending-latitude

DEFINITION
This is the longitude of the ending point of a traffic segment

ASN.1 REPRESENTATION
ending-latitude ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Ending-latitude:qty”
ASN-NAME “Ending-latitude”
ASN-OBJECT-IDENTIFIER { add-data-element ending-latitude(1) }
DEFINITION This is the longitude of the ending point of a traffic segment
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Ending-latitude : : = IA5String (SIZE(1..10))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Hours/Minutes/Seconds”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Ending-linear-reference-point

DEFINITION
Ending milepoint of the traffic segment

ASN.1 REPRESENTATION
ending-linear-reference-point ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Ending-linear-reference-point:nbr”
ASN-NAME “Ending-linear-reference-point”
ASN-OBJECT-IDENTIFIER { add-data-element ending-linear-reference-point(1) }
DEFINITION Ending milepoint of the traffic segment
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Ending-linear-reference-point : : = IA5String (SIZE(1..99))
“
FORMAT “ASN.1 encoding”

UNIT-OF-MEASURE " "
VALID-VALUE-RULE "See the ASN.1 DATA-TYPE"
}

Ending-longitude

DEFINITION
This is the latitude of the ending point of a traffic segment

ASN.1 REPRESENTATION
ending-longitude ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME "CrossSection.Ending-longitude:qty"
ASN-NAME "Ending-longitude"
ASN-OBJECT-IDENTIFIER { add-data-element ending-longitude(1) }
DEFINITION This is the latitude of the ending point of a traffic segment
DESCRIPTIVE-NAME-CONTEXT {"Archive Data"}
DATA-CONCEPT-TYPE data-element
STANDARD "ADD"
DATA TYPE "
Ending-longitude : : = IA5String (SIZE(1..10))
"
FORMAT "ASN.1 encoding"
UNIT-OF-MEASURE "Hours/Minutes/Seconds"
VALID-VALUE-RULE "See the ASN.1 DATA-TYPE"
}

Ending-nearest-node-description

DEFINITION
The nearest node (e.g., intersecting street) to the the ending location of the linear roadway feature (e.g., link)

ASN.1 REPRESENTATION
ending-nearest-node-description ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME "CrossSection.Ending-nearest-node-description:txt"
ASN-NAME "Ending-nearest-node-description"
ASN-OBJECT-IDENTIFIER { add-data-element ending-nearest-node-description(1) }
DEFINITION The nearest node (e.g., intersecting street) to the the ending location of the linear roadway feature (e.g., link)
DESCRIPTIVE-NAME-CONTEXT {"Archive Data"}
DATA-CONCEPT-TYPE data-element
STANDARD "ADD"
DATA TYPE "
Ending-nearest-node-description : : = IA5String (SIZE(1..99))
"
FORMAT "ASN.1 encoding"
UNIT-OF-MEASURE " "
VALID-VALUE-RULE "See the ASN.1 DATA-TYPE"
}

Ending-nearest-node-offet

DEFINITION
The distance from the nearest node street to the ending point of the linear roadway feature. A positive number indicates that the nearest intersection is located within the linear roadway feature, a minus number indicates that the nearest intersection is

ASN.1 REPRESENTATION
ending-nearest-node-offet ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME "CrossSection.Ending-nearest-node-offet:qty"
ASN-NAME "Ending-nearest-node-offet"
ASN-OBJECT-IDENTIFIER { add-data-element ending-nearest-node-offet(1) }
DEFINITION
The distance from the nearest node street to the ending point of the linear roadway feature. A positive number indicates that the nearest intersection is located within the linear roadway feature, a minus number indicates that the nearest intersection is
DESCRIPTIVE-NAME-CONTEXT {"Archive Data"}
DATA-CONCEPT-TYPE data-element
STANDARD "ADD"
DATA TYPE "
Ending-nearest-node-offet : : = REAL
FORMAT "ASN.1 encoding"

UNIT-OF-MEASURE " "
VALID-VALUE-RULE "See the ASN.1 DATA-TYPE"
}

Ending-route-number

DEFINITION
(defined above)

ASN.1 REPRESENTATION
ending-route-number ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME "CrossSection.Ending-route-number:nbr"
ASN-NAME "Ending-route-number"
ASN-OBJECT-IDENTIFIER { add-data-element ending-route-number(1) }
DEFINITION (defined above)
DESCRIPTIVE-NAME-CONTEXT {"Archive Data"}
DATA-CONCEPT-TYPE data-element
STANDARD "ADD"
DATA TYPE "
Ending-route-number : : = IA5String (SIZE(1..99))
"
FORMAT "ASN.1 encoding"
UNIT-OF-MEASURE " "
VALID-VALUE-RULE "See the ASN.1 DATA-TYPE"
}

Ending-route-signing

DEFINITION
(defined above)

ASN.1 REPRESENTATION
ending-route-signing ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME "CrossSection.Ending-route-signing:cd"
ASN-NAME "Ending-route-signing"
ASN-OBJECT-IDENTIFIER { add-data-element ending-route-signing(1) }
DEFINITION (defined above)
DESCRIPTIVE-NAME-CONTEXT {"Archive Data"}
DATA-CONCEPT-TYPE data-element
STANDARD "ADD"
DATA TYPE "
"
FORMAT "ASN.1 encoding"
UNIT-OF-MEASURE " "
VALID-VALUE-RULE "See the ASN.1 DATA-TYPE"
}

HPMS-location-referencing-system-identifier

DEFINITION
The LRS Identification reported in this item for the station must be the same as the LRS identification reported in the HPMS for the section of roadway where the station is located. The LRS identification is a 12-character, right justified value. The LR

ASN.1 REPRESENTATION
hpms-location-referencing-system-identifier ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME "CrossSection.HPMS-location-referencing-system-identifier:id"
ASN-NAME "HPMS-location-referencing-system-identifier"
ASN-OBJECT-IDENTIFIER { add-data-element hpms-location-referencing-system-identifier(1) }
DEFINITION
The LRS Identification reported in this item for the station must be the same as the LRS identification reported in the HPMS for the section of roadway where the station is located. The LRS identification is a 12-character, right justified value. The LR
DESCRIPTIVE-NAME-CONTEXT {"Archive Data"}
DATA-CONCEPT-TYPE data-element
STANDARD "ADD"
DATA TYPE "
HPMS-location-referencing-system-identifier : : = IA5String (SIZE(1..12))
"
FORMAT "ASN.1 encoding"
UNIT-OF-MEASURE " "

VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

HPMS-location-referencing-system-point

DEFINITION
This is the LRS location point for the station. It is similar information to the LRS Beginning Point and LRS Ending Point in the HPMS. The KMPT for the station must be within the range of the LRS beginning point and LRS ending point for the roadway secti

ASN.1 REPRESENTATION
hpms-location-referencing-system-point ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.HPMS-location-referencing-system-point:nbr”
ASN-NAME “HPMS-location-referencing-system-point”
ASN-OBJECT-IDENTIFIER { add-data-element hpms-location-referencing-system-point(1) }
DEFINITION
This is the LRS location point for the station. It is similar information to the LRS Beginning Point and LRS Ending Point in the HPMS. The KMPT for the station must be within the range of the LRS beginning point and LRS ending point for the roadway secti
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
HPMS-location-referencing-system-point : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Lane-number

DEFINITION
Local lane number code, documented in archive metadata

ASN.1 REPRESENTATION
lane-number ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Lane-number:nbr”
ASN-NAME “Lane-number”
ASN-OBJECT-IDENTIFIER { add-data-element lane-number(1) }
DEFINITION Local lane number code, documented in archive metadata
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Lane-number : : = ENUMERATED {
    Actual lane number (1-98),
    All lanes for this station (99)
    …
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Lane-operation-begin-time

DEFINITION
The start time of the lane operation

ASN.1 REPRESENTATION
lane-operation-begin-time ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Lane-operation-begin-time:utc”
ASN-NAME “Lane-operation-begin-time”
ASN-OBJECT-IDENTIFIER { add-data-element lane-operation-begin-time(1) }
DEFINITION The start time of the lane operation
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Lane-operation-begin-time : : = UTCTime

“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Lane-operation-end-time

DEFINITION
The end time of the lane operation

ASN.1 REPRESENTATION
lane-operation-end-time ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Lane-operation-end-time:utc”
ASN-NAME “Lane-operation-end-time”
ASN-OBJECT-IDENTIFIER { add-data-element lane-operation-end-time(1) }
DEFINITION The end time of the lane operation
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Lane-operation-end-time : : = UTCTime
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Lane-operation-type

DEFINITION
Type of traffic operation allowed in the lane

ASN.1 REPRESENTATION
lane-operation-type ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Lane-operation-type:cd”
ASN-NAME “Lane-operation-type”
ASN-OBJECT-IDENTIFIER { add-data-element lane-operation-type(1) }
DEFINITION Type of traffic operation allowed in the lane
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Lane-operation-type : : = ENUMERATED {
General Purpose (1),
HOV-Exclusive (2),
HOV-Shared (3),
Reversible-General Purpose (4),
Reversible-HOV-Exclusive (5),
Reversible-HOV-Shared
…
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Lane-type

DEFINITION
Through, auxiliary, ramp, turn lane, etc.

ASN.1 REPRESENTATION
lane-type ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Lane-type:cd”
ASN-NAME “Lane-type”
ASN-OBJECT-IDENTIFIER { add-data-element lane-type(1) }
DEFINITION Through, auxiliary, ramp, turn lane, etc.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”

DATA TYPE “
Lane-type : : = ENUMERATED {
Through (1),
Auxiliary (2),
Ramp (3),
TurnLane (4)
…
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Lane.operation-days

DEFINITION
The days of the week for the lane operation

ASN.1 REPRESENTATION
lane.operation-days ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Lane.operation-days:cd”
ASN-NAME “Lane.operation-days”
ASN-OBJECT-IDENTIFIER { add-data-element lane.operation-days(1) }
DEFINITION The days of the week for the lane operation
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Lane.operation-days : : = ENUMERATED {
Weekdays Only (1),
Weekends Only (2),
All Days (3)
…
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Location-identifier

DEFINITION
Identifier of associated ROADWAY_DESCRIPTION

ASN.1 REPRESENTATION
location-identifier ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Location-identifier:id”
ASN-NAME “Location-identifier”
ASN-OBJECT-IDENTIFIER { add-data-element location-identifier(1) }
DEFINITION Identifier of associated ROADWAY_DESCRIPTION
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Location-identifier : : = INTEGER (1..99)
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Location-referencing-system

DEFINITION
Code indicating which reference system is being defined by this row.

ASN.1 REPRESENTATION
location-referencing-system ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Location-referencing-system:cd”
ASN-NAME “Location-referencing-system”

ASN-OBJECT-IDENTIFIER { add-data-element location-referencing-system(1) }
DEFINITION Code indicating which reference system is being defined by this row.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Location-referencing-system : : = ENUMERATED {
See SAE J2266
…
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-50th-percentile-speed

DEFINITION
The median speed for a given interval.

ASN.1 REPRESENTATION
metric-50th-percentile-speed ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-50th-percentile-speed:rt”
ASN-NAME “Metric-50th-percentile-speed”
ASN-OBJECT-IDENTIFIER { add-data-element metric-50th-percentile-speed(1) }
DEFINITION The median speed for a given interval.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-50th-percentile-speed : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Miles per Hour”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-85th-percentile-speed

DEFINITION
The 85th percentile speed for a given interval.

ASN.1 REPRESENTATION
metric-85th-percentile-speed ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-85th-percentile-speed:rt”
ASN-NAME “Metric-85th-percentile-speed”
ASN-OBJECT-IDENTIFIER { add-data-element metric-85th-percentile-speed(1) }
DEFINITION The 85th percentile speed for a given interval.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-85th-percentile-speed : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Miles per Hour”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-Monthly-average-weekday-traffic

DEFINITION
Average of the MADWs for Monday through either Thursday or Friday.

ASN.1 REPRESENTATION
metric-monthly-average-weekday-traffic ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-Monthly-average-weekday-traffic:qty”
ASN-NAME “Metric-Monthly-average-weekday-traffic”
ASN-OBJECT-IDENTIFIER { add-data-element metric-monthly-average-weekday-traffic(1) }
DEFINITION Average of the MADWs for Monday through either Thursday or Friday.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}

DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-Monthly-average-weekday-traffic : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Vehicles”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-annual-average-daily-hourly-traffic

DEFINITION
Average of the seven AADWs for a given year.

ASN.1 REPRESENTATION
metric-annual-average-daily-hourly-traffic ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-annual-average-daily-hourly-traffic:qty”
ASN-NAME “Metric-annual-average-daily-hourly-traffic”
ASN-OBJECT-IDENTIFIER { add-data-element metric-annual-average-daily-hourly-traffic(1)
}
DEFINITION Average of the seven AADWs for a given year.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-annual-average-daily-hourly-traffic : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Vehicles”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-annual-average-daily-traffic

DEFINITION
Average of the seven AADWs for a given year.

ASN.1 REPRESENTATION
metric-annual-average-daily-traffic ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-annual-average-daily-traffic:qty”
ASN-NAME “Metric-annual-average-daily-traffic”
ASN-OBJECT-IDENTIFIER { add-data-element metric-annual-average-daily-traffic(1) }
DEFINITION Average of the seven AADWs for a given year.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-annual-average-daily-traffic : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Vehicles”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-annual-average-days-of-the-week

DEFINITION
Average of the twelve MADWs for a year.

ASN.1 REPRESENTATION
metric-annual-average-days-of-the-week ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-annual-average-days-of-the-week:qty”
ASN-NAME “Metric-annual-average-days-of-the-week”
ASN-OBJECT-IDENTIFIER { add-data-element metric-annual-average-days-of-the-week(1) }
DEFINITION Average of the twelve MADWs for a year.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-annual-average-days-of-the-week : : = REAL
“

FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Vehicles”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-annual-average-hourly-days-of-the-week

DEFINITION
Average of the twelve MADWs for a year.

ASN.1 REPRESENTATION
metric-annual-average-hourly-days-of-the-week ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-annual-average-hourly-days-of-the-week:qty”
ASN-NAME “Metric-annual-average-hourly-days-of-the-week”
ASN-OBJECT-IDENTIFIER { add-data-element metric-annual-average-hourly-days-of-theweek(
1) }
DEFINITION Average of the twelve MADWs for a year.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-annual-average-hourly-days-of-the-week : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Vehicles”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-annual-average-weekday-hourly-traffic

DEFINITION
Average of the MADWs for Monday through Thursday or Friday.

ASN.1 REPRESENTATION
metric-annual-average-weekday-hourly-traffic ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-annual-average-weekday-hourly-traffic:qty”
ASN-NAME “Metric-annual-average-weekday-hourly-traffic”
ASN-OBJECT-IDENTIFIER { add-data-element metric-annual-average-weekday-hourlytraffic(
1) }
DEFINITION Average of the MADWs for Monday through Thursday or Friday.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-annual-average-weekday-hourly-traffic : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Vehicles”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-annual-average-weekday-traffic

DEFINITION
Average of the MADWs for Monday through Thursday or Friday.

ASN.1 REPRESENTATION
metric-annual-average-weekday-traffic ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-annual-average-weekday-traffic:qty”
ASN-NAME “Metric-annual-average-weekday-traffic”
ASN-OBJECT-IDENTIFIER { add-data-element metric-annual-average-weekday-traffic(1) }
DEFINITION Average of the MADWs for Monday through Thursday or Friday.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-annual-average-weekday-traffic : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Vehicles”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-annual-average-weekend-hourly-traffic

DEFINITION
Average of the MADWs for Saturday and Sunday.

ASN.1 REPRESENTATION
metric-annual-average-weekend-hourly-traffic ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-annual-average-weekend-hourly-traffic:qty”
ASN-NAME “Metric-annual-average-weekend-hourly-traffic”
ASN-OBJECT-IDENTIFIER { add-data-element metric-annual-average-weekend-hourlytraffic(
1) }
DEFINITION Average of the MADWs for Saturday and Sunday.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-annual-average-weekend-hourly-traffic : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Vehicles”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-annual-average-weekend-traffic

DEFINITION
Average of the AADWs for Saturday and Sunday. Some agencies may include Friday and/or Monday in this calculation.

ASN.1 REPRESENTATION
metric-annual-average-weekend-traffic ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-annual-average-weekend-traffic:qty”
ASN-NAME “Metric-annual-average-weekend-traffic”
ASN-OBJECT-IDENTIFIER { add-data-element metric-annual-average-weekend-traffic(1) }
DEFINITION Average of the AADWs for Saturday and Sunday. Some agencies may include Friday and/or Monday in this calculation.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-annual-average-weekend-traffic : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Vehicles”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-combination-trucks

DEFINITION
Number of combination trucks divided by total traffic volume and multiplied by 100.

ASN.1 REPRESENTATION
metric-combination-trucks ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-combination-trucks:pct”
ASN-NAME “Metric-combination-trucks”
ASN-OBJECT-IDENTIFIER { add-data-element metric-combination-trucks(1) }
DEFINITION Number of combination trucks divided by total traffic volume and multiplied by 100.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-combination-trucks : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-combination-trucks

DEFINITION
Number of combination trucks.

ASN.1 REPRESENTATION
metric-combination-trucks ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-combination-trucks:qty”
ASN-NAME “Metric-combination-trucks”
ASN-OBJECT-IDENTIFIER { add-data-element metric-combination-trucks(1) }
DEFINITION Number of combination trucks.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-combination-trucks : : = INTEGER (0..10000)
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Vehicles”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-daily-traffic

DEFINITION
Traffic volume summarized for a single day.

ASN.1 REPRESENTATION
metric-daily-traffic ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-daily-traffic:qty”
ASN-NAME “Metric-daily-traffic”
ASN-OBJECT-IDENTIFIER { add-data-element metric-daily-traffic(1) }
DEFINITION Traffic volume summarized for a single day.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-daily-traffic : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Vehicles”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-data-alternation

DEFINITION
Indicator of the type of editing or replacement that has occurred; must include locally defined methods that are fully described in the metadata

ASN.1 REPRESENTATION
metric-data-alternation ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-data-alternation:cd”
ASN-NAME “Metric-data-alternation”
ASN-OBJECT-IDENTIFIER { add-data-element metric-data-alternation(1) }
DEFINITION Indicator of the type of editing or replacement that has occurred; must include locally defined methods that are fully described in the metadata
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-data-alternation : : = ENUMERATED {
    Not altered (1),
    Manually altered (2),
    Imputed (3)
    …
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-design-hour-directional-volume

DEFINITION
The larger of the directional traffic volumes for the 30th highest hour of the year as a percentage of AADT. This value will be divided by the AADT and multiplied by 100.

ASN.1 REPRESENTATION
metric-design-hour-directional-volume ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-design-hour-directional-volume:pct”
ASN-NAME “Metric-design-hour-directional-volume”
ASN-OBJECT-IDENTIFIER { add-data-element metric-design-hour-directional-volume(1) }
DEFINITION The larger of the directional traffic volumes for the 30th highest hour of the year as a percentage of AADT. This value will be divided by the AADT and multiplied by 100.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-design-hour-directional-volume : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-design-hour-volume-factor

DEFINITION
Design hour volume as a percentage of AADT, usually referred to as the K-factor. It is the volume of 30th highest hour of a year divided by the AADT and multiplied by 100.

ASN.1 REPRESENTATION
metric-design-hour-volume-factor ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-design-hour-volume-factor:pct”
ASN-NAME “Metric-design-hour-volume-factor”
ASN-OBJECT-IDENTIFIER { add-data-element metric-design-hour-volume-factor(1) }
DEFINITION Design hour volume as a percentage of AADT, usually referred to as the K-factor. It is the volume of 30th highest hour of a year divided by the AADT and multiplied by 100.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-design-hour-volume-factor : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-kinetic-energy

DEFINITION
Proportional to volume * speed.

ASN.1 REPRESENTATION
metric-kinetic-energy ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-kinetic-energy:rt”
ASN-NAME “Metric-kinetic-energy”
ASN-OBJECT-IDENTIFIER { add-data-element metric-kinetic-energy(1) }
DEFINITION Proportional to volume * speed.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-kinetic-energy : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Vehicle-miles per hour”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-lane.distribution

DEFINITION
Percentage of traffic volume in a single lane divided by the directional volume. This statistic must be associated with a LANE_DESCRIPTION.LaneNumber data element.

ASN.1 REPRESENTATION
metric-lane.distribution ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-lane.distribution:pct”
ASN-NAME “Metric-lane.distribution”
ASN-OBJECT-IDENTIFIER { add-data-element metric-lane.distribution(1) }
DEFINITION Percentage of traffic volume in a single lane divided by the directional volume. This statistic must be associated with a LANE_DESCRIPTION.LaneNumber data element.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-lane.distribution : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-monthly-average-daily-traffic

DEFINITION
Average of the seven MADWs for a single month.

ASN.1 REPRESENTATION
metric-monthly-average-daily-traffic ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-monthly-average-daily-traffic:qty”
ASN-NAME “Metric-monthly-average-daily-traffic”
ASN-OBJECT-IDENTIFIER { add-data-element metric-monthly-average-daily-traffic(1) }
DEFINITION Average of the seven MADWs for a single month.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-monthly-average-daily-traffic : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Vehicles”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-monthly-average-days-of-the-week

DEFINITION
Average for a given month for each weekday (Sunday, Monday, … , Saturday).

ASN.1 REPRESENTATION
metric-monthly-average-days-of-the-week ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-monthly-average-days-of-the-week:qty”
ASN-NAME “Metric-monthly-average-days-of-the-week”
ASN-OBJECT-IDENTIFIER { add-data-element metric-monthly-average-days-of-the-week(1) }
DEFINITION Average for a given month for each weekday (Sunday, Monday, … , Saturday).
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-monthly-average-days-of-the-week : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Vehicles”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-monthly-average-hourly-daily-traffic

DEFINITION
Average of the seven MADWs for a single month.

ASN.1 REPRESENTATION
metric-monthly-average-hourly-daily-traffic ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-monthly-average-hourly-daily-traffic:qty”
ASN-NAME “Metric-monthly-average-hourly-daily-traffic”
ASN-OBJECT-IDENTIFIER { add-data-element metric-monthly-average-hourly-daily-traffic(1) }
DEFINITION Average of the seven MADWs for a single month.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-monthly-average-hourly-daily-traffic : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Vehicles”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-monthly-average-hourly-days-of-the-week

DEFINITION
Average for a given month for each weekday (Sunday, Monday, … , Saturday).

ASN.1 REPRESENTATION
metric-monthly-average-hourly-days-of-the-week ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-monthly-average-hourly-days-of-the-week:qty”
ASN-NAME “Metric-monthly-average-hourly-days-of-the-week”
ASN-OBJECT-IDENTIFIER { add-data-element metric-monthly-average-hourly-days-of-the-week(1) }
DEFINITION Average for a given month for each weekday (Sunday, Monday, … , Saturday).
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-monthly-average-hourly-days-of-the-week : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Vehicles”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-monthly-average-weekday-hourly-traffic

DEFINITION
Average of the MADWs for Monday through either Thursday or Friday.

ASN.1 REPRESENTATION
metric-monthly-average-weekday-hourly-traffic ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-monthly-average-weekday-hourly-traffic:qty”
ASN-NAME “Metric-monthly-average-weekday-hourly-traffic”
ASN-OBJECT-IDENTIFIER { add-data-element metric-monthly-average-weekday-hourly-traffic(1) }
DEFINITION Average of the MADWs for Monday through either Thursday or Friday.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-monthly-average-weekday-hourly-traffic : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Vehicles”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-monthly-average-weekend-hourly-traffic

DEFINITION

Average of the MADWs for Saturday and Sunday. Some agencies may include Friday and/or Monday in this calculation.

