

Message Set Standard

4. *Message Descriptions*

General Description

The messages developed for external traffic management center to center communications are defined within the context of the ITS Natural Architecture. This standard defines messages for a near real-time data exchange between a traffic management subsystem and the following types of transportation center/subsystems: information service provider; transit management; emergency management; toll administration; emissions management.

The messages are grouped into the following message sets. The message sets are applicable for implementing data flows between traffic management and other management center/subsystems including another traffic management center. The messages can be sent in a one-time request/reply sequence; at a regular update interval or in response to an event occurrence. The message sets are listed in Table 4-1. Also defined in this table is a message group. A message group is a collection of message sets that addresses data communication for a single category of TMS functional application.

The six message groups provide the management centers with the following data exchange functionality:

- **Roadway-Network:** provides ability to exchange a description of a specific traffic network as defined by a set of links and nodes. The messages can also be used to add or delete links or nodes or change specific link and node characteristics.
- **Network-State:** provides a snapshot of current traffic performance for a specific traffic network. Messages can be used to update a complete network or a subset of links and nodes. Also used for predicted traffic performance; roadway specific environmental (weather and emissions) conditions; current conditions of parking facilities and traffic conditions on current priority routes.
- **Network-Events:** provides a description of all traffic related incidents and planned roadway events that are currently active in a specific traffic network. Also provides response plans and specific messages to address the updating of specific incidents or events. This group also includes a summary message that can provide a full description of a current or predicted roadway event.
- **Traffic-Request:** provides a center with the ability to request specific data elements that are available in the Traffic Management Data Dictionary. These requests are defined for specific categories of traffic information including: roadway

**Table 4-1
Message Groups and Sets for External TMC Communication**

Message Group	Message Set Category
1 - Roadway-Network	1.1 - Roadway-Network-Description 1.2 - Roadway-Network-Update
2 - Network-State	2.1 - Current-Network-State 2.2 - Predicted-Network-State 2.3 - Roadway-Network-Environment 2.4 - Current-Priority-Routes 2.5 - Current-Parking-State
3 - Network-Events	3.1 - Current-Network-Incidents 3.2 - Planned-Roadway-Events 3.3 - Event-Defined-Response 3.4 - Network-Incident-Update 3.5 - Roadway-Event-Update 3.6 - Event-Bulletin
4 - Traffic-Request	4.1 - Traffic-Status-Request 4.2 - Traffic-Control-Request 4.3 - Control-Response
5 - Traffic-Device-Status	5.1 - Field-Device-Status 5.2 - Surface-Street-Device-Status
6 - Traffic-Control	6.1 - Field-Device-Control 6.2 - Surface-Street-Control

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network; network performance, traffic events and traffic control device parameters. This group also includes requests for specific types of control transfer between subsystems.

- **Traffic-Device-Status:** provides a center with the ability to send traffic control device data after receiving a request for status. This message group implements a read-only capability.
- **Traffic-Control:** This message group provides a center with the ability to effect remote control over traffic control devices that are functionally controlled locally at another center. This message group implements a write capability for device specific control parameters.

Figure 4-1 is the top-level message tree detailing the lower level message sets below these message groups.

The message sets, specified by this standard, satisfy the data flow requirements of the logical architecture of the following transportation center based subsystems:

1. Other Traffic Management Subsystem (other TMS)
2. Information Service Provider (Advanced Traveler Information Subsystem)
3. Transit Management Subsystem (TrMS)
4. Emergency Management Subsystem (EMS)
5. Emission Management Subsystem (EMMS)
6. Toll Administration Subsystem (TAS)

and a Traffic Management Subsystem. Figure 4-2 is the Level O Architecture Interconnect Diagram specified by the ITS National Architecture. The diagram shows only the external TMS interconnect to other centers/subsystems. Only the data flows labeled (1) to (6), from a TMS to another Subsystem, are specified by this standard. Data flows labeled (7) to (10) are outside the scope of this standard.

The message sets, specified by this standard may be sent from a Traffic Management Subsystem to any other transportation center/subsystem that conforms to the data exchange requirements of the NTCIP-Application Profile-Data Exchange-ASN.1. (DATEX-ASN-AP). See reference 2.2.7.

Figure 4-1
Message Tree For TMS Data Exchange Function

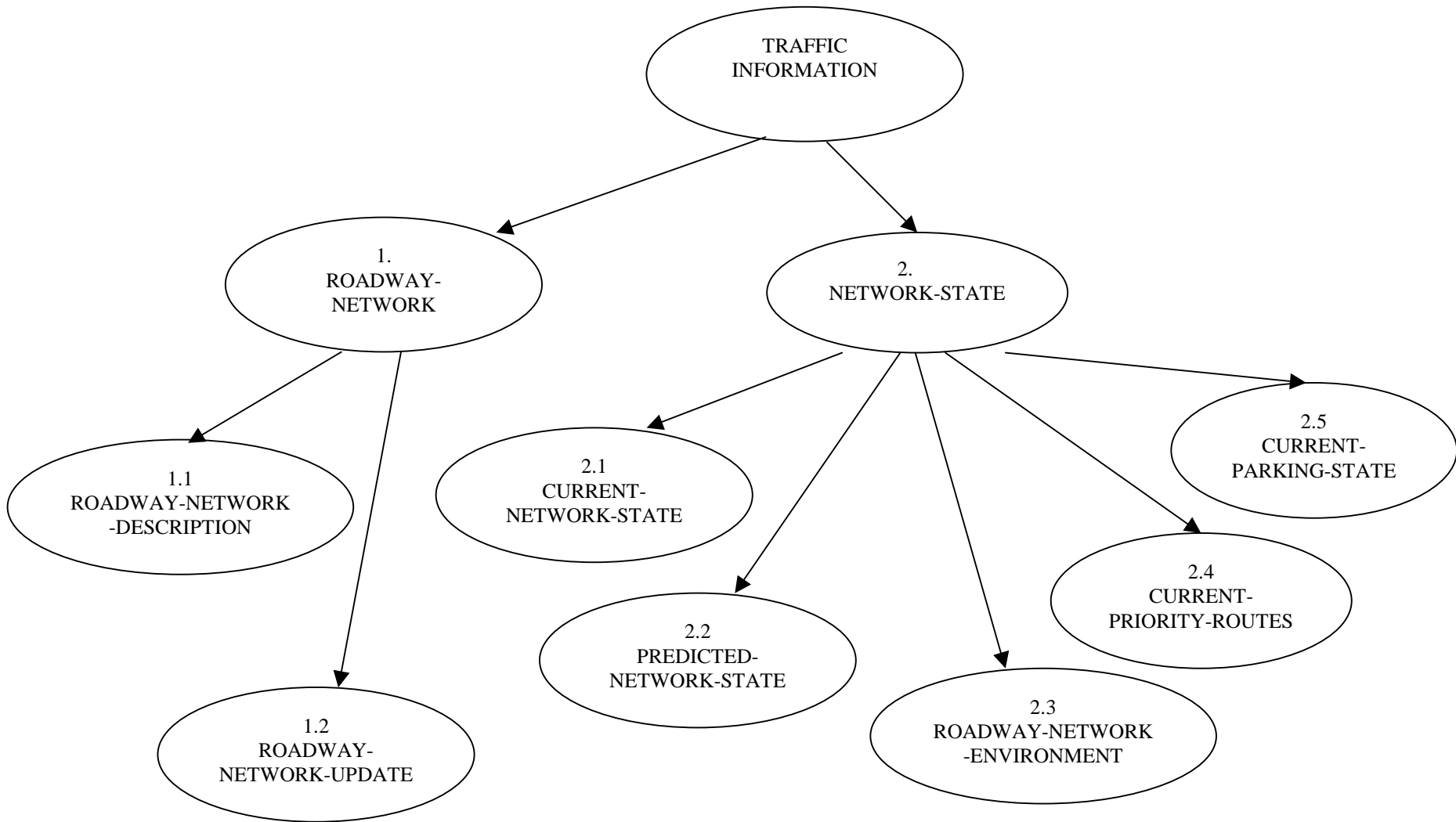


Figure 4-1
Message Tree For TMS Data Exchange Functions (Cont'd)

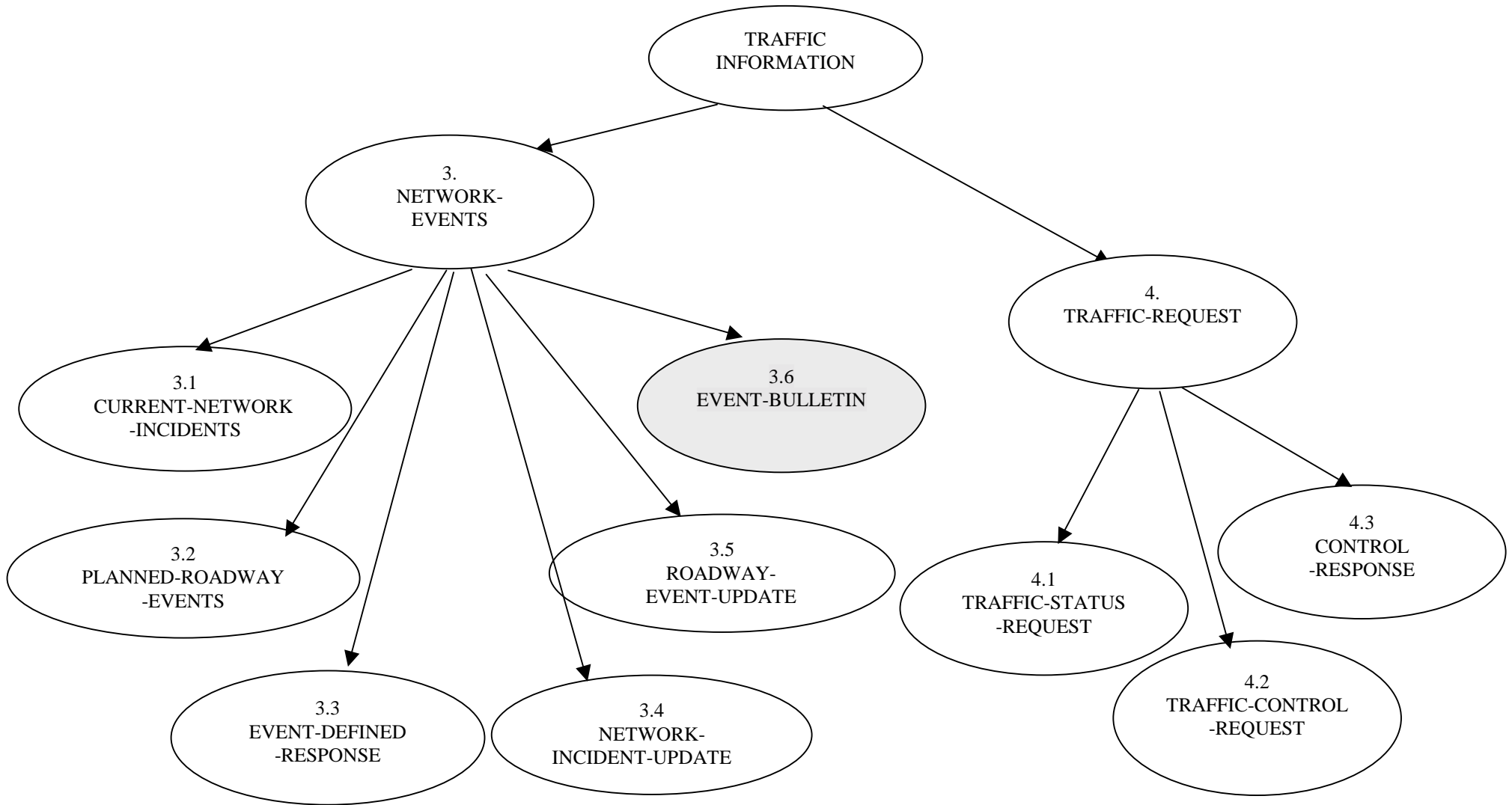
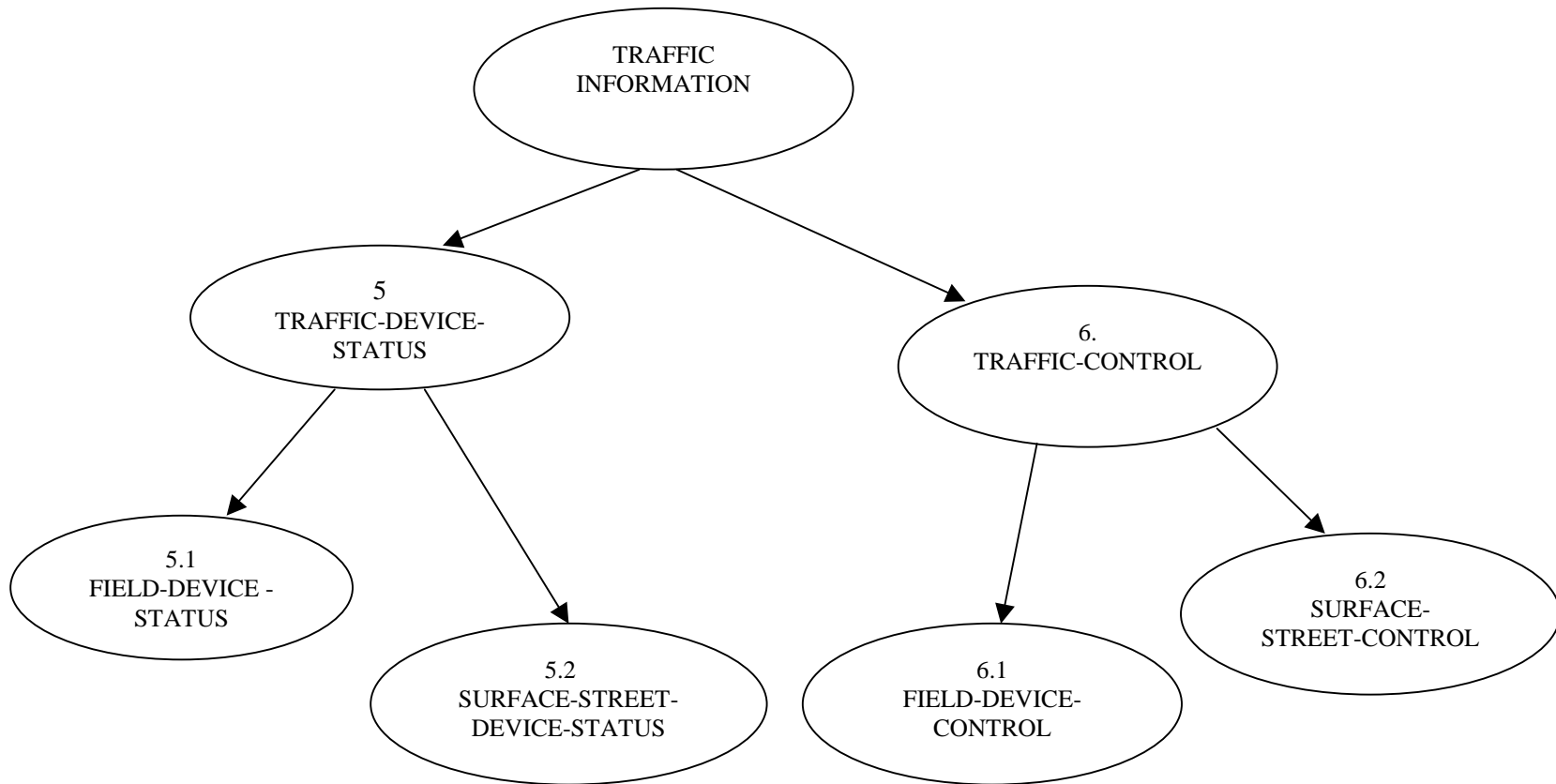
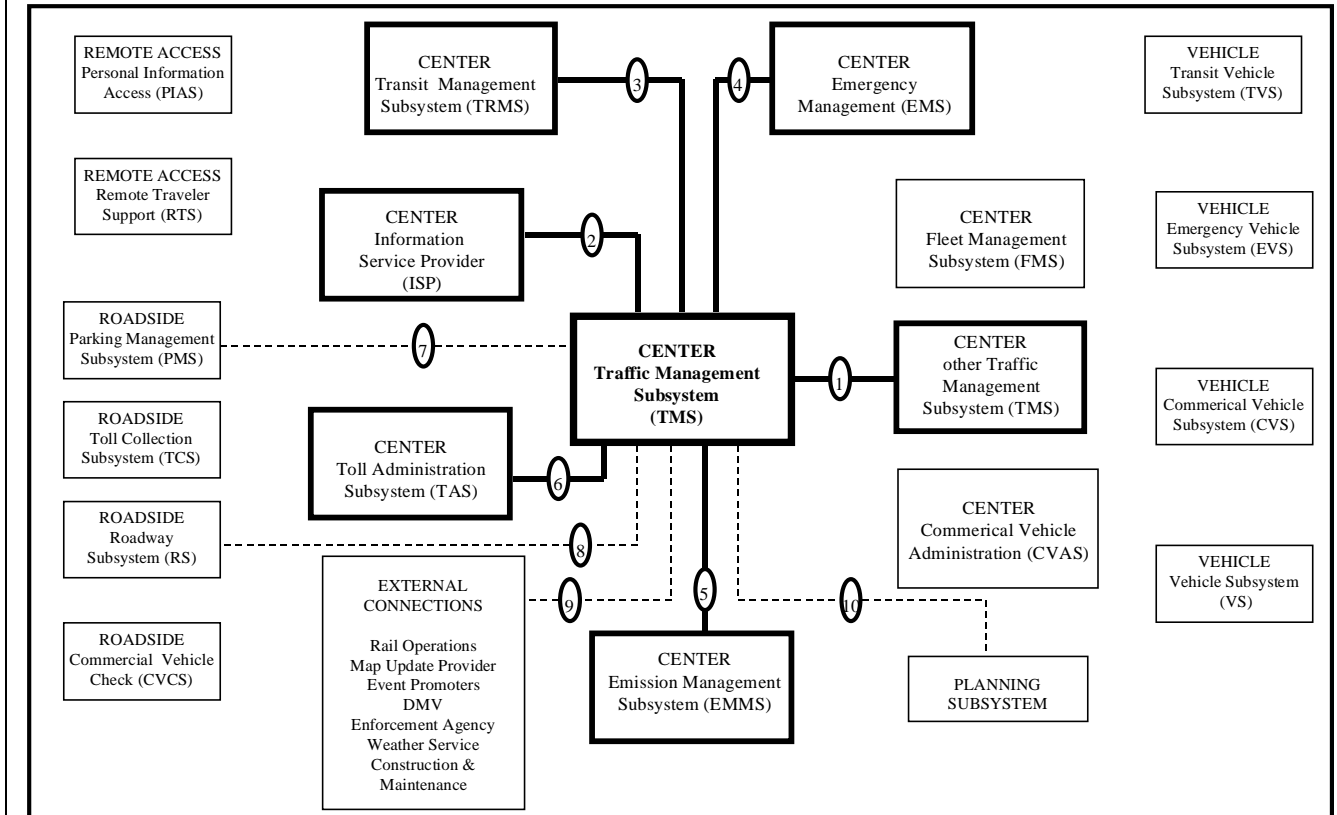


Figure 4-1
Message Tree For TMS Data Exchange Functions (Cont'd)



**Figure 4-2:
Level 0 Architecture Interconnect
Diagram with ETMC² Highlighted
(National Architecture)**



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4. *Message Descriptions (Cont'd)*

4.1 **Description of Roadway-Network Messages**

Roadway-Network messages are one-way messages sent from a TMS to another center based subsystem. Two message sets are included in this group: Roadway-Network-Description and Roadway-Network-Update.

4.1.1 **Roadway-Network-Description Message Set**

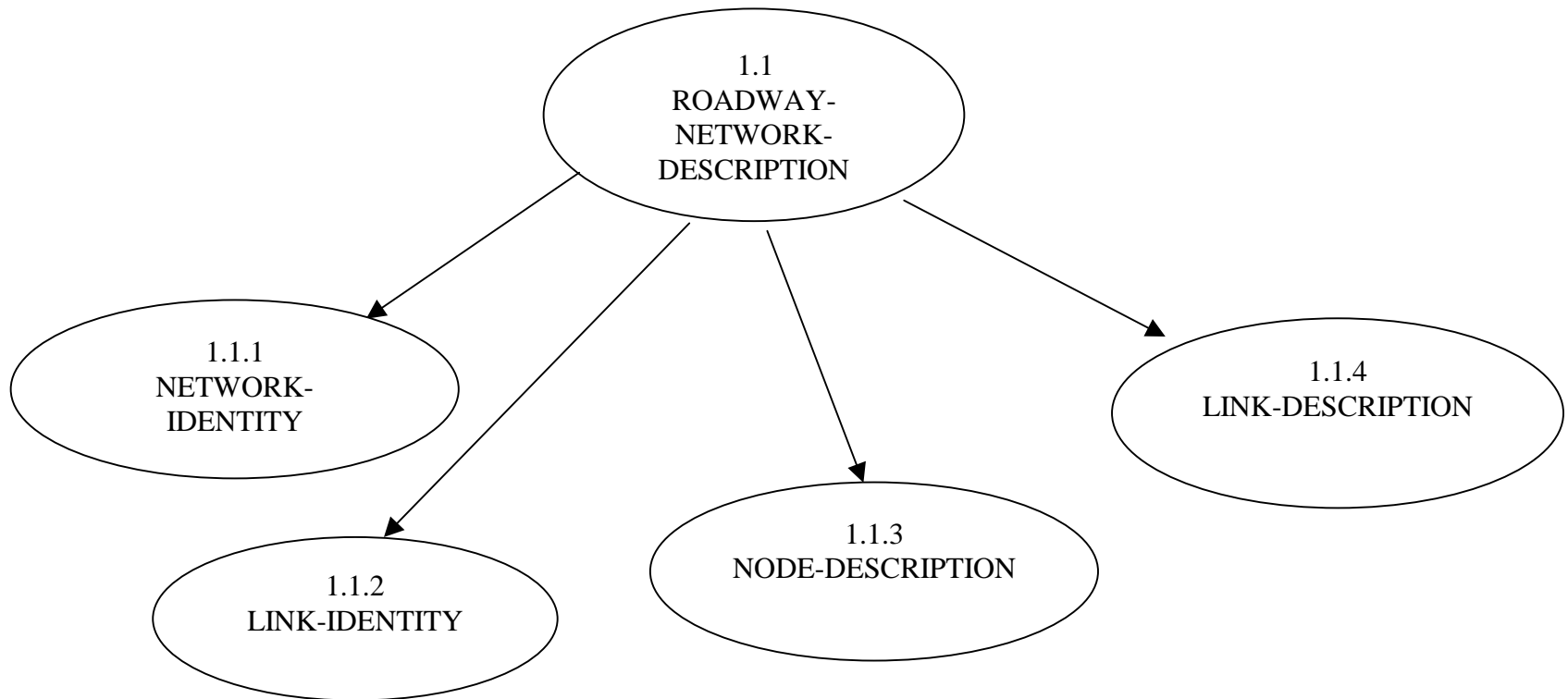
This message set provides a complete description of a specific traffic network as defined by a set of connected links and nodes. The set consists of 4 messages: Network-Identify; Link-Identify; Node-Description; Link-Description. Figure 4.1.1-1 shows the message tree for this set.

4.1.1.1 **Network-Identity**

Network Identity is a message sent from a TMS to any other center based subsystem. It identifies a specific traffic network by identification Identifier, name and jurisdiction and specifies the list of links and nodes composing that network.

- Network-Identifier: Uniquely identifies a traffic network by alphanumeric identifier (TMDD-DE 3411).
- Network-Name: Accepted name for specified network (TMDD-DE 3412).
- Network-Section Count: The number of sections in a network (TMDD-DE 3413).
- Organization-Contact-Organization Name: The organization that manages the network (TMDD-DE 3344).
- Section-Identifier: Uniquely identifies the specified network section by alphanumeric identifier (TMDD-DE 3421).
- Section-Link Count: The current number of links in the specified network section (TMDD-DE 3422).
- Section-Node Count: The current number of nodes in the specified network section in a network (TMDD-DE 3424).

Figure 4.1.1-1
Messages For Roadway-Network-Description Set



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4. *Message Descriptions (Cont'd)*

- Link-Identifier List: SEQUENCE OF: Identification alphanumeric for the set of links included in the specified network by section (TMDD-DE 3012).
- Node-Identifier List: SEQUENCE OF: Identification alphanumeric for the set of nodes included in the specified network by section (TMDD-DE 3042).

4.1.1.2 Link-Identity

Link Identify is a message that can be sent from a TMC to any other center. It uniquely relates a link to a physical set of identifying roadway characteristics, for example: roadway name. This message is used for identifying the full set of network links.

- Link-Identifier: Unique alphanumeric designation for specific roadway traffic link (TMDD-DE 3012).
- Link-Name: The name of a roadway as used for identification of a link (TMDD-DE 3019).
- Link-Jurisdiction: The name of the jurisdiction in which the link is located (TMDD-DE 3013).
- Link-Ownership: The name of the agency owner/operator of the link (TMDD-DE 3021).
- Link-Road Designator: County, state, or federal route number assigned to roadway link (TMDD-DE 3030).
- Link-Data Stored: Specifies the several types of roadway data stored for this link at the originating TMC (TMDD-DE 3004).
- Link-Type: Designation for the type of roadway this link represents e.g., freeway (TMDD-DE 3039).

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4. *Message Descriptions (Cont'd)*

4.1.1.3 Node-Description

Node description is a message that can be sent from a TMC to any other center. It uniquely relates a node to a set of identifying roadway characteristics, for example intersection name. This message is used for identifying and describing the full set of network nodes.

- Node-Identifier: Unique alphanumeric designation for a specific roadway traffic node (TMDD-DE 3042).
- Node-Name: The name of a roadway intersection as used for identification of a node (TMDD-DE 3047).
- Node-Jurisdiction: The name of the jurisdiction in which the node is located (TMDD-DE 3043).
- Node-Ownership: The name of the agency owner/operator of the node (TMDD-DE 3048).
- Node-Latitude: The latitude of the specified node. Units are microdegrees. See reference 2.2.9 for Location Reference Message Specification (TMDD-DE 3044).
- Node-Longitude: The longitude of the specified node. Units are microdegrees. See reference 2.2.9 for Location Reference Message Specification (TMDD-DE 3046).
- Node-Type: Designation for the type of roadway intersection this node represents, e.g., freeway interchange (TMDD-DE 3051).
- Node-Links Number: The number of roadway links beginning or ending at this node (TMDD-DE 3045).

4.1.1.4 Link-Description

Link Description is a message that can be sent from a TMC to any other center/subsystem. It uniquely relates a link to a set of identifying roadway characteristics for example, link length or speed limit.

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4. *Message Descriptions (Cont'd)*

This message is used for describing the full set of characteristics and features for the specified link(s).

- Link-Identifier: unique alphanumeric designation for specific roadway traffic link (TMDD-DE 3012).
- Link-Begin Node Latitude: the latitude of the beginning node of the specified link. Units are microdegrees. See reference 2.2.9 for Location Reference Message Specification (TMDD-DE 3001).
- Link-Begin Node Longitude: the longitude of the beginning node of the specific link. Units are microdegrees. See reference 2.2.9 for Location Preference Message Specification (TMDD-DE 3002).
- Link-Begin Node Identifier: unique alphanumeric designation for the node at beginning of specified link (TMDD-DE 3000).
- Link-End Node Identifier: unique alphanumeric designation for the node at end of specified link (TMDD-DE 3009).
- Link-End Node Latitude: latitude of the end node of the specified link. Units in microdegrees. See reference 2.2.9 for Location Reference Message Specification (TMDD-DE 3010).
- Link-End Node Longitude: longitude of the end node of the specified link. Units in microdegrees. See Reference 2.2.9 for Location Reference Message Specification (TMDD-DE 3011).
- Link-Direction: general direction of traffic flow on link as designated on roadway signing (TMDD-DE 3008).
- Link-Length: length of link from beginning node to end node links in meters (TMDD-DE 3016).
- Link-Capacity: maximum sustained vehicle flows on link. Units in vehicles per hour (TMDD-DE 3003).

