

CROCS
Controller to RSU Open C-ITS Schema
Data Dictionary

Draft Rev. 0.1

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Glossary of terms (traffic/UTC)

Approach	Flow of traffic in a particular direction
ASN.1	Abstract Syntax Notation
Controller	Traffic signal controller
Cycle time	Duration (in seconds) of the Plan
Fixed Time	Plan stages are fixed in duration
GLOSA	Green Light Optimised Speed Advisory
HTTP	Hypertext Transfer Protocol
Inter-green	Time period between two stages
MAP	An electronic description of the junction layout
MOVA	Microprocessor Optimised Vehicle Actuation
OBU	On-board (ie. in-vehicle) unit
PER	Packed Encoding Rules
Phase(s)	Approaches currently on Green
Plan	Sequence of Stages/Phases
RSU	Road Side Unit
SCOOT	Split Cycle Offset, Optimisation & Timing
SPaT	Signal Phase and Timing – defined by SAE J2735
SOAP	Simple Object Access Protocol
Stage(s)	A combination of vehicle movements
UTC	Urban Traffic Control
WSDL	Web Service Description Language
XER	XML Encoding Rules
XML	Extensible Markup Language
XSD	XML Schema Definition

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Version History

Version	Date	Details
Draft 0.1	06/02/17	First published version

1 Introduction

The CROCS (Controller to RSU Open C-ITS Schema) standard was developed to provide a common interface to allow SPaT/MAP to be exchanged between a TR2500 Traffic Signal Controller and a C-ITS Road Side Unit (RSU).

A common data dictionary has been defined to describe the objects used by CROCS. For each object, this data dictionary includes a textual description of the object and how it might be used.

2 SPaT/MAP objects

Signal Phase and Timing (SPaT) objects are transmitted by ITS-G5 (or 802.11p) to inform an On Board Unit (OBU) of the signal status and timing of the approaching junction.

MAP objects are transmitted by ITS-G5 (802.11p) to inform an On Board Unit (OBU) of the junction geometry including 'Approach IDs' and allowable movements.

SPaT/MAP is defined by DSRC_R32_Source_REG-D.asn with object definitions in ITS-Container.txt. This standard is written in ASN.1 and a specific encoding rule is used for the exchange of data.

The transmission of data over ITS-G5 uses Packed Encoding Rules (PER) which, whilst very efficient, are not very flexible and difficult to encode/decode.

To overcome the inflexibility of PER, XML Encoding Rules (XER) was chosen for CROCS. As PER and XER are both defined ASN.1 encoding rules it means that data objects defined in one are directly translatable to the other. Although this data dictionary is written to describe XER, it is equally applicable to PER.

There are a number of objects defined by this standard; most are optional with only a small number which are mandatory. The standard defines two top level [Mandatory] messages, SPAT and MapData.

Each of these top level messages (Parents) have a number of objects (Children) arranged in a hierarchical order, which in turn may have a number of Child objects. A child object which is 'Mandatory' is only required to be supported if its parent object is also supported.

2.1 SPaT

The SPaT message is a sequence of up to 5 main objects. These object groups consist of further sub-objects.

The majority of objects in the SPaT message are optional, although in order to support higher level applications (eg. GLOSA) a number of these optional objects must be supported.

The table in appendix A summarises the SPaT objects which CROCS supports and indicates the status of the object (Mandatory/Optional) in the DSRC standard (SAE J2735).

2.2 MAP

The MAP message is a sequence of up to 11 main objects groups. These object groups are then comprised of further sub-objects.

The majority of objects in the MAP message are optional, although in order to support higher level applications a number of these optional objects must be supported.

The table in appendix B summarises the objects which CROCS supports and indicates the status of the object (Mandatory/Optional) in the DSRC standard (SAE J2735).

3 Protocol

CROCS is transferred from a Controller to RSU using XER (XML Encoding Rules). The XML is contained within a Simple Object Access Protocol (SOAP) header and is sent using an HTTP post to port 80.

SOAP was chosen since it provides a common standard for exchange of data between different systems and defines the transmission protocol. SOAP is also used for DATEX II and other UTMC data exchanges.

The data flow is from Controller to RSU.

3.1 Frequency and validity of messages

The frequency and validity of messages is defined as:

SPaT – Whenever the SPaT content changes and every 30 seconds, whichever occurs first;

MAP - Whenever the MAP content changes and every 5 minutes, whichever occurs first.

If the message content hasn't changed then the last message is repeated at 30 seconds (SPaT) and 5 minutes (MAP).

SOAP messages are from a 'sender' (Controller) to a receiver (RSU). On receipt of a SOAP message the receiver sends an acknowledgement back to the sender as part of the SOAP message exchange.

The RSU therefore knows that the Controller is still sending messages as a SPaT message will be received at least every 30 seconds and a MAP message will be received at least every 5 minutes. If a message has not been received after a period equal to twice the update rate then the RSU will assume that the Controller has stopped sending messages and the last message received will no longer be valid.

The Controller will know if the message has been received by the RSU as it will receive acknowledgements to each message sent out.

3.2 CROCS Schema

The CROCS schema is made up of a SOAP header definition (WSDL) and five XML Schema Definitions (XSD) as follows:

crocs.wsdl	-	SOAP header definition file
CROCS-0-1.xsd	-	Main CROCS schema
ITS-Container.xsd	-	Data types used in ITS
REGION.xsd	-	Regional variations
REG-D.xsd	-	European specific variations
asn1.xsd	-	ASN.1 specific data types

These schemas are stored and available at

www.idtuk.com/downloads/crocs/

This is a temporary location until CROCS is adopted by the relevant standards body.

4 Example

The following example shows a typical CROCS SPaT message for a simple junction sent between a test Controller and RSU. A similar message structure is used for MAP.

```
POST / HTTP/1.1
Host: 192.168.41.209:60006
Content-Type: text/xml; charset=utf-8
Content-Length: 1962
SOAPAction: "crocs/CrocsPortType/SPATCommunicate"

<?xml version="1.0" encoding="UTF-8"?>
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:CROCS="CROCS-0-1"><SOAP-
ENV:Body><CROCS:SPAT><msgID>19</msgID><intersections>
<IntersectionState><id><id>1</id></id><revision>1</revision><status>1000010000000000
</status><timeStamp>44600</timeStamp><states>
<MovementState><signalGroup>1</signalGroup><state-time-speed>
<MovementEvent><eventState>stop-And-Remain</eventState><timing>
<startTime>27296</startTime>
<minEndTime>36002</minEndTime>
<likelyTime>28398</likelyTime><confidence>0</confidence>
</timing></MovementEvent>
<MovementEvent><eventState>pre-Movement</eventState><timing>
<minEndTime>36002</minEndTime>
<likelyTime>28418</likelyTime><confidence>0</confidence>
<nextTime>28398</nextTime>
</timing></MovementEvent>
<MovementEvent><eventState>permissive-Movement-Allowed</eventState><timing>
<minEndTime>36002</minEndTime>
<nextTime>28418</nextTime>
</timing></MovementEvent>
</state-time-speed></MovementState>
<MovementState><signalGroup>2</signalGroup><state-time-speed>
<MovementEvent><eventState>permissive-Movement-Allowed</eventState><timing>
<startTime>27396</startTime>
<minEndTime>36002</minEndTime>
<maxEndTime>28048</maxEndTime>
</timing></MovementEvent>
</state-time-speed></MovementState>
<MovementState><signalGroup>3</signalGroup><state-time-speed>
<MovementEvent><eventState>permissive-clearance</eventState><timing>
<startTime>28046</startTime>
<minEndTime>36002</minEndTime>
</timing></MovementEvent>
</state-time-speed></MovementState>
<MovementState><signalGroup>4</signalGroup><state-time-speed>
<MovementEvent><eventState>stop-And-Remain</eventState><timing>
<startTime>26744</startTime>
<minEndTime>36002</minEndTime>
</timing></MovementEvent>
</state-time-speed></MovementState>
</states></IntersectionState>
</intersections></CROCS:SPAT></SOAP-ENV:Body></SOAP-ENV:Envelope>
```

Appendix A SPaT message

The following table summarises the SPaT objects which CROCS supports and indicates the status of the object (Mandatory/Optional) in the DSRC standard (SAE J2735). The hierarchy is shown by a tab prior to the object name.

Ref	Object Name	M/O	Data Type
3.1	SPaT	M	SEQUENCE
3.2	MsgID	M	DSRCmsgID2
3.3	MsgSubID	O	DSRCmsgSubID
3.4	Intersections	M	IntersectionStateList [1..32]
3.5	IntersectionState	M	SEQUENCE OF
3.6	Id	M	IntersectionReferenceID
3.7	Region	O Remove	RoadRegulatorID
3.8	Id	M	IntersectionID
3.9	Revision	M	MsgCount
3.10	status	M	IntersectionStatusObject
3.11	moy	O	MinuteOfTheYear
3.12	timestamp	O	DSecond2
3.13	states	M	MovementList [1..255]
3.14	MovementState	M	SEQUENCE OF
3.15	movementName	O Remove	DescriptiveName
3.16	signalGroup	M	SignalGroupID
3.17	state-time-speed	M	MovementEventList [1..16]
3.18	MovementEvent	M	SEQUENCE OF
3.19	eventState	M	MovementPhaseState
3.20	timing	O	TimeChangeDetails
3.21	startTime	O	TimeMark
3.22	minEndTime	M	TimeMark
3.23	maxEndTime	O	TimeMark
3.24	likelyTime	O	TimeMark
3.25	confidence	O	TimeIntervalConfidence [0..15]
3.26	nextTime	O	TimeMark
3.27	speeds	O	AdvisorySpeedList [1..16]
3.28	AdvisorySpeedList	M	SEQUENCE OF
3.29	type	M	AdvisorySpeedType
3.30	speed	O	SpeedAdvice [0..500]
3.31	confidence	O	SpeedConfidence
3.32	distance	O	ZoneLength
3.33	class	O	RestrictionClassID
3.34	regional	O	RegionalAdvisorySpeed
3.35	maneuverAssistList	O	ManeuverAssistList [1..16]
3.36	ConnectionManeuverAssist	M	SEQUENCE OF
3.37	connectionID	M	LaneConnectionID
3.38	queueLength	O	ZoneLength

3.39	availableStorageLength	O	ZoneLength
3.40	waitOnStop	O	WaitOnStopline
3.41	pedBicycleDetect	O	PedestrianBicycleDetect
3.42	regional	O	RegionalConnectionManeuverAssist
3.43	Reg-ConnectionManeuverAssist	M	
3.44	vehicleToLanePositions	O	VehicleToLanePositionList
3.45	VehicleToLanePostion	M	VehicleToLanePostion
3.46	stationID	M	StationID
3.47	laneID	M	LaneID
3.48	rsuDistanceFromAnchor	O	NodeOffsetPoint

A.1 SPAT

Descriptive Name	Signal Phase and Timing
Mandatory/Optional	Mandatory
Data Type	Sequence of objects
CROCS	
<pre> <xsd:element name="sPAT" type="SPAT"/> <xsd:complexType name="SPAT"> <xsd:sequence> <xsd:element name="msgID" type="DSRCmsgID2"/> <xsd:element name="msgSubID" minOccurs="0" type="DSRCmsgSubID"/> <xsd:element name="intersections" type="IntersectionStateList"/> <xsd:element name="regional" minOccurs="0" type="RegionalSPAT"/> </xsd:sequence> </xsd:complexType> </pre>	
Definition	This is the top level Signal Phase and Timing message and is a complex object comprising several other data elements.

A.2 SPaT: msgID

Descriptive Name	Message Type
Mandatory/Optional	Mandatory
Data Type	DSRCmsgID2
CROCS	
<pre> <xsd:simpleType name="DSRCmsgID2"> <xsd:restriction base="xsd:unsignedByte"/> </xsd:simpleType> </pre>	
Definition	For SPaT msgID = 13h (19 decimal).

A.3 SPaT: msgSubID

Descriptive Name	Message Sub-type
Mandatory/Optional	Optional
Data Type	DSRCmsgSubID2
CROCS	
<pre><xsd:simpleType name="DSRCmsgSubID"> <xsd:restriction base="xsd:unsignedByte"/> </xsd:simpleType></pre>	
Definition	Currently only set to 0. Retained for compatibility.

A.4 SPaT: intersections

Descriptive Name	Intersection States
Mandatory/Optional	Mandatory
Data Type	IntersectionStateList [1.32]
CROCS	
<pre><xsd:complexType name="IntersectionStateList"> <xsd:sequence minOccurs="1" maxOccurs="32"> <xsd:element name="IntersectionState" type="IntersectionState"/> </xsd:sequence> </xsd:complexType></pre>	
Definition	A list of interection states (between 1 and 32).