ASN.1 REPRESENTATION
metric-monthly-average-weekend-hourly-traffic ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-monthly-average-weekend-hourly-traffic:qty”
ASN-NAME “Metric-monthly-average-weekend-hourly-traffic”
ASN-OBJECT-IDENTIFIER { add-data-element metric-monthly-average-weekend-hourly-traffic(1) }
DEFINITION Average of the MADWs for Saturday and Sunday. Some agencies may include Friday and/or Monday in this calculation.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-monthly-average-weekend-hourly-traffic : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Vehicles”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-monthly-average-weekend-traffic

DEFINITION
Average of the MADWs for Saturday and Sunday. Some agencies may include Friday and/or Monday in this calculation.

ASN.1 REPRESENTATION
metric-monthly-average-weekend-traffic ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-monthly-average-weekend-traffic:qty”
ASN-NAME “Metric-monthly-average-weekend-traffic”
ASN-OBJECT-IDENTIFIER { add-data-element metric-monthly-average-weekend-traffic(1) }
DEFINITION Average of the MADWs for Saturday and Sunday. Some agencies may include Friday and/or Monday in this calculation.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-monthly-average-weekend-traffic : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Vehicles”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-occupancy-standard-deviation

DEFINITION
Standard deviation for the loop occupanciesused to create an aggregated (average) occupancy

ASN.1 REPRESENTATION
metric-occupancy-standard-deviation ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-occupancy-standard-deviation:qty”
ASN-NAME “Metric-occupancy-standard-deviation”
ASN-OBJECT-IDENTIFIER { add-data-element metric-occupancy-standard-deviation(1) }
DEFINITION Standard deviation for the loop occupanciesused to create an aggregated (average) occupancy
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-occupancy-standard-deviation : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-quality-control

DEFINITION
Locally-defined QC code, documented in archive metadata.

ASN.1 REPRESENTATION
```
metric-quality-control ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-quality-control:cd”
ASN-NAME “Metric-quality-control”
ASN-OBJECT-IDENTIFIER { add-data-element metric-quality-control(1) }
DEFINITION Locally-defined QC code, documented in archive metadata.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-quality-control : : = ENUMERATED {
    Passed (1),
    Failed (2)
    …
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}
```

Metric-single-unit-trucks

DEFINITION
Number of single-unit trucks divided by total traffic volume and multiplied by 100.

ASN.1 REPRESENTATION
```
metric-single-unit-trucks ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-single-unit-trucks:pct”
ASN-NAME “Metric-single-unit-trucks”
ASN-OBJECT-IDENTIFIER { add-data-element metric-single-unit-trucks(1) }
DEFINITION Number of single-unit trucks divided by total traffic volume and
multiplied by 100.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-single-unit-trucks : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}
```

Metric-single-unit-trucks

DEFINITION
Number of single-unit trucks.

ASN.1 REPRESENTATION
```
metric-single-unit-trucks ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-single-unit-trucks:qty”
ASN-NAME “Metric-single-unit-trucks”
ASN-OBJECT-IDENTIFIER { add-data-element metric-single-unit-trucks(1) }
DEFINITION Number of single-unit trucks.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-single-unit-trucks : : = INTEGER (0..10000)
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Vehicles”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}
```

Metric-speed-congested

DEFINITION

Average space mean speed during congested traffic conditions; congested conditions must be locally defined

ASN.1 REPRESENTATION
metric-speed-congested ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-speed-congested:rt”
ASN-NAME “Metric-speed-congested”
ASN-OBJECT-IDENTIFIER { add-data-element metric-speed-congested(1) }
DEFINITION Average space mean speed during congested traffic conditions; congested conditions must be locally defined
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-speed-congested : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Miles per Hour”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-speed-standard-deviation

DEFINITION
Standard deviation of speed

ASN.1 REPRESENTATION
metric-speed-standard-deviation ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-speed-standard-deviation:rt”
ASN-NAME “Metric-speed-standard-deviation”
ASN-OBJECT-IDENTIFIER { add-data-element metric-speed-standard-deviation(1) }
DEFINITION Standard deviation of speed
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-speed-standard-deviation : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Miles per Hour”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-spot-speed-derived

DEFINITION
Speed of vehicles computed from volume and occupancy measurements taken by roadwaybased detectors; metadata must contain the description for how the speed is derived

ASN.1 REPRESENTATION
metric-spot-speed-derived ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-spot-speed-derived:rt”
ASN-NAME “Metric-spot-speed-derived”
ASN-OBJECT-IDENTIFIER { add-data-element metric-spot-speed-derived(1) }
DEFINITION Speed of vehicles computed from volume and occupancy measurements taken by roadway-based detectors; metadata must contain the description for how the speed is derived
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-spot-speed-derived : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Miles per Hour”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-spot-speed-measured

DEFINITION
Speed of vehicles directly measured by roadway-based detectors

ASN.1 REPRESENTATION
metric-spot-speed-measured ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-spot-speed-measured:rt”
ASN-NAME “Metric-spot-speed-measured”
ASN-OBJECT-IDENTIFIER { add-data-element metric-spot-speed-measured(1) }
DEFINITION Speed of vehicles directly measured by roadway-based detectors
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-spot-speed-measured : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Miles per Hour”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-spot-speed-stndard-deviation

DEFINITION
Standard deviation for the spot speeds used to create an aggregated (average) speed

ASN.1 REPRESENTATION
metric-spot-speed-stndard-deviation ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-spot-speed-stndard-deviation:qty”
ASN-NAME “Metric-spot-speed-stndard-deviation”
ASN-OBJECT-IDENTIFIER { add-data-element metric-spot-speed-stndard-deviation(1) }
DEFINITION Standard deviation for the spot speeds used to create an aggregated
(average) speed
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-spot-speed-stndard-deviation : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-traffic-volume

DEFINITION
The count of traffic volume

ASN.1 REPRESENTATION
metric-traffic-volume ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-traffic-volume:qty”
ASN-NAME “Metric-traffic-volume”
ASN-OBJECT-IDENTIFIER { add-data-element metric-traffic-volume(1) }
DEFINITION The count of traffic volume
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-traffic-volume : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Vehicles”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-type

DEFINITION
The type of measurement from the detector

ASN.1 REPRESENTATION
metric-type ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-type:cd”
ASN-NAME “Metric-type”

ASN-OBJECT-IDENTIFIER { add-data-element metric-type(1) }
DEFINITION The type of measurement from the detector
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-type : : = ENUMERATED {
Vehicle count (1),
FlowRate (2),
VC (3),
Length (4),
Speed (5),
Detector vehicle speed (6),
IVR (7),
WIM (8),
Headway (9),
Gap (10),
T_Speed (11),
S_Speed (12),
Detector occupancy (13)
…
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-units

DEFINITION
Description of the units of the primary measure

ASN.1 REPRESENTATION
metric-units ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-units:txt”
ASN-NAME “Metric-units”
ASN-OBJECT-IDENTIFIER { add-data-element metric-units(1) }
DEFINITION Description of the units of the primary measure
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-units : : = IA5String (SIZE(1..30))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-value

DEFINITION
Numeric value of the statistic.

ASN.1 REPRESENTATION
metric-value ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-value:qty”
ASN-NAME “Metric-value”
ASN-OBJECT-IDENTIFIER { add-data-element metric-value(1) }
DEFINITION Numeric value of the statistic.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-value : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-vehicle-queue-length

DEFINITION
A count of the average number of vehicles in queue, measured by the detector over a specified time period.

ASN.1 REPRESENTATION
metric-vehicle-queue-length ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-vehicle-queue-length:qty”
ASN-NAME “Metric-vehicle-queue-length”
ASN-OBJECT-IDENTIFIER { add-data-element metric-vehicle-queue-length(1) }
DEFINITION A count of the average number of vehicles in queue, measured by the detector over a specified time period.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-vehicle-queue-length : : = INTEGER (1..20000)
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Vehicles”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-volume-standard-deviation

DEFINITION
Standard deviation for the volume used to create an aggregated volume

ASN.1 REPRESENTATION
metric-volume-standard-deviation ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-volume-standard-deviation:qty”
ASN-NAME “Metric-volume-standard-deviation”
ASN-OBJECT-IDENTIFIER { add-data-element metric-volume-standard-deviation(1) }
DEFINITION Standard deviation for the volume used to create an aggregated volume
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-volume-standard-deviation : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-weekly-average-daily-hourly-traffic

DEFINITION
Average of the seven days of a given week for an hour.

ASN.1 REPRESENTATION
metric-weekly-average-daily-hourly-traffic ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-weekly-average-daily-hourly-traffic:qty”
ASN-NAME “Metric-weekly-average-daily-hourly-traffic”
ASN-OBJECT-IDENTIFIER { add-data-element metric-weekly-average-daily-hourly-traffic(1)
}
DEFINITION Average of the seven days of a given week for an hour.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-weekly-average-daily-hourly-traffic : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Vehicles”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-weekly-average-daily-traffic

DEFINITION

Average of the seven days of a given week.

ASN.1 REPRESENTATION
metric-weekly-average-daily-traffic ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-weekly-average-daily-traffic:qty”
ASN-NAME “Metric-weekly-average-daily-traffic”
ASN-OBJECT-IDENTIFIER { add-data-element metric-weekly-average-daily-traffic(1) }
DEFINITION Average of the seven days of a given week.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-weekly-average-daily-traffic : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Vehicles”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-weekly-average-weekday-hourly-traffic

DEFINITION
Average of Monday through either Thursday or Friday for a given week by hour.

ASN.1 REPRESENTATION
metric-weekly-average-weekday-hourly-traffic ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-weekly-average-weekday-hourly-traffic:qty”
ASN-NAME “Metric-weekly-average-weekday-hourly-traffic”
ASN-OBJECT-IDENTIFIER { add-data-element metric-weekly-average-weekday-hourlytraffic(
1) }
DEFINITION Average of Monday through either Thursday or Friday for a given week by
hour.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-weekly-average-weekday-hourly-traffic : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Vehicles”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-weekly-average-weekday-traffic

DEFINITION
Average of Monday through either Thursday or Friday for a given week.

ASN.1 REPRESENTATION
metric-weekly-average-weekday-traffic ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-weekly-average-weekday-traffic:qty”
ASN-NAME “Metric-weekly-average-weekday-traffic”
ASN-OBJECT-IDENTIFIER { add-data-element metric-weekly-average-weekday-traffic(1) }
DEFINITION Average of Monday through either Thursday or Friday for a given week.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-weekly-average-weekday-traffic : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Vehicles”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-weekly-average-weekend-hourly-traffic

DEFINITION
Average of Saturday and Sunday for a single week by hour. Some agencies may include Friday and/or Monday in this calculation.

ASN.1 REPRESENTATION

metric-weekly-average-weekend-hourly-traffic ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-weekly-average-weekend-hourly-traffic:qty”
ASN-NAME “Metric-weekly-average-weekend-hourly-traffic”
ASN-OBJECT-IDENTIFIER { add-data-element metric-weekly-average-weekend-hourly-traffic(1) }
DEFINITION Average of Saturday and Sunday for a single week by hour. Some agencies may include Friday and/or Monday in this calculation.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-weekly-average-weekend-hourly-traffic : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Vehicles”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-weekly-average-weekend-traffic

DEFINITION
Average of Saturday and Sunday for a single week. Some agencies may include Friday and/or Monday in this calculation.

ASN.1 REPRESENTATION
metric-weekly-average-weekend-traffic ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Metric-weekly-average-weekend-traffic:qty”
ASN-NAME “Metric-weekly-average-weekend-traffic”
ASN-OBJECT-IDENTIFIER { add-data-element metric-weekly-average-weekend-traffic(1) }
DEFINITION Average of Saturday and Sunday for a single week. Some agencies may include Friday and/or Monday in this calculation.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-weekly-average-weekend-traffic : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Vehicles”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Roadway-functional-class

DEFINITION
FHWA numeric functional classification code.

ASN.1 REPRESENTATION
roadway-functional-class ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Roadway-functional-class:cd”
ASN-NAME “Roadway-functional-class”
ASN-OBJECT-IDENTIFIER { add-data-element roadway-functional-class(1) }
DEFINITION FHWA numeric functional classification code.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Roadway-functional-class : : = ENUMERATED {
    Rural Interstate (1),
    Rural Principal Arterial (2),
    Rural Minor Arterial (6),
    Rural Major Collector (7),
    Rural Minor Collector (8),
    Rural Local (9),
    Urban Interstate (11),
    Urban Freeway,
    Expressway (12),
    Urban Principal Arterial (14),
    Urban Minor Arterial (16),
    Urba
    …
}
“
FORMAT “ASN.1 encoding”

UNIT-OF-MEASURE " "
VALID-VALUE-RULE "See the ASN.1 DATA-TYPE"
}

Roadway-identifier

DEFINITION
A unique number identifying this roadway LOCATION

ASN.1 REPRESENTATION
roadway-identifier ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME "CrossSection.Roadway-identifier:id"
ASN-NAME "Roadway-identifier"
ASN-OBJECT-IDENTIFIER { add-data-element roadway-identifier(1) }
DEFINITION A unique number identifying this roadway LOCATION
DESCRIPTIVE-NAME-CONTEXT {"Archive Data"}
DATA-CONCEPT-TYPE data-element
STANDARD "ADD"
DATA TYPE "
Roadway-identifier : : = INTEGER (1..256)
"
FORMAT "ASN.1 encoding"
UNIT-OF-MEASURE " "
VALID-VALUE-RULE "See the ASN.1 DATA-TYPE"
}

Roadway-route-number

DEFINITION
Signed route number, character field

ASN.1 REPRESENTATION
roadway-route-number ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME "CrossSection.Roadway-route-number:nbr"
ASN-NAME "Roadway-route-number"
ASN-OBJECT-IDENTIFIER { add-data-element roadway-route-number(1) }
DEFINITION Signed route number, character field
DESCRIPTIVE-NAME-CONTEXT {"Archive Data"}
DATA-CONCEPT-TYPE data-element
STANDARD "ADD"
DATA TYPE "
Roadway-route-number : : = IA5String (SIZE(1..10))
"
FORMAT "ASN.1 encoding"
UNIT-OF-MEASURE " "
VALID-VALUE-RULE "See the ASN.1 DATA-TYPE"
}

Roadway-route-qualifier

DEFINITION
Route signing qualifier code

ASN.1 REPRESENTATION
roadway-route-qualifier ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME "CrossSection.Roadway-route-qualifier:cd"
ASN-NAME "Roadway-route-qualifier"
ASN-OBJECT-IDENTIFIER { add-data-element roadway-route-qualifier(1) }
DEFINITION Route signing qualifier code
DESCRIPTIVE-NAME-CONTEXT {"Archive Data"}
DATA-CONCEPT-TYPE data-element
STANDARD "ADD"
DATA TYPE "
Roadway-route-qualifier : : = ENUMERATED {
    No Qualifier or Not Signed (0),
    Alternate (1),
    Business Route (2),
    Bypass (3),
    Spur (4),
    Loop (5),
    Proposed (6),
    Temporary (7),

Truck Route (8),
None of the Above (9)
…
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Roadway-route-signing

DEFINITION
Route signing code

ASN.1 REPRESENTATION
roadway-route-signing ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Roadway-route-signing:cd”
ASN-NAME “Roadway-route-signing”
ASN-OBJECT-IDENTIFIER { add-data-element roadway-route-signing(1) }
DEFINITION Route signing code
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Roadway-route-signing : : = ENUMERATED {
Not Signed (0),
Interstate (1),
U.S. (2),
State (3),
Off-Interstate Business Marker (4),
County (5),
Township (6),
Municipal (7),
Parkway or Forest Route Marker (8),
None of the Above (9)
…
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Site-group-name

DEFINITION
Name of the site group

ASN.1 REPRESENTATION
site-group-name ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Site-group-name:txt”
ASN-NAME “Site-group-name”
ASN-OBJECT-IDENTIFIER { add-data-element site-group-name(1) }
DEFINITION Name of the site group
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Site-group-name : : = IA5String (SIZE(1..50))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Site-group-roadway-level

DEFINITION
The level of lateral aggregation this site group represents

ASN.1 REPRESENTATION

site-group-roadway-level ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Site-group-roadway-level:cd”
ASN-NAME “Site-group-roadway-level”
ASN-OBJECT-IDENTIFIER { add-data-element site-group-roadway-level(1) }
DEFINITION The level of lateral aggregation this site group represents
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Site-group-roadway-level : : = ENUMERATED {
Roadway (1),
Station (2),
Roadway and Station (3)
…
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Site-group-usage

DEFINITION
The use of this site group for traffic counting purposes

ASN.1 REPRESENTATION
site-group-usage ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Site-group-usage:cd”
ASN-NAME “Site-group-usage”
ASN-OBJECT-IDENTIFIER { add-data-element site-group-usage(1) }
DEFINITION The use of this site group for traffic counting purposes
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Site-group-usage : : = ENUMERATED {
Recreational Route (1),
Report Set (2),
Screenline (3),
Cordon (4)
…
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Station-HPMS-sample-identifier

DEFINITION
If the station is on an HPMS standard sample section, code the HPMS Sample Identifier per the HPMS Field Manual (Item 47).

ASN.1 REPRESENTATION
station-hpms-sample-identifier ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Station-HPMS-sample-identifier:id”
ASN-NAME “Station-HPMS-sample-identifier”
ASN-OBJECT-IDENTIFIER { add-data-element station-hpms-sample-identifier(1) }
DEFINITION If the station is on an HPMS standard sample section, code the HPMS Sample Identifier per the HPMS Field Manual (Item 47).
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Station-HPMS-sample-identifier : : = IA5String (SIZE(1..12))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Station-auxiliary-lane-relationship

DEFINITION
A textual description of the location of the station relative to uxiliary lanes (e.g., acceleration, deceleration).

ASN.1 REPRESENTATION
station-auxiliary-lane-relationship ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Station-auxiliary-lane-relationship:txt”
ASN-NAME “Station-auxiliary-lane-relationship”
ASN-OBJECT-IDENTIFIER { add-data-element station-auxiliary-lane-relationship(1) }
DEFINITION A textual description of the location of the station relative to
uxiliary lanes (e.g., acceleration, deceleration).
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Station-auxiliary-lane-relationship : : = IA5String (SIZE(1..256))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Station-auxiliary-lanes

DEFINITION
Number of auxiliary lanes.

ASN.1 REPRESENTATION
station-auxiliary-lanes ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Station-auxiliary-lanes:qty”
ASN-NAME “Station-auxiliary-lanes”
ASN-OBJECT-IDENTIFIER { add-data-element station-auxiliary-lanes(1) }
DEFINITION Number of auxiliary lanes.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Station-auxiliary-lanes : : = INTEGER (1..10)
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Station-classfication-system-classes

DEFINITION
This indicates the total number of classes in the vehicle classification system. The default value is 13 which indicates the standard FHWA 13 class system (see Appendix 4-C).

ASN.1 REPRESENTATION
station-classfication-system-classes ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Station-classfication-system-classes:qty”
ASN-NAME “Station-classfication-system-classes”
ASN-OBJECT-IDENTIFIER { add-data-element station-classfication-system-classes(1) }
DEFINITION This indicates the total number of classes in the vehicle classification system. The default value is 13 which indicates the standard FHWA 13 class system (see Appendix 4-C).
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Station-classfication-system-classes : : = INTEGER (1..30)
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Station-classfication-system-type

DEFINITION
The classification scheme in use

ASN.1 REPRESENTATION
station-classfication-system-type ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Station-classfication-system-type:cd”
ASN-NAME “Station-classfication-system-type”
ASN-OBJECT-IDENTIFIER { add-data-element station-classfication-system-type(1) }
DEFINITION The classification scheme in use
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Station-classfication-system-type : : = ENUMERATED {
FHWA TMG (1),
User Defined (2)
…
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Station-context-geometric-feature-description

DEFINITION
Text field describing the context item

ASN.1 REPRESENTATION
station-context-geometric-feature-description ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Station-context-geometric-feature-description:txt”
ASN-NAME “Station-context-geometric-feature-description”
ASN-OBJECT-IDENTIFIER { add-data-element station-context-geometric-feature-description(1) }
DEFINITION Text field describing the context item
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Station-context-geometric-feature-description : : = IA5String (SIZE(1..256))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Station-context-geometric-feature-offset-distance

DEFINITION
Upstream (-) or downstream (+) distance from the station in the base units for the archive (miles or kilometers).

ASN.1 REPRESENTATION
station-context-geometric-feature-offset-distance ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Station-context-geometric-feature-offset-distance:qty”
ASN-NAME “Station-context-geometric-feature-offset-distance”
ASN-OBJECT-IDENTIFIER { add-data-element station-context-geometric-feature-offset-distance(1) }
DEFINITION Upstream (-) or downstream (+) distance from the station in the base units for the archive (miles or kilometers).
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Station-context-geometric-feature-offset-distance : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Station-context-geometric-feature-type

DEFINITION
Code for this particular context item

ASN.1 REPRESENTATION
station-context-geometric-feature-type ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Station-context-geometric-feature-type:cd”
ASN-NAME “Station-context-geometric-feature-type”
ASN-OBJECT-IDENTIFIER { add-data-element station-context-geometric-feature-type(1) }
DEFINITION Code for this particular context item
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Station-context-geometric-feature-type : : = ENUMERATED {
Intersection (1),
Traffic Signal (2),
Stop Sign (3),
Horizontal Curve (4),
On-ramp terminus (5),
Off-ramp initiation (6),
Weaving area (7)
…
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Station-identifier

DEFINITION
Unique identifier for a station

ASN.1 REPRESENTATION
station-identifier ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Station-identifier:id”
ASN-NAME “Station-identifier”
ASN-OBJECT-IDENTIFIER { add-data-element station-identifier(1) }
DEFINITION Unique identifier for a station
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Station-identifier : : = INTEGER (1..10)
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Station-lanes-detectorized

DEFINITION
Number of lanes with sensors and detectors.

ASN.1 REPRESENTATION
station-lanes-detectorized ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Station-lanes-detectorized:qty”
ASN-NAME “Station-lanes-detectorized”
ASN-OBJECT-IDENTIFIER { add-data-element station-lanes-detectorized(1) }
DEFINITION Number of lanes with sensors and detectors.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Station-lanes-detectorized : : = INTEGER (1..20)
“
FORMAT “ASN.1 encoding”

UNIT-OF-MEASURE " "
VALID-VALUE-RULE "See the ASN.1 DATA-TYPE"
}

Station-latitude

DEFINITION
This is the longitude of the station location with the west hemisphere assumed and decimal place understood as XXX.XXX XXX.