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4. *Message Descriptions (Cont'd)*

- Link-Speed Limit: posted legal speed limit on link for automobiles (TMDD-DE-3034).
- Link-Speed Limit Truck: posted legal speed limit for truck on link (TMDD-DE 3035).
- Link-Lane Count: the prevailing number of through lanes at any point on the link (TMDD-DE 3014).
- Link-Shoulder Width Right: width of right (outside) shoulder for a specified link (TMDD-DE 3032).
- Link-Shoulder Width Left: width of left (median) shoulder for specified link (TMDD-DE 3031).
- Link-Median Type: type of median used for separate opposing/parallel traffic links (TMDD-DE 3018).
- Link-Pavement Type: payment material used on link roadway surface (TMDD-DE 3022).
- Link-Restriction Axle Court: maximum axle count for vehicles allowed on specified link (TMDD-DE 3024).
- Link-Restriction Height: minimum vertical vehicle clearance on specified link (TMDD-DE 3026).
- Link-Restriction Length: maximum vehicle length allowed on specified link (TMDD-DE 3027).
- Link-Restriction Weight: maximum vehicle weight allowable on specified link (TMDD-DE 3028).
- Link-Restriction Width: maximum vehicle width allowable on specified link (TMDD-DE 3029).
- Link-Restriction Weight Axle: maximum axle weight allowed on a specified link (TMDD-DE 3870).

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4. *Message Descriptions (Cont'd)*

4.1.2 Roadway-Network-Update Message Set

This message set provides an update of specific characteristics and features for specified links and or nodes. The update is only for those specific links and nodes that have changed since last complete update. This message set can be used to add or delete links or nodes or change specific characteristics. The set consists of three messages: Network-Update; Link-Update; Node-Update. Figure 4.1.2-1 shows the message tree for this set.

4.1.2.1 Network-Update

Network-Update is a message sent from a TMS to any other center based subsystem, requiring network (link and node) based information. It identifies a specific traffic network and the identifier of a single specific link or a single specific node that is being updated.

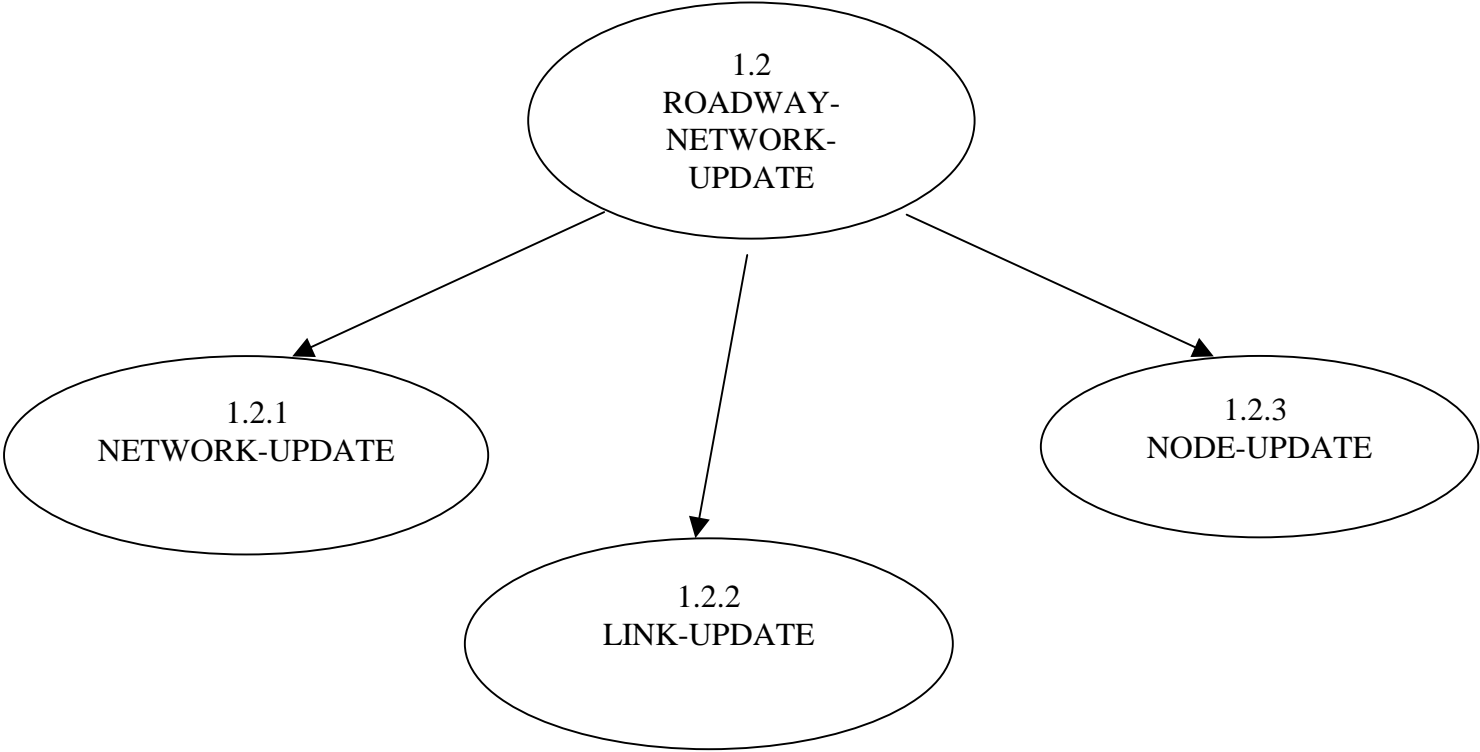
- Network-Identifier: uniquely identifies a traffic roadway network by identification alphanumeric (TMDD-DE 3411).
- Network-Name: agreed to accepted name for specified network (TMDD-DE 3412).
- Section-Identifier: Uniquely identifies the specified network section by alphanumeric identifier (TMDD-DE 3421).
- Link-Identifier: identifies the link that is being updated within the specified network and section (TMDD-DE 3012).
- Node-Identifier: identifies the node that is being updated within the specified network and section (TMDD-DE 3042).

4.1.2.2 Link-Update

Link Update is a message sent from a TMS only when a network link is to be updated. It includes only those data elements that changed with respect to that link.

- Network-Identifier: unique alphanumeric designation for the network containing the specified link (TMDD-DE 3411).

Figure 4.1.2-1
Messages For Roadway-Description-Update Set



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4. *Message Descriptions (Cont'd)*

- Link-Identifier: unique alphanumeric designation for specific roadway traffic link (TMDD-DE 3012).
- Link-Begin Node Latitude: the latitude of the beginning node of the specified link. Units are microdegrees. See reference 2.2.9 for Location Reference Message Specification (TMDD-DE 3001).
- Link-Begin Node Longitude: The longitude of the beginning node of the specific link. Units are microdegrees. See reference 2.2.9 for Location Preference Message Specification (TMDD-DE 3002).
- Link-Begin Node Identifier: unique alphanumeric designation for the node at beginning of specified link (TMDD-DE 3000).
- Link-End Node Identifier: unique alphanumeric designation for the node at end of specified link (TMDD-DE 3009).
- Link-End Node Latitude: latitude of the end node of the specified link. Units in microdegrees. See reference 2.2.9 for Location Reference Message Specification (TMDD-DE 3010).
- Link-End Node Longitude: longitude of the end node of the specified link. Units in microdegrees. See reference 2.2.9 for Location Reference Message Specification (TMDD-DE 3011).
- Link-Direction: general direction of traffic flow on link as designated on roadway signing (TMDD-DE 3008).
- Link-Length: length of link from beginning node to end node length is in meters (TMDD-DE 3016).

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4. *Message Descriptions (Cont'd)*

- Link-Capacity: maximum sustained vehicle flows on link. Units in vehicles per hour (TMDD-DE 3003).
- Link-Speed Limit: posted legal speed limit on link for automobiles (TMDD-DE 3034).
- Link-Speed Limit Truck: posted legal speed limit for truck on link (TMDD-DE 3035).
- Link-Lane Count: the prevailing number of through lanes at any point on a specified link (TMDD-DE 3014).
- Link-Shoulder Width Right: width of right (outside) shoulder for a specified link (TMDD-DE 3032).
- Link-Shoulder Width Left: width of left (median) shoulder for specified link (TMDD-DE 3031).
- Link-Median Type: type of median used for separate opposing/parallel traffic links (TMDD-DE 3018).
- Link-Pavement Type: payment material used on link roadway surface (TMDD-DE 3022).
- Link-Restriction Axle Count: maximum axle count for vehicles allowed on specified link (TMDD-DE 3024).
- Link-Restriction Height: minimum vertical vehicle clearance on specified link (TMDD-DE 3026).
- Link-Restriction Length: maximum vehicle length allowed on specified link (TMDD-DE 3027).
- Link-Restriction Weight: maximum vehicle weight allowable on specified link (TMDD-DE 3028).

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4. *Message Descriptions (Cont'd)*

- Link-Restriction Width: maximum vehicle width allowable on specified link (TMDD-DE 3029).
- Link-RestrictionWeightAxle: Maximum axle weight allowed on a specified link (TMDD-DE 3870).

4.1.2.3 Node-Update

Node Update is a message sent from a TMS only when a network node is to be updated. It includes only those data elements that changed with respect to that node.

- Network-Identifier: unique alphanumeric designation for the network containing the specified node (TMDD-DE 3411).
- Node-Identifier: unique alphanumeric designation for a specific roadway traffic node (TMDD-DE 3042).
- Node-Name: The name of a roadway intersection as used for identification of a node (TMDD-DE 3047).
- Node-Jurisdiction: The name of the jurisdiction in which the node is located (TMDD-DE 3043).
- Node-Ownership: The name of the agency owner/operator of the node (TMDD-DE 3048).
- Node-Latitude: The latitude of the specified node. Units are microdegrees. See reference 2.2.9 for Location Reference Message Specification (TMDD-DE 3044).
- Node-Longitude: The longitude of the specified node. Units are microdegrees. See reference 2.2.9 for Location Reference Message Specification (TMDD-DE 3046).
- Node-Type: Designation for the type of roadway intersection this node represents, e.g., freeway interchange (TMDD-DE 3051).
- Node-Links Number: The number of roadway links beginning or ending at this node (TMDD-DE 3045).

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4. *Message Descriptions (Cont'd)*

4.2 **Description of Network-State Messages**

Network-State messages are one-way messages sent from a TMS to other center based subsystems that have a need to know the current and/or predicted traffic conditions on a network.

The messages are sent to subscribing centers on a regular update interval. The update interval can be customized to the specific receiving center. The messages can also be customized to the full section of network links and nodes or a specific subset.

Two message sets are included in this group: Current-Network-State and Predicted-Network-State.

4.2.1 **Current-Network-State Message Set**

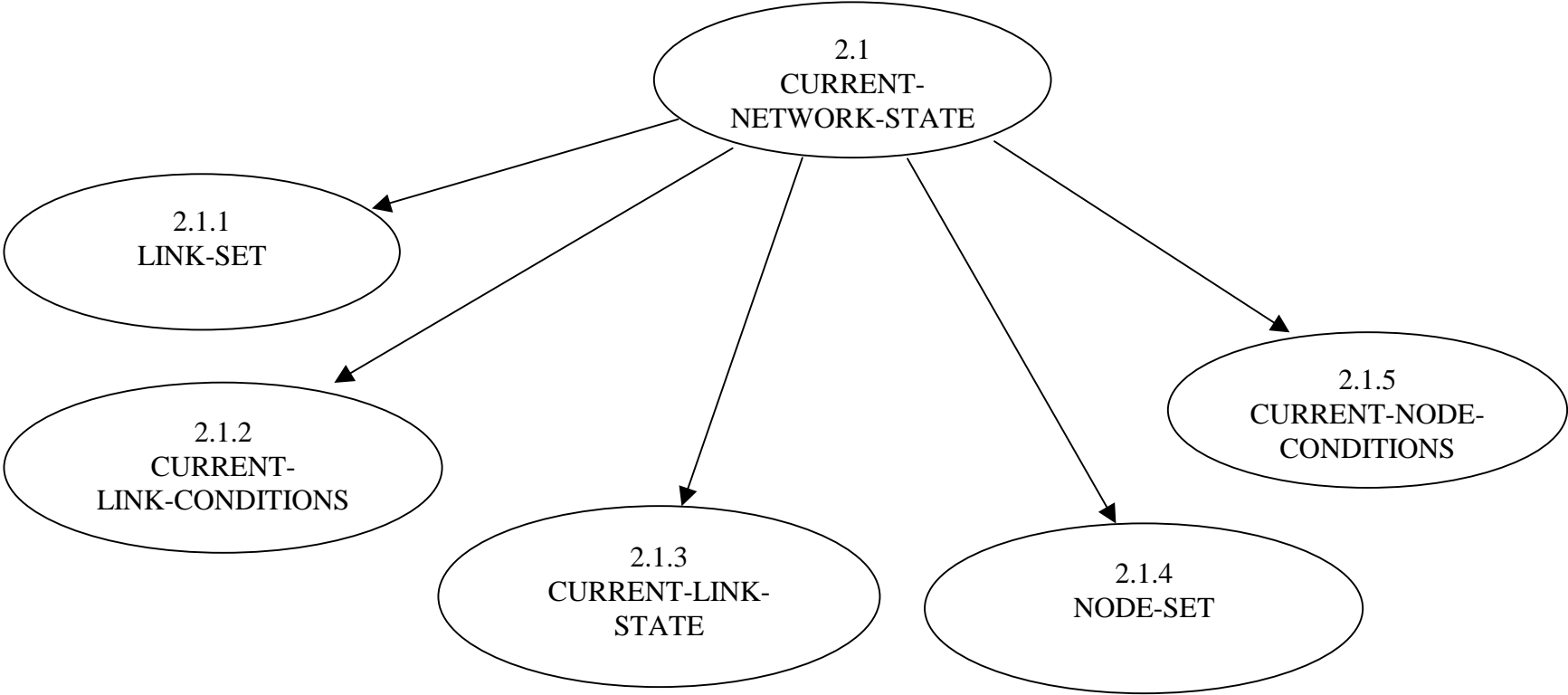
This message set provides a snapshot of current link and node performance measures for a specific traffic network. Messages can be used to update any configuration of links and nodes. The set consists of five messages: Link-Set; Current-Link-Conditions; Current-Link-State; Node-Set; Current-Node-Conditions. Figure 4.2.1-1 shows the message tree for this set.

4.2.1.1 **Link-Set**

Link Set is a message sent from the TMS to other center based subsystems subscribing to this message set. It identifies a specific set of links, part of a specific network, whose current performance will be updated by following messages. The data elements of this message include network identification; number of links and link identification.

- Network-Identifier: uniquely identifies a traffic network by identification alphanumeric (TMDD-DE 3411).
- Section-Identifier: uniquely identifies the specified network section by alphanumeric identifier (TMDD-DE 3421).
- Section-Link Count: the number of links for which current traffic conditions and state data will be provided (TMDD-DE 3422).

Figure 4.2.1-1
Messages For Current-Network-State Set



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4. *Message Descriptions (Cont'd)*

- Link-Identifier List: SEQUENCE OF: alphanumeric sequence for the links for which current traffic conditions and state data will be provided (TMDD-DE 3012).
- Link-Measurement Duration: duration of the data collection interval for the current link conditions and flow data from link detectors (TMDD-DE 3052).
- Link-Measurement End Time: the end time of the data collection interval for the current link conditions and flow data from link detectors (TMDD-DE 3053).

4.2.1.2 Current-Link-Conditions

Current Link Conditions is a follower message sent from the TMS to other center based subsystems subscribing to this message set. It provides a set of data elements for a specified link describing the current-link operating conditions. The conditions are provided for specific interval time duration with a specified end time.

- Link-Identifier: unique alphanumeric designation for specific roadway traffic link (TMDD-DE 3012).
- Link-Data Type: the type of data currently available (e.g. actual; historical) for this link (TMDD-DE 3426).
- Link-Lanes Number Open: lowest number of lanes currently open along length of specified link (TMDD-DE 3015).
- Link-Priority Type: current priority use of roadway as assigned to specified link (TMDD-DE 3023).
- Link-Restriction Class: current class of traffic restriction as assigned to specified link (TMDD-DE 3025).
- Link-Status: current roadway operating status as assigned to specified link (TMDD-DE 3036).
- Link-Surface Condition: current roadway surface conditions that clearly effect current operations on specified link (TMDD-DE 3037).

4. *Message Descriptions (Cont'd)*

- Link-Over saturated Flag: flag that indicates the existence of over saturated conditions on specified link. (TMDD-DE 3474).
- Link-Level of Service: qualitative measure of flow conditions currently existing on specified link. (TMDD-DE 3017)

4.2.1.3 Current-Link-State

Current Link State is a follower message sent from the TMC to other centers subscribing to this message set. It provides a set of data elements for a specified link describing the current traffic flow parameters. The parameters are provided for specific interval time duration with a specified end time.

- Link-Identifier: unique alphanumeric designation for a specific roadway traffic link. (TMDD-DE 3012)
- Link-Data Type: the type of data currently available (e.g. actual; historical) for this link (TMDD-DE 3426).
- Link-Delay: average additional time required for a vehicle to travel end to end on a specified link above the travel time recorded during free flow-conditions. (TMDD-DE 3005)
- Link-Travel Time: average time for a vehicle to travel end to end on a specified link during a selected time interval. (TMDD-DE 3038)
- Link-Volume: volume flow in vehicles per hour measured on a specified link over a selected time interval. (TMDD-DE 3040)
- Link-Speed: average speed of vehicles on the specified link over a selected time interval. (TMDD-DE 3033)
- Link-Density: average concentration of vehicles (per kilometer) on specified link over a selected time interval. (TMDD-DE 3006)
- Link-Headway: estimated headway (the time between vehicles) on a specified link. (TMDD-DE 3892)

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- Link-Occupancy: average percent of time that roadway detectors on specified link are activated by vehicle flow. (TMDD-DE 3020)

4.2.1.4 Node-Set

Node Set is a message sent from the TMC to other centers subscribing to this message set. It identifies a specific set of nodes, part of a specific network, whose current performance will be updated by following messages. The data elements of this message include network identification, number of nodes and node identification.

- Network-Identifier: uniquely identifies a traffic network with alphanumeric identification (TMDD-DE 3411).
- Section-Identifier: Uniquely identifies the specified network section by alphanumeric identifier (TMDD-DE 3421).
- Section-Node Count: the number of nodes for which current traffic conditions and state data will be provided (TMDD-DE 3424).
- Node-Identifier List: SEQUENCE OF: identification alphanumeric for the set of nodes for which current traffic conditions and state data are provided (TMDD-DE 3042).

4.2.1.5 Current-Node-Conditions

Current Node Conditions is a follower message sent from the TMS to other center based subsystems subscribing to this message set. It provides a set of data elements for a specified node, describing the operating conditions.

- Node-Identifier: unique alphanumeric designation for a specific roadway node. (TMDD-DE 3042)
- Node-Status: current conditions at node indicating normal or abnormal operations. (TMDD-DE 3049)

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4. *Message Descriptions (Cont'd)*

4.2.2 Predicted-Network State Message Set

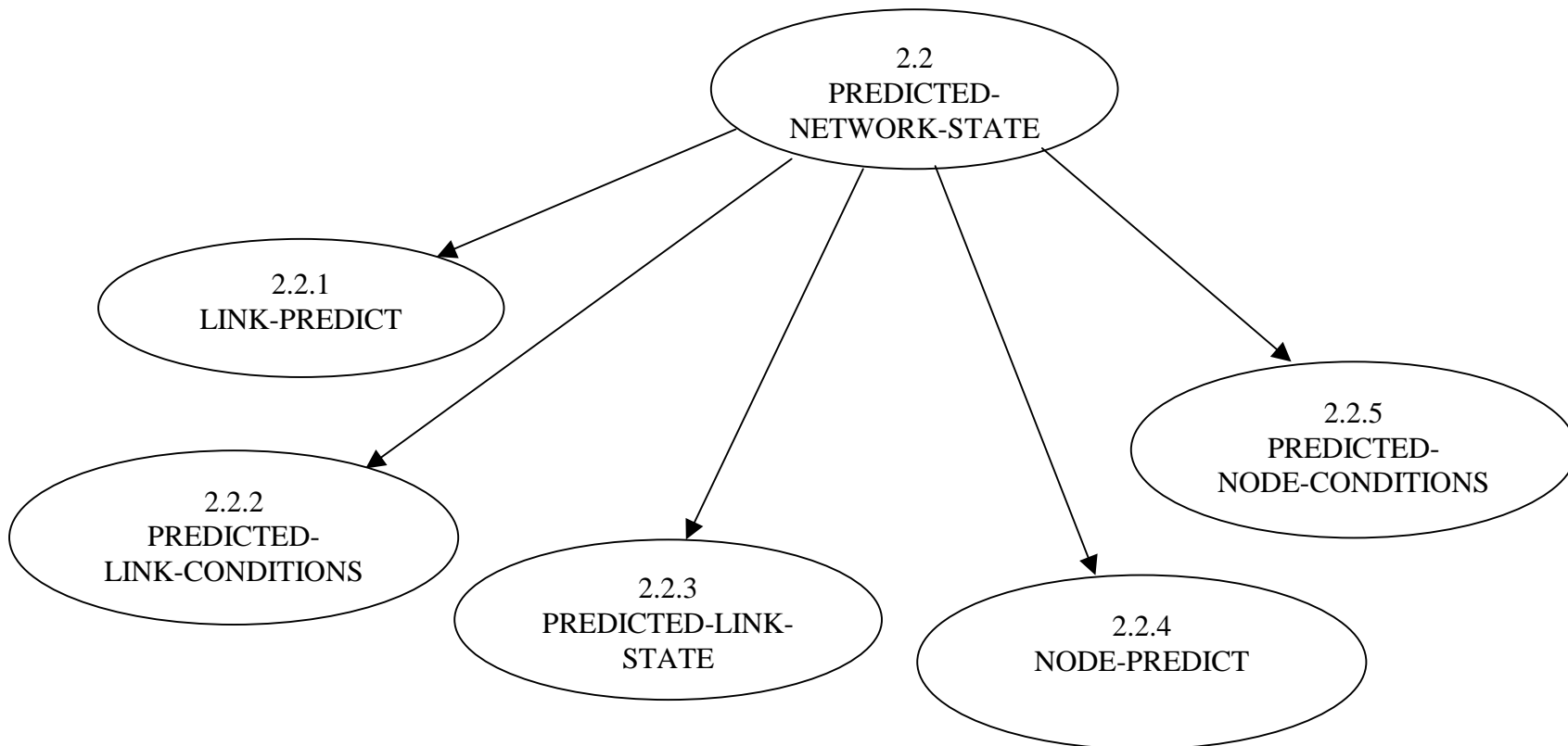
This message set provides a snapshot(s) of future link and node performance measures for a specific traffic network. Prediction includes a start time, number of time intervals, and time length of intervals. The set can be used to update a complete network, a subset of links and nodes or a single link or node. The set consists of five messages: Link-Predict; Predicted-Link-Conditions; Predicted-Link-State; Node-Predict; Predicted-Node-Conditions. Figure 4.2.2-1 shows the message tree for this set.

4.2.2.1 Link-Predict

Link Predict is a message sent from the TMS to other center based subsystems subscribing to this message set. It may also be sent one time based on a Request Message received from another center. It identifies a specific set of links and a specific start time, time interval and end time intervals with respect to which the predictions are provided.

- Network-Identifier: uniquely identifies a traffic network by identification alphanumeric (TMDD-DE 3411).
- Section-Identifier: uniquely identifies the specified network section by alphanumeric identifier (TMDD-DE 3421).
- Section-Link Count: number of links for which predicted traffic conditions data will be provided (TMDD-DE 3422).
- Prediction-Begin Time: the clock time when prediction time interval starts (TMDD-DE 3562).
- Prediction-Time: the time interval in seconds, over which a prediction is valid (TMDD-DE 3564).
- Prediction-End Time: the clock time when prediction time interval ends (TMDD-DE 3563).

Figure 4.2.2-1
Messages For Predicted-Network-State Set



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- Link-Identifier List: SEQUENCE OF: identification alphanumeric for the set of links for which traffic predictions are provided (TMDD-DE 3012).

4.2.2.2 Predicted-Link-Conditions

Predicted Link Conditions is a follower message sent to subscribing centers after transmission of Link Predict. It provides a set of data elements for a single link over the specified prediction time interval. Additional messages are sent for additional links.

- Link-Identifier: unique alphanumeric designation for specific roadway traffic link (TMDD-DE 3012).
- Link-Lanes Number Open: lowest number of lanes expected to be open over prediction interval (TMDD-DE 3015).
- Link-Priority Type: priority use of roadway link expected for prediction interval (TMDD-DE 3023).
- Link-Restriction Class: expected restrictions applicable to roadway link during prediction interval (TMDD-DE 3025).
- Link-Surface Condition: expected roadway surface conditions for specified link during prediction interval (TMDD-DE 3037).
- Link-Over saturated Flag: expected roadway saturated conditions for specified link during prediction interval (TMDD-DE 3474).
- Link-Level of Service: expected level of service on specified link during prediction interval (TMDD-DE 3017).

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4.2.2.3 Predicted-Link-State

Predicted Link State is a follower message sent to subscribing enters after transmission of Link Predict. It provides a set of data elements for a single link over the specified prediction time interval. Additional messages are sent for additional links.

- Link-Identifier: unique alphanumeric designation for a specific roadway traffic link (TMDD-DE 3012).
- Predicted-Link Average Speed: average speed of vehicles expected on specified link during each prediction interval (TMDD-DE 3553).
- Predicted-Link Average Queue Length: the average queue length of stopped vehicles predicted for the specified link during the prediction period (TMDD-DE 3552).
- Predicted-Link Max Queue Length: the maximum queue length of stopped vehicles predicted for the link during the prediction period (TMDD-DE 3556).
- Predicted-Link Stop Delay: the average stopped time delay estimated for the link during the prediction period. Units are seconds per vehicle (TMDD-DE 3558).
- Predicted-HOV Lane Vehicle Count: the estimated number of vehicles over a specific time interval that are in compliance (TMDD-DE 3550).
- Predicted-HOV Lane Violation Count: the estimated number of vehicles over a specific time interval that are in violation (TMDD-DE 3551).
- Predicted-Phase Volume: the estimated phase specific turning volumes at end node of specified link in percent (TMDD-DE 3561).

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4. *Message Descriptions (Cont'd)*

4.2.2.4 Node-Predict

Node Predict is a message sent from the TMC to other centers subscribing to this message set. It may also be sent one time based on a Request Message received from another center. It identifies a specific set of nodes and a specific start time, time interval and number of intervals with respect to which the predictions are provided.

- Network-Identifier: uniquely identifies a traffic network by alphanumeric identifier (TMDD-DE 3411).
- Section-Identifier: uniquely identifies the specified network section by alphanumeric identifier (TMDD-DE 3421).
- Section-Node Count: number of nodes for which predicted traffic data will be provided (TMDD-DE 3424).
- Prediction-Begin Time: the clock time when a prediction time interval starts (TMDD-DE 3562).
- Prediction-Time: the time interval in seconds, over which a prediction is valid (TMDD-DE 3564).
- Prediction-End Time: the clock time when a prediction time interval ends (TMDD-DE 3563).
- Node-Identifier List: SEQUENCE OF: identification alphanumeric for the set of nodes for which traffic predictions are provided (TMDD-DE 3042).

4.2.2.5 Predicted-Node-Conditions

Predicted Node Conditions is a follower message sent to subscribing centers after transmission of Node Predict. It provides a set of data elements for a single node over the specified prediction time interval.

- Node-Identifier: unique alphanumeric designation for a specific roadway traffic node (TMDD-DE 3042).

Message Set Standard

4. *Message Descriptions (Cont'd)*

- Node-Status: expected future conditions at node indicating normal/abnormal operations during prediction intervals (TMDD-DE 3049).

4.2.3 Roadway-Network-Environment Message Set

This message set provides a snapshot of current roadside air quality-emissions conditions; and current roadside weather (airborne and road surface) conditions based on synthesis of roadside sensor station data.

Messages can be used to transmit conditions at one or more links, nodes, arterial or intersections. The messages may be sent once in response to a status request message. Alternatively, the messages may be published on a regular interval and received by centers that have subscribed to the set. Finally, single messages filtered to specific network locations or sections may be sent in response to certain thresholds being exceeded.

