NATIONAL TRANSPORTATION COMMUNICATIONS FOR ITS PROTOCOL

CASE STUDY REPORT

NTCIP 9005 v01.09

Texas Department of Transportation Statewide Center-to-Center Software and Systems Integration

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PREFACE

When early adopters began using the NTCIP in their deployment activities, there was limited guidance available. Since then, *The NTCIP Guide* (NTCIP 9001) has been developed to help users understand, specify, and deploy the family of standards. NTCIP 9001 version 03 was completed in 2002 and is available.

Early NTCIP deployments and the initial NTCIP case studies identified issues due to content ambiguities and shortfalls in the first version of several standards. Subsequent amendments addressed many of these issues.

Case study reports revealed that functional requirements within user specifications could be improved. As a result, a systems engineering approach to standards development has been adopted to help users better specify NTCIP-based systems. New versions of ITS standards will add sections on concepts of operation, functional requirements, traceability to the data dictionary, and dialogues and sequences.

Early adopters also revealed that testing was an issue in many of their deployments. An NTCIP working group on testing and conformity assessment was created in 2002 to further assess and define testing issues.

The case studies also revealed a general need for continued outreach, education and training. These needs are being addressed through a variety of ongoing Standards Development Organization activities.

These NTCIP case studies have proved valuable to the ITS community and have facilitated the continued improvement of the standards. As a result of lessons learned from the case studies, and improvements in the standards development process, future deployments are expected to face fewer challenges.

1. PURPOSE OF THE CASE STUDY

1-1 INTRODUCTION

Field deployment of NTCIP-conforming equipment has begun. State and local Departments of Transportation and their consultants are aware of the interoperability and interchangeability features promised by the NTCIP, and are including references to the NTCIP in their procurement documents. For all but a few, this is their first experience with the NTCIP.

The purpose of this project, sponsored by AASHTO, FHWA, ITE, and NEMA, is to:

a. Prepare a second series of case studies that describe the lessons learned by vendors, agencies, and consultants during another five of the early projects that required NTCIP compliance, and

b. Update the existing three Case Study projects.

The objective is to compile an unbiased investigation that incorporates the perspectives from different implementation positions.

Two Environmental Sensor Systems (ESS)[1] projects, one Center-to-Center Project using NTCIP 2304 (DATEX-ASN), and two traffic signal control projects were selected for Phase 2 of the study. The two Variable Message Sign (VMS) projects and the one signal control project investigated during Phase 1 are to be revisited to update the status of these projects. Additional projects may be investigated in FY 2003.

The material for these eight case studies (5 new ones and 3 updates) were drawn from interviews with individuals who were directly involved in the NTCIP implementation and from project-related documents such as specifications, test plans, and procurement documents. An attempt was made to interview at least three individuals that performed different roles in each project, such as agency champion, procurement specification writer, agency field technician, and vendor representative. The interviews, conducted by individuals familiar with the NTCIP, were structured around an updated survey prepared for these case study investigations. Whenever possible, relevant project documents for each project are included in that case study report.

This document focuses on the implementation of devices using the NTCIP. It does not attempt to explain the details of the NTCIP. Additional information on the NTCIP, including specific NTCIP standards, is available on the NTCIP Website (www.ntcip.org)[2].

2. THE CASE STUDY

In 1999, the State of Texas initiated a project to link disparate traffic management centers located across the state. The project was initiated based on a need by the various transportation agencies to exchange real-time data about the state of the transportation system and a desire by these agencies to be able to allow some degree of shared device control. In order to ensure the long-term viability of the integration project, there was a strong desire to base the implementation of these features on the new ITS standards.

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1 Environmental Sensor Stations are considered a device subgroup addressed within the NTCIP Standard NTCIP 1204. The term ESS is used to address road weather information systems. ESS are commonly referred to as Road Weather Information Systems (RWIS).

2 The White Paper "Understanding the NTCIP Class Profiles from an End User's Perspective," prepared by the NTCIP Profiles Working Group is an excellent example.

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However, the agency was also aware that the standards had yet to be proven in the field and that changes were likely to occur throughout the project timeframe.

Thus, the project was conducted in multiple phases in order to minimize risks and to provide an early proof-of-concept. The first phase was a pilot project to demonstrate that the systems in Dallas and Fort Worth could be linked to share information, such as traffic incident details. The next phase added command and control features to the basic information exchange functionality. Phase 3 then extended the system to link with the San Antonio TransGuide system.

The project was funded through a federal earmark to be an early deployment of the standards so that the industry would be able to gain a better understanding of the issues involved with deploying the new center-to-center standards.

The project schedule is summarized below. Phase four was just being investigated when the interviews were conducted.

Phase 1: Demonstrate data sharing (e.g., incidents, lane closures, link speeds) between the Dallas and Fort Worth Advanced Traffic Management Systems.

Phase 2: Demonstrate command and control (e.g., Dynamic Message Signs, Lane Control Signals, Closed Circuit TV, video switching) between the Dallas and Fort Worth systems.

Phase 3: Extend the network to include the San Antonio TransGuide system.

Phase 4: Add additional functionality (e.g., transit, parking, environmental sensors, traffic signals, High Occupancy Vehicles, etc.)

Southwest Research Institute was the System Integrator for the Texas Department of Transportation (Agency) on the project. They were responsible for modifying the existing systems in Dallas, Fort Worth, and San Antonio to support the link into the statewide network.

The objectives of the Agency in implementing this project were:

- To share information between traffic management centers in the State of Texas.
- To allow for limited remote command and control of devices between traffic management centers.
- To demonstrate a sample deployment of ITS standards for linking traffic management centers.
- To identify problems within the standards so that they may be resolved.
- To identify challenges in deploying the standards in order to benefit future projects.

The System Integrator's goal was to satisfy the client's expectations.

Table 1: Project Timeline

MILESTONE	*Standards Status*	*Date*
Project Started	DATEX-ASN – Committee Draft for User Comment; TMDD – Approved; MS/ETMCC – User Comment	9/1999
Phase 1 Completed (Information Exchange)	DATEX-ASN – Under ballot to become a Draft International Standard TMDD – Approved	9/2000

MILESTONE	*Standards Status*	*Date*
	MS/ETMCC – Approved	
Phase 2 Completed (Control)	DATEX-ASN – Draft Int'l Standard TMDD – Approved MS/ETMCC – Approved significant revisions being considered	1/2001
Phase 3 Completed (San Antonio)	DATEX-ASN – Draft Int'l Standard TMDD – Approved with efforts to add MS/ETMCC – Approved with efforts to significantly modify based on lessons learned	1/2002

3. PROJECT PROCUREMENT

In the fall of 1997, the Agency competitively bid the Statewide Integrator Program. The bidding process considered both price and team qualifications and resulted in an award to the System Integrator in January 1998. The contract provided a flexible mechanism to receive consulting support for a variety of tasks. In early 1999, the Agency identified the need to integrate different centers around the state; this resulted in the phase 1 pilot project. Once this project was successfully completed, Phases 2 & 3 were funded in sequence by task order under the original contract.

3-1 PRE-QUALIFICATION

No explicit pre-qualification was required for the project; however, after proposals were received, five of the eight submitting were determined to be well qualified and were invited to oral presentations.

3-2 SELECTION & AWARD

The Agency made the selection based on qualifications and price. The Agency reviewed these criteria by developing a matrix of qualifications, references, specific names of large projects with transportation experience, especially DMS, CCTV, etc., and performing a review.

4. SPECIFICATIONS

The Agency pursued funding to deploy the NTCIP and other ITS standards in a pilot project. However, once the project was funded, there were still many details about the scope of the project that were left to be resolved.

The first task of the project involved the Systems Integrator working with the Agency and a dozen other involved agencies to determine how the users wanted to use the system. This information was documented in a Concept of Operations Document. The Systems Integrator then used this document, along with the relevant ITS standards, to develop a requirements document. The requirements were reviewed by the participating agencies. This process was facilitated by the fact that roughly 75 percent of the agency participants had previously taken the National Architecture training and that the Systems Integrator was well experienced in using a well-defined Systems Engineering Process.

Of course, one of the challenges faced while implementing any large-scale project is that the requirements of the project tend to evolve over time. Participants will typically identify additional features throughout the project life-cycle. In order to manage the challenges such changes created, all key project documentation was managed through a configuration control process with any proposed changes having to be explicitly budgeted and approved prior to becoming a formal part of the project.

4-1 PROJECT-RELATED NTCIP STANDARDS STATUS

The NTCIP standards relevant to this project are shown in the table below.

Table 2: Standards Related to the Texas "Statewide Software and Systems Integration" Implementation

Standard	*Description*
ISO 14827	Data Exchange Standard in ASN.1 (DATEX-ASN). Defines how the messages are exchanged between the various centers in the deployment.
ITE TM 1	Traffic Management Data Dictionary (TMDD). Defines the meaning of each piece of data exchanged between the centers.
ITE TM 2	Message Set for External Traffic Management Center Communications (MS/ETMCC). Defines the structures of data that are exchanged between the centers. Each piece of each structure is defined in the TMDD. The rules for exchanging the structures in the deployment followed DATEX-ASN.

During the project, the Systems Integrator was an active participant in the Traffic Management Data Dictionary Steering Committee as well as the NTCIP Center-to-Center Working Group and kept abreast of the various issues related to deployment of the standard. Nonetheless, the draft standards changed significantly during the lifetime of the project. Each change had to be considered by a Change Control Board in order to determine its impact on the project and whether or not the change should be incorporated into the project.

5. NTCIP FUNCTIONS AND FEATURES

This section discusses the functions and features implemented.

5-1 FUNCTIONALITY

This project was designed to share information about traffic incidents among traffic operations centers and to additionally provide for the command and control of targeted devices, such as cameras, message signs, and lane control signals.

Most of the data used to implement this functionality was covered by the standardized data elements contained in either the TMDD or NTCIP data dictionaries, but the project had to define a few additional pieces of data in order to meet the full needs of the clients. The project attempted to use the messages as defined in the MS/ETMCC standard; however, significant modifications were required in order to ensure that these messages met the client's requirements while not imposing undue requirements at considerable additional cost to the project. Most of these changes related only to the message structure and not to the data elements themselves.

In order to improve the standards, the project has provided extensive feedback to the standards efforts and these comments are now being used to develop the second version of the TMDD and MS/ETMCC standards.

5-2 INTERCHANGEABILITY & INTEROPERABILITY

Due to the fact that extensive modifications and interpretations had to be made in regards to the MS/ETMCC standard and that a draft version of DATEX-ASN was used on the project, the deployment is not interoperable with the other management systems that have been deployed using the DATEX-ASN and MS/ETMCC standards. The software design used in this project, however, allows the System Integrator's code to be relatively easily integrated into any of the traffic operations systems deployed throughout the state. Further, this project was originally viewed as a prototype effort designed to promote the standards and identify limitations.

From this perspective, the project is considered to be a success. The resulting software (1) has demonstrated the benefits of migrating towards standards through the benefits of better documentation, (2) has identified issues with the current versions of the standards and has provided feedback to those efforts in order to advance the state of the art, and (3) will facilitate future integration efforts throughout the state.

5-3 THE LEARNING CURVE

The System Integrator was an active participant on the TMDD Steering Committee throughout the project and was therefore largely familiar with the contents of the standards; however actually reducing the messages to practice proved problematic and numerous detailed edits had to be made in order to fulfill project requirements. This was due to the fact that the MS/ETMCC did not provide a mature set of messages.

The Agency was less familiar with the standards, but was aware enough of the potential benefits to support their adoption. It did not initially have the internal software staff involved on the project and will likely involve these people earlier in the process on future projects.

Definitions

Interchangeability: the capability to exchange devices of the same device type (e.g., a signal controller from different vendors) without changes to the software beyond updating the appropriate parameters and variables. Some non-standard functions and features might not be available.

Interoperability: the capability to operate devices from different manufacturers, or different device types (e.g., signal controllers and DMS) on the same communications wire/channel.

6. TESTING COMPLIANCE

Due to the nature of the contract, no specific test plan was required under the main contract. However, as the tasks to develop the software began, the various task assignments included the development of test plans by the System Integrator. These plans were approved by the Agency and then implemented to ensure that the delivered product complied.

The test plans focused on end-user functionality and required roughly five days to perform. While the functionality was being demonstrated, the System Integrator used specialized software to capture the byte streams for later manual inspection in order to ensure that the resulting data exchanges conformed to the standards.

6-1 TESTING TOOLS

No specific tools were available to assist in testing of the center-to-center standards when the testing took place. The availability of tools would have assisted the project considerably.

7. USING THE STANDARDS

The Agency and System Integrator representatives were asked to briefly describe their experience.

7-1 FROM THE AGENCY'S PERSPECTIVE

The Agency felt that the project proved to be successful, although it required more time and money than originally expected. It believes the project has facilitated reaching interoperability, but also believes the standards still need improvements before interoperability can be achieved without some level of customization for each system.

The agency will likely review the previous decision to use the DATEX-ASN standard. While the standard proved to provide the necessary services without any problems, the marketplace no longer offers a commercially available tool to assist in the deployment of DATEX-ASN systems. As a result, there is now interest in considering XML or CORBA in order to be more consistent with the broader information technology industry.

The Agency believes it is much more knowledgeable about the standards than it was at the start of the project, but feels like there is more to learn. Nevertheless, it understands that the project was successful due to the knowledgeable Systems Integrator.

The Agency stressed the importance of talking to people who have gone through the effort before and making sure that the requirements for the system are well defined. It also made clear that it was important to discuss the project with the other related agencies to ensure that their systems will be available within the timeframe of the project.

7-2 FROM THE SYSTEM INTEGRATOR'S PERSPECTIVE

The System Integrator indicated that the biggest challenge that it faced was attempting to deploy a set of standards that were continuously evolving. It believes that deploying the standards was worth the challenges faced by the team, but expressed concern that the lack of growing support of the DATEX-ASN standard suggests that it may be best to base future projects on an alternative protocol.

The System Integrator strongly suggested that any agency considering implementing the TMDD and/or MS/ETMCC standards should first clearly identify the concept of operations of the system prior to development. The current version of the MS/ETMCC standard does not provide this and clearly defining the concept of operations will more clearly define (1) which portions of the standards must be implemented and (2) whether the standards need to be enhanced to fully meet user expectations.

8. LESSONS LEARNED

8-1 FOR AGENCIES

During the interviews, the following recommendations were made for an Agency preparing for an implementation:

- Gain a thorough understanding of the standards.
- Talk to others who have already gone through the experience.
- Ensure that other participating agencies are equally committed to the project.

- Ensure that the project team is qualified.
- Realize that complications may occur during the project.
- Have realistic objectives and goals.
- Be aware that there are limitations to the standards and that interoperability may not be fully achieved.

8-2 RECOMMENDATIONS FOR IMPROVEMENTS TO THE STANDARDS

- **The standards need to be maintained.** This project revealed several limitations in the current standards and that improvements need to be incorporated into the standards if the goal of interoperability is to be achieved. The standards should include a concept of operations, a standard reference model, and test plans. Further, as the information technology industry advances, the Agency needs to constantly re-evaluate its current selection of protocols; it may be appropriate to consider an XML standard since the ITS industry has not more actively embraced the DATEX-ASN standard.
- **There is a need to develop a test plan in order to ensure that implementations are conformant.** Once the standards are in a stable form, there will be a need to ensure that deployments conform to the standard.
- **Provide tools to assist in conformance testing.** Providing tools that ensured conformance would allow for more thorough testing of deployments and would prevent the agencies from having to rely so heavily on their systems integrator to perform the final testing.

