BSI Standards Publication

Public transport — Service interface for real-time information relating to public transport operations

Part 5: Functional service interfaces
situation exchange: Situation Exchange

bsi.

National foreword

This Published Document is the UK implementation of CEN/TS 15531-5:2016. It supersedes DD CEN/TS 15531-5:2011 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee EPL/278, Intelligent transport systems.

A list of organizations represented on this committee can be obtained on request to its secretary.

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English Version

Public transport - Service interface for real-time information relating to public transport operations - Part 5: Functional service interfaces situation exchange: Situation Exchange

Transport public - Interface de service pour les informations en temps réel relatives aux opérations de transport public - Partie 5: Service d'interface fonctionnelle - Échange de l'état de l'exploitation et de son contexte

Öffentlicher Verkehr - Diensteschnittstelle für den Echtzeitaustausch von Betriebsinformationen des ÖPNV (SIRI) - Teil 5: Funktionelle Serviceschnittstelle: Situativer Austausch

This Technical Specification (CEN/TS) was approved by CEN on 25 February 2016 for provisional application.

The period of validity of this CEN/TS is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the CEN/TS can be converted into a European Standard.

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European foreword

This document (CEN/TS 15531-5:2016) has been prepared by Technical Committee CEN/TC 278 "Intelligent transport systems", the secretariat of which is held by NEN.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes CEN/TS 15531-5:2011.

The 15531 series consists of the following parts, under the general title *Public transport - Service interface for real-time information relating to public transport operations*

— Part 1: Context and framework

— Part 2: Communications

— Part 3: Functional service interfaces

— Part 4: Functional service interfaces: Facility Monitoring

— Part 5: Functional service interfaces - Situation exchange

The following corrections and modifications have been in this new version of CEN/TS 15531-5:

— Correct spec to include projection attributes for affectedStopPlaceComponent

— Document FacilityRef as part of request

— Document Access Mode as part of request

— Document Scope as part of request

— Document RoadFilter and Accessibility need filter as part of request

— Correct Documentation of AffectedRoads as part of Delivery

— Correct Documentation of capability Matrix

— Correct Documentation of Reason codes

— Added Annex D to Doc on GTFS real-time mapping

— StopMonitoringDelivery upgrade to DatexII

All changes are available in the file ReadMe.txt which is accompanying the XSD-schema, available from http://www.siri.org.uk.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this Technical Specification: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta,

Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

Public transport services rely increasingly on information systems to ensure reliable, efficient operation and widely accessible, accurate passenger information.

Well-defined, open interfaces have a crucial role in improving the economic and technical viability of Public Transport Information Systems of all kinds. Using standardised interfaces, systems can be implemented as discrete pluggable modules that can be chosen from a wide variety of suppliers in a competitive market, connecting diverse systems; rather than as monolithic proprietary systems from a single supplier. Interfaces also allow the systematic automated testing of each functional module, vital for managing the complexity of increasing large and dynamic systems. Furthermore, with a well-defined, version interface, individual functional modules can be replaced or evolved, without unexpected breakages of obscurely dependent function.

The SIRI framework is a European Technical Specification that provides a specification for a number of functional interfaces that allow public transport data of specific types to be exchanged readily using structured interfaces.

This further Technical Specification specifies an additional SIRI functional service to exchange incident and event information about disruptions to public transport between servers containing real-time public transport vehicle or journey time data. These include the control centres of transport operators as well as information systems that deliver passenger travel information services.

This document describes the SIRI Situation Exchange service, one of a modular set of services for the exchange of Real-time information. The Situation Exchange service (SIRI-SX) is concerned with the exchange of planned events and unplanned incident data among systems, including incident capture, real-time management and dissemination systems. It is an additional functional service based on the European Technical Specification known as "SIRI" – Service Interface for Real-time Information. SIRI provides a framework for specifying communications and data exchange protocols for organisations wishing to exchange Real-time Information (RTI) relating to public transport operations.

The specification for the base SIRI framework on which SIRI-SX is built is presented in three parts:

a) context and framework, including background, scope and role, normative references, terms and definitions, symbols and abbreviations, business context and use cases (SIRI Part 1: EN 15531-1);

b) the mechanisms to be adopted for data exchange communications links (SIRI Part 2: EN 15531-2);

c) data structures for a series of individual application interface modules (SIRI Part 3: EN 15531-3):

1) Production Timetable (SIRI-PT);

2) Estimated Timetable (SIRI-ET);

3) Stop Timetable (SIRI-ST);

4) Stop Monitoring (SIRI-SM);

5) Vehicle Monitoring (SIRI-VM);

6) Connection Timetable (SIRI-CT);

7) Connection Monitoring (SIRI-CM);

8) General Message (SIRI-GM).

Additional documents are used for additional functional services, to date these are:

— **Facilities Management (SIRI-FM)** service is used to exchange information on the current status of facilities such as lifts, escalators or ticketing machines. It provides a short description of the facility itself, expresses any change to its operational status and specifically the accessibility status for the disabled or those with special needs people. It provides all the current relevant information relating to all facilities fulfilling a set of selection criteria (Part 4: CEN/TS 15531-4).