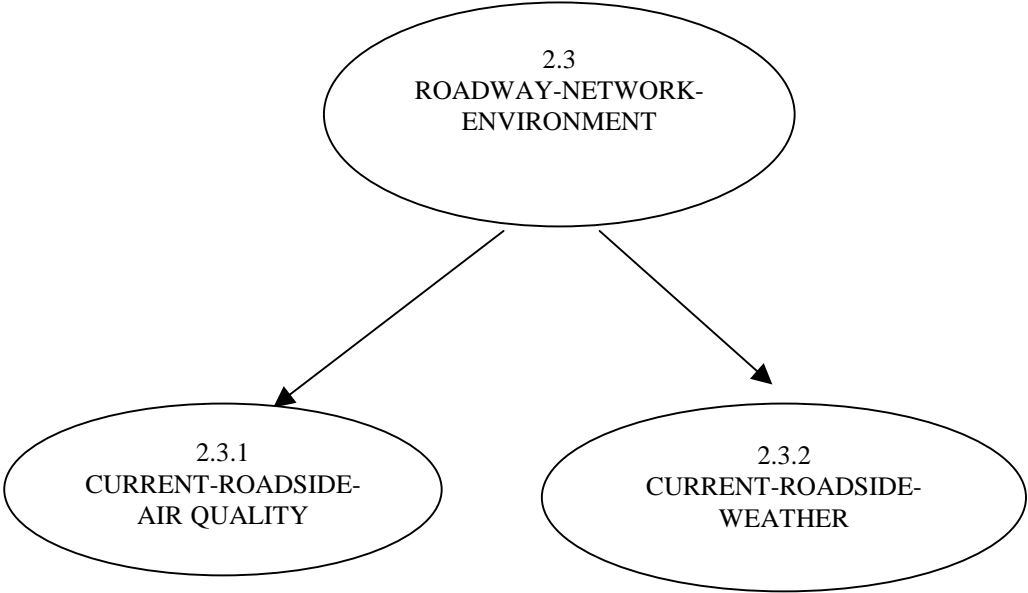
The set consists of two messages: Current-Roadside-Air Quality; Current-Roadside-Weather. Figure 4.2.3-1 shows the message tree for this set.

4.2.3.1 Current-Roadside-Air Quality

Current Roadside Air Quality is a message sent from the TMS to other center based systems subscribing to this message set. It may also be used to send site-specific emission conditions from an Emissions Management Subsystem (EMMS) back to a Traffic Management Subsystem.

- Network-Identifier: unique alphanumeric identifier for the traffic network for which air quality data is applicable (TMDD-DE 3411).

Figure 4.2.3-1
Messages For Roadway-Network-Environment Set



Message Set Standard

4. *Message Descriptions (Cont'd)*

- Device-Link Identifier: alphanumeric identifier of link for which air quality data is provided (TMDD-DE 3748).
- Device-Node Identifier: alphanumeric identifier of node for which air quality data is provided (TMDD-DE 3750).
- Intersection-Identifier: alphanumeric identifier of intersection for which air quality data is provided (TMDD-DE 3404).
- Artery-Identifier: alphanumeric identifier of arterial surface street for which air quality data is provided (TMDD-DE 3401).
- Device-Location Latitude: location latitude of specified roadside sensor / sensor station (TMDD-DE 3704).
- Device-Location Height: height above ground of specified roadside sensor / sensor station (TMDD-DE 3703).
- Device-Location Longitude: location longitude of specified roadside sensor / sensor station (TMDD-DE 3705).
- Device-Organization Operator Identifier: name of agency that operates the sensor station (TMDD-DE 3706).
- Device-Device Identifier: alphanumeric identifier of sensor station from which air quality data was collected (TMDD-DE 3701).
- Device-Device Type: code identifying the type of device from which data was collected (TMDD-DE 3747).
- ESS-Data Air Quality CO: local atmospheric concentration of carbon monoxide measured in parts per million (NTCIP object, `essNtcipAirQuality 1`).
- ESS-Data Air Quality NO: local atmospheric concentration of nitrous oxide measured in parts per million (NTCIP object, `essNtcipAirQuality 3`).

Message Set Standard

Message Set Standard

4. *Message Descriptions (Cont'd)*

- ESS-Data Air Quality NO2: local atmospheric concentration of nitrogen dioxide measured in parts per million (NTCIP object, `essNtcipAirQuality 4`).
- ESS-Data Air Quality O3: local atmospheric concentration of ozone measured in parts per million (NTCIP object, `essNtcipAirQuality 6`).
- ESS-Data Air Quality SO2: local atmospheric concentration of sulfur dioxide measured in parts per million (NTCIP object, `essNtcipAirQuality 5`).
- ESS-Data Air Quality CO2: local atmospheric concentration of carbon dioxide measured in parts per million (NTCIP object, `essNtcipAirQuality 2`).

4.2.3.2 Current-Roadside-Weather

Current Roadside Weather is a message sent from the TMS to other center based subsystems subscribing to this message set. Provides roadside weather at specific locations.

- Network-Identifier: unique alphanumeric identifier of the traffic network for which weather data is provided (TMDD-DE 3411).
- Device-Link Identifier: alphanumeric identifier of link for which weather data is provided (TMDD-DE 3748).
- Device-Node Identifier: alphanumeric identifier of node for which weather data is provided (TMDD-DE 3750).
- Intersection-Identifier: alphanumeric identifier of intersection for which weather data is provided (TMDD-DE 3404).
- Artery-Identifier: alphanumeric identifier of arterial surface street for which weather data is provided (TMDD-DE 3401).
- Device-Location Latitude: location latitude of specified roadside sensor / sensor station (TMDD-DE 3704).
- Device-Location Height: height above ground of specified roadside sensor / sensor station (TMDD-DE 3703).

Message Set Standard

4. *Message Descriptions (Cont'd)*

- Device-Location Longitude: location longitude of specified roadside sensor / sensor station (TMDD-DE 3705).
- Device-Organization Operator Identifier: unique alphanumeric identifier of agency that operates the sensor station (TMDD-DE 3706).
- Device-Device Identifier: alphanumeric identifier of sensor station from which weather data was collected (TMDD-DE 3701).
- Device-Device Type: code identifying the type of device from which weather data was collected (TMDD-DE 3747).
- ESS-Data Precipitation Situation: code identifying the precipitation occurring at the specified sensor station (NTCIP object, `essNtcipPrecip 6`).
- ESS-Data Surface Ice Thickness: numerical index describing ice conditions on the roadway surface at sensor station (NTCIP object, `essNtcipPrecip 7`).
- ESS-Data Surface Precipitation One Hour: numerical index describing the water equivalent of surface precipitation on the roadway over past one hour (NTCIP object, `essBufPrecip 19`).

Message Set Standard

4. *Message Descriptions (Cont'd)*

- ESS-Data Surface Status: code indicating overall surface condition of roadway (NTCIP object, `essPavementSensorEntry 7`).
- ESS-Data Surface Temperature: roadway surface temperature in degrees celsius (NTCIP object, `essPavementSensorEntry 8`).
- ESS-Data Visibility: roadway visibility measured in decimeters (NTCIP object, `essNtcipVisibility 1`).
- ESS-Data Wind Direction: a two minute average of wind direction at the roadway measured in degrees from north (NTCIP object, `essBufWind 1`).
- ESS-Data Wind Gust: maximum wind gust recorded over past 10 minutes at sensor station roadway location (NTCIP object, `essBufWind 41`).

4.2.4 Current-Priority-Routes Message Set

This message set provides a snapshot of the currently active priority routes in a specified network. Priority routes are classified into three types:

1. Current Emergency Routes – these routes are of short duration lasting only for the time interval that the emergency vehicle is in transit. These routes are used by public safety organizations that operate/dispatch the vehicles.
2. Current Commercial Vehicle Routes – these routes, of short duration, are requested by commercial transportation organizations for shipment of unique cargoes (i.e., wideloads or hazardous materials). The routes would be requested, scheduled and released based on a established route planning procedure used by an advanced commercial operations center/subsystem.

Message Set Standard

4. *Message Descriptions (Cont'd)*

3. Current Transit Routes – These routes are developed by transit organizations and transmitted to traffic management centers for coordination of overall traffic operations. These routes are typically active over a time period of weeks or months and fixed with respect to the use of roadway links and nodes.

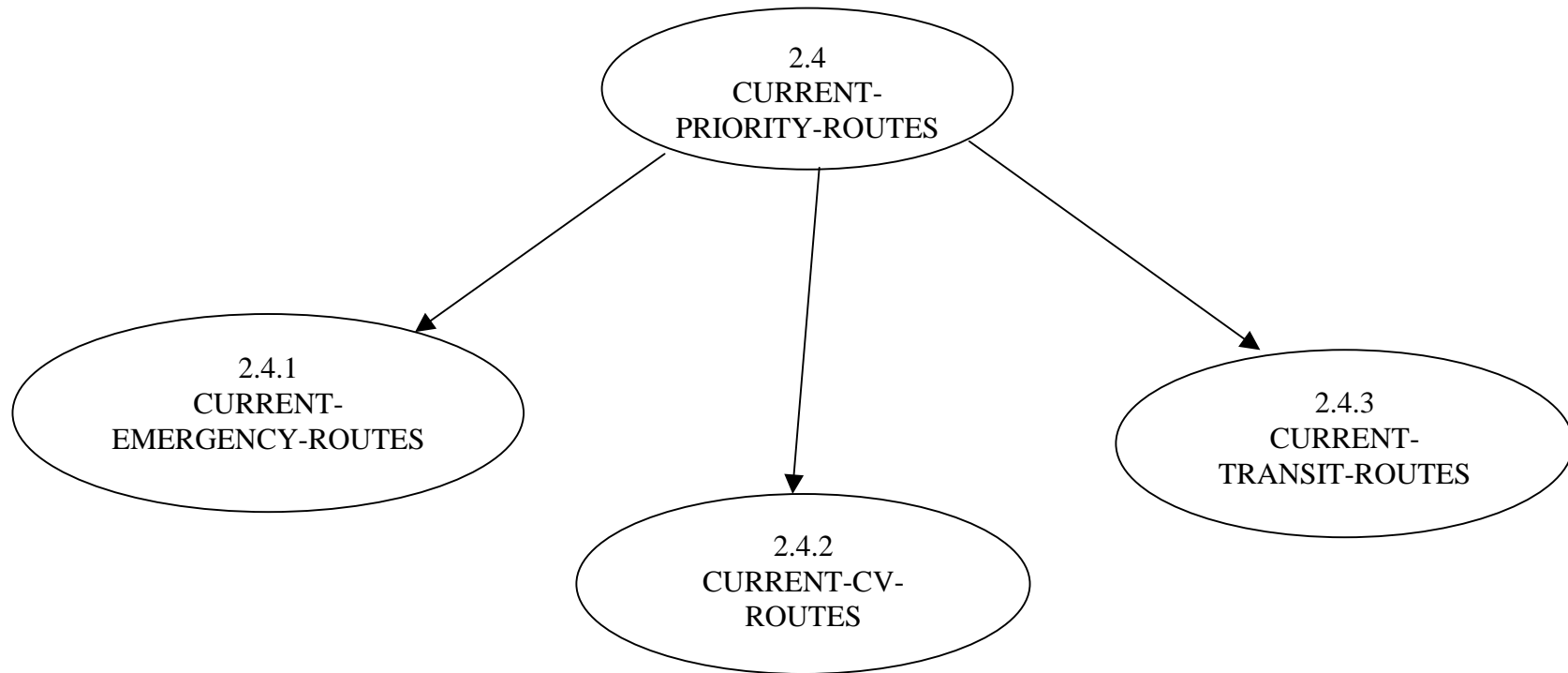
These messages are used to transmit traffic conditions on one or more routes in a specified network. The messages may be published once in response to a status request message. Alternatively, the messages may be published on a regular interval and received by centers that have subscribed to individual messages from the set. Figure 4.2.4-1 provides the message tree for this set.

4.2.4.1 Current-Emergency-Routes

Current Emergency Routes is a message sent from a TMS to other center based subsystem subscribing to this message set. It describes the route (trip) in terms of network links and nodes; identifies the related emergency event and provides the current travel time for a vehicle traveling the route.

- Network-Identifier: unique alphanumeric identifier of the traffic network for which current route information is provided (TMDD-DE 3411).
- Organization-Contact-Organization Identifier: unique alphanumeric identifier of transportation center/subsystem that coordinates traffic operations of priority routes (TMDD-DE 3343).
- Event-Identifier: unique alphanumeric designation of incident event to which emergency route is related (TMDD-DE 3215).
- Trip-Origin Location: location reference for origin of route (SAE-J2354 route instruction data element).
- Trip-Destination Location: location reference for destination of route (SAE-J2354 route instruction data element).
- Waypoint-SEQUENCE OF Waypoint List: sequence of location references for intermediate destinations (SAE-J2354 trip guidance message).

Figure 4.2.4-1
Messages For Current-Priority-Routes Set



Message Set Standard

4. *Message Descriptions (Cont'd)*

- Trip-Estimated Travel Time: estimated travel time for vehicle traveling on emergency route (SAE-J2354 route instruction data element).
- Waypoint Times-SEQUENCE OF Waypoint Travel Time: sequence of travel times for intermediate destinations (SAE-J2354 trip guidance message).
- Organization-Resource-Center Identifier: unique alphanumeric identifier for organization operating/dispatching emergency vehicle (TMDD-DE 3217).
- Organization-Resource-Center Name: name of organization operating/dispatching emergency vehicle (TMDD-DE 3355).
- Trip-Route Identity: unique identifier for an emergency route assigned by dispatching resource-center (SAE-J2354 route instruction data element).

4.2.4.2 Current-CV-Routes

Current Commercial Vehicle Routes is a message sent from TMS to other center based subsystems subscribing to this message set. It describes the route (trip) of a commercial vehicle in terms of network links and nodes; identifies requesting commercial organization and current travel time for vehicle traveling the route.

- Network-Identifier: unique alphanumeric identifier of the traffic network for which current route information is provided (TMDD-DE 3411).
- Organization-Contact-Organization Identifier: unique identifier of transportation center/subsystem that coordinates traffic operations of priority routes (TMDD-DE 3343).
- Trip-Origin Location: location reference for origin of route (SAE-J2354 route instruction data element).
- Trip-Destination Location: location reference for destination of route (SAE-J2354 route instruction data element).
- Waypoint-SEQUENCE OF Waypoint List: sequence of location reference for intermediate destinations (SAE-J2354 trip guidance message).

Message Set Standard

4. *Message Descriptions (Cont'd)*

- Trip-Estimated Travel Time: estimated travel time for vehicle traveling over commercial route (SAE-J2354 route instruction data element).
- Waypoint Times-SEQUENCE OF Waypoint Travel Time: sequence of travel times for intermediate destinations (SAE-J2354 trip guidance message).
- Organization-Resource-Center Identifier: unique alphanumeric identifier for organization operating/dispatching commercial vehicle (TMDD-DE 3217).
- Organization-Resource-Center Name: name of organization operating/dispatching commercial vehicle (TMDD-DE 3355).
- Trip-RouteIdentifier: unique identifier for a cv route assigned by dispatching resource-center (SAE-J2354 route instruction data element).

4.2.4.3 Current-Transit-Routes

Current Transit Routes is a message sent from a TMS to other center based subsystems subscribing to this message set. It describes the route in terms of origin, destination and way points and current travel times based on overall traffic flows on the links.

- Network-Identifier: unique alphanumeric identifier of the traffic network for which current-route information is provided (TMDD-DE 3411).
- Organization-Contact-Organization Identifier: unique alphanumeric identifier of transportation center/subsystem that coordinates traffic operations of priority routes (TMDD-DE 3343).
- Trip-Origin Location: location reference for origin of route (SAE-J2354 route instruction data element).
- Trip-Destination Location: location reference for destination of route (SAE-J2354 route instruction data element).
- Waypoint-SEQUENCE OF Waypoint List: sequence of location reference for intermediate destinations (SAE-J2354 trip guidance message).

Message Set Standard

4. *Message Descriptions (Cont'd)*

- Trip-Estimated Travel Time: estimated travel time for transit vehicle traveling over transit routes (SAE-J2354 route instruction data element).
- Waypoint Times-SEQUENCE OF Waypoint Travel Time: sequence of travel time for intermediate destinations (SAE-J2354 trip guidance message).
- Organization-Resource-Center Identifier: unique alphanumeric identifier for organization operating/dispatching transit vehicle (TMDD-DE 3217).
- Organization-Resource-Center Name: name of organization operating/dispatching transit vehicle (TMDD-DE 3355).
- Trip-Route Identity: unique identifier for a transit route assigned by dispatching resource center (SAE-J2354 route instruction data element).

4.2.5 **Current-Parking-State Message Set**

This single message provides a snapshot of available capacity of parking facilities in a specified network or sub network (i.e., network section). The message conveys information so that traffic operations can utilize changeable sign and advisory radio messages to provide parking advisories and routing for the motorist.

This message is used to transmit parking availability on one or more parking facilities associated with one or more roadway links. The messages may be sent once in response to a status request message. Alternatively, the message may be published on a regular interval and received by center based subsystem that have subscribed to the set.

- Network-Identifier: unique alphanumeric identifier of traffic network for which current parking information is provided (TMDD-DE 3411).
- Link-Identifier: alphanumeric identifier of network link which provide access to specified parking facility (TMDD-DE 3012).
- Parking-Lot-Identifier: alphanumeric identifier of parking facility (SAE-J2354 parking message data element).

Message Set Standard

4. *Message Descriptions (Cont'd)*

- Parking-Lot-Location: location reference which encapsulates the facility location using one of LRMS profiles (SAE-J2354 parking message data element).
- Parking-Type: code identifying type of parking – on road, public lot, private lot, enclosed public lot, enclosed private lot (TCIP PIDD 45).
- Parking-Spaces Total: total vehicle capacity of the facility (TCIP PIDD 43)
- Parking-Status: code indicating availability of parking spaces (SAE-J2354 parking message data element).
- Parking-Availability: number of open spaces available at facility (TCIP PIDD 33).
- Parking-Operator Name: name of organization operating the facility (TCIP PIDD 40).
- Device-Device Identifier: unique alphanumeric identifier of gate device controlling access to parking facility (TMDD-DE 3701).
- Gate-Status: code indicating whether gate is on-line (open, closed), standby, off-line (TMDD-DE 3734).

Message Set Standard

4. *Message Descriptions (Cont'd)*

4.3 Description of Network-Event Messages

Network-Event messages are messages sent from a TMS to other center based subsystems. The messages could also be used by centers other than TMCs (such as Transit or Emergency Management centers) to distribute information updates of incidents and special events with major traffic impacts.

This message group consists of six message sets: Current-Network-Incidents; Planned-Roadway-Events; Event-Defined-Response; Network-Incident-Update; Roadway-Event-Update and Event-Bulletin.

4.3.1. Current-Network-Incidents Message Set

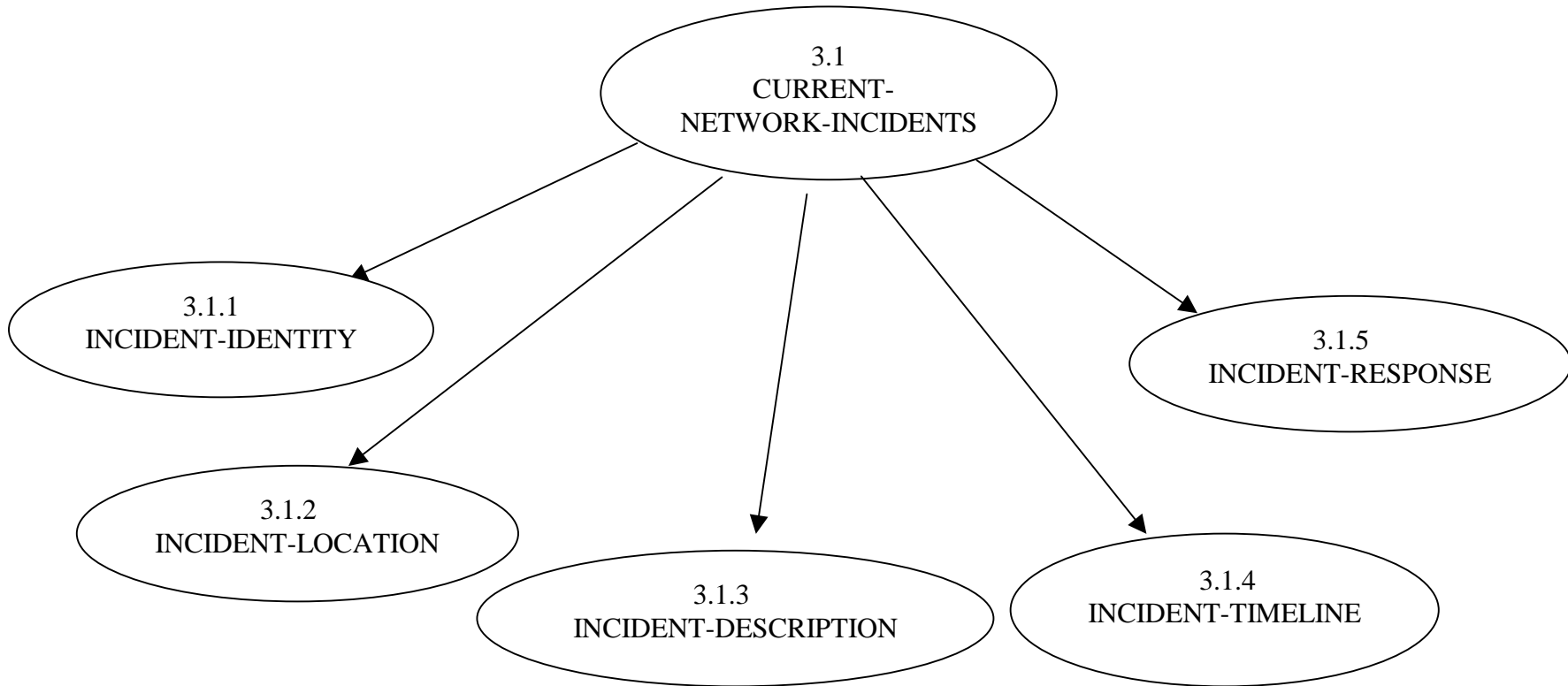
This message set provides a full description of all roadway-based incidents and other incidents/emergencies that have a significant traffic impact and are currently active in a specific traffic network. The messages provide incident identity, location, description, timeline and response information.

The messages in this set are normally communicated to other subscribed centers on a regularly published interval. The set would also be transmitted one-time based on a received request from a specific center. Individual messages filtered to a specific incident would also be transmitted one-time based on a received request from a specific center based subsystem.

The messages in this set are: Incident-Identity; Incident-Location; Incident-Description; Incident-Timeline; Incident-Response. Figure 4.3.1-1 shows the message tree for this set.

In general, the traffic management center responsible for traffic operations on a specific network would control the updating of the data elements in this message and its distribution. In certain situations based on regional considerations, other transportation centers would coordinate the flow and update of these messages.

Figure 4.3.1-1
Messages For Current-Network-Incidents Set



Message Set Standard

4. *Message Descriptions (Cont'd)*

4.3.1.1 Incident-Identity

This message provides the set of data elements that identify the incidents that are currently active on a specific traffic network. This message may be separately requested by an individual subscribing center.

- Organization-Contact-Organization Identifier: alphanumeric identifier for organization managing the currently active incidents impacting specified traffic roadway network (TMDD-DE 3343).
- Network-Identifier: alphanumeric identifier for network on which the identified incidents are active (TMDD-DE 3411).
- Organization-Contact-Organization Name: name of organization managing currently active incidents impacting specific traffic roadway network (TMDD-DE 3344).
- Event-Description Type Incident: code that identifies type of roadway incident, accidents and situations arising from unplanned roadway events (TMDD-DE 3818).
- Event-Identifier: unique alphanumeric designation for specific incident event (TMDD-DE 3215).
- Event-Incident-Status: code indicating timeline status of specified incident (TMDD-DE 3313).
- Contact-Phone Number: landline office number of person to contact at managing organization regarding a roadway event (TMDD-DE 3207).
- Event-Update Time: time the event log was last updated for this incident (TMDD-DE 3294).
- Event-Update Type: type of update made to event log for this event (TMDD-DE 3296).

Message Set Standard

4. *Message Descriptions (Cont'd)*

4.3.1.2 Incident-Location

This message provides the currently known location for all currently active incident events. This message may be requested by a subscribing center based subsystem.

- Event-Identifier: unique alphanumeric designation for specific incident event (TMDD-DE 3215).
- Link-Identifier: link alphanumeric identifier corresponding to location of incident event (TMDD-DE 3012).
- Link-Jurisdiction: the name of law enforcement agency with authority over this link (TMDD-DE 3013).
- Event-Location Roadway Identifier: unique alphanumeric identifier that can be used instead of full roadway name (TMDD-DE 3259).
- Event-Location Roadway Name: name of the roadway on which incident occurred (TMDD-DE 3260).
- Event-Location Roadway Side: code for the side of link that incident is located (TMDD-DE 3261).
- Event-Location Type: code identifying the location reference message profile used to locate this roadway incident (TMDD-DE 3265).
- Event-Location LRMS Message Profile: CHOICE OF location reference profile: defining location of this roadway incident based on Event-Location Type code. The profiles shall utilize the LRMS data interoperability protocol (reference 2.2.9).

Message Set Standard

Message Set Standard

4. *Message Descriptions (Cont'd)*

4.3.1.3 Incident-Description

This message provides a description of all currently active incidents. This message may be separately requested by an individual subscribing center.

- Event-Identifier: unique alphanumeric designation for specific incident for specific incident event (TMDD-DE 3215).
- Event-Incident Details: code based details of incident expanding on description of Event-Description Type Incident (TMDD-DE 3212).
- Event-Description: A text description of the specified roadway event. For this message the event is an incident (TMDD-DE 3209).
- Event-Incident Severity: code describing the severity of an incident (TMDD-DE 3312).
- Event-Lanes Affected: bit string describing the specific lanes blocked or closed on link at incident location. Lanes numbered from inner median to shoulder (TMDD-DE 3219).
- Event-Detection Method: code indicating the detection method for specified incident (TMDD-DE 3302).
- Event-Incident Human Fatalities Count: number of fatalities known at time of report for specified incident (TMDD-DE 3303).
- Event-Incident Human Injuries Count: number of injuries known at time of report for specified incident (TMDD-DE 3304).
- Event-Incident Property Damage: code describing type of property damage present at incident (TMDD-DE 3305).
- Event-Description Type Pavement Condition: code describing pavement condition during occurrence of specified incident (TMDD-DE 3298).
- Event-Incident Buses Involved Count: total number of buses involved in an incident (TMDD-DE 3889).
- Event-Incident Cars Involved Count: total number of cars involved in an incident (TMDD-DE 3890).

Message Set Standard

Message Set Standard

4. *Message Descriptions (Cont'd)*

- Event-Incident Trucks Involved Count: total number of trucks involved in an incident (TMDD-DE 3891).
- Event-Description Type Weather Condition: code describing weather conditions during occurrence of specified incident (TMDD-DE 3299).
- Event-Incident Human Injury Type: code that indicates the level of human injury at an incident (TMDD-DE 3369).
- Event-Description Type Obstruction: Description of situations arising from unplanned roadway obstructions that call for driver caution and may create delays (TMDD-DE 3822).
- Event-Incident Vehicles Involved Count: number of vehicles involved in specified incident (TMDD-DE 3318).
- Event-Incident Vehicles Involved: code indicating types of vehicles involved in specified incident (TMDD-DE 3319).

4.3.1.4 Incident-Timeline

This message provides an incident timeline for all currently active incident events. This message may be requested by a subscribing center based subsystem.

- Event-Identifier: unique alphanumeric designation for specific incident event (TMDD-DE 3215).
- Event-Timeline First Arrival at Scene Time: the time of first responder arrival at scene (TMDD-DE 3311).
- Event-Timeline Confirmed and Responding: the time a roadway incident was initially confirmed and associated activities were started (TMDD-DE 3317).
- Event-Timeline Cleared and Recovering: the time a roadway incident was cleared, activities were completed and roadway is recovering (TMDD-DE 3315).
- Event-Timeline Duration: the actual time duration of a roadway event (TMDD-DE 3276).
- Event-Timeline Estimated Duration: the estimated time duration of a roadway incident (TMDD-DE 3279).