A.5 intersections: intersectionState

Descriptive Name	Intersection State object
Mandatory/Optional	Mandatory
Data Type	Sequence of objects
CROCS	
<pre><xsd:complexType name="IntersectionState"> <xsd:sequence> <xsd:element name="id" type="IntersectionReferenceID"/> <xsd:element name="revision" type="MsgCount"/> <xsd:element name="status" type="IntersectionStatusObject"/> <xsd:element name="moy" minOccurs="0" type="MinuteOfTheYear"/> <xsd:element name="timeStamp" minOccurs="0" type="DSecond2"/> <xsd:element name="enabledLanes" minOccurs="0" type="EnabledLaneList"/> <xsd:element name="states" type="MovementList"/> <xsd:element name="maneuverAssistList" minOccurs="0" type="ManeuverAssistList"/> <xsd:element name="priority" minOccurs="0" type="SignalControlState"/> <xsd:element name="preempt" minOccurs="0" type="SignalControlState"/> <xsd:element name="regional" minOccurs="0" type="RegionalIntersectionState"/> </xsd:sequence> </xsd:complexType></pre>	
Definition	This complex object holds the SPaT data, one entry per intersection.

A.6 intersectionState: id

Descriptive Name	Intersection ID
Mandatory/Optional	Mandatory
Data Type	IntersectionReferenceID
CROCS	
<pre><xsd:complexType name="IntersectionReferenceID"> <xsd:sequence> <xsd:element name="region" minOccurs="0" type="RoadRegulatorID"/> <xsd:element name="id" type="IntersectionID"/> </xsd:sequence> </xsd:complexType></pre>	
Definition	
<p>This complex object holds an optional 'region' and an ID for the intersection. The optional 'region' is only used for testing and is not used in CROCS.</p>	

A.7 id: region

Descriptive Name	Region
Mandatory/Optional	Optional (Only used for testing)
Data Type	RoadRegulatorID
CROCS	
Definition	
<p>This optional object is only used in debug and has not been included in CROCS.</p>	

A.8 id: id

Descriptive Name	Intersection ID
Mandatory/Optional	Mandatory
Data Type	IntersectionID [0..65535]
CROCS	
<pre><xsd:simpleType name="IntersectionID"> <xsd:restriction base="xsd:unsignedShort"/> </xsd:simpleType></pre>	
Definition	
<p>This object holds the ID for the intersection and is used to reference the SPaT data to Intersection geometry in the MAP data. This could be the SCN or any other unique identifier.</p>	

A.9 intersectionState: revision

Descriptive Name	Version of CROCS/SPaT
Mandatory/Optional	Mandatory
Data Type	MsgCount [0..127]
CROCS	
<pre><xsd:simpleType name="MsgCount"> <xsd:restriction base="xsd:unsignedByte"> <xsd:minInclusive value="0"/> <xsd:maxInclusive value="127"/> </xsd:restriction> </xsd:simpleType></pre>	
Definition	
This object specifies the revision/version for SPaT.	

A.10 intersectionState: status

Descriptive Name	Intersection Status
Mandatory/Optional	Mandatory
Data Type	IntersectionStatusObject
CROCS	
<pre><xsd:simpleType name="IntersectionStatusObject"> <xsd:union> <xsd:simpleType> <xsd:restriction base="asn1:BitString"> <xsd:length value="16"/> </xsd:restriction> </xsd:simpleType> <xsd:simpleType> <xsd:restriction> <xsd:simpleType> <xsd:list> <xsd:simpleType> <xsd:restriction base="xsd:token"> <xsd:enumeration value="manualControlIsEnabled"/> <xsd:enumeration value="stopTimeIsActivated"/> <xsd:enumeration value="failureFlash"/> <xsd:enumeration value="preemptIsActive"/> <xsd:enumeration value="transitSignalPriorityIsActive"/> <xsd:enumeration value="fixedTimeOperation"/> <xsd:enumeration value="trafficDependentOperation"/> <xsd:enumeration value="standbyOperation"/> <xsd:enumeration value="failureMode"/> <xsd:enumeration value="off"/> <xsd:enumeration value="recentMAPmessageUpdate"/> <xsd:enumeration value="recentChangeInMAPassignedLanesIDsUsed"/> <xsd:enumeration value="noValidMAPisAvailableAtThisTime"/> <xsd:enumeration value="noValidSPaTisAvailableAtThisTime"/> </xsd:restriction> </xsd:simpleType> </xsd:list> </xsd:simpleType> <xsd:maxLength value="16"/> </xsd:restriction> </xsd:simpleType> </xsd:union> </xsd:simpleType></pre>	

Definition

A bit string of junction status values. The following bit values could be supported [in the UK]:

- Bit 0 – Signals in manual control
- Bit 5 – If the traffic signals is running in fixed time
- Bit 6 – If demand dependant stages are running
- Bit 9 – Off, if the controller is still running, but not setting the signals
- Bit 10 – New MAP update
- Bit 11 – If the lanes in the MAP have been updated or changed
- Bit 12 – If the MAP is not available
- Bit 13 – If SPaT is not available.

Generally, the data value will be 0020h for Fixed time and 0040h for demand dependant. There is no value for SCOOT/MOVA so suggest setting this to 0040h (demand dependant).

A.11 intersectionState: moy

Descriptive Name	Minute of the Year (MOY)
Mandatory/Optional	Optional
Data Type	MinuteOfTheYear
CROCS	

```
<xsd:simpleType name="MinuteOfTheYear">
  <xsd:restriction base="xsd:unsignedInt">
    <xsd:minInclusive value="0"/>
    <xsd:maxInclusive value="527040"/>
  </xsd:restriction>
</xsd:simpleType>
```

Definition

Minute of the current Year. Units on 1 minute with reference to 00:00 on January 1st. Only used with messages to be archived.

A.12 intersectionState: timestamp

Descriptive Name	Timestamp of the message
Mandatory/Optional	Optional
Data Type	DSecond2
CROCS	

```
<xsd:simpleType name="DSecond2">
  <xsd:restriction base="xsd:unsignedShort"/>
</xsd:simpleType>
```

Definition

The time the message was constructed in milliseconds. The range is 0..65535 and defines the time with reference to the start of the current minute.

A.13 intersectionState: states

Descriptive Name	Sequence of Movements
Mandatory/Optional	Mandatory
Data Type	MovementList [1..255]
CROCS	
<pre><xsd:complexType name="MovementList"> <xsd:sequence minOccurs="1" maxOccurs="255"> <xsd:element name="MovementState" type="MovementState"/> </xsd:sequence> </xsd:complexType></pre>	
Definition	A list of movement states (between 1 and 255).

A.14 state: MovementState

Descriptive Name	A Movement state
Mandatory/Optional	Mandatory
Data Type	MovementState
CROCS	
<pre><xsd:complexType name="MovementState"> <xsd:sequence> <xsd:element name="signalGroup" type="SignalGroupID"/> <xsd:element name="state-time-speed" type="MovementEventList"/> <xsd:element name="maneuverAssistList" minOccurs="0" type="ManeuverAssistList"/> <xsd:element name="regional" minOccurs="0" type="RegionalMovementState"/> </xsd:sequence> </xsd:complexType></pre>	
Definition	A movement state.

A.15 MovementState: movementName

Descriptive Name	A descriptive name for the movement
Mandatory/Optional	Optional (Only used for debug)
Data Type	DescriptiveName
CROCS	
Definition	A descriptive name for the movement. Not used in CROCS.

A.16 MovementState: signalGroup

Descriptive Name	Unique reference for the signals
Mandatory/Optional	Mandatory
Data Type	SignalGroupID [0..255]
CROCS	
<pre><xsd:simpleType name="SignalGroupID"> <xsd:restriction base="xsd:unsignedByte"/> </xsd:simpleType></pre>	
Definition	Signal group ID is a unique reference between 0 and 255 and references the lane data in the MAP.

A.17 MovementState: state-time-speed

Descriptive Name	A list of Movements
Mandatory/Optional	Mandatory
Data Type	MovementEventList [1..16]
CROCS	
<pre><xsd:complexType name="MovementEventList"> <xsd:sequence minOccurs="1" maxOccurs="16"> <xsd:element name="MovementEvent" type="MovementEvent"/> </xsd:sequence> </xsd:complexType></pre>	
Definition	A complex object of Movement events. Allows for up to 16 movements.

A.18 state-time-speed: MovementEvent

Descriptive Name	A list of SPaT data values
Mandatory/Optional	Mandatory
Data Type	Sequence of [complex] objects
CROCS	
<pre><xsd:complexType name="MovementEvent"> <xsd:sequence> <xsd:element name="eventState" type="MovementPhaseState"/> <xsd:element name="timing" minOccurs="0" type="TimeChangeDetails"/> <xsd:element name="speeds" minOccurs="0" type="AdvisorySpeedList"/> <xsd:element name="regional" minOccurs="0" type="RegionalMovementEvent"/> </xsd:sequence> </xsd:complexType></pre>	
Definition	The SPaT timing values

A.19 MovementEvent: eventState

Descriptive Name	A specific Movement state
Mandatory/Optional	Mandatory
Data Type	MovementPhaseState
CROCS	

```
<xsd:simpleType name="MovementPhaseState">
  <xsd:restriction base="xsd:token">
    <xsd:enumeration value="unavailable"/>
    <xsd:enumeration value="dark"/>
    <xsd:enumeration value="stop-Then-Proceed"/>
    <xsd:enumeration value="stop-And-Remain"/>
    <xsd:enumeration value="pre-Movement"/>
    <xsd:enumeration value="permissive-Movement-Allowed"/>
    <xsd:enumeration value="protected-Movement-Allowed"/>
    <xsd:enumeration value="permissive-clearance"/>
    <xsd:enumeration value="protected-clearance"/>
    <xsd:enumeration value="caution-Conflicting-Traffic"/>
  </xsd:restriction>
</xsd:simpleType>
```

Definition

A movement state definition. Some of these states may not be available [in the UK].

A.20 MovementEvent: timing

Descriptive Name	SPaT Values
Mandatory/Optional	Optional
Data Type	TimeChangeDetails
CROCS	

```
<xsd:complexType name="TimeChangeDetails">
  <xsd:sequence>
    <xsd:element name="startTime" minOccurs="0" type="TimeMark"/>
    <xsd:element name="minEndTime" type="TimeMark"/>
    <xsd:element name="maxEndTime" minOccurs="0" type="TimeMark"/>
    <xsd:element name="likelyTime" minOccurs="0" type="TimeMark"/>
    <xsd:element name="confidence" minOccurs="0" type="TimeIntervalConfidence"/>
    <xsd:element name="nextTime" minOccurs="0" type="TimeMark"/>
  </xsd:sequence>
</xsd:complexType>
```

Definition

The SPaT timing values

A.21 timing: startTime

Descriptive Name	The time the current state started
Mandatory/Optional	Optional
Data Type	TimeMark [0..36002]
CROCS	
<pre><xsd:simpleType name="TimeMark"> <xsd:restriction base="xsd:unsignedShort"> <xsd:minInclusive value="0"/> <xsd:maxInclusive value="36002"/> </xsd:restriction> </xsd:simpleType></pre>	
Definition	<p>TimeMark is tenths of a second in the current or next hour.</p> <ul style="list-style-type: none"> - 36001 is used to indicate > 3600s. - 36002 is used when the value is unknown. <p>The time the current state started.</p>

A.22 timing: minEndTime

Descriptive Name	The earliest time the state can end
Mandatory/Optional	Mandatory
Data Type	TimeMark [0..36002]
CROCS	
<pre><xsd:simpleType name="TimeMark"> <xsd:restriction base="xsd:unsignedShort"> <xsd:minInclusive value="0"/> <xsd:maxInclusive value="36002"/> </xsd:restriction> </xsd:simpleType></pre>	
Definition	<p>TimeMark is tenths of a second in the current or next hour.</p> <ul style="list-style-type: none"> - 36001 is used to indicate > 3600s. - 36002 is used when the value is unknown. <p>A prediction of the earliest time the state can end.</p>

A.23 timing: maxEndTime

Descriptive Name	The latest time the state can end
Mandatory/Optional	Optional
Data Type	TimeMark [0..36002]
CROCS	
<pre><xsd:simpleType name="TimeMark"> <xsd:restriction base="xsd:unsignedShort"> <xsd:minInclusive value="0"/> <xsd:maxInclusive value="36002"/> </xsd:restriction> </xsd:simpleType></pre>	

Definition

TimeMark is tenths of a second in the current or next hour.

- 36001 is used to indicate > 3600s.
- 36002 is used when the value is unknown.

A prediction of the latest time the state can end.

A.24 timing: likelyTime

Descriptive Name The likely time the state will end

Mandatory/Optional Optional

Data Type TimeMark [0..36002]

CROCS

```
<xsd:simpleType name="TimeMark">
  <xsd:restriction base="xsd:unsignedShort">
    <xsd:minInclusive value="0"/>
    <xsd:maxInclusive value="36002"/>
  </xsd:restriction>
</xsd:simpleType>
```

Definition

TimeMark is tenths of a second in the current or next hour.

- 36001 is used to indicate > 3600s.
- 36002 is used when the value is unknown.