ANNEX A: SYSTEM CAPABILITIES

A.1 Systems in the Network

Center Number	*Manufacturers of Central Systems*	*Communications types and capacity*	*Major Capabilities of EACH Center (monitoring of field devices status, control of field devices, ATIS function, Intermodal Management Center, Emergency Management Center, etc.)*
1. TransVISION	Lockheed Martin	TxDOT internal interface over Ethernet over ATM	Command Control and monitoring of devices (CCTV, DMS, video switching, etc.) and incident management and archiving
2. DalTrans	Texas Transportation Institute	TxDOT internal interface over Ethernet over ATM	Command Control and monitoring of devices (CCTV, DMS, video switching, etc.) and incident management and archiving
3 TransGuide	Southwest Research Institute	TxDOT internal interface over Ethernet over ATM	Command Control and monitoring of devices (CCTV, DMS, video switching, etc.) and incident management and archiving
4. Incident GUI	Southwest Research Institute	TxDOT internal interface over Ethernet over ATM	Incident Management and archving
5. Remote Control GUI	Southwest Research Institute	TxDOT internal interface over Ethernet over ATM	Command Control and monitoring of devices (CCTV, DMS, video switching, etc.) and incident management and archiving
6 TxDOT internal interface	Southwest Research Institute	DATEX-ASN over Ethernet and ATM	Internal Interface - DATEX-ASN translator

A.2 Standards Implemented

Standard	*Implemented?*
ISO 14827 DATEX-ASN (v0.09)	Yes
NTCIP 2305 AP-DATEX	No, did not implement OER encoding
ITE 0.1 (Traffic Management Data Dictionary)	Yes

Standard	*Implemented?*
ITE 0.2 (External Message Set)	Yes

A.3 TMDD Data Supported

The following table identifies those data elements included in one or more messages supported by the TxDOT system. For specific information as to what data is supported in which TxDOT message, see Annex C.

Data Element	*Data Concept Identifier*
LINK_DataType_code	253
EVENT_UpdateTime_UTC	478
LINK_BeginNodeIdentifier_identifier	3000
LINK_BeginNodeLatitude_location	3001
LINK_BeginNodeLongitude_location	3002
LINK_Capacity_rate	3003
LINK_DataStored_code	3004
LINK_Delay_quantity	3005
LINK_Density_rate	3006
LINK_Direction_code	3008
LINK_EndNodeIdentifier_identifier	3009
LINK_EndNodeLatitude_location	3010
LINK_EndNodeLongitude_location	3011
LINK_Identifier_identifier	3012
LINK_Jurisdiction_text	3013
LINK_LaneCount_quantity	3014
LINK_Length_quantity	3016
LINK_LevelOfService_code	3017
LINK_MedianType_code	3018
LINK_Name_text	3019
LINK_Occupancy_percent	3020
LINK_Ownership_text	3021
LINK_PavementType_code	3022
LINK_RestrictionAxleCount_quantity	3024
LINK_RestrictionHeight_quantity	3026

Data Element	*Data Concept Identifier*
LINK_RestrictionLength_quantity	3027
LINK_RestrictionWeight_quantity	3028
LINK_RestrictionWidth_quantity	3029
LINK_RoadDesignator_number	3030
LINK_ShoulderWidthLeft_quantity	3031
LINK_ShoulderWidthRight_quantity	3032
LINK_Speed_rate	3033
LINK_SpeedLimit_	3034
LINK_SpeedLimitTruck_rate	3035
LINK_TravelTime_quantity	3038
LINK_Type_code	3039
LINK_Volume_quantity	3040
NODE_Identifier_identifier	3042
NODE_Jurisdiction_text	3043
NODE_Latitude_location	3044
NODE_LinksNumber_quantity	3045
NODE_Longitude_location	3046
NODE_Name_text	3047
NODE_Ownership_text	3048
NODE_Status_code	3049
NODE_Type_code	3051
ORGANIZATION.CONTACT_PhoneLandline_text	3207
EVENT_Description_text	3209
EVENT_DescriptionNotesAndComments_text	3210
EVENT_DescriptionTypeEvent_code	3211
EVENT_DescriptionTypeIncident_code	3212
EVENT_DescriptionTypePlannedRoadwayClosure_code	3213
EVENT_Identifier_identifier	3215

Data Element	*Data Concept Identifier*
EVENT_LanesShouldersBlocked_code	3218
EVENT_LanesBlockedOrClosed_code	3219
EVENT_LocationCrossStreetBegin_text	3229
EVENT_LocationCrossStreetEnd_text	3232
EVENT_LocationRoadway_identifier	3259
EVENT_LocationRoadwayName_text	3260
EVENT_LocationRoadwaySide_code	3261
EVENT_LocationType_code	3265
EVENT_ResponsePlanAlternateRoute_text	3268
EVENT_ResponsePlan_identifier	3269
EVENT_ResponsePlanType_code	3270
EVENT_OrganizationResponseStatus_code	3272
EVENT_TimelineEnd_utc	3278
EVENT_TimelineEstimatedDuration_quantity	3279
EVENT_TimelineScheduleDates	3281
EVENT_TimelineScheduleDaysOfTheWeek_code	3282
EVENT_TimelineScheduleEnd_date	3283
EVENT_TimelineScheduleEnd_utc	3284
EVENT_TimelineScheduleStart_date	3286
EVENT_TimelineScheduleStart_utc	3287
EVENT_TimelineScheduleType_code	3289
EVENT_TimelineStart_utc	3291
EVENT_Update_date	3292
EVENT_Update_utc	3294
EVENT_UpdateAuthorLastRevised_text	3295
EVENT_UpdateType	3296
EVENT_IncidentConditionPavement_code	3298
EVENT_IncidentConditionWeather_code	3299

Data Element	*Data Concept Identifier*
EVENT_HumanFatalitiesCount_quantity	3303
EVENT_HumanInjuriesCount_quantity	3304
EVENT_IncidentPropertyDamage_code	3305
EVENT_IncidentSeverity_code	3312
EVENT_IncidentStatus_code	3313
EVENT_TimelineClearedAndRecovering_utc	3315
EVENT_TimelineConfirmedAndResponding_utc	3317
EVENT_IncidentVehiclesInvolvedCount_quantity	3318
EVENT_IncidentVehiclesInvolved_code	3319
EVENT_OrganizationReported_identifier	3335
EVENT_OrganizationRequired_identifier	3336
EVENT_OrganizationResponding_identifier	3337
ORGANIZATION.CONTACT_Organization_identifier	3343
ORGANIZATION.CONTACT_OrganizationName_text	3344
ORGANIZATION.CONTACT_PersonPhoneNumber_text	3347
EVENT_ResponsePlanAuthor_text	3365
NETWORK_Identifier_identifier	3411
NETWORK_Name_text	3412
DEVICE_Device_identifier	3701
DEVICE_LocationLatitude_number	3704
DEVICE_LocationLongitude_number	3705
DEVICE_Link_identifier	3748
DEVICE_Node_identifier	3750
CCTV_ChannelIdentifier	TxDOT Specific
CCTV_ChannelName	TxDOT Specific
CCTV_Lock_mode	TxDOT Specific
CCTV_LockHolderIdentifier	TxDOT Specific
CCTV_ControlDirectionRequestStatus	TxDOT Specific

Data Element	*Data Concept Identifier*
CCTV_ControlLockRequestStatus	TxDOT Specific
CCTV_ControlPositionRequestStatus	TxDOT Specific
CCTV_ControlPresetRequestStatus	TxDOT Specific
CCTV_ControlSwitchRequestStatus	TxDOT Specific
CCTV_Count	TxDOT Specific
CCTV_CurrentCameraDirection	TxDOT Specific
CCTV_CurrentPresetPosition	TxDOT Specific
CCTV_InputChannelCount	TxDOT Specific
CCTV_OutputChannelCount	TxDOT Specific
CCTV_PositionReference	TxDOT Specific
CONNECTION_RequestStatus	TxDOT Specific
DEVICE_DataType	TxDOT Specific
DEVICE_Name	TxDOT Specific
DMS_BeaconControl	TxDOT Specific
DMS_BeaconStatus	TxDOT Specific
DMS_ControlRequestStatus	TxDOT Specific
DMS_Count	TxDOT Specific
DMS_GeometryColumnCount	TxDOT Specific
DMS_GeometryRowCount	TxDOT Specific
DMS_MessageMultiString	TxDOT Specific
DMS_Status	TxDOT Specific
DMS_UpdateType	TxDOT Specific
EVENT_DescriptionTypeEventOther	TxDOT Specific
EVENT_DescriptionTypeIncidentOther	TxDOT Specific
EVENT_DescriptionTypePlannedRoadwayClosureOther	TxDOT Specific
EVENT_DescriptionTypeSpecialEvent	TxDOT Specific
EVENT_DescriptionTypeSpecialEventOther	TxDOT Specific
EVENT_IncidentConditionPavementOther	TxDOT Specific

Data Element	*Data Concept Identifier*
EVENT_IncidentConditionWeatherOther	TxDOT Specific
EVENT_IncidentDetectionMethod_code	TxDOT Specific
EVENT_IncidentDetectionMethodOther	TxDOT Specific
EVENT_IncidentPropertyDamageOther	TxDOT Specific
EVENT_IncidentSeverityOther	TxDOT Specific
EVENT_IncidentStatusOther	TxDOT Specific
EVENT_IncidentVehclesInvolvedOther	TxDOT Specific
EVENT_LanesShouldersBlockedOther	TxDOT Specific
EVENT_Location	TxDOT Specific
EVENT_LocationCrossStreetName_text	TxDOT Specific
EVENT_OrganizationResponseStatusOther	TxDOT Specific
EVENT_ResponsePlanTypeOther	TxDOT Specific
EVENT_TimelineScheduleTypeOther	TxDOT Specific
EVENT_UpdateTypeOther	TxDOT Specific
HOST_AccessIdentifier	TxDOT Specific
HOST_AccessPassword	TxDOT Specific
LCS_ControlRequestStatus	TxDOT Specific
LCS_Count	TxDOT Specific
LCS_CurrentDisplaySettings	TxDOT Specific
LCS_GeometryHeadCount	TxDOT Specific
LCS_HeadCapabilities	TxDOT Specific
LCS_Status	TxDOT Specific
LCS_UpdateType	TxDOT Specific
LINK_DataStoredOther_	TxDOT Specific
LINK_DataTypeOther	TxDOT Specific
LINK_IdentifierList	TxDOT Specific
LINK_MedianTypeOther	TxDOT Specific
LINK_PavementTypeOther	TxDOT Specific

Data Element	*Data Concept Identifier*
LINK_TypeOther	TxDOT Specific
LINK_UpdateType	TxDOT Specific
LINK_VehicleClassification	TxDOT Specific
NETWORK_IdNumber	TxDOT Specific
NETWORK_LinkCount	TxDOT Specific
NETWORK_NodeCount	TxDOT Specific
NETWORK_UpdateType	TxDOT Specific
USER_Identifier	TxDOT Specific
NODE_IdentifierList	TxDOT Specific
NODE_StatusOther	TxDOT Specific
NODE_TypeOther	TxDOT Specific
Password	TxDOT Specific
VIDEO.CHANNEL_InputIdentifier	TxDOT Specific
VIDEO.CHANNEL_OutputIdentifier	TxDOT Specific

A.4 Messages Supported

Message from Message Set for External Traffic Management Center Communications (MS/ETMCC) Standard	*Support*
Network-identity	Support of modified structure
Network-update	No
Link-identity	No
Link-description	Support of modified structure
Link-update	No
Node-description	Yes
Node-update	No
Incident-identity	Support of modified structure within a larger message
Incident-location	Support of modified structure within a larger message

Message from Message Set for External Traffic Management Center Communications (MS/ETMCC) Standard	*Support*
Incident-description	Support of modified structure within a larger message
Incident-timeline	Support of modified structure within a larger message
Incident-response	Support of modified structure within a larger message
N/A	The above structures are rolled together into an Incident structure, a series of these structures are then combined together in order to form either a CurrentNetworkIncidents message or a IncidentUpdates message
Event-identity	Support of modified structure within a larger message
Event-location	Support of modified structure within a larger message
Event-description	Support of modified structure within a larger message
Event-daily-timeline	Support of modified structure within a larger message
Event-schedule	Support of modified structure within a larger message
N/A	The above structures are rolled together into an Event structure, a series of these structures are then combined together in order to form either a CurrentNetworkEvents message or a EventUpdates message
Response-organization	No
Link-set	No
Current-link-conditions	No
Link-description	Support of modified structure
Current-link-state	Support of modified structure within a larger message
Node-set	No
Current-node-conditions	Yes
Field-device-status-request	Support of modified structure
Device-control-request	No
Device-control-response	No
N/A	The TxDOT device control logic uses a number of customized messages, including: ConnectionRequest,

Message from Message Set for External Traffic Management Center Communications (MS/ETMCC) Standard	*Support*
	ConnectionRequestResponse, CCTV-video-channel-data, Network-device-status-request, Network-device-status-response, DMS-device-status, DMSStatusList, DMS-command-request, DMS-command-response, CCTV-lock-command-request, CCTV-lock-command-response, CCTV-direction-command-request, CCTV-direction-command-response, CCTV-preset-command-request, CCTV-preset-command-response, CCTV-position-command-request, CCTV-position-command-response, CCTV-switch-command-request, CCTV-switch-command-response, LCS-command-request, LCS-command-response, LCS-device-status, LCSStatusList
DMS-device-status	Support of modified structure
DMS-device-control	No
CCTV-device-status	No
CCTV-device-control	No
HAR-device-status	No
HAR-schedule-entry	No
HAR-program-entry	No

ANNEX B: THE NTCIP STANDARDS PROCESS

During the standards development process, all NTCIP standards progress through a series of stages. These stages are described below:

- **Proposal** – someone submits an idea.
- **Working Draft** – The idea is reviewed in committee and goes through an iterative editing process.
- **User Comment** – When the Working Group reaches a reasonable level of consensus on the draft, it is submitted to the Joint Committee and upon their approval, it is distributed for user comments.
- **Recommended** – The Working Group has reached consensus on the document and the Joint Committee elevated the standard to this level by a 2/3rds vote. Typically, the Joint Committee also decides to send to ballot at this point.
- **Approved** – All three Standard Development Organizations balloted the standard, received enough affirmative votes, and have approved the document through their legal department, the standard reaches this level.
- **Published** – After a standard is approved, it then goes to the editorial group who is responsible for proper formatting and copyright statements. Once it is available in published form, the file is removed from the Web Site and the SDOs start charging a fee for it.