Message Set Standard

Message Set Standard

4. *Message Descriptions (Cont'd)*

- Event-Timeline End Time: the actual end time of a roadway event (TMDD-DE 3278).

4.3.1.5 Incident-Response

This message describes current response status for all currently active incident events. The message may be requested by a subscribing center based subsystem.

- Event-Identifier: unique alphanumeric designation for specific incident event (TMDD-DE 3215).
- Event-Response Plan Type: code indicating the type of response plan selected to respond to this roadway incident (TMDD-DE 3270).
- Event-Response Plan Identifier: unique alphanumeric designating a specific response plan for specified incident (TMDD-DE 3269).
- Event-Response Plan Author: identifier of person responsible for plan currently active for specified incident (TMDD-DE 3365).
- Event-Response Alternate Route: text description of alternate route(s) in effect for specific roadway incident (TMDD-DE 3268).
- Event-Description Advice Alternate Route: detour options that qualify a situation description (TMDD-DE 3814).
- Event-Description Type Incident Response Status: data element used to identify response status for an incident event (TMDD-DE 3885).
- Event-Organization Required Identifier: unique alphanumeric identifier(s) for organization(s) required at specified roadway incident (TMDD-DE 3336).
- Event-Organization Responding Identifier: unique alphanumeric identifier(s) for organization(s) actively responding to specified roadway incident (TMDD-DE 3337).
- Event-Organization Response Status: for each responding organization, the code indicating current status of response to specified roadway incident (TMDD-DE 3272).

4.3.2 Planned-Roadway-Events Message Set

This message set provides a description of all planned roadway events and significant off-roadway planned events that have a significant traffic impact in a specific traffic network. 4/6/01

Message Set Standard

4. *Message Descriptions (Cont'd)*

Categories of events include: long and short duration construction/maintenance actions; traffic generated by entertainment/sporting events; road restrictions and closures due to unique political/societal events. The messages provide information on event identity; location; description; daily timeline and schedule.

The messages in this set are normally communicated to other center based subsystems on a regularly published interval. The set or individual messages (for example: location of all planned events) would also be transmitted one-time based on a received request from a specific center. Individual messages filtered to a specific event would also be transmitted one-time based on a received request from a specific center.

The messages in this set are: Event-Identity; Event-Location; Event-Description; Event-Daily-Timeline and Event-Schedule.

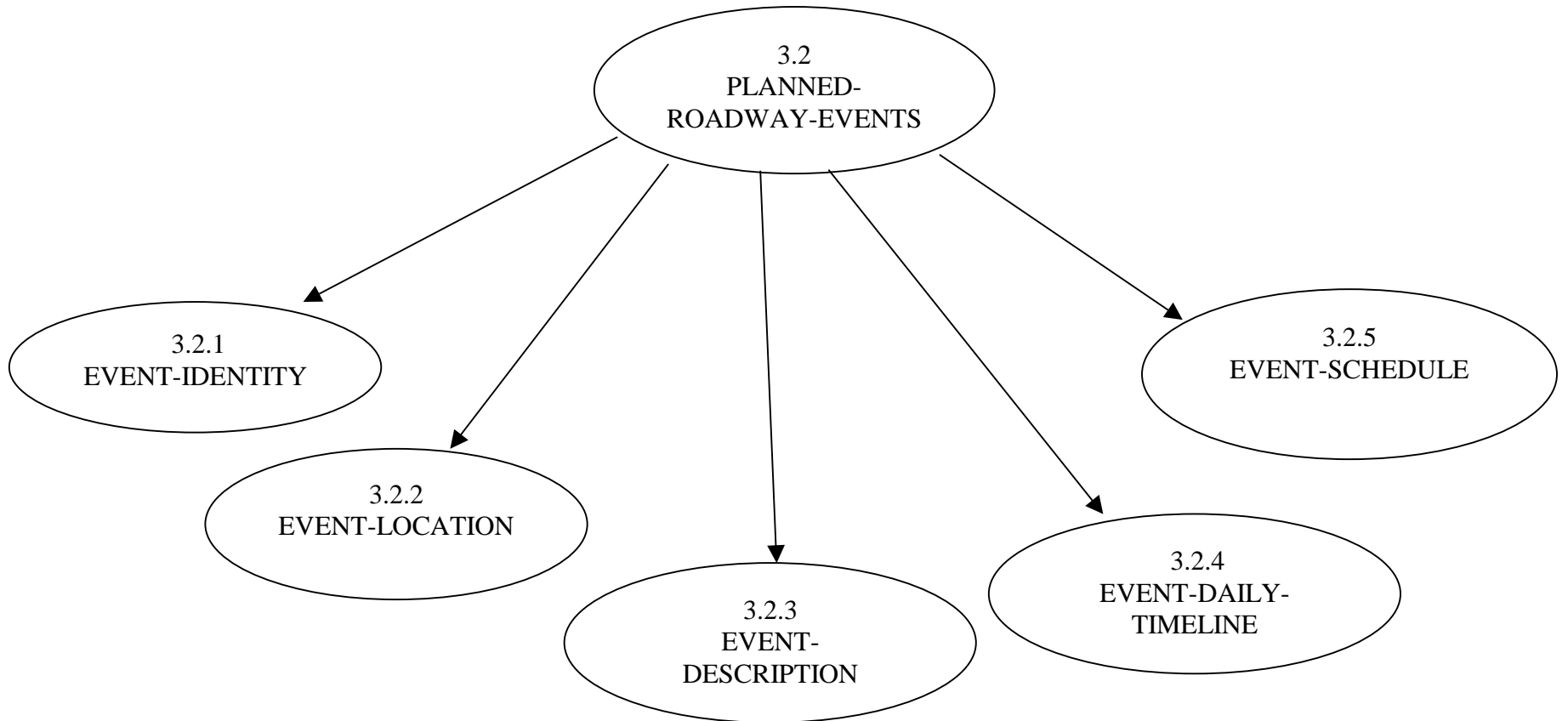
In general, the traffic management center responsible for traffic operations would control the updating and distribution of the messages in this message set. Figure 4.3.2-1 shows the message tree for this set.

4.3.2.1 Event-Identity

This message provides the set of data elements that identify the list of planned events that are currently scheduled for a specific traffic network. This message may be separately requested by an individual subscribing center based subsystem.

- Organization-Contact-Organization Identifier: organization(s) coordinating the currently scheduled planned event(s) (TMDD-DE 3343).
- Organization-Contact-Organization Name: name of organization(s) coordinating the currently scheduled planned events (TMDD-DE 3344).
- Network-Identifier: unique alphanumeric identifier for network on which the planned events are scheduled (TMDD-DE 3411).
- Event-Description Type Event: code that identifies the type of events (TMDD-DE 3211).
- Event-Identifier: unique alphanumeric identifier for scheduled planned events (TMDD-DE 3215).

Figure 4.3.2-1
Messages For Planned-Roadway-Events Set



Message Set Standard

4. *Message Descriptions (Cont'd)*

- Event-Organization Report Identifier: the unique identifier of the organization that reported the roadway event (TMDD-DE 3335).
- Contact-Phone Number: telephone number of organization personnel with responsibility for coordinating the planned event (TMDD-DE 3207).
- Event-Update-Date: the date that the planned event log was last modified for this specific event (TMDD-DE 3292).
- Event-Update Time: the time that the planned event log was last modified for this specific event (TMDD-DE 3294).
- Event-Update: the number of times the log was modified for a specific event (TMDD-DE 3293).
- Event-Update Author Last Revised: name-identifier of author who last updated log for specific roadway event (TMDD-DE 3295).

4.3.2.2 Event-Location

This message provides the set of data elements that locate the currently scheduled planned events. This message may be requested by a subscribing center based subsystem.

- Event-Identifier: unique alphanumeric identifier of the organization reporting the event (TMDD-DE 3215).
- Link-Identifier: unique alphanumeric identifier of link corresponding to location of planned event (TMDD-DE 3012)
- Link-Jurisdiction: name of law enforcement agency with authority over this link with specified planned event (TMDD-DE 3013).
- Event-Location Roadway Identifier: unique alphanumeric identifier of roadway where the planned event is located (TMDD-DE 3259)
- Event-Location Roadway Name: the name of roadway where the planned event is located (TMDD-DE 3260).
- Event-Location Roadway Side: identifies the side of a road or route when required for event situation description (TMDD DE 3261).

Message Set Standard

Message Set Standard

4. *Message Descriptions (Cont'd)*

- Event-Location Type: code identifying the location reference message profile used to locate this planned event (TMDD-DE 3265).
- Event-Location LRMS Message Profile: CHOICE OF location reference: profile defining location of this planned event based on Event-Location Type code. The profiles shall utilize the LRMS data interoperability protocol (reference 2.2.9).

4.3.2.3 Event-Description

The message provides the set of data elements that describe key characteristics of the planned event.

- Event-Identifier: unique identifier of the planned event (TMDD-DE 3215).
- Event-Description: text description of specified planned event. Indicates expected traffic impacts (TMDD-DE 3209).
- Event-Description Notes and Comments: notes and comments providing planned event details (TMDD-DE 3210).
- Event-Description Type Closure: description of road closures and blockages often requiring detours or creating delays (TMDD-DE 3819).
- Event-Description Type Roadwork: descriptions of construction, maintenance and related activities that require driver caution and may create delays (TMDD-DE 3213).
- Event-Description Type Special Event: type event code based on non-traffic events with major traffic impacts (TMDD-DE 3214).
- Event-Description Type Sporting Events: type event code based on non-traffic sporting event with major traffic impacts (TMDD-DE 3886).
- Event-Description Type Disturbances: type event code based on non-traffic disturbances event with major traffic impacts (TMDD-DE 3884).
- Event-Lanes Effected: bit string indicating which lanes are closed or blocked by a planned event (TMDD-DE 3219).
- Event-Response Alternate Route: text description of alternate route(s) in effect during the specified planned event (TMDD-DE 3268).

Message Set Standard

Message Set Standard

4. *Message Descriptions (Cont'd)*

- Event-Description Advice Alternate Route: Detour options that relate to a specific event (TMDD-DE 3814).
- Event-Response Plan Identifier: unique alphanumeric identifier for response plan in effect to mitigate impact of this planned event (TMDD-DE 3269).

4.3.2.4 Event-Daily Timeline

This message provides the set of data elements that describe the daily timeline of the specified planned event. Generally provides information from a schedule and actual timeline perspective. This message may be requested by an individual subscribing center.

- Event-Identifier: unique identifier of planned event (TMDD-DE 3215).
- Event-Timeline Schedule Start: scheduled start time on current day of planned event (TMDD-DE 3287).
- Event-Timeline Start: actual start time on current day of planned event (TMDD-DE 3291).
- Event-Timeline Schedule End: scheduled stop time on current day of planned event (TMDD-DE 3284).
- Event-Timeline End: actual stop time on current day of planned event (TMDD-DE 3278).

4.3.2.5 Event-Schedule

This message provides the long term schedule for the planned event. Generally provides schedule information updated on a daily basis for specified planned event. This message may be requested by an individual subscribing center.

- Event-Identifier: unique alphanumeric identifier of planned event (TMDD-DE 3215).
- Event-Timeline Schedule Type: timeline code that indicates the type of schedule the planned event follows (TMDD-DE 3289).
- Event-Timeline Schedule Days of Week: timeline code that indicates the day of week that a planned event is active (TMDD-DE 3282).

Message Set Standard

Message Set Standard

4. *Message Descriptions (Cont'd)*

- Event-Timeline Schedule Start Date: scheduled date for starting planned event activity (TMDD-DE 3286).
- Event-Timeline Schedule End Date: scheduled date for completing planned event activity (TMDD-DE 3283).
- Event-Timeline Schedule Dates: dates (YYYYMMDD) during which a planned event is scheduled to be active (TMDD-DE 3281).

4.3.3 Event-Defined-Response Message Set

This message set provides descriptions of response plans that will be employed to mitigate the traffic impacts and other consequences of active incidents and events. Response Plans are developed for specific networks, roadways and event types and conditions.

The messages in this set are normally published in real time to subscribing centers when a response plan has been first developed and assigned to a specified incident or planned event. As the response plan changes or specific parts of the plan evolve, during the course of the event timeline, plan updates are sent to subscribing centers. The messages provide information referenced to the event, indicating managing organization(s), resource organization(s), assigned resources, and assigned control devices and response plan status.

Other transportation centers may also request on a one time basis, an update to the response for a specific event.

The messages in this set are: Response-Organization; Response Plans; Agency-Response; Device-Response.

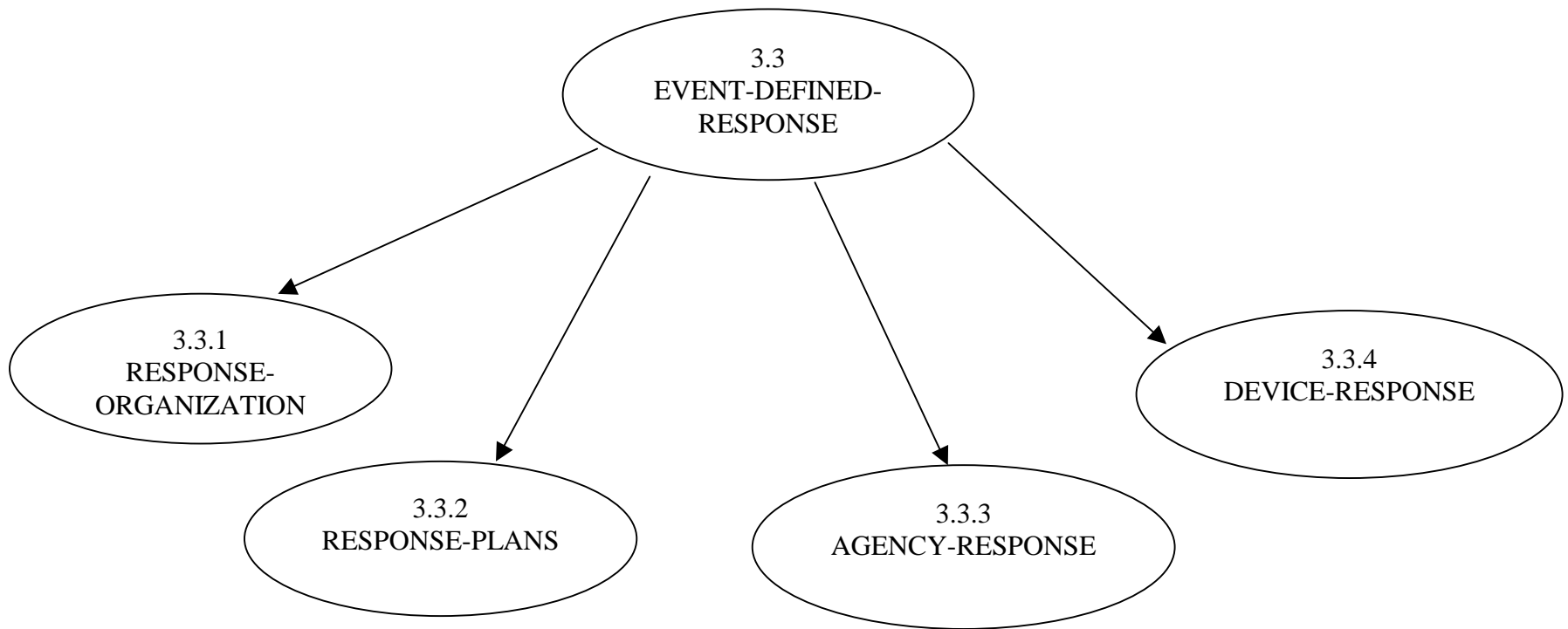
In general, the transportation center responsible for traffic operations would control the updating and distribution of the messages in this message set. Other transportation centers would also participate in the updating of these messages based on assigned responsibilities for specific events. Figure 4.3.3-1 shows the message tree for this set.

4.3.3.1 Response-Organization

This message provides the set of data elements assigning an event, from the current event list, to a managing organization.

- Event-Identifier: unique alphanumeric designation for specific event (TMDD-DE 3215).

Figure 4.3.3-1
Messages For Event-Defined-Response Set



Message Set Standard

4. *Message Descriptions (Cont'd)*

- Organization-Contact-Organization Name: name of organization managing this event (TMDD-DE 3344).
- Event-Description Type **Event**: code identifying the type of event (TMDD-DE 3211).
- Contact-E-mail Address: E-mail address of person at organization to contact regarding roadway event (TMDD-DE 3204).
- Organization-Contact-Suborganization Identifier: unique identification (within organization) for the suborganization with responsibility for handling this event (TMDD-DE 3352).
- Organization-Contact-Suborganization Name: the name of suborganization with the responsibility for handling this event (TMDD-DE 3353).
- Organization-Contact-Suborganization Function: traffic function that the responsible suborganization performs within the organization (TMDD-DE 3351).
- Organization-Contact-Person Name: person at the suborganization line assigned the coordination function for this event (TMDD-DE 3206).
- Contact-Phone **Number**: phone number of person assigned the coordination function for this event (TMDD-DE 3207).
- Contact-Phone Mobile Phone: mobile phone number of persons assigned the coordination function for this event (TMDD-DE 3350).
- Organization-Contact-Radio Unit: radio unit number of person assigned the coordination function for this event (TMDD-DE 3208).
- Contact-Pager Phone Number: pager phone number of person assigned the coordination function for this event (TMDD-DE 3347).

Message Set Standard

4. *Message Descriptions (Cont'd)*

4.3.3.2 Response-Plans

This message provides the set of data elements that describe the response to a specified event, from the current event list.

- Event-Identifier: unique alphanumeric identification for specified event (TMDD-DE 3215).
- Event-Response Plan Type: code that identifies the type of response plan selected for responding to specified event (TMDD-DE 3270).
- Event-Response Plan Identifier: unique identifier for response plan assigned to specified event (TMDD-DE 3269).
- Event-Response Alternate Route: text description of response plan assigned to specified event (TMDD-DE 3268).
- Event-Response Plan Author: name of author who developed and assigned response plan to specified event (TMDD-DE 3365).
- Organization -Resource Equipment Identifier: unique identifier(s) of an organization(s) traffic equipment assigned to specified event (TMDD-DE 3356).
- Organization-Resource Equipment Type: code identifying the type of equipment assigned to a specified event by a responding organization (TMDD-DE 3275).
- Event-Description Advice Alternate Route: detour options that qualify an event situation description (TMDD-DE 3814).

4.3.3.3 Agency-Response

This message provides the set of data elements that define the agencies and vehicles responding to a roadway event.

- Event-Identifier: unique alphanumeric identification for specified event (TMDD-DE 3215).

Message Set Standard

4. *Message Descriptions (Cont'd)*

- Event-Response Plan Identifier: unique alphanumeric identification of response plan applicable to specified event (TMDD-DE 3269).
- Organization-Resource Center Name: name of organization(s) that have equipment and/or people assigned to specified event (TMDD-DE 3355).
- Organization-Resource Center Identifier: unique identifier of organization(s) that have equipment and/or people assigned to specified event (TMDD-DE 3217).
- Event-Organization Response Status: code indicating current status of response by organization assigned to specific event (TMDD-DE 3272).
- Organization-Resource-Person On-Site Name: name of on-site person(s) from responding organization assigned to specified event (TMDD-DE 3273).
- Organization-Resource-Person On-Site Title: title of on-site person(s) from responding organization assigned to specified event (TMDD-DE 3360).
- Organization-Resource-Vehicle Type: code identifying type of vehicles requested to support a roadway event (TMDD-DE 3364).
- Organization-Resource-Vehicle Identifier: unique identifiers of organization(s) vehicles requested to support a roadway event (TMDD-DE 3274).
- Organization-Resource-Vehicle Location: text description of vehicle location when in direct support of roadway events (TMDD-DE 3271).
- Organization-Resource-Vehicle Latitude: location latitude of organization vehicle responding to roadway event (TMDD-DE 3362).
- Organization-Resource-Vehicle Longitude: location longitude of organization vehicle responding to roadway event (TMDD-DE 3363).

Message Set Standard

Message Set Standard

4. *Message Descriptions (Cont'd)*

4.3.3.4 Device-Response

This message provides the set of data elements that specify the devices and equipment assigned to a specified event. Specific devices and equipment include HAR, CCTV, DMS, portable equipment, signal and metering modifications.

- Event-Identifier: unique alphanumeric identification for specified event (TMDD-DE 3215).
- Event-Response Plan Identifier: unique identification of response plan applicable to specified event (TMDD-DE 3269).
- Organization-Resource-Equipment Type: code for equipment types owned by organization and assigned to specified event (TMDD-DE 3275).
- Organization-Resource-Equipment Identifier: unique identifiers for organization(s) traffic equipment assigned to specified event (TMDD-DE 3356).
- Organization-Resource-Equipment Location: text description for location of organization(s) equipment assigned to a roadway event (TMDD-DE 3358).
- Organization-Resource-Equipment Latitude: location latitude of organization traffic equipment responding to roadway event (TMDD-DE 3357).
- Organization-Resource-Equipment Longitude: location longitude of organization traffic equipment responding to roadway event (TMDD-DE 3359).

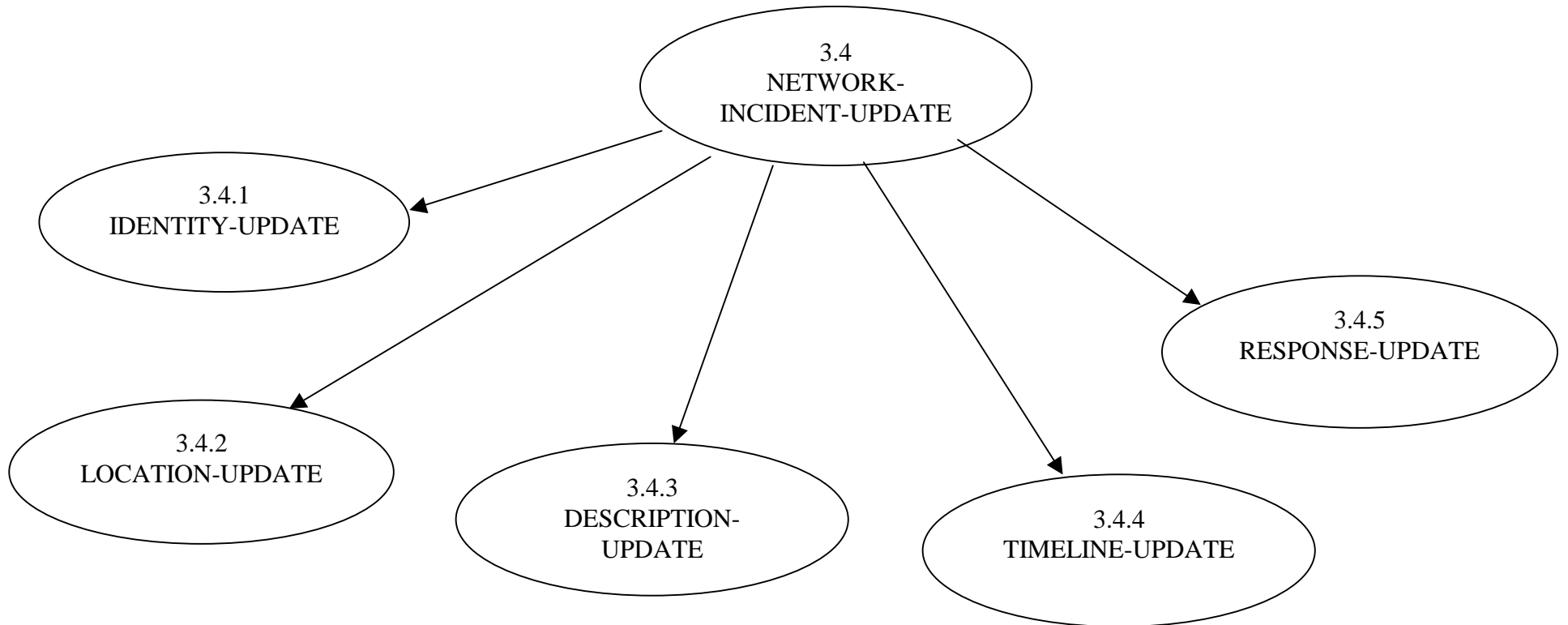
4.3.4 Network-Incident-Update Message Set

This message set provides an update description to a currently active incident. It also provides an initial description of a newly detected incident. Operationally, this set differs from Current-Network-Incidents in that it only communicates information content for a single incident and only for those data elements that have changed.

The messages in this set are published, as changes occur in real time, to subscribing centers. The messages are sent with guaranteed receipt. The messages provide updated/new information, referenced to an incident identity; incident location; incident description; incident timeline or incident response. The messages in this set are: Identity-Update; Location-Update; Description-Update; Timeline-Update and Response-Update.

In general, the transportation center responsible for traffic operations, when assigned as

Figure 4.3.4-1
Messages For Network-Incident-Update Set



Message Set Standard

4. *Message Descriptions (Cont'd)*

the managing organization, would control the updating and distributing of the messages in this message set. Other centers would also participate in the updating of these messages, based on assigned responsibilities. Figure 4.3.4-1 shows the message tree for this set.

4.3.4.1 Identity-Update

This message provides an update to the set of data elements that identifies a specified incident currently active in the network. Only the changed data elements are sent in this message.

- Organization-Contact-Organization Identifier: unique alphanumeric for organization managing the currently active incidents impacting specified traffic roadway network (TMDD-DE 3343).
- Network-Identifier: unique alphanumeric identifier for network on which the identified incidents are active (TMDD-DE 3411).
- Organization-Contact-Organization Name: name of organization managing currently active incidents impacting specified traffic roadway network (TMDD-DE 3344).
- Event-Description Type Incident: code that identifies type of roadway incident, accidents arising from unplanned roadway events (TMDD-DE 3818).
- Event-Identifier: unique alphanumeric designation for specific incident event (TMDD-DE 3215).
- Event-Incident-Status: code indicating timeline status of specified incident (TMDD-DE 3313).
- Contact-Phone Number: landline office number of person contact at managing organization for specified incident (TMDD-DE 3207).
- Event-Update Time: time the event log was last updated for this incident (TMDD-DE 3294).
- Event-Update Type: type of update made to event log for this event (TMDD-DE 3296).

Message Set Standard

4. *Message Descriptions (Cont'd)*

4.3.4.2 Location-Update

This message provides an update to the set of data elements that locate a specified incident currently active in the network. Only the changed data elements are sent in this message.

- Event-Identifier: unique alphanumeric designation for specific incident events (TMDD-DE 3215).
- Link-Identifier: identifier alphanumeric of link corresponding to location of incident event (TMDD-DE 3012).
- Link-Jurisdiction: name of law enforcement agency with authority over this link (TMDD-DE 3013).
- Event-Location Roadway Identifier: unique alphanumeric that can be used instead of full name of roadway on which incident occurred(TMDD-DE 3259)
- Event-Location Roadway Name: name of the roadway on which incident occurred (TMDD-DE 3260).
- Event-Location Roadway Side: code for the side of link that incident is located (TMDD-DE 3261).
- Event-Location Type: code identifying the location reference message profile used to locate this roadway incident (TMDD-DE 3265).
- Event-Location LRMS Message Profile: CHOICE OF location reference profile: defining location of this roadway incident based on Event-Location Type data element. The profiles shall utilize the LRMS data interoperability protocol (reference 2.2.9).

4.3.4.3 Description-Update

This message provides an update to the set of data elements that describes a specified incident currently active in the network. Only the changed data elements are sent in the message.

- Event-Identifier: unique alphanumeric designation for specific incident for specific incident event (TMDD-DE 3215).