A prediction of the likely time the state will end.

A.25 timing: confidence

Descriptive Name A confidence level of the likelyTime

Mandatory/Optional Optional

Data Type TimeIntervalConfidence

CROCS

```
<xsd:simpleType name="TimeIntervalConfidence">
  <xsd:restriction base="xsd:unsignedByte">
    <xsd:minInclusive value="0"/>
    <xsd:maxInclusive value="15"/>
  </xsd:restriction>
</xsd:simpleType>
```

Definition

The confidence is an integer (percentage) of how confident the likelyTime is. In a fixed time UTC system this could be quite high, say =15 (100%), but with demand dependant stages and/or SCOOT/MOVA, this would be lower.

A.26 timing: nextTime

Descriptive Name	The next time the state will start
Mandatory/Optional	Optional
Data Type	TimeMark [0..36002]
CROCS	
<pre><xsd:simpleType name="TimeMark"> <xsd:restriction base="xsd:unsignedShort"> <xsd:minInclusive value="0"/> <xsd:maxInclusive value="36002"/> </xsd:restriction> </xsd:simpleType></pre>	
Definition	<p>TimeMark is tenths of a second in the current or next hour.</p> <ul style="list-style-type: none"> - 36001 is used to indicate > 3600s. - 36002 is used when the value is unknown. <p>A prediction of the next time the state will start.</p>

A.27 MovementEvent: speeds

Descriptive Name	A list of advisory speeds
Mandatory/Optional	Optional
Data Type	AdvisorySpeedList [1..16]
CROCS	
<pre><xsd:complexType name="AdvisorySpeedList"> <xsd:sequence minOccurs="1" maxOccurs="16"> <xsd:element name="AdvisorySpeed" type="AdvisorySpeed"/> </xsd:sequence> </xsd:complexType></pre>	
Definition	<p>A list of advisory speeds.</p>

A.28 speeds: AdvisorySpeedList

Descriptive Name	An advisory speed
Mandatory/Optional	Mandatory
Data Type	AdvisorySpeed
CROCS	
<pre><xsd:complexType name="AdvisorySpeed"> <xsd:sequence> <xsd:element name="type" type="AdvisorySpeedType"/> <xsd:element name="speed" minOccurs="0" type="SpeedAdvice"/> <xsd:element name="confidence" minOccurs="0" type="ITS-Container:SpeedConfidence"/> <xsd:element name="distance" minOccurs="0" type="ZoneLength"/> <xsd:element name="class" minOccurs="0" type="RestrictionClassID"/> <xsd:element name="regional" minOccurs="0" type="RegionalAdvisorySpeed"/> </xsd:sequence> </xsd:complexType></pre>	
Definition	<p>An advisory speed.</p>

A.29 AdvisorySpeedList: type

Descriptive Name	Advisory speed type
Mandatory/Optional	Mandatory
Data Type	AdvisorySpeedType
CROCS	<pre><xsd:simpleType name="AdvisorySpeedType"> <xsd:union memberTypes="xsd:token"> <xsd:simpleType> <xsd:restriction base="xsd:token"> <xsd:enumeration value="none"/> <xsd:enumeration value="greenwave"/> <xsd:enumeration value="ecoDrive"/> <xsd:enumeration value="transit"/> </xsd:restriction> </xsd:simpleType> </xsd:union> </xsd:simpleType></pre>
Definition	Advisory speed type selection of 'none', 'greenwave', 'ecoDrive' or 'transit'.

A.30 AdvisorySpeedList: speed

Descriptive Name	Advisory speed value
Mandatory/Optional	Optional
Data Type	SpeedAdvice [0..500]
CROCS	<pre><xsd:simpleType name="SpeedAdvice"> <xsd:restriction base="xsd:unsignedShort"> <xsd:minInclusive value="0"/> <xsd:maxInclusive value="500"/> </xsd:restriction> </xsd:simpleType></pre>
Definition	The advisory speed in units of 0.1m/s. A value of 500 is speed unavailable.

A.31 AdvisorySpeedList: confidence

Descriptive Name	Confidence level of the advisory speed
Mandatory/Optional	Optional
Data Type	SpeedConfidence
CROCS	<pre> <xsd:simpleType name="SpeedConfidence"> <xsd:union> <xsd:simpleType> <xsd:restriction base="xsd:token"> <xsd:enumeration value="equalOrWithinOneCentimeterPerSec"/> <xsd:enumeration value="equalOrWithinOneMeterPerSec"/> <xsd:enumeration value="outOfRange"/> <xsd:enumeration value="unavailable"/> </xsd:restriction> </xsd:simpleType> <xsd:simpleType> <xsd:restriction base="xsd:unsignedByte"> <xsd:minInclusive value="1"/> <xsd:maxInclusive value="127"/> </xsd:restriction> </xsd:simpleType> </xsd:union> </xsd:simpleType> </pre>
Definition	A confidence level for the advisory speed. A value of 127 is advisory speed unavailable.

A.32 AdvisorySpeedList: distance

Descriptive Name	Advisory speed zone length
Mandatory/Optional	Optional
Data Type	ZoneLength
CROCS	<pre> <xsd:simpleType name="ZoneLength"> <xsd:restriction base="xsd:unsignedShort"> <xsd:minInclusive value="0"/> <xsd:maxInclusive value="10000"/> </xsd:restriction> </xsd:simpleType> </pre>
Definition	The advisory speed zone length in units of 1m from the stop bar.

A.33 AdvisorySpeedList: class

Descriptive Name	Advisory speed class
Mandatory/Optional	Optional
Data Type	RestrictionClassID
CROCS	
<pre><xsd:simpleType name="RestrictionClassID"> <xsd:restriction base="xsd:unsignedByte"/> </xsd:simpleType></pre>	
Definition	
RestrictionClassID is the vehicle class the speed advisory applies to. Zero or not present means all classes.	

A.34 AdvisorySpeedList: regional

Descriptive Name	Regional Variations
Mandatory/Optional	Optional
Data Type	RegionalAdvisorySpeed
CROCS	
<pre><xsd:complexType name="RegionalAdvisorySpeed"> <xsd:complexContent> <xsd:extension base="REGION:Reg-AdvisorySpeed"/> </xsd:complexContent> </xsd:complexType></pre>	
Definition	
No objects currently defined. Included for compatibility.	

A.35 IntersectionState: maneuverAssistList

Descriptive Name	A list of allowable maneuvers
Mandatory/Optional	Optional
Data Type	ManeuverAssistList [1..16]
CROCS	
<pre><xsd:complexType name="ManeuverAssistList"> <xsd:sequence minOccurs="1" maxOccurs="16"> <xsd:element name="ConnectionManeuverAssist" type="ConnectionManeuverAssist"/> </xsd:sequence> </xsd:complexType></pre>	
Definition	
A list of allowable maneuvers.	

A.36 maneuverAssistList: ConnectionManeuverAssist

Descriptive Name	Allowable maneuver details
Mandatory/Optional	Mandatory
Data Type	ManeuverAssistList
CROCS	
<pre> <xsd:complexType name="ConnectionManeuverAssist"> <xsd:sequence> <xsd:element name="connectionID" type="LaneConnectionID"/> <xsd:element name="queueLength" minOccurs="0" type="ZoneLength"/> <xsd:element name="availableStorageLength" minOccurs="0" type="ZoneLength"/> <xsd:element name="waitOnStop" minOccurs="0" type="WaitOnStopline"/> <xsd:element name="pedBicycleDetect" minOccurs="0" type="PedestrianBicycleDetect"/> <xsd:element name="regional" minOccurs="0" type="RegionalConnectionManeuverAssist"/> </xsd:sequence> </xsd:complexType> </pre>	
Definition	Details of the allowable maneuver.

A.37 ConnectionManeuverAssist: connectionID

Descriptive Name	Connection ID
Mandatory/Optional	Mandatory
Data Type	LaneConnectionID [0..255]
CROCS	
<pre> <xsd:simpleType name="LaneConnectionID"> <xsd:restriction base="xsd:unsignedByte"/> </xsd:simpleType> </pre>	
Definition	An ID for the Connection

A.38 ConnectionManeuverAssist: queueLength

Descriptive Name	The length of the queue
Mandatory/Optional	Optional
Data Type	ZoneLength [0..10000]
CROCS	
<pre> <xsd:simpleType name="ZoneLength"> <xsd:restriction base="xsd:unsignedShort"> <xsd:minInclusive value="0"/> <xsd:maxInclusive value="10000"/> </xsd:restriction> </xsd:simpleType> </pre>	
Definition	The queue length in units of 1m.

A.39 ConnectionManeuverAssist: availableStorageLength

Descriptive Name	The length of the [vehicle] storage
Mandatory/Optional	Optional
Data Type	ZoneLength [0..10000]
CROCS	
<pre><xsd:simpleType name="ZoneLength"> <xsd:restriction base="xsd:unsignedShort"> <xsd:minInclusive value="0"/> <xsd:maxInclusive value="10000"/> </xsd:restriction> </xsd:simpleType></pre>	
Definition	The length of the [vehicle] storage in units of 1m.

A.40 ConnectionManeuverAssist: waitOnStop

Descriptive Name	Wait on Stopline
Mandatory/Optional	Optional
Data Type	WaitOnStopline
CROCS	
<pre><xsd:simpleType name="WaitOnStopline"> <xsd:restriction base="xsd:boolean"/> </xsd:simpleType></pre>	
Definition	If true, vehicles must stop at the stop line and not in the collision area.

A.41 ConnectionManeuverAssist: pedBicycleDetect

Descriptive Name	Pedestrian or bicycle detected
Mandatory/Optional	Optional
Data Type	PedestrianBicycleDetect
CROCS	
<pre><xsd:simpleType name="PedestrianBicycleDetect"> <xsd:restriction base="xsd:boolean"/> </xsd:simpleType></pre>	
Definition	Set to true if any pedestrian or bicycles are detected crossing the zone.

A.42 ConnectionManeuverAssist: regional

Descriptive Name	Regional Connection Maneuver Assist
Mandatory/Optional	Optional
Data Type	RegionalConnectionManeuverAssist
CROCS	
<pre><xsd:complexType name="RegionalConnectionManeuverAssist"> <xsd:complexContent> <xsd:extension base="REG-D:Reg-ConnectionManeuverAssist"/> </xsd:complexContent> </xsd:complexType></pre>	
Definition	Regional variations

A.43 regional: Reg-ConnectionManeuverAssist

Descriptive Name	Regional Connection Maneuver Assist
Mandatory/Optional	Mandatory
Data Type	Sequence of [complex] objects
CROCS	<pre><xsd:complexType name="Reg-ConnectionManeuverAssist"> <xsd:sequence> <xsd:element name="vehicleToLanePositions" minOccurs="0" type="VehicleToLanePositionList"/> <xsd:element name="rsuDistanceFromAnchor" minOccurs="0" type="CROCS-0-1:NodeOffsetPoint"/> </xsd:sequence> </xsd:complexType></pre>
Definition	

A.44 Reg-ConnectionManeuverAssist: vehicleToLanePositions

Descriptive Name	Vehicle to Lane
Mandatory/Optional	Optional
Data Type	VehicleToLanePositionList (Complex type)
CROCS	<pre><xsd:complexType name="VehicleToLanePositionList"> <xsd:sequence minOccurs="1" maxOccurs="5"> <xsd:element name="VehicleToLanePosition" type="VehicleToLanePosition"/> </xsd:sequence> </xsd:complexType></pre>
Definition	

A.45 vehicleToLanePositions: VehicleToLanePosition

Descriptive Name	Vehicle to Lane Position
Mandatory/Optional	Mandatory
Data Type	VehicleToLanePosition (Complex type)
CROCS	<pre><xsd:complexType name="VehicleToLanePosition"> <xsd:sequence> <xsd:element name="stationID" type="ITS-Container:StationID"/> <xsd:element name="laneID" type="CROCS-0-1:LaneID"/> </xsd:sequence> </xsd:complexType></pre>
Definition	

A.46 VehicleToLanePosition: stationID

Descriptive Name	Station ID
Mandatory/Optional	Mandatory
Data Type	StationID
CROCS	
<pre><xsd:simpleType name="StationID"> <xsd:restriction base="xsd:unsignedInt"/> </xsd:simpleType></pre>	
Definition	Station ID for the regional connection maneuver assist.

A.47 VehicleToLanePosition: laneID

Descriptive Name	Station ID
Mandatory/Optional	Mandatory
Data Type	LaneID
CROCS	
<pre><xsd:simpleType name="LaneID"> <xsd:restriction base="xsd:unsignedByte"/> </xsd:simpleType></pre>	
Definition	Lane ID for the regional connection maneuver assist.