ANNEX C: TMDD – TXDOT MESSAGE SET COMPARISON

EXISTING TMDD MESSAGES	TxDOT IMPLEMENTATION OF TMDD MESSAGES

Network-identity ::= SEQUENCE
{
network-identifier IA5String (SIZE(1..32)),
network-name IA5String (SIZE(1..128)) OPTIONAL,
network-section-count INTEGER (1..255) OPTIONAL,
organization-contact-organization-name IA5String (SIZE(1..128)) OPTIONAL,
link-identifier-list SEQUENCE OF Link-identifier-list-by-section,
node-identifier-list SEQUENCE OF Node-identifier-list-by-section
}
	Network-identity ::= SEQUENCE
	{
	network-identifier [0] NetworkIdentifier,
	network-name [1] NetworkName OPTIONAL,
	organization-contact-organization-name [2] OrganizationContactOrganizationName OPTIONAL,
	network-link-count [3] NetworkLinkCount,
	link-identifier-list [4] SEQUENCE OF Link-description,
	network-node-count [5] NetworkNodeCount,
	node-identifier-list [6] SEQUENCE OF Node-description,
	network-update-type [7] ObjectUpdateType
	}

Network-update ::= SEQUENCE
{
network-identifier IA5String (SIZE(1..32)),
network-name IA5String (SIZE(1..128)) OPTIONAL,
section-identifier IA5String (SIZE(1..32)) OPTIONAL,
link-identifier-list SEQUENCE OF IA5String (SIZE(1..32)),
node-identifier-list SEQUENCE OF IA5String (SIZE(1..32))
}	

EXISTING TMDD MESSAGES	TxDOT IMPLEMENTATION OF TMDD MESSAGES

```
Link-identity ::= SEQUENCE
{
 link-identifier        IA5String      (SIZE(1..32)),
 link-name              IA5String      (SIZE(1..128)) OPTIONAL,
 link-jurisdiction      IA5String      (SIZE(1..128)) OPTIONAL,
 link-ownership         IA5String      (SIZE(1..256)) OPTIONAL,
 link-road-designator   IA5String      (SIZE(1..64)) OPTIONAL,
 link-data-stored       BIT STRING
   {
      link-data-stored-current-link-volume           (2),
      link-data-stored-current-occupancy             (3),
      link-data-stored-current-average-speed         (4),
      link-data-stored-current-delay-time            (5),
      link-data-stored-current-travel-time           (6),
      link-data-stored-roadway-status                (7),
      link-data-stored-daily-peak-volume-and-hour    (8),
      link-data-stored-other-no-additional-information-required (0),
      link-data-stored-other-additional-information-required    (1)
   } OPTIONAL,
 link-data-stored-other   IA5String  (SIZE(1..256)) OPTIONAL,
 link-type                    BIT STRING
            {
            link-type-freeway        (2),
            link-type-arterial       (3),
            link-type-collector      (4),
```

EXISTING TMDD MESSAGES	TxDOT IMPLEMENTATION OF TMDD MESSAGES

link-type-local (5),
link-type-service-road (6),
link-type-tunnel (7),
link-type-detour (8),
link-type-dedicated-road (9),
link-type-military-road (10),
link-type-railroad-link (11),
link-type-air-link (12),
link-type-ferry (13),
link-type-other-no-additional-information-required (0),
link-type-other-additional-information-required (1)
} OPTIONAL,
link-type-other IA5String (SIZE(1..256)) OPTIONAL
}
 	
Link-description ::= SEQUENCE
{
link-identifier IA5String (SIZE(1..32)),
link-begin-node-latitude INTEGER (-90000000..90000000),
link-begin-node-longitude INTEGER (-180000000..180000000),
link-begin-node-identifier IA5String (SIZE(1..32)),
link-end-node-identifier IA5String (SIZE(1..32)),
link-end-node-latitude INTEGER (-90000000..90000000),
link-end-node-longitude INTEGER (-180000000..180000000),
link-direction ENUMERATED
{
link-direction-north (1),
	Link-description ::= SEQUENCE
	{
	link-identifier [0] LinkIdentifier,
	link-name [1] LinkName OPTIONAL,
	link-jurisdiction [2] LinkJurisdiction OPTIONAL,
	link-ownership [3] LinkOwnership OPTIONAL,
	link-road-designator [4] LinkRoadDesignator OPTIONAL,
	link-data-stored [5] LinkDataStored OPTIONAL,
	link-data-stored-other [6] OtherText256 OPTIONAL,
	link-type [7] LinkType OPTIONAL,

EXISTING TMDD MESSAGES	TxDOT IMPLEMENTATION OF TMDD MESSAGES
link-direction-northeast (2), link-direction-east (3), link-direction-southeast (4), link-direction-south (5), link-direction-southwest (6), link-direction-west (7), link-direction-northwest (8), link-direction-not-directional (9), link-direction-positive-direction (10), link-direction-negative-direction (11), link-direction-both-direction (12), link-direction-any-other (0) }, link-length INTEGER (0..160000), link-capacity INTEGER (0..300000), link-speed-limit INTEGER (0..255), link-speed-limit-truck INTEGER (0..255) OPTIONAL, link-lane-count INTEGER (0..50), link-shoulder-width-right INTEGER (0..999) OPTIONAL, link-shoulder-width-left INTEGER (0..999) OPTIONAL, link-median-type ENUMERATED { link-median-type-curbed (2), link-median-type-concrete-barrier (3), link-median-type-concrete-barrier-with-visibility-screen (4), link-median-type-guardrail (5), link-median-type-open-grass (6), link-median-type-open-sand (7), link-median-type-painted-median-no-access (8),	link-type-other [8] OtherText256 OPTIONAL, link-begin-node-identifier [9] LinkBeginNodeIdentifier, link-begin-node-latitude [10] LinkBeginNodeLatitude OPTIONAL, link-begin-node-longitude [11] LinkBeginNodeLongitude OPTIONAL, link-end-node-identifier [12] LinkEndNodeIdentifier, link-end-node-latitude [13] LinkEndNodeLatitude OPTIONAL, link-end-node-longitude [14] LinkEndNodeLongitude OPTIONAL, link-direction [15] LinkDirection OPTIONAL, link-length [16] LinkLength OPTIONAL, link-capacity [17] LinkCapacity OPTIONAL, link-speed-limit [18] LinkSpeedLimit OPTIONAL, link-speed-limit-truck [19] LinkSpeedLimitTruck OPTIONAL, link-lane-count [20] LinkLaneCount OPTIONAL, link-shoulder-width-right [21] LinkShoulderWidthRight OPTIONAL, link-shoulder-width-left [22] LinkShoulderWidthLeft OPTIONAL, link-median-type [23] LinkMedianType OPTIONAL, link-median-type-other [24] OtherText256 OPTIONAL, link-pavement-type [25] LinkPavementType OPTIONAL, link-pavement-type-other [26] OtherText256 OPTIONAL, link-restriction-axle-count [27] LinkRestrictionAxleCount OPTIONAL, link-restriction-height [28] LinkRestrictionHeight OPTIONAL, link-restriction-length [29] LinkRestrictionLength OPTIONAL, link-restriction-weight [30] LinkRestrictionWeight OPTIONAL, link-restriction-width [31] LinkRestrictionWidth OPTIONAL }

EXISTING TMDD MESSAGES	TxDOT IMPLEMENTATION OF TMDD MESSAGES

link-median-type-separate-roadways (9),
link-median-type-unprotected (10),
link-median-type-other-no-additional-information-required (0),
link-median-type-other-additional-information-required (1)
} OPTIONAL,
link-median-type-other IA5String (SIZE(1..256)) OPTIONAL,
link-pavement-type ENUMERATED
{
link-pavement-type-asphalt (2),
link-pavement-type-open-graded-asphalt (3),
link-pavement-type-concrete (4),
link-pavement-type-grooved-concrete (5),
link-pavement-type-steel-bridge (6),
link-pavement-type-concrete-bridge (7),
link-pavement-type-asphalt-overlay-bridge (8),
link-pavement-type-timber-bridge (9),
link-pavement-type-gravel (10),
link-pavement-type-dirt (11),
link-pavement-type-other-no-additional-information-required(0),
link-pavement-type-other-additional-information-required (1)
} OPTIONAL,
link-pavement-type-other IA5String (SIZE(1..256)) OPTIONAL,
link-restriction-axle-count INTEGER (0..20) OPTIONAL,
link-restriction-height INTEGER (0..2000) OPTIONAL,
link-restriction-length INTEGER (0..6000) OPTIONAL,
link-restriction-weight INTEGER (0..80000) OPTIONAL,
link-restriction-width INTEGER (0..2000) OPTIONAL,
link-restriction-weight-axle INTEGER (0..20000) OPTIONAL
}	

EXISTING TMDD MESSAGES	TxDOT IMPLEMENTATION OF TMDD MESSAGES

```
Link-update ::= SEQUENCE
{
 network-identifier        IA5String       (SIZE(1..32)),
 link-identifier           IA5String       (SIZE(1..32)),
 link-begin-node-latitude  INTEGER(-90000000..90000000)OPTIONAL,
 link-begin-node-longitude INTEGER(-180000000..180000000)OPTIONAL,
 link-begin-node-identifier IA5String     (SIZE(1..32)) OPTIONAL,
 link-end-node-identifier  IA5String       (SIZE(1..32)) OPTIONAL,
 link-end-node-latitude    INTEGER(-90000000..90000000)  OPTIONAL,
 link-end-node-longitude INTEGER (-180000000..180000000) OPTIONAL,
 link-direction               ENUMERATED
            {
            link-direction-north        (1),
            link-direction-northeast    (2),
            link-direction-east         (3),
            link-direction-southeast    (4),
            link-direction-south        (5),
            link-direction-southwest    (6),
            link-direction-west         (7),
            link-direction-northwest    (8),
            link-direction-not-directional (9),
            link-direction-positive-direction (10),
            link-direction-negative-direction (11),
```

EXISTING TMDD MESSAGES	TxDOT IMPLEMENTATION OF TMDD MESSAGES

```
          link-direction-both-direction (12),
          link-direction-any-other    (0)
          } OPTIONAL,
link-length                  INTEGER     (0..160000) OPTIONAL,
link-capacity                INTEGER     (0..300000) OPTIONAL,
link-speed-limit             INTEGER     (0..255) OPTIONAL,
link-speed-limit-truck       INTEGER     (0..255) OPTIONAL,
link-lane-count              INTEGER     (0..50) OPTIONAL,
link-shoulder-width-right    INTEGER     (0..999) OPTIONAL,
link-shoulder-width-left     INTEGER     (0..999) OPTIONAL,
link-median-type             ENUMERATED
  {
   link-median-type-curbed                                  (2),
   link-median-type-concrete-barrier                        (3),
   link-median-type-concrete-barrier-with-visibility-screen (4),
   link-median-type-guard-rail                              (5),
   link-median-type-open-grass                              (6),
   link-median-type-open-sand                               (7),
   link-median-type-painted-median-no-access                (8),
   link-median-type-separate-roadways                       (9),
   link-median-type-unprotected                             (10),
   link-median-type-other-no-additional-information-needed (0),
   link-median-type-other-additional-information-needed    (1)
} OPTIONAL,
link-median-type-other       IA5String (SIZE(1..256)) OPTIONAL,
link-pavement-type             ENUMERATED
{
 link-pavement-type-asphalt                (2),
 link-pavement-type-open-graded-asphalt    (3),
```

EXISTING TMDD MESSAGES	TxDOT IMPLEMENTATION OF TMDD MESSAGES

```
   link-pavement-type-concrete                (4),
   link-pavement-type-grooved-concrete        (5),
   link-pavement-type-steel-bridge            (6),
   link-pavement-type-concrete-bridge         (7),
   link-pavement-type-asphalt-overlay-bridge  (8),
   link-pavement-type-timber-bridge           (9),
   link-pavement-type-gravel                 (10),
   link-pavement-type-dirt                   (11),
   link-pavement-type-other-no-additional-information-required  (0),
   link-pavement-type-other-additional-information-required  (1)
  } OPTIONAL,
  link-pavement-type-other      IA5String (SIZE(1..256)) OPTIONAL,
  link-restriction-axle-count     INTEGER     (0..20) OPTIONAL,
  link-restriction-height         INTEGER     (0..2000) OPTIONAL,
  link-restriction-length         INTEGER     (0..6000) OPTIONAL,
  link-restriction-weight         INTEGER     (0..80000) OPTIONAL,
  link-restriction-width          INTEGER     (0..2000) OPTIONAL,
  link-restriction-weight-axle    INTEGER     (0..20000) OPTIONAL
}



Node-description ::= SEQUENCE
{
   node-identifier          IA5String   (SIZE(1..32)),
   node-name                IA5String   (SIZE(1..128)) OPTIONAL,
   node-jurisdiction        IA5String   (SIZE(1..128)) OPTIONAL,
   node-ownership           IA5String   (SIZE(1..128)) OPTIONAL,
   node-latitude            INTEGER     (-90000000..90000000),
```

EXISTING TMDD MESSAGES	TxDOT IMPLEMENTATION OF TMDD MESSAGES

```
   node-longitude           INTEGER     (-180000000..180000000),
   node-type                    BIT STRING
        {
          node-type-freeway-interchange                    (2),
          node-type-arterial-with-secondary-cross-street   (3),
          node-type-arterial-with-crossing-arterial        (4),
          node-type-frontage-road-with-arterial            (5),
          node-type-railroad-crossing                      (6),
          node-type-transit-crossing                       (7),
          node-type-bus-route-node                         (8),
          node-type-train-route-node                       (9),
          node-type-wharf-ferry-node                      (10),
          node-type-transfer-point                        (11),
          node-type-other-no-additional-information-required   (0),
          node-type-other-additional-information-required      (1)
        } OPTIONAL,
  node-type-other          IA5String       (SIZE(1..256)) OPTIONAL,
  node-links-number        INTEGER         (0..999) OPTIONAL
}




Node-update ::= SEQUENCE
{
 network-identifier           IA5String   (SIZE(1..32)),
 node-identifier              IA5String   (SIZE(1..32)),
 node-name                    IA5String   (SIZE(1..128)) OPTIONAL,
 node-jurisdiction            IA5String   (SIZE(1..128)) OPTIONAL,
```

EXISTING TMDD MESSAGES	TxDOT IMPLEMENTATION OF TMDD MESSAGES

node-ownership IA5String (SIZE(1..128)) OPTIONAL,
node-latitude INTEGER (-90000000..90000000) OPTIONAL,
node-longitude INTEGER (-180000000..180000000) OPTIONAL,
node-type BIT STRING
{
node-type-freeway-interchange (2),
node-type-arterial-with-secondary-cross-street (3),
node-type-arterial-with-crossing-arterial (4),
node-type-frontage-road-with-arterial (5),
node-type-railroad-crossing (6),
node-type-transit-crossing (7),
node-type-bus-route-node (8),
node-type-train-route-node (9),
node-type-wharf-ferry-node (10),
node-type-other-no-additional-information-required (0),
node-type-other-additional-information-required (1)
} OPTIONAL,
node-type-other IA5String (SIZE(1..256)) OPTIONAL,
node-links-number INTEGER (0..999) OPTIONAL
}	

EXISTING TMDD MESSAGES	TxDOT IMPLEMENTATION OF TMDD MESSAGES

	Node-description ::= SEQUENCE
	{
	  node-identifier [0] NodeIdentifier,
	  node-name [1] NodeName OPTIONAL,
	  node-jurisdiction [2] NodeJurisdiction OPTIONAL,
	  node-ownership [3] NodeOwnership OPTIONAL,
	  node-latitude [4] NodeLatitude,
	  node-longitude [5] NodeLongitude,
	  node-type [6] NodeType OPTIONAL,
	  node-type-other [7] OtherText256 OPTIONAL,
	  node-links-number [8] NodeLinksNumber OPTIONAL
	}

EXISTING TMDD MESSAGES	TxDOT IMPLEMENTATION OF TMDD MESSAGES

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

Incident-identity ::= SEQUENCE
{
  organization-contact-organization-identifier IA5String SIZE(1..32)),
  network-identifier IA5String (SIZE(1..32)),
  organization-contact-organization-name IA5String (SIZE(1..128)) OPTIONAL,
  event-identifier IA5String (SIZE(1..32)),
  event-description-type-incident ENUMERATED
  -- this list is a subgroup of the ITIS-code list
  -- {
  -- accident (1),
  -- serious-accident (2),
  -- injury-accident (3),
  -- minor-accident (4),
  -- multi-vehicle-accident (5),
  -- numerous-accidents (6),
  -- accident-involving-a-bicycle (7),
  -- accident-involving-a-bus (8),
  -- accident-involving-a-motorcycle (9),
  -- accident-involving-a-pedestrian (10),
  -- accident-involving-a-train (11),
  -- accident-involving-a-truck (12),
  -- accident-involving-hazardous-materials (13),
  -- earlier-accident (14),
  -- medical-emergency (15),
  -- secondary-accident (16),
	Incident-identity ::= SEQUENCE
	{
	  network-id-number [0] NetworkIdentifier,
	  event-identifier [1] EventIdentifier,
	  event-update-type [2] EventUpdateType,
	  event-update-type-other [3] OtherText256 OPTIONAL,
	  event-update-time [4] EventUpdateTime OPTIONAL,
	  organization-contact-organization-id [5] OrganizationContactOrganizationId OPTIONAL,
	  organization-contact-organization-name [6] OrganizationContactOrganizationName OPTIONAL,
	  event-incident-status [7] EventIncidentStatus OPTIONAL,
	  event-incident-status-other [8] OtherText256 OPTIONAL,
	  organization-contact-person-phone-number [9] OrganizationContactPersonPhoneNumber OPTIONAL
	}