Message Set Standard

4. *Message Descriptions (Cont'd)*

- Event-Incident Details: further details describing the situation of a specified incident (TMDD-DE 3212).
- Event-Description: A text description of the specified roadway event. For this message the event is an incident (TMDD-DE 3209).
- Event-Incident Severity: code describing the severity of an incident (TMDD-DE 3312).
- Event-Lanes Effected: bit string describing the specific lanes blocked or closed on link at incident location. Lanes numbered from inner median to shoulder (TMDD-DE 3219).
- Event-Detection Method: code indicating the detection method(s) for specified incident (TMDD-DE 3302).
- Event-Incident Human Fatalities Count: number of fatalities known at time of report for specified incident (TMDD-DE 3303).
- Event-Incident Human Injuries Count: number of injuries known at time of report for specified incident (TMDD-DE 3304).
- Event-Incident Human Injury Type: code that indicates the level of human injury at a specified incident (TMDD-DE 3369).
- Event-Incident Property Damage: codes describing type of property damage present at incident (TMDD-DE 3305).
- Event-Description Type Pavement Condition: code describing pavement condition during occurrence of specified incident or weather event (TMDD-DE 3298).
- Event-Description Type Obstruction: code describing unplanned situations involving roadway obstructions (TMDD-DE 3822).
- Event-Incident Buses Involved Count: total number of buses involved in an incident (TMDD-DE 3889).
- Event-Incident Cars Involved Count: total number of cars involved in an incident (TMDD-DE 3890).

Message Set Standard

Message Set Standard

4. *Message Descriptions (Cont'd)*

- Event-Incident Trucks Involved Count: total number of trucks involved in an incident (TMDD-DE 3889).
- Event-Description Type Weather Condition: code describing weather conditions during occurrence of specified incident (TMDD-DE 3299).
- Event-Incident Vehicles Involved Count: number of vehicles involved in specified incident (TMDD-DE 3318).
- Event-Incident Vehicles Involved: codes indicating type of vehicles involved in specified incident (TMDD-DE 3319).

4.3.4.4 Timeline-Update

This message provides an update to the set of data elements that adjusts the timeline of a specified incident currently active in the network. Only the changed data elements are sent in the message.

- Event-Identifier: unique alphanumeric designation for specific incident event (TMDD-DE 3215).
- Event-Timeline First Arrival at Scene Time: the time of first responder arrival at scene (TMDD-DE 3311).
- Event-Timeline Confirmed and Responding: the time a roadway incident was initially confirmed and associated activities were started (TMDD-DE 3317).
- Event-Timeline Cleared and Recovering: the time a roadway incident was cleared, activities were completed and roadway is recovering (TMDD-DE 3315).
- Event-Timeline Duration: the actual time duration of a roadway event (TMDD-DE 3276).
- Event-Timeline Estimated Duration: the estimated time duration of a roadway incident (TMDD-DE 3279).
- Event-Timeline End Time: the actual end time of a roadway event (TMDD-DE 3278).

Message Set Standard

Message Set Standard

4. *Message Descriptions (Cont'd)*

4.3.4.5 Response-Update

This message provides an update to the set of data elements that specify the response plan currently in effect for a specified incident currently active in the network. Only the changed data elements are sent in this message.

- Event-Identifier: unique alphanumeric designation for specific incident event (TMDD-DE 3215).
- Event-Response Plan Type: code indicating the type of response plan selected to respond to this roadway incident (TMDD-DE 3270).
- Event-Response Plan Identifier: unique alphanumeric designating a specific response plan (TMDD-DE 3269).
- Event-Response Plan Author: identifier of person responsible for plan currently active for specified incident (TMDD-DE 3365).
- Event-Response Alternate Route: text description of alternate route(s) in effect for specific roadway incident or event situation (TMDD-DE 3268).
- Event-Description Advice Alternate Route: detour options that qualify an event situation description (TMDD-DE 3814).
- Event-Description Type Incident Response Status: data element used to identify response status for an incident event (TMDD-DE 3885).
- Event-Organization Required Identifier: unique alphanumeric identifier(s) for organization(s) required at specified roadway incident (TMDD-DE 3336).
- Event-Organization Responding Identifier: unique alphanumeric identifier(s) for organization(s) actively responding to specified roadway incident (TMDD-DE 3337).
- Event-Organization Response Status: for each responding organization, the code indicating current status of response to specified roadway incident (TMDD-DE 3272).

4.3.5 Roadway-Event-Update Message Set

This message set provides an update description to a currently listed planned event. The set shall also be used to provide initial description to a newly scheduled planned event.

Message Set Standard

Message Set Standard

4. *Message Descriptions (Cont'd)*

Operationally, this set differs from Planned-Roadway-Events in that it only communicates information content for a single planned event and only for those data elements that have changed. The messages in this set are published, as changes occur in real time, to subscribing centers. The messages are sent with guaranteed receipt. The messages provide updated/new information referenced to an event identity; event location; event description; event timeline; event schedule.

The messages in this section are: Event-Identity-Update; Event-Location-Update; Event-Description-Update; Event-Timeline-Update; Event-Schedule-Update.

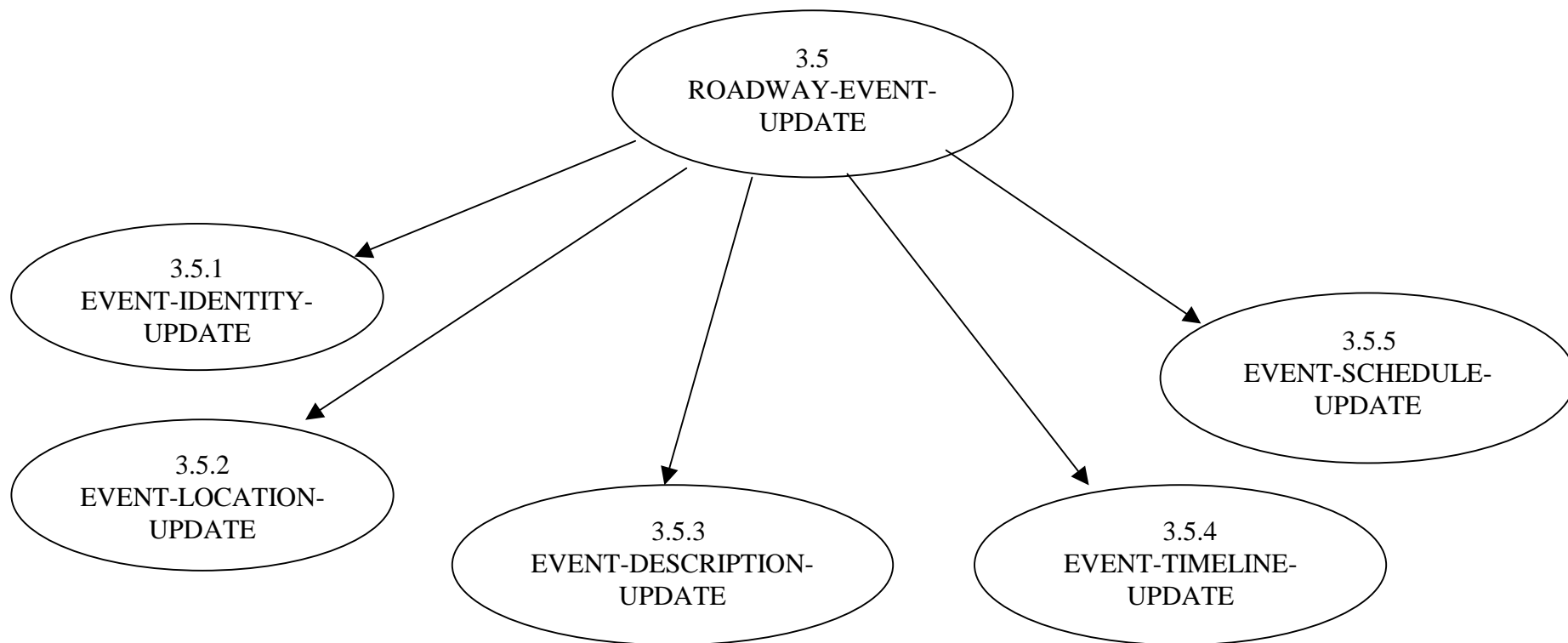
In general, the transportation center responsible for traffic operations, when assigned as the managing organization, would control the updating and distributing of the messages in this set. Figure 4.3.5-1 shows the message tree for this set.

4.3.5.1 Event-Identity-Update

This message provides an update to the set of data elements that identifies a planned event currently scheduled (or newly scheduled) in the network. Only the changed data elements are sent in this message.

- Organization-Contact-Organization Identifier: organization coordinating the currently scheduled planned events (TMDD-DE 3343).
- Organization-Contact-Organization Name: name of organization coordinating the currently scheduled planned events (TMDD-DE 3344).
- Network-Identifier: unique alphanumeric identifier for network on which the planned events are scheduled (TMDD-DE 3411).
- Event-Description Type Event: code that identifies the type of events (TMDD-DE 3211).
- Event-Identifier: unique alphanumeric identifier for scheduled planned events (TMDD-DE 3215).
- Event-Organization Reported Identifier: the unique alphanumeric identifier of the organization that reported the roadway event (TMDD-DE 3335).
- Event-Update Quantity: the number of times the log was modified for a specific roadway event (TMDD-DE 3293).

Figure 4.3.5-1
Messages For Roadway-Event-Update Set



Message Set Standard

4. *Message Descriptions (Cont'd)*

- Contact-Phone Number: telephone number of organization personnel with responsibility for coordinating the planned event (TMDD-DE 3207).
- Event-Update-Date: the date that the planned event log was last modified for this specific event (TMDD-DE 3292).
- Event-Update Time: the time that the planned event log was last modified for this specific event (TMDD-DE 3294).
- Event-Update Author Last Revised: name-identifier of author who last updated log for specific roadway event (TMDD-DE 3295).

4.3.5.2 Event-Location-Update

This message provides an update to the set of data elements that locates a specified planned event currently (or newly) scheduled in the network. Only the changed data elements are sent in the message.

- Event-Identifier: unique alphanumeric identifier of the organization reporting the event (TMDD-DE 3215).
- Link-Identifier: identifier alphanumeric for link corresponding to location of planned event (TMDD-DE 3012).
- Link-Jurisdiction: the name of the law enforcement agency with authority over this link (TMDD-DE 3013).
- Event-Location Roadway Identifier: unique alphanumeric that can be used instead of full name of roadway on which incident occurred (TMDD-DE 3259)
- Event-Location Roadway Name: the name of roadway where the planned event is located (TMDD-DE 3260).
- Event-Location Type: code identifying the location reference message profile used to locate this planned event (TMDD-DE 3265).
- Event-Location LRMS Message Profile: CHOICE OF location reference profile: location of this planned event based on Event-Location Type data element. The profiles shall utilize the LRMS data interoperability protocol (reference 2.2.9).

Message Set Standard

Message Set Standard

4. *Message Descriptions (Cont'd)*

4.3.5.3 Event-Description-Update

This message provides an update to the set of data elements that describe a currently or newly scheduled planned event in the network. Only the changed data elements are sent in the message.

- Event-Identifier: unique alphanumeric identifier of the planned event (TMDD-DE 3215).
- Event-Description: text description of specified planned event. Indicates expected traffic impacts (TMDD-DE 3209).
- Event-Description Notes and Comments: notes and comments providing planned event details (TMDD-DE 3210).
- Event-Description Type Closure: type of event code based on construction type closures (TMDD-DE 3819).
- Event-Description Type Special Event: type of event code based on non-traffic special events with major traffic impacts (TMDD-DE 3214).
- Event-Description Type Sporting Events: type of event code based on non-traffic sporting events with major traffic impacts (TMDD-DE 3886).
- Event-Description Type Disturbances: type of event code based on non-traffic disturbances with major traffic impacts (TMDD-DE 3884).
- Event-Description Type Roadwork: Descriptions of construction, maintenance and related activities that require driver caution and may create delays (TMDD-DE 3213).
- Event-Lanes Effected: bit string indicating which lanes are closed or blocked by a planned event (TMDD-DE 3219).
- Event-Response Alternate Route: text description of alternate route(s) in effect during the specified planned event (TMDD-DE 3268).
- Event-Response Plan Identifier: unique alphanumeric identification for response plan in effect to mitigate effect of this planned event (TMDD-DE 3269).

Message Set Standard

Message Set Standard

4. *Message Descriptions (Cont'd)*

- Event-Description Advice Alternate Route: detour options that qualify an event description or situation (TMDD-DE 3814).

4.3.5.4 Event-Timeline-Update

This message provides an update to the set of data elements that describes the daily timeline for a currently or newly scheduled planned event. Only the changed data elements are sent in the message.

- Event-Identifier: unique identifier of planned event (TMDD-DE 3215).
- Event-Timeline Schedule Start: scheduled start time on current day of planned event (TMDD-DE 3287).
- Event-Timeline Start: actual start time on current day of planned event (TMDD-DE 3291).
- Event-Timeline Schedule End: scheduled stop time on current day of planned event (TMDD-DE 3284).
- Event-Timeline End: actual stop time on current day of planned event (TMDD-DE 3278).

4.3.5.5 Event-Schedule-Update

This message provides an update to the set of data elements that describe the long term schedule for a currently or newly scheduled planned event. Only the changed data elements are sent in the message.

- Event-Identifier: unique alphanumeric identifier of planned event (TMDD-DE 3215).
- Event-Timeline Schedule Type: timeline code that indicates the type of schedule the planned event follows (TMDD-DE 3289).
- Event-Timeline Schedule Days of the Week: timeline code that indicates the day of week that a planned event is active (TMDD-DE 3282).

Message Set Standard

Message Set Standard

4. *Message Descriptions (Cont'd)*

- Event-Timeline Schedule Start Date: scheduled date for starting planned event activity (TMDD-DE 3286).
- Event-Timeline Schedule End Date: scheduled date for completing planned event activity (TMDD-DE 3283).
- Event-Timeline Schedule Dates: dates (YYYYMMDD) during which a planned event is scheduled to be active (TMDD-DE 3281).

4.3.6 Event-Bulletin Message Set

The Event Bulletin Message Set meets governmental agency needs by carrying full descriptions of a current or predicted roadway situation to ISPs and to other agencies not closely involved in managing the situation. One message is currently included in this message set: the Event Report Message (ERM)

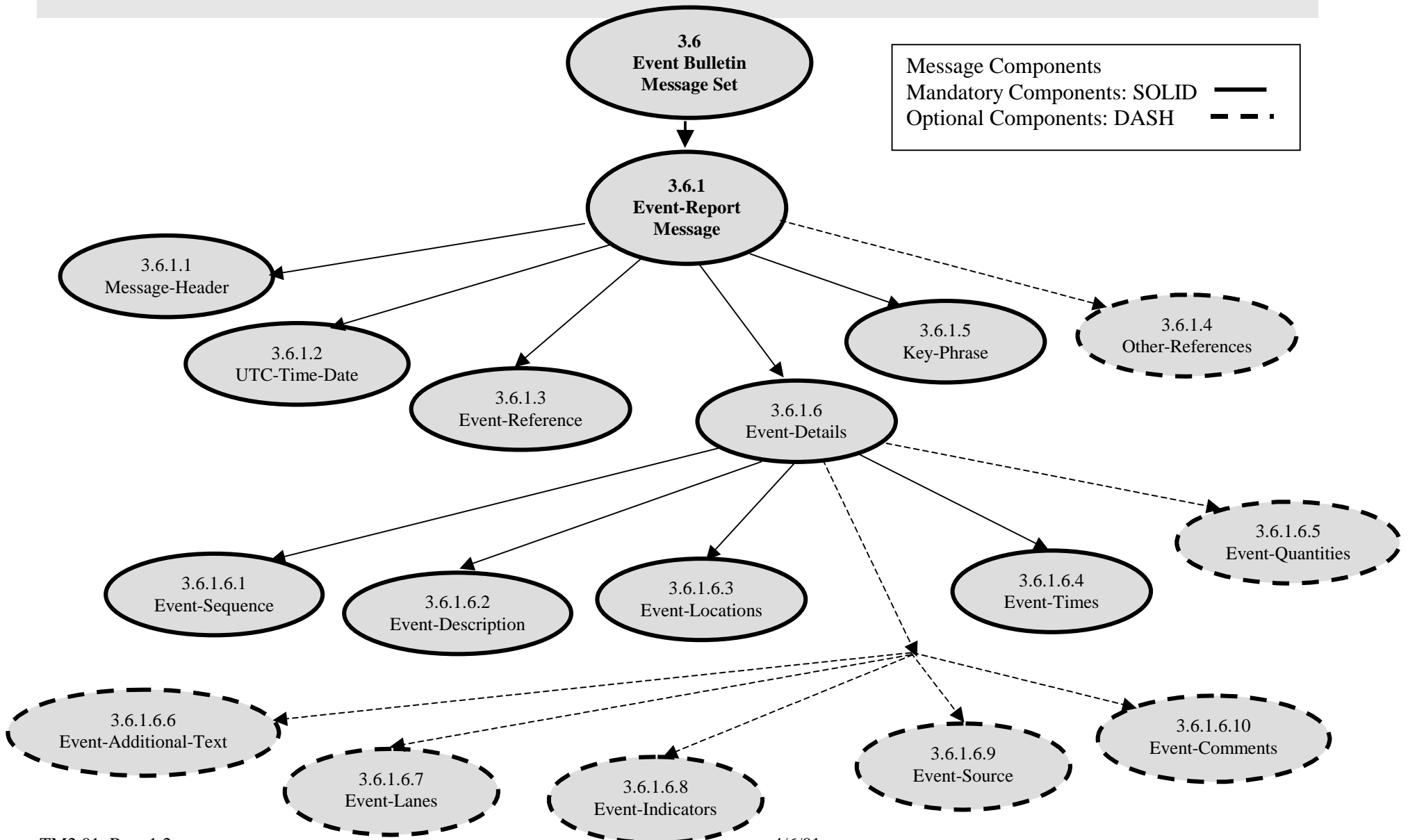
4.3.6.1 Event Report Message

Event Report Messages are one-way "summary" messages sent from a TMS to another center-based subsystem, such as an ISP or an agency not closely involved with the situation. Their main purpose is to support detailed, near real time event summaries or overviews for exchange between TMCs, and from TMCs to ISPs, collecting together all those parts of detailed event messages that are relevant for traffic management or may be passed on to the public.

The Event Report Message (ERM) provides a complete bulletin regarding a current or expected roadway situation. A flexible structure of message elements (pieces of a message) is adopted that allows the complete messages to be as simple or as complex as required, according to operational needs. This section defines the message structure in full, including all allowable options. Only a small number of these options is typically used in an actual, operational message.

In general, the transportation center responsible for traffic operations, when assigned as the managing organization, would control the updating and distributing of the message in this set. Figure 4.3.6-1 shows the message tree for this set; message; and message components.

Figure 4.3.6-1
Event Report Message with Components



Message Set Standard

4. *Message Descriptions (Cont'd)*

The tree shows the structure of the message as a series partial message elements or “message chunks”. Many of these “pieces or chunks” are mandatory and must always be part of the message. However other message “pieces or chunks” are optional and only appear in a specific message instance when specific information related to the event requires dissemination.

The message “pieces”, both mandatory and optional, are described in the following paragraphs. The start of an Event Report Message comprises a message header, a reference to the event and any other related events, a key event-description (e.g. accident), and any number of event elements.

4.3.6.1.1 Message-Header

Event Report Messages start with the following data organized into a mandatory header message element:

- event-organization-sending-identifier: a reference to the organization sending the messages (TMDD 3801).
- event-organization-notified-identifier: a reference to the organization or group of organizations receiving the message. (TMDD 3334).
- event-message-type-identifier: identifies this as an Event Report Message (TMDD 3802).
- event-message-type-version: distinguishes between updates of this message structure (TMDD 3803).
- event-message-number: a unique reference number for the message (TMDD 3804).
- event-message-time-stamp: the UTC time/date the message was created (uses Section 4.3.6.1.2).

Message Set Standard

4. *Message Descriptions (Cont'd)*

4.3.6.1.2 UTC-Time-Date

Mandatory Time and Date elements are inserted directly after the Header element.

- event-utc-time: time of day expressed in Coordinated Universal Time (UTC). UTC is also known as Zulu or GMT (TMDD 3805).
- event-utc-date: date consistent with Coordinated Universal Time, i.e. the date in Greenwich, England (TMDD 3806).

4.3.6.1.3 Event-Reference

All events are given a mandatory unique identifier. The version number references successive snapshots of the event.

- event-identifier: a unique reference number for the event. (TMDD 3215).
- event-update: a version number of successive updates of the event. Higher version numbers supersede (overwrite) earlier versions in the database (TMDD 3293).
- event-description-author: optionally, the name or identifier of the person who created this version of the event description (TMDD 3329).
- event-message-expiry-time: optionally, the UTC time/date when this message about the event is no longer valid (uses Section 4.3.6.1.2).

4.3.6.1.4 Other-References

This message “piece” is optional. One or more of these other references can also be appended to the complete message.

- canceled-earlier-update: cancellation of a situation update previously sent in error (uses Section 4.3.6.1.3).
- responsible-situation: a simultaneous, or earlier, event that can be regarded as the reason for this situation (uses Section 4.3.6.1.3).
- previous-event: another event that must end before this situation can start (uses Section 4.3.6.1.3).
- event-project-reference: an agency internal reference number, e.g. to a construction project which is the reason for this event (TMDD 3807).

Message Set Standard

4. *Message Descriptions (Cont'd)*

4.3.6.1.5 Key-Phrase

The key description that captures the most important aspect of event must be the first partial description of Event Element 1. It is included at this point in the message, as a mandatory headline.

- key-phrase: the first partial description within the event description. It should capture the most important aspect of the event, e.g. multi-vehicle accident (see Section 4.3.6.1.6.2.1).

For mobile situations, e.g. snowplows, abnormal loads, the key description is event-description-type-mobile-situation: 'mobile situation' (see Section 4.3.6.1.6.2.1). This flags the whole situation as a mobile situation, for which data input and display may be different.

4.3.6.1.6 Event-Element-Details (for a single Message)

Situation descriptions for a single event and event message are built up from one or more event elements. Details of each event element (pieces of the message) are presented in the following sequence. The specific element details are:

- Event-Element-Sequence
- Event-Element-Description
- Event-Element-Location
- Event-Element-Times
- Event-Element-Quantities
- Event-Element-Additional Text
- Event-Element-Lanes
- Event-Element-Indicators
- Event-Element-Source
- Event-Element-Comments

4.3.6.1.6.1 Event-Element-Sequence

This is a sequential reference to successive forecast snapshots of the situation as it is expected to develop through time. Higher sequence numbers describe the event as it is currently predicted to evolve in successively later time periods (TMDD 3878).

Event elements that refer to the same moment in time (e.g. describing present observations) all have the same sequence number, typically "1". Elements that refer to successive forecast snapshots have higher numbers (... 2, 3, 4, etc.). It is also possible to have multiple elements relating to time "1", followed by multiple elements relating to time "2", etc.

Message Set Standard

4. Message Descriptions (Cont'd)

4.3.6.1.6.2 Event-Element-Description

A sequence of choice is used in the Event-Description to provide the option for users to structure their messages as required. Each event element is described by one or more event-descriptions, causes or advice, in the sequence they should be presented to users. Additionally, specific quantities and free text can be placed within this sequence to add necessary detail for the message to be presented to users. For Event Element 1 these are appended to the Key Phrase/Headline Description in Section 4.3.6.1.5 above. A null description can be used if necessary.

- event-phrase: an atomic element of a description of the situation. Each partial description or "phrase" conveys a single concept, e.g. Overturned truck (Uses Section 4.3.6.1.6.2.1).
- event-cause: a partial description that is judged to be the reason (or part of the reason) for the situation, e.g. Stopped traffic *due to roadwork* (Uses Section 4.3.6.1.6.2.1).
- event-advice: additional text added to a situation description for public safety or traveler information reasons, e.g. Dense fog, *keep your distance* (Uses Section 4.3.6.1.6.2.2).
- event-quantities: elements can be quantified by one or more quantities (Uses Section 4.3.6.1.6.5).
- event-additional-text: additional description information of the event element can be added through free text for dissemination to end users (Uses Section 4.3.6.1.6.6).

4.3.6.1.6.2.1 Event-type

Each event-description used in the Key-Phrase and the Event-Element-Description involves a choice from event-description-type (TMDD 3211) data element. Causes that are optionally used in the Event-Element-Description use the same code tables. A code table in each type defines the actual partial descriptions used to build situation descriptions.

- traffic-conditions: qualitative descriptors of level of service and its perception by travelers (TMDD 3817).
- incidents: chance occurrences involving vehicles from the traffic stream, that could present a potential hazard to road users (TMDD 3818).

Message Set Standard

4. *Message Descriptions (Cont'd)*

- closures: situations which prevent some or all vehicles from using a road in the specified direction(s) (TMDD 3819).
- roadwork: any maintenance or construction activity that may potentially affect traffic (TMDD 3213).
- obstructions: chance occurrences involving earlier causes or causes external to the traffic stream that could present a potential hazard to road users (TMDD 3822).
- delays-status-cancellations: situations in which normal travel times may be increased (TMDD 3830).
- unusual-driving: warnings of specific vehicles which may pose a hazard to other road users (TMDD 3831).
- mobile-situation: warnings of specific vehicles or convoys which may affect travel (TMDD 3832).
- device -status: warnings of faults or failures to traffic systems (TMDD 3833).
- restrictions: information about restrictions on vehicle dimensions and other traffic regulations (TMDD 3025).
- incident-response-status: information to indicate the status of the response (TMDD 3885).
- disasters: descriptions of natural disasters (including fires) often occurring off the roadway, which may however affect travelers. (TMDD 3880).
- disturbances: descriptions of disturbances which may sometimes occur off the roadway, but which however affect travelers. (TMDD 3884).
- sporting-events: descriptions of sporting events often occurring off the roadway, which may however affect travelers. (TMDD 3886).
- special-events: deliberate human actions external to the traffic stream which could potentially affect traffic (TMDD 3214).

Message Set Standard

4. *Message Descriptions (Cont'd)*

- parking-information: information about parking availability and changes in parking restrictions (TMDD 3835).
- system-information: other information of potential interest to travelers (TMDD 3836).
- weather-conditions: other details of general weather situations (sky conditions, UV and fire indices) of interest to travelers and highway maintenance workers (TMDD 3299).
- precipitation: descriptors of precipitation conditions that may adversely affect travel (TMDD 3825).
- winds: descriptors of wind conditions, including conditions that may adversely affect travel (TMDD 3826).
- visibility-air-quality: air quality and visibility descriptions (TMDD 3827).
- temperature: descriptors of temperature, actual or perceived (TMDD 3828).
- pavement-conditions: further details of road surface condition, expanding on the summary above (TMDD 3298).
- winter-driving-restrictions: descriptions of restrictions and recommendations placed on travelers during winter conditions (TMDD 3888).
- winter-driving-index: a measure of driving impairment due to winter weather-related road surface conditions (TMDD 3823).

4.3.6.1.6.2.2 Event-advice

Each additional information item involves choice from the codes listed below. Code tables define the actual advice text used to build situation descriptions:

- suggestion: suggestions for travelers that can be added to a situation description, e.g. why not ride share? (TMDD 3842).
- warning: advice for end users in the form of warnings that can be added to a situation description, e.g. look out for flagman (TMDD 3840).

Message Set Standard

4. *Message Descriptions (Cont'd)*

- instructions-recommendations: driving recommendations passed on to the public, e.g. approach with care (TMDD 3843).
- instructions-mandatory: driving instructions passed on to the public, e.g. use left lane (TMDD 3882).
- qualifiers: information to qualify a description, e.g. rising slowly (TMDD 3847).
- generic-locations: descriptive information regarding generic places, e.g. in the downtown area (TMDD 3846).
- lane-roadway-descriptions: indicates the type of lane being referenced, e.g. through lanes, right-turning lanes (TMDD 3844).
- alternate-route: indicates that the subsequent location is being used for a purpose other than to locate a situation element, i.e. as part of a proposed-detour, confirmed-detour, destination-of-detailed-detour or an alternate destination (TMDD 3814).
- transit-mode: descriptions of transportation system alternatives, including ferries and transit (TMDD 3879).
- vehicle-groups-affected: description of vehicle types which may be affected by an ongoing or impending event (TMDD 3887).
- traveler-group-affected: description of traveler groups which may be affected by an ongoing or impending event (TMDD 3851).
- responder-group-affected: description of incident response group affected, requested, dispatched or at scene of situation (TMDD 3883).
- incident-response-equipment: description of the incident response equipment that may be requested to be dispatched or at the scene of a situation (TMDD 3881, originally taken from IEEE IM P1512)

Message Set Standard

4. *Message Descriptions (Cont'd)*

4.3.6.1.6.3 Event-Locations

These specific sets of data elements give details of the event element location, plus any associated locations. Each event element has one or more locations associated with it. Locations are listed in the sequence that should be presented to users.