ASN.1 REPRESENTATION
station-latitude ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME "CrossSection.Station-latitude:qty"
ASN-NAME "Station-latitude"
ASN-OBJECT-IDENTIFIER { add-data-element station-latitude(1) }
DEFINITION This is the longitude of the station location with the west hemisphere assumed and decimal place understood as XXX.XXX XXX.
DESCRIPTIVE-NAME-CONTEXT {"Archive Data"}
DATA-CONCEPT-TYPE data-element
STANDARD "ADD"
DATA TYPE "
Station-latitude : : = IA5String (SIZE(1..10))
"
FORMAT "ASN.1 encoding"
UNIT-OF-MEASURE "Hours/minutes/seconds"
VALID-VALUE-RULE "See the ASN.1 DATA-TYPE"
}

Station-left-shoulder-width

DEFINITION
The width of the leftshoulder

ASN.1 REPRESENTATION
station-left-shoulder-width ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME "CrossSection.Station-left-shoulder-width:qty"
ASN-NAME "Station-left-shoulder-width"
ASN-OBJECT-IDENTIFIER { add-data-element station-left-shoulder-width(1) }
DEFINITION The width of the leftshoulder
DESCRIPTIVE-NAME-CONTEXT {"Archive Data"}
DATA-CONCEPT-TYPE data-element
STANDARD "ADD"
DATA TYPE "
Station-left-shoulder-width : : = INTEGER (0..20)
"
FORMAT "ASN.1 encoding"
UNIT-OF-MEASURE "Feet"
VALID-VALUE-RULE "See the ASN.1 DATA-TYPE"
}

Station-location-referencing-system-value1

DEFINITION
First value in the reference system. For example, route code

ASN.1 REPRESENTATION
station-location-referencing-system-value1 ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME "CrossSection.Station-location-referencing-system-value1:nbr"
ASN-NAME "Station-location-referencing-system-value1"
ASN-OBJECT-IDENTIFIER { add-data-element station-location-referencing-system-value1(1)
}
DEFINITION First value in the reference system. For example, route code
DESCRIPTIVE-NAME-CONTEXT {"Archive Data"}
DATA-CONCEPT-TYPE data-element
STANDARD "ADD"
DATA TYPE "
Station-location-referencing-system-value1 : : = IA5String (SIZE(1..30))
FORMAT "ASN.1 encoding"
UNIT-OF-MEASURE " "
VALID-VALUE-RULE "See the ASN.1 DATA-TYPE"
}

Station-location-referencing-system-value2

DEFINITION
Second value, if any, for the reference system. For example, milepoint.

ASN.1 REPRESENTATION
station-location-referencing-system-value2 ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Station-location-referencing-system-value2:nbr”
ASN-NAME “Station-location-referencing-system-value2”
ASN-OBJECT-IDENTIFIER { add-data-element station-location-referencing-system-value2(1)
}
DEFINITION Second value, if any, for the reference system. For example, milepoint.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Station-location-referencing-system-value2 : : = IA5String (SIZE(1..30))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Station-location-referencing-system-value3

DEFINITION
Third value, if any, for the reference system.

ASN.1 REPRESENTATION
station-location-referencing-system-value3 ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Station-location-referencing-system-value3:nbr”
ASN-NAME “Station-location-referencing-system-value3”
ASN-OBJECT-IDENTIFIER { add-data-element station-location-referencing-system-value3(1)
}
DEFINITION Third value, if any, for the reference system.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Station-location-referencing-system-value3 : : = IA5String (SIZE(1..30))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Station-location-referencing-system-value4

DEFINITION
Fourth value, if any, for the reference system.

ASN.1 REPRESENTATION
station-location-referencing-system-value4 ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Station-location-referencing-system-value4:nbr”
ASN-NAME “Station-location-referencing-system-value4”
ASN-OBJECT-IDENTIFIER { add-data-element station-location-referencing-system-value4(1)
}
DEFINITION Fourth value, if any, for the reference system.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Station-location-referencing-system-value4 : : = IA5String (SIZE(1..30))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Station-location-referencing-system-value5

DEFINITION
Fifth value, if any, for the reference system.

ASN.1 REPRESENTATION
station-location-referencing-system-value5 ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Station-location-referencing-system-value5:nbr”
ASN-NAME “Station-location-referencing-system-value5”
ASN-OBJECT-IDENTIFIER { add-data-element station-location-referencing-system-value5(1)
}
DEFINITION Fifth value, if any, for the reference system.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Station-location-referencing-system-value5 : : = IA5String (SIZE(1..30))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Station-location-referencing-system-value6

DEFINITION
Sixth value, if any, for the reference system.

ASN.1 REPRESENTATION
station-location-referencing-system-value6 ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Station-location-referencing-system-value6:nbr”
ASN-NAME “Station-location-referencing-system-value6”
ASN-OBJECT-IDENTIFIER { add-data-element station-location-referencing-system-value6(1)
}
DEFINITION Sixth value, if any, for the reference system.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Station-location-referencing-system-value6 : : = IA5String (SIZE(1..30))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Station-longitude

DEFINITION
This is the latitude of the station location with the north hemisphere assumed and decimal place understood as XX.XXX XXX.

ASN.1 REPRESENTATION
station-longitude ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Station-longitude:qty”
ASN-NAME “Station-longitude”
ASN-OBJECT-IDENTIFIER { add-data-element station-longitude(1) }
DEFINITION This is the latitude of the station location with the north hemisphere assumed and decimal place understood as XX.XXX XXX.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Station-longitude : : = IA5String (SIZE(1..10))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Hours/minutes/seconds”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Station-median-type

DEFINITION

The type of median separating travel directions

ASN.1 REPRESENTATION
station-median-type ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Station-median-type:cd”
ASN-NAME “Station-median-type”
ASN-OBJECT-IDENTIFIER { add-data-element station-median-type(1) }
DEFINITION The type of median separating travel directions
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Station-median-type : : = ENUMERATED {
Curbed (1),
Positive Barrier (2),
Unprotected (3),
None (4)
…
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Station-median-width

DEFINITION
The width of the median, including the left shoulders

ASN.1 REPRESENTATION
station-median-width ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Station-median-width:qty”
ASN-NAME “Station-median-width”
ASN-OBJECT-IDENTIFIER { add-data-element station-median-width(1) }
DEFINITION The width of the median, including the left shoulders
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Station-median-width : : = INTEGER (0..200)
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Feet”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Station-ramp-relationship

DEFINITION
A textual description of the location of station relative to on- and off-ramps that are within 1,500 feet of the station. The description shall include notation as to: (1) proximity of the ramps (distance upstream or downstream from the station) and (2)

ASN.1 REPRESENTATION
station-ramp-relationship ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Station-ramp-relationship:txt”
ASN-NAME “Station-ramp-relationship”
ASN-OBJECT-IDENTIFIER { add-data-element station-ramp-relationship(1) }
DEFINITION
A textual description of the location of station relative to on- and off-ramps that are within 1,500 feet of the station. The description shall include notation as to: (1) proximity of the ramps (distance upstream or downstream from the station) and (2)
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Station-ramp-relationship : : = IA5String (SIZE(1..256))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Station-right-shoulder-width

DEFINITION
The width of the right shoulder

ASN.1 REPRESENTATION
station-right-shoulder-width ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Station-right-shoulder-width:qty”
ASN-NAME “Station-right-shoulder-width”
ASN-OBJECT-IDENTIFIER { add-data-element station-right-shoulder-width(1) }
DEFINITION The width of the right shoulder
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Station-right-shoulder-width : : = INTEGER (0..20)
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Feet”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Station-roadway-grade

DEFINITION
The change in elevation of a segment divided by the horizontal (plan) distance of the segment, expressed as a percent.

ASN.1 REPRESENTATION
station-roadway-grade ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Station-roadway-grade:pct”
ASN-NAME “Station-roadway-grade”
ASN-OBJECT-IDENTIFIER { add-data-element station-roadway-grade(1) }
DEFINITION The change in elevation of a segment divided by the horizontal (plan) distance of the segment, expressed as a percent.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Station-roadway-grade : : = INTEGER (1..15)
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Station-through-lanes

DEFINITION
Number of through lanes

ASN.1 REPRESENTATION
station-through-lanes ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “CrossSection.Station-through-lanes:qty”
ASN-NAME “Station-through-lanes”
ASN-OBJECT-IDENTIFIER { add-data-element station-through-lanes(1) }
DEFINITION Number of through lanes
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Station-through-lanes : : = INTEGER (1..20)
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Binning-scheme-data-type

DEFINITION
The type of data represented by the binning scheme

ASN.1 REPRESENTATION
binning-scheme-data-type ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “DetectorContext.Binning-scheme-data-type:cd”
ASN-NAME “Binning-scheme-data-type”
ASN-OBJECT-IDENTIFIER { add-data-element binning-scheme-data-type(1) }
DEFINITION The type of data represented by the binning scheme
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Binning-scheme-data-type : : = ENUMERATED {
Vehicle count (1),
FlowRate (2),
VC (3),
Length (4),
Speed (5),
Detector vehicle speed (6),
IVR (7),
WIM (8),
Headway (9),
Gap (10),
T_Speed (11),
S_Speed (12),
Detector occupancy (13)
…
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Binning-scheme-definition

DEFINITION
Free text definition of the scheme

ASN.1 REPRESENTATION
binning-scheme-definition ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “DetectorContext.Binning-scheme-definition:txt”
ASN-NAME “Binning-scheme-definition”
ASN-OBJECT-IDENTIFIER { add-data-element binning-scheme-definition(1) }
DEFINITION Free text definition of the scheme
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Binning-scheme-definition : : = IA5String (SIZE(1..256))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Binning-scheme-identifier

DEFINITION
Unique identifier for a binning scheme

ASN.1 REPRESENTATION
binning-scheme-identifier ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “DetectorContext.Binning-scheme-identifier:id”
ASN-NAME “Binning-scheme-identifier”
ASN-OBJECT-IDENTIFIER { add-data-element binning-scheme-identifier(1) }
DEFINITION Unique identifier for a binning scheme
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Binning-scheme-identifier : : = IA5String (SIZE(1..10))
“

FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Binning-scheme-label

DEFINITION
A short alphanumeric label used in reports, e.g., “PU” for FHWA vehicle classification 3 (pickups).

ASN.1 REPRESENTATION
binning-scheme-label ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “DetectorContext.Binning-scheme-label:tct”
ASN-NAME “Binning-scheme-label”
ASN-OBJECT-IDENTIFIER { add-data-element binning-scheme-label(1) }
DEFINITION A short alphanumeric label used in reports, e.g., “PU” for FHWA vehicle classification 3 (pickups).
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Binning-scheme-label : : = IA5String (SIZE(1..20))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Binning-scheme-maximum-value

DEFINITION

ASN.1 REPRESENTATION
binning-scheme-maximum-value ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “DetectorContext.Binning-scheme-maximum-value:qty”
ASN-NAME “Binning-scheme-maximum-value”
ASN-OBJECT-IDENTIFIER { add-data-element binning-scheme-maximum-value(1) }
DEFINITION
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Binning-scheme-maximum-value : : = INTEGER (0..1024)
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Binning-scheme-minimum-value

DEFINITION

ASN.1 REPRESENTATION
binning-scheme-minimum-value ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “DetectorContext.Binning-scheme-minimum-value:qty”
ASN-NAME “Binning-scheme-minimum-value”
ASN-OBJECT-IDENTIFIER { add-data-element binning-scheme-minimum-value(1) }
DEFINITION
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Binning-scheme-minimum-value : : = INTEGER (0..1024)
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Binning-scheme-name

DEFINITION
Name for the binning scheme (free text)

ASN.1 REPRESENTATION
binning-scheme-name ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “DetectorContext.Binning-scheme-name:txt”
ASN-NAME “Binning-scheme-name”
ASN-OBJECT-IDENTIFIER { add-data-element binning-scheme-name(1) }
DEFINITION Name for the binning scheme (free text)
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Binning-scheme-name : : = IA5String (SIZE(1..40))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Detector-Installation-comments

DEFINITION
Free text description of the installation procedure.

ASN.1 REPRESENTATION
detector-installation-comments ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “DetectorContext.Detector-Installation-comments:txt”
ASN-NAME “Detector-Installation-comments”
ASN-OBJECT-IDENTIFIER { add-data-element detector-installation-comments(1) }
DEFINITION Free text description of the installation procedure.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Detector-Installation-comments : : = IA5String (SIZE(1..512))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Detector-acceptance-test-result

DEFINITION
Result of the test performed during maintenance

ASN.1 REPRESENTATION
detector-acceptance-test-result ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “DetectorContext.Detector-acceptance-test-result:cd”
ASN-NAME “Detector-acceptance-test-result”
ASN-OBJECT-IDENTIFIER { add-data-element detector-acceptance-test-result(1) }
DEFINITION Result of the test performed during maintenance
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Detector-acceptance-test-result : : = ENUMERATED {
    Passed (1),
    Failed (2)
    …
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Detector-acceptance-test

DEFINITION
Type of acceptance test

ASN.1 REPRESENTATION
detector-acceptance-test ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “DetectorContext.Detector-acceptance-test:cd”
ASN-NAME “Detector-acceptance-test”
ASN-OBJECT-IDENTIFIER { add-data-element detector-acceptance-test(1) }
DEFINITION Type of acceptance test
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Detector-acceptance-test : : = ENUMERATED {
Installation (1),
Startup (2),
Calibration,
Field testing (3)
…
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Detector-defining-standard

DEFINITION
Indicates which standard defines the type of sensor array. TSS, DCM, TMDD

ASN.1 REPRESENTATION
detector-defining-standard ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “DetectorContext.Detector-defining-standard:cd”
ASN-NAME “Detector-defining-standard”
ASN-OBJECT-IDENTIFIER { add-data-element detector-defining-standard(1) }
DEFINITION Indicates which standard defines the type of sensor array. TSS, DCM, TMDD
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Detector-defining-standard : : = ENUMERATED {
TSS (1),
DCM (2),
TMDD (3)
…
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Detector-identifier

DEFINITION
Unique identification number of an individual detector within a network. A globallyunique identifier should be used to guarantee uniqueness.

ASN.1 REPRESENTATION
detector-identifier ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “DetectorContext.Detector-identifier:id”
ASN-NAME “Detector-identifier”
ASN-OBJECT-IDENTIFIER { add-data-element detector-identifier(1) }
DEFINITION Unique identification number of an individual detector within a network. A globally-unique identifier should be used to guarantee uniqueness.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Detector-identifier : : = INTEGER (1..30)
“

FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Detector-maintenance-activity-type

DEFINITION
Type of maintenance performed

ASN.1 REPRESENTATION
detector-maintenance-activity-type ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “DetectorContext.Detector-maintenance-activity-type:cd”
ASN-NAME “Detector-maintenance-activity-type”
ASN-OBJECT-IDENTIFIER { add-data-element detector-maintenance-activity-type(1) }
DEFINITION Type of maintenance performed
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Detector-maintenance-activity-type : : = ENUMERATED {
Repair Sensor (1),
Tune Loops (2),
Clean (3)
…
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Detector-maintenance-comments

DEFINITION
Free text description of the maintenance procedure.

ASN.1 REPRESENTATION
detector-maintenance-comments ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “DetectorContext.Detector-maintenance-comments:txt”
ASN-NAME “Detector-maintenance-comments”
ASN-OBJECT-IDENTIFIER { add-data-element detector-maintenance-comments(1) }
DEFINITION Free text description of the maintenance procedure.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Detector-maintenance-comments : : = IA5String (SIZE(1..512))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Detector-maintenance-test-result

DEFINITION
Result of the test performed during maintenance

ASN.1 REPRESENTATION
detector-maintenance-test-result ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “DetectorContext.Detector-maintenance-test-result:cd”
ASN-NAME “Detector-maintenance-test-result”
ASN-OBJECT-IDENTIFIER { add-data-element detector-maintenance-test-result(1) }
DEFINITION Result of the test performed during maintenance
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Detector-maintenance-test-result : : = ENUMERATED {
Passed (1),
Failed

```
    …
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}
```

Detector-maintenance-test_cd

DEFINITION
Type of test performed during maintenance

ASN.1 REPRESENTATION

```
detector-maintenance-test_cd ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “DetectorContext.Detector-maintenance-test_cd”
ASN-NAME “Detector-maintenance-test_cd”
ASN-OBJECT-IDENTIFIER { add-data-element detector-maintenance-test_cd(1) }
DEFINITION Type of test performed during maintenance
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Detector-maintenance-test_cd : : = ENUMERATED {
    Calibration (1)
    …
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}
```

Detector-operation

DEFINITION
Operation mode of the detector. Code must be entered into the DATA_ELEMENT table by the archive manager.

ASN.1 REPRESENTATION

```
detector-operation ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “DetectorContext.Detector-operation:cd”
ASN-NAME “Detector-operation”
ASN-OBJECT-IDENTIFIER { add-data-element detector-operation(1) }
DEFINITION Operation mode of the detector. Code must be entered into the
DATA_ELEMENT table by the archive manager.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Detector-operation : : = ENUMERATED {
    Refer to DCM
    …
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}
```

Detector-reference-type

DEFINITION
The lateral geometry measured by the detector

ASN.1 REPRESENTATION

```
detector-reference-type ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “DetectorContext.Detector-reference-type:cd”
ASN-NAME “Detector-reference-type”
ASN-OBJECT-IDENTIFIER { add-data-element detector-reference-type(1) }
DEFINITION The lateral geometry measured by the detector
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
```

DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Detector-reference-type : : = ENUMERATED {
Lane (1),
Station (2),
Roadway (3)
…
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Detector-type

DEFINITION
Code naming the type of a vehicular detector providing traffic data. Use the code from the standard defined in the DETECTOR_Type_Type_code. If the type is userdefined, use the DCM “Other” code, and identify the type in the metadata.

ASN.1 REPRESENTATION
detector-type ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “DetectorContext.Detector-type:cd”
ASN-NAME “Detector-type”
ASN-OBJECT-IDENTIFIER { add-data-element detector-type(1) }
DEFINITION Code naming the type of a vehicular detector providing traffic data. Use the code from the standard defined in the DETECTOR_Type_Type_code. If the type is user-defined, use the DCM “Other” code, and identify the type in the metadata.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Detector-type : : = ENUMERATED {
Road Tube (1),
Piezo (2),
Inductive-loop (3),
WIM Piezo (4),
Bending Plate (5),
Contact Closure (6),
Acoustic (7),
Radar (8),
Microwave (9),
Infrared (10),
Laser (11),
Optoisolated (12),
FiberOptic (13),
Contact Relay (14),
Quartz (15),
Light Curtain (16),
Video Image (1
…
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Detector-zone-length

DEFINITION
The length of the detecting zone from leading edge of the sensing zone to the trailing edge of the sensing zone.

ASN.1 REPRESENTATION
detector-zone-length ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “DetectorContext.Detector-zone-length:qty”
ASN-NAME “Detector-zone-length”
ASN-OBJECT-IDENTIFIER { add-data-element detector-zone-length(1) }
DEFINITION The length of the detecting zone from leading edge of the sensing zone to the trailing edge of the sensing zone.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}

DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Detector-zone-length : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Feet”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Device-location-elevation

DEFINITION
The elevation of a device in decimeters. (TMDD Device-location-elevation)

ASN.1 REPRESENTATION
device-location-elevation ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “DetectorContext.Device-location-elevation:qty”
ASN-NAME “Device-location-elevation”
ASN-OBJECT-IDENTIFIER { add-data-element device-location-elevation(1) }
DEFINITION The elevation of a device in decimeters. (TMDD Device-locationelevation)
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Device-location-elevation : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Decimeters”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Device-location-height

DEFINITION
The height of a device from the ground in decimeters. (TMDD Device-location-height)

ASN.1 REPRESENTATION
device-location-height ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “DetectorContext.Device-location-height:qty”
ASN-NAME “Device-location-height”
ASN-OBJECT-IDENTIFIER { add-data-element device-location-height(1) }
DEFINITION The height of a device from the ground in decimeters. (TMDD Devicelocation-height)
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Device-location-height : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Decimeters”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Device-mobility-type

DEFINITION
Mobility type of the device (e.g., permanent structure or transportable) (TMDD Device-mobility-type)

ASN.1 REPRESENTATION
device-mobility-type ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “DetectorContext.Device-mobility-type:cd”
ASN-NAME “Device-mobility-type”
ASN-OBJECT-IDENTIFIER { add-data-element device-mobility-type(1) }
DEFINITION Mobility type of the device (e.g., permanent structure or transportable) (TMDD Device-mobility-type)
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “

Device-mobility-type : : = ENUMERATED {
Permanent (1),
Transportable (2),
Mobile (3),
Other (4)
…
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Device-operation-type

DEFINITION
Operational category of a device (TMDD Device-operation-type)

ASN.1 REPRESENTATION
device-operation-type ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “DetectorContext.Device-operation-type:cd”
ASN-NAME “Device-operation-type”
ASN-OBJECT-IDENTIFIER { add-data-element device-operation-type(1) }
DEFINITION Operational category of a device (TMDD Device-operation-type)
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Device-operation-type : : = ENUMERATED {
Staffed (1),
Automatic (2),
Unknown (3),
Other (4)
…
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Device-url

DEFINITION
Uniform Resource Locator for where additional information for this device or entity can be found. Additional information may be a map, status information or maintenance information. Any set of ASCII characters up to 128. (TMDD Device-url)

ASN.1 REPRESENTATION
device-url ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “DetectorContext.Device-url:txt”
ASN-NAME “Device-url”
ASN-OBJECT-IDENTIFIER { add-data-element device-url(1) }
DEFINITION Uniform Resource Locator for where additional information for this device or entity can be found. Additional information may be a map, status information or maintenance information. Any set of ASCII characters up to 128. (TMDD Device-url)
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Device-url : : = IA5String (SIZE(1..64))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Effective-date

DEFINITION
Date and time this database row was entered

ASN.1 REPRESENTATION
effective-date ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “Global.Effective-date:utc”
ASN-NAME “Effective-date”
ASN-OBJECT-IDENTIFIER { add-data-element effective-date(1) }
DEFINITION Date and time this database row was entered
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Effective-date : : = UTCTime
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

End-date

DEFINITION
Date and time this entity ceased to exist

ASN.1 REPRESENTATION
end-date ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “Global.End-date:utc”
ASN-NAME “End-date”
ASN-OBJECT-IDENTIFIER { add-data-element end-date(1) }
DEFINITION Date and time this entity ceased to exist
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
End-date : : = UTCTime
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Expiration-date

DEFINITION
Date and time this database row was replaced, or end of time for last entry

ASN.1 REPRESENTATION
expiration-date ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “Global.Expiration-date:utc”
ASN-NAME “Expiration-date”
ASN-OBJECT-IDENTIFIER { add-data-element expiration-date(1) }
DEFINITION Date and time this database row was replaced, or end of time for last entry
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Expiration-date : : = UTCTime
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-aggregated-maximum-value

DEFINITION
Maximum value in the sample

ASN.1 REPRESENTATION
metric-aggregated-maximum-value ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “Global.Metric-aggregated-maximum-value:qty”
ASN-NAME “Metric-aggregated-maximum-value”

ASN-OBJECT-IDENTIFIER { add-data-element metric-aggregated-maximum-value(1) }
DEFINITION Maximum value in the sample
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-aggregated-maximum-value : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-aggregated-minimum-value

DEFINITION
Minimum value in the sample

ASN.1 REPRESENTATION
metric-aggregated-minimum-value ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “Global.Metric-aggregated-minimum-value:qty”
ASN-NAME “Metric-aggregated-minimum-value”
ASN-OBJECT-IDENTIFIER { add-data-element metric-aggregated-minimum-value(1) }
DEFINITION Minimum value in the sample
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-aggregated-minimum-value : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-aggregated-standard-deviation

DEFINITION
Sample standard deviation of the statistic.

ASN.1 REPRESENTATION
metric-aggregated-standard-deviation ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “Global.Metric-aggregated-standard-deviation:qty”
ASN-NAME “Metric-aggregated-standard-deviation”
ASN-OBJECT-IDENTIFIER { add-data-element metric-aggregated-standard-deviation(1) }
DEFINITION Sample standard deviation of the statistic.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-aggregated-standard-deviation : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-number-valid-records

DEFINITION
The number of valid (QC-passed) records that are in the set of records used to compute an aggregated metric

ASN.1 REPRESENTATION
metric-number-valid-records ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “Global.Metric-number-valid-records:qty”
ASN-NAME “Metric-number-valid-records”
ASN-OBJECT-IDENTIFIER { add-data-element metric-number-valid-records(1) }
DEFINITION The number of valid (QC-passed) records that are in the set of records used to compute an aggregated metric
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element

STANDARD “ADD”
DATA TYPE “
Metric-number-valid-records : : = INTEGER (0..50000)
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Start-date

DEFINITION
Date and time this entity came into existence

ASN.1 REPRESENTATION
start-date ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “Global.Start-date:utc”
ASN-NAME “Start-date”
ASN-OBJECT-IDENTIFIER { add-data-element start-date(1) }
DEFINITION Date and time this entity came into existence
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Start-date : : = UTCTime
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Traffic-direction

DEFINITION
FHWA 8-point direction code; this is the nominal route direction for north- or eastbound roads, the opposite direction for south- or west-bound roads.