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES
-- rescue-and-recovery-work-in-progress (17),	
-- accident-investigation-work (18),	
-- incident (19),	
-- stalled-vehicle (20),	
-- abandoned-vehicle (21),	
-- disabled-vehicle (22),	
-- disabled-truck (23),	
-- disabled-semi-trailer (24),	
-- disabled-bus (25),	
-- disabled-train (26),	
-- vehicle-spun-out (27),	
-- vehicle-on-fire (28),	
-- vehicle-in-water (29),	
-- vehicles-slowing-to-look-at-accident (30),	
-- jackknifed-semi-trailer (31),	
-- jackknifed-trailer-home (32),	
-- jackknifed-trailer (33),	
-- spillage-occurring-from-moving-vehicle (34),	
-- acid-spill (35),	
-- chemical-spill (36),	
-- fuel-spill (37),	
-- hazardous-materials-spill (38),	
-- oil-spill (39),	
-- spilled-load (40),	
-- toxic-spill (41),	
-- overturned-vehicle (42),	
-- overturned-truck (43),	
-- overturned-semi-trailer (44),	
-- overturned-bus (45),	

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

```
        -- derailed-train                                    (46),
        -- stuck-vehicle                                     (47),
        -- truck-stuck-under-bridge                          (48),
        -- bus-stuck-under-bridge                            (49),
        -- accident-cleared                                  (126),
        -- incident-cleared                                  (127)
          --  },
  event-incident-status                ENUMERATED
   {
    incident-status-incident-detected        (2),
    incident-status-confirmed-and-responding (3),
    incident-status-first-arrival-at-scene   (4),
    incident-status-cleared-and-recovering   (5),
    incident-status-over-and-done            (6),
    incident-status-update                   (7),
    incident-status-other-no-additional-information-required   (0),
    incident-status-other-additional-information-required      (1)
   }  OPTIONAL,
  event-incident-status-other IA5String (SIZE(1..256)) OPTIONAL,
  event-description-type-incident-response-status
          contact-phone-number        IA5String     (SIZE(1..32))
OPTIONAL,

          event-update-time           IA5String    (SIZE(11)) OPTIONAL,

          event-update-type           ENUMERATED

           {

             event-update-type-new                    (2),
```

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

event-update-type-update (3),
event-update-type-delete (4),
event-update-type-clear-or-closed (5),
event-update-type-other (6),
event-update-type-other-no-additional-information-required (0),
event-update-type-other-additional-information-required (1)
},
event-update-type-other IA5String (SIZE(1..256)) OPTIONAL
}
 	
Incident-location ::= SEQUENCE
{
event-identifier IA5String (SIZE(1..32)),
link-identifier IA5String (SIZE(1..32)),
link-jurisdiction IA5String (SIZE(1..128)),
event-location-roadway-name IA5String (SIZE(1..128)) OPTIONAL,
event-location-roadway-identifier IA5String(SIZE(1..32)) OPTIONAL,
event-location-roadway-side ENUMERATED	

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

```
    {
    event-location-roadway-right-hand-side      (2),
    event-location-roadway-left-hand-side       (3),
    event-location-roadway-other-no-additional-information  (0),
    event-location-roadway-other-additional-information     (1)
    } OPTIONAL,
  event-location-roadway-side-other IA5String(SIZE(1..256))OPTIONAL,
  event-location-type      ENUMERATED
    {
    event-location-type-point             (2),
    event-location-type-link          (3),
    event-location-type-area          (4),
    event-location-type-polygon           (5),
    event-location-type-geographic-coordinate-node    (6),
    event-location-type-linear-referencing-road-reference (7),
    event-location-type-cross-streets         (8),
    event-location-type-street-address        (9),
    event-location-type-relation-to-junction     (10),
    event-location-type-no-additional-information     (0),
    event-location-type-additional-information-required   (1)
    },
  event-location-type-other    IA5String  (SIZE(1..256)) OPTIONAL,
  event-location  Location-reference
}



Incident-description ::= SEQUENCE
{
```

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

event-identifier IA5String (SIZE(1..32)),
event-incident-details ENUMERATED
{
incident-details-rollover-overturn-jackknife (2),
incident-details-immersion (3),
incident-details-gas-inhalation (4),
incident-details-non-collision-injury (5),
incident-details-debris-thrown-falling-object (6),
incident-details-collision-with-pedestrian (7),
incident-details-collision-with-cycle-cyclist (8),
incident-details-collision-with-railroad-train (9),
incident-details-collision-with-animal (10),
incident-details-collision-with-motor-vehicle-transport (11),
incident-details-collision-with-parked-motor-vehicle (12),
incident-details-collision-with-ground (13),
incident-details-collision-with-building (14),
incident-details-collision-with-impact-attenuator (15),
incident-details-collision-with-bridge-structure (16),
incident-details-collision-with-guardrail (17),
incident-details-collision-with-concrete-barrier (18),
incident-details-collision-with-post (19),
incident-details-collision-with-utility-poles (20),
incident-details-collision-with-culvert-ditch (21),
incident-details-collision-with-curb (22),
incident-details-collision-with-embankment (23),
incident-details-collision-with-fence (24),
incident-details-collision-with-wall (25),
incident-details-collision-with-fire-hydrant (26),
incident-details-collision-with-shrubbery-bushes (27),
	Incident-location ::= SEQUENCE
	{
	link-identifier [0] LinkIdentifier OPTIONAL,
	link-jurisdiction [1] LinkJurisdiction OPTIONAL,
	event-location-roadway-name [2] EventLocationRoadwayName OPTIONAL,
	event-location-cross-street-name [3] EventLocationCrossStreetBeginText OPTIONAL,
	event-location-roadway-side [4] EventLocationRoadwaySide OPTIONAL,
	event-location-type [5] EventLocationType OPTIONAL,
	event-location [6] LocationReference OPTIONAL
	}

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES
incident-details-collision-with-tree (28), incident-details-collision-with-boulder (29), incident-details-collision-with-pavement-irregularity (30), incident-details-collision-unknown (31), incident-details-other-no-additional-information (0), incident-details-other-additional-information (1) } OPTIONAL, event-incident-details-other IA5String (SIZE(1..256)) OPTIONAL, event-description IA5String (SIZE(1..256)) OPTIONAL, event-incident-severity ENUMERATED { incident-severity-none (2), incident-severity-minor (3), incident-severity-major (4), incident-severity-natural-disaster (5), incident-severity-other-no-additional-information-required (0), incident-severity-other-additional-information-required (1) }, event-incident-severity-other IA5String (SIZE(1..256)) OPTIONAL, event-lanes-effected BIT STRING OPTIONAL, event-detection-method ENUMERATED { detection-method-transit-agency (2), detection-method-traffic-agency (3), detection-method-commercial-traffic-service (4), detection-method-unknown-motorist-observer (5), detection-method-commercial-fleet-operator (6), detection-method-dot (7), detection-method-automobile-club-patrol (8),	Incident-description ::= SEQUENCE { event-description-type-incident [0] EventDescriptionTypeIncident OPTIONAL,

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES
detection-method-spotter-aircraft (9), detection-method-breakdown-service-private (10), detection-method-camera-observation (11), detection-method-emergency-service-patrol-non-police (12), detection-method-induction-loop-monitoring-station (13), detection-method-microwave-monitoring-station (14), detection-method-mobile-platform-measurement (15), detection-method-mobile-telephone-caller-previously-unknown(16), detection-method-police-patrol (17), detection-method-public-and-private-utilities (18), detection-method-road-condition-model (19), detection-method-registered-motorist-observer (20), detection-method-roadside-telephone-caller (21), detection-method-snowplow-report (22), detection-method-traffic-monitoring-station (23), detection-method-video-processing-monitoring-station (24), detection-method-vehicle-probe-measurement (25), detection-method-weather-model (26), detection-method-other-no-additional-information (0), detection-method-other-additional-information (1) } OPTIONAL, detection-method-other IA5String (SIZE(1..256)) OPTIONAL, event-incident-human-fatalities-count INTEGER (0..255), event-incident-human-injuries-count INTEGER (0..65535), event-incident-property-damage BIT STRING { incident-property-damage-guard-rail-damage (2), incident-property-damage-utility-pole-light-pole-damage (3), incident-property-damage-pavement-damage (4),	event-description-type-incident-other [1] OtherText256 OPTIONAL, event-description [2] EventDescription OPTIONAL, event-incident-severity [3] EventIncidentSeverity OPTIONAL, event-incident-severity-other [4] OtherText256 OPTIONAL, event-lanes-blocked-or-closed [5] EventLanesBlockedOrClosed OPTIONAL, event-incident-detection-method [6] EventIncidentDetectionMethod OPTIONAL, event-incident-detection-method-other [7] OtherText256 OPTIONAL, event-incident-human-fatalities-count [8] EventIncidentHumanFatalitiesCount OPTIONAL, event-incident-human-injuries-count [9] EventIncidentHumanInjuriesCount OPTIONAL, event-incident-property-damage [10] EventIncidentPropertyDamage OPTIONAL, event-incident-property-damage-other [11] OtherText256 OPTIONAL, event-incident-condition-pavement [12] EventIncidentConditionPavement OPTIONAL, event-incident-condition-pavement-other [13] OtherText256 OPTIONAL, event-incident-condition-weather [14] EventIncidentConditionWeather OPTIONAL, event-incident-condition-weather-other [15] OtherText256 OPTIONAL, event-incident-vehicles-involved-count [16] EventIncidentVehiclesInvolvedCount OPTIONAL, event-incident-vehicles-involved [17] EventIncidentVehiclesInvolved OPTIONAL, event-incident-vehicles-involved-other [18] OtherText256 OPTIONAL }

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES
incident-property-damage-structure-damage (5), incident-property-damage-traffic-equipment-damage (6), incident-property-damage-vehicle-damage (7), incident-property-damage-other-no-additional-info-required (0), incident-property-damage-other-additional-info-required (1) } OPTIONAL, event-property-damage-other IA5String (SIZE(1..256)) OPTIONAL, event-description-type-pavement-condition ENUMERATED -- this list is a subgroup of the ITIS-code list -- { -- impassable (1), -- almost-impassable (2), -- passable-with-care (3), -- passable (4), -- surface-water-hazard (5), -- danger-of-hydroplaning (6), -- wet-pavement (7), -- treated-pavement (8), -- slippery (9), -- mud-on-roadway (10), -- leaves-on-roadway (11), -- loose-sand-on-roadway (12), -- loose-gravel (13), -- fuel-on-roadway (14), -- oil-on-roadway (15), -- road-surface-in-poor-condition (16), -- melting-tar (17), -- ice (18), -- icy-patches (19),	

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES
-- black-ice (20), -- ice-pellets-on-roadway (21), -- ice-build-up (22), -- freezing-rain (23), -- wet-and-icy-roads (24), -- melting-snow (25), -- slush (26), -- frozen-slush (27), -- snow-on-roadway (28), -- packed-snow (29), -- packed-snow-patches (30), -- plowed-snow (31), -- wet-snow (32), -- fresh-snow (33), -- powder-snow (34), -- granular-snow (35), -- frozen-snow (36), -- crusted-snow (37), -- deep-snow (38), -- snow-drifts (39), -- drifting-snow (40), -- expected-snow-accumulation (41), -- current-snow-accumulation (42), -- dry-pavement (123), -- snow-cleared (124), -- pavement-conditions-improved (125), -- skid-hazard-reduced (126), -- pavement-conditions-cleared (127) -- } OPTIONAL,	

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

event-incident-buses-involved-count INTEGER (0..255) OPTIONAL,
event-incident-cars-involved-count INTEGER (0..255) OPTIONAL,
event-incident-trucks-involved-count INTEGER (0..255) OPTIONAL,
event-incident-human-injury-type BIT STRING
{
human-injury-type-no-injury (2),
human-injury-type-possible-injury (3),
human-injury-type-not-incapacitating (4),
human-injury-type-incapacitating (5),
human-injury-type-fatality (6),
human-injury-type-died-prior (7),
human-injury-type-no-person-coded-in-crash (8),
human-injury-type-unknown-injury-severity (9),
human-injury-type-major-injury (10)
human-injury-type-minor-injury (11),
human-injury-type-other-no-information-required (0),
human-injury-type-other-information-required (1)
} OPTIONAL,
event-incident-human-injury-type-other IA5String(SIZE(1..256)) OPTIONAL,
event-description-type-obstruction ENUMERATED
-- this list is a subgroup of the ITIS-code list
-- {
-- obstruction-on-roadway (1),
-- object-on-roadway (2),
--objects-falling-from-moving-vehicle (3),
-- debris-on-roadway (4),
-- storm-damage (5),
-- people-on-roadway (6),	

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES
-- bicyclists-on-roadway (7), -- sightseers-obstructing-access (8), -- large-numbers-of-visitors (9), -- animal-on-roadway (10), -- large-animal-on-roadway (11), -- herd-of-animals-on-roadway (12), -- animal-struck (13), -- fallen-trees (14), -- downed-power-lines (15), -- downed-cables (16), -- subsidence (17), -- road-surface-collapse (18), -- pavement-buckled (19), -- pothole (20), -- flooding (21), -- broken-water-main (22), -- collapsed-sewer (23), -- sewer-overflow (24), -- gas-leak (25), -- snowmelt (26), -- mudslide (27), -- avalanche (28), -- rock-fall (29), -- landslide (30), -- clearance-work (126), -- obstruction-cleared (127) -- } OPTIONAL, event-description-type-weather-condition ENUMERATED -- this list is a subgroup of the ITIS-code list	

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

-- {
-- overcast (1),
-- cloudy (2),
-- mostly-cloudy (3),
-- partly-cloudy (4),
-- partly-sunny (5),
-- mostly-sunny (6),
-- sunny (7),
-- fair (8),
-- clear (9),
-- mostly-clear (10),
-- mostly-dry (11),
-- dry (12),
-- uV-index-very-high (13),
-- uV-index-high (14),
-- uV-index-moderate (15),
-- uV-index-low (16),
-- uV-index-very-low (17),
-- barometric-pressure (18),
-- weather-forecast-withdrawn (127)
-- } OPTIONAL,
 	
event-incident-vehicles-involved-count INTEGER (0..255),
event-incident-vehicles-involved BIT STRING
{
vehicles-involved-public-transit-bus (2),
vehicles-involved-light-rail (3),
vehicles-involved-commuter-passenger-rail (4),
vehicles-involved-freight-rail (5),	

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES
vehicles-involved-public-safety-vehicle (6), vehicles-involved-convertible (7), vehicles-involved-2-door-sedan-hardtop-coupe (8), vehicles-involved-3-door-2-door-hatchback (9), vehicles-involved-4-door-sedan-hardtop (10), vehicles-involved-5-door-4-door-hatchback (11), vehicles-involved-station-wagon (12), vehicles-involved-hatchback-number-of-doors-unknown (13), vehicles-involved-auto-based-pickup (14), vehicles-involved-auto-based-panel (15), vehicles-involved-large-limousine (16), vehicles-involved-utility (17), vehicles-involved-minivan (18), vehicles-involved-standard-van (19), vehicles-involved-compact-pickup (20), vehicles-involved-standard-pickup (21), vehicles-involved-pickup-with-slide-in-camper (22), vehicles-involved-truck-based-station-wagon (23), vehicles-involved-light-truck-based-suburban-limousine (24), vehicles-involved-cab-chassis-based (25), vehicles-involved-truck-based-panel (26), vehicles-involved-light-truck-based-motor-home (27), vehicles-involved-school-bus (28), vehicles-involved-other-bus (29), vehicles-involved-single-unit-straight-truck (30), vehicles-involved-medium-heavy-truck-based-motor-home (31), vehicles-involved-truck-tractor (32), vehicles-involved-motorcycle (33), vehicles-involved-moped (34),	