A.48 Reg-ConnectionManeuverAssist: rsuDistanceFromAnchor

Descriptive Name	Distance from Anchor
Mandatory/Optional	Optional
Data Type	NodeOffsetPoint
CROCS	
<pre><xsd:complexType name="NodeOffsetPoint"> <xsd:choice> <xsd:element name="node-XY1" type="Node-XY-20b"/> <xsd:element name="node-XY2" type="Node-XY-22b"/> <xsd:element name="node-XY3" type="Node-XY-24b"/> <xsd:element name="node-XY4" type="Node-XY-26b"/> <xsd:element name="node-XY5" type="Node-XY-28b"/> <xsd:element name="node-XY6" type="Node-XY-32b"/> <xsd:element name="node-LatLon" type="Node-LLmD-64b"/> <xsd:element name="node-Regional" type="RegionalNodeOffsetPoint"/> </xsd:choice> </xsd:complexType></pre>	
Definition	Distance from the node reference.

Appendix B MAP message

The following table summarises the objects which CROCS supports and indicates the status of the object (Mandatory/Optional) in the DSRC standard (SAE J2735).

B.1	MapData	M	SEQUENCE OF
B.2	msgID	M	DSRCmsgID2
B.3	msgSubID	O	DSRCmsgSubID
B.4	msgIssueRevision	M	MsgCount
B.5	layerType	O	LayerType
B.6	layerID	O	LayerID
B.7	intersections	O	IntersectionGeometryList
B.8	IntersectionGeometry	M	SEQUENCE OF
B.9	name	O Remove	DescriptiveName
B.10	id	M	IntersectionReferenceID
B.11	region	O	RoadRegulatorID
B.12	id	M	IntersectionID
B.13	revision	M	MsgCount
B.14	refPoint	M	Position3D-2
B.15	lat	M	Latitude
B.16	long	M	Longitude
B.17	elevation	O	Elevation2
B.18	regional	O	RegionalPosition3D
B.19	Reg-Position3D	M	Reg-Position3D
B.20	altitude	M	Sequence of
B.21	altitudeValue	M	AltitudeValue
B.22	altitudeConfidence	M	AltitudeConfidence
B.23	laneWidth	O	LaneWidth
B.24	speedLimits	O	SpeedLimitList [1..9]
B.25	RegulatorySpeedLimit	M	SEQUENCE OF
B.26	type	M	SpeedLimitType
B.27	speed	M	Velocity
B.28	laneSet	M	LaneList
B.29	LaneList	M	GenericLane [1..255]
B.30	GenericLane	M	
B.31	laneID	M	LaneID
B.32	name	O Remove	DescriptiveName
B.33	ingressApproach	O	ApproachID [0..15]
B.34	laneAttributes	M	LaneAttributes
B.35	directionalUse	M	LaneDirection
B.36	sharedWidth	M	LaneSharing
B.37	laneType	M	LaneTypeAttributes
B.38	regional	O	RegionallaneAttributes
B.39	Reg-LaneAttributes	M	Sequence of

B.40	nodeList	M	NodeList2
B.41	nodes		NodeSet
B.42	Node		SEQUENCE OF [2..63]
B.43	delta	M	NodeOffsetPoint
B.44	x	M	Offset
B.45	y	M	Offset
B.46	attributes	O	NodeAttributeSet
B.47	localNode	O	NodeAttributeList
B.48	disabled	O	SegmentAttributeList
B.49	enabled	O	SegmentAttributeList
B.50	data	O	LaneDataAttributeList
B.51	LaneDataAttribute	M	LaneDataAttribute
B.52	regional	O	RegionalNodeAttributeList
B.53	Reg-NodeAttribute	M	RegionalNodeAttribute
B.54	dWidth	O	Offset-B10
B.55	dElevation	O	Offset-B10
B.56	computed	M	ComputedLane
B.57	referenceLaneID	M	LaneID
B.58	offsetXaxis	M	Choice of small/large
B.59	offsetYaxis	M	Choice of small/large
B.60	rotateXY	O	Angle
B.61	scaleXaxis	O	Scale-B12
B.62	scaleYaxis	O	Scale-B12
B.63	regional	O	RegionalComputedLane
B.64	Reg-ComputedLane	M	Reg-ComputedLane
B.65	connectsTo	O	ConnectsToList [1..16]
B.66	Connection	M	Connection
B.67	connectingLane	M	ConnectingLane
B.68	remoteIntersection	O	IntersectionReferenceID
B.69	region	O	RoadRegulatorID
B.70	id	M	IntersectionID
B.71	signalGroup	O	SignalGroupID
B.72	userClass	O	RestrictionClassID
B.73	connectionID	O	LaneConnectionID
B.74	overlays	O	SEQUENCE OF
B.75	OverlayLaneList	M	LaneID
B.76	regional	O	RegionalGenericLane
B.77	Reg-GenericLane	M	Reg-GenericLane
B.78	roadSegments	O	RoadSegmentList
B.79	RoadSegment	M	RoadSegment
B.80	name	O Remove	DescriptiveName
B.81	id	M	RoadSegmentReferenceID
B.13	revision	M	MsgCount
B.14	refPoint	M	Position3D-2
B.15	lat	M	Latitude
B.16	long	M	Longitude

B.17	elevation	O	Elevation2
B.18	regional	O	RegionalPosition3D
B.19	Reg-Position3D	M	Reg-Position3D
B.20	Altitude	M	Sequence of
B.21	AltitudeValue	M	AltitudeValue
B.22	altitudeConfidence	M	AltitudeConfidence
B.23	laneWidth	O	LaneWidth
B.24	speedLimits	O	SpeedLimitList
B.25	RegulatorySpeedLimit	M	SEQUENCE OF [1..9]
B.26	type	M	SpeedLimitType
B.27	speed	M	Velocity
B.82	roadLaneSet	M	RoadLaneSetList
B.83	RoadLaneSetList	M	GenericLane [1..255]
B.30	GenericLane	M	
B.31	laneID	M	LaneID
B.32	name	O Remove	DescriptiveName
B.33	ingressApproach	O	ApproachID [0..15]
B.34	laneAttributes	M	LaneAttributes
B.35	directionalUse	M	LaneDirection
B.36	sharedWidth	M	LaneSharing
B.37	laneType	M	LaneTypeAttributes
B.38	regional	O	RegionalLaneAttributes
B.39	Reg-LaneAttributes	M	Sequence of
B.40	nodeList	M	NodeList2
B.41	nodes		NodeSet
B.42	Node		SEQUENCE OF [2..63]
B.43	delta	M	NodeOffsetPoint
B.44	x	M	Offset
B.45	y	M	Offset
B.46	attributes	O	NodeAttributeSet
B.47	localNode	O	NodeAttributeList
B.48	disabled	O	SegmentAttributeList
B.49	enabled	O	SegmentAttributeList
B.50	data	O	LaneDataAttributeList
B.51	LaneDataAttribute	M	LaneDataAttribute
B.52	regional	O	RegionalNodeAttributeList
B.53	Reg-NodeAttribute	M	RegionalNodeAttribute
B.54	dWidth	O	Offset-B10
B.55	dElevation	O	Offset-B10
B.56	computed	M	ComputedLane
B.57	referenceLaneID	M	LaneID
B.58	offsetXaxis	M	Choice of small/large
B.59	offsetYaxis	M	Choice of small/large
B.60	rotateXY	O	Angle
B.61	scaleXaxis	O	Scale-B12
B.62	scaleYaxis	O	Scale-B12

B.63	regional	O	RegionalComputedLane
B.64	Reg-ComputedLane	M	Reg-ComputedLane
B.65	connectsTo	O	ConnectsToList [1..16]
B.66	Connection	M	Connection
B.67	connectingLane	M	ConnectingLane
B.68	remoteIntersection	O	IntersectionReferenceID
B.69	region	O	RoadRegulatorID
B.70	id	M	IntersectionID
B.71	signalGroup	O	SignalGroupID
B.72	userClass	O	RestrictionClassID
B.73	connectionID	O	LaneConnectionID
B.74	overlays	O	SEQUENCE OF
B.75	OverlayLaneList	M	LaneID
B.76	regional	O	RegionalGenericLane
B.77	Reg-GenericLane	M	Reg-GenericLane
B.84	restrictionList	O	RestrictionClassList [1..254]
B.85	RestrictionClassAssignment	M	SEQUENCE OF
B.86	id	M	RestrictionClassID
B.87	users	M	RestrictionUserTypeList [1..16]
B.88	RestrictionUserType	M	Choice of basicType or regional
B.89	basicType	M	RestrictionAppliesTo
B.90	regional	M	RegionalRestrictionUserType
B.91	Reg-RestrictionUserType	M	SEQUENCE OF
B.92	emission	O	EmissionType
B.93	regional	O	RegionalMapData
B.94	Reg-MapData	M	SignalHeadLocations
B.95	SignalHeadLocationList	O	SEQUENCE OF [1..20]
B.96	node	M	NodeOffsetPoint
B.97	x	M	Offset
B.98	y	M	Offset
B.99	elevation	M	Offset-B11
B.100	signalGroupID	M	SignalGroupID
B.101	crc	O	MsgCRC

B.1 MapData

Descriptive Name	MAP data
Mandatory/Optional	Mandatory
Data Type	Sequence of [complex] objects
CROCS	
<pre> <xsd:element name="mapData" type="MapData"/> <xsd:complexType name="MapData"> <xsd:sequence> <xsd:element name="msgID" type="DSRCmsgID2"/> <xsd:element name="msgSubID" minOccurs="0" type="DSRCmsgSubID"/> <xsd:element name="msgIssueRevision" type="MsgCount"/> <xsd:element name="layerType" minOccurs="0" type="LayerType"/> <xsd:element name="layerID" minOccurs="0" type="LayerID"/> <xsd:element name="intersections" minOccurs="0" type="IntersectionGeometryList"/> <xsd:element name="roadSegments" minOccurs="0" type="RoadSegmentList"/> <xsd:element name="dataParameters" minOccurs="0" type="DataParameters"/> <xsd:element name="restrictionList" minOccurs="0" type="RestrictionClassList"/> <xsd:element name="regional" minOccurs="0" type="RegionalMapData"/> <xsd:element name="crc" minOccurs="0" type="MsgCRC"/> </xsd:sequence> </xsd:complexType> </pre>	
Definition	This is the top level MAP message and is a complex object comprising several other data elements.

B.2 MapData: msgID

Descriptive Name	Message Type
Mandatory/Optional	Mandatory
Data Type	DSRCmsgID2
CROCS	
<pre> <xsd:simpleType name="DSRCmsgID2"> <xsd:restriction base="xsd:unsignedByte"/> </xsd:simpleType> </pre>	
Definition	For MAP msgID = 12h (18 decimal).

B.3 MapData: msgSubID

Descriptive Name	Message Sub-type
Mandatory/Optional	Optional
Data Type	DSRCmsgSubID2
CROCS	
<pre> <xsd:simpleType name="DSRCmsgSubID"> <xsd:restriction base="xsd:unsignedByte"/> </xsd:simpleType> </pre>	
Definition	Currently only set to 0.

B.4 MapData: msgIssueRevision

Descriptive Name	Message revision
Mandatory/Optional	Mandatory
Data Type	MsgCount
CROCS	<pre><xsd:simpleType name="MsgCount"> <xsd:restriction base="xsd:unsignedByte"> <xsd:minInclusive value="0"/> <xsd:maxInclusive value="127"/> </xsd:restriction> </xsd:simpleType></pre>
Definition	Revision for the message [0..127]

B.5 MapData: layerType

Descriptive Name	Layer type
Mandatory/Optional	Optional
Data Type	LayerType
CROCS	<pre><xsd:simpleType name="LayerType"> <xsd:union memberTypes="xsd:token"> <xsd:simpleType> <xsd:restriction base="xsd:token"> <xsd:enumeration value="none"/> <xsd:enumeration value="mixedContent"/> <xsd:enumeration value="generalMapData"/> <xsd:enumeration value="intersectionData"/> <xsd:enumeration value="curveData"/> <xsd:enumeration value="roadwaySectionData"/> <xsd:enumeration value="parkingAreaData"/> <xsd:enumeration value="sharedLaneData"/> </xsd:restriction> </xsd:simpleType> </xsd:union> </xsd:simpleType></pre>
Definition	Enumerated value to indicate the layer type

B.6 MapData: layerID

Descriptive Name	Layer ID
Mandatory/Optional	Optional
Data Type	LayerID [0..100]
CROCS	<pre><xsd:simpleType name="LayerID"> <xsd:restriction base="xsd:unsignedByte"> <xsd:minInclusive value="0"/> <xsd:maxInclusive value="100"/> </xsd:restriction> </xsd:simpleType></pre>
Definition	Used for logical fragmentation of MAP data.

B.7 MapData: intersections

Descriptive Name	Intersection Geometry List
Mandatory/Optional	Optional
Data Type	IntersectionGeometryList [1..32]
CROCS	
<pre><xsd:complexType name="IntersectionGeometryList"> <xsd:sequence minOccurs="1" maxOccurs="32"> <xsd:element name="IntersectionGeometry" type="IntersectionGeometry"/> </xsd:sequence> </xsd:complexType></pre>	
Definition	A list of intersection Geometry. This object holds the MAP data.