ASN.1 REPRESENTATION
traffic-direction ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “Global.Traffic-direction:cd”
ASN-NAME “Traffic-direction”
ASN-OBJECT-IDENTIFIER { add-data-element traffic-direction(1) }
DEFINITION FHWA 8-point direction code; this is the nominal route direction for north- or east-bound roads, the opposite direction for south- or west-bound roads.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Traffic-direction : : = ENUMERATED {
    North (1),
    Northeast (2),
    East (3),
    Southeast (4),
    South (5),
    Southwest (6),
    West (7),
    Northwest (8)
    …
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Intersection-control-type

DEFINITION
Type of traffic control at the intersection

ASN.1 REPRESENTATION
intersection-control-type ITS-DATA-ELEMENT : : = {

DESCRIPTIVE-NAME “Intersection.Intersection-control-type:cd”
ASN-NAME “Intersection-control-type”
ASN-OBJECT-IDENTIFIER { add-data-element intersection-control-type(1) }
DEFINITION Type of traffic control at the intersection
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Intersection-control-type : : = ENUMERATED {
Signal (1),
Flashing Beacon (2),
Stop Sign (3),
None (4)
…
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Intersection-identifier

DEFINITION
Intersection identifier

ASN.1 REPRESENTATION
intersection-identifier ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “Intersection.Intersection-identifier:id”
ASN-NAME “Intersection-identifier”
ASN-OBJECT-IDENTIFIER { add-data-element intersection-identifier(1) }
DEFINITION Intersection identifier
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Intersection-identifier : : = IA5String (SIZE(1..10))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Intersection-number-legs

DEFINITION
Number of roads entering or leaving the intersection.

ASN.1 REPRESENTATION
intersection-number-legs ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “Intersection.Intersection-number-legs:nbr:cd”
ASN-NAME “Intersection-number-legs”
ASN-OBJECT-IDENTIFIER { add-data-element intersection-number-legs(1) }
DEFINITION Number of roads entering or leaving the intersection.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Intersection-number-legs : : = INTEGER (1..8)
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Turning-movement-approach-leg-name

DEFINITION
The highway name for the approach leg for vehicles entering into the intersection

ASN.1 REPRESENTATION
turning-movement-approach-leg-name ITS-DATA-ELEMENT : : = {

DESCRIPTIVE-NAME “Intersection.Turning-movement-approach-leg-name:txt”
ASN-NAME “Turning-movement-approach-leg-name”
ASN-OBJECT-IDENTIFIER { add-data-element turning-movement-approach-leg-name(1) }
DEFINITION The highway name for the approach leg for vehicles entering into the intersection
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Turning-movement-approach-leg-name : : = IA5String (SIZE(1..128))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Turning-movement-exit-leg-name

DEFINITION
The highway name for the exit leg for vehicles leaving (moving away from) into the intersection

ASN.1 REPRESENTATION
turning-movement-exit-leg-name ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “Intersection.Turning-movement-exit-leg-name:txt”
ASN-NAME “Turning-movement-exit-leg-name”
ASN-OBJECT-IDENTIFIER { add-data-element turning-movement-exit-leg-name(1) }
DEFINITION The highway name for the exit leg for vehicles leaving (moving away from) into the intersection
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Turning-movement-exit-leg-name : : = IA5String (SIZE(1..128))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Turning-movement-type

DEFINITION
The type of turning movement being measured

ASN.1 REPRESENTATION
turning-movement-type ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “Intersection.Turning-movement-type:cd”
ASN-NAME “Turning-movement-type”
ASN-OBJECT-IDENTIFIER { add-data-element turning-movement-type(1) }
DEFINITION The type of turning movement being measured
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Turning-movement-type : : = ENUMERATED {
    Through (1),
    Left (2),
    Right (3)
    …
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Organization-agency-abbreviation

DEFINITION
Abbreviation of agency

ASN.1 REPRESENTATION
organization-agency-abbreviation ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “Organization.Organization-agency-abbreviation:txt”
ASN-NAME “Organization-agency-abbreviation”
ASN-OBJECT-IDENTIFIER { add-data-element organization-agency-abbreviation(1) }
DEFINITION Abbreviation of agency
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Organization-agency-abbreviation : : = IA5String (SIZE(1..100))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Organization-agency-name

DEFINITION
Full name of agency

ASN.1 REPRESENTATION
organization-agency-name ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “Organization.Organization-agency-name:txt”
ASN-NAME “Organization-agency-name”
ASN-OBJECT-IDENTIFIER { add-data-element organization-agency-name(1) }
DEFINITION Full name of agency
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Organization-agency-name : : = IA5String (SIZE(1..256))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Organization-city

DEFINITION
FIPS code for the agency’s city, null if county- or statewide

ASN.1 REPRESENTATION
organization-city ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “Organization.Organization-city:cd”
ASN-NAME “Organization-city”
ASN-OBJECT-IDENTIFIER { add-data-element organization-city(1) }
DEFINITION FIPS code for the agency’s city, null if county- or statewide
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Organization-city : : = ENUMERATED {
see FIPS PUB 8-6 http:,
www.itl.nist.gov,
fipspubs,
fip8-6-0.htm
…
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Organization-contact-person-adddress1

DEFINITION
First line of address

ASN.1 REPRESENTATION
organization-contact-person-adddress1 ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “Organization.Organization-contact-person-adddress1:txt”
ASN-NAME “Organization-contact-person-adddress1”
ASN-OBJECT-IDENTIFIER { add-data-element organization-contact-person-adddress1(1) }
DEFINITION First line of address
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Organization-contact-person-adddress1 : : = IA5String (SIZE(1..100))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Organization-contact-person-adddress2

DEFINITION
Second line of address

ASN.1 REPRESENTATION
organization-contact-person-adddress2 ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “Organization.Organization-contact-person-adddress2:txt”
ASN-NAME “Organization-contact-person-adddress2”
ASN-OBJECT-IDENTIFIER { add-data-element organization-contact-person-adddress2(1) }
DEFINITION Second line of address
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Organization-contact-person-adddress2 : : = IA5String (SIZE(1..100))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Organization-contact-person-adddress3

DEFINITION
Third line of address

ASN.1 REPRESENTATION
organization-contact-person-adddress3 ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “Organization.Organization-contact-person-adddress3:txt”
ASN-NAME “Organization-contact-person-adddress3”
ASN-OBJECT-IDENTIFIER { add-data-element organization-contact-person-adddress3(1) }
DEFINITION Third line of address
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Organization-contact-person-adddress3 : : = IA5String (SIZE(1..100))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Organization-contact-person-city

DEFINITION
City name

ASN.1 REPRESENTATION
organization-contact-person-city ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “Organization.Organization-contact-person-city:txt”
ASN-NAME “Organization-contact-person-city”
ASN-OBJECT-IDENTIFIER { add-data-element organization-contact-person-city(1) }
DEFINITION City name

DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Organization-contact-person-city : : = IA5String (SIZE(1..100))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Organization-contact-person-country

DEFINITION
Country of agency

ASN.1 REPRESENTATION
organization-contact-person-country ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “Organization.Organization-contact-person-country:txt”
ASN-NAME “Organization-contact-person-country”
ASN-OBJECT-IDENTIFIER { add-data-element organization-contact-person-country(1) }
DEFINITION Country of agency
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Organization-contact-person-country : : = IA5String (SIZE(1..100))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Organization-contact-person-email

DEFINITION
Phone number of contact

ASN.1 REPRESENTATION
organization-contact-person-email ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “Organization.Organization-contact-person-email:nbr”
ASN-NAME “Organization-contact-person-email”
ASN-OBJECT-IDENTIFIER { add-data-element organization-contact-person-email(1) }
DEFINITION Phone number of contact
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Organization-contact-person-email : : = IA5String (SIZE(1..20))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Organization-contact-person-name

DEFINITION
Contact person or office

ASN.1 REPRESENTATION
organization-contact-person-name ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “Organization.Organization-contact-person-name:txt”
ASN-NAME “Organization-contact-person-name”
ASN-OBJECT-IDENTIFIER { add-data-element organization-contact-person-name(1) }
DEFINITION Contact person or office
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Organization-contact-person-name : : = IA5String (SIZE(1..100))
“

FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Organization-contact-person-phone-number

DEFINITION
E-mail address of contact

ASN.1 REPRESENTATION
organization-contact-person-phone-number ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “Organization.Organization-contact-person-phone-number:txt”
ASN-NAME “Organization-contact-person-phone-number”
ASN-OBJECT-IDENTIFIER { add-data-element organization-contact-person-phone-number(1) }
DEFINITION E-mail address of contact
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Organization-contact-person-phone-number : : = IA5String (SIZE(1..100))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Organization-contact-person-state

DEFINITION
State, FIPS two-letter State alpha code

ASN.1 REPRESENTATION
organization-contact-person-state ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “Organization.Organization-contact-person-state:cd”
ASN-NAME “Organization-contact-person-state”
ASN-OBJECT-IDENTIFIER { add-data-element organization-contact-person-state(1) }
DEFINITION State, FIPS two-letter State alpha code
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Organization-contact-person-state : : = ENUMERATED {
see FIPS PUB 5-2 (http:,
www.itl.nist.gov,
fipspubs,
fip5-2.htm)
…
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Organization-contact-person-zipcode

DEFINITION
Zip or postal code of agency

ASN.1 REPRESENTATION
organization-contact-person-zipcode ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “Organization.Organization-contact-person-zipcode:nbr”
ASN-NAME “Organization-contact-person-zipcode”
ASN-OBJECT-IDENTIFIER { add-data-element organization-contact-person-zipcode(1) }
DEFINITION Zip or postal code of agency
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Organization-contact-person-zipcode : : = IA5String (SIZE(1..10))
“

FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Organization-county

DEFINITION
FIPS code for the agency’s county, null if statewide

ASN.1 REPRESENTATION
organization-county ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “Organization.Organization-county:cd”
ASN-NAME “Organization-county”
ASN-OBJECT-IDENTIFIER { add-data-element organization-county(1) }
DEFINITION FIPS code for the agency’s county, null if statewide
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Organization-county : : = ENUMERATED {
see FIPS PUB 5-4 http:,
www.itl.nist.gov,
fipspubs,
fip6-4.htm
…
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Organization-function

DEFINITION
A textual description of the function of an organization (transportation, emergency management, public safety, etc.) within a region.

ASN.1 REPRESENTATION
organization-function ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “Organization.Organization-function:txt”
ASN-NAME “Organization-function”
ASN-OBJECT-IDENTIFIER { add-data-element organization-function(1) }
DEFINITION A textual description of the function of an organization
(transportation, emergency management, public safety, etc.) within a region.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Organization-function : : = IA5String (SIZE(1..256))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Organization-identification

DEFINITION
(defined above)

ASN.1 REPRESENTATION
organization-identification ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “Organization.Organization-identification:cd”
ASN-NAME “Organization-identification”
ASN-OBJECT-IDENTIFIER { add-data-element organization-identification(1) }
DEFINITION (defined above)
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “

Organization-identification : : = INTEGER (1..256)
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Organization-parent-agency

DEFINITION
If this is a part of a larger agency, put the AgencyID of the parent agency in this field. Otherwise, leave it null.

ASN.1 REPRESENTATION
organization-parent-agency ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “Organization.Organization-parent-agency:txt”
ASN-NAME “Organization-parent-agency”
ASN-OBJECT-IDENTIFIER { add-data-element organization-parent-agency(1) }
DEFINITION If this is a part of a larger agency, put the AgencyID of the parent agency in this field. Otherwise, leave it null.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Organization-parent-agency : : = IA5String (SIZE(1..256))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Organization-server-owner

DEFINITION
“Y” if this agency owns the archive server, “N” otherwise

ASN.1 REPRESENTATION
organization-server-owner ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “Organization.Organization-server-owner:txt”
ASN-NAME “Organization-server-owner”
ASN-OBJECT-IDENTIFIER { add-data-element organization-server-owner(1) }
DEFINITION “Y” if this agency owns the archive server, “N” otherwise
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Organization-server-owner : : = ENUMERATED {
Y(1),
N(2)}
...
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Organization-state

DEFINITION
FIPS State numeric code for the agency’s state

ASN.1 REPRESENTATION
organization-state ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “Organization.Organization-state:cd”
ASN-NAME “Organization-state”
ASN-OBJECT-IDENTIFIER { add-data-element organization-state(1) }
DEFINITION FIPS State numeric code for the agency’s state
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “

Organization-state : : = ENUMERATED {
see FIPS PUB 5-2 (http:,
www.itl.nist.gov,
fipspubs,
fip5-2.htm)
…
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Organization

DEFINITION
Name of the traffic management center associated with this organization.

ASN.1 REPRESENTATION
organization ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “Organization:organization-center-name:txt”
ASN-NAME “Organization”
ASN-OBJECT-IDENTIFIER { add-data-element organization(1) }
DEFINITION Name of the traffic management center associated with this organization.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Organization : : = IA5String (SIZE(1..256))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

GPS-metric-instantaneous-speed

DEFINITION
Instantaneous speed measurement from an onboard probe vehicle monitoring system

ASN.1 REPRESENTATION
gps-metric-instantaneous-speed ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “ProbeVehicle.GPS-metric-instantaneous-speed:rt”
ASN-NAME “GPS-metric-instantaneous-speed”
ASN-OBJECT-IDENTIFIER { add-data-element gps-metric-instantaneous-speed(1) }
DEFINITION Instantaneous speed measurement from an onboard probe vehicle monitoring system
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
GPS-metric-instantaneous-speed : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Miles per Hour”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

GPS-metric-quality-control

DEFINITION
Locally-defined QC code, documented in archive metadata.

ASN.1 REPRESENTATION
gps-metric-quality-control ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “ProbeVehicle.GPS-metric-quality-control:cd”
ASN-NAME “GPS-metric-quality-control”
ASN-OBJECT-IDENTIFIER { add-data-element gps-metric-quality-control(1) }
DEFINITION Locally-defined QC code, documented in archive metadata.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”

DATA TYPE “
GPS-metric-quality-control : : = INTEGER (1..100)
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

GPS-metric-time

DEFINITION
Date/time of the measurement

ASN.1 REPRESENTATION
gps-metric-time ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “ProbeVehicle.GPS-metric-time:utc”
ASN-NAME “GPS-metric-time”
ASN-OBJECT-IDENTIFIER { add-data-element gps-metric-time(1) }
DEFINITION Date/time of the measurement
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
GPS-metric-time : : = UTCTime
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Location-latitude

DEFINITION
This is the latitude of the probe vehicle location with the north hemisphere assumed and decimal place understood as XX.XXX XXX.

ASN.1 REPRESENTATION
location-latitude ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “ProbeVehicle.Location-latitude:qty”
ASN-NAME “Location-latitude”
ASN-OBJECT-IDENTIFIER { add-data-element location-latitude(1) }
DEFINITION This is the latitude of the probe vehicle location with the north hemisphere assumed and decimal place understood as XX.XXX XXX.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Location-latitude : : = IA5String (SIZE(1..10))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Location-longitude

DEFINITION
This is the longitude of the probe vehicle location with the west hemisphere assumed and decimal place understood as XXX.XXX XXX.

ASN.1 REPRESENTATION
location-longitude ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “ProbeVehicle.Location-longitude:qty”
ASN-NAME “Location-longitude”
ASN-OBJECT-IDENTIFIER { add-data-element location-longitude(1) }
DEFINITION This is the longitude of the probe vehicle location with the west hemisphere assumed and decimal place understood as XXX.XXX XXX.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Location-longitude : : = IA5String (SIZE(1..10))

“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Vehicle-identifier

DEFINITION
Unique Identifier for an individual probe vehicle; assumed to be private and anonymous

ASN.1 REPRESENTATION
vehicle-identifier ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “ProbeVehicle.Vehicle-identifier:id”
ASN-NAME “Vehicle-identifier”
ASN-OBJECT-IDENTIFIER { add-data-element vehicle-identifier(1) }
DEFINITION Unique Identifier for an individual probe vehicle; assumed to be private and anonymous
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Vehicle-identifier : : = IA5String (SIZE(1..15))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Corresponding-segment-sequence-number

DEFINITION
The sequential order of the lower level segments that are used to construct the section

ASN.1 REPRESENTATION
corresponding-segment-sequence-number ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “TrafficSegment.Corresponding-segment-sequence-number:nbr”
ASN-NAME “Corresponding-segment-sequence-number”
ASN-OBJECT-IDENTIFIER { add-data-element corresponding-segment-sequence-number(1) }
DEFINITION The sequential order of the lower level segments that are used to construct the section
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Corresponding-segment-sequence-number : : = INTEGER (1..100)
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Corresponding-segment-type

DEFINITION
The type of lower level segment from which the section is constructed

ASN.1 REPRESENTATION
corresponding-segment-type ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “TrafficSegment.Corresponding-segment-type:cd”
ASN-NAME “Corresponding-segment-type”
ASN-OBJECT-IDENTIFIER { add-data-element corresponding-segment-type(1) }
DEFINITION The type of lower level segment from which the section is constructed
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Corresponding-segment-type : : = ENUMERATED {
Detector section (1),
Link (2)
…

}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Link-identifier

DEFINITION
Link identification

ASN.1 REPRESENTATION
link-identifier ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “TrafficSegment.Link-identifier:id”
ASN-NAME “Link-identifier”
ASN-OBJECT-IDENTIFIER { add-data-element link-identifier(1) }
DEFINITION Link identification
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Link-identifier : : = IA5String (SIZE(1..10))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-probe-vehicle-number-of-vehicles

DEFINITION
Used when summarizing link statistics

ASN.1 REPRESENTATION
metric-probe-vehicle-number-of-vehicles ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “TrafficSegment.Metric-probe-vehicle-number-of-vehicles:qty”
ASN-NAME “Metric-probe-vehicle-number-of-vehicles”
ASN-OBJECT-IDENTIFIER { add-data-element metric-probe-vehicle-number-of-vehicles(1) }
DEFINITION Used when summarizing link statistics
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-probe-vehicle-number-of-vehicles : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-probe-vehicle-number-stops

DEFINITION
Number of stops on a link for a probe vehicle

ASN.1 REPRESENTATION
metric-probe-vehicle-number-stops ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “TrafficSegment.Metric-probe-vehicle-number-stops:qty”
ASN-NAME “Metric-probe-vehicle-number-stops”
ASN-OBJECT-IDENTIFIER { add-data-element metric-probe-vehicle-number-stops(1) }
DEFINITION Number of stops on a link for a probe vehicle
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-probe-vehicle-number-stops : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-probe-vehicle-stop-delay

DEFINITION
Total delay resulting from stops

ASN.1 REPRESENTATION
metric-probe-vehicle-stop-delay ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “TrafficSegment.Metric-probe-vehicle-stop-delay:qty”
ASN-NAME “Metric-probe-vehicle-stop-delay”
ASN-OBJECT-IDENTIFIER { add-data-element metric-probe-vehicle-stop-delay(1) }
DEFINITION Total delay resulting from stops
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-probe-vehicle-stop-delay : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Hours”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-queue-length-maximum

DEFINITION
A count of the maximum number of vehicles in queue.

ASN.1 REPRESENTATION
metric-queue-length-maximum ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “TrafficSegment.Metric-queue-length-maximum:qty”
ASN-NAME “Metric-queue-length-maximum”
ASN-OBJECT-IDENTIFIER { add-data-element metric-queue-length-maximum(1) }
DEFINITION A count of the maximum number of vehicles in queue.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-queue-length-maximum : : = INTEGER (1..20000)
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Vehicles”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-roadway-density

DEFINITION
Vehicle concentration per mile on the traffic segment

ASN.1 REPRESENTATION
metric-roadway-density ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “TrafficSegment.Metric-roadway-density:qty”
ASN-NAME “Metric-roadway-density”
ASN-OBJECT-IDENTIFIER { add-data-element metric-roadway-density(1) }
DEFINITION Vehicle concentration per mile on the traffic segment
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-roadway-density : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-travel-time-derived

DEFINITION

Derived travel times computed from spot speed measurements from roadway-based devices.

ASN.1 REPRESENTATION
metric-travel-time-derived ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “TrafficSegment.Metric-travel-time-derived:qty”
ASN-NAME “Metric-travel-time-derived”
ASN-OBJECT-IDENTIFIER { add-data-element metric-travel-time-derived(1) }
DEFINITION Derived travel times computed from spot speed measurements from roadway-based devices.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-travel-time-derived : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Minutes”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-travel-time-direct

DEFINITION
Direct measurements of travel times taken from the passage of vehicles over a highway distance;

ASN.1 REPRESENTATION
metric-travel-time-direct ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “TrafficSegment.Metric-travel-time-direct:qty”
ASN-NAME “Metric-travel-time-direct”
ASN-OBJECT-IDENTIFIER { add-data-element metric-travel-time-direct(1) }
DEFINITION Direct measurements of travel times taken from the passage of vehicles over a highway distance;
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-travel-time-direct : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Minutes”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-travel-time-standard-deviation

DEFINITION
Standard deviation of travel time for all measurements over a link

ASN.1 REPRESENTATION
metric-travel-time-standard-deviation ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “TrafficSegment.Metric-travel-time-standard-deviation:qty”
ASN-NAME “Metric-travel-time-standard-deviation”
ASN-OBJECT-IDENTIFIER { add-data-element metric-travel-time-standard-deviation(1) }
DEFINITION Standard deviation of travel time for all measurements over a link
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-travel-time-standard-deviation : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Minutes”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-vehicle-delay

DEFINITION
Delay time for travel along a particular traffic segment. This is additional time it will take above the free flow travel time for that time period to travel from one end of the traffic segment to the other.

ASN.1 REPRESENTATION
metric-vehicle-delay ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “TrafficSegment.Metric-vehicle-delay:qty”
ASN-NAME “Metric-vehicle-delay”
ASN-OBJECT-IDENTIFIER { add-data-element metric-vehicle-delay(1) }
DEFINITION Delay time for travel along a particular traffic segment. This is additional time it will take above the free flow travel time for that time period to travel from one end of the traffic segment to the other.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-vehicle-delay : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Hours”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-vehicle-hours-of-travel

DEFINITION
The number of hours it takes all vehicles to traverse a traffic segment in a given time period

ASN.1 REPRESENTATION
metric-vehicle-hours-of-travel ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “TrafficSegment.Metric-vehicle-hours-of-travel:qty”
ASN-NAME “Metric-vehicle-hours-of-travel”
ASN-OBJECT-IDENTIFIER { add-data-element metric-vehicle-hours-of-travel(1) }
DEFINITION The number of hours it takes all vehicles to traverse a traffic segment in a given time period
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-vehicle-hours-of-travel : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Vehicle-hours”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-vehicle-miles-traveled-daily

DEFINITION
DVMT is computed by multiplying the length of a traffic segment in miles by its AADT.