— **Situation Exchange (SIRI-SX):** this document. The SIRI Situation and Incident Exchange service is used to exchange information messages between identified participants in a standardised structured format suitable for travel information services. It enables messages to be sent and to be revoked (Part 5: CEN/TS 15531-5, this document).

The XML schema can be downloaded from http://www.siri.org.uk/, along with available guidance on its use, example XML files, and case studies of national and local deployments. The SIRI-SX service is included in version 1.3 of the schema onwards.

1   Scope

The SIRI Situation Exchange service (SIRI-SX) allows the efficient exchange of data about Situations caused by planned and unplanned incidents and events and is intended to support the use cases identified in Annex C. Situations are actual or potential perturbations to normal operation of a transport network. The SIRI-SX service uses the common SIRI communication framework and services which are described in EN 15531-1 and EN 15531-2 and not repeated in this document.

The Situation Exchange service has a rich Situation model, allowing a structured description of all aspects of multimodal travel Situations, including cause, scope, effect and rules for distribution to an audience. The structured values enabling computer based distribution through a wide variety of channels, and the presentation of data in different formats for different device and different audiences. The Situation Exchange Service allows the exchange of incident and event information between, amongst others:

— Control centres;

— Operations Staff;

— Public Information systems;

— Alert systems and personalised alert systems;

— UTMC systems;

— Journey planners;

— AVMS (Automatic Vehicle Management Systems).

SIRI-SX uses a network model based on the CEN Transmodel conceptual model for Public Transport networks, schedules and operations, along with the CEN Identification of Fixed Objects in Public Transport (IFOPT) model for describing physical transport interchanges.

The Situation Exchange service is envisaged as a 'back office' capture and exchange service that will feed other public facing travel information dissemination systems in particular those using the TPEG format. Transport Protocol Expert Group (TPEG) is a European Broadcasting Union fostered standard for broadcasting travel data over Digital Assisted Broadcasting (DAB) radio and other channels. TPEG is maintained by the Traveller Information Services Association (TISA). To this end, the SIRI-SX situation classification model has been harmonized as far as possible with that of TPEG and DATEX2 so that full interoperability can be achieved. Uses of structured elements from TPEG, for which translations already exist in most European languages, also facilitates human readability in different national languages. Maintaining and improving a harmonization with TPEG will be a continuing objective. In addition to the TPEG exchangeable content, SIRI-SX messages contain additional structured information which allows them to be processed in additional ways.

Situation and computer systems and applications are typically *distributed*, that is information will be captured on one system and exchanged with others for dissemination and further processing. This means that a message design is needed that allows the management of the identity of distributed messages over time and across different systems, so that subsequent updates to a Situation can be reconciled by different systems over a network, and obsolete messages can be retired automatically. The SIRI-SX SITUATION model is designed to support the distributed management of Situations.

2   Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 15531-1:2015, *Public transport — Service interface for real-time information relating to public transport operations — Part 1: Context and framework*

3   Terms and definitions

For the purposes of this document, the terms and definitions given in EN 15531-1:2015 and the following apply.

NOTE   In accordance with Transmodel conventions, capital letters are used to indicate conceptual model entities from Transmodel, for example VEHICLE JOURNEY, STOP PLACE, etc., and also those from IFOPT and SIRI. Later in this document, the names of classes and attributes expressing these entities in the UML diagrams and the XML schema are shown in Upper Camel Case, e.g. ***VehicleJourney***. Not all conceptual entities are expressed as classes and not all concrete classes and attributes relate directly to a conceptual entity.

3.1
Access Space – IFOPT & NeTEx
passenger area within a STOP PLACE such as a concourse or booking hall, immigration hall or security area that is accessible by pedestrians, but without a direct access to vehicles

Note 1 to entry: Direct access to a VEHICLE is always from a QUAY and/or BOARDING POSITION. An ACCESS SPACE may be a Room, Hall, Concourse, Corridor, or bounded open space within a STOP PLACE.

3.2
Accessibility – IFOPT
possibility of a user with a specific USER NEED, such as a disability or encumbrance, to access either fixed or moving Public Transport facilities

3.3
Accessibility Assessment – IFOPT & NeTEx
ACCESSIBILITY characteristics of an entity used by PASSENGERs such as a STOP PLACE, or a STOP PLACE COMPONENT

Note 1 to entry: Described by ACCESSIBILITY LIMITATIONs, and/or a set of SUITABILITies.

3.4
Accessibility Limitation – IFOPT & NeTEx
categorisation of the mobility characteristics of a STOP PLACE COMPONENT such as a STOP PATH LINK or ACCESS SPACE to indicate its ACCESSIBILITY by mobility constrained users, for example those needing wheelchair access, step-free access or wanting to avoid confined spaces such as lifts

Note 1 to entry: A small number of well-defined categories are used that are chosen to allow the consistent capture of data and the efficient computation of ROUTEs for different classes of user.