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

```
    vehicles-involved-three-wheeled-motorcycle-or-moped     (35),
    vehicles-involved-ATV-ATC               (36),
    vehicles-involved-snowmobile            (37),
    vehicles-involved-farm-equipment-other-than-trucks      (38),
    vehicles-involved-construction-equipment-other-than-trucks(39),
    vehicles-involved-unknown               (40),
    vehicles-involved-other-no-information-required      (0),
    vehicles-involved-other-information-required         (1)
    }  OPTIONAL,
  event-vehicles-involved-other IA5String(SIZE(1..256))OPTIONAL
}



Incident-timeline ::= SEQUENCE
{
  event-identifier      A5String   (SIZE(1..32)),
  event-timeline-first-arrival-at-scene-time A5String(SIZE(11))
OPTIONAL,
  event-timeline-confirmed-and-responding-time IA5String
(SIZE(11)) OPTIONAL,
  event-timeline-cleared-and-recovering-time    IA5String
(SIZE(11)) OPTIONAL,
  event-timeline-duration        INTEGER  (0..4294967296) OPTIONAL,
  event-timeline-estimated-duration INTEGER(0..4294967296) OPTIONAL,
  event-timeline-end-time           IA5String   (SIZE(11)) OPTIONAL,
}
```

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

```
Incident-response ::= SEQUENCE
{
  event-identifier      IA5String    (SIZE(1..32)),
  event-response-plan-type      ENUMERATED
    {
    response-plan-type-system-plan    (2),
    response-plan-type-modified-system-plan   (3),
    response-plan-type-manual-input-plan  (4),
    response-plan-type-other-no-additional-information-required (0),
    response-plan-type-other-additional-information-required  (1)
    }  OPTIONAL,
  event-response-plan-type-other IA5String(SIZE(1..256)) OPTIONAL,
  event-response-plan-identifier IA5String(SIZE(1..32)),
  event-response-plan-author    IA5String (SIZE(1..128)) OPTIONAL,
  event-response-alternate-route IA5String(SIZE(1..1024))OPTIONAL,
  event-description-advice-alternate-route       ENUMERATED
     -- this list is a subgroup of the ITIS-code list
     -- {
        -- detour-where-possible                          (1),
        -- no-detour-available                            (2),
        -- follow-signs                                   (3),
        -- follow-detour-signs                            (4),
        -- follow-special-detour-markers                  (5),
        -- do-not-follow-detour-signs                     (6),
        -- detour-in-operation                            (7),
        -- follow-local-detour                            (8),
        -- compulsory-detour-in-operation                 (9),
```

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

-- no-suitable-detour-available (10),
-- detour-is-no-longer-recommended (11),
-- local-drivers-are-recommended-to-avoid-the-area (12),
-- trucks-are-recommended-to-avoid-the-area (13),
-- consider-alternate-route (14),
-- consider-alternate-parking (15),
-- consider-alternate-destination (16),
-- consider-alternate-area (17)
-- } OPTIONAL,
event-organization-required-identifier IA5String (SIZE(1..32)) OPTIONAL,
event-organization-responding-identifier IA5String (SIZE(1..32)) OPTIONAL,
event-organization-response-status ENUMERATED
{
response-status-organization-detected (2),
response-status-organization-notified (3),
response-status-organization-en-route (4),
response-status-organization-on-site (5),
response-status-organization-returned-or-returning-from-site(6),
response-status-other-no-additional-information-require (0),
response-status-other-additional-information-required (1)
} OPTIONAL,
event-organization-response-status-other IA5String (SIZE(1..256))OPTIONAL
 	
event-description-type-incident-response-status ENUMERATED
-- this list is a subgroup of the ITIS-code list
-- {
-- unconfirmed-report (1),	

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES
-- initial-response-en-route (2), -- follow-up-response-en-route (3), -- initial-response-on-scene (4), -- follow-up-response-on-scene (5), -- confirmed-report (6), -- scene-is-unsecured-at-this-time (7), -- response-scene-secured (8), -- rescue-and-recovery-work-in-progress (9), -- extraction-in-progress (10), -- clearance-work-in-progress (11), -- body-removal-operations (12), -- fire-or-containment-contained (13), -- fire-or-containment-not-contained (14), -- event-cleared (15), -- traffic-clearing (16), -- incident-closed (17) -- } OPTIONAL, }	

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

	Incident-timeline ::= SEQUENCE
	{
	event-timeline-confirmed-and-responding-time [0] EventTimelineConfirmedAndRespondingTime OPTIONAL,
	event-timeline-cleared-and-recovering-time [1] EventTimelineClearedAndRecoveringTime OPTIONAL,
	event-timeline-estimated-duration [2] EventTimelineEstimatedDuration OPTIONAL
	}
	
	Incident-response ::= SEQUENCE
	{

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES
	event-response-plan-type [0] EventResponsePlanType OPTIONAL, event-response-plan-type-other [1] OtherText256 OPTIONAL, event-response-plan [2] EventResponsePlan OPTIONAL, event-response-plan-author [3] EventResponsePlanAuthor OPTIONAL, event-response-alternate-route [4] EventResponseAlternateRoute OPTIONAL, event-organization-required-id [5] EventOrganizationRequiredId OPTIONAL, event-organization-responding-id [6] EventOrganizationRespondingId OPTIONAL, event-organization-response-status [7] EventOrganizationResponseStatus OPTIONAL, event-organization-response-status-other [8] OtherText256 OPTIONAL }

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES
	---------- ------

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

```
        -- Composite incident definition.

        ------------------------------------------------------------------------
------

Incident ::= SEQUENCE
{
  incident-identity     Incident-identity,
  incident-location     Incident-location OPTIONAL,
  incident-description  Incident-description OPTIONAL,
  incident-timeline     Incident-timeline OPTIONAL,
  incident-response     Incident-response OPTIONAL
}


------------------------------------------------------------------------------
--
-- List of incidents requested when getting current incident status.
------------------------------------------------------------------------------
--
CurrentNetworkIncidents ::= SEQUENCE OF Incident


------------------------------------------------------------------------------
--
-- List of incidents sent on an incident update.  Allows for either
-- periodic or event-driven updates (event-driven would only have one
-- incident).
------------------------------------------------------------------------------
--
IncidentUpdates ::= SEQUENCE OF Incident
```

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

Event-identity ::= SEQUENCE
{
organization-contact-organization-identifier IA5String (SIZE(1..32)),
organization-contact-organization-name IA5String (SIZE(1..128)) OPTIONAL,
network-identifier IA5String (SIZE(1..32)),
event-identifier IA5String (SIZE(1..32)),
event-description-type-event ENUMERATED
-- this list is a subgroup of the ITIS-code list
-- {
-- traffic-conditions (1),
-- incidents (2),
-- closures (3),
-- roadwork (4),
-- obstructions (5),
-- delays-status-cancellations (6),
-- unusual-driving (7),
-- mobile-situation (8),
-- device-status (9),
-- restrictions (10),
-- incident-response-status (11),
-- disasters (12),
-- disturbances (13),
-- sporting-events (14),
	Event-identity ::= SEQUENCE
	{
	network-identifier [0] NetworkIdentifier,
	event-identifier [1] EventIdentifier,
	organization-contact-organization-identifier [2] OrganizationContactOrganizationId OPTIONAL,
	organization-contact-organization-name [3] OrganizationContactOrganizationName OPTIONAL,
	event-description-type-event [4] EventDescriptionTypeEvent,
	event-description-type-event-other [5] OtherText256 OPTIONAL,
	event-organization-report-identifier [6] EventOrganizationReportIdentifier OPTIONAL,
	organization-contact-phone-landline [7] OrganizationContactPhoneLandline OPTIONAL,
	
	--# Next two fields added to allow for deleting events.
	event-update-type [8] EventUpdateType,
	event-update-type-other [9] OtherText256 OPTIONAL,
	
	event-update-date [10] EventUpdateDate OPTIONAL,
	event-update-time [11] EventUpdateTime OPTIONAL,
	event-update-author-last-revised [12] EventUpdateAuthorLastRevised OPTIONAL
	}

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES
-- special-events (15), -- parking-information (16), -- system-information (17), -- weather-conditions (18), -- precipitation (19), -- winds (20), -- visibility-air-quality (21), -- temperature (22), -- pavement-conditions (23), -- winter-driving-conditions (24), -- winter-driving-index (25), -- traveler-suggestion (26), -- traveler-warning (27), -- traveler-recommendations (28), -- traveler-instructions-mandatory (29), -- qualifiers (30), -- generic-locations (31), -- lane-roadway-descriptions (32), -- alternate-route (33), -- units (34), -- transit-mode (35), -- vehicle-groups-affected (36), -- traveler-group-affected (37), -- responder-group-affected (38), -- incident-response-equipment (39) -- }, event-organization-report-identifier IA5String (SIZE(1..32)) OPTIONAL, contact-phone-number IA5String (SIZE(1..32)) OPTIONAL,	

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

event-update-date IA5String (SIZE(8)),
event-update-time IA5String (SIZE(11)),
event-update INTEGER (0..255),
event-update-author-last-revised IA5String (SIZE(1..128)) OPTIONAL
}
 	
Event-location ::= SEQUENCE
{
event-identifier IA5String (SIZE(1..32)),
link-identifier IA5String (SIZE(1..32)),
link-jurisdiction IA5String (SIZE(1..128)) OPTIONAL,
event-location-roadway-identifier IA5String (SIZE(1..32)) OPTIONAL,
event-location-roadway-name IA5String (SIZE(1..128)) OPTIONAL,
event-location-roadway-side ENUMERATED
{
event-location-roadway-right-hand-side (2),
event-location-roadway-left-hand-side (3),
event-location-roadway-other-no-additional-information (0),
event-location-roadway-other-additional-information (1)
} OPTIONAL,
event-location-roadway-side-other IA5String (SIZE(1..256)) OPTIONAL,
event-location-type ENUMERATED
{
event-location-type-point (2),
event-location-type-link (3),
	Event-location ::= SEQUENCE
	{
	link-identifier [1] LinkIdentifier OPTIONAL,
	link-jurisdiction [2] LinkJurisdiction OPTIONAL,
	event-location-roadway-identifier [3] EventLocationRoadwayIdentifier OPTIONAL,
	event-location-roadway-name [4] EventLocationRoadwayName OPTIONAL,
	event-location-cross-street-begin-name [5] EventLocationCrossStreetBeginText OPTIONAL,
	event-location-cross-street-end-name [6] EventLocationCrossStreetEndText OPTIONAL,
	event-location-type [7] EventLocationType,
	event-location-type-other [8] OtherText256 OPTIONAL,
	event-location [9] LocationReference
	}

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES
event-location-type-area (4), event-location-type-polygon (5), event-location-type-geographic-coordinate-node (6), event-location-type-linear-referencing-road-reference (7), event-location-type-cross-streets (8), event-location-type-street-address (9), event-location-type-relation-to-junction (10), event-location-type-no-additional-information-required (0), event-location-type-additional-information-required (1) }, event-location-type-other IA5String (SIZE(1..256)) OPTIONAL, event-location Location-reference }	

Event-description ::= SEQUENCE
{
event-identifier IA5String (SIZE(1..32)),
event-description IA5String (SIZE(1..2048)) OPTIONAL,
event-description-notes-and-comments IA5String (SIZE(1..1024)) OPTIONAL,
event-description-type-closure ENUMERATED
-- this list is a subgroup of the ITIS-code list
-- {
-- closed-to-traffic (1),
	Event-description ::= SEQUENCE
	{
	event-description [0] EventDescription OPTIONAL,
	event-description-notes-and-comments [1] EventDescriptionNotesAndComments OPTIONAL,
	event-description-type-planned-roadway-closure [2] EventDescriptionTypePlannedRoadwayClosure OPTIONAL,
	event-description-type-planned-roadway-closure-other [3] OtherText256 OPTIONAL,
	event-description-type-special-event [4]

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES
-- closed (2), -- closed-ahead (3), -- closed-intermittently (4), --closed-for-repairs (5), -- closed-for-the-season (6), -- blocked (7), -- blocked-ahead (8), -- reduced-to-one-lane (9), -- reduced-to-two-lanes (10), -- reduced-to-three-lanes (11), -- collapse (12), -- out (13), -- open-to-traffic (123), -- open (124), -- reopened-to-traffic (125), -- clearing (126), -- cleared (127) -- } OPTIONAL, event-description-type-roadwork ENUMERATED -- this list is a subgroup of the ITIS-code list -- { -- road-construction (1), -- major-road-construction (2), -- long-term-road-construction (3), -- construction-work (4), -- paving-operations (5), -- work-in-the-median (6), -- road-reconstruction (7),	EventDescriptionTypeSpecialEvent OPTIONAL, event-description-type-special-event-other [5] OtherText256 OPTIONAL, event-lanes-blocked-or-closed [6] EventLanesBlockedOrClosed, event-lanes-shoulders-blocked [7] EventLanesShouldersBlocked, event-lanes-shoulders-blocked-other [8] OtherText256 OPTIONAL, event-response-alternate-route [9] EventResponseAlternateRoute OPTIONAL, event-response-plan-identifier [10] EventResponsePlanIdentifier OPTIONAL }

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES
-- opposing-traffic (8), -- narrow-lanes (9), -- construction-traffic-merging (10), -- single-line-traffic-alternating-directions (11), -- road-maintenance-operations (12), -- road-marking-operations (13), -- bridge-maintenance-operations (14), -- bridge-construction (15), -- bridge-demolition-work (16), -- blasting (17), -- avalanche-control-activities (18), -- water-main-work (19), -- gas-main-work (20), -- work-on-underground-cables (21), -- work-on-underground-services (22), -- new-road-construction-layout (23), -- new-road-layout (24), -- temporary-lane-markings (25), -- temporary-traffic-lights (26), -- emergency-maintenance (27), -- road-maintenance-cleared (122), -- normal-road-layout-restored (123), -- road-work-clearance-in-progress (124), -- road-construction-cleared (125), -- normal-traffic-lanes-restored (126), -- road-work-cleared (127) -- } OPTIONAL, event-description-type-special-event ENUMERATED -- this list is a subgroup of the ITIS-code list -- {	

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES
-- major-event (1), -- airshow (2), -- hot-air-ballooning (3), -- concert (4), -- state-occasion (5), -- vIP-visit (6), -- show (7), -- festival (8), -- exhibition (9), -- performing-arts (10), -- outdoor-market (11), -- fair (12), -- carnival (13), -- fireworks-display (14), -- trade-expo (15), -- movie-filming (16), -- presidential-visit (17), -- parade (18), -- procession (19), -- funeral-procession (20), -- crowd (21), -- holiday-traffic (22), -- event-ended (127) -- } OPTIONAL, event-description-type-sporting-events ENUMERATED -- this list is a subgroup of the ITIS-code list -- { -- sports-event (1),	

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES
-- game (2), -- tournament (3), -- track-and-field-event (4), -- baseball-game (5), -- basketball-game (6), -- boxing-match (7), -- football-game (8), -- soccer-game (9), -- golf-tournament (10), -- hockey-game (11), -- tennis-tournament (12), -- wrestling-match (13), -- road-race (14), -- automobile-race (15), -- bicycle-race (16), -- race-event (17), -- marathon (18), -- horse-show (19), -- rodeo (20), -- water-sports-event (21), -- winter-sports-event (22), -- skating-event (23), -- sporting-event-ended (127) -- } OPTIONAL, -- this list is a subgroup of the ITIS-code list -- { -- assault (1), -- crime (2),	

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES
-- robbery (3),	
-- fare-dispute (4),	
-- shooting (5),	
-- gunfire-on-roadway (6),	
-- suicide (7),	
-- fight (8),	
-- gang-fight (9),	
-- person-harassment (10),	
-- person-injured (11),	
-- unruly-passenger (12),	
-- person-intoxicated (13),	
-- crowd-control-problem (14),	
-- demonstration (15),	
-- march (16),	
-- public-disturbance (17),	
-- riot (18),	
-- civil-unrest (19),	
-- civil-emergency (20),	
-- strike (21),	
-- public-transit-strike (22),	
-- stampede (23),	
-- teargas-used (24),	
-- security-alert (25),	
-- security-incident (26),	
-- checkpoint (27),	
-- bomb-alert (28),	
-- terrorist-incident (29),	
-- high-velocity-shell-fire (30),	
-- explosives-in-use (31),	