ASN.1 REPRESENTATION
metric-vehicle-miles-traveled-daily ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “TrafficSegment.Metric-vehicle-miles-traveled-daily:qty”
ASN-NAME “Metric-vehicle-miles-traveled-daily”
ASN-OBJECT-IDENTIFIER { add-data-element metric-vehicle-miles-traveled-daily(1) }
DEFINITION DVMT is computed by multiplying the length of a traffic segment in miles by its AADT.
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-vehicle-miles-traveled-daily : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Metric-vehicle-miles-traveled

DEFINITION
VMT is computed by multiplying the length of a traffic segment in miles by a traffic volume statistic. The time period for the estimate should be specified in the

StartDateTime and EndDateTime columns of the associated TRAFFIC_MEASUREMENT or TRAFFIC_MEAS

ASN.1 REPRESENTATION
metric-vehicle-miles-traveled ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “TrafficSegment.Metric-vehicle-miles-traveled:qty”
ASN-NAME “Metric-vehicle-miles-traveled”
ASN-OBJECT-IDENTIFIER { add-data-element metric-vehicle-miles-traveled(1) }
DEFINITION
VMT is computed by multiplying the length of a traffic segment in miles by a traffic volume statistic. The time period for the estimate should be specified in the StartDateTime and EndDateTime columns of the associated TRAFFIC_MEASUREMENT or TRAFFIC_MEAS
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Metric-vehicle-miles-traveled : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Network-trip-identifier

DEFINITION
Network trip identification

ASN.1 REPRESENTATION
network-trip-identifier ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “TrafficSegment.Network-trip-identifier:id”
ASN-NAME “Network-trip-identifier”
ASN-OBJECT-IDENTIFIER { add-data-element network-trip-identifier(1) }
DEFINITION Network trip identification
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Network-trip-identifier : : = IA5String (SIZE(1..10))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Section-identifier

DEFINITION
Section identifier

ASN.1 REPRESENTATION
section-identifier ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “TrafficSegment.Section-identifier:id”
ASN-NAME “Section-identifier”
ASN-OBJECT-IDENTIFIER { add-data-element section-identifier(1) }
DEFINITION Section identifier
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Section-identifier : : = INTEGER (1..10)
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Section-name

DEFINITION
Name of the section definition

ASN.1 REPRESENTATION
section-name ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “TrafficSegment.Section-name:txt”
ASN-NAME “Section-name”
ASN-OBJECT-IDENTIFIER { add-data-element section-name(1) }
DEFINITION Name of the section definition
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Section-name : : = IA5String (SIZE(1..128))
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Segment-free-flow-speed

DEFINITION
The speed of vehicles on the traffic segment under unimpeded and very low volume conditions

ASN.1 REPRESENTATION
segment-free-flow-speed ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME ″TrafficSegment.Segment-free-flow-speed:rt″
ASN-NAME ″Segment-free-flow-speed″
ASN-OBJECT-IDENTIFIER { add-data-element segment-free-flow-speed(1) }
DEFINITION The speed of vehicles on the traffic segment under unimpeded and very low volume conditions
DESCRIPTIVE-NAME-CONTEXT {″Archive Data″}
DATA-CONCEPT-TYPE data-element
STANDARD ″ADD″
DATA TYPE ″
Segment-free-flow-speed : : = IA5String (SIZE(1..99))
″
FORMAT ″ASN.1 encoding″
UNIT-OF-MEASURE ″Miles per hour″
VALID-VALUE-RULE ″See the ASN.1 DATA-TYPE″
}

Segment-length

DEFINITION
The length of the traffic segment from beginning Node to ending Node in meters

ASN.1 REPRESENTATION
segment-length ITS-DATA-ELEMENT : : = {
DESCRIPTIVE-NAME “TrafficSegment.Segment-length:qty”
ASN-NAME “Segment-length”
ASN-OBJECT-IDENTIFIER { add-data-element segment-length(1) }
DEFINITION The length of the traffic segment from beginning Node to ending Node in meters
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Segment-length : : = REAL
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “Miles”
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

Segment-type

DEFINITION
The designation of the section type

ASN.1 REPRESENTATION
segment-type ITS-DATA-ELEMENT : : = {

DESCRIPTIVE-NAME “TrafficSegment.Segment-type:cd”
ASN-NAME “Segment-type”
ASN-OBJECT-IDENTIFIER { add-data-element segment-type(1) }
DEFINITION The designation of the section type
DESCRIPTIVE-NAME-CONTEXT {“Archive Data”}
DATA-CONCEPT-TYPE data-element
STANDARD “ADD”
DATA TYPE “
Segment-type : : = ENUMERATED {
Freeway (1),
Arterial (2),
Collector (3),
Service-road (4),
Tunnel (5),
Detour (6),
Dedicated-link (7),
Military-road (8),
Railroad-link (9),
Air-link (10),
Ferry (11),
On-ramp (12),
Off-ramp (13),
Unknown (14),
Other (15)
…
}
“
FORMAT “ASN.1 encoding”
UNIT-OF-MEASURE “ “
VALID-VALUE-RULE “See the ASN.1 DATA-TYPE”
}

A3. DATA FRAMES

CrossSectionIntersectionDescription

DEFINITION
Information about the physical characteristics of an intersection

ASN.1 REPRESENTATION
crossSectionIntersectionDescription ITS-DATA-FRAME : : = {
DESCRIPTIVE-NAME ″CrossSectionIntersectionDescription:frame″
ASN-NAME ″CrossSectionIntersectionDescription″
ASN-OBJECT-IDENTIFIER { add-data-element crossSectionIntersectionDescription(1) }
DEFINITION ″Information about the physical characteristics of an intersection.″
DESCRIPTIVE-NAME-CONTEXT {″Archive Data″}
DATA-CONCEPT-TYPE data-frame
STANDARD ″ADD″
REFERENCED-DATA-ELEMENTS {
{ add-data-element intersection-identifier(1) },
{ add-data-element intersection-control-type(1) },
{ add-data-element intersection-number-legs(1) },
{ add-data-element start-date(1) },
{ add-data-element end-date(1) },
{ add-data-element effective-date(1) },
{ add-data-element expiration-date(1) },
}
DATA TYPE ″
CrossSectionIntersectionDescription :: SEQUENCE {
identifier Intersection-identifier,
control-type Intersection-control-type,
number-legs Intersection-number-legs,
date Start-date,
date End-date,
date Effective-date,
date Expiration-date,
}
″
}

CrossSectionLaneOperation

DEFINITION
Information about how the operating characteristics of a lane, including restrictions

ASN.1 REPRESENTATION

```
crossSectionLaneOperation ITS-DATA-FRAME ::= {
DESCRIPTIVE-NAME ″CrossSectionLaneOperation:frame″
ASN-NAME ″CrossSectionLaneOperation″
ASN-OBJECT-IDENTIFIER { add-data-element crossSectionLaneOperation(1) }
DEFINITION ″Information about how the operating characteristics of a lane,
including restrictions.″
DESCRIPTIVE-NAME-CONTEXT {″Archive Data″}
DATA-CONCEPT-TYPE data-frame
STANDARD ″ADD″
REFERENCED-DATA-ELEMENTS {
    { add-data-element lane-number(1) },
    { add-data-element lane-operation-type(1) },
    { add-data-element lane.operation-days(1) },
    { add-data-element lane-operation-begin-time(1) },
    { add-data-element lane-operation-end-time(1) },
    { add-data-element start-date(1) },
    { add-data-element end-date(1) },
    { add-data-element effective-date(1) },
    { add-data-element expiration-date(1) },
}
DATA TYPE ″
CrossSectionLaneOperation :: SEQUENCE {
    number Lane-number,
    operation-type Lane-operation-type,
    days Lane.operation-days,
    operation-begin-time Lane-operation-begin-time,
    operation-end-time Lane-operation-end-time,
    date Start-date,
    date End-date,
    date Effective-date,
    date Expiration-date,
}
″
}
```

CrossSectionMetrics

DEFINITION
Traffic measurements and statistics observed or created at the lowest temporal level of the original source data for a Cross Section entity

ASN.1 REPRESENTATION

```
crossSectionMetrics ITS-DATA-FRAME : : = {
DESCRIPTIVE-NAME ″CrossSectionMetrics:frame″
ASN-NAME ″CrossSectionMetrics″
ASN-OBJECT-IDENTIFIER { add-data-element crossSectionMetrics(1) }
DEFINITION ″Traffic measurements and statistics observed or created at the lowest
temporal level of the original source data for a Cross Section entity.″
DESCRIPTIVE-NAME-CONTEXT {″Archive Data″}
DATA-CONCEPT-TYPE data-frame
STANDARD ″ADD″
REFERENCED-DATA-ELEMENTS {
    { add-data-element roadway-identifier(1) },
    { add-data-element station-identifier(1) },
    { add-data-element lane-number(1) },
    { add-data-element binning-scheme-identifier(1) },
    { add-data-element binning-scheme-bin-number(1) },
    { add-data-element metric-type(1) },
    { add-data-element metric-quality-control(1) },
    { add-data-element metric-data-alteration(1) },
    { add-data-element metric-value(1) },
    { add-data-element metric-units(1) },
    { add-data-element start-date(1) },
    { add-data-element end-date(1) },
    { add-data-element effective-date(1) },
    { add-data-element expiration-date(1) },
}
```

```
DATA TYPE ″
CrossSectionMetrics :: SEQUENCE {
    identifier Roadway-identifier,
    identifier Station-identifier,
    number Lane-number,
    scheme-identifier Binning-scheme-identifier,
    scheme-bin-number Binning-scheme-bin-number,
    type Metric-type,
    quality-control Metric-quality-control,
    data-alteration Metric-data-alteration,
    value Metric-value,
    units Metric-units,
    date Start-date,
    date End-date,
    date Effective-date,
    date Expiration-date,
}
″
}
```

CrossSectionMetrics2

DEFINITION
Traffic measurements and statistics observed or created at the lowest temporal level of the original source data for a Cross Section entity (alternate design)

ASN.1 REPRESENTATION

```
crossSectionMetrics2 ITS-DATA-FRAME : : = {
DESCRIPTIVE-NAME ″CrossSectionMetrics2:frame″
ASN-NAME ″CrossSectionMetrics2″
ASN-OBJECT-IDENTIFIER { add-data-element crossSectionMetrics2(1) }
DEFINITION ″Traffic measurements and statistics observed or created at the lowest
temporal level of the original source data for a Cross Section entity (alternate
design).″
DESCRIPTIVE-NAME-CONTEXT {″Archive Data″}
DATA-CONCEPT-TYPE data-frame
STANDARD ″ADD″
REFERENCED-DATA-ELEMENTS {
    { add-data-element roadway-identifier(1) },
    { add-data-element station-identifier(1) },
    { add-data-element lane-number(1) },
    { add-data-element metric-traffic-volume(1) },
    { add-data-element metric-loop-occupancy(1) },
    { add-data-element metric-spot-speed-measured(1) },
    { add-data-element metric-spot-speed-derived(1) },
    { add-data-element metric-quality-control(1) },
    { add-data-element metric-data-alteration(1) },
    { add-data-element start-date(1) },
    { add-data-element end-date(1) },
    { add-data-element effective-date(1) },
    { add-data-element expiration-date(1) },
}
DATA TYPE ″
CrossSectionMetrics2 :: SEQUENCE {
    identifier Roadway-identifier,
    identifier Station-identifier,
    number Lane-number,
    traffic-volume Metric-traffic-volume,
    loop-occupancy Metric-loop-occupancy,
    spot-speed-measured Metric-spot-speed-measured,
    spot-speed-derived Metric-spot-speed-derived,
    quality-control Metric-quality-control,
    data-alteration Metric-data-alteration,
    date Start-date,
    date End-date,
    date Effective-date,
    date Expiration-date,
}
″
}
```

CrossSectionMetricsAggregated

DEFINITION

Temporally aggregated traffic measurements and statistics at a Cross Section entity

ASN.1 REPRESENTATION

```
crossSectionMetricsAggregated ITS-DATA-FRAME ::= {
DESCRIPTIVE-NAME ″CrossSectionMetricsAggregated:frame″
ASN-NAME ″CrossSectionMetricsAggregated″
ASN-OBJECT-IDENTIFIER { add-data-element crossSectionMetricsAggregated(1) }
DEFINITION ″Temporally aggregated traffic measurements and statistics at a Cross
Section entity.″
DESCRIPTIVE-NAME-CONTEXT {″Archive Data″}
DATA-CONCEPT-TYPE data-frame
STANDARD ″ADD″
REFERENCED-DATA-ELEMENTS {
    { add-data-element roadway-identifier(1) },
    { add-data-element station-identifier(1) },
    { add-data-element lane-number(1) },
    { add-data-element binning-scheme-identifier(1) },
    { add-data-element binning-scheme-bin-number(1) },
    { add-data-element metric-type(1) },
    { add-data-element metric-quality-control(1) },
    { add-data-element metric-imputation(1) },
    { add-data-element metric-value(1) },
    { add-data-element metric-units(1) },
    { add-data-element metric-aggregated-standard-deviation(1) },
    { add-data-element metric-aggregated-minimum-value(1) },
    { add-data-element metric-aggregated-maximum-value(1) },
    { add-data-element metric-number-valid-records(1) },
    { add-data-element metric-number-total-records(1) },
    { add-data-element start-date(1) },
    { add-data-element end-date(1) },
    { add-data-element effective-date(1) },
}
DATA TYPE ″
CrossSectionMetricsAggregated :: SEQUENCE {
    identifier Roadway-identifier,
    identifier Station-identifier,
    number Lane-number,
    scheme-identifier Binning-scheme-identifier,
    scheme-bin-number Binning-scheme-bin-number,
    type Metric-type,
    quality-control Metric-quality-control,
    imputation Metric-imputation,
    value Metric-value,
    units Metric-units,
    aggregated-standard-deviation Metric-aggregated-standard-deviation,
    aggregated-minimum-value Metric-aggregated-minimum-value,
    aggregated-maximum-value Metric-aggregated-maximum-value,
    number-valid-records Metric-number-valid-records,
    number-total-records Metric-number-total-records,
    date Start-date,
    date End-date,
    date Effective-date,
}
″
}
```

CrossSectionMetricsAggregated2

DEFINITION

Temporally aggregated traffic measurements and statistics at a Cross Section entity (alternate design)

ASN.1 REPRESENTATION

```
crossSectionMetricsAggregated2 ITS-DATA-FRAME ::= {
DESCRIPTIVE-NAME ″CrossSectionMetricsAggregated2:frame″
ASN-NAME ″CrossSectionMetricsAggregated2″
ASN-OBJECT-IDENTIFIER { add-data-element crossSectionMetricsAggregated2(1) }
DEFINITION ″Temporally aggregated traffic measurements and statistics at a Cross
Section entity (alternate design).″
DESCRIPTIVE-NAME-CONTEXT {″Archive Data″}
DATA-CONCEPT-TYPE data-frame
STANDARD ″ADD″
REFERENCED-DATA-ELEMENTS {
    { add-data-element roadway-identifier(1) },
    { add-data-element station-identifier(1) },
    { add-data-element lane-number(1) },
```

```
    { add-data-element  metric-traffic-volume(1)  },
    { add-data-element  metric-loop-occupancy(1)  },
    { add-data-element  metric-spot-speed-measured(1)  },
    { add-data-element  metric-spot-speed-derived(1)  },
    { add-data-element  metric-quality-control(1)  },
    { add-data-element  metric-imputation(1)  },
    { add-data-element  metric-number-valid-records(1)  },
    { add-data-element  metric-number-total-records(1)  },
    { add-data-element  start-date(1)  },
    { add-data-element  end-date(1)  },
    { add-data-element  effective-date(1)  },
}
DATA TYPE ″
CrossSectionMetricsAggregated2  ::  SEQUENCE {
    identifier Roadway-identifier,
    identifier Station-identifier,
    number Lane-number,
    traffic-volume Metric-traffic-volume,
    loop-occupancy Metric-loop-occupancy,
    spot-speed-measured Metric-spot-speed-measured,
    spot-speed-derived Metric-spot-speed-derived,
    quality-control Metric-quality-control,
    imputation Metric-imputation,
    number-valid-records Metric-number-valid-records,
    number-total-records Metric-number-total-records,
    date Start-date,
    date End-date,
    date Effective-date,
}
″
}
```

CrossSectionRoadwayDescription

DEFINITION

″ROADWAYs″ are bi-directional (exept for one-way roadways) and represent a line across the roadway, perpendicular to its direction. The ″line″ can be offset at different lanes or directions as long as there are no traffic generators between two segments.

ASN.1 REPRESENTATION

```
crossSectionRoadwayDescription ITS-DATA-FRAME ::= {
DESCRIPTIVE-NAME ″CrossSectionRoadwayDescription:frame″
ASN-NAME ″CrossSectionRoadwayDescription″
ASN-OBJECT-IDENTIFIER  {  add-data-element crossSectionRoadwayDescription(1)  }
DEFINITION
″″ROADWAYs″ are bi-directional (exept for one-way roadways)  and represent a line
across the roadway, perpendicular to its direction. The ″line″ can be offset at
different lanes or directions as long as there are no traffic generators between two
segments.
.″
DESCRIPTIVE-NAME-CONTEXT  {″Archive Data″}
DATA-CONCEPT-TYPE data-frame
STANDARD ″ADD″
REFERENCED-DATA-ELEMENTS  {
    { add-data-element  roadway-identifier(1)  },
    { add-data-element  organization-identification(1)  },
    { add-data-element  roadway-route-signing(1)  },
    { add-data-element  roadway-route-qualifier(1)  },
    { add-data-element  roadway-route-number(1)  },
    { add-data-element  roadway-functional-class(1)  },
    { add-data-element  start-date(1)  },
    { add-data-element  end-date(1)  },
    { add-data-element  effective-date(1)  },
    { add-data-element  expiration-date(1)  },
}
DATA TYPE ″
CrossSectionRoadwayDescription  ::  SEQUENCE {
    roadway Roadway-identifier,
    agency Organization-identification,
    signing Roadway-route-signing,
    qualifier Roadway-route-qualifier,
    number Roadway-route-number,
    class Roadway-functional-class,
    date Start-date,
    date End-date,
```

```
    date Effective-date,
    date Expiration-date,
}
″
}
```

CrossSectionStationContext

DEFINITION
Additional information about the geometric or other situational charactersitics at a Station location

ASN.1 REPRESENTATION

```
crossSectionStationContext ITS-DATA-FRAME ::= {
DESCRIPTIVE-NAME ″CrossSectionStationContext:frame″
ASN-NAME ″CrossSectionStationContext″
ASN-OBJECT-IDENTIFIER { add-data-element crossSectionStationContext(1) }
DEFINITION ″Additional information about the geometric or other situational
charactersitics at a Station location.″
DESCRIPTIVE-NAME-CONTEXT {″Archive Data″}
DATA-CONCEPT-TYPE data-frame
STANDARD ″ADD″
REFERENCED-DATA-ELEMENTS {
    { add-data-element station-identifier(1) },
    { add-data-element station-context-geometric-feature-type(1) },
    { add-data-element station-context-geometric-feature-description(1) },
    { add-data-element station-context-geometric-feature-offset-distance(1) },
    { add-data-element start-date(1) },
    { add-data-element end-date(1) },
    { add-data-element effective-date(1) },
    { add-data-element expiration-date(1) },
}
DATA TYPE ″
CrossSectionStationContext :: SEQUENCE {
    identifier Station-identifier,
    context-geometric-feature-type Station-context-geometric-feature-type,
    context-geometric-feature-description Station-context-geometric-feature-description,
    context-geometric-feature-offset-distance Station-context-geometric-feature-offset-distance,
    date Start-date,
    date End-date,
    date Effective-date,
    date Expiration-date,
}
″
}
```

CrossSectionStationDescription

DEFINITION
″STATIONs″ are preferably uni-directional; can include both directions simultaneously (e.g., 2-lane highways)

ASN.1 REPRESENTATION

```
crossSectionStationDescription ITS-DATA-FRAME ::= {
DESCRIPTIVE-NAME ″CrossSectionStationDescription:frame″
ASN-NAME ″CrossSectionStationDescription″
ASN-OBJECT-IDENTIFIER { add-data-element crossSectionStationDescription(1) }
DEFINITION ″″STATIONs″ are preferably uni-directional; can include both directions
simultaneously (e.g., 2-lane highways).″
DESCRIPTIVE-NAME-CONTEXT {″Archive Data″}
DATA-CONCEPT-TYPE data-frame
STANDARD ″ADD″
REFERENCED-DATA-ELEMENTS {
    { add-data-element roadway-identifier(1) },
    { add-data-element station-identifier(1) },
    { add-data-element traffic-direction(1) },
    { add-data-element station-through-lanes(1) },
    { add-data-element station-auxiliary-lanes(1) },
    { add-data-element station-lanes-detectorized(1) },
    { add-data-element station-classfication-system-classes(1) },
    { add-data-element station-classfication-system-type(1) },
    { add-data-element beginning-linear-reference-point(1) },
    { add-data-element hpms-location-referencing-system-identifier(1) },
    { add-data-element hpms-location-referencing-system-point(1) },
```

```
    { add-data-element station-longitude(1) },
    { add-data-element station-latitude(1) },
    { add-data-element station-hpms-sample-identifier(1) },
    { add-data-element start-date(1) },
    { add-data-element end-date(1) },
    { add-data-element effective-date(1) },
    { add-data-element expiration-date(1) },
}
DATA TYPE ″
CrossSectionStationDescription :: SEQUENCE {
    roadway Roadway-identifier,
    station Station-identifier,
    direction Traffic-direction,
    through-lanes Station-through-lanes,
    auxiliary-lanes Station-auxiliary-lanes,
    detectorized-lanes Station-lanes-detectorized,
    class-system Station-classfication-system-classes,
    class-system-type Station-classfication-system-type,
    linear-reference-point Beginning-linear-reference-point,
    LRS-id HPMS-location-referencing-system-identifier,
    LRS-milepoint HPMS-location-referencing-system-point OPTIONAL,
    longitude Station-longitude,
    latitude Station-latitude,
    HPMS-sample-id Station-HPMS-sample-identifier,
    date Start-date,
    date End-date,
    date Effective-date,
    date Expiration-date,
}
″
}
```

CrossSectionStationGeometry

DEFINITION
Information about the highway geometric characteristics at a Station location

ASN.1 REPRESENTATION

```
crossSectionStationGeometry ITS-DATA-FRAME ::= {
DESCRIPTIVE-NAME ″CrossSectionStationGeometry:frame″
ASN-NAME ″CrossSectionStationGeometry″
ASN-OBJECT-IDENTIFIER { add-data-element crossSectionStationGeometry(1) }
DEFINITION ″Information about the highway geometric characteristics at a Station
location.″
DESCRIPTIVE-NAME-CONTEXT {″Archive Data″}
DATA-CONCEPT-TYPE data-frame
STANDARD ″ADD″
REFERENCED-DATA-ELEMENTS {
    { add-data-element station-identifier(1) },
    { add-data-element station-median-type(1) },
    { add-data-element station-median-width(1) },
    { add-data-element station-left-shoulder-width(1) },
    { add-data-element station-right-shoulder-width(1) },
    { add-data-element station-roadway-grade(1) },
    { add-data-element station-ramp-relationship(1) },
    { add-data-element station-auxiliary-lane-relationship(1) },
    { add-data-element start-date(1) },
    { add-data-element end-date(1) },
    { add-data-element effective-date(1) },
    { add-data-element expiration-date(1) },
}
DATA TYPE ″
CrossSectionStationGeometry :: SEQUENCE {
    identifier Station-identifier,
    median-type Station-median-type,
    median-width Station-median-width,
    left-shoulder-width Station-left-shoulder-width,
    right-shoulder-width Station-right-shoulder-width,
    roadway-grade Station-roadway-grade,
    ramp-relationship Station-ramp-relationship,
    auxiliary-lane-relationship Station-auxiliary-lane-relationship,
    date Start-date,
    date End-date,
    date Effective-date,
    date Expiration-date,
```