B.8 intersections: IntersectionGeometry

Descriptive Name	Intersection Geometry
Mandatory/Optional	Mandatory
Data Type	Sequence of [complex] objects
CROCS	
<pre><xsd:complexType name="IntersectionGeometry"> <xsd:sequence> <xsd:element name="id" type="IntersectionReferenceID"/> <xsd:element name="revision" type="MsgCount"/> <xsd:element name="refPoint" type="Position3D-2"/> <xsd:element name="laneWidth" minOccurs="0" type="LaneWidth"/> <xsd:element name="speedLimits" minOccurs="0" type="SpeedLimitList"/> <xsd:element name="laneSet" type="LaneList"/> <xsd:element name="preemptPriorityData" minOccurs="0" type="PreemptPriorityList"/> <xsd:element name="regional" minOccurs="0" type="RegionalIntersection"/> </xsd:sequence> </xsd:complexType></pre>	
Definition	An intersection geometry definition.

B.9 IntersectionGeometry: name

Descriptive Name	Intersection Geometry name
Mandatory/Optional	Optional (Only used in debug)
Data Type	DescriptiveName
CROCS	
Definition	Only used in debug, not used in CROCS.

B.10 IntersectionGeometry: id

Descriptive Name	Intersection Geometry ID
Mandatory/Optional	Mandatory
Data Type	IntersectionReferenceID
CROCS	
<pre><xsd:complexType name="IntersectionReferenceID"> <xsd:sequence> <xsd:element name="region" minOccurs="0" type="RoadRegulatorID"/> <xsd:element name="id" type="IntersectionID"/> </xsd:sequence> </xsd:complexType></pre>	
Definition	ID for the intersection

B.11 id: region

Descriptive Name	Intersection region
Mandatory/Optional	Optional
Data Type	RoadRegulatorID
CROCS	
<pre><xsd:simpleType name="RoadRegulatorID"> <xsd:restriction base="xsd:unsignedShort"/> </xsd:simpleType></pre>	
Definition	Road regulator ID

B.12 id: id

Descriptive Name	Intersection ID
Mandatory/Optional	Mandatory
Data Type	IntersectionID
CROCS	
<pre><xsd:simpleType name="IntersectionID"> <xsd:restriction base="xsd:unsignedShort"/> </xsd:simpleType></pre>	
Definition	A unique ID for the intersection, used to reference MAP to SPaT data.

B.13 IntersectionGeometry: revision

Descriptive Name	Version of MAP data
Mandatory/Optional	Mandatory
Data Type	MsgCount [0..127]
CROCS	
<pre><xsd:simpleType name="MsgCount"> <xsd:restriction base="xsd:unsignedByte"> <xsd:minInclusive value="0"/> <xsd:maxInclusive value="127"/> </xsd:restriction> </xsd:simpleType></pre>	
Definition	
This object holds the revision/version for MAP data.	

B.14 IntersectionGeometry: refPoint

Descriptive Name	Reference position for the intersection
Mandatory/Optional	Mandatory
Data Type	Position3D-2 (Complex object)
CROCS	
<pre><xsd:complexType name="Position3D-2"> <xsd:sequence> <xsd:element name="lat" type="ITS-Container:Latitude"/> <xsd:element name="long" type="ITS-Container:Longitude"/> <xsd:element name="elevation" minOccurs="0" type="Elevation2"/> <xsd:element name="regional" minOccurs="0" type="RegionalPosition3D"/> </xsd:sequence> </xsd:complexType></pre>	
Definition	
Reference position for the intersection	

B.15 refPoint: lat

Descriptive Name	Latitude
Mandatory/Optional	Mandatory
Data Type	Latitude
CROCS	
<pre><xsd:simpleType name="Latitude"> <xsd:union> <xsd:simpleType> <xsd:restriction base="xsd:token"> <xsd:enumeration value="oneMicrodegreeSouth"/> <xsd:enumeration value="oneMicrodegreeNorth"/> <xsd:enumeration value="unavailable"/> </xsd:restriction> </xsd:simpleType> <xsd:simpleType> <xsd:restriction base="xsd:int"> <xsd:minInclusive value="-900000000"/> <xsd:maxInclusive value="900000001"/> </xsd:restriction> </xsd:simpleType> </xsd:union> </xsd:simpleType></pre>	
Definition	
Latitude in micro-degree north or south	

B.16 refPoint: long

Descriptive Name	Longitude
Mandatory/Optional	Mandatory
Data Type	Longitude
CROCS	
<pre><xsd:simpleType name="Longitude"> <xsd:union> <xsd:simpleType> <xsd:restriction base="xsd:token"> <xsd:enumeration value="oneMicrodegreeWest"/> <xsd:enumeration value="oneMicrodegreeEast"/> <xsd:enumeration value="unavailable"/> </xsd:restriction> </xsd:simpleType> <xsd:simpleType> <xsd:restriction base="xsd:int"> <xsd:minInclusive value="-1800000000"/> <xsd:maxInclusive value="1800000001"/> </xsd:restriction> </xsd:simpleType> </xsd:union> </xsd:simpleType></pre>	
Definition	Longitude in micro-degree east or west

B.17 refPoint: elevation

Descriptive Name	Elevation
Mandatory/Optional	Optional
Data Type	Elevation2
CROCS	
<pre><xsd:simpleType name="Elevation2"> <xsd:restriction base="xsd:int"> <xsd:minInclusive value="-4096"/> <xsd:maxInclusive value="61439"/> </xsd:restriction> </xsd:simpleType></pre>	
Definition	Not used in Europe. Use RegionalPosition3D.

B.18 refPoint: regional

Descriptive Name	Regional variation
Mandatory/Optional	Optional
Data Type	RegionalPosition3D
CROCS	
<pre><xsd:complexType name="RegionalPosition3D"> <xsd:complexContent> <xsd:extension base="REG-D:Reg-Position3D"/> </xsd:complexContent> </xsd:complexType></pre>	
Definition	Elevation for use in Europe

B.19 regional: Reg-Position3D

Descriptive Name	Regional Elevation
Mandatory/Optional	Mandatory
Data Type	Reg-Position3D
CROCS	<pre><xsd:complexType name="Reg-Position3D"> <xsd:sequence> <xsd:element name="altitude" minOccurs="0" type="ITS-Container:Altitude"/> </xsd:sequence> </xsd:complexType></pre>
Definition	Elevation for use in Europe

B.20 Reg-Position3D: Altitude

Descriptive Name	Altitude
Mandatory/Optional	Mandatory
Data Type	Altitude
CROCS	<pre><xsd:complexType name="Altitude"> <xsd:sequence> <xsd:element name="altitudeValue" type="AltitudeValue"/> <xsd:element name="altitudeConfidence" type="AltitudeConfidence"/> </xsd:sequence> </xsd:complexType></pre>
Definition	Altitude definition

B.21 Altitude: altitudeValue

Descriptive Name	Altitude
Mandatory/Optional	Mandatory
Data Type	AltitudeValue
CROCS	<pre><xsd:simpleType name="AltitudeValue"> <xsd:union> <xsd:simpleType> <xsd:restriction base="xsd:token"> <xsd:enumeration value="referenceEllipsoidSurface"/> <xsd:enumeration value="oneCentimeter"/> <xsd:enumeration value="unavailable"/> </xsd:restriction> </xsd:simpleType> <xsd:simpleType> <xsd:restriction base="xsd:int"> <xsd:minInclusive value="-100000"/> <xsd:maxInclusive value="800001"/> </xsd:restriction> </xsd:simpleType> </xsd:union> </xsd:simpleType></pre>
Definition	Altitude value in units of 1 cm

B.22 Altitude: altitudeConfidence

Descriptive Name	Altitude Confidence
Mandatory/Optional	Mandatory
Data Type	AltitudeConfidence
CROCS	<pre> <xsd:simpleType name="AltitudeConfidence"> <xsd:restriction base="xsd:token"> <xsd:enumeration value="alt-000-01"/> <xsd:enumeration value="alt-000-02"/> <xsd:enumeration value="alt-000-05"/> <xsd:enumeration value="alt-000-10"/> <xsd:enumeration value="alt-000-20"/> <xsd:enumeration value="alt-000-50"/> <xsd:enumeration value="alt-001-00"/> <xsd:enumeration value="alt-002-00"/> <xsd:enumeration value="alt-005-00"/> <xsd:enumeration value="alt-010-00"/> <xsd:enumeration value="alt-020-00"/> <xsd:enumeration value="alt-050-00"/> <xsd:enumeration value="alt-100-00"/> <xsd:enumeration value="alt-200-00"/> <xsd:enumeration value="outOfRange"/> <xsd:enumeration value="unavailable"/> </xsd:restriction> </xsd:simpleType> </pre>
Definition	A Confidence value for altitude.

B.23 IntersectionGeometry: laneWidth

Descriptive Name	Lane Width
Mandatory/Optional	Optional
Data Type	LaneWidth
CROCS	<pre> <xsd:simpleType name="LaneWidth"> <xsd:restriction base="xsd:unsignedShort"> <xsd:minInclusive value="0"/> <xsd:maxInclusive value="32767"/> </xsd:restriction> </xsd:simpleType> </pre>
Definition	Specifies lane width (0..32767) in units of 1 cm.

B.24 IntersectionGeometry: speedLimits

Descriptive Name	Speed limit list
Mandatory/Optional	Optional
Data Type	SpeedLimitList
CROCS	
<pre><xsd:complexType name="SpeedLimitList"> <xsd:sequence minOccurs="1" maxOccurs="9"> <xsd:element name="RegulatorySpeedLimit" type="RegulatorySpeedLimit"/> </xsd:sequence> </xsd:complexType></pre>	
Definition	
A table of speed limits [1..9]	

B.25 speedLimits: RegulatorySpeedLimit

Descriptive Name	Speed limit
Mandatory/Optional	Mandatory
Data Type	Sequence of [complex] objects
CROCS	
<pre><xsd:complexType name="RegulatorySpeedLimit"> <xsd:sequence> <xsd:element name="type" type="SpeedLimitType"/> <xsd:element name="speed" type="Velocity"/> </xsd:sequence> </xsd:complexType></pre>	
Definition	

B.26 RegulatorySpeedLimit: type

Descriptive Name	Speed limit type
Mandatory/Optional	Mandatory
Data Type	SpeedLimitType
CROCS	
<pre><xsd:simpleType name="SpeedLimitType"> <xsd:union memberTypes="xsd:token"> <xsd:simpleType> <xsd:restriction base="xsd:token"> <xsd:enumeration value="unknown"/> <xsd:enumeration value="maxsd:peedInSchoolZone"/> <xsd:enumeration value="maxsd:peedInSchoolZoneWhenChildrenArePresent"/> <xsd:enumeration value="maxsd:peedInConstructionZone"/> <xsd:enumeration value="vehicleMinSpeed"/> <xsd:enumeration value="vehicleMaxsd:peed"/> <xsd:enumeration value="vehicleNightMaxsd:peed"/> <xsd:enumeration value="truckMinSpeed"/> <xsd:enumeration value="truckMaxsd:peed"/> <xsd:enumeration value="truckNightMaxsd:peed"/> <xsd:enumeration value="vehiclesWithTrailersMinSpeed"/> <xsd:enumeration value="vehiclesWithTrailersMaxsd:peed"/> <xsd:enumeration value="vehiclesWithTrailersNightMaxsd:peed"/> </xsd:restriction> </xsd:simpleType> </xsd:union> </xsd:simpleType></pre>	
Definition	
An enumerated list of speed limit types.	

B.27 RegulatorySpeedLimit: speed

Descriptive Name	Speed value
Mandatory/Optional	Mandatory
Data Type	Velocity
CROCS	<pre><xsd:simpleType name="Velocity"> <xsd:restriction base="xsd:unsignedShort"> <xsd:minInclusive value="0"/> <xsd:maxInclusive value="8191"/> </xsd:restriction> </xsd:simpleType></pre>
Definition	The speed value in units of 0.02 m/s.

B.28 IntersectionGeometry: laneset

Descriptive Name	A list of lanes
Mandatory/Optional	Mandatory
Data Type	LaneList [1..255]
CROCS	<pre><xsd:complexType name="LaneList"> <xsd:sequence minOccurs="1" maxOccurs="255"> <xsd:element name="GenericLane" type="GenericLane"/> </xsd:sequence> </xsd:complexType></pre>
Definition	A list of lanes [1..255].