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES
-- air-raid (32), -- weapons-of-mass-destruction-threat (33), -- military-operations (34), -- security-problem-cleared (126), -- traffic-disturbance-cleared (127) -- } OPTIONAL, event-lanes-affected BIT STRING, event-response-alternate-route IA5String (SIZE(1..1024)) OPTIONAL, event-description-advice-alternate-route ENUMERATED -- this list is a subgroup of the ITIS-code list -- { -- detour-where-possible (1), -- no-detour-available (2), -- follow-signs (3), -- follow-detour-signs (4), -- follow-special-detour-markers (5), -- do-not-follow-detour-signs (6), -- detour-in-operation (7), -- follow-local-detour (8), -- compulsory-detour-in-operation (9), -- no-suitable-detour-available (10), -- detour-is-no-longer-recommended (11), -- local-drivers-are-recommended-to-avoid-the-area (12), -- trucks-are-recommended-to-avoid-the-area (13), -- consider-alternate-route (14), -- consider-alternate-parking (15), -- consider-alternate-destination (16), -- consider-alternate-area (17) -- } OPTIONAL,	

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES
event-response-plan-identifier IA5String (SIZE(1..32)) }	

Event-daily-timeline ::= SEQUENCE
{
event-identifier IA5String (SIZE(1..32)),
event-timeline-schedule-start-time IA5String (SIZE(11)) OPTIONAL,
event-timeline-start-time IA5String (SIZE(11)) OPTIONAL,
event-timeline-schedule-end-time IA5String (SIZE(11)) OPTIONAL,
event-timeline-end-time IA5String (SIZE(11)) OPTIONAL
}
	Event-timeline ::= SEQUENCE
	{
	event-timeline-schedule-start [0] EventTimelineScheduleStart OPTIONAL,
	event-timeline-start [1] EventTimelineStart OPTIONAL,
	event-timeline-schedule-end [2] EventTimelineScheduleEnd OPTIONAL,
	event-timeline-end [3] EventTimelineEnd OPTIONAL
	}

Event-schedule ::= SEQUENCE { event-identifier IA5String (SIZE(32)), event-timeline-schedule-type ENUMERATED { timeline-schedule-type-repeat-time-spans-on-days-of-the-week (2), timeline-schedule-type-repeat-time-spans-on-dates (3), timeline-schedule-type-repeat-at-times-on-days-of-week (4), timeline-schedule-type-repeat-at-times-on-dates (5),	Event-schedule ::= SEQUENCE { event-timeline-schedule-type [0] EventTimelineScheduleType OPTIONAL, event-timeline-schedule-type-other [1] OtherText256 OPTIONAL, event-timeline-schedule-days-of-week [2] EventTimelineScheduleDaysOfWeek OPTIONAL, event-timeline-schedule-start-date [3] EventTimelineScheduleStartDate OPTIONAL, event-timeline-schedule-end-date [4] EventTimelineScheduleEndDate OPTIONAL, event-timeline-schedule-dates [5] EventTimelineScheduleDates OPTIONAL

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

timeline-schedule-type-between-date-times-inclusive (6),
timeline-schedule-type-other-no-additional-info-required (0),
timeline-schedule-type-other-additional-info-required (1)
},
event-timeline-schedule-type-other IA5String(SIZE(1..256)) OPTIONAL,
event-timeline-schedule-days-of-week BIT STRING
{
timeline-schedule-days-unknown (0),
timeline-schedule-days-sunday (1),
timeline-schedule-days-monday (2),
timeline-schedule-days-tuesday (3),
timeline-schedule-days-wednesday (4),
timeline-schedule-days-thursday (5),
timeline-schedule-days-friday (6),
timeline-schedule-days-saturday (7)
},
event-timeline-schedule-start-date IA5String (SIZE(8)),
event-timeline-schedule-end-date IA5String (SIZE(8)),
event-timeline-schedule-dates SEQUENCE OF IA5String (SIZE(8))
}
	}
	
	---------- 	
	--
	-- Composite event definition.
	---------- 	
	--
	Event ::= SEQUENCE
	{

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES
	event-identity Event-identity, event-location Event-location OPTIONAL, event-description Event-description OPTIONAL, event-timeline Event-timeline OPTIONAL, event-schedule Event-schedule OPTIONAL } ---------- -- -- List of events requested when getting current event status. ---------- -- CurrentNetworkEvents ::= SEQUENCE OF Event ---------- -- -- List of events sent on an event update. Allows for either -- periodic or event-driven updates (event-driven would only have one -- event). ---------- -- EventUpdates ::= SEQUENCE OF Event
Response-organization ::= SEQUENCE { event-identifier IA5String (SIZE(1..32)), organization-contact-organization-name IA5String	

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES
SIZE(1..128)), event-description-type-event ENUMERATED -- this list is a subgroup of the ITIS-code list { -- traffic-conditions (1), -- incidents (2), -- closures (3), -- roadwork (4), -- obstructions (5), -- delays-status-cancellations (6), -- unusual-driving (7), -- mobile-situation (8), -- device-status (9), -- restrictions (10), -- incident-response-status (11), -- disasters (12), -- disturbances (13), -- sporting-events (14), -- special-events (15), -- parking-information (16), -- system-information (17), -- weather-conditions (18), -- precipitation (19), -- winds (20), -- visibility-air-quality (21), -- temperature (22), -- pavement-conditions (23), -- winter-driving-conditions (24), -- winter-driving-index (25),	

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES
-- traveler-suggestion (26), -- traveler-warning (27), -- traveler-recommendations (28), -- traveler-instructions-mandatory (29), -- qualifiers (30), -- generic-locations (31), -- lane-roadway-descriptions (32), -- alternate-route (33), -- units (34), -- transit-mode (35), -- vehicle-groups-affected (36), -- traveler-group-affected (37), -- responder-group-affected (38), -- incident-response-equipment (39) -- }, organization-contact-sub-organization-identifier IA5String (SIZE(1..32)) OPTIONAL, organization-contact-sub-organization-name IA5String (SIZE(1..128)) OPTIONAL, organization-contact-sub-organization-function BIT STRING { sub-organization-function-street-operations (2), sub-organization-function-highway-operations (3), sub-organization-function-auto-tow (4), sub-organization-function-single-unit-truck-tow (5), sub-organization-function-semi-trailer-tow (6), sub-organization-function-coroner (7), sub-organization-function-fire-and-rescue (8), sub-organization-function-hazmat (9),	

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES
sub-organization-function-environmental (10), sub-organization-function-emergency-medical-services (11), sub-organization-function-sanitation (12), sub-organization-function-law-enforcement (13), sub-organization-function-transit-operations (14), sub-organization-function-special-services (15), sub-organization-function-maintenance (16), sub-organization-function-public-works (17), sub-organization-function-service-patrols (18), sub-organization-function-media (19), sub-organization-function-traffic-reporting-service (20), sub-organization-function-other-no-additional-info-required(0), sub-organization-function-other-additional-info-required (1) } OPTIONAL, organization-contact-sub-organization-function-other IA5String (SIZE(1..256)) OPTIONAL, organization-contact-person-name IA5String (SIZE(1..64)) OPTIONAL, organization-contact-radio-unit IA5String(SIZE(1..32)) OPTIONAL, contact-phone-number IA5String(SIZE(1..32)) OPTIONAL, contact-phone-mobile-phone IA5String(SIZE(1..32)) OPTIONAL, contact-email-address IA5String(SIZE(1..128)) OPTIONAL, contact-pager-phone-number IA5String(SIZE(1..32)) OPTIONAL }	

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

Link-set ::= SEQUENCE
{
network-identifier IA5String SIZE(1..32)),
section-identifier IA5String (SIZE(1..32)) OPTIONAL,
section-link-count INTEGER (1..255) OPTIONAL,
link-identifier-list SEQUENCE OF IA5String (SIZE(1..32)),
link-measurement-duration INTEGER (1..86400) OPTIONAL,
link-measurement-end-time IA5String (SIZE(6)) OPTIONAL
}
	-- Link sets not implemented. Traffic data for all links defined in the
	-- network are sent.

Current-link-conditions ::= SEQUENCE { link-identifier IA5String (SIZE(1..32)), link-data-type ENUMERATED { link-data-type-actual (2), link-data-type-reconstructed (3), link-data-type-historical (4), link-data-type-predicted (5), link-data-type-smoothed (6), link-data-type-averaged (7), link-data-type-no-additional-information-required (0), link-data-type-additional-information-required (1)	-- Current-link-condition is not used in this implmentation. One field -- from this message (link-level-of-service) has been moved to Current --link-state so that only one message would be required.

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

} OPTIONAL,
link-data-type-other IA5String (SIZE(1..256)) OPTIONAL,
link-lanes-number-open INTEGER (0..50) OPTIONAL,
link-priority-type BIT STRING
{
link-priority-special-events (2),
link-priority-snow-ice-clearance (3),
link-priority-weather-evacuation (4),
link-priority-defense-movements (5),
link-priority-hazmat (6),
link-priority-agricultural-access (7),
link-priority-none (8),
link-priority-other-no-additional-information-required (0),
link-priority-other-additional-information-required (1)
} OPTIONAL,
link-priority-other IA5String (SIZE(1..256)) OPTIONAL,
link-restriction-class ENUMERATED
-- this list is a subgroup of the ITIS-code list
-- {
-- restrictions (1),
-- ramp-restrictions (2),
-- truck-restriction (3),
-- speed-restriction (4),
-- noise-restriction (5),
-- traffic-regulations-have-been-changed (6),
-- local-access-only (7),
-- no-trailers (8),
-- no-high-profile-vehicles (9),
-- hazardous-materials-truck-restriction (10),	

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES
-- no-through-traffic (11), -- no-motor-vehicles (12), -- width-limit (13), -- height-limit (14), -- length-limit (15), -- axle-load-limit (16), -- gross-weight-limit (17), -- axle-count-limit (18), -- carpool-lane-available (19), -- carpool-restrictions-changed (20), -- hOV-2-no-single-occupant-vehicles (21), -- hOV-3-no-vehicles-with-less-than-three-occupants (22), -- bus-lane-available-for-all-vehicles (23), -- truck-lane-available-for-all-vehicles (24), -- permits-call-in-basis (25), -- npermits-temporarily-closed (26), -- permits-closed (27), -- permits-open (115), -- restrictions-for-high-profile-vehicles-lifted (116), -- width-limit-lifted (117), -- height-limit-lifted (118), -- length-limit-lifted (119), -- axle-count-limit-lifted (120), -- weight-limit-lifted (121), -- axle-count-limit-lifted (122), -- carpool-restrictions-lifted (123), -- lane-restrictions-lifted (124), -- ramp-restrictions-lifted (125), -- motor-vehicle-restrictions-lifted (126),	

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES
-- restrictions-lifted (127) -- } OPTIONAL, link-status ENUMERATED { link-status-no-determination (2), link-status-open (3), link-status-restricted (4), link-status-closed (5), link-status-other-no-additional-information-required (0), link-status-other-additional-information-required (1) } OPTIONAL, link-status-other IA5String (SIZE(1..256)) OPTIONAL, link-surface-condition BIT STRING { link-surface-condition-dry (2), link-surface-condition-wet (3), link-surface-condition-snow-or-slush (4), link-surface-condition-ice (5), link-surface-condition-oil (6), link-surface-condition-debris (7),	

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES
link-surface-condition-rocks (8), link-surface-condition-salted (9), link-surface-condition-broken-pavement (10), link-surface-condition-power-lines-down (11), link-surface-condition-material-spill (12), link-surface-condition-chemical-spill (13), link-surface-condition-none (14), link-surface-condition-other-no-additional-information-required (0), link-surface-condition-other-additional-information-required (1) } OPTIONAL, link-surface-condition-other IA5String (SIZE(1..256)) OPTIONAL, link-oversaturated-flag ENUMERATED { link-not-oversaturated (0), link-oversaturated (1)	Link-description ::= SEQUENCE { link-identifier [0] LinkIdentifier, link-name [1] LinkName OPTIONAL, link-jurisdiction [2] LinkJurisdiction OPTIONAL, link-ownership [3] LinkOwnership OPTIONAL, link-road-designator [4] LinkRoadDesignator OPTIONAL, link-data-stored [5] LinkDataStored OPTIONAL, link-data-stored-other [6] OtherText256 OPTIONAL, link-type [7] LinkType OPTIONAL, link-type-other [8] OtherText256 OPTIONAL,

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

} OPTIONAL,
 	
link-level-of-service IA5String (SIZE (1..1)) OPTIONAL
 	
}
 	
Link-description ::= SEQUENCE
{
link-identifier IA5String (SIZE(1..32)),
link-begin-node-latitude INTEGER (-90000000..90000000),
link-begin-node-longitude INTEGER (-180000000..180000000),
link-begin-node-identifier IA5String (SIZE(1..32)),
link-end-node-identifier IA5String (SIZE(1..32)),
link-end-node-latitude INTEGER (-90000000..90000000),
link-end-node-longitude INTEGER (-180000000..180000000),
link-direction ENUMERATED
{
link-direction-north (1),
link-direction-northeast (2),
link-direction-east (3),
link-direction-southeast (4),
link-direction-south (5),
link-direction-southwest (6),
link-direction-west (7),
link-direction-northwest (8),
	link-begin-node-identifier [9] LinkBeginNodeIdentifier,
	link-begin-node-latitude [10] LinkBeginNodeLatitude OPTIONAL,
	link-begin-node-longitude [11] LinkBeginNodeLongitude OPTIONAL,
	link-end-node-identifier [12] LinkEndNodeIdentifier,
	link-end-node-latitude [13] LinkEndNodeLatitude OPTIONAL,
	link-end-node-longitude [14] LinkEndNodeLongitude OPTIONAL,
	link-direction [15] LinkDirection OPTIONAL,
	link-length [16] LinkLength OPTIONAL,
	link-capacity [17] LinkCapacity OPTIONAL,
	link-speed-limit [18] LinkSpeedLimit OPTIONAL,
	link-speed-limit-truck [19] LinkSpeedLimitTruck OPTIONAL,
	link-lane-count [20] LinkLaneCount OPTIONAL,
	link-shoulder-width-right [21] LinkShoulderWidthRight OPTIONAL,
	link-shoulder-width-left [22] LinkShoulderWidthLeft OPTIONAL,
	link-median-type [23] LinkMedianType OPTIONAL,
	link-median-type-other [24] OtherText256 OPTIONAL,
	link-pavement-type [25] LinkPavementType OPTIONAL,
	link-pavement-type-other [26] OtherText256 OPTIONAL,
	link-restriction-axle-count [27] LinkRestrictionAxleCount OPTIONAL,
	link-restriction-height [28] LinkRestrictionHeight OPTIONAL,
	link-restriction-length [29] LinkRestrictionLength OPTIONAL,
	link-restriction-weight [30] LinkRestrictionWeight OPTIONAL,
	link-restriction-width [31] LinkRestrictionWidth OPTIONAL
	}
	
	# TxDOT's definition of current link state. This message is used to
	# provide current traffic data for the network.

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

link-direction-not-directional (9),
link-direction-positive-direction (10),
link-direction-negative-direction (11),
link-direction-both-direction (12),
link-direction-any-other (0)
},
link-length INTEGER (0..160000),
link-capacity INTEGER (0..300000),
link-speed-limit INTEGER (0..255),
link-speed-limit-truck INTEGER (0..255) OPTIONAL,
link-lane-count INTEGER (0..50),
link-shoulder-width-right INTEGER (0..999) OPTIONAL,
link-shoulder-width-left INTEGER (0..999) OPTIONAL,
link-median-type ENUMERATED
{
link-median-type-curbed (2),
link-median-type-concrete-barrier (3),
link-median-type-concrete-barrier-with-visibility-screen (4),
link-median-type-guardrail (5),
link-median-type-open-grass (6),
link-median-type-open-sand (7),
link-median-type-painted-median-no-access (8),
link-median-type-separate-roadways (9),
link-median-type-unprotected (10),
link-median-type-other-no-additional-information-required(0),
link-median-type-other-additional-information-required (1)
} OPTIONAL,
link-median-type-other IA5String (SIZE(1..256)) OPTIONAL,
link-pavement-type ENUMERATED
	Current-link-state ::= SEQUENCE
	{
	network-identifier [0] NetworkIdentifier,
	link-identifier [1] LinkIdentifier,
	link-data-type [2] LinkDataType,
	link-data-type-other [3] OtherText256 OPTIONAL,
	link-delay [4] LinkDelay OPTIONAL,
	link-travel-time [5] LinkTravelTime OPTIONAL,
	link-volume [6] LinkVolume OPTIONAL,
	link-speed [7] LinkSpeed OPTIONAL,
	link-density [8] LinkDensity OPTIONAL,
	link-occupancy [9] LinkOccupancy OPTIONAL,
	link-level-of-service [10] LinkLevelOfService OPTIONAL,
	link-vehicle-classification [11] LinkVehicleClassification OPTIONAL,
	link-update-type [12] ObjectUpdateType
	}