}
″
}

CrossSectionStationLocationReferencing

DEFINITION
Alternate location referencing for a Station location

ASN.1 REPRESENTATION
```
crossSectionStationLocationReferencing ITS-DATA-FRAME ::= {
DESCRIPTIVE-NAME ″CrossSectionStationLocationReferencing:frame″
ASN-NAME ″CrossSectionStationLocationReferencing″
ASN-OBJECT-IDENTIFIER { add-data-element crossSectionStationLocationReferencing(1) }
DEFINITION ″Alternate location referencing for a Station location.″
DESCRIPTIVE-NAME-CONTEXT {″Archive Data″}
DATA-CONCEPT-TYPE data-frame
STANDARD ″ADD″
REFERENCED-DATA-ELEMENTS {
    { add-data-element station-identifier(1) },
    { add-data-element location-referencing-system(1) },
    { add-data-element station-location-referencing-system-value1(1) },
    { add-data-element station-location-referencing-system-value2(1) },
    { add-data-element station-location-referencing-system-value3(1) },
    { add-data-element station-location-referencing-system-value4(1) },
    { add-data-element station-location-referencing-system-value5(1) },
    { add-data-element station-location-referencing-system-value6(1) },
    { add-data-element effective-date(1) },
    { add-data-element expiration-date(1) },
}
DATA TYPE ″
CrossSectionStationLocationReferencing :: SEQUENCE {
    identifier Station-identifier,
    referencing-system Location-referencing-system,
    location-referencing-system-value1 Station-location-referencing-system-value1,
    location-referencing-system-value2 Station-location-referencing-system-value2
OPTIONAL,
    location-referencing-system-value3 Station-location-referencing-system-value3
OPTIONAL,
    location-referencing-system-value4 Station-location-referencing-system-value4
OPTIONAL,
    location-referencing-system-value5 Station-location-referencing-system-value5
OPTIONAL,
    location-referencing-system-value6 Station-location-referencing-system-value6
OPTIONAL,
    date Effective-date,
    date Expiration-date,
}
″
}
```

CrossSectionTrafficMetricsSummaryAnnual

DEFINITION
Commonly used traffic annually-aggregated statistics for the Station and Roadway Cross Section entities

ASN.1 REPRESENTATION
```
crossSectionTrafficMetricsSummaryAnnual ITS-DATA-FRAME ::= {
DESCRIPTIVE-NAME ″CrossSectionTrafficMetricsSummaryAnnual:frame″
ASN-NAME ″CrossSectionTrafficMetricsSummaryAnnual″
ASN-OBJECT-IDENTIFIER { add-data-element crossSectionTrafficMetricsSummaryAnnual(1) }
DEFINITION ″Commonly used traffic annually-aggregated statistics for the Station
and Roadway Cross Section entities.″
DESCRIPTIVE-NAME-CONTEXT {″Archive Data″}
DATA-CONCEPT-TYPE data-frame
STANDARD ″ADD″
REFERENCED-DATA-ELEMENTS {
    { add-data-element roadway-identifier(1) },
    { add-data-element station-identifier(1) },
    { add-data-element metric-annual-average-days-of-the-week(1) },
    { add-data-element metric-annual-average-daily-traffic(1) },
    { add-data-element metric-annual-average-weekday-traffic(1) },
    { add-data-element metric-annual-average-weekend-traffic(1) },
```

```
    { add-data-element  metric-annual-average-weekday-hourly-traffic(1) },
    { add-data-element  metric-annual-average-weekend-hourly-traffic(1) },
    { add-data-element  metric-50th-percentile-speed(1) },
    { add-data-element  metric-85th-percentile-speed(1) },
    { add-data-element  metric-speed-standard-deviation(1) },
    { add-data-element  metric-annual-average-hourly-days-of-the-week(1) },
    { add-data-element  metric-annual-average-daily-hourly-traffic(1) },
    { add-data-element  metric-annual-average-weekend-hourly-traffic(1) },
    { add-data-element  metric-design-hour-volume-factor(1) },
    { add-data-element  metric-design-hour-directional-volume(1) },
    { add-data-element  metric-lane.distribution(1) },
    { add-data-element  metric-single-unit-trucks(1) },
    { add-data-element  metric-single-unit-trucks(1) },
    { add-data-element  metric-combination-trucks(1) },
    { add-data-element  metric-combination-trucks(1) },
    { add-data-element  metric-speed-congested(1) },
    { add-data-element  start-date(1) },
    { add-data-element  end-date(1) },
    { add-data-element  effective-date(1) },
    { add-data-element  expiration-date(1) },
}
DATA TYPE ″
CrossSectionTrafficMetricsSummaryAnnual :: SEQUENCE {
    identifier Roadway-identifier,
    identifier Station-identifier,
    annual-average-days-of-the-week Metric-annual-average-days-of-the-week,
    annual-average-daily-traffic Metric-annual-average-daily-traffic,
    annual-average-weekday-traffic Metric-annual-average-weekday-traffic,
    annual-average-weekend-traffic Metric-annual-average-weekend-traffic,
    annual-average-weekday-hourly-traffic Metric-annual-average-weekday-hourly-traffic,
    annual-average-weekend-hourly-traffic Metric-annual-average-weekend-hourly-traffic,
    50th-percentile-speed Metric-50th-percentile-speed,
    85th-percentile-speed Metric-85th-percentile-speed,
    speed-standard-deviation Metric-speed-standard-deviation,
    annual-average-hourly-days-of-the-week Metric-annual-average-hourly-days-of-the-week,
    annual-average-daily-hourly-traffic Metric-annual-average-daily-hourly-traffic,
    annual-average-weekend-hourly-traffic Metric-annual-average-weekend-hourly-traffic,
    design-hour-volume-factor Metric-design-hour-volume-factor,
    design-hour-directional-volume Metric-design-hour-directional-volume,
    lane.distribution Metric-lane.distribution,
    single-unit-trucks Metric-single-unit-trucks,
    single-unit-trucks Metric-single-unit-trucks,
    combination-trucks Metric-combination-trucks,
    combination-trucks Metric-combination-trucks,
    speed-congested Metric-speed-congested,
    date Start-date,
    date End-date,
    date Effective-date,
    date Expiration-date,
}
″
}
```

CrossSectionTrafficMetricsSummaryMonthly

DEFINITION

Commonly used traffic monthly-aggregated statistics for the Station and Roadway Cross Section entities

ASN.1 REPRESENTATION

```
crossSectionTrafficMetricsSummaryMonthly ITS-DATA-FRAME : : = {
DESCRIPTIVE-NAME ″CrossSectionTrafficMetricsSummaryMonthly:frame″
ASN-NAME ″CrossSectionTrafficMetricsSummaryMonthly″
ASN-OBJECT-IDENTIFIER { add-data-element crossSectionTrafficMetricsSummaryMonthly(1) }
DEFINITION ″Commonly used traffic monthly-aggregated statistics for the Station and
Roadway Cross Section entities.″
DESCRIPTIVE-NAME-CONTEXT {″Archive Data″}
DATA-CONCEPT-TYPE data-frame
STANDARD ″ADD″
REFERENCED-DATA-ELEMENTS {
    { add-data-element  roadway-identifier(1) },
    { add-data-element  station-identifier(1) },
    { add-data-element  metric-monthly-average-days-of-the-week(1) },
    { add-data-element  metric-monthly-average-daily-traffic(1) },
    { add-data-element  metric-monthly-average-weekday-traffic(1) },
    { add-data-element  metric-monthly-average-weekend-traffic(1) },
    { add-data-element  metric-monthly-average-hourly-days-of-the-week(1) },
```

```
    { add-data-element  metric-monthly-average-hourly-daily-traffic(1) },
    { add-data-element  metric-monthly-average-weekday-hourly-traffic(1) },
    { add-data-element  metric-monthly-average-weekend-hourly-traffic(1) },
    { add-data-element  metric-monthly-average-hourly-days-of-the-week(1) },
    { add-data-element  metric-monthly-average-hourly-daily-traffic(1) },
    { add-data-element  metric-monthly-average-weekday-hourly-traffic(1) },
    { add-data-element  metric-monthly-average-weekend-hourly-traffic(1) },
    { add-data-element  start-date(1) },
    { add-data-element  end-date(1) },
    { add-data-element  effective-date(1) },
    { add-data-element  expiration-date(1) },
}
DATA TYPE ″
CrossSectionTrafficMetricsSummaryMonthly :: SEQUENCE {
    identifier Roadway-identifier,
    identifier Station-identifier,
    monthly-average-days-of-the-week Metric-monthly-average-days-of-the-week,
    monthly-average-daily-traffic Metric-monthly-average-daily-traffic,
    monthly-average-weekday-traffic Metric-Monthly-average-weekday-traffic,
    monthly-average-weekend-traffic Metric-monthly-average-weekend-traffic,
    monthly-average-hourly-days-of-the-week Metric-monthly-average-hourly-days-of-the-week,
    monthly-average-hourly-daily-traffic Metric-monthly-average-hourly-daily-traffic,
    monthly-average-weekday-hourly-traffic Metric-monthly-average-weekday-hourly-traffic,
    monthly-average-weekend-hourly-traffic Metric-monthly-average-weekend-hourly-traffic,
    monthly-average-hourly-days-of-the-week Metric-monthly-average-hourly-days-of-the-week,
    monthly-average-hourly-daily-traffic Metric-monthly-average-hourly-daily-traffic,
    monthly-average-weekday-hourly-traffic Metric-monthly-average-weekday-hourly-traffic,
    monthly-average-weekend-hourly-traffic Metric-monthly-average-weekend-hourly-traffic,
    date Start-date,
    date End-date,
    date Effective-date,
    date Expiration-date,
}
″
}
```

DetectorContextAcceptanceTesting

DEFINITION
Information about the testing used to accept the detector after initial field installation

ASN.1 REPRESENTATION

```
detectorContextAcceptanceTesting ITS-DATA-FRAME ::= {
DESCRIPTIVE-NAME ″DetectorContextAcceptanceTesting:frame″
ASN-NAME ″DetectorContextAcceptanceTesting″
ASN-OBJECT-IDENTIFIER { add-data-element detectorContextAcceptanceTesting(1) }
DEFINITION ″Information about the testing used to accept the detector after initial
field installation.″
DESCRIPTIVE-NAME-CONTEXT {″Archive Data″}
DATA-CONCEPT-TYPE data-frame
STANDARD ″ADD″
REFERENCED-DATA-ELEMENTS {
    { add-data-element  detector-identifier(1) },
    { add-data-element  detector-acceptance-test(1) },
    { add-data-element  detector-acceptance-test-result(1) },
    { add-data-element  start-date(1) },
    { add-data-element  end-date(1) },
    { add-data-element  effective-date(1) },
    { add-data-element  expiration-date(1) },
}
DATA TYPE ″
DetectorContextAcceptanceTesting :: SEQUENCE {
    identifier Detector-identifier,
    acceptance-test Detector-acceptance-test,
    acceptance-test-result Detector-acceptance-test-result,
    date Start-date,
    date End-date,
    date Effective-date,
    date Expiration-date,
}
″
}
```

DetectorContextBinningScheme

DEFINITION

Information about the binning (classification) scheme used toreport measurements

ASN.1 REPRESENTATION

```
detectorContextBinningScheme ITS-DATA-FRAME ::= {
DESCRIPTIVE-NAME ″DetectorContextBinningScheme:frame″
ASN-NAME ″DetectorContextBinningScheme″
ASN-OBJECT-IDENTIFIER { add-data-element detectorContextBinningScheme(1) }
DEFINITION ″Information about the binning (classification) scheme used toreport
measurements.″
DESCRIPTIVE-NAME-CONTEXT {″Archive Data″}
DATA-CONCEPT-TYPE data-frame
STANDARD ″ADD″
REFERENCED-DATA-ELEMENTS {
    { add-data-element binning-scheme-identifier(1) },
    { add-data-element binning-scheme-data-type(1) },
    { add-data-element binning-scheme-name(1) },
    { add-data-element binning-scheme-definition(1) },
    { add-data-element start-date(1) },
    { add-data-element end-date(1) },
    { add-data-element effective-date(1) },
    { add-data-element expiration-date(1) },
}
DATA TYPE ″
DetectorContextBinningScheme :: SEQUENCE {
    scheme-identifier Binning-scheme-identifier,
    scheme-data-type Binning-scheme-data-type,
    scheme-name Binning-scheme-name,
    scheme-definition Binning-scheme-definition,
    date Start-date,
    date End-date,
    date Effective-date,
    date Expiration-date,
}
″
}
```

DetectorContextBinningSchemeValue

DEFINITION

Details of the binning scheme

ASN.1 REPRESENTATION

```
detectorContextBinningSchemeValue ITS-DATA-FRAME ::= {
DESCRIPTIVE-NAME ″DetectorContextBinningSchemeValue:frame″
ASN-NAME ″DetectorContextBinningSchemeValue″
ASN-OBJECT-IDENTIFIER { add-data-element detectorContextBinningSchemeValue(1) }
DEFINITION ″Details of the binning scheme.″
DESCRIPTIVE-NAME-CONTEXT {″Archive Data″}
DATA-CONCEPT-TYPE data-frame
STANDARD ″ADD″
REFERENCED-DATA-ELEMENTS {
    { add-data-element binning-scheme-identifier(1) },
    { add-data-element binning-scheme-bin-number(1) },
    { add-data-element binning-scheme-label(1) },
    { add-data-element binning-scheme-name(1) },
    { add-data-element binning-scheme-minimum-value(1) },
    { add-data-element binning-scheme-maximum-value(1) },
    { add-data-element binning-scheme-definition(1) },
    { add-data-element effective-date(1) },
    { add-data-element expiration-date(1) },
}
DATA TYPE ″
DetectorContextBinningSchemeValue :: SEQUENCE {
    scheme-identifier Binning-scheme-identifier,
    scheme-bin-number Binning-scheme-bin-number,
    scheme-label Binning-scheme-label,
    scheme-name Binning-scheme-name,
    scheme-minimum-value Binning-scheme-minimum-value,
    scheme-maximum-value Binning-scheme-maximum-value,
    scheme-definition Binning-scheme-definition,
    date Effective-date,
    date Expiration-date,
}
″
}
```

DetectorContextDescription

DEFINITION
Information about the pysical characteristics of a detector used to monitor traffic conditions

ASN.1 REPRESENTATION

```
detectorContextDescription ITS-DATA-FRAME ::= {
DESCRIPTIVE-NAME ″DetectorContextDescription:frame″
ASN-NAME ″DetectorContextDescription″
ASN-OBJECT-IDENTIFIER { add-data-element detectorContextDescription(1) }
DEFINITION ″Information about the pysical characteristics of a detector used to
monitor traffic conditions.″
DESCRIPTIVE-NAME-CONTEXT {″Archive Data″}
DATA-CONCEPT-TYPE data-frame
STANDARD ″ADD″
REFERENCED-DATA-ELEMENTS {
    { add-data-element lane-number(1) },
    { add-data-element station-identifier(1) },
    { add-data-element detector-identifier(1) },
    { add-data-element detector-reference-type(1) },
    { add-data-element detector-zone-length(1) },
    { add-data-element detector-defining-standard(1) },
    { add-data-element detector-type(1) },
    { add-data-element detector-operation(1) },
    { add-data-element device-location-elevation(1) },
    { add-data-element device-location-height(1) },
    { add-data-element device-mobility-type(1) },
    { add-data-element device-operation-type(1) },
    { add-data-element device-url(1) },
    { add-data-element start-date(1) },
    { add-data-element end-date(1) },
    { add-data-element effective-date(1) },
    { add-data-element expiration-date(1) },
}
DATA TYPE ″
DetectorContextDescription :: SEQUENCE {
    number Lane-number,
    identifier Station-identifier,
    identifier Detector-identifier,
    reference-type Detector-reference-type,
    zone-length Detector-zone-length,
    defining-standard Detector-defining-standard,
    type Detector-type,
    operation Detector-operation,
    location-elevation Device-location-elevation OPTIONAL,
    location-height Device-location-height OPTIONAL,
    mobility-type Device-mobility-type,
    operation-type Device-operation-type,
    url Device-url OPTIONAL,
    date Start-date,
    date End-date,
    date Effective-date,
    date Expiration-date,
}
″
}
```

DetectorContextInstallation

DEFINITION
Information about the procedures used to install the detector

ASN.1 REPRESENTATION

```
detectorContextInstallation ITS-DATA-FRAME ::= {
DESCRIPTIVE-NAME ″DetectorContextInstallation:frame″
ASN-NAME ″DetectorContextInstallation″
ASN-OBJECT-IDENTIFIER { add-data-element detectorContextInstallation(1) }
DEFINITION ″Information about the procedures used to install the detector.″
DESCRIPTIVE-NAME-CONTEXT {″Archive Data″}
DATA-CONCEPT-TYPE data-frame
STANDARD ″ADD″
REFERENCED-DATA-ELEMENTS {
    { add-data-element detector-identifier(1) },
```

```
    { add-data-element detector-installation-comments(1) },
    { add-data-element start-date(1) },
    { add-data-element end-date(1) },
    { add-data-element effective-date(1) },
    { add-data-element expiration-date(1) },
}
DATA TYPE ″
DetectorContextInstallation :: SEQUENCE {
    identifier Detector-identifier,
    Installation-comments Detector-Installation-comments,
    date Start-date,
    date End-date,
    date Effective-date,
    date Expiration-date,
}
″
}
```

DetectorContextMaintenanceHistory

DEFINITION
Information about the history of maintenance activities on a detector

ASN.1 REPRESENTATION

```
detectorContextMaintenanceHistory ITS-DATA-FRAME ::= {
DESCRIPTIVE-NAME ″DetectorContextMaintenanceHistory:frame″
ASN-NAME ″DetectorContextMaintenanceHistory″
ASN-OBJECT-IDENTIFIER { add-data-element detectorContextMaintenanceHistory(1) }
DEFINITION ″Information about the history of maintenance activities on a detector.″
DESCRIPTIVE-NAME-CONTEXT {″Archive Data″}
DATA-CONCEPT-TYPE data-frame
STANDARD ″ADD″
REFERENCED-DATA-ELEMENTS {
    { add-data-element detector-identifier(1) },
    { add-data-element detector-maintenance-activity-type(1) },
    { add-data-element detector-maintenance-test_cd(1) },
    { add-data-element detector-maintenance-test-result(1) },
    { add-data-element detector-maintenance-comments(1) },
    { add-data-element start-date(1) },
    { add-data-element end-date(1) },
    { add-data-element effective-date(1) },
    { add-data-element expiration-date(1) },
}
DATA TYPE ″
DetectorContextMaintenanceHistory :: SEQUENCE {
    identifier Detector-identifier,
    maintenance-activity-type Detector-maintenance-activity-type,
    maintenance-test_cd Detector-maintenance-test_cd,
    maintenance-test-result Detector-maintenance-test-result,
    maintenance-comments Detector-maintenance-comments,
    date Start-date,
    date End-date,
    date Effective-date,
    date Expiration-date,
}
″
}
```

IntersectionTurns

DEFINITION
Turning movements (volume) at an intersection

ASN.1 REPRESENTATION

```
intersectionTurns ITS-DATA-FRAME : : = {
DESCRIPTIVE-NAME ″IntersectionTurns:frame″
ASN-NAME ″IntersectionTurns″
ASN-OBJECT-IDENTIFIER { add-data-element intersectionTurns(1) }
DEFINITION ″Turning movements (volume) at an intersection.″
DESCRIPTIVE-NAME-CONTEXT {″Archive Data″}
DATA-CONCEPT-TYPE data-frame
STANDARD ″ADD″
REFERENCED-DATA-ELEMENTS {
    { add-data-element intersection-identifier(1) },
```

```
    { add-data-element turning-movement-approach-leg-name(1) },
    { add-data-element turning-movement-exit-leg-name(1) },
    { add-data-element traffic-direction(1) },
    { add-data-element turning-movement-type(1) },
    { add-data-element metric-traffic-volume(1) },
    { add-data-element metric-quality-control(1) },
    { add-data-element start-date(1) },
    { add-data-element end-date(1) },
    { add-data-element effective-date(1) },
    { add-data-element start-date(1) },
}
DATA TYPE ″
IntersectionTurns :: SEQUENCE {
    identifier Intersection-identifier,
    movement-approach-leg-name Turning-movement-approach-leg-name,
    movement-exit-leg-name Turning-movement-exit-leg-name,
    direction Traffic-direction,
    movement-type Turning-movement-type,
    traffic-volume Metric-traffic-volume,
    quality-control Metric-quality-control,
    date Start-date,
    date End-date,
    date Effective-date,
    date Start-date,
}
″
}
```

LaneDescription

DEFINITION
Information about the lane(s) being monitored for traffic conditions

ASN.1 REPRESENTATION

```
laneDescription ITS-DATA-FRAME : : = {
DESCRIPTIVE-NAME ″LaneDescription:frame″
ASN-NAME ″LaneDescription″
ASN-OBJECT-IDENTIFIER { add-data-element laneDescription(1) }
DEFINITION ″Information about the lane(s) being monitored for traffic conditions.″
DESCRIPTIVE-NAME-CONTEXT {″Archive Data″}
DATA-CONCEPT-TYPE data-frame
STANDARD ″ADD″
REFERENCED-DATA-ELEMENTS {
    { add-data-element station-identifier(1) },
    { add-data-element lane-number(1) },
    { add-data-element lane-type(1) },
    { add-data-element start-date(1) },
    { add-data-element end-date(1) },
    { add-data-element effective-date(1) },
    { add-data-element start-date(1) },
}
DATA TYPE ″
LaneDescription :: SEQUENCE {
    identifier Station-identifier,
    number Lane-number,
    type Lane-type,
    date Start-date,
    date End-date,
    date Effective-date,
    date Start-date,
}
″
}
```

OrganizationInformation

DEFINITION
Information about the organization or agency supplying the data to the archive

ASN.1 REPRESENTATION

```
organizationInformation ITS-DATA-FRAME ::= {
DESCRIPTIVE-NAME ″OrganizationInformation:frame″
ASN-NAME ″OrganizationInformation″
```

```
ASN-OBJECT-IDENTIFIER { add-data-element organizationInformation(1) }
DEFINITION "Information about the organization or agency supplying the data to the
archive."
DESCRIPTIVE-NAME-CONTEXT {"Archive Data"}
DATA-CONCEPT-TYPE data-frame
STANDARD "ADD"
REFERENCED-DATA-ELEMENTS {
    { add-data-element organization-agency-name(1) },
    { add-data-element organization-agency-abbreviation(1) },
    { add-data-element organization-parent-agency(1) },
    { add-data-element organization-server-owner(1) },
    { add-data-element organization-state(1) },
    { add-data-element organization-county(1) },
    { add-data-element organization-city(1) },
    { add-data-element organization-contact-person-name(1) },
    { add-data-element organization-contact-person-email(1) },
    { add-data-element organization-contact-person-phone-number(1) },
    { add-data-element organization-contact-person-address1(1) },
    { add-data-element organization-contact-person-address2(1) },
    { add-data-element organization-contact-person-address3(1) },
    { add-data-element organization-contact-person-city(1) },
    { add-data-element organization-contact-person-state(1) },
    { add-data-element organization-contact-person-zipcode(1) },
    { add-data-element organization-contact-person-country(1) },
    { add-data-element organization-function(1) },
    { add-data-element organization(1) },
    { add-data-element start-date(1) },
    { add-data-element end-date(1) },
    { add-data-element effective-date(1) },
    { add-data-element expiration-date(1) },
}
DATA TYPE "
OrganizationInformation :: SEQUENCE {
    agency Organization-agency-name,
    agency-abbreviation Organization-agency-abbreviation,
    agency-parent Organization-parent-agency,
    server Organization-server-owner,
    agency-state Organization-state,
    agency-county Organization-county,
    agency-city Organization-city,
    agency-person Organization-contact-person-name,
    agency-person-email Organization-contact-person-email,
    agency-person-phone Organization-contact-person-phone-number,
    agency-person-address1 Organization-contact-person-address1,
    agency-person-address2 Organization-contact-person-address2,
    agency-person-address3 Organization-contact-person-address3,
    agency-person-city Organization-contact-person-city,
    agency-person-state Organization-contact-person-state,
    agency-person-zipcode Organization-contact-person-zipcode,
    agency-person-country Organization-contact-person-country,
    agency-function Organization-function OPTIONAL,
    agency-center-name Organization,
    date Start-date,
    date End-date,
    date Effective-date,
    date Expiration-date,
}
"
}
```