- event-location-type: the type of location affected by the event (uses Section 4.3.6.1.6.3.1).
- event-related-location: the locations related to the event (uses Section 4.3.6.1.6.3.4).

4.3.6.1.6.3.1 Event-Location-Type

Locations may be of a type specific to roadway links or specific to geographic areas.

- event-location-type-link: a reference to a point on a route or a segment of a route. Segments of a route are stretches of specific named or numbered roads defined by primary and secondary locations, in specified directions. Point event elements occur at a single, primary location, in specified directions (uses Section 4.3.6.1.6.3.2).
- event-location-type-area: areas may be named jurisdictions (e.g. Boulder County), fuzzy concepts (e.g. the Front Range) or geometric polygons (TMDD 3809).

Message Set Standard

4. *Message Descriptions (Cont'd)*

4.3.6.1.6.3.2 Event-Location-Type-Link

The data elements used in route references are listed below:

- event-location-type-area: code referencing the state/province and (where required) the county whose road number is indicated below (TMDD 3809).
- link-road-designator: the officially designated road number for that roadway section (usually the highest order, lowest number route where multiple road numbers exist). (TMDD 3030).
- link-primary-location: the primary location is that end of the event element where a cause of the situation can be identified, e.g. the accident site. If no point cause can be defined (e.g. fog), either end of the event element (uses Section 4.3.6.1.6.3.3).
- link-secondary-location: optional data element that identifies the secondary location of the event element. This data element is not used for point locations (uses Section 4.3.6.1.6.3.3).
- link-direction: positive, negative, both directions or non-directional in relation to the distance marker system (TMDD 3008).
- link-location-linear-reference-version: optionally, the version of the distance marker system used in the references can be defined (TMDD 3854).

4.3.6.1.6.3.3 Link-Location

Primary and secondary locations each comprise:

- link-location-linear-reference: a roadway location defined using an officially designated mileage or kilometer referencing system, measured from the start of the route (TMDD 3855).
- event-location-coordinates-latitude: the latitude of the roadway location. This redundant information is included as a check on distance marker system updates (TMDD 3226).

Message Set Standard

4. *Message Descriptions (Cont'd)*

- event-location-coordinates-longitude: the longitude of the roadway location. This redundant information is included as a check on distance marker system updates (TMDD 3227)

4.3.6.1.6.3.4 Related-Location

Optionally, this can be used one or more times to indicate other locations related to the event element, such as recommended detours or suggested alternate destinations.

- event-response-alternate-route-type: indicates that the subsequent location is being used for a purpose other than to locate a situation element, i.e. as part of a proposed-detour, confirmed-detour, destination-of-detailed-detour or an alternate destination (TMDD 3814).
- related-location-reference: a location used in one of the ways qualified above (uses Section 4.3.6.1.6.3.1).

4.3.6.1.6.4 Event-Times

These data items give times associated with a situation element of the event.

- update-time: this is used to indicate the UTC time/date when the event element was validated, i.e. actually observed or calculated, or otherwise confirmed to be correct (uses Section 4.3.6.1.2).
- valid-period: defines the time period during which the event element is valid (uses Section 4.3.6.1.6.4.1)
- sequence-time: optionally, this can be used to indicate the UTC time/date of a future instant for which a sequential forecast of the event element has been made (uses Section 4.3.6.1.2).
- start time: Optionally, some event elements contain information which is expected to become effective at a known time/date in the future, called the start time. Start-time is the UTC date/time when the event element is expected to start, or is said to have started. Messages without a start time are effective immediately (uses Section 4.3.6.1.2).

Message Set Standard

4. *Message Descriptions (Cont'd)*

- recurrent times: indicate the time periods during which a situation shall reoccur (uses Section 4.3.6.1.6.4.2).

4.3.6.1.6.4.1 Event-valid-period

Each event element shall include an estimated duration, an expected end time, or one-or-more effective periods.

- event-expected-end-time: the UTC time/date when the event element is expected to end. At this time the event element shall be deleted or archived unless it is updated before that time/date (uses Section 4.3.6.1.2).
- event-timeline-estimated-duration: the expected duration of the event element, estimated from the event-element-update-time. At this time the event element shall be deleted or archived, unless the duration is updated before it has expired. (TMDD 3279)
- event-effective-period: one or more named periods within which the event element applies, e.g. Sunday afternoon. These are often used for weather forecast situations (uses Section 4.3.6.1.6.4.3).

4.3.6.1.6.4.2 Event-recurrent-times

Optionally, these data elements can be used to indicate the time periods during which a situation shall reoccur.

- event-period: one or more named periods within which the event element applies, e.g. Sunday afternoon. These are often used for weather forecast situations (uses Section 4.3.6.1.6.4.3).
- event-timeline-schedule-times: optionally, one or more periods of the day (expressed in local time) when a recurring event normally starts and ends (TMDD 3280).

4.3.6.1.6.4.3 Event-time-period

Some event elements are expected to recur during predictable periods, e.g. congestion; night-time roadwork.

- event-timeline-schedule-days-of-the-week: one or more days of the week (expressed in local time) when a recurring event normally occurs (TMDD 3282)

Message Set Standard

4. *Message Descriptions (Cont'd)*

- event-effective-period-qualifier: optionally, one or more qualitative periods of the day within which the event applies (TMDD 3813).

4.3.6.1.6.5 Event-Quantities

Data elements that quantify the Event Situation can be appended, but are not required, within the message as defined in the Event-Description (Section 4.3.6.1.6.2). These data quantities assist in defining further details specific to the event when disseminated to end users.

4.3.6.1.6.5.1 Data-Extent

Each event element can be optionally quantified by one or more of the quantities below. The quantity is presented to users immediately after the partial description of the event element.

- event-length-affected: the length of a route affected by a situation (TMDD 3856).
- event-proportion-affected: the proportion of a link or a named area thought to be affected by a particular situation (e.g. a snowstorm) (TMDD 3857).
- event-location-coordinates-above-altitude: the height (above mean sea level) above which a situation is expected to occur (TMDD 3858).
- event-location-coordinates-below-altitude: the height (above mean sea level) below which a situation is expected to occur (TMDD 3859).
- event-quantity-range: the percent (x 10, i.e. parts per thousand) spread of possible values for a quantity above (TMDD 3877).

4.3.6.1.6.5.2 Data-Information

Each event element can be optionally quantified by one or more of the quantities below. The quantity is presented to users immediately after the partial description of the event element.

- event-frequency-AM: a radio frequency in the commercial AM band (TMDD 3873).
- event-frequency-FM: a radio frequency in the commercial FM band (TMDD 3874).
- organization-contact-phone-number: a ten to twenty digit phone number (TMDD 3207).

Message Set Standard

4. *Message Descriptions (Cont'd)*

- event-broadcast-channel-number: a broadcast channel number, e.g. for CB or TV (TMDD 3876).

4.3.6.1.6.5.3 Data-Link-State

Each event element can be optionally quantified by one or more of the quantities below. The quantity is presented to users immediately after the partial description of the event element.

- link-delay: the estimated additional travel time relative to normal travel conditions (TMDD 3005).
- link-signal-cycle-delay: estimated delay per vehicle occurring due to signal cycle (TMDD 3893).
- link-headway: vehicle headway on the link (TMDD 3892).
- link-travel-time: estimated travel time on the link (TMDD 3038).
- link-capacity-existing: practical capacity has reduced from its normal value to this percentage of normal capacity (TMDD 3864).
- link-travel-time-increase: the percentage increase in travel times relative to normal conditions (TMDD 3861).
- link-speed-average: the average speed of travel on a particular link. (TMDD 3033)
- event-speed-vehicle-estimated: the estimated or expected average speed of a vehicle, e.g. a snowplow or a convoy (TMDD 3862).

4.3.6.1.6.5.4 Data-Link-Restrictions

Each event element can be optionally quantified by one or more of the quantities below. The quantity is presented to users immediately after the partial description of the event element.

- link-speed-limit-advisory: the advisory speed limit in operation (TMDD 3863).
- link-speed-limit: the posted speed limit in operation. (TMDD 3034).
- link-speed-limit-truck: the posted speed limit in operation for trucks. (TMDD 3035).

Message Set Standard

4. *Message Descriptions (Cont'd)*

- link-restriction-length: the maximum length of vehicle allowed (TMDD 3027).
- link-restriction-height: the maximum height of vehicle allowed (TMDD 3026).
- link-restriction-width: the maximum width of vehicle allowed (TMDD 3029).
- link-restriction-weight-vehicle: the maximum gross weight of vehicle allowed (TMDD 3028).
- link-restriction-weight-axle: the maximum axle weight allowed (TMDD 3870).
- link-restriction-axle-count: the maximum number of axles allowed, per vehicle. (TMDD 3024)

4.3.6.1.6.5.5 Data-incident-details

Each event element can be optionally quantified by one or more of the quantities below. The quantity is presented to users immediately after the partial description of the event element.

- event-incident-vehicles-involved-count: the total number of vehicles involved in an incident (TMDD 3318).
- event-incident-cars-involved-count: the total number of cars involved in an incident (TMDD 3890).
- event-incident-trucks-involved-count: the total number of trucks involved in an incident (TMDD 3891).
- event-incident-buses-involved-count: the total number of buses involved in an incident (TMDD 3889).
- event-incident-human-fatalities-count: the number of fatalities thought to be present at the time of a report (TMDD 3303).
- event-incident-human-injuries-count: the total number of non-fatal injuries thought to be present at an incident at the time of a report (TMDD 3304).
- event-incident-human-major-injuries-count: the number of serious injuries thought to be present at the time of a report (TMDD 3865).

Message Set Standard

4. *Message Descriptions (Cont'd)*

- event-incident-human-minor-injuries-count: the number of slight injuries thought to be present at an incident at the time of a report (TMDD 3866).

4.3.6.1.6.5.6 Data-Road-Weather

Each event element can be optionally quantified by one or more of the quantities below. The quantity is presented to users immediately after the partial description of the event element.

- ess-avg-wind-direction: the current or forecast wind direction (NTCIP ESS 3.6.1).
- ess-avg-wind-speed: the current or forecast average wind speed (NTCIP ESS 3.6.2).
- ess-max-wind-gust-speed: the maximum current or forecast wind speed (NTCIP ESS 3.6.6).
- ess-air-temperature: the current or forecast air temperature. When used with a heat index or wind chill phrase this is the apparent temperature (NTCIP ESS 3.7.2.3).
- ess-dewpoint-temperature: the current or forecast dew point temperature (NTCIP ESS 3.7.4).
- ess-max-temp: the maximum air temperature in a 24 hour period. (NTCIP ESS 3.7.5).
- ess-min-temp: the minimum air temperature in a 24 hour period. (NTCIP ESS 3.7.6).
- ess-relative-humidity: the relative humidity (NTCIP ESS 3.8.1).
- ess-atmospheric-pressure: the barometric pressure adjusted to mean sea level (NTCIP ESS 3.5.4)
- ess-precip-rate: the rainfall rate or liquid equivalent precipitation rate for frozen precipitation (NTCIP ESS 3.8.7).
- ess-snowfall-accumulation-rate: the rate of snowfall accumulation during precipitation (NTCIP ESS 3.8.8).
- ess-visibility: the current or forecast visibility in tenths of meters (NTCIP ESS 3.10.1).
- ess-UV-index: the UV index value (NTCIP ESS 3.9.3).

Message Set Standard

4. *Message Descriptions (Cont'd)*

- **ess-probability:** the probability assessment for a weather situation, e.g. the probability of rain (NTCIP ESS 3.8.18).

4.3.6.1.6.5.7 Data-Parking

Each event element can be optionally quantified by one or more of the quantities below. The quantity is presented to users immediately after the partial description of the event element.

- **event-parking-number-of-spaces:** the number of parking spaces available (TMDD 3871).
- **event-parking-occupancy:** the percentage occupancy of a parking lot (TMDD 3872).

4.3.6.1.6.5.8 Data-Surface-Conditions

Each event element can be optionally quantified by one or more of the quantities below. The quantity is presented to users immediately after the partial description of the event element.

- **ess-water-depth:** the depth of water, e.g. of total rain accumulation, or of flood water (NTCIP ESS 3.8.2).
- **ess-adjacent-snow-depth:** the depth of snow typically found away from the roadway, e.g. accumulated snow resulting from a storm (NTCIP ESS 3.8.3).
- **ess-roadway-snow-depth:** the depth of unpacked snow on the pavement (NTCIP ESS 3.8.4).
- **ess-roadway-snow-pack-depth:** the depth of packed snow on the pavement (NTCIP ESS 3.8.5).
- **ess-ice-thickness:** the depth of ice on the pavement (NTCIP ESS 3.8.10).
- **ess-surface-temperature:** the current or forecast temperature on the pavement surface (NTCIP ESS 3.11.2.8).
- **ess-pavement-temperature:** the current or forecast temperature between 2 and 10 cm below the pavement surface (NTCIP ESS 3.11.2.9).
- **ess-surface-water-depth:** the depth of surface water on the pavement, e.g. due to snowmelt (NTCIP ESS 3.11.2.10).

Message Set Standard

4. *Message Descriptions (Cont'd)*

- **ess-surface-salinity**: the pavement salinity in parts per hundred thousand (NTCIP ESS 3.11.2.11).
- **ess-surface-freeze-point**: the temperature at which the solution on the roadway will freeze (NTCIP ESS 3.11.2.13).
- **ess-mobile-friction**: indicates measured coefficient of friction in percent (NTCIP ESS 3.12.1).
- **ess-pavement-treatment**: the type of treatment being applied to the pavement (uses Section 4.3.6.1.6.5.9).

4.3.6.1.6.5.9 Pavement-Treatment

Optionally, these data elements provide details of the pavement treatment being used.

- **ess-pave-treatment-amount**: the quantity of the pavement treatment being applied in kilograms per lane kilometer (NTCIP ESS 3.13.3).
- **ess-pave-treatment-width**: optionally, the width of the spread of the pavement treatment in meters (NTCIP ESS 3.13.4).
- **ess-pavement-treatment-table**: optionally, lists the constituents of the chemical treatment being applied (uses Section 4.3.6.1.6.5.10).

4.3.6.1.6.5.10 Treatment-Table

Optionally, this table lists the constituents of the chemical treatment being applied. Each row of the table specifies a proportion of the mix, and its contents.

- **ess-pavement-treatment-index**: the row number in the table (NTCIP ESS 3.13.2.1).
- **ess-pave-treat-product-type**: one constituent of the treatment being applied to the road, e.g. cMA (Calcium-Magnesium Acetate), kAC (Potassium-Magnesium Acetate), naFormate (Sodium Formate), naA (Sodium Acetate), or water (as a diluting agent) (NTCIP ESS 3.13.2.2).
- **ess-pave-treat-product-form**: the condition of the treatment being applied to the road, e.g. dry, prewet, liquid (NTCIP ESS 3.13.2.3).

Message Set Standard

4. *Message Descriptions (Cont'd)*

- **ess-percent-product-mix**: the percentage of the total application mix by weight that is of the type specified in **ess-pave-treat-product-type**. The sum of these percentages within the total mixture shall equal 100 (NTCIP ESS 3.13.2.4).

4.3.6.1.6.6 Event-Additional-Text

Free text can be used, as an optional message element, to add to the event description and is made available for end users. The use of this optional free text within the message is further defined in the Event-Description (Section 4.3.6.1.6.2).

- **event-description-text**: text appended to the partial description of the event element that provides additional information to end uses (TMDD 3209).
- **event-description-language**: the language in which the text is written (TMDD 3816).

4.3.6.1.6.7 Event-Lanes

These optional data elements can be used to indicate lane configurations at a situation element.

- **event-lanes-total-original**: this can be used to indicate how many lanes are normally available through a situation element location in the specified travel direction, e.g. three through lanes. It can be used more than once if both directions are to be indicated, or if turning lanes and through lanes are present (TMDD 3221).
- **event-lanes-affected**: this can be used to indicate one or more lanes or shoulders that are affected by a situation element, e.g. lanes slick due to an oil spill (TMDD 3219).

4.3.6.1.6.8 Event-Indicators

These optional indicators can be used to further qualify the event element.

- **event-priority-level**: indicates how important it is that a message should be disseminated promptly, according to its highest priority event element. (TMDD 3301)
- **event-confidence-level**: indicates how reliable the information in this event element's partial description was thought to be, at the update time. (TMDD 3300).
- **event-access-level**: indicates whether the information in this event element is public domain, or restricted to certain user groups (TMDD 3815).

Message Set Standard

4. *Message Descriptions (Cont'd)*

- event-response-plan: indicates whether a predefined response plan (action plan) is being activated. (TMDD 3269)

4.3.6.1.6.9 Event-Source

These optional items can be used to give further information about the *original* source of the information in this event element.

- event-detection-method: indicates the type of information source for this event element, e.g. police patrol, weather model. (TMDD 3302)
- event-organization-reported-identifier: an alphanumeric code referencing the organization that provided the information in this event element. (TMDD 3335)
- organization-contact-organization-name: the name of the organization that provided the information in this event element. (TMDD 3344)
- organization-contact-person-name: the name of the person that provided the information in the event element. (TMDD 3206)

4.3.6.1.6.10 Event-Comments

This optional free text can be used to add to the event element description, or to append a comment, not for end users.

- Event-description-notes-and-comment: Optional comment, not to be passed to the public. Typically comments are used for center operator information (TMDD 3210).
- Event-description-language: Optionally, the language in which the text is written (TMDD 3816).

Message Set Standard

4. *Message Descriptions (Cont'd)*

4.4 **Description of Traffic-Request Messages**

Traffic-Request Messages are one-way one time messages sent from a TMC to another TMC; from another transportation center (i.e. transit, advanced traveler information, emergency management, etc.) to a TMC; or from a TMC to another center.

The request message group includes three message sets:

1. **Status-Request:** this request results in a transfer of data elements related to specific traffic operating conditions and field device settings. It is a request to view data.
2. **Control-Request:** this request results in a transfer of control of specific traffic related control devices. As such, this request type is only sent to received from another TMC. Where specific center-to-center agreements/priorities are established this request can be transmitted between a TMC and other transportation centers. It is a request to view status and control settings and change the control settings.
3. **Control-Response:** is a specific return message sent back to the requesting center describing the disposition of the control-request.

4.4.1 **Traffic-Status-Request Message Set**

This message set is composed of a series of request messages. When transmitted, each message requests a specific type of traffic data. Figure 4.4.1-1 shows the message tree for this set.

4.4.1.1 **Network-Events-Request**

This message requests an update of data elements associated with a single network event. The return messages to this request is either the Network-Incident-Update or the Roadway-Event-Update set of messages. The selection is based on the value of the event-type data element (TMDD-DE 3211).

- **Organization-Contact-Organization Identifier:** identifying alphanumeric of organization requesting a current status data of active incidents and/or planned events (TMDD-DE 3343).

Figure 4.4.1-1
Messages For Traffic-Status-Request Set

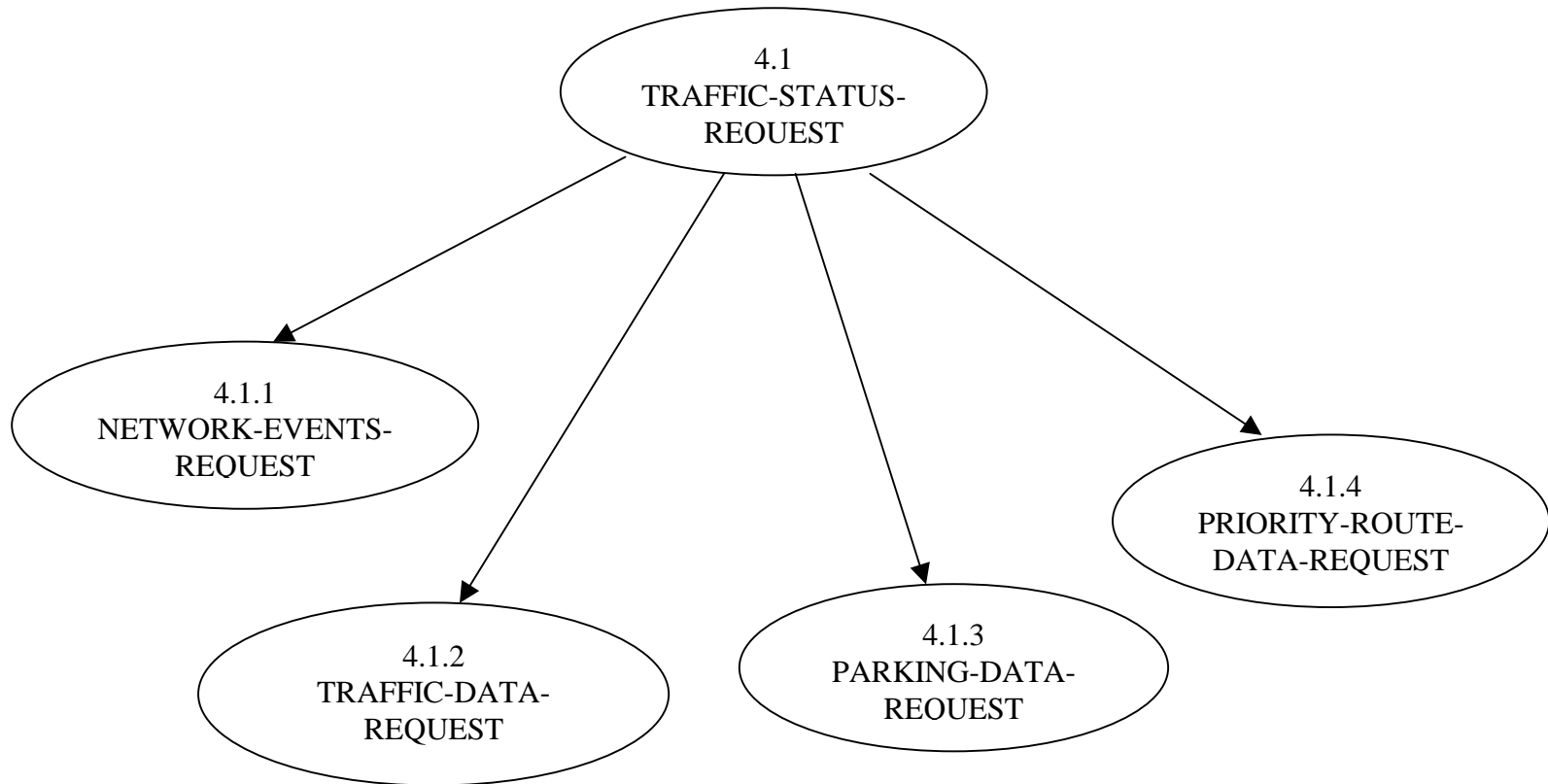
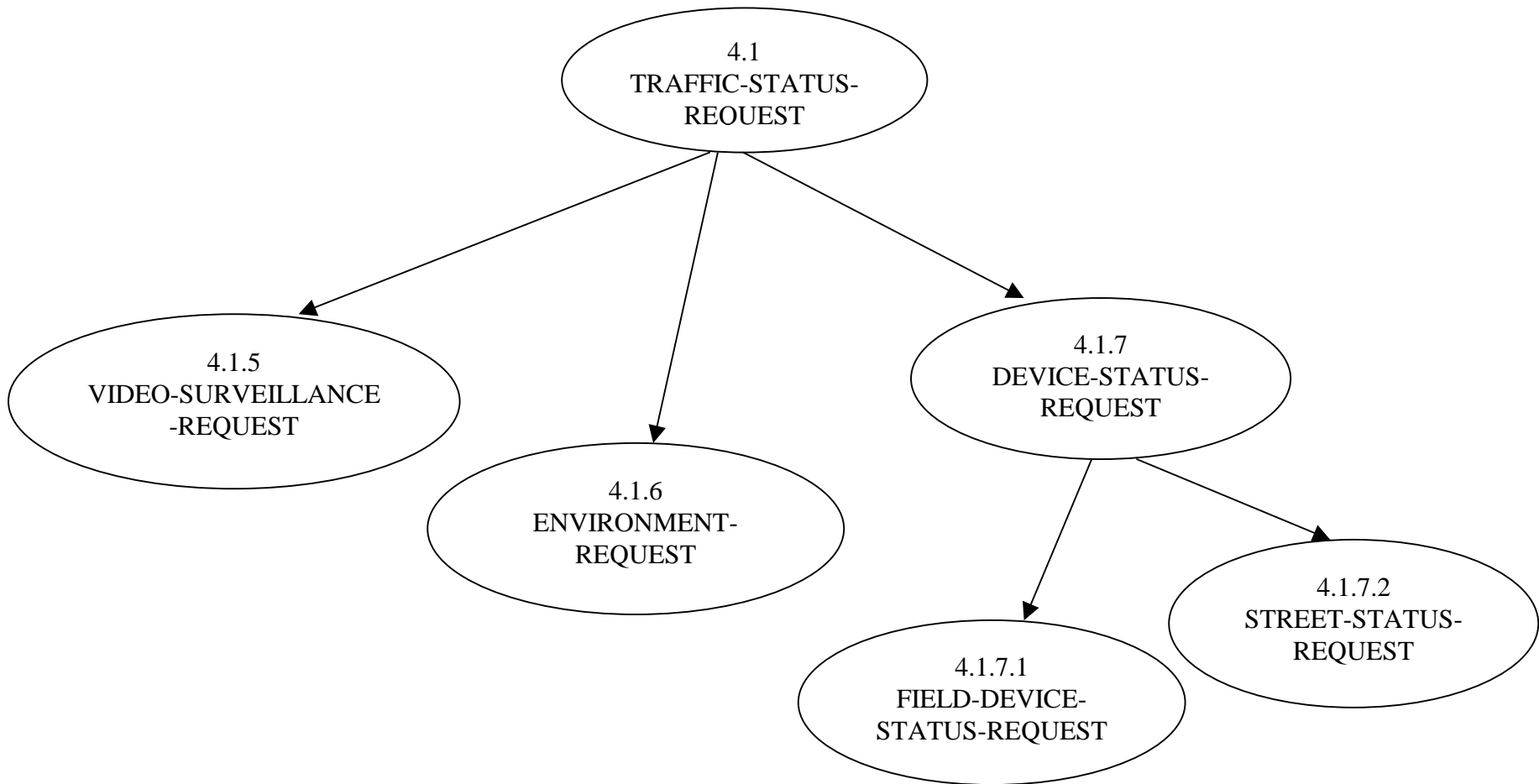


Figure 4.4.1-1 (cont'd)
Messages For Traffic-Status-Request Set



Message Set Standard

Message Set Standard

4. *Message Descriptions (Cont'd)*

- Event-Description Type Event: code that identifies type of event, either incident or planned event (TMDD-DE 3211).
- Organization-Resource Center Identifier: identifying alphanumeric of organization's center requesting a current status data of active incidents and/or planned events (TMDD-DE 3217).
- Event-Identifier: unique identifier for events active and/or scheduled on roadway network (TMDD-DE 3215).
- Network-Identifier: unique alphanumeric identifier for traffic network on which events are active (TMDD-DE 3411).

4.4.1.2 Traffic-Data-Request

This message requests an update of current performance associated with a single network link and/or single network node. The return messages to this request is the Current-Network-State set of messages.

- Organization-Contact-Organization Identifier: unique identifier of organization requesting the operating status of the network containing the requested link and/or node (TMDD-DE 3343).
- Organization-Resource Center Identifier: unique identifier of organization's center requesting the operating status of the network containing the requested link and/or node (TMDD-DE 3217).
- Network-Identifier: unique identifier for traffic network containing requested link and/or node data (TMDD-DE 3411).
- Link-Identifier: unique identifier for network link for which data was requested (TMDD-DE 3012).
- Node-Identifier: unique identifier for network node for which data was requested (TMDD-DE 3042).

4.4.1.3 Parking-Data-Request

This message requests an update of current availability conditions at a single parking facility. The return message to this request is the Current-Parking-Status messages.