B.29 laneSet: LaneList

Descriptive Name	A list of lane definitions
Mandatory/Optional	Mandatory
Data Type	GenericLane
CROCS	<pre><xsd:complexType name="LaneList"> <xsd:sequence minOccurs="1" maxOccurs="255"> <xsd:element name="GenericLane" type="GenericLane"/> </xsd:sequence> </xsd:complexType></pre>
Definition	A list of lane definitions

B.30 LaneList: GenericLane

Descriptive Name	A lane definition
Mandatory/Optional	Mandatory
Data Type	GenericLane
CROCS	<pre> <xsd:complexType name="GenericLane"> <xsd:sequence> <xsd:element name="laneID" type="LaneID"/> <xsd:element name="ingressApproach" minOccurs="0" type="ApproachID"/> <xsd:element name="egressApproach" minOccurs="0" type="ApproachID"/> <xsd:element name="laneAttributes" type="LaneAttributes"/> <xsd:element name="maneuvers" minOccurs="0" type="AllowedManeuvers"/> <xsd:element name="nodeList" type="NodeList2"/> <xsd:element name="connectsTo" minOccurs="0" type="ConnectsToList"/> <xsd:element name="overlays" minOccurs="0" type="OverlayLaneList"/> <xsd:element name="regional" minOccurs="0" type="RegionalGenericLane"/> </xsd:sequence> </xsd:complexType> </pre>
Definition	A lane definition

B.31 GenericLane: laneID

Descriptive Name	Lane ID
Mandatory/Optional	Mandatory
Data Type	LaneID
CROCS	<pre> <xsd:simpleType name="LaneID"> <xsd:restriction base="xsd:unsignedByte"/> </xsd:simpleType> </pre>
Definition	An unique lane ID

B.32 GenericLane: name

Descriptive Name	Name
Mandatory/Optional	Optional (Only used in debug)
Data Type	DescriptiveName
CROCS	
Definition	Not used in CROCS.

B.33 GenericLane: ingressApproach & egressApproach

Descriptive Name	Ingress/egress (lane) Approach
Mandatory/Optional	Optional
Data Type	ApproachID [0..15]
CROCS	<pre><xsd:simpleType name="ApproachID"> <xsd:restriction base="xsd:unsignedByte"> <xsd:minInclusive value="0"/> <xsd:maxInclusive value="15"/> </xsd:restriction> </xsd:simpleType></pre>
Definition	Ingress/egress Approach IDs to/from the intersection.

B.34 GenericLane: laneAttributes

Descriptive Name	Lane Attributes
Mandatory/Optional	Mandatory
Data Type	LaneAttributes
CROCS	<pre><xsd:complexType name="LaneAttributes"> <xsd:sequence> <xsd:element name="directionalUse" type="LaneDirection"/> <xsd:element name="sharedWith" type="LaneSharing"/> <xsd:element name="laneType" type="LaneTypeAttributes"/> <xsd:element name="regional" minOccurs="0" type="RegionalLaneAttributes"/> </xsd:sequence> </xsd:complexType></pre>
Definition	A list of lane attributes

B.35 laneAttributes: directionalUse

Descriptive Name	Lane Direction
Mandatory/Optional	Mandatory
Data Type	LaneDirection
CROCS	

```

<xsd:simpleType name="LaneDirection">
  <xsd:union>
    <xsd:simpleType>
      <xsd:restriction base="asn1:BitString">
        <xsd:length value="2"/>
      </xsd:restriction>
    </xsd:simpleType>
    <xsd:simpleType>
      <xsd:restriction>
        <xsd:simpleType>
          <xsd:list>
            <xsd:simpleType>
              <xsd:restriction base="xsd:token">
                <xsd:enumeration value="ingressPath"/>
                <xsd:enumeration value="egressPath"/>
              </xsd:restriction>
            </xsd:simpleType>
          </xsd:list>
        </xsd:simpleType>
      </xsd:restriction>
    </xsd:simpleType>
  </xsd:union>
</xsd:simpleType>

```

Definition

Lane direction details

B.36 laneAttributes: sharedWidth

Descriptive Name	Lane sharing
Mandatory/Optional	Mandatory
Data Type	LaneSharing
CROCS	

```

<xsd:simpleType name="LaneSharing">
  <xsd:union>
    <xsd:simpleType>
      <xsd:restriction base="asn1:BitString">
        <xsd:length value="10"/>
      </xsd:restriction>
    </xsd:simpleType>
    <xsd:simpleType>
      <xsd:restriction>
        <xsd:simpleType>
          <xsd:list>
            <xsd:simpleType>
              <xsd:restriction base="xsd:token">
                <xsd:enumeration value="overlappingLaneDescriptionProvided"/>
                <xsd:enumeration value="multipleLanesTreatedAsOneLane"/>
                <xsd:enumeration value="otherNonMotorizedTrafficTypes"/>
                <xsd:enumeration value="individualMotorizedVehicleTraffic"/>
                <xsd:enumeration value="busVehicleTraffic"/>
                <xsd:enumeration value="taxiVehicleTraffic"/>
                <xsd:enumeration value="pedestriansTraffic"/>
                <xsd:enumeration value="cyclistVehicleTraffic"/>
                <xsd:enumeration value="trackedVehicleTraffic"/>
                <xsd:enumeration value="pedestrianTraffic"/>
              </xsd:restriction>
            </xsd:simpleType>
          </xsd:list>
        </xsd:simpleType>
        <xsd:maxLength value="10"/>
      </xsd:restriction>
    </xsd:simpleType>
  </xsd:union>
</xsd:simpleType>

```

Definition
Lane sharing details

B.37 laneAttributes: laneType

Descriptive Name	Lane type
Mandatory/Optional	Mandatory
Data Type	LaneTypeAttributes
CROCS	<pre><xsd:complexType name="LaneTypeAttributes"> <xsd:choice> <xsd:element name="vehicle" type="LaneAttributes-Vehicle"/> <xsd:element name="crosswalk" type="LaneAttributes-Crosswalk"/> <xsd:element name="bikeLane" type="LaneAttributes-Bike"/> <xsd:element name="sidewalk" type="LaneAttributes-Sidewalk"/> <xsd:element name="median" type="LaneAttributes-Barrier"/> <xsd:element name="striping" type="LaneAttributes-Striping"/> <xsd:element name="trackedVehicle" type="LaneAttributes-TrackedVehicle"/> <xsd:element name="parking" type="LaneAttributes-Parking"/> </xsd:choice> </xsd:complexType></pre>
Definition	Lane type details

B.38 laneAttributes: regional

Descriptive Name	Regional Variation
Mandatory/Optional	Optional
Data Type	Reg-LaneAttributes
CROCS	<pre><xsd:complexType name="RegionalLaneAttributes"> <xsd:complexContent> <xsd:extension base="REGION:Reg-LaneAttributes"/> </xsd:complexContent> </xsd:complexType></pre>
Definition	Regional lane attributes

B.39 regional: Reg-LaneAttributes

Descriptive Name	Regional Variation
Mandatory/Optional	Mandatory
Data Type	Reg-LaneAttributes
CROCS	<pre><xsd:complexType name="Reg-LaneAttributes"> <xsd:sequence> <xsd:any namespace="##other" processContents="lax" minOccurs="0"/> </xsd:sequence> </xsd:complexType></pre>
Definition	Regional lane attributes. Not yet defined, included for future compatibility.

B.40 GenericLane: nodeList

Descriptive Name	Lane spatial path information
Mandatory/Optional	Mandatory
Data Type	NodeList2
CROCS	<pre><xsd:complexType name="NodeList2"> <xsd:choice> <xsd:element name="nodes" type="NodeSet"/> <xsd:element name="computed" type="ComputedLane"/> </xsd:choice> </xsd:complexType></pre>
Definition	Lane spatial path information and attributes.

B.41 nodeList: nodes

Descriptive Name	Node list
Mandatory/Optional	Mandatory
Data Type	NodeSet
CROCS	<pre><xsd:complexType name="NodeSet"> <xsd:sequence minOccurs="2" maxOccurs="63"> <xsd:element name="Node" type="Node"/> </xsd:sequence> </xsd:complexType></pre>
Definition	Node list

B.42 nodes: Node

Descriptive Name	Node
Mandatory/Optional	Mandatory
Data Type	Node
CROCS	<pre><xsd:complexType name="Node"> <xsd:sequence> <xsd:element name="delta" type="NodeOffsetPoint"/> <xsd:element name="attributes" minOccurs="0" type="NodeAttributeSet"/> </xsd:sequence> </xsd:complexType></pre>
Definition	Node details

B.43 Node: delta

Descriptive Name	Node position
Mandatory/Optional	Mandatory
Data Type	NodeOffsetPoint
CROCS	<pre><xsd:complexType name="NodeOffsetPoint"> <xsd:choice> <xsd:element name="node-XY1" type="Node-XY-20b"/> <xsd:element name="node-XY2" type="Node-XY-22b"/> <xsd:element name="node-XY3" type="Node-XY-24b"/> <xsd:element name="node-XY4" type="Node-XY-26b"/> <xsd:element name="node-XY5" type="Node-XY-28b"/> <xsd:element name="node-XY6" type="Node-XY-32b"/> <xsd:element name="node-LatLon" type="Node-LLmD-64b"/> <xsd:element name="node-Regional" type="RegionalNodeOffsetPoint"/> </xsd:choice> </xsd:complexType></pre>
Definition	Node position (as an offset)

B.44 delta: x

Descriptive Name	X offset
Mandatory/Optional	Mandatory
Data Type	Offset-Bxx
CROCS	<pre><xsd:simpleType name="Offset-B10"> <xsd:restriction base="xsd:short"> <xsd:minInclusive value="-512"/> <xsd:maxInclusive value="511"/> </xsd:restriction> </xsd:simpleType></pre>
Definition	Node offset value. Offset-B10 shown, other objects available with higher offsets.

B.45 delta: y

Descriptive Name	Y offset
Mandatory/Optional	Mandatory
Data Type	Offset-Bxx
CROCS	<pre><xsd:simpleType name="Offset-B10"> <xsd:restriction base="xsd:short"> <xsd:minInclusive value="-512"/> <xsd:maxInclusive value="511"/> </xsd:restriction> </xsd:simpleType></pre>
Definition	Node offset value. Offset-B10 shown, other objects available with higher offsets.

B.46 Node: attributes

Descriptive Name	Node attributes
Mandatory/Optional	Optional
Data Type	NodeAttributeSet
CROCS	
<pre><xsd:complexType name="NodeAttributeSet"> <xsd:sequence> <xsd:element name="localNode" minOccurs="0" type="NodeAttributeList"/> <xsd:element name="disabled" minOccurs="0" type="SegmentAttributeList"/> <xsd:element name="enabled" minOccurs="0" type="SegmentAttributeList"/> <xsd:element name="data" minOccurs="0" type="LaneDataAttributeList"/> <xsd:element name="regional" minOccurs="0" type="RegionalNodeAttributeList"/> <xsd:element name="dWidth" minOccurs="0" type="Offset-B10"/> <xsd:element name="dElevation" minOccurs="0" type="Offset-B10"/> </xsd:sequence> </xsd:complexType></pre>	
Definition	Node attributes

B.47 attributes: localNode

Descriptive Name	A list of Node attributes
Mandatory/Optional	Optional
Data Type	NodeAttributeList
CROCS	
<pre><xsd:simpleType name="NodeAttributeList"> <xsd:restriction> <xsd:simpleType> <xsd:list itemType="NodeAttribute"/> </xsd:simpleType> <xsd:minLength value="1"/> <xsd:maxLength value="8"/> </xsd:restriction> </xsd:simpleType></pre>	
Definition	A list of Node attributes.

B.48 attributes: disabled

Descriptive Name	Attributes which are disabled at this node.
Mandatory/Optional	Optional
Data Type	SegmentAttributeList
CROCS	
<pre><xsd:simpleType name="SegmentAttributeList"> <xsd:restriction> <xsd:simpleType> <xsd:list itemType="SegmentAttribute"/> </xsd:simpleType> <xsd:minLength value="1"/> <xsd:maxLength value="8"/> </xsd:restriction> </xsd:simpleType></pre>	
Definition	Attributes which are disabled at this node.

B.49 attributes: enabled

Descriptive Name	Attributes which are enabled at this node.
Mandatory/Optional	Optional
Data Type	SegmentAttributeList
CROCS	<pre> <xsd:simpleType name="SegmentAttributeList"> <xsd:restriction> <xsd:simpleType> <xsd:list itemType="SegmentAttribute"/> </xsd:simpleType> <xsd:minLength value="1"/> <xsd:maxLength value="8"/> </xsd:restriction> </xsd:simpleType> </pre>
Definition	Attributes which are enabled at this node.