ProbeVehicleGPSMeasurement

DEFINITION
The time and location measurements of a probe-equipped vehicle

ASN.1 REPRESENTATION

```
probeVehicleGPSMeasurement ITS-DATA-FRAME ::= {
DESCRIPTIVE-NAME "ProbeVehicleGPSMeasurement:frame"
ASN-NAME "ProbeVehicleGPSMeasurement"
ASN-OBJECT-IDENTIFIER { add-data-element probeVehicleGPSMeasurement(1) }
DEFINITION "The time and location measurements of a probe-equipped vehicle."
DESCRIPTIVE-NAME-CONTEXT {"Archive Data"}
DATA-CONCEPT-TYPE data-frame
STANDARD "ADD"
REFERENCED-DATA-ELEMENTS {
    { add-data-element vehicle-identifier(1) },
```

```
    { add-data-element location-latitude(1) },
    { add-data-element location-longitude(1) },
    { add-data-element gps-metric-instantaneous-speed(1) },
    { add-data-element gps-metric-quality-control(1) },
    { add-data-element gps-metric-time(1) },
}
DATA TYPE ″
ProbeVehicleGPSMeasurement :: SEQUENCE {
    identifier Vehicle-identifier,
    latitude Location-latitude,
    longitude Location-longitude,
    metric-instantaneous-speed GPS-metric-instantaneous-speed,
    metric-quality-control GPS-metric-quality-control,
    metric-time GPS-metric-time,
}
″
}
```

ProbeVehicleRoadwayMeasurement

DEFINITION
The detection of the passage of a probe-equipped vehicle at a specific roadway location by a roadway detector

ASN.1 REPRESENTATION

```
probeVehicleRoadwayMeasurement ITS-DATA-FRAME ::= {
DESCRIPTIVE-NAME ″ProbeVehicleRoadwayMeasurement:frame″
ASN-NAME ″ProbeVehicleRoadwayMeasurement″
ASN-OBJECT-IDENTIFIER { add-data-element probeVehicleRoadwayMeasurement(1) }
DEFINITION ″The detection of the passage of a probe-equipped vehicle at a specific
roadway location by a roadway detector.″
DESCRIPTIVE-NAME-CONTEXT {″Archive Data″}
DATA-CONCEPT-TYPE data-frame
STANDARD ″ADD″
REFERENCED-DATA-ELEMENTS {
    { add-data-element vehicle-identifier(1) },
    { add-data-element detector-identifier(1) },
    { add-data-element start-date(1) },
    { add-data-element effective-date(1) },
    { add-data-element expiration-date(1) },
}
DATA TYPE ″
ProbeVehicleRoadwayMeasurement :: SEQUENCE {
    identifier Vehicle-identifier,
    identifier Detector-identifier,
    date Start-date,
    date Effective-date,
    date Expiration-date,
}
″
}
```

TrafficSegmentSectionCorrespondence

DEFINITION
Information on the lower level Traffic Segment entities that comprise a Section, including their sequential order

ASN.1 REPRESENTATION

```
trafficSegmentSectionCorrespondence ITS-DATA-FRAME ::= {
DESCRIPTIVE-NAME ″TrafficSegmentSectionCorrespondence:frame″
ASN-NAME ″TrafficSegmentSectionCorrespondence″
ASN-OBJECT-IDENTIFIER { add-data-element trafficSegmentSectionCorrespondence(1) }
DEFINITION ″Information on the lower level Traffic Segment entities that comprise a
Section, including their sequential order.″
DESCRIPTIVE-NAME-CONTEXT {″Archive Data″}
DATA-CONCEPT-TYPE data-frame
STANDARD ″ADD″
REFERENCED-DATA-ELEMENTS {
    { add-data-element section-identifier(1) },
    { add-data-element corresponding-segment-type(1) },
    { add-data-element detector-section-identifier(1) },
    { add-data-element link-identifier(1) },
    { add-data-element corresponding-segment-sequence-number(1) },
```

```
    { add-data-element  segment-length(1) },
}
DATA TYPE ″
TrafficSegmentSectionCorrespondence :: SEQUENCE {
    identifier Section-identifier,
    segment-type Corresponding-segment-type,
    section-identifier Detector-section-identifier,
    identifier Link-identifier,
    segment-sequence-number Corresponding-segment-sequence-number,
    length Segment-length,
}
″
}
```

TrafficSegmentSectionDefinition

DEFINITION
Information used to identify the geolocation of a section

ASN.1 REPRESENTATION

```
trafficSegmentSectionDefinition ITS-DATA-FRAME ::= {
DESCRIPTIVE-NAME ″TrafficSegmentSectionDefinition:frame″
ASN-NAME ″TrafficSegmentSectionDefinition″
ASN-OBJECT-IDENTIFIER { add-data-element trafficSegmentSectionDefinition(1) }
DEFINITION ″Information used to identify the geolocation of a section.″
DESCRIPTIVE-NAME-CONTEXT {″Archive Data″}
DATA-CONCEPT-TYPE data-frame
STANDARD ″ADD″
REFERENCED-DATA-ELEMENTS {
    { add-data-element  section-identifier(1) },
    { add-data-element  section-name(1) },
    { add-data-element  traffic-direction(1) },
    { add-data-element  beginning-linear-reference-point(1) },
    { add-data-element  beginning-route-signing(1) },
    { add-data-element  beginning-route-number(1) },
    { add-data-element  beginning-latitude(1) },
    { add-data-element  beginning-longitude(1) },
    { add-data-element  beginning-nearest-node-description(1) },
    { add-data-element  beginning-nearest-node-offet(1) },
    { add-data-element  ending-linear-reference-point(1) },
    { add-data-element  ending-route-signing(1) },
    { add-data-element  ending-route-number(1) },
    { add-data-element  ending-latitude(1) },
    { add-data-element  ending-longitude(1) },
    { add-data-element  ending-nearest-node-description(1) },
    { add-data-element  ending-nearest-node-offet(1) },
    { add-data-element  segment-length(1) },
    { add-data-element  segment-type(1) },
    { add-data-element  segment-free-flow-speed(1) },
    { add-data-element  start-date(1) },
    { add-data-element  end-date(1) },
    { add-data-element  effective-date(1) },
    { add-data-element  expiration-date(1) },
}
DATA TYPE ″
TrafficSegmentSectionDefinition :: SEQUENCE {
    identifier Section-identifier,
    name Section-name,
    direction Traffic-direction,
    linear-reference-point Beginning-linear-reference-point,
    route-signing Beginning-route-signing,
    route-number Beginning-route-number,
    latitude Beginning-latitude,
    longitude Beginning-longitude,
    nearest-node-description Beginning-nearest-node-description OPTIONAL,
    nearest-node-offet Beginning-nearest-node-offet OPTIONAL,
    linear-reference-point Ending-linear-reference-point,
    route-signing Ending-route-signing,
    route-number Ending-route-number,
    latitude Ending-latitude,
    longitude Ending-longitude,
    nearest-node-description Ending-nearest-node-description OPTIONAL,
    nearest-node-offet Ending-nearest-node-offet OPTIONAL,
    length Segment-length,
    type Segment-type,
    date Start-date,
```

```
    date End-date,
    date Effective-date,
    date Expiration-date,
}
″
}
```

TrafficSegmentSectionMetrics

DEFINITION
Measurements and statistics compiled for a Section

ASN.1 REPRESENTATION

```
trafficSegmentSectionMetrics ITS-DATA-FRAME ::= {
DESCRIPTIVE-NAME ″TrafficSegmentSectionMetrics:frame″
ASN-NAME ″TrafficSegmentSectionMetrics″
ASN-OBJECT-IDENTIFIER { add-data-element trafficSegmentSectionMetrics(1) }
DEFINITION ″Measurements and statistics compiled for a Section.″
DESCRIPTIVE-NAME-CONTEXT {″Archive Data″}
DATA-CONCEPT-TYPE data-frame
STANDARD ″ADD″
REFERENCED-DATA-ELEMENTS {
    { add-data-element metric-travel-time-direct(1) },
    { add-data-element metric-travel-time-derived(1) },
    { add-data-element metric-probe-vehicle-number-stops(1) },
    { add-data-element metric-probe-vehicle-stop-delay(1) },
    { add-data-element metric-probe-vehicle-number-of-vehicles(1) },
    { add-data-element metric-travel-time-standard-deviation(1) },
    { add-data-element metric-vehicle-delay(1) },
    { add-data-element metric-roadway-density(1) },
    { add-data-element metric-vehicle-miles-traveled(1) },
    { add-data-element metric-queue-length-maximum(1) },
    { add-data-element metric-queue-length-average(1) },
    { add-data-element metric-vehicle-hours-of-travel(1) },
    { add-data-element start-date(1) },
    { add-data-element end-date(1) },
    { add-data-element effective-date(1) },
    { add-data-element expiration-date(1) },
}
DATA TYPE ″
TrafficSegmentSectionMetrics :: SEQUENCE {
    travel-time-direct Metric-travel-time-direct,
    travel-time-derived Metric-travel-time-derived,
    probe-vehicle-number-stops Metric-probe-vehicle-number-stops OPTIONAL,
    probe-vehicle-stop-delay Metric-probe-vehicle-stop-delay OPTIONAL,
    probe-vehicle-number-of-vehicles Metric-probe-vehicle-number-of-vehicles,
    travel-time-standard-deviation Metric-travel-time-standard-deviation,
    vehicle-delay Metric-vehicle-delay,
    roadway-density Metric-roadway-density,
    vehicle-miles-traveled Metric-vehicle-miles-traveled,
    queue-length-maximum Metric-queue-length-maximum OPTIONAL,
    queue-length-average Metric-queue-length-average OPTIONAL,
    vehicle-hours-of-travel Metric-vehicle-hours-of-travel,
    date Start-date,
    date End-date,
    date Effective-date,
    date Expiration-date,
}
```

APPENDIXES

(Nonmandatory Information)

X1. FUNCTIONAL REQUIREMENTS

X1.1 Overview

X1.1.1 These are the functional requirements for this specification. Other sections will have additional requirements for implementation.

X1.2 Documentation

X1.2.1 All documentation and supporting metadata of this specification shall be made in conformance with Practice E2468.

X1.3 Archive Original Source Data

X1.3.1 Traffic data as received from the field by the first ITS center or from remotely located devices that monitor or estimate the movements of probe vehicles shall be archived with their original temporal and spatial resolution and without edits or transformations.

X1.3.2 This specification shall specify the temporal and spatial resolution of original source data.

X1.3.3 This specification shall specify the length of time original source data is to be retained in its original format.

X1.3.4 This specification shall be capable of storing edited or "smoothed" original source data (in addition to the original source data).

X1.4 Data Collection Conditions Documentation

X1.4.1 Conditions surrounding data collection by devices, whether fixed point on a road section or remotely monitoring traffic conditions, shall be documented, including:

X1.4.1.1 Type of equipment,
X1.4.1.2 Type of field or remote communication used,
X1.4.1.3 Installation details,
X1.4.1.4 Calibration tests and results,
X1.4.1.5 Maintenance history, and
X1.4.1.6 Unusual events affecting data collection.

X1.5 Roadway Device Identification

X1.5.1 This specification shall be capable of naming individual roadway devices so that any device within a country can be uniquely identified.

X1.6 Roadway Device Location

X1.6.1 Each roadway device that monitors traffic conditions shall have its location defined in several ways, including its network section, link, and/or area-wide spatial coverage for remotely located devices monitoring probe vehicle movement. The metadata shall fully describe the referencing systems used.

X1.6.2 *Linear Referencing:*
X1.6.2.1 State,
X1.6.2.2 County,
X1.6.2.3 Route,
X1.6.2.4 Travel direction, and
X1.6.2.5 Mile point or equivalent.

X1.6.3 Lane number.

X1.6.4 Georeferencing.

X1.7 Device Performance

X1.7.1 Data collection device performance ("detector health") shall be collected and archived. Performance shall be defined, at a minimum in terms of:

X1.7.1.1 Amount of data reported from the field or remotely monitored,
X1.7.1.2 Mean time between failures, and
X1.7.1.3 Self-reported diagnostics from the field or remote monitoring equipment.

X1.8 Roadway Typology

X1.8.1 The nature of the physical roadway at the location of the data collection devices or sensing coverage area shall be documented. This shall include:

X1.8.1.1 *Highway Cross Section* (in accordance with highway performance monitoring system (HPMS) definitions):
(1) Number of lanes,
(2) Median type,
(3) Median width,
(4) Left shoulder width, and
(5) Right shoulder width.

X1.8.1.2 *Percent Grade*—Average percent grade on the section 1500 ft (457 m) upstream of the data collection device.

X1.8.1.3 Relationship to interchange and intersection ramps.

X1.8.1.4 Relationship to auxiliary lanes.

X1.9 Roadway Function

X1.9.1 The traffic-carrying nature of the lanes or roadway being monitored at the location of data collection devices or being remotely sensed shall be documented. This shall include:

X1.9.1.1 Functional classification,
X1.9.1.2 Travel direction handled by time of day,
X1.9.1.3 Traffic restrictions by time of day,
X1.9.1.4 Traffic movements handled (for example, turns), and
X1.9.1.5 Mainline versus auxiliary (frontage road, collector/distributor).

X1.10 Influencing Traffic Movements

X1.10.1 The nature of traffic movements influencing data measurements at the location of data collection devices or being remotely sensed shall be documented. This shall include the presence of:

X1.10.1.1 Weaving movements (by type),[8]

X1.10.1.2 Entering and exiting traffic, and

X1.10.1.3 Directional queues affecting traffic flow on some but not all of the lanes in a section.

X1.11 Provide for Aggregation Processing

X1.11.1 The data structure shall be capable of aggregating measurements over temporal and spatial dimensions in accordance with the requirements of users' applications in addition to the minimum requirements specified in the following:

X1.11.1.1 The aggregation data structure shall be determined during the design process of the archived data management system (ADMS) through formal requirements analysis of stakeholder needs, as specified in Guide E2259.

X1.11.1.2 Speed and roadway occupancy for longitudinal aggregations shall be computed as vehicle miles of travel (VMT)-weighted averages for lateral spatial aggregation.

X1.11.1.3 All other aggregations for speed and occupancy shall be volume-weighted averages.

X1.11.2 *Provide for Temporal Aggregation Processing:*

X1.11.2.1 Once the aggregation structure is determined, aggregations shall be made from the temporal level immediately below the aggregation level. For example, if original source data exist at the 5-min level, 15-min aggregations are computed using the 5-min level, hourly aggregations are computed using the 15-min level, and so on.

X1.11.2.2 Summary statistics for each aggregation level shall be capable of being stored, including:

(1) Standard deviation,

(2) Minimum value,

(3) Maximum value, and

(4) Number of valid records used in the aggregation.

X1.11.2.3 Traffic Monitoring Guide (TMG) nesting rules shall be used to generate volume data from vehicle classification or other binned types.

X1.11.2.4 Traffic measurements from roadside detectors (for example, volume, speed, and occupancy) shall be aggregated and stored at 1-h intervals so as to facilitate comparison to portable counters that are used for periodic sampling at various locations.

X1.11.2.5 Where the temporal resolution of original source data allows, traffic measurements from roadside detectors (for example, volume, speed, and occupancy) shall be aggregated and stored at either 5- or 15-min intervals, whichever is lower.

X1.11.3 *Provide for Spatial Aggregation Processing:*

X1.11.3.1 *Lateral Aggregation of Lane-Based Detection Device Measurements:*

(1) All mainline lanes for a travel direction shall be aggregated into "station" measurements.

(2) All mainline lanes for both directions of travel shall be aggregated into "roadway" measurements.

(3) Mainline lanes shall include all access-controlled lanes such as collector distributors.

(4) Frontage roads that allow access to adjacent property shall not be considered.

X1.11.3.2 *Longitudinal Aggregation of Device Measurements:*

(1) Predefined "traffic segments" shall be defined by users in the metadata as being either:

(a) The sum of half the distances to the nearest upstream and downstream fixed-location detectors or

(b) The distance between adjacent fixed-location detectors.

X1.11.3.3 *Longitudinal Aggregation Levels*—The following hierarchy shall be maintained in constructing contiguous longitudinal aggregations:

(1) Links as defined by the Traffic Management Data Dictionary (TMDD) shall be allowed by the data structure.

(2) The lowest level of longitudinal aggregation shall be either the traffic segment or the link, whichever has the shortest length, except for various probe-based data elements such as travel time or speed that may be available from the original sources data for longitudinal distances that are finer or shorter, such as a sublink, than the traffic segments or links defined by the location of the fixed-location detection devices.

(3) Links and traffic segments shall be aggregated into user-defined "sections" that shall be for a single signed route.

(4) Sections shall be aggregated into "network trips" that shall be from predetermined points on the highway network and may encompass multiple signed routes.

(5) Network trips shall be aggregated into "user trips" that shall have as termini the beginning location of the trip (origin) and the ending location (destination).

(6) Additional user-longitudinal aggregations shall be capable of being stored.

X1.12 Provide for Integration of Data Sources

X1.12.1 The archived data structure shall allow integration of traffic data from ITS sources with other sources of traffic data including the ability to blend data from fixed-point detectors with traffic data representing conditions along roadway sections consisting of links and nodes.

X1.13 Quality Control (QC)

X1.13.1 QC procedures shall be applied to the data residing in the archive.

X1.13.1.1 QC procedures shall include those developed for the American Association of State Highway and Transportation Officials (AASHTO) traffic data collection guidelines.

X1.13.1.2 QC procedures shall include those developed by Lomax et al. for the Federal Highway Administration (FHWA) **(10)**.

X1.13.2 Estimates of data quality shall be developed and reported for the data within the archive.

X1.13.3 Documentation of QC procedures and results shall be provided at each level of aggregation.

X1.13.4 System-level QC reports shall be provided as follows:

X1.13.4.1 *Validity*—The degree to which data values satisfy acceptance requirements of the validation criteria or fall within the respective domain of acceptable values.

X1.13.4.2 *Timeliness*—The degree to which data values or a set of values are provided at the time required or specified.

[8] As defined in the Highway Capacity Manual **(9)** .

X1.13.4.3 *Coverage*—The degree to which data values in a sample accurately represent the whole of that which is to be measured.

X1.13.4.4 *Accessibility (Also Referred to as Usability)*—The relative ease with which data can be retrieved and manipulated by data consumers to meet their needs.

X1.13.4.5 *Completeness*—The degree to which data values are present in the attributes that require them.

X1.13.5 Estimates of data quality shall be developed for each calendar year at a minimum.

X1.14 Document Archive Structure

X1.14.1 The archive structure shall be documented to allow users to understand the nature of the data stored as well as detection, monitoring, or sensing systems whether fixed-point-based detectors or along network-based links between nodes.

X1.15 Processing Documentation

X1.15.1 All processing performed on the data shall be documented. This shall include:

X1.15.1.1 Edits (changes to the data),

X1.15.1.2 Missing data handling,

X1.15.1.3 Imputations, and

X1.15.1.4 Transformations.

X1.16 Provide for Output Processing

X1.16.1 The archive shall provide for individual queries, customized datasets, and summary reports of data contained in the archive to support user functions.

X1.17 Transformation of Traffic Measurements

X1.17.1 The basic traffic measurements shall be transformed to other statistics to support user functions and shall be stored within the archive.

X1.17.2 Where relevant, the transformed statistics shall be stored at the same temporal and spatial aggregation levels as specified in X1.3.1.

X1.17.3 *Traffic Volume Measurements:*

X1.17.3.1 This specification shall specify the computation and storage of VMT.

X1.17.3.2 This specification shall specify the computation and storage of annual average daily traffic (AADT), average weekend daily traffic (AWEDT), average hourly daily traffic (AHDT), and average weekday daily traffic (AWDDT).

X1.17.3.3 This specification shall specify the computation and storage of hourly capacity.

X1.17.3.4 This specification shall specify the computation and storage of maximum queue length.

X1.17.3.5 This specification shall specify the computation and storage of average queue length.

X1.17.3.6 This specification shall specify the computation and storage of K- and D-factors.

X1.17.3.7 This specification shall specify the computation and storage of average peak-hour and peak-period volumes.

X1.17.3.8 This specification shall specify the computation and storage of by-lane distribution percents.

X1.17.3.9 This specification shall specify the computation and storage of number and percent single-unit trucks.

X1.17.3.10 This specification shall specify the computation and storage of number and percent combination trucks.

X1.17.3.11 This specification shall specify the computation and storage of volume of trucks-by-truck configuration.

X1.17.3.12 This specification shall specify the computation and storage of turning movements at signalized intersections.

X1.17.4 *Speed Measurements (that is, from Roadside Detection Devices Generally Considered to be Time Mean Speed Measurements):*

X1.17.4.1 This specification shall specify the computation and storage of free flow speed.

X1.17.4.2 This specification shall specify the computation and storage of space mean speed of predefined traffic segments.

X1.17.4.3 This specification shall specify the computation and storage of estimated travel time of predefined traffic segments.

(1) Two types of travel times shall be distinguished: (*1*) direct measurements of travel times taken from the passage of vehicles over a highway distance and (*2*) derived travel times computed from spot speed measurements from roadway-based devices.

X1.17.4.4 This specification shall specify the computation and storage of median speed.

X1.17.4.5 This specification shall specify the computation and storage of 85th percentile speed.

X1.17.4.6 This specification shall specify the computation and storage of congested speed.

X1.17.4.7 This specification shall specify the computation and storage of vehicle hours of travel (VHT).

X1.17.5 *Roadway Occupancy Measurements (that is, from Roadside Detection Devices)*—This specification shall specify the computation and storage of roadway density.

X1.17.6 *Roadway-Based Probe Vehicle Travel Time Measurements:*

X1.17.6.1 Data from roadway devices that detect the passage of probe vehicles shall be stored and include:

(1) Anonymous vehicle identifier if the movement of a small number of fleet-probe vehicles is being monitored or indicated as statistically sampled if a very large number of anonymous probes is being monitored.

(2) Device identifier.

(3) Date/time stamp.

X1.17.6.2 Travel times for predefined traffic segments between consecutive roadway devices shall be computed for aggregated time levels as determined from user requirements.

(1) Aggregated time levels shall be determined as the beginning times that vehicles enter the traffic segment on the upstream end. The date/time stamp from X1.17.6.1(*3*) shall be rounded to correspond to the aggregated time level.

X1.17.7 *Vehicle Position-Based Travel Time Measurements:*

X1.17.7.1 Time and spatial location measurements from vehicles or personal devices shall be capable of being stored and shall include at a minimum:

(1) Anonymous identifier,

(2) Date/time stamp,

(3) Latitude/longitude, and

(4) Local georeferencing data.