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

```
      {
      link-pavement-type-asphalt        (2),
      link-pavement-type-open-graded-asphalt  (3),
      link-pavement-type-concrete       (4),
      link-pavement-type-grooved-concrete     (5),
      link-pavement-type-steel-bridge      (6),
      link-pavement-type-concrete-bridge      (7),
      link-pavement-type-asphalt-overlay-bridge  (8),
      link-pavement-type-timber-bridge     (9),
      link-pavement-type-gravel        (10),
      link-pavement-type-dirt          (11),
      link-pavement-type-other-no-additional-information-required
(0),
      link-pavement-type-other-additional-information-required   (1)
      } OPTIONAL,
   link-pavement-type-other     IA5String   (SIZE(1..256)) OPTIONAL,
   link-restriction-axle-count  INTEGER  (0..20) OPTIONAL,
   link-restriction-height      INTEGER  (0..2000) OPTIONAL,
   link-restriction-length      INTEGER  (0..6000) OPTIONAL,
   link-restriction-weight      INTEGER  (0..80000) OPTIONAL,
   link-restriction-width    INTEGER  (0..2000) OPTIONAL,
   link-restriction-weight-axle    INTEGER  (0..20000) OPTIONAL
}
```

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES
Current-link-state ::= SEQUENCE { link-identifier IA5String (SIZE(1..32)), link-data-type ENUMERATED { link-data-type-actual (2), link-data-type-reconstructed (3), link-data-type-historical (4), link-data-type-predicted (5), link-data-type-smoothed (6), link-data-type-averaged (7), link-data-type-no-additional-information-required (0), link-data-type-additional-information-required (1) } OPTIONAL, link-data-type-other IA5String(SIZE(1..256)) OPTIONAL, link-delay INTEGER (0..605000) OPTIONAL, link-travel-time INTEGER (0..65535) OPTIONAL, link-volume INTEGER (1..100000) OPTIONAL, link-speed-average INTEGER (0..255) OPTIONAL,	# Node sets not implemented. Only traffic data for all links defined # in the network are sent. # Current node conditions not needed in this implementation. Current-node-conditions ::= SEQUENCE { node-identifier [0] NodeIdentifier,

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

link-density INTEGER (0..2000) OPTIONAL,
link-headway INTEGER (0..605000) OPTIONAL,
link-occupancy INTEGER (0..100) OPTIONAL
}
 	
Node-set ::= SEQUENCE
{
network-identifier IA5String (SIZE(1..32)),
section-identifier IA5String (SIZE(1..32)) OPTIONAL,
section-node-count INTEGER (1..255) OPTIONAL,
node-identifier-list SEQUENCE OF IA5String (SIZE(1..32))
}
 	
Current-node-conditions ::= SEQUENCE
{
node-identifier IA5String (SIZE(1..32)),
node-status ENUMERATED
{
node-status-no-determination (2),
node-status-open (3),
node-status-restricted (4),
node-status-closed (5),
node-status-other-no-additional-information-required (0),
node-status-other-additional-information-required (1)
	node-status [1] NodeStatus,
	node-status-other [2] OtherText256 OPTIONAL
	}
	
	# TxDOT-defined message for obtaining the current travel speed on the
	# instrumented roadway.
	
	Network-state-report ::= SEQUENCE
	{
	network-identifier [0] NetworkIdentifier,
	network-link-count [1] NetworkLinkCount,
	current-state-list [2] SEQUENCE OF Current-link-state
	}

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES
}, node-status-other IA5String (SIZE(1..256)) OPTIONAL }	

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES
	Device control is not accomplished by obtaining access to a device, then performing multiple operations on it. Control requests are issued for a specific device type, and in the form of a command request/response.

Field-device-status-request ::= SEQUENCE
{
organization-contact-organization-identifier IA5String (SIZE(1..32)),
network-identifier IA5String (SIZE(1..32)),
organization-resource-center-identifier IA5String (SIZE(1..32)) OPTIONAL,
network-identifier IA5String (SIZE(1..32)),
device-node-identifier IA5String (SIZE(1..32)) OPTIONAL,
device-link-identifier IA5String (SIZE(1..32)) OPTIONAL,
E(1..32)),
device-type ENUMERATED
{
device-type-cctv-camera (2),
device-type-dynamic-message-sign (3),
device-type-environmental-sensor-station (4),
device-type-gate (5),
device-type-highway-advisory-radio (6),
device-type-meter (7),
device-type-detector (8),
device-type-controller (9),
device-type-other-no-additional-information (0),
device-type-other-additional-information (1)
	---------- 	
	-- This data element identifies the number of instances
	-- of a particular device type.
	---------- 	
	DeviceCount ::= INTEGER (0..999)
	---------- 	
	-- This data element identifies a type of device data.
	-- It is used when making a device status request.
	---------- 	
	DeviceDataType ::= ENUMERATED
	{
	device-data-type-dms-status (2),
	device-data-type-lcs-status (3),
	device-data-type-cctv-status (4),
	device-data-type-cctv-snapshot (5)
	}
	---------- 	
	-- This data element is used to report the status of a
	-- remote user's connection request to a TMC for purposes
	-- of device command/control.
	---------- 	

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES
},	ConnectionRequestStatus::= BIT STRING
device-type-other IA5String (SIZE(1..256)) OPTIONAL,	{
device-identifier IA5String (SIZE(1..32))	connection-request-status-unknown (1),
}	connection-request-status-success (2),
	connection-request-status-failed-invalid-login (3),
	connection-request-status-failed-system-busy (4),
	connection-request-status-failed-remote-access-denied (5)
	}
Device-control-request ::= SEQUENCE	----------
{	-- This data element is used to select which types of device
organization-contact-organization-identifier IA5String (SIZE(1..32)),	-- data to return for a specified network.
organization-resource-center-identifier IA5String (SIZE(1..32)) OPTIONAL,	----------
device-organization-operator-identifier IA5String (SIZE(1..32)) OPTIONAL,	NetworkDeviceDataTypes ::= BIT STRING
network-identifier IA5String (SIZE(1..32)),	{
device-link-identifier IA5String (SIZE(1..32)) OPTIONAL,	network-device-data-types-dms-status (1),
device-node-identifier IA5String (SIZE(1..32)) OPTIONAL,	network-device-data-types-lcs-status (2),
device-type ENUMERATED	network-device-data-types-cctv-status (3),
{	network-device-data-types-video-inputs (4),
device-type-cctv-camera (2),	network-device-data-types-video-outputs (5)
device-type-dynamic-message-sign (3),	}
device-type-environmental-sensor-station (4),	----------
device-type-gate (5),	-- This data element is used to report the status of a DMS
device-type-highway-advisory-radio (6),	-- control request.
device-type-meter (7),	----------
device-type-detector (8),	DMSControlRequestStatus ::= BIT STRING
device-type-controller (9),	{
device-type-other-no-additional-information (0),	dms-control-request-status-unknown (0),

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

device-type-other-additional-information (1)
},
device-type-other IA5String (SIZE(1..256)) OPTIONAL,
device-identifier IA5String (SIZE(1..32)),
device-node-identifier IA5String (SIZE(1..32))
}
 	
Device-control-response ::= SEQUENCE
{
organization-contact-organization-identifier IA5String (SIZE(1..32)),
organization-resource-center-identifier IA5String (SIZE(1..32)) OPTIONAL,
device-organization-operator-identifier IA5String (SIZE(1..32)) OPTIONAL,
network-identifier IA5String (SIZE(1..32)),
device-link-identifier IA5String (SIZE(1..32)) OPTIONAL,
device-node-identifier IA5String (SIZE(1..32)) OPTIONAL,
device-type ENUMERATED
{
device-type-cctv-camera (2),
device-type-dynamic-message-sign (3),
device-type-environmental-sensor-station (4),
device-type-gate (5),
device-type-highway-advisory-radio (6),
device-type-meter (7),
	dms-control-request-status-success (1),
	dms-control-request-status-permission-denied (2),
	dms-control-request-status-unknown-identifier (3),
	dms-control-request-status-invalid-message (4),
	dms-control-request-status-invalid-message-size (5),
	dms-control-request-status-beacon-request-failed (6)
	}
	
	--- 	
	-- This data element is used to report the status of an LCS
	-- control request.
	--- 	
	LCSControlRequestStatus ::= BIT STRING
	{
	lcs-control-request-status-unknown (0),
	lcs-control-request-status-success (1),
	lcs-control-request-status-permission-denied (2),
	lcs-control-request-status-unknown-identifier (3),
	lcs-control-request-status-invalid-request (4)
	}
	--- 	
	-- This message is used to request access to a remote TMC
	-- for purposes of sending subsequent command/control
	-- requests to roadside devices.
	--- 	
	ConnectionRequest ::= SEQUENCE
	{
	network-identifier [0] NetworkIdentifier,
	host-access-identifier [1] UserIdentifier,

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

device-type-detector (8),
device-type-controller (9),
device-type-other-no-additional-information (0),
device-type-other-additional-information (1)
},
device-type-other IA5String (SIZE(1..256)) OPTIONAL,
device-identifier IA5String (SIZE(1..32)),
device-node-identifier IA5String (SIZE(1..32)),
device-acknowledge-control ENUMERATED
{
device-control-acknowledged-device-available (2),
device-control-denied-device-in-use (3),
device-control-denied-device-off-line (4),
device-control-other-no-additional-information (0),
device-control-other-additional-information (1)
},
device-acknowledge-control-other IA5String (SIZE(1..256)) OPTIONAL
}
	host-access-password [2] Password
	}
	
	--- 	
	-- This is the response message for the connection request.
	--- 	
	ConnectionRequestResponse ::= SEQUENCE
	{
	network-identifier [0] NetworkIdentifier,
	connection-request-status [1] ConnectionRequestStatus
	}
	
	--- 	
	-- This message is used to request the status of a specific
	-- field device at the TMC. Would only be issued after
	-- a successful connection request.
	--- 	
	Field-device-status-request ::= SEQUENCE
	{
	network-identifier [0] NetworkIdentifier,
	device-identifier [1] DeviceIdentifier,
	device-link-identifier [2] LinkIdentifier OPTIONAL,
	device-node-identifier [3] NodeIdentifier OPTIONAL,
	device-data-type [4] DeviceDataType
	}
	
	--- 	
	-- This sequence identifies video channel information for a
	-- network. A list of these for both video input and output

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

```
-- channels can be retrieved using the
-- Network-device-status-request message.
-------------------------------------------------------------
CCTV-video-channel-data ::= SEQUENCE
{
 network-identifier                    [0] NetworkIdentifier,
 cctv-channel-identifier               [1] DeviceIdentifier,
 cctv-channel-name                     [2] DeviceName
}


-------------------------------------------------------------
-- This message allows a remote user to request all of the
-- current device information for specific device types at
-- a network. Dynamic lists can be built from the response
-- data, from which specific command/control requests can
-- be made. This is a one-time subscription, which should
-- be cancelled when the response is sent.
-------------------------------------------------------------
Network-device-status-request ::= SEQUENCE
{
 network-identifier                    [0] NetworkIdentifier,
 device-data-types                     [1] NetworkDeviceDataTypes
}


-------------------------------------------------------------
-- This publication message returns the information requested
-- in the Network-device-status-request message.
-------------------------------------------------------------
Network-device-status-response ::= SEQUENCE
```

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES
	{
	network-identifier [0] NetworkIdentifier,
	dms-count [1] DeviceCount,
	lcs-count [2] DeviceCount,
	cctv-count [3] DeviceCount,
	cctv-input-channel-count [4] DeviceCount,
	cctv-output-channel-count [5] DeviceCount,
	dms-status-list [6] DMSStatusList,
	lcs-status-list [7] LCSStatusList,
	cctv-status-list [8] CCTVStatusList,
	cctv-input-channel-list [9] CCTVInputChannelList,
	cctv-output-channel-list [10] CCTVOutputChannelList
	}
	DMS-device-status ::= SEQUENCE
	{
	network-identifier [0] NetworkIdentifier,
	device-identifier [1] DeviceIdentifier,
	device-name [2] DeviceName,
	device-location-latitude [3] Latitude,
	device-location-longitude [4] Longitude,
	dms-status [5] DMSStatus,
	dms-geometry-row-count [6] DMSGeometryRowCount,
	dms-geometry-column-count [7] DMSGeometryColumnCount,
	dms-beacon-status [8] DMSBeaconStatus,
	dms-message-MULTI-string [9] DMSMessageMULTIString,
	dms-update-type [10] ObjectUpdateType

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES
	}
	---------- --
	-- Allows for a report containining multiple DMSstatuses. This can be used
	-- for both the comprehensive DMS status list and any updates (event-driven or
	-- periodic).
	---------- --
	DMSStatusList ::= SEQUENCE OF DMS-device-status
DMS-device-status ::= SEQUENCE	
{	
network-identifier IA5String (SIZE(1..32)),	DMS-device-status ::= SEQUENCE
device-link-identifier IA5String (SIZE(1..32)) OPTIONAL,	{
device-node-identifier IA5String (SIZE(1..32)) OPTIONAL,	network-identifier [0] NetworkIdentifier,
device-organization-operator-identifier IA5String (SIZE(1..32)) OPTIONAL,	device-identifier [1] DeviceIdentifier,
device-identifier IA5String (SIZE(1..32)),	device-name [2] DeviceName,
dms-error-short-error-status BIT STRING	device-location-latitude [3] Latitude,
{	device-location-longitude [4] Longitude,
dms-error-communications-error (2),	dms-status [5] DMSStatus,
dms-error-power-error (3),	dms-geometry-row-count [6] DMSGeometryRowCount,
dms-error-attached-device-error (4),	dms-geometry-column-count [7] DMSGeometryColumnCount,
dms-error-lamp-error (5),	dms-beacon-status [8] DMSBeaconStatus,
dms-error-pixel-error (6),	dms-message-MULTI-string [9] DMSMessageMULTIString,
dms-error-photocell-error (7),	dms-update-type [10] ObjectUpdateType
dms-error-message-error (8),	}
dms-error-controller-error (9),	---------- --

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

dms-error-temperature-warning (10),
dms-error-fan-error (11),
dms-error-other-no-additional-information-required (0),
dms-error-other-additional-information-required (1)
},
dms-error-other IA5String (SIZE(1..256)) OPTIONAL,
dms-message-MULTI-string OCTET STRING (SIZE(1..1024)) OPTIONAL,
dms-message-table-source OCTET STRING (SIZE(5)) OPTIONAL,
dms-message-time-remaining INTEGER (0..65535) OPTIONAL,
dms-message-source-mode ENUMERATED
{
dms-message-source-mode-local (2),
dms-message-source-mode-external (3),
dms-message-source-mode-other-com1 (4),
dms-message-source-mode-other-com2 (5),
dms-message-source-mode-other-com3 (6),
dms-message-source-mode-other-com4 (7),
dms-message-source-mode-central (8),
dms-message-source-mode-time-based-scheduler (9),
dms-message-source-mode-power-recovery (10),
dms-message-source-mode-reset (11),
dms-message-source-mode-comm-loss (12),
dms-message-source-mode-power-loss (13),
dms-message-source-mode-end-duration (14),
dms-message-source-mode-other-no-additional-info-required (0),
dms-message-source-mode-other-additional-info-required (1)
} OPTIONAL,
dms-message-source-mode-other IA5String (SIZE(1..256)) OPTIONAL
}
	-- Allows for a report containining multiple DMSstatuses. This can be used
	-- for both the comprehensive DMS status list and any updates (event-driven or
	-- periodic).
	---------- 	
	DMSStatusList ::= SEQUENCE OF DMS-device-status
	