B.50 attributes: data

Descriptive Name	Attributes which require additional data values
Mandatory/Optional	Optional
Data Type	LaneDataAttributeList
CROCS	<pre> <xsd:complexType name="LaneDataAttributeList"> <xsd:sequence minOccurs="1" maxOccurs="8"> <xsd:element name="LaneDataAttribute" type="LaneDataAttribute"/> </xsd:sequence> </xsd:complexType> </pre>
Definition	Attributes which require additional data values

B.51 data: LaneDataAttribute

Descriptive Name	Additional attribute data
Mandatory/Optional	Mandatory
Data Type	LaneDataAttribute
CROCS	<pre> <xsd:complexType name="LaneDataAttributeList"> <xsd:sequence minOccurs="1" maxOccurs="8"> <xsd:element name="LaneDataAttribute" type="LaneDataAttribute"/> </xsd:sequence> </xsd:complexType> </pre>
Definition	Additional attribute data

B.52 attributes: regional

Descriptive Name	Regional Variation
Mandatory/Optional	Optional
Data Type	RegionalNodeAttributeList
CROCS	<pre><xsd:complexType name="RegionalNodeAttributeList"> <xsd:sequence minOccurs="1" maxOccurs="8"> <xsd:element name="RegionalNodeAttribute" type="RegionalNodeAttribute"/> </xsd:sequence> </xsd:complexType></pre>
Definition	Regional node attributes

B.53 regional: RegionalNodeAttribute

Descriptive Name	Regional Variation
Mandatory/Optional	Mandatory (Not yet defined)
Data Type	RegionalNodeAttribute
CROCS	<pre><xsd:complexType name="RegionalNodeAttribute"> <xsd:complexContent> <xsd:extension base="REGION:Reg-NodeAttribute"/> </xsd:complexContent> </xsd:complexType></pre>
Definition	Regional node attribute. Not yet defined.

B.54 RegionalNodeAttribute: dWidth

Descriptive Name	Lane taper
Mandatory/Optional	Optional
Data Type	Offset-B10
CROCS	<pre><xsd:simpleType name="Offset-B10"> <xsd:restriction base="xsd:short"> <xsd:minInclusive value="-512"/> <xsd:maxInclusive value="511"/> </xsd:restriction> </xsd:simpleType></pre>
Definition	A Lane taper.

B.55 RegionalNodeAttribute: dElevation

Descriptive Name	Lane height change
Mandatory/Optional	Optional
Data Type	Offset-B10
CROCS	
<pre><xsd:simpleType name="Offset-B10"> <xsd:restriction base="xsd:short"> <xsd:minInclusive value="-512"/> <xsd:maxInclusive value="511"/> </xsd:restriction> </xsd:simpleType></pre>	
Definition	Lane height change

B.56 nodeList: computed

Descriptive Name	Data need to create a Computed Lane
Mandatory/Optional	Mandatory
Data Type	ComputedLane
CROCS	
<pre><xsd:complexType name="ComputedLane"> <xsd:sequence> <xsd:element name="referenceLaneId" type="LaneID"/> <xsd:element name="offsetXaxis"> <xsd:complexType> <xsd:choice> <xsd:element name="small" type="DrivenLineOffsetSm"/> <xsd:element name="large" type="DrivenLineOffsetLg"/> </xsd:choice> </xsd:complexType> </xsd:element> <xsd:element name="offsetYaxis"> <xsd:complexType> <xsd:choice> <xsd:element name="small" type="DrivenLineOffsetSm"/> <xsd:element name="large" type="DrivenLineOffsetLg"/> </xsd:choice> </xsd:complexType> </xsd:element> <xsd:element name="rotateXY" minOccurs="0" type="Angle"/> <xsd:element name="scaleXaxis" minOccurs="0" type="Scale-B12"/> <xsd:element name="scaleYaxis" minOccurs="0" type="Scale-B12"/> <xsd:element name="regional" minOccurs="0" type="RegionalComputedLane"/> </xsd:sequence> </xsd:complexType></pre>	
Definition	Data need to create a Computed Lane

B.57 computed: referenceLaneID

Descriptive Name	ID of the Reference Lane
Mandatory/Optional	Mandatory
Data Type	LaneID
CROCS	
<pre><xsd:simpleType name="LaneID"> <xsd:restriction base="xsd:unsignedByte"/> </xsd:simpleType></pre>	
Definition	ID of the Reference Lane

B.58 computed: offsetXaxis

Descriptive Name	X axis offset
Mandatory/Optional	Mandatory
Data Type	
CROCS	
<pre><xsd:simpleType name="DrivenLineOffsetSm"> <xsd:restriction base="xsd:short"> <xsd:minInclusive value="-2047"/> <xsd:maxInclusive value="2047"/> </xsd:restriction> </xsd:simpleType> <xsd:simpleType name="DrivenLineOffsetLg"> <xsd:restriction base="xsd:short"> <xsd:minInclusive value="-32767"/> <xsd:maxInclusive value="32767"/> </xsd:restriction> </xsd:simpleType></pre>	
Definition	X axis offset in units of 1cm

B.59 computed: offsetYaxis

Descriptive Name	Y axis offset
Mandatory/Optional	Mandatory
Data Type	
CROCS	
<pre><xsd:simpleType name="DrivenLineOffsetSm"> <xsd:restriction base="xsd:short"> <xsd:minInclusive value="-2047"/> <xsd:maxInclusive value="2047"/> </xsd:restriction> </xsd:simpleType> <xsd:simpleType name="DrivenLineOffsetLg"> <xsd:restriction base="xsd:short"> <xsd:minInclusive value="-32767"/> <xsd:maxInclusive value="32767"/> </xsd:restriction> </xsd:simpleType></pre>	
Definition	Y axis offset in units of 1cm

B.60 computed: rotateXY

Descriptive Name	An [optional] angle for the lane
Mandatory/Optional	Optional
Data Type	Angle
CROCS	
<pre><xsd:simpleType name="Angle"> <xsd:restriction base="xsd:unsignedShort"> <xsd:minInclusive value="0"/> <xsd:maxInclusive value="28800"/> </xsd:restriction> </xsd:simpleType></pre>	
Definition	An [optional] angle for the lane in units of 0.0125 degrees

B.61 computed: scaleXaxis

Descriptive Name	A scale factor for the lane
Mandatory/Optional	Optional
Data Type	Scale-B12
CROCS	
<pre><xsd:simpleType name="Scale-B12"> <xsd:restriction base="xsd:short"> <xsd:minInclusive value="-2048"/> <xsd:maxInclusive value="2047"/> </xsd:restriction> </xsd:simpleType></pre>	
Definition	A scale factor for the lane

B.62 computed: scaleYaxis

Descriptive Name	A scale factor for the lane
Mandatory/Optional	Optional
Data Type	Scale-B12
CROCS	
<pre><xsd:simpleType name="Scale-B12"> <xsd:restriction base="xsd:short"> <xsd:minInclusive value="-2048"/> <xsd:maxInclusive value="2047"/> </xsd:restriction> </xsd:simpleType></pre>	
Definition	A scale factor for the lane

B.63 computed: regional

Descriptive Name	Regional Variation
Mandatory/Optional	Optional
Data Type	RegionalComputedLane
CROCS	<pre><xsd:complexType name="RegionalComputedLane"> <xsd:complexContent> <xsd:extension base="REGION:Reg-ComputedLane"/> </xsd:complexContent> </xsd:complexType></pre>
Definition	Regional lane variation

B.64 regional: Reg-ComputedLane

Descriptive Name	Regional Variation
Mandatory/Optional	Mandatory (Not defined)
Data Type	Reg-ComputedLane
CROCS	<pre><xsd:complexType name="Reg-ComputedLane"> <xsd:sequence> <xsd:any namespace="##other" processContents="lax" minOccurs="0"/> </xsd:sequence> </xsd:complexType></pre>
Definition	Regional computed lane. Not yet defined.

B.65 GenericLane: connectsTo

Descriptive Name	A list of lane connections
Mandatory/Optional	Optional
Data Type	ConnectsToList
CROCS	<pre><xsd:complexType name="ConnectsToList"> <xsd:sequence minOccurs="1" maxOccurs="16"> <xsd:element name="Connection" type="Connection"/> </xsd:sequence> </xsd:complexType></pre>
Definition	A list of lane connections

B.66 connectsTo: Connection

Descriptive Name	A connection definition
Mandatory/Optional	Mandatory
Data Type	Connection
CROCS	
<pre><xsd:complexType name="Connection"> <xsd:sequence> <xsd:element name="connectingLane" type="ConnectingLane"/> <xsd:element name="remoteIntersection" minOccurs="0" type="IntersectionReferenceID"/> <xsd:element name="signalGroup" minOccurs="0" type="SignalGroupID"/> <xsd:element name="userClass" minOccurs="0" type="RestrictionClassID"/> <xsd:element name="connectionID" minOccurs="0" type="LaneConnectionID"/> </xsd:sequence> </xsd:complexType></pre>	
Definition	A connection definition

B.67 Connection: connectingLane

Descriptive Name	A connecting lane definition
Mandatory/Optional	Mandatory
Data Type	ConnectingLane
CROCS	
<pre><xsd:complexType name="ConnectingLane"> <xsd:sequence> <xsd:element name="lane" type="LaneID"/> <xsd:element name="maneuver" minOccurs="0" type="AllowedManeuvers"/> </xsd:sequence> </xsd:complexType></pre>	
Definition	A connecting lane definition

B.68 Connection: remoteIntersection

Descriptive Name	Remote intersection ID
Mandatory/Optional	Optional
Data Type	IntersectionReferenceID
CROCS	
<pre><xsd:complexType name="IntersectionReferenceID"> <xsd:sequence> <xsd:element name="region" minOccurs="0" type="RoadRegulatorID"/> <xsd:element name="id" type="IntersectionID"/> </xsd:sequence> </xsd:complexType></pre>	
Definition	A reference ID for the remote intersection

B.69 remoteIntersection: region

Descriptive Name	Region
Mandatory/Optional	Optional (Only used in debug)
Data Type	RoadRegulatorID
CROCS	
Definition	
This optional object is only used in debug and has not been included in CROCS.	

B.70 remoteIntersection: id

Descriptive Name	Intersection ID
Mandatory/Optional	Mandatory
Data Type	IntersectionID [0..65535]
CROCS	
<pre><xsd:simpleType name="IntersectionID"> <xsd:restriction base="xsd:unsignedShort"/> </xsd:simpleType></pre>	
Definition	
This object holds the ID for the intersection and is used to reference the SPaT data to Intersection geometry in the MAP data. This could be the SCN or any other unique identifier.	

B.71 Connection: signalGroup

Descriptive Name	Unique reference for the signals
Mandatory/Optional	Optional
Data Type	SignalGroupID [0..255]
CROCS	
<pre><xsd:simpleType name="SignalGroupID"> <xsd:restriction base="xsd:unsignedByte"/> </xsd:simpleType></pre>	
Definition	
The Signal Group ID.	

B.72 Connection: userClass

Descriptive Name	User Class
Mandatory/Optional	Optional
Data Type	RestrictionClassID
CROCS	
<pre><xsd:simpleType name="RestrictionClassID"> <xsd:restriction base="xsd:unsignedByte"/> </xsd:simpleType></pre>	
Definition	
The restriction class this applies to.	

B.73 Connection: connectionID

Descriptive Name	Connection ID
Mandatory/Optional	Optional
Data Type	LaneConnectionID
CROCS	
<pre><xsd:simpleType name="LaneConnectionID"> <xsd:restriction base="xsd:unsignedByte"/> </xsd:simpleType></pre>	
Definition	Connection ID relating to this lane.

B.74 GenericLane: overlays

Descriptive Name	Overlay lane list
Mandatory/Optional	Optional
Data Type	OverlayLaneList
CROCS	
<pre><xsd:simpleType name="OverlayLaneList"> <xsd:restriction> <xsd:simpleType> <xsd:list itemType="LaneID"/> </xsd:simpleType> <xsd:minLength value="1"/> <xsd:maxLength value="5"/> </xsd:restriction> </xsd:simpleType></pre>	
Definition	Used where two different lanes overlay.

B.75 overlays: OverlayLaneList

Descriptive Name	Overlay lane
Mandatory/Optional	Mandatory
Data Type	LaneID
CROCS	
<pre><xsd:simpleType name="LaneID"> <xsd:restriction base="xsd:unsignedByte"/> </xsd:simpleType></pre>	
Definition	ID of the overlaying lane

B.76 GenericLane: regional

Descriptive Name	Regional Variation
Mandatory/Optional	Optional
Data Type	RegionalGenericLane
CROCS	<pre><xsd:complexType name="RegionalGenericLane"> <xsd:complexContent> <xsd:extension base="REGION:Reg-GenericLane"/> </xsd:complexContent> </xsd:complexType></pre>
Definition	Regional lane variation

B.77 regional: Reg-GenericLane

Descriptive Name	Regional Variation
Mandatory/Optional	Mandatory (Not yet defined)
Data Type	Reg-GenericLane
CROCS	<pre><xsd:complexType name="Reg-GenericLane"> <xsd:sequence> <xsd:any namespace="##other" processContents="lax" minOccurs="0"/> </xsd:sequence> </xsd:complexType></pre>
Definition	Regional generic lane. Not yet defined.

B.78 SPAT: roadSegments

Descriptive Name	A list of road segments
Mandatory/Optional	Optional
Data Type	RoadSegmentList
CROCS	<pre><xsd:complexType name="RoadSegmentList"> <xsd:sequence minOccurs="1" maxOccurs="32"> <xsd:element name="RoadSegment" type="RoadSegment"/> </xsd:sequence> </xsd:complexType></pre>
Definition	A list of road segments.