X1.17.7.2 Travel times for traffic segments or links shall be derived from the time/spatial location measurements.

X1.17.8 *User-Specified Transformations*—This specification shall allow the computation and storage of other transformations of traffic data measurements as specified by users of the ADMS.

X2. SUMMARY OF DATA ELEMENT/DATA FRAME ASSOCIATION

TABLE X2.1 Data Frame/Data Element Association

Data Frame	Data Element
CrossSectionIntersectionDescription	Intersection.Intersection-identifier:id
	Intersection.Intersection-control-type:cd
	Intersection.Intersection-number-legs:nbr:cd
	Global.Start-date:utc
	Global.End-date:utc
	Global.Effective-date:utc
	Global.Expiration-date:utc
CrossSectionLaneOperation	CrossSection.Lane-number:nbr
	CrossSection.Lane-operation-type:cd
	CrossSection.Lane.operation-days:cd
	CrossSection.Lane-operation-begin-time:utc
	CrossSection.Lane-operation-end-time:utc
	Global.Start-date:utc
	Global.End-date:utc
	Global.Effective-date:utc
	Global.Expiration-date:utc
CrossSectionMetrics	CrossSection.Roadway-identifierid
	CrossSecti on.Station-identifier:id
	CrossSection.Lane-number:nbr
	DetectorContext.Binning-scheme-identifier:id
	DetectorContext.Binning-scheme-bin-number:nbr
	CrossSection.Metric-type:cd
	CrossSection.Metric-quality-control:cd
	CrossSection.Metric-data-alteration:cd
	CrossSection.Metric-value:qty
	CrossSection.Metric-units:txt
	Global.Start-date:utc
	Global.End-date:utc
	Global.Effective-date:utc
	Global.Expiration-date:utc
CrossSectionMetrics2	CrossSection.Roadway-identifier:id
	CrossSection.Station-identifier:id
	CrossSection.Lane-number:nbr
	Cross Section.Metric-traffic-volume:qty
	CrossSection.Metric-loop-occupancy:pct
	CrossSection.Metric-spot-speed-measured:rt
	CrossSection.Metric-spot-speed-derived:rt
	CrossSection.Metric-quality-control:cd
	CrossSection.Metric-data-alteration:cd
	Global.Start-date:utc
	Global.End-date:utc
	Global.Effective-date:utc
	Global.Expiration-date:utc
CrossSectionMetricsAggregated	CrossSection.Roadway-identifier:id
	CrossSection.Station-identifie:id
	CrossSection.Lane-number:nbr
	DetectorContext.Binning-scheme-identifier:id
	DetectorContext.Binning-scheme-bin-number:nbr
	CrossSection.Metric-type:cd
	CrossSection.Metric-quality-control:cd
	CrossSection.Metric-imputation:cd
	CrossSection.Metric-value:qty
	CrossSection.Metric-units:txt
	Global.Metric-aggregated-standard-deviation:qty
	Global.Metric-aggregated-minimum-value:qty
	Global.Metric-aggregated-maximum-value:qty
	Global.Metric-number-valid-records:qty

TABLE X2.1 *Continued*

Data Frame	Data Element
	Global.Metric-number-total-records:qty
	Global.Start-date:utc
	Global.End-date:utc
	Global.Effective-date:utc
CrossSectionMetricsAggregated2	CrossSection.Roadway-identifier:id
	CrossSecti on.Station-identifier:id
	CrossSection.Eane-number:nbr
	CrossSection.Metric-traffic-volume:qty
	CrossSection.Metric-loop-occupancy:pct
	CrossSection.Metric-spot-speed-measured:rt
	Cross Section.Metric-spot-speed-derived.rt
	CrossSection.Metric-quality-control:cd
	CrossSection.Metric-imputation:cd
	Global.Metric-number-valid-records:qty
	Global.Metric-number-total-records:qty
	Global.Start-date:utc
	GlobaLEnd-date:utc
	Global.Effective-date:utc
CrossSectionRoadwayDescription	CrossSection.Roadway-identifier:id
	Organization.Organization-identification:cd
	CrossSection.Roadway-route-signing:cd
	CrossSection.Roadway-route-qualifier:cd
	CrossSection.Roadway-route-number:nbr
	CrossSection.Roadway-functional-class:cd
	Global.Start-date:utc
	Global.End-date:utc
	Global.Effective-date:utc
	Global.Expiration-date:utc
CrossSectionStationContext	CrossSection.Station-identifier:id
	CrossSecti on.Station-context-geometric-feature-type:cd
	CrossSection.Station-context-geometric-feature-description:txt
	CrossSecti on.Station-context-geometric-feature-offset-di stance:qty
	Global.Start-date:utc
	Global.End-date:utc
	Global.Effective-date:utc
	Global.Expiration-date:utc
CrossSectionStationDescription	CrossSection.Roadway-identifier:id
	CrossSection.Station-identifier:id
	Global.Traffic-direction:cd
	CrossSection.Station-through-lanes:qty
	CrossSection.Station-auxiliary-lanes:qty
	CrossSection.Station-lanes-detectorized:qty
	CrossSection.Station-classfication-system-classes:qty
	CrossSecti on.Station-classfication-system-type:cd
	CrossSection.Beginning-linear-reference-point:nbr
	CrossSection.HPMS-location-referencing-system-identifier:id
	CrossSection.HPMS-location-referencing-system-point:nbr
	CrossSecti on.Station-longitude:qty
	CrossSecti on.Station-latitude:qty
	CrossSection.Station-HPMS-sample-identifier:id
	Global.Start-date:utc
	Global.End-date:utc
	Global.Effective-date:utc
	Global.Expiration-date:utc
CrossSectionStationGeometry	CrossSection.Station-identifier:id
	CrossSection.Station-median-type:cd
	CrossSection.Station-median-width:qty
	CrossSection.Station-left-shoulder-width:qty
	CrossSection.Station-right-shoulder-width:qty
	CrossSection.Station-roadway-grade:pct
	CrossSection.Station-ramp-relationship:txt
	CrossSecti on.Station-auxiliary-lane-relationship:txt
	Global.Start-date:utc
	Global.End-date:utc
	Global.Effective-date:utc
	Global.Expiration-date:utc
CrossSectionStationLocationReferencing	CrossSection.Station-identifier:id
	CrossSection.Location-referencing-system:cd
	CrossSecti on.Station-location-referencing-sy stem-value1:nbr

TABLE X2.1 *Continued*

Data Frame	Data Element
	CrossSection.Station-location-referencing-system-value2:nbr
	CrossSection.Station-location-referencing-system-value3:nbr
	CrossSection.Station-location-referencing-system-value4:nbr
	CrossSection.Station-location-referencing-system-value5:nbr
	CrossSection.Station-location-referencing-system-value6:nbr
	Global.Effective-date:utc
	Global.Expiration-date:utc
CrossSectionTrafficMetricsSummaryAnnual	CrossSection.Roadway-identifier:id
	CrossSecti on.Station-identifier:id
	CrossSection.Metric-annual-average-day s-of-the-week:qty
	CrossSection.Metric-annual-average-daily-traffic:qty
	CrossSection.Metric-annual-average-weekday-traffic:qty
	CrossSecti on.Metric-annual-average-weekend-traffic:qty
	CrossSection.Metric-annual-average-weekday -hourly-traffic:qty
	CrossSection.Metric-annual-average-weekend-hourly-traffic:qty
	CrossSection.Metric-50th-percentile-speed:rt
	CrossSecti on.Metric-8 5 th-percentile-speed:rt
	CrossSection.Metric-speed-standard-deviation:rt
	CrossSection.Metric-annual-average-hourly-days-of-the-week:qty
	CrossSection.Metric-annual-average-daily-hourly-traffic:qty
	CrossSecti on.Metric-annual-average-weekend-hourly-traffic:qty
	CrossSection.Metric-design-hour-volume-factor:pct
	CrossSection.Metric-design-hour-directional-volume:pct
	CrossSection.Metric-lane.distribution:pct
	CrossSection.Metric-single-unit-trucks:qty
	CrossSection.Metric-single-unit-trucks:pct
	CrossSection.Metric-combination-trucks:qty
	CrossSection.Metric-combination-trucks:pct
	CrossSection.Metric-speed-congested:rt
	Global.Start-date:utc
	Global.End-date:utc
	Global.Effective-date:utc
	Global.Expiration-date:utc
CrossSectionTrafficMetricsSummaryMonthly	CrossSection.Roadway-identifier:id
	CrossSection.Station-identifier:id
	CrossSection.Metric-monthly-average-days-of-the-week:qty
	CrossSection.Metric-monthly-average-daily-traffic:qty
	CrossSection.Metric-Monthly-average-weekday-traffic:qty
	CrossSection.Metric-monthly-average-weekend-traffic:qty
	CrossSection.Metric-monthly-average-hourly-days-of-the-week:qty
	CrossSection.Metric-monthly-average-hourly-daily-traffic:qty
	CrossSection.Metric-monthly-average-weekday-hourly-traffic:qty
	CrossSection.Metric-monthly-average-weekend-hourly -traffic:qty
	CrossSection.Metric-monthly-average-hourly -day s-of-the-week:qty
	CrossSection.Metric-monthly-average-hourly-daily-traffic:qty
	CrossSection.Metric-monthly-average-weekday -hourly-traffic:qty
	CrossSection.Metric-monthly-average-weekend-hourly -traffic:qty
	Global.Start-date:utc
	Global.End-date:utc
	Global.Effective-date:utc
	Global.Expiration-date:utc
DetectorContextAcceptanceTesting	DetectorContext.Detector-identifier:id
	DetectorContext.Detector-acceptance-test:cd
	DetectorContext.Detector-acceptance-test-result:cd
	Global.Start-date:utc
	Global.End-date:utc
	Global.Effective-date:utc
	Global.Expiration-date:utc
DetectorContextBinningScheme	DetectorContext.Binning-scheme-identifier:id
	DetectorContext.Binning-scheme-data-type:cd
	DetectorContext.Binning-scheme-name:txt
	DetectorContext.Binning-scheme-definition:txt
	Global.Start-date:utc
	Global.End-date:utc
	Global.Effective-date:utc
	Global.Expiration-date:utc
DetectorContextBinningSchemeValue	DetectorContext.Binning-scheme-identifier:id
	DetectorContext.Binning-scheme-bin-number:nbr
	DetectorContext.Binning-scheme-label:tct
	DetectorContext.Binning-scheme-name:txt

TABLE X2.1 *Continued*

Data Frame	Data Element
	DetectorContext.Binning-scheme-minimum-value:qty
	DetectorContext.Binning-scheme-maximum-value:qty
	DetectorContext.Binning-scheme-definition:txt
	Global.Effective-date:utc
	Global.Expiration-date:utc
DetectorContextDescription	CrossSection.Lane-number:nbr
	CrossSection.Station-identifier:id
	DetectorContext.Detector-identifier:id
	DetectorContext.Detector-reference-type:cd
	DetectorContext.Detector-zone-length:qty
	DetectorContext.Detector-defming-standard:cd
	DetectorContext.Detector-type:cd
	DetectorContext.Detector-operation:cd
	DetectorContext.Device-location-elevation:qty
	DetectorContext.Device-location-height:qty
	DetectorContext.Device-mobility-type:cd
	DetectorContext.Device-operation-type:cd
	DetectorContext.Device-url:txt
	Global.Start-date:utc
	Global.End-date:utc
	Global.Effective-date:utc
	Global.Expiration-date:utc
DetectorContextInstallation	DetectorContext.Detector-identifier:id
	DetectorContext.Detector-Installation-comments:txt
	Global.Start-date:utc
	Global.End-date:utc
	Global.Effective-date:utc
	Global.Expiration-date:utc
DetectorContextMaintenanceHistory	DetectorContext.Detector-identifierid
	DetectorContext.Detector-maintenance-activity-type:cd
	DetectorContext.Detector-maintenance-test cd
	DetectorContext.Detector-maintenance-test-result:cd
	DetectorContext.Detector-maintenance-comments:txt
	Global.Start-date:utc
	Global.End-date:utc
	Global.Effective-date:utc
	Global.Expiration-date:utc
IntersectionTurns	Intersect on.Intersection-identifier:id
	Intersection.Tuming-movement-approach-leg-name:txt
	Intersection.Turning-movement-exit-leg-name:txt
	Global.Traffic-direction:cd
	Intersection.Turning-movement-type:cd
	CrossSection.Metric-traffic-volume:qty
	CrossSection.Metric-quality-control:cd
	Global.Start-date:utc
	Global.End-date:utc
	Global.Effective-date:utc
	Global.Start-date:utc
LaneDescription	CrossSection.Station-identifier:id
	CrossSection.Lane-number:nbr
	CrossSection.Lane-type:cd
	Global.Start-date:utc
	Global.End-date:utc
	Global.Effective-date:utc
	Global.Start-date:utc
OrganizationInformation	Organization.Organizati on-agency-name:txt
	Organization.Organization-agency-abbreviation:txt
	Organization.Organization-parent-agency:txt
	Organization.Organization-server-owner:txt
	Organization.Organizati on-state:cd
	Organization.Organization-county:cd
	Organization.Organization-city:cd
	Organization.Organization-contact-person-name:txt
	Organization.Organization-contact-person-email:nbr
	Organization.Organization-contact-person-phone-number:txt
	Organizati on.Organizati on-contact-person-address l:txt
	Organization.Organization-contact-person-address2:txt
	Organization.Organization-contact-person-address3:txt
	Organization.Organization-contact-person-city:txt

TABLE X2.1 *Continued*

Data Frame	Data Element
	Organization.Organization-contact-person-state: cd
	Organization.Organization-contact-person-zipcode:nbr
	Organization.Organization-contact-person-country:txt
	Organization.Organization-function:rxt
	Organization:organization-center-name:txt
	Global.Start-date:utc
	Global.End-date:utc
	Global.Effective-date:utc
	Global.Expiration-date:utc
ProbeVehicleGPSMeasurement	ProbeVehicle.Vehicle-identifierid
	Probe Vehicle.Location-latitude:qty
	ProbeVehicle.Location-longitude:qty
	ProbeVehicle.GPS-metric-instantaneous-speed:rt
	ProbeVehicle.GPS-metric-quality-control:cd
	ProbeVehicle.GPS-metric-time:utc
ProbeVehicleRoadwayMeasurement	ProbeVehicle.Vehicle-identifier:id
	DetectorContext.Detector-identifierid
	Global.Start-daterutc
	Global.Effective-date:utc
	Global.Expiration-date:utc
TrafficSegmentDetectorSectionDefmition	TrafficSegment.Detector-section-identifierid
	TrafficSegment.Detector-section-name:txt
	Global.Traffic-direction:cd
	CrossSection.Beginning-linear-reference-point:nbr
	CrossSection.Beginning-route-signing:cd
	CrossSection.Beginning-route-number:nbr
	CrossSection.Beginning-latitude:qty
	CrossSection.Beginning-longitude:qty
	CrossSection.Beginning-nearest-node-description:txt
	CrossSection.Beginning-nearest-node-offet:qty
	CrossSection.Ending-linear-reference-point:nbr
	CrossSection.Ending-route-signing:cd
	CrossSection.Ending-route-number:nbr
	CrossSection.Ending-latitude:qty
	CrossSection.Ending-longitudeiqty
	CrossSection.Ending-nearest-node-description:txt
	CrossSection.Ending-nearest-node-offet:qty
	TrafficSegment.Segment-length:qty
	TrafficSegment.Segment-type:cd
	Global.Start-date:utc
	Global.End-date:utc
	Global.Effective-date:utc
	Global.Expirati on-date:utc
TrafficSegmentDetectorSectionMetrics	TrafficSegment.Detector-section-identifier:id
	TrafficSegment.Metric-travel-time-direct:qty
	TrafficSegment.Metric-travel-time-derived:qty
	TrafficSegment.Metric-probe-vehicle-number-stops:qty
	TrafficSegment.Metric-probe-vehicle-stop-delay:qty
	TrafficSegment.Metric-probe-vehicle-number-of-vehicles:qty
	TrafficSegment.Metric-travel-time-standard-deviation:qty
	TrafficSegment.Metric-vehicle-delay:qty
	TrafficSegment.Metric-roadway-density:qty
	TrafficSegment.Metric-vehicle-miles-traveled:qty
	TrafficSegment.Metric-queue-length-maximum:qty
	TrafficSegment.Metric-queue-length-average:qty
	TrafficSegment.Metric-vehicle-hours-of-travel:qty
	Global.Start-date:utc
	Global.End-date:utc
	Global.Effective-date:utc
	Global.Expiration-date:utc
TrafficSegmentLinkDefinition	TrafficSegment.Link-identifier:id
	TrafficSegment.Link-name:txt
	Global.Traffic-directi on:cd
	CrossSection.Beginning-linear-reference-point:nbr
	CrossSection.Beginning-route-signing:cd
	CrossSection.Beginning-route-number:nbr
	CrossSection.Beginning-latitude:qty
	CrossSection.Beginning-longitude:qty
	CrossSection.Beginning-nearest-node-description:txt
	CrossSection.Beginning-nearest-node-offet:qty

TABLE X2.1 *Continued*

Data Frame	Data Element
	CrossSection.Ending-linear-reference-point:nbr
	CrossSection.Ending-route-signing:cd
	CrossSection.Ending-route-number:nbr
	Cross Section.Ending-latitude:qty
	Cross Section.Ending-longitude:qty
	CrossSection.Ending-nearest-node-description:txt
	Cross Section.Ending-nearest-node-offet:qty
	Traffics egment.Segment-length:qty
	TrafficSegment.Segment-type:cd
	Global.Start-date:utc
	Global.End-date:utc
	Global.Effective-date:utc
	Global.Expiration-date:utc
TrafficSegmentLinkMetrics	TrafficSegment.Link-identifier:id
	TrafficSegment.Metric-travel-time-direct:qty
	TrafficSegment.Metric-travel-time-derived:qty
	TrafficSegment.Metric-probe-vehicle-number-stops:qty
	TrafficSegment.Metric-probe-vehicle-stop-delay:qty
	TrafficSegment.Metric-probe-vehicle-number-of-vehicles:qty
	TrafficSegment.Metric-travel-time-standard-deviation:qty
	TrafficSegment.Metric-vehicle-delay:qty
	TrafficSegment.Metric-roadway-density:qty
	TrafficSegment.Metric-vehicle-miles-traveled:qty
	TrafficSegment.Metric-queue-length-maximum:qty
	TrafficSegment.Metric-queue-length-average:qty
	TrafficSegment.Metric-vehicle-hours-of-travel:qty
	Global.Start-date:utc
	Global.End-date:utc
	Global.Effective-date:utc
	Global.Expiration-date:utc
TrafficSegmentNetworkTripCorrespondence	TrafficSegment.Network-trip-identifier:id
	TrafficSegment.Corresponding-segment-type:cd
	TrafficSegment.Detector-section-identifier:id
	TrafficSegment.Link-identifier:id
	TrafficSegment.Corresponding-segment-sequence-number:nbr
	TrafficSegment.S egment-length:qty
TrafficSegmentNetworkTripDefmition	TrafficSegment.Link-identifier:id
	TrafficSegment.Link-name:txt
	Global.Traffic-directi on:cd
	CrossSection.Beginning-linear-reference-point:nbr
	CrossSection.Beginning-route-signing:cd
	CrossSection.Beginning-route-number:nbr
	CrossSection.Beginning-latitude:qty
	CrossSection.Beginning-longitude:qty
	CrossSection.Beginning-nearest-node-description:txt
	CrossSection.Beginnmng-nearest-node-offet:qty
	CrossSection.Ending-linear-reference-point:nbr
	CrossSection.Ending-route-signing:cd
	CrossSection.Ending-route-number:nbr
	Cross Section.Ending-latitude:qty
	CrossSection.Ending-longitude:qty
	CrossSection.Ending-nearest-node-description:txt
	CrossSection.Ending-nearest-node-offet:qty
	TrafficSegment.Segment-length:qty
	Traffics egment.Segment-type:cd
	Global.Start-date:utc
	Global.End-date:utc
	Global.Effective-date:utc
	Global.Expiration-date:utc
TrafficSegmentNetworkTripMetrics	TrafficSegment.Network-trip-identifier:id
	TrafficSegment.Metric-travel-time-direct:qty
	TrafficSegment.Metric-travel-time-derived:qty
	TrafficSegment.Metric-probe-vehicle-number-stops:qty
	TrafficSegment.Metric-probe-vehicle-stop-delay:qty
	TrafficSegment.Metric-probe-vehicle-number-of-vehicles:qty
	TrafficSegment.Metric-travel-time-standard-deviation:qty
	TrafficSegment.Metric-vehicle-delay:qty
	TrafficSegment.Metric-roadway-density:qty
	TrafficSegment.Metric-vehicle-miles-traveled:qty
	TrafficSegment.Metric-queue-length-maximum:qty
	TrafficSegment.Metric-queue-length-average:qty

TABLE X2.1 *Continued*

Data Frame	Data Element
	TrafficSegment.Metric-vehicle-hours-of-travel:qty
	Global.Start-date:utc
	Global.End-date:utc
	Global.Effective-date:utc
	Global.Expiration-date:utc
TrafficSegmentSectionCorrespondence	TrafficSegment.Section-identifier:id
	TrafficSegment.Corresponding-segment-type:cd
	TrafficSegment.Detector-section-identifier:id
	TrafficSegment.Link-identifier:id
	TrafficSegment.Corresponding-segment-sequence-number:nbr
	TrafficSegment.Segment-length:qty
TrafficSegmentSectionDefmition	TrafficSegment.Section-identifier:id
	TrafficSegment.Section-name:txt
	Global.Traffic-direction:cd
	CrossSection.Beginning-linear-reference-point:nbr
	CrossSection.Beginning-route-signing:cd
	CrossSection.Beginning-route-number:nbr
	CrossSection.Beginning-latitude:qty
	CrossSection.Beginning-longitude:qty
	CrossSection.Beginning-nearest-node-description:txt
	CrossSection.Beginning-nearest-node-offet:qty
	CrossSection.Ending-linear-reference-point:nbr
	CrossSection.Ending-route-signing:cd
	CrossSection.Ending-route-number:nbr
	CrossSection.Ending-latitude:qty
	Cross Section.Ending-longitude:qty
	CrossSection.Ending-nearest-node-description:txt
	CrossSection.Ending-nearest-node-offet:qty
	TrafficSegment.Segment-length:qty
	Traffics egment.S egment-type:cd
	Global.Start-date:utc
	Global.End-date:utc
	Global.Effective-date:utc
	Global.Expiration-date:utc
	TrafficSegment.Section-identifier:id
TrafficSegmentSectionMetrics	TrafficSegment.Metric-travel-time-direct:qty
	TrafficSegment.Metric-travel-time-derived:qty
	TrafficSegment.Metric-probe-vehicle-number-stops: qty
	TrafficSegment.Metric-probe-vehicle-stop-delay:qty
	TrafficSegment.Metric-probe-vehicle-number-of-vehicles:qty
	TrafficSegment.Metric-travel-time-standard-deviation:qty
	TrafficSegment.Metric-vehicle-delay:qty
	TrafficSegment.Metric-roadway-density:qty
	TrafficSegment.Metric-vehicle-miles-traveled:qty
	TrafficSegment.Metric-queue-length-maximum:qty
	TrafficSegment.Metric-queue-length-average:qty
	TrafficSegment.Metric-vehicle-hours-of-travel:qty
	Global.Start-date:utc
	Global.End-date:utc
	Global.Effective-date:utc
	Global.Expiration-date:utc

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