	---------- 	
	-- This data element is used to specify whether to turn DMS
	-- beacons on or off, or to not change the current status.
	---------- 	
	DMSBeaconControl ::= ENUMERATED
	{
	dms-beacon-control-no-change (0),
	dms-beacon-control-off (1),
	dms-beacon-control-on (2)
	}
	
	---------- 	
	-- This message requests an update of a specific DMS. It is
	-- a one-time subscription, which should be cancelled when
	-- the response is sent.
	---------- 	

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

END
 	
DMS-device-control ::= SEQUENCE
{
 network-identifier IA5String (SIZE(1..32)),
 device-organization-operator-identifier IA5String (SIZE(1..32)) OPTIONAL,
 device-link-identifier IA5String (SIZE(1..32)),
 device-node-identifier IA5String (SIZE(1..32)) OPTIONAL,
 device-organization-operator-identifier IA5String (SIZE(1..32)) OPTIONAL,
 device-identifier IA5String (SIZE(1..32)) OPTIONAL,
 dms-request-activate-message INTEGER (1..255),
 dms-message-activation-code BIT STRING OPTIONAL
}
	DMS-command-request ::= SEQUENCE
	{
	 network-identifier [0] NetworkIdentifier,
	 device-identifier [1] DeviceIdentifier,
	 user-identifier [2] UserIdentifier,
	 password [3] Password,
	 dms-beacon-control [4] DMSBeaconControl,
	 dms-message-MULTI-string [5] DMSMessageMULTIString
	}
	
	--- 	
	-- This publication message returns the status of the
	-- DMS-command-request.
	--- 	
	DMS-command-response ::= SEQUENCE
	{
	 network-identifier [0] NetworkIdentifier,
	 device-identifier [1] DeviceIdentifier,
	 status [2] DMSControlRequestStatus
	}

CCTV-device-status ::= SEQUENCE { network-identifier IA5String (SIZE(1..32)), device-link-identifier IA5String (SIZE(1..32)) OPTIONAL, device-organization-operator-identifier IA5String (SIZE(1..32)) OPTIONAL, device-identifier IA5String (SIZE(1..32)), device-node-identifier IA5String (SIZE(1..32)) OPTIONAL,	--- -- This data element is used to report the status of a CCTV -- 'Lock Camera' control request. --- CCTVControlLockRequestStatus ::= BIT STRING {

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

cctv-error BIT STRING
{
cctv-error-communications-error (2),
cctv-error-power-failure (3),
cctv-error-device-error (4),
cctv-error-controller-error (5),
cctv-error-other-error-no-additional-information (0),
cctv-error-other-error-additional-information (1)
},
cctv-error-other IA5String (SIZE(1..256)) OPTIONAL,
cctv-position-pan OCTET STRING (SIZE(4)) OPTIONAL,
cctv-position-tilt OCTET STRING (SIZE(4)) OPTIONAL,
cctv-position-zoom-lens OCTET STRING (SIZE(4)) OPTIONAL,
cctv-position-iris-lens OCTET STRING (SIZE(4)) OPTIONAL,
cctv-position-focus-lens OCTET STRING (SIZE(4)) OPTIONAL
}
 	
CCTV-device-control ::= SEQUENCE
{
cctv-request-command ENUMERATED
{
cctv-request-other-command-no-additional-information (0),
cctv-request-other-command-additional-information (1),
cctv-request-preset (2),
cctv-request-focus (3),
cctv-request-iris (4),
cctv-request-pan (5),
cctv-request-tilt (6),
	cctv-control-lock-request-status-unknown (0),
	cctv-control-lock-request-status-success (1),
	cctv-control-lock-request-status-permission-denied (2),
	cctv-control-lock-request-status-unknown-identifier (3),
	cctv-control-lock-request-status-command-not-supported (4),
	cctv-control-lock-request-status-already-locked (5)
	}
	
	--- 	
	-- This data element is used to report the status of a CCTV
	-- 'Set Preset' control request.
	--- 	
	CCTVControlPresetRequestStatus ::= BIT STRING
	{
	cctv-control-preset-request-status-unknown (0),
	cctv-control-preset-request-status-success (1),
	cctv-control-preset-request-status-permission-denied (2),
	cctv-control-preset-request-status-unknown-identifier (3),
	cctv-control-preset-request-status-command-not-supported (4),
	cctv-control-preset-request-status-preset-not-supported (5)
	}
	
	--- 	
	-- This data element is used to report the status of a CCTV
	-- 'Set Direction' control request.
	--- 	
	CCTVControlDirectionRequestStatus ::= BIT STRING
	{
	cctv-control-direction-request-status-unknown (0),

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

cctv-request-zoom (7),
cctv-request-text-overlay (8)
} OPTIONAL,
cctv-request-other IA5String (SIZE(1..256)) OPTIONAL,
network-identifier IA5String (SIZE(1..32)) OPTIONAL,
device-link-identifier IA5String (SIZE(1..32)),
device-organization-operator-identifier IA5String (SIZE(1..32)) OPTIONAL,
device-identifier IA5String (SIZE(1..32)),
device-node-identifier IA5String (SIZE(1..32)) OPTIONAL,
cctv-position-pan OCTET STRING (SIZE(4)) OPTIONAL,
cctv-position-tilt OCTET STRING (SIZE(4)) OPTIONAL,
cctv-position-zoom-lens OCTET STRING (SIZE(4)) OPTIONAL,
cctv-position-iris-lens OCTET STRING (SIZE(4)) OPTIONAL,
cctv-position-focus-lens OCTET STRING (SIZE(4)) OPTIONAL
}
	cctv-control-direction-request-status-success (1),
	cctv-control-direction-request-status-permission-denied (2),
	cctv-control-direction-request-status-unknown-identifier (3),
	cctv-control-direction-request-status-command-not-supported (4),
	cctv-control-direction-request-status-direction-not-supported (5)
	}
	
	--- 	
	-- This data element is used to report the status of a CCTV
	-- 'Set Absolute Position' or 'Set Offset Position' control
	-- request.
	--- 	
	CCTVControlPositionRequestStatus ::= BIT STRING
	{
	cctv-control-position-request-status-unknown (0),
	cctv-control-position-request-status-success (1),
	cctv-control-position-request-status-permission-denied (2),
	cctv-control-position-request-status-unknown-identifier (3),
	cctv-control-position-request-status-command-not-supported (4),
	cctv-control-position-request-status-failed-pan (5),
	cctv-control-position-request-status-failed-tilt (6),
	cctv-control-position-request-status-failed-zoom (7),
	cctv-control-position-request-status-failed-focus (8),
	cctv-control-position-request-status-failed-iris (9)
	}
	
	--- 	
	-- This data element is used to report the status of a CCTV
	-- 'Video Switch' control request.

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

	CCTVControlSwitchRequestStatus ::= BIT STRING
	{
	cctv-control-switch-request-status-unknown (0),
	cctv-control-switch-request-status-success (1),
	cctv-control-switch-request-status-permission-denied (2),
	cctv-control-switch-request-status-unknown-identifier (3),
	cctv-control-switch-request-status-command-not-supported (4),
	cctv-control-switch-request-status-unknown-output-id (5)
	}

	-- This data element is used to specify whether to lock or
	-- unlock a CCTV.

	CCTVLockMode ::= ENUMERATED
	{
	cctv-lock-mode-lock (1),
	cctv-lock-mode-unlock (2)
	}

	-- This message requests a lock/unlock of a specific CCTV.
	-- It is a one-time subscription, which should be cancelled when
	-- the response is sent.

	CCTV-lock-command-request ::= SEQUENCE
	{
	network-identifier [0] NetworkIdentifier,

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

```
 device-identifier                        [1] DeviceIdentifier,
 user-identifier                          [2] UserIdentifier,
 password                                 [3] Password,
 lock-mode                                [4] CCTVLockMode
}


-------------------------------------------------------------
-- This publication message returns the status of the
-- CCTV-lock-command-request.
-------------------------------------------------------------
CCTV-lock-command-response ::= SEQUENCE
{
 network-identifier                       [0] NetworkIdentifier,
 device-identifier                        [1] DeviceIdentifier,
 status                                   [2] CCTVControlLockRequestStatus,
 cctv-lock-holder-identifier              [3] CCTVLockHolderIdentifier
OPTIONAL
}


-------------------------------------------------------------
-- This message requests a specific CCTV to move to a specified
-- direction. It is a one-time subscription, which should be
-- cancelled when the response is sent.
-------------------------------------------------------------
CCTV-direction-command-request ::= SEQUENCE
{
 network-identifier                       [0] NetworkIdentifier,
 device-identifier                        [1] DeviceIdentifier,
 user-identifier                          [2] UserIdentifier,
 password                                 [3] Password,
```

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

```
 requested-camera-direction              [4] CCTVCurrentCameraDirection
}


--------------------------------------------------------------
-- This publication message returns the status of the
-- CCTV-direction-command-request.
--------------------------------------------------------------
CCTV-direction-command-response ::= SEQUENCE
{
 network-identifier                      [0] NetworkIdentifier,
 device-identifier                       [1] DeviceIdentifier,
 status                                  [2]
CCTVControlDirectionRequestStatus
}


--------------------------------------------------------------
-- This message requests a specific CCTV to move to a specified
-- preset position. It is a one-time subscription, which should be
-- cancelled when the response is sent.
--------------------------------------------------------------
CCTV-preset-command-request ::= SEQUENCE
{
 network-identifier                      [0] NetworkIdentifier,
 device-identifier                       [1] DeviceIdentifier,
 user-identifier                         [2] UserIdentifier,
 password                                [3] Password,
 requested-camera-preset                 [4] CCTVCurrentPresetPosition
}


--------------------------------------------------------------
```

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

```
-- This publication message returns the status of the
-- CCTV-preset-command-request.
-------------------------------------------------------------
CCTV-preset-command-response ::= SEQUENCE
{
 network-identifier                    [0] NetworkIdentifier,
 device-identifier                     [1] DeviceIdentifier,
 status                                [2] CCTVControlPresetRequestStatus
}


-------------------------------------------------------------
-- This message requests a specific CCTV to move to a specified
-- position. It is a one-time subscription, which should be
-- cancelled when the response is sent. The PositionReference
-- values can be either absolute or delta positions.
-------------------------------------------------------------
CCTV-position-command-request ::= SEQUENCE
{
 network-identifier                    [0] NetworkIdentifier,
 device-identifier                     [1] DeviceIdentifier,
 user-identifier                       [2] UserIdentifier,
 password                              [3] Password,
 pan                                   [4] CCTVPositionReference
OPTIONAL,
 tilt                                  [5] CCTVPositionReference
OPTIONAL,
 zoom                                  [6] CCTVPositionReference
OPTIONAL,
 focus                                 [7] CCTVPositionReference
OPTIONAL,
 iris                                  [8] CCTVPositionReference OPTIONAL
```

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

```
}


-------------------------------------------------------------
-- This publication message returns the status of the
-- CCTV-position-command-request.
-------------------------------------------------------------
CCTV-position-command-response ::= SEQUENCE
{
 network-identifier                      [0] NetworkIdentifier,
 device-identifier                       [1] DeviceIdentifier,
 status                                  [2]
CCTVControlPositionRequestStatus
}


-------------------------------------------------------------
-- This message requests a CCTV video switch to occur.
-- It is a one-time subscription, which should be
-- cancelled when the response is sent. The PositionReference
-- values can be either absolute or delta positions.
-------------------------------------------------------------
CCTV-switch-command-request ::= SEQUENCE
{
 network-identifier                      [0] NetworkIdentifier,
 device-identifier                       [1] DeviceIdentifier,
 user-identifier                         [2] UserIdentifier,
 password                                [3] Password,
 video-channel-input-identifier          [4] VideoChannelIdentifier,
 video-channel-output-identifier         [5] VideoChannelIdentifier
}
```

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

TMDD DOES NOT SUPPORT LANE CONTROL SIGNALS (LCS)	----------
	-- This publication message returns the status of the
	-- CCTV-switch-command-request.
	---------- 	
	CCTV-switch-command-response ::= SEQUENCE
	{
	network-identifier [0] NetworkIdentifier,
	device-identifier [1] DeviceIdentifier,
	status [2] CCTVControlSwitchRequestStatus
	}
	
	---------- 	
	-- This message requests an update of a specific LCS. It is
	-- a one-time subscription, which should be cancelled when
	-- the response is sent.
	---------- 	
	LCS-command-request ::= SEQUENCE
	{
	network-identifier [0] NetworkIdentifier,
	device-identifier [1] DeviceIdentifier,
	user-identifier [2] UserIdentifier,
	password [3] Password,
	current-display-settings [4] LCSCurrentDisplaySettings
	}
	
	---------- 	

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

```
-- This publication message returns the status of the
-- LCS-command-request.
-------------------------------------------------------------
LCS-command-response ::= SEQUENCE
{
 network-identifier                      [0] NetworkIdentifier,
 device-identifier                       [1] DeviceIdentifier,
 status                                  [2] LCSControlRequestStatus
}



-------------------------------------------------------------------------
--
-- Definition of the status information for a single Lane Control
-- for both the comprehensive LCS list and any updates (event-driven or
-- periodic).
-------------------------------------------------------------------------
--
LCS-device-status ::= SEQUENCE
{
 network-identifier                      [0] NetworkIdentifier,
 device-identifier                       [1] DeviceIdentifier,
 device-name                             [2] DeviceName,
 device-location-latitude                [3] Latitude,
 device-location-longitude               [4] Longitude,
 lcs-status                              [5] LCSStatus,
 lcs-geometry-head-count                 [6] LCSGeometryHeadCount,
 lcs-head-capabilities                  [7] LCSGeometryHeadCapabilities,
 lcs-current-display-settings            [8] LCSCurrentDisplaySettings,
 lcs-update-type                         [9] ObjectUpdateType
```

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES
	}
	---------- -- -- Allows for a report containining multiple LCS statuses. This can be used -- for both the comprehensive LCS list and any updates (event-driven or -- periodic). ---------- -- LCSStatusList ::= SEQUENCE OF LCS-device-status
HAR-device-status ::= SEQUENCE { network-identifier IA5String (SIZE(1..32)), device-link-identifier IA5String (SIZE(1..32)) OPTIONAL, device-node-identifier IA5String (SIZE(1..32)) OPTIONAL, device-organization-operator-identifier IA5String (SIZE(1..32)) OPTIONAL, device-identifier IA5String (SIZE(1..32)), har-call-sign IA5String (SIZE(1..16)),	

EXISTING TMDD MESSAGES	TXDOT IMPLEMENTATION OF TMDD MESSAGES

```
      har-error-short-error        BIT STRING
            {
            har-error-no-error             (0),
            har-error-comm-failure         (1),
            har-error-power-failure        (2)
            },
      har-status-current-message   INTEGER  (0..255) OPTIONAL,
      har-status-mode              INTEGER  (0..255) OPTIONAL,
      har-schedule-table  SEQUENCE OF HAR-schedule-entry OPTIONAL,
      har-program-table   SEQUENCE OF HAR-program-entry OPTIONAL
      }

HAR-schedule-entry ::= SEQUENCE
      {
      har-day-to-start               IA5String   (SIZE(8)) OPTIONAL,
      har-time-to-start              IA5String   (SIZE(6)) OPTIONAL,
      har-program-identifier         INTEGER     (0..255) OPTIONAL
      }

HAR-program-entry ::= SEQUENCE

      har-program-number             INTEGER     (1..255) OPTIONAL,
      har-message-identifier         OCTET STRING OPTIONAL
      }
```

§