Message Set Standard

Message Set Standard

4. *Message Descriptions (Cont'd)*

- Organization-Contact-Organization Identifier: unique identifier of organization requesting the operating status of parking facilities associated with specific traffic network (TMDD-DE 3343).
- Organization-Resource Center Identifier: unique identifier of organization's center requesting the operating status of parking facilities associated with specific traffic network (TMDD-DE 3217).
- Network-Identifier: unique alphanumeric identifier of traffic network that supplies/receives vehicles from the specific parking facility (TMDD-DE 3411).
- Link-Identifier: unique alphanumeric identifier of traffic link on which parking lot is located (TMDD-DE 3012).
- Parking-Lot-Identifier: unique alphanumeric identifier of parking facility for which data was requested (SAE-J2354 parking message data element).

4.4.1.4 Priority-Route-Data-Request

This message requests an update of traffic conditions on a specified priority route. The return message is one of the messages from the Current-Priority Route set of messages.

- Organization-Contact-Organization Identifier: unique identifier of organization requesting the status of the specified priority route (TMDD-DE 3343).
- Organization-Contact-Suborganization Identifier: unique identifier of suborganization requesting the status of the specified priority route (TMDD-DE 3352).
- Network-Identifier: unique alphanumeric identifier for traffic network containing priority route (TMDD-DE 3411).
- Organization-Resource Center Identifier: unique identifier for organization operating/dispatching priority vehicle (TMDD-DE 3217).
- Trip-Route-Identifier: unique alphanumeric identifier for priority route assigned by dispatching resource-center (SAE-J2354 route instruction data element).

4.4.1.5 Video-Surveillance Request

This message requests the video stream from a field device be sent to the requesting center. The response to this message opens a video channel and sends the requested video.

- Organization-Contact-Organization Identifier: unique identifier of organization requesting the surveillance video (TMDD-DE 3343).
- Organization-Resource Center Identifier: unique identifier of organization's center requesting the operating status of video surveillance associated with specific traffic network (TMDD-DE 3217).

Message Set Standard

Message Set Standard

4. *Message Descriptions (Cont'd)*

- Network-Identifier: unique alphanumeric identifier for traffic network containing CCTV device (TMDD-DE 3411).
- Device-Link Identifier: unique alphanumeric identifier of link for which CCTV video data was requested (TMDD-DE 3748).
- Device-Node Identifier: unique alphanumeric identifier of node for which CCTV video data was requested (TMDD-DE 3750).
- Device-Device Identifier: unique identifier for CCTV device for which video is requested (TMDD-DE 3701).
- Device-Device Type: code for type of field device for which data is requested (TMDD-DE 3747).
- CCTV-Video Channel Identifier: unique alphanumeric identifies the channel input at the receiving center for the specified field device video (TMDD-DE 3745).

4.4.1.6 Environment-Request

This message requests that environmental emissions or roadside weather data for specific sensor stations at network locations be sent to the requesting center. The return message is one of the messages from the Roadway-Network-Environment set of messages.

- Organization-Contact-Organization Identifier: unique identifier of organization requesting the environmental data elements (TMDD-DE 3343).
- Organization-Resource Center Identifier: unique identifier of organization's center requesting the operating status of environmental sensor associated with specific traffic network (TMDD-DE 3217).
- Network-Identifier: unique alphanumeric identifier for traffic network containing the environmental device locations (TMDD-DE 3411).
- Device-Link Identifier: unique alphanumeric identifier of link for which environmental data was requested (TMDD-DE 3748).
- Device-Node Identifier: unique alphanumeric identifier of node for which environmental data was requested (TMDD-DE 3750).
- Device-Device Type: code identifying the type of field device for which data is requested (TMDD-DE 3747).
- Device-Device Identifier: unique alphanumeric identifier of sensor station located on specified link or node for which environmental data was requested (TMDD-DE 3701)

4.4.1.7 Device-Status-Request

Device-Status-Request messages is a set of two request messages that allow the requesting center to separately request field device status or surface street device status.

Message Set Standard

4. *Message Descriptions (Cont'd)*

4.4.1.7.1 Field-Device-Status-Request

This message requests the current status of specific field control and surveillance devices (i.e., ramp controllers, DMS, HAR, gate controllers for reversible lanes) related to network links and/or nodes.

- Organization-Contact-Organization Identifier: unique identifier of organization requesting the field device status (TMDD-DE 3343).
- Organization-Resource Center Identifier: unique identifier of organization's center requesting the operating status of surface street control associated with specific traffic network (TMDD-DE 3217).
- Network-Identifier: unique identifier for traffic network containing field devices (TMDD-DE 3411).
- Device-Node Identifier: unique node identifier for network node at which field device is located (TMDD-DE 3750).
- Device-Link Identifier: unique link identifier of network link on which field device is located (TMDD-DE 3748).
- Device-Device Type: code identifying the type of field device for which status is requested (TMDD-DE 3747).
- Device-Device Identifier: identifier of field device located on specified link or node for which status was requested (TMDD-DE 3701).

4.4.1.7.2 Street-Status-Request

This message requests the current status of specific surface street controllers related to intersections, arterials and surface street network sections.

- Organization-Contact-Organization Identifier: unique identifier of organization requesting surface street control status (TMDD-DE 3343).
- Organization-Resource Center Identifier: unique identifier of organization's center requesting the operating status of surface street control associated with specific traffic network (TMDD-DE 3217).

Message Set Standard

Message Set Standard

4. *Message Descriptions (Cont'd)*

- Network-Identifier: unique identifier for traffic network containing controller devices (TMDD-DE 3411).
- Intersection-Identifier: unique identifier of intersection in specified network for which control status is requested. Intersection is signalized (TMDD-DE 3404).
- Artery-Identifier: unique identifier of arterial in specified network for which control status is requested arterial contains links, nodes and control devices (TMDD-DE 3401).
- Section-Identifier: unique identifier of surface street section in specified network for which control status is requested. Section incorporates a set of signalized intersections and common timing plans (TMDD-DE 3421).
- Device-Device Type: code identifying the type of surface street device for which status is requested (TMDD-DE 3747).
- Device-Device Identifier: identifier of surface street device for which status was requested (TMDD-DE 3701).

4.4.2 Control-Request Message Set

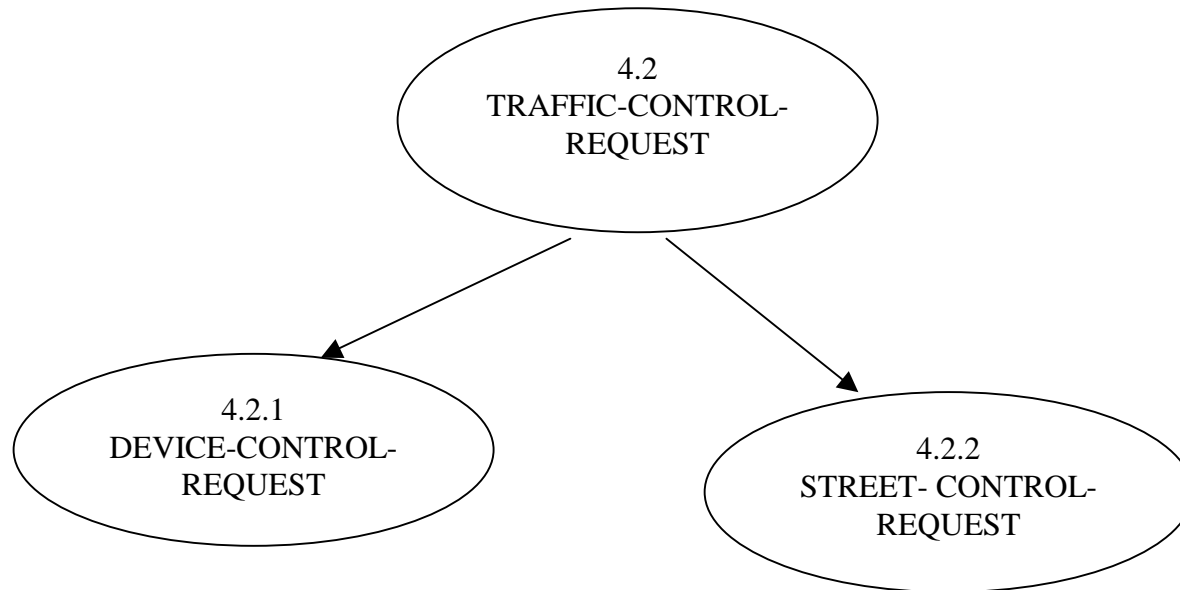
This message set is composed of a series of specific request messages. When transmitted, each message requests a level of control authority with respect to a specific field control device (ramp meter, DMS, HAR, CCTV, other devices); or a signalized intersection, arterial, surface street network. Figure 4.4.2-1 shows the message tree for this set.

4.4.2.1 Device-Control-Request

This message requests control of specific field devices including ramp metering at specified ramps: dynamic message signs at specified locations or other location specific devices. The transferred level of control is that level necessary to observe or influence motorist behavior (i.e., change of metering rates or thresholds; change of displayed or broadcast message; changing camera field of view).

- Organization-Contact Organization Identifier: unique identifier of organization requesting the control transfer of specific field devices (TMDD-DE 3343).
- Organization-Resource Center Identifier: unique identifier of center, for organization requesting the control transfer of specific field devices (TMDD-DE 3217).
- Device-Organization Operator Identifier: unique identifier of the organization that operates the field device for which control is requested (TMDD-DE 3706).

Figure 4.4.2-1
Messages For Control-Request Set



Message Set Standard

Message Set Standard

4. *Message Descriptions (Cont'd)*

- Network-Identifier: unique alphanumeric identifier of network containing specified field device (TMDD-DE 3411).
- Device-Link Identifier: unique identifier of link within network containing specified field device (TMDD-DE 3748).
- Device-Device Type: code identifying the type of field device for which control is requested (TMDD-DE 3747).
- Device-Device Identifier: unique identifier of field device specified for transfer of control (TMDD-DE 3701).
- Device-Node Identifier: unique identifier of node within network at which specified field device is located (TMDD-DE 3750).

4.4.2.2 Street-Control-Request

This message requests transfer of control for specific street controllers related to intersections, arterials and surface street network sections. The transferred level of control is that level necessary to anticipate and mitigate the development of congested conditions across network boundaries or between freeway and surface street networks.

- Organization-Contact Organization Identifier: unique identifier of organization requesting transfer of surface street control (TMDD-DE 3343).
- Organization-Resource Center Identifier: unique identifier of center, for organization requesting the transfer of surface street control (TMDD-DE 3217).
- Device-Organization Operator Identifier: unique alphanumeric identifier of the organization that operates the street control devices for which control is requested (TMDD-DE 3706).
- Network-Identifier: unique alphanumeric identifier of signalized surface street network (TMDD-DE 3411).
- Intersection-Identifier: unique alphanumeric identifier of intersection in specified network for which control transfer is requested (TMDD-DE 3404).
- Artery-Identifier: unique alphanumeric identifier of arterial in specified network for which control transfer is requested (TMDD-DE 3401).

Message Set Standard

Message Set Standard

4. *Message Descriptions (Cont'd)*

- Section-Identifier: unique identifier of surface street section of specified network for which control transfer is requested (TMDD-DE 3421).
- Device-Device Type: code identifying the type of surface street control device for which control is requested (TMDD-DE 3747).
- Device-Device Identifier: unique identifier of surface street control device specified for transfer of control (TMDD-DE 3701).

4.4.3 Control-Response Message Set

This message set is only transmitted when a request for control of a traffic control field device or street signal controller is received by the traffic management center operating the specified device. The response message reflects back to the requesting center / system. The response message communicates three possible actions:

- Control request accepted - device available
- Control request denied - device in use
- Control request denied - device off-line

The response message is published to the requesting subscription center with guaranteed delivery. Figure 4.4.3-1 shows the message tree for this set.

4.4.3.1 Device-Control-Response

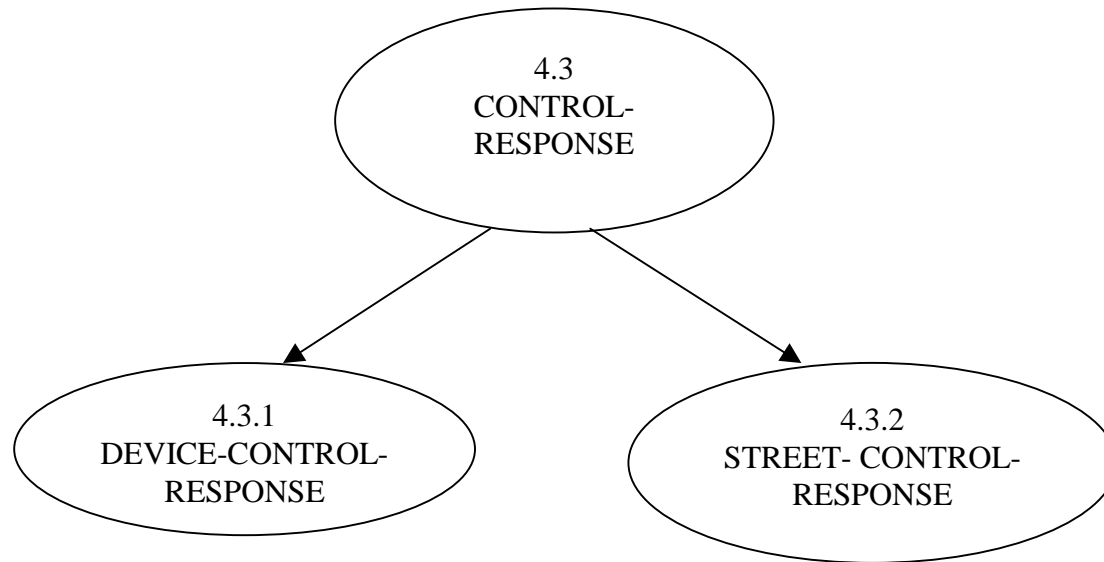
This message responds to a request for control of a field device by reflecting back the request message with the addition of a DEVICE-Acknowledge Control Data Element.

This Acknowledge Control data element has the following valid value list:

- 0 = Other Control No Additional Information;
- 1 = Other Control Additional Information;
- 2 = Control acknowledged, device available;
- 3 = Control denied, device in use;
- 4 = Control denied, device off-line;
- 0 through 31 reserved for National Standard;
- 32 through 63 reserved for local use.

This data element has a Data Concept Identifier of 3763, as assigned by the TMDD.

Figure 4.4.3-1
Messages For Control-Response Set



Message Set Standard

Message Set Standard

4. *Message Descriptions (Cont'd)*

The set of control-response data elements are:

- Organization-Contact Organization Identifier: unique identifier of organization requesting the control transfer of specific field devices (TMDD-DE 3343).
- Organization-Resource Center Identifier: unique identifier of center, for organization requesting the control transfer of specific field devices (TMDD-DE 3217).
- Device-Organization Operator Identifier: unique identifier of the organization that operates the field device for which control is requested (TMDD-DE 3706).
- Network-Identifier: unique alphanumeric identifier of network containing specified field device (TMDD-DE 3411).
- Device-Link Identifier: unique alphanumeric identifier of link containing specified field device (TMDD-DE 3748).
- Device-Device Type: code identifying the type of field device for which control is requested (TMDD-DE 3747).
- Device-Device Identifier: unique alphanumeric identifier of field device specified for transfer of control (TMDD-DE 3701).
- Device-Node Identifier: unique alphanumeric identifier of node at which specified field device is located (TMDD-DE 3750).
- Device-Acknowledge Control: acknowledgment of request for device control from a TMC to another transportation center-based subsystem (TMDD-DE 3763).

4.4.3.2 Street-Control-Response

This message responds to a request for control of a specific street signal controller, related to intersections, arterials and surface street sections. The response message reflects back the request message with the addition of a Device-Acknowledge Control data element.

Message Set Standard

Message Set Standard

4. *Message Descriptions (Cont'd)*

This Acknowledge Control data element has the following varied value list:

- 0 = Other Control No Additional Information;
- 1 = Other Control Additional Information;
- 2 = Control acknowledged, device available;
- 3 = Control denied, device in use;
- 4 = Control denied, device off-line;
- 0 through 31 reserved for National Standard;
- 32 through 63 reserved for local use.

This data element has a Data Concept Identifier of 3763, as assigned by the TMDD.

The set of control-response data elements are:

- Organization-Contact Organization Identifier: unique alphanumeric identifier of organization requesting transfer of surface street control (TMDD-DE 3343).
- Organization-Resource Center Identifier: unique identifier of center, for organization requesting the transfer of surface street control (TMDD-DE 3217).
- Device-Organization Operator Identifier: unique identifier of the organization that operates the street control devices for which control is requested (TMDD-DE 3706).
- Network-Identifier: unique alphanumeric identifier of signalized surface street network (TMDD-DE 3411).
- Intersection-Identifier: unique alphanumeric identifier of intersection in specified network for which control transfer is requested (TMDD-DE 3404).
- Artery-Identifier: unique alphanumeric identifier of arterial in specified network for which control transfer is requested (TMDD-DE 3401).
- Section-Identifier: unique alphanumeric identifier of surface street section of specified network for which control transfer is requested (TMDD-DE 3421).
- Device-Device Type: code identifying the type of signal control device for which control is requested (TMDD-DE 3747).
- Device-Device Identifier: unique alphanumeric identifier of signal control device specified for transfer of control (TMDD-DE 3701).
- Device-Acknowledge Control: acknowledgment of request for signal device control from a TMC to another transportation center-based subsystem (TMDD-DE 3763).

Message Set Standard

4. *Message Descriptions (Cont'd)*

4.5 Description of Traffic Device – Status Messages

Traffic-Device-Status Messages are sent from a TMC in response to a Device-Status-Request message from another center. The status message is referenced to a single traffic device specified by the request message. The status message may be sent one time or at a regular update interval as specified by the request message.

This message group consists of two message sets. The sets are: field device status, surface street device status.

4.5.1 Field-Device-Status Message Set

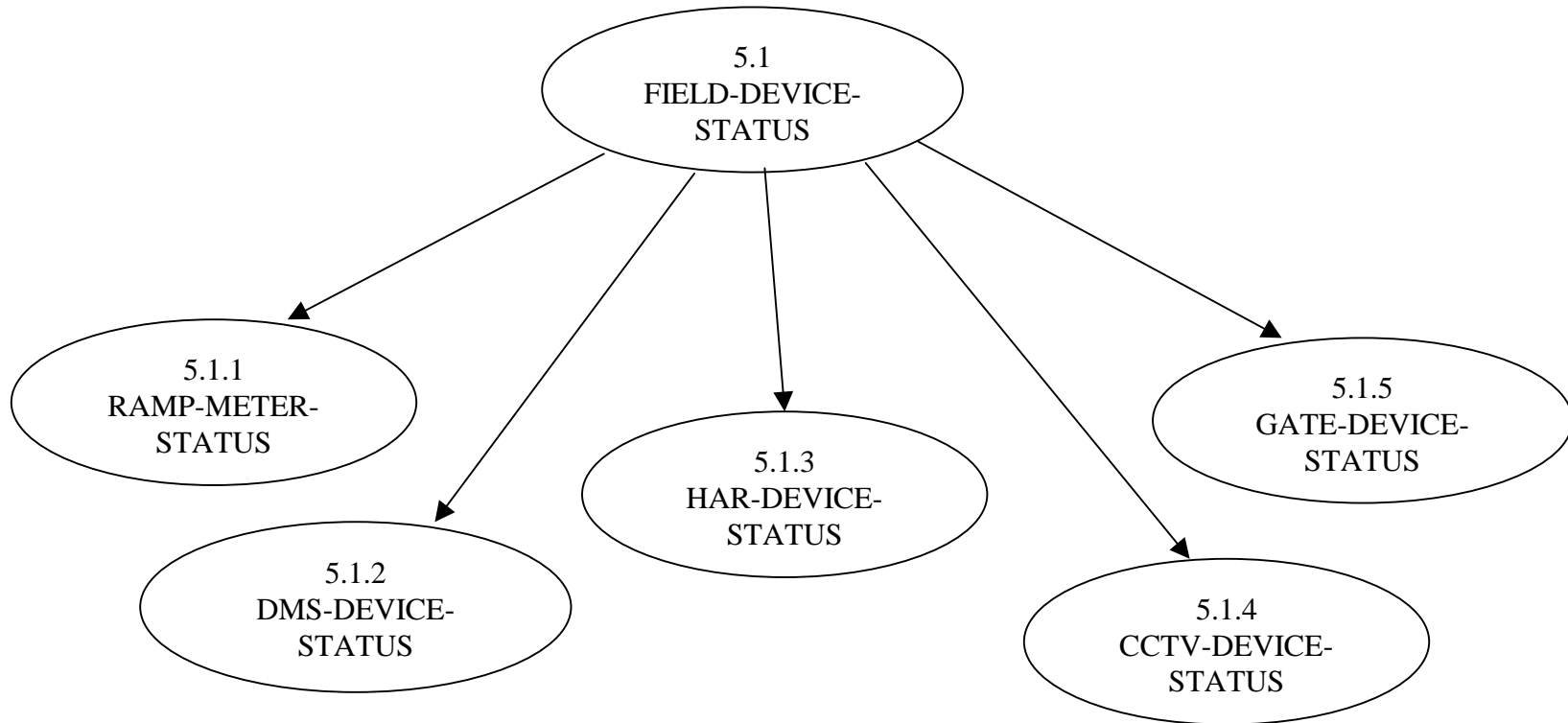
This message set is composed of status message referenced to specified field control and surveillance devices. Specific status messages are specified for ramp and other metering devices, dynamic message signs, highway advisory radio, closed circuit TV and gate controller. Status messages for other field devices shall be included in this set as the required data elements are developed for the Traffic Management Data Dictionary (reference 2.1.1). Figure 4.5.1-1 shows the message tree for this set.

4.5.1.1 Ramp-Meter-Status

This message provides device status for a specified metered ramp or other network link with metering (includes ramp, mainline, connector, tunnel):

- Network-Identifier: unique alphanumeric identifier for traffic network containing specified metered link (TMDD-DE 3411).
- Device-Link Identifier: unique alphanumeric identifier for network link on which metering device is located (TMDD-DE 3748).
- Device-Node Identifier: unique alphanumeric identifier for network node at which metering device is located (TMDD-DE 3750).
- Device-Organization Operator Identifier: unique alphanumeric identifier of the organization that operates the device (TMDD-DE 3706).
- Device-Device Identifier: unique alphanumeric identifier of metering device for which status is requested (TMDD-DE 3701).

Figure 4.5.1-1
Messages For Field-Device-Status Set



Message Set Standard

4. *Message Descriptions (Cont'd)*

- Meter-Metering Type: type of metering control on link; ramp, mainline, connector, tunnel (TMDD-DE 3532).
- Ramp-Current State: code indicating operating state of specified ramp (TMDD-DE 3536).
- Detector-Identifier: unique identifier for ramp queue detector on metered link. Provides cross reference to link detector measurements (TMDD-DE 3504).
- Detector-Occupancy: percent time that a detector is indicating a vehicle presence measured over a specified update interval (NTCIP object, TMDD-DE 3607).
- Ramp-Meter-Queue Detector Occupancy Threshold: queue detector threshold currently in effect at specified ramp. When exceeded increase metering rate to next least restrictive level (NTCIP object, TMDD-DE 3646).
- Ramp-Meter-Maximum Meter Rate: least restrictive metering rate currently in effect at specified ramp (NTCIP object, TMDD-DE 3641).
- Ramp-Meter-Minimum Meter Rate: most restrictive metering rate currently in effect at specified ramp (NTCIP object, TMDD-DE 3644).
- Meter-Status: code indicating current operating state of the meter (TMDD-DE 3533).
- Meter-Mainline Speed Threshold: speed threshold levels used by metering algorithm to select metering levels (TMDD-DE 3531).
- Ramp-Meter-Advance Queue Occupancy Threshold: threshold in percent that determine when normal metering will be interrupted to service excess demand (NTCIP object, TMDD-DE 3632).

Message Set Standard

4. *Message Descriptions (Cont'd)*

4.5.1.2 DMS-Device-Status

This message provides device status for a specified dynamic message sign.

- Network-Identifier: unique alphanumeric identifier for traffic network containing specified message sign (TMDD-DE 3411).
- Device-link Identifier: unique alphanumeric identifier for link location of specified message sign. Provides cross-reference to link based description and performance data elements (TMDD-DE 3748).
- Device-Node Identifier: unique alphanumeric identifier for node location of specified message sign. Provides cross-reference to node based description and performance data elements (TMDD-DE 3750).
- Device-Organization Operator Identifier: unique alphanumeric identifier of the organization that owns the specified dynamic message sign (TMDD-DE 3706).
- Device-Device Identifier: unique alphanumeric identifier for specified dynamic message sign (TMDD-DE 3701).
- DMS-Error Short Error Status: summary error codes of errors currently in effect for specified message sign (NTCIP object).
- DMS-Message MULTI String: text of current displayed message written in MULTI language (NTCIP object).
- DMS-Message Table Source: identifies the message number used to generate currently displayed message (NTCIP object).
- DMS-Message Time Remaining: amount of time remaining in minutes that current message is being displayed (NTCIP object).

Message Set Standard

4. *Message Descriptions (Cont'd)*

- DMS-Message Source Mode: code indicating the source that initiated the currently displayed message (NTCIP object).

4.5.1.3 HAR-Device-Status

This message provides device status for a specified highway advisory radio.

- Network-Identifier: unique alphanumeric identifier for traffic network containing specified advisory radio (TMDD-DE 3411).
- Device-Link Identifier: unique alphanumeric identifier for link with location of specified advisory radio. Provides cross-reference to link based description and performance data elements (TMDD-DE 3748).
- Device-Node Identifier: unique alphanumeric identifier for node with location of specified advisory radio. Provides cross-reference to node based description and performance data elements (TMDD-DE 3750).
- Device-Organization Operator Identifier: unique identifier of organization that owns the specified advisory radio (TMDD-DE 3706).
- HAR-Call Sign: unique call sign identifier for specified advisory radio (TMDD-DE 3758).
- HAR-Error Short Error: summary error codes of errors, currently in effect for specified advisory radio (NTCIP object).
- HAR-Status Current Message: program number of current program being broadcast by specified advisory radio (NTCIP object).
- HAR-Status Mode: code indicating the commanded source of the broadcast either the play schedule, a specific program or a play thru source (NTCIP object).
- HAR-Schedule Table: the sequence of start times and programs currently scheduled for the specified advisory radio (NTCIP object).

Message Set Standard

4. *Message Descriptions (Cont'd)*

- HAR-Program Table: the list of messages available for inclusion in one or more programs (NTCIP object).

4.5.1.4 CCTV-Device-Status

This message provides status for a specified CCTV camera device.

- Network-Identifier: unique alphanumeric identifier for traffic network containing specified CCTV camera (TMDD-DE 3411).
- Device-Link Identifier: unique alphanumeric identifier for location of specified CCTV. Provides cross-reference to link based description and performance data elements (TMDD-DE 3748).
- Device-Organization Operator Identifier: unique identifier of agency that owns the specified CCTV (TMDD-DE 3706).
- Device-Device Identifier: unique alphanumeric identifier for specified CCTV device (TMDD-DE 3701).
- Device-Node Identifier: unique identifier for node location of specified CCTV. Provides cross-reference to node based description and performance data elements (TMDD-DE 3750).
- CCTV-Error: summary error codes of errors currently in effect for specified CCTV device (TMDD-DE 3702).
- CCTV-Position Pan: azimuth position of camera line of sight in degrees from north (NTCIP object).
- CCTV-Position Tilt: elevation position of camera line of sight in degrees from local horizontal (NTCIP object).
- CCTV-Position Zoom Lens: zoom position of camera lens in percent of full travel (NTCIP object).

Message Set Standard

4. *Message Descriptions (Cont'd)*

- CCTV-Position Iris Lens: Iris position of camera lens in percent of full travel (NTCIP object).
- CCTV-Position Focus Lens: focus position of camera lens in percent of full travel (NTCIP object).