B.79 roadSegment: RoadSegment

Descriptive Name	Road segment definition
Mandatory/Optional	Mandatory
Data Type	RoadSegment
CROCS	
<pre> <xsd:complexType name="RoadSegment"> <xsd:sequence> <xsd:element name="id" type="RoadSegmentReferenceID"/> <xsd:element name="revision" type="MsgCount"/> <xsd:element name="refPoint" type="Position3D-2"/> <xsd:element name="laneWidth" minOccurs="0" type="LaneWidth"/> <xsd:element name="speedLimits" minOccurs="0" type="SpeedLimitList"/> <xsd:element name="roadLaneSet" type="RoadLaneSetList"/> <xsd:element name="regional" minOccurs="0" type="RegionalRoadSegment"/> </xsd:sequence> </xsd:complexType> </pre>	
Definition	A road segment definition

B.80 RoadSegment: name

Descriptive Name	A descriptive name for the road segment
Mandatory/Optional	Optional (Only used in debug)
Data Type	DescriptiveName
CROCS	
Definition	A descriptive name for the movement. Not used in CROCS.

B.81 RoadSegment: id

Descriptive Name	Road Segment ID
Mandatory/Optional	Mandatory
Data Type	RoadSegmentReferenceID
CROCS	
<pre> <xsd:complexType name="RoadSegmentReferenceID"> <xsd:sequence> <xsd:element name="region" minOccurs="0" type="RoadRegulatorID"/> <xsd:element name="id" type="RoadSegmentID"/> </xsd:sequence> </xsd:complexType> </pre>	
Definition	An unique segment ID

B.82 RoadSegment: roadLaneSet

Descriptive Name	Road Lane List
Mandatory/Optional	Mandatory
Data Type	RoadLaneSetList
CROCS	<pre><xsd:complexType name="RoadLaneSetList"> <xsd:sequence minOccurs="1" maxOccurs="255"> <xsd:element name="GenericLane" type="GenericLane"/> </xsd:sequence> </xsd:complexType></pre>
Definition	A list of Road Lanes

B.83 roadLaneSet: RoadLaneSetList

Descriptive Name	Road Lane data
Mandatory/Optional	Mandatory
Data Type	GenericLane
CROCS	<pre><xsd:complexType name="GenericLane"> <xsd:sequence> <xsd:element name="laneID" type="LaneID"/> <xsd:element name="ingressApproach" minOccurs="0" type="ApproachID"/> <xsd:element name="egressApproach" minOccurs="0" type="ApproachID"/> <xsd:element name="laneAttributes" type="LaneAttributes"/> <xsd:element name="maneuvers" minOccurs="0" type="AllowedManeuvers"/> <xsd:element name="nodeList" type="NodeList2"/> <xsd:element name="connectsTo" minOccurs="0" type="ConnectsToList"/> <xsd:element name="overlays" minOccurs="0" type="OverlayLaneList"/> <xsd:element name="regional" minOccurs="0" type="RegionalGenericLane"/> </xsd:sequence> </xsd:complexType></pre>
Definition	Road Lane data

B.84 SPAT: restrictionList

Descriptive Name	Restriction List
Mandatory/Optional	Optional
Data Type	RestrictionClassList
CROCS	<pre><xsd:complexType name="RestrictionClassList"> <xsd:sequence minOccurs="1" maxOccurs="254"> <xsd:element name="RestrictionClassAssignment" type="RestrictionClassAssignment"/> </xsd:sequence> </xsd:complexType></pre>
Definition	A list of restriction classes to be applied.

B.85 restrictionList: RestrictionClassAssignment

Descriptive Name	Restriction Class
Mandatory/Optional	Mandatory
Data Type	RestrictionClassAssignment
CROCS	
<pre><xsd:complexType name="RestrictionClassAssignment"> <xsd:sequence> <xsd:element name="id" type="RestrictionClassID"/> <xsd:element name="users" type="RestrictionUserTypeList"/> </xsd:sequence> </xsd:complexType></pre>	
Definition	A restriction class definition.

B.86 RestrictionClassAssignment: id

Descriptive Name	Restriction Class ID
Mandatory/Optional	Mandatory
Data Type	RestrictionClassID
CROCS	
<pre><xsd:simpleType name="RestrictionClassID"> <xsd:restriction base="xsd:unsignedByte"/> </xsd:simpleType></pre>	
Definition	An ID for the restriction class.

B.87 RestrictionClassAssignment: users

Descriptive Name	Restriction User Class List
Mandatory/Optional	Mandatory
Data Type	RestrictionUserTypeList
CROCS	
<pre><xsd:complexType name="RestrictionUserTypeList"> <xsd:sequence minOccurs="1" maxOccurs="16"> <xsd:element name="RestrictionUserType" type="RestrictionUserType"/> </xsd:sequence> </xsd:complexType></pre>	
Definition	A list of restricted user classes.

B.88 users: RestrictionUserType

Descriptive Name	Restriction User
Mandatory/Optional	Mandatory
Data Type	RestrictionUserTypeList
CROCS	<pre><xsd:complexType name="RestrictionUserType"> <xsd:choice> <xsd:element name="basicType" type="RestrictionAppliesTo"/> <xsd:element name="regional" type="RegionalRestrictionUserType"/> </xsd:choice> </xsd:complexType></pre>
Definition	A choice of either 'basic' or 'regional' user type.

B.89 RestrictionUserType: basicType

Descriptive Name	Basic Restriction User types
Mandatory/Optional	Mandatory
Data Type	RestrictionAppliesTo
CROCS	<pre><xsd:simpleType name="RestrictionAppliesTo"> <xsd:union memberTypes="xsd:token"> <xsd:simpleType> <xsd:restriction base="xsd:token"> <xsd:enumeration value="none"/> <xsd:enumeration value="equippedTransit"/> <xsd:enumeration value="equippedTaxis"/> <xsd:enumeration value="equippedOther"/> <xsd:enumeration value="emissionCompliant"/> <xsd:enumeration value="equippedBicycle"/> <xsd:enumeration value="weightCompliant"/> <xsd:enumeration value="heightCompliant"/> <xsd:enumeration value="pedestrians"/> <xsd:enumeration value="slowMovingPersons"/> <xsd:enumeration value="wheelchairUsers"/> <xsd:enumeration value="visualDisabilities"/> <xsd:enumeration value="audioDisabilities"/> <xsd:enumeration value="otherUnknownDisabilities"/> </xsd:restriction> </xsd:simpleType> </xsd:union> </xsd:simpleType></pre>
Definition	An enumerated list of basic user restriction types.

B.90 RestrictionUserType: regional

Descriptive Name	Regional Restriction User types
Mandatory/Optional	Mandatory
Data Type	RegionalRestrictionUserType
CROCS	<pre><xsd:complexType name="RegionalRestrictionUserType"> <xsd:complexContent> <xsd:extension base="REG-D:Reg-RestrictionUserType"/> </xsd:complexContent> </xsd:complexType></pre>
Definition	Regional Restriction User types

B.91 regional: Reg-RestrictionUserType

Descriptive Name	Regional Restriction User type
Mandatory/Optional	Mandatory
Data Type	EmissionType
CROCS	<pre><xsd:complexType name="Reg-RestrictionUserType"> <xsd:sequence> <xsd:element name="emission" minOccurs="0" type="EmissionType"/> </xsd:sequence> </xsd:complexType></pre>
Definition	Regional Restriction User type

B.92 Reg-RestrictionUserType: emission

Descriptive Name	Regional Restriction User type
Mandatory/Optional	Optional
Data Type	Sequence of EmissionType
CROCS	<pre><xsd:complexType name="Reg-RestrictionUserType"> <xsd:sequence> <xsd:element name="emission" minOccurs="0" type="EmissionType"/> </xsd:sequence> </xsd:complexType> <xsd:simpleType name="EmissionType"> <xsd:union memberTypes="xsd:token"> <xsd:simpleType> <xsd:restriction base="xsd:token"> <xsd:enumeration value="typeA"/> <xsd:enumeration value="typeB"/> <xsd:enumeration value="typeC"/> <xsd:enumeration value="typeD"/> <xsd:enumeration value="typeE"/> </xsd:restriction> </xsd:simpleType> </xsd:union> </xsd:simpleType></pre>
Definition	Regional Restriction User type

B.93 SPAT: regional

Descriptive Name	Regional Map Data
Mandatory/Optional	Optional
Data Type	RegionalMapData
CROCS	
<pre><xsd:complexType name="RegionalMapData"> <xsd:complexContent> <xsd:extension base="REG-D:Reg-MapData"/> </xsd:complexContent> </xsd:complexType></pre>	
Definition	Regional MAP data

B.94 regional: Reg-MapData

Descriptive Name	Regional Map Data
Mandatory/Optional	Mandatory
Data Type	SignalHeadLocationList
CROCS	
<pre><xsd:complexType name="Reg-MapData"> <xsd:sequence> <xsd:element name="signalHeadLocations" minOccurs="0" type="SignalHeadLocationList"/> </xsd:sequence> </xsd:complexType></pre>	
Definition	Regional Restriction User type

B.95 Reg-MapData: SignalHeadLocationList

Descriptive Name	Signal Head Location List
Mandatory/Optional	Optional
Data Type	Sequence of SignalHeadLocation [1..20]
CROCS	
<pre><xsd:complexType name="SignalHeadLocationList"> <xsd:sequence minOccurs="1" maxOccurs="20"> <xsd:element name="SignalHeadLocation" type="SignalHeadLocation"/> </xsd:sequence> </xsd:complexType></pre>	
<pre><xsd:complexType name="SignalHeadLocation"> <xsd:sequence> <xsd:element name="node" type="CROCS-0-1:NodeOffsetPoint"/> <xsd:element name="elevation" type="CROCS-0-1:Offset-B11"/> <xsd:element name="signalGroupID" type="CROCS-0-1:SignalGroupID"/> </xsd:sequence> </xsd:complexType></pre>	
Definition	A list of signal head locations

B.96 SignalHeadLocationList: node

Descriptive Name	Signal Head offset
Mandatory/Optional	Mandatory
Data Type	NodeOffsetPoint
CROCS	<pre> <xsd:complexType name="NodeOffsetPoint"> <xsd:choice> <xsd:element name="node-XY1" type="Node-XY-20b"/> <xsd:element name="node-XY2" type="Node-XY-22b"/> <xsd:element name="node-XY3" type="Node-XY-24b"/> <xsd:element name="node-XY4" type="Node-XY-26b"/> <xsd:element name="node-XY5" type="Node-XY-28b"/> <xsd:element name="node-XY6" type="Node-XY-32b"/> <xsd:element name="node-LatLon" type="Node-LLmD-64b"/> <xsd:element name="node-Regional" type="RegionalNodeOffsetPoint"/> </xsd:choice> </xsd:complexType> </pre>
Definition	A signal head offset (location)

B.97 node: x

Descriptive Name	X offset
Mandatory/Optional	Mandatory
Data Type	Offset-Bxx
CROCS	<pre> <xsd:simpleType name="Offset-B10"> <xsd:restriction base="xsd:short"> <xsd:minInclusive value="-512"/> <xsd:maxInclusive value="511"/> </xsd:restriction> </xsd:simpleType> </pre>
Definition	Node offset value. Offset-B10 shown, other objects available with higher offsets.

B.98 node: y

Descriptive Name	Y offset
Mandatory/Optional	Mandatory
Data Type	Offset-Bxx
CROCS	<pre> <xsd:simpleType name="Offset-B10"> <xsd:restriction base="xsd:short"> <xsd:minInclusive value="-512"/> <xsd:maxInclusive value="511"/> </xsd:restriction> </xsd:simpleType> </pre>
Definition	Node offset value. Offset-B10 shown, other objects available with higher offsets.

B.99 SignalHeadLocationList: elevation

Descriptive Name	Node height
Mandatory/Optional	Mandatory
Data Type	Offset-B11
CROCS	
<pre><xsd:simpleType name="Offset-B11"> <xsd:restriction base="xsd:short"> <xsd:minInclusive value="-1024"/> <xsd:maxInclusive value="1023"/> </xsd:restriction> </xsd:simpleType></pre>	
Definition	Traffic signal head elevation offset.

B.100 SignalHeadLocationList: signalGroupID

Descriptive Name	Signal Group ID
Mandatory/Optional	Mandatory
Data Type	SignalGroupID
CROCS	
<pre><xsd:simpleType name="SignalGroupID"> <xsd:restriction base="xsd:unsignedByte"/> </xsd:simpleType></pre>	
Definition	ID of the signal group

B.101 SPAT: crc

Descriptive Name	CRC
Mandatory/Optional	Optional (Not used in Europe)
Data Type	MsgCRC
CROCS	
<pre><xsd:simpleType name="MsgCRC"> <xsd:restriction base="xsd:hexBinary"> <xsd:length value="2"/> </xsd:restriction> </xsd:simpleType></pre>	
Definition	A CRC checksum for the message. Not used in Europe.