4.5.1.5 Gate-Device-Status

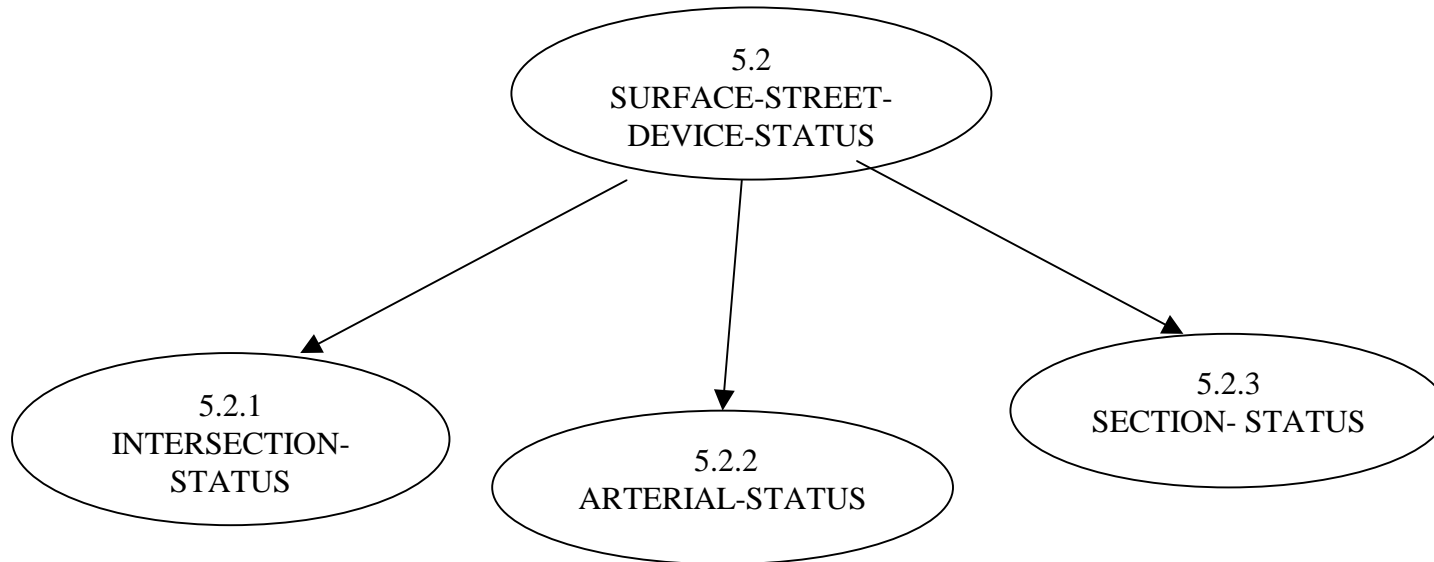
This message provides status for a specified gate controller.

- Network-Identifier: unique alphanumeric identifier for traffic network containing specified gate device (TMDD-DE 3411).
- Device-Link Identifier: unique identifier for link location of specified gate device controlling access to link (TMDD-DE 3748).
- Device-Organization Operator Identifier: unique alphanumeric identifier of agency that operates the specified gate device (TMDD-DE 3706).
- Device-Device Identifier: unique identifier for specified gate device (TMDD-DE 3701).
- Gate-Type: code indicating the type of roadway access or parking access that the specified gate controls (TMDD-DE 3735).
- Gate-Status: code indicating the current open/closed condition of the gate (TMDD-DE 3734).

4.5.2 Surface-Street-Device-Status

This message set is composed of status messages referenced to specific surface street control devices. Status messages are specified for intersections, arterials and street networks (Sections). Figure 4.5.2-1 shows the message tree for this set.

Figure 4.5.2-1
Messages For Surface-Street-Device-Status Set



Message Set Standard

Message Set Standard

4. *Message Descriptions (Cont'd)*

4.5.2.1 Intersection-Status

This message provides signal control status at an individual signalized intersection.

- Network-Identifier: unique alphanumeric identifier for traffic network containing specified intersection (TMDD-DE 3411).
- Device-Organization Operator Identifier: unique alphanumeric identifier of agency that operates the specified signal control device (TMDD-DE 3706).
- Device-Node Identifier: unique node identifier for location of specified intersection controller. Provides for cross-reference to node based description and performances parameters (TMDD-DE-3750).
- Intersection-Identifier: unique identifier of surface street intersection with specified signal controller (TMDD-DE-3404).
- Artery-Identifier: unique road identifier for artery which includes specified intersection (TMDD-DE-3401)
- Section-Identifier: unique section identifier for street network that includes specified intersection (TMDD-DE-3421).
- Device-Device Identifier: unique identifier for specified intersection controller device (TMDD-DE 3701).
- Intersection-Name: accepted name of specified intersection (i.e., street/cross-street name) (TMDD-DE-3405).
- Timing-Plan-Cycle Length: time interval for specified intersection to complete control commands in the cycle (NTCIP object, TMDD-DE 3649).
- Intersection-Offset Time: time interval between arterial or section reference point and starting point of coordinated interval (NTCIP object, TMDD-DE 3611).
- Controller-Identifier: unique identifier of controller assigned to specified intersection (TMDD-DE-3462).
- Controller-Response State: current operating state of controller (responding; not responding) (TMDD-DE-3465).

Message Set Standard

Message Set Standard

4. *Message Descriptions (Cont'd)*

- Phase-Signal State: current signal phases active at the intersection. Relates current signal phases to intersection approaches (TMDD-DE-3478).
- Intersection-Signal Control Mode: traffic control mode currently in affect at intersection (TMDD-DE-3472).
- Phase-Force Off Control: phase command to force termination of green interval in the activated mode (NTCIP object, TMDD-DE 3614).
- Phase-Hold Control: phase command that retains existing green phase (NTCIP object, TMDD-DE 3615).

4.5.2.2 Arterial-Status

This message provides signal control status for a coordinated set of traffic signals along a specified arterial.

- Network-Identifier: unique alphanumeric identifier for traffic network containing specified arterial (TMDD-DE 3411).
- Device-Organization Operator Identifier: unique alphanumeric identifier of agency that operates the specified signal control device (TMDD-DE 3706).
- Artery-Name: street name of specified arterial (TMDD-DE-3402).
- Artery-Identifier: unique alphanumeric identifier of arterial (TMDD-DE-3401).
- Device-Device Identifier: unique identifier for specified artery controller device (TMDD-DE 3701).
- Controller-Identifier: unique identifier of controller assigned to specified artery (TMDD-DE-3462).
- Controller-Response State: current operating state of controller (responding; not responding) (TMDD-DE-3465).
- Artery-Intersections Count: number of controlled signalized intersections along the arterial(TMDD-DE-3403).

Message Set Standard

Message Set Standard

4. *Message Descriptions (Cont'd)*

- Timing-Plan-Identifier: unique identifier of timing plan currently in effect on arterial (TMDD-DE-3486).
- Artery-Time Space Identifier: unique identifier of time space diagram currently in effect on arterial (TMDD-DE-3450).
- Timing-Plan Name: descriptive name of timing plan currently in effect on arterial (TMDD-DE-3487).
- Timing-Plan-Cycle Length: time interval currently in effect to complete all signal commands for arterial intersections (NTCIP object, TMDD-DE 3649).
- TRSP-Plan Change Threshold: threshold currently in effect to determine when current timing plans for arterial should be changed to different plan (TMDD-DE-3494).
- TRSP-Plan Change Inhibit: minimum time interval between TRSP plan changes (TMDD-DE-3493).
- TRSP-Plan Identifier: unique identifier for traffic responsive plan currently in effect along arterial (TMDD-DE-3495).

4.5.2.3 Section-Status

This message provides a signal control status for a coordinated set of traffic signals within a specified section of a street network. The traffic section uses a common timing plan:

- Network-Identifier: unique alphanumeric identifier of traffic network containing specified section (TMDD-DE 3411).
- Device-Organization Operator Identifier: unique alphanumeric identifier of agency that operates the specified section control device (TMDD-DE 3706).
- Section-Identifier: unique alphanumeric identifier for section within specified network (TMDD-DE-3421).
- Section-Name: descriptive name of specified surface street network section (TMDD-DE-3423).

Message Set Standard

4. *Message Descriptions (Cont'd)*

- Timing-Plan-Name: descriptive name of timing plan currently in effect for specified section (TMDD-DE-3487).
- Section-Signal Control Mode: mode of operation currently in effect for specified traffic section (TMDD-DE-3484).
- Device-Device Identifier: unique identifier for specified section controller device (TMDD-DE 3701).
- Controller-Identifier: unique identifier of controller assigned to specified section (TMDD-DE-3462).
- Controller-Response State: current operating state of controller (responding; not responding) (TMDD-DE-3465).
- Timing-Plan-Cycle-Length: time interval currently in effect to complete all signal commands for intersections within section (NTCIP object, TMDD-DE 3649).
- Timing-Plan-Identifier: unique identifier of signal timing plan currently in effect for specified section (TMDD-DE-3486).
- TRSP-Plan Change Threshold: threshold currently in effect to determine when current timing plan for network section should be changed to different plan (TMDD-DE 3494).
- TRSP-Plan Change Inhibit: minimum time interval between TRSP plan changes (TMDD-DE-3493).
- TRSP-Plan Identifier: unique identifier for traffic responsive plan currently in effect in specified section (TMDD-DE-3495).

Message Set Standard

Message Set Standard

4. *Message Descriptions (Cont'd)*

4.6 **Description of Traffic-Control Messages**

Control-Messages are sent between traffic management centers and another traffic management center. The control message is referenced to a single traffic device specified by the request message. The control message is generally sent on a regular update interval to another center-based transportation subsystems after a specific traffic control request and response message sequence (sections 4.4.2, 4.4.3) established an active center to center control connection.

This message group consists of two message sets. These sets are field device control, surface street control.

4.6.1 **Field-Device-Control Message Set**

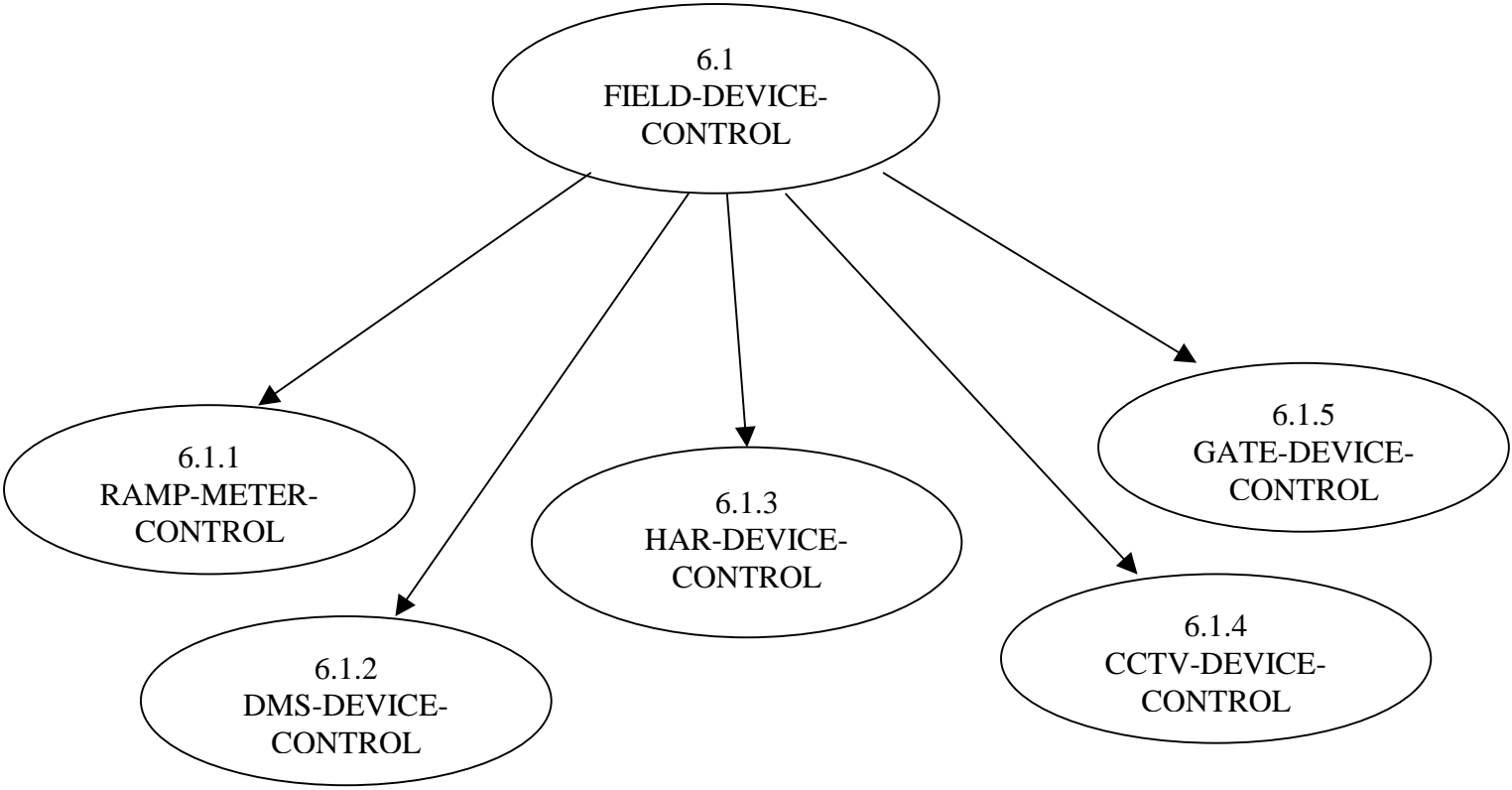
This message set is composed of control message referenced to specified field devices. Control messages are specified for ramp and other metering devices, dynamic message signs, highway advisory radio, closed circuit TV and gate controller. Control messages for other field devices shall be included in this set when required data elements are developed for the Traffic Management Data Dictionary (reference 2.1.1) Figure 4.6.1-1 shows the message tree for this set.

4.6.1.1 **Ramp-Meter-Control**

This message provides device control for a specified metered ramp or other network link with metering (includes ramp, mainline, connector, tunnel):

- Network-Identifier: unique alphanumeric identifier for traffic network containing specified metered link (TMDD-DE 3411).
- Device-Organization Operator Identifier: unique alphanumeric identifier of agency that operates the specified metering control device (TMDD-DE 3706).
- Device-Link Identifier: unique alphanumeric identifier for network link with which metering ramp provides for cross device is located (TMDD-DE 3748).
- Device-Node Identifier: unique alphanumeric identifier for network node at which metering device is located (TMDD-DE 3750).
- Device-Device Identifier: unique alphanumeric identifier of metering device for which control is transferred (TMDD-DE 3701).

Figure 4.6.1-1
Messages For Field-Device-Control Set



Message Set Standard

Message Set Standard

4. *Message Descriptions (Cont'd)*

- Meter-Metering Type: type of metering control on link; ramp, mainline, connector, tunnel (TMDD-DE 3532).
- Ramp-Meter-Queue Detector Occupancy Threshold: queue detector threshold currently in effect at specified ramp. When exceeded increases metering rate to next least restrictive level (NTCIP object, TMDD-DE 3646).
- Ramp-Meter-Maximum Meter Rate: least restrictive metering rate currently in effect at specified ramp (NTCIP object, TMDD-DE 3641).
- Ramp-Meter-Minimum Meter Rate: most restrictive metering rate currently in effect at specified ramp (NTCIP object, TMDD-DE 3644).
- Meter-Mainline Speed Threshold: Speed threshold levels used by metering algorithm to select metering levels (TMDD-DE 3531).
- Ramp-Meter-Advance Queue Occupancy Threshold: threshold in percent that determines when normal metering will be interrupted to service excess demand (NTCIP object, TMDD-DE 3632).

4.6.1.2 DMS-Device-Control

This message provides device control for a specified dynamic message sign.

- Network-Identifier: unique alphanumeric identifier for traffic network containing specified message sign (TMDD-DE 3411).
- Device-Organization Operator Identifier: unique alphanumeric identifier of agency that operates the specified DMS control device (TMDD-DE 3706).
- Device-link Identifier: unique alphanumeric identifier for link location of specified message sign. Provides cross-reference to link based description and performance data elements (TMDD-DE 3748).
- Device-Node Identifier: unique alphanumeric identifier for node location of specified message sign. Provides cross-reference to node based description and performance data elements (TMDD-DE 3750).

Message Set Standard

4. *Message Descriptions (Cont'd)*

- Device-Device Identifier: unique identifier for specified dynamic message sign (TMDD-DE 3701).
- DMS-Request Activate Message: code indicating the next message which the specified sign shall activate (NTCIP object).
- DMS-Message Activation Code: parameters required to activate a message (NTCIP object).

4.6.1.3 HAR-Device-Control

This message provides device control for a specified highway advisory radio.

- HAR-Request Command: control command to another transportation center-based subsystem for action (TMDD-DE 3743).
- Network-Identifier: unique alphanumeric identifier for traffic network containing specified advisory radio (TMDD-DE 3411).
- Device-Link Identifier: unique alphanumeric identifier for link location of specified advisory radio. Provides cross-reference to link based description and performance data elements (TMDD-DE 3748).
- Device-Node Identifier: unique alphanumeric identifier for node location of specified advisory radio. Provides cross-reference to node based description and performance data elements (TMDD-DE 3750).
- Device-Organization Operator Identifier: unique alphanumeric identifier of organization that owns the specified advisory radio (TMDD-DE 3706).
- HAR-Call Sign: unique call sign identifier for specified advisory radio (TMDD-DE 3758).

Message Set Standard

4. *Message Descriptions (Cont'd)*

- HAR-Current Message: message text of current program being broadcast by specified advisory radio (TMDD-DE 3759).
- HAR-Status Mode: code indicating the commanded source of the broadcast either the play schedule, a specific program or a play thru source (NTCIP object).
- HAR-Schedule Table: the sequence of start times and programs currently scheduled for the specified advisory radio (NTCIP object).

4.6.1.4 CCTV-Device-Control

This message provides control for a specified CCTV camera device.

- CCTV-Request Command: control command to effect specific CCTV camera action (TMDD-DE 3708).
- Network-Identifier: unique alphanumeric identifier for traffic network containing specified CCTV camera (TMDD-DE 3411).
- Device-Link Identifier: unique link identifier for location of specified CCTV. Provides cross-reference to link based description and performance data elements (TMDD-DE 3748).
- Device-Organization Operator Identifier: unique identifier of agency that owns the specified CCTV (TMDD-DE 3706).
- Device-Device Identifier: unique alphanumeric identifier for specified CCTV device (TMDD-DE 3701).
- Device-Node Identifier: unique node identifier for location of specified CCTV. Provides cross-reference to node based description and performance data elements (TMDD-DE 3750).
- CCTV-Position Pan: azimuth position of camera line of sight in degrees from north (NTCIP object).

Message Set Standard

4. *Message Descriptions (Cont'd)*

- CCTV-Position Tilt: elevation position of camera line of sight in degrees from local horizontal (NTCIP object).
- CCTV-Position Zoom Lens: zoom position of camera lens in percent of full travel (NTCIP object).
- CCTV-Position Iris Lens: Iris position of camera lens in percent of full travel (NTCIP object).
- CCTV-Position Focus Lens: focus position of camera lens in percent of full travel (NTCIP object).

4.6.1.5 Gate-Device-Control

This message provides control for a specified gate controller.

- Gate-Request Command: control command to open, close or reposition a gate (TMDD-DE 3733).
- Network-Identifier: unique alphanumeric identifier for traffic network containing specified gate device (TMDD-DE 3411).
- Device-Link Identifier: unique link identifier for location of specified gate device controlling access to link or parking facility (TMDD-DE 3748).
- Device-Organization Operator Identifier: unique identifier of agency that covers the specified gate device (TMDD-DE 3706).
- Device-Device Identifier: unique alphanumeric identifier for specified gate device (TMDD-DE 3701).
- Gate-Type: code indicating the type of roadway access or parking access that the specified gate controls (TMDD-DE 3735).

Message Set Standard

Message Set Standard

4. *Message Descriptions (Cont'd)*

4.6.2 Surface-Street-Control

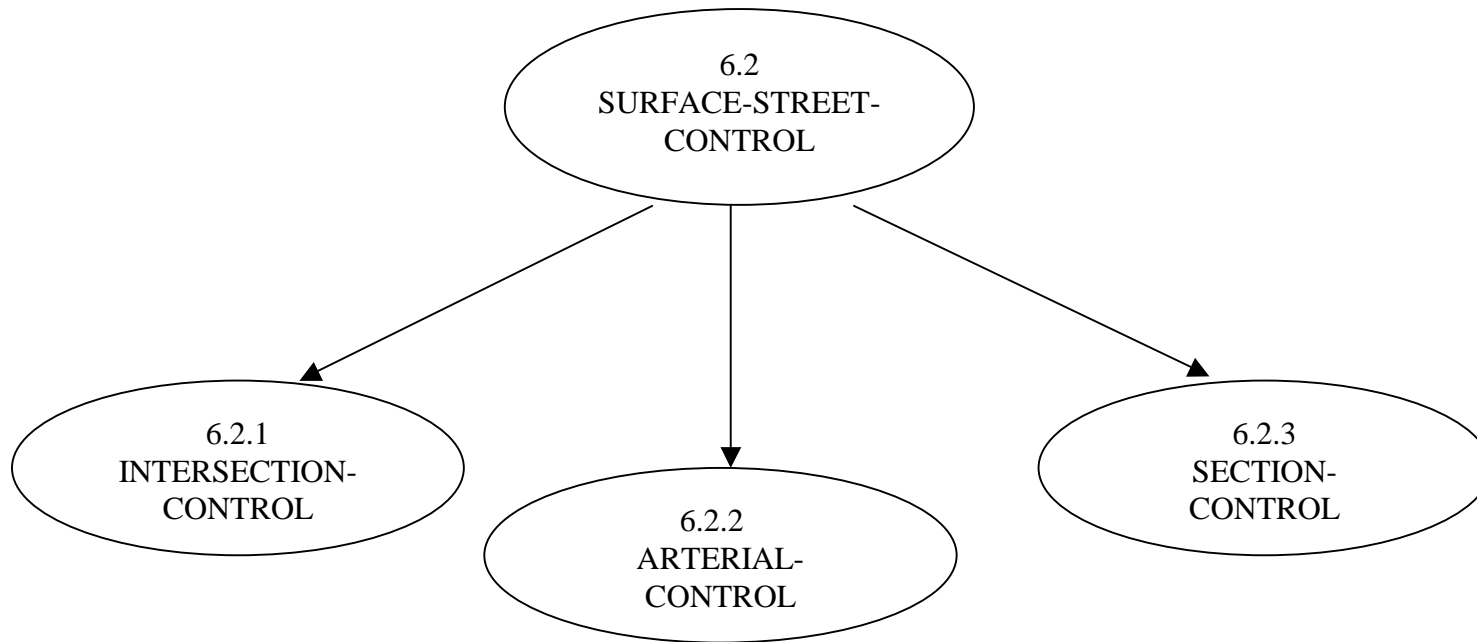
This message set is composed of control messages referenced to specific surface street control devices. Control messages are specified for intersections, arterials and sections of street networks. Figure 4.6.2-1 shows the message tree for this set.

4.6.2.1 Intersection-Control

This message provides signal control at an individual signalized intersection.

- Network-Identifier: unique alphanumeric identifier for traffic network containing specified intersection (TMDD-DE 3411).
- Device-Organization Operator Identifier: unique identifier of agency that operates the specified intersection controller device (TMDD-DE 3706).
- Device-Device Identifier: unique alphanumeric identifier for specified intersection controller device (TMDD-DE 3701).
- Device-Node Identifier: unique node identifier for location of specified intersection controllers. Provides for cross-reference to node based description and performances parameters (TMDD-DE-3750).
- Intersection-Identifier: unique alphanumeric identifier of specified surface street intersection with specified controller (TMDD-DE-3404).
- Artery-Identifier: road identifier for artery which includes specified intersection (TMDD-DE-3401)
- Section-Identifier: section identifier for street network that includes specified intersection (TMDD-DE-3421).
- Intersection-Name: accepted name of specified intersection with specified controller, (i.e., street/cross-street name) (TMDD-DE-3405).
- Timing-Plan-Cycle Length: modified time interval for specified intersection to complete control commands in the cycle (NTCIP object, TMDD-DE 3649).
- Intersection-Offset Time: modified time interval between arterial or section reference point and starting point of coordinated interval (NTCIP object, TMDD-DE 3611).

Figure 4.6.2-1
Messages For Surface-Street-Control Set



Message Set Standard

Message Set Standard

4. *Message Descriptions (Cont'd)*

- Controller-Identifier: unique identifier of controller assigned to specified intersection and specified for control (TMDD-DE-3462).
- Phase-Signal State: current signal phases active at the intersection. Relates current signal phases to intersection approaches (TMDD-DE-3478).
- Intersection-Signal Control Mode: modified traffic control mode in affect at intersection (TMDD-DE-3472).
- Phase-Force Off Control: modified phase command to force termination of green interval in the activated mode (NTCIP object, TMDD-DE 3614).
- Phase-Hold Control: modified phase command that retains existing green phase (NTCIP object, TMDD-DE 3615).

4.6.2.2 Arterial-Control

This message provides signal control for a coordinated set of traffic signals along a specified arterial.

- Network-Identifier: unique alphanumeric identifier for traffic network containing specified arterial (TMDD-DE 3411).
- Device-Organization Operator Identifier: unique identifier of agency that operates the specified arterial controller device (TMDD-DE 3706).
- Controller-Identifier: unique identifier of controller assigned to specified arterial and specified for control (TMDD-DE-3462).
- Device-Device Identifier: unique alphanumeric identifier for specified controller device (TMDD-DE 3701).
- Artery-Name: street name of arterial specified for control (TMDD-DE-3402).
- Artery-Identifier: unique identifier of arterial specified for control (TMDD-DE-3401).
- Artery-Intersection Count: number of controlled signalized intersections along the arterial (TMDD-DE-3403).

Message Set Standard

Message Set Standard

4. *Message Descriptions (Cont'd)*

- Timing-Plan-Name: descriptive name of timing plan to go into effect on arterial (TMDD-DE-3487).
- Artery-Time Space Identifier: unique identifier of time space diagram to go into effect on arterial (TMDD-DE-3450).
- Timing-Plan-Cycle Length: modified time interval to go into effect to complete all signal commands for arterial intersections (NTCIP object, TMDD-DE 3649).
- Timing-Plan-Identifier: unique identifier of timing plan to go into effect on arterial (TMDD-DE-3486).
- TRSP-Plan Change Threshold: threshold to go into effect to determine when current timing plans for arterial should be changed to different plan (TMDD-DE-3494).
- TRSP-Plan Change Inhibit: minimum time interval between TRSP plan changes to go into effect on specified arterial (TMDD-DE-3493).
- TRSP-Plan-Identifier: unique identifier for traffic responsive plan to go into effect on specified arterial (TMDD-DE-3495).

4.6.2.3 Section-Control

This message provides a signal control for a coordinated set of traffic signals within a specified section of a street network. The traffic section uses a common timing plan:

- Network-Identifier: unique identifier of traffic network containing section specified for control action(TMDD-DE 3411).
- Device-Organization Operator Identifier: unique identifier of agency that operates the specified section controller device (TMDD-DE 3706).
- Controller-Identifier: unique identifier of controller assigned to specified section and specified for control (TMDD-DE-3462).
- Device-Device Identifier: unique alphanumeric identifier for specified controller device (TMDD-DE 3701).

Message Set Standard

4. *Message Descriptions (Cont'd)*

- Section-Identifier: unique identifier for section specified for control action (TMDD-DE-3421).
- Section-Signal Control Mode: mode of operation to go into effect for specified traffic section (TMDD-DE-3484).
- Section-Name: descriptive name of surface street network section specified for control action (TMDD-DE-3423).
- Timing-Plan-Cycle-Length: time interval currently to go into effect to complete all signal commands for intersections within section (NTCIP object, TMDD-DE 3649).
- Timing-Plan-Identifier: unique identifier of signal timing plan to go into effect for specified section (TMDD-DE-3486).
- Timing-Plan-Name: descriptive name of timing plan to go into effect for specified section (TMDD-DE-3487).
- TRSP-Plan Change Threshold: threshold to go into effect to determine when current timing plan for network section should be changed to different plan (TMDD-DE-3494).
- TRSP-Plan Change Inhibit: minimum time interval to go into effect between TRSP plan changes (TMDD-DE-3493).
- TRSP-Plan Identifier: unique identifier for traffic responsive plan to go into effect in specified section (TMDD-DE-3495).