3.5
Affects Scope – SIRI-SX
scope of a SITUATION ELEMENT or consequence of a SITUATION ELEMENT in terms of the specific entities such as OPERATORs, NETWORKs, LINEs, SCHEDULED STOP POINTs, STOP PLACEs, PLACEs, etc that are affected

3.6
Base Situation Element – SIRI-SX
original record of a particular SITUATION

Note 1 to entry: This may subsequently be followed by UPDATE SITUATION ELEMENTs that record further changes.

3.7
Boarding Position – IFOPT & NeTEx
location within a QUAY from which passengers may directly board, or onto which passengers may directly alight from, a PT vehicle

3.8
Connection Link – Transmodel
physical (spatial) possibility for a passenger to change from one public transport vehicle to another to continue a trip

Note 1 to entry: Different transfer times may be necessary to cover interchange over a given connection link, depending on the kind of passenger.

Note 2 to entry: IN NeTEx the name is revised to be CONNECTION.

3.9
Consequence – Trident
outcome of a SITUATION

3.10
Control Action – Transmodel
action resulting from a decision taken by the controller causing an amendment of the operation planned in the PRODUCTION PLAN

Note 1 to entry: For SIRI-SX, CONTROL ACTIONs may often give rise to a SITUATION, but are entirely distinct concepts.

3.11
Direction – Transmodel & NeTEx
classification for the general orientation of ROUTEs

Note 1 to entry: In IFOPT the DIRECTION may be an important aspect of a PATH LINK that may only be traversed one way.

3.12
Easement – SIRI-SX
temporary permission to use a ticket purchased for use of a transport service on a different travel product because the original service has been disrupted

EXAMPLE   To use a bus instead of the metro.

3.13
Interchange – Transmodel & NeTEx
scheduled possibility for transfer of passengers between two SERVICE JOURNEYs at the same or different STOP POINTs

3.14
Level – IFOPT & NeTEx
identified storey (ground, first, basement, mezzanine, etc.) within an interchange building on which STOP PLACE COMPONENTs reside

Note 1 to entry: A STOP PATH LINK may connect components on different levels.

3.15
Local Service – IFOPT & NeTEx
named service relating to the use of the STOP PLACE or transport services at a particular location, for example porterage, assistance for disabled users, booking offices, etc

Note 1 to entry: The service may have a VALIDITY CONDITION associated with it. A LOCAL SERVICE is treated as a form of non-material EQUIPMENT.

3.16
Location – Transmodel
position of a POINT with reference to a given LOCATING SYSTEM (e.g. coordinates)

3.17
Operator – Transmodel & NeTEx
organisation in charge of the operation of some or all transport services within a particular area

3.18
Passenger Accessibility Assessment – IFOPT
categorisation of the ACCESSIBILITY characteristics of a PASSENGER to indicate their requirements for ACCESSIBILITY

Note 1 to entry: For example that are unable to navigate stairs, or lifts, or have visual or Auditory impairments. PASSENGER ACCESSIBILITY TYPE corresponds to one or more ACCESSIBILITY LIMITATIONs, allowing the computation of paths for passengers with constrained mobility. For example, Wheelchair, No Lifts, No Stairs.

3.19
Place – Transmodel & NeTEx
geographic location of any type which may be specified as the origin or destination of a trip

Note 1 to entry: A PLACE may be of dimension 0 (a POINT), 1 (a road section) or 2 (a ZONE).

Note 2 to entry: In IFOPT a PLACE may be of dimension 3 and be further associated with a LEVEL.

3.20
Planned event – SIRI-SX
cause of a SITUATION that is known about in advance

Note 1 to entry: It will have a known start and likely end time.

Note 2 to entry: In SIRI-SX this is recorded as an attribute of a general purpose incident description.

3.21
Projection – Transmodel & NeTEx
An oriented correspondence - of the shape of an ENTITY on a source layer, - onto an entity in a target layer: e.g. POINT, LINK, LINK SEQUENCE, COMPLEX FEATURE, - within a defined TYPE OF PROJECTION

Note 1 to entry: A general purpose mechanism used in SIRI-SX to indicate the geographical scope of a SITUATION.

3.22
Publishing Action – SIRI-SX
part of SITUATION ELEMENT content that contains guidance as to how the SITUATION should be disseminated

3.23
Quay – IFOPT & NeTEx
place where passengers have access to PT vehicles, such as a platform, stance, or quayside

Note 1 to entry: A QUAY may serve one or more VEHICLE STOPPING PLACEs and be associated with one or more STOP POINTs.

Note 2 to entry: A QUAY is a recursive structure that may contain other sub QUAYs. A child QUAY must be physically contained within its parent QUAY.

3.24
Reason – TPEG
classification of a SITUATION ELEMENT as being of a particular type

Note 1 to entry: The nature of the REASON is likely to have implications for the duration and consequence of the SITUATION.

3.25
Route – Transmodel & NeTEx
ordered list of located POINTs defining one single path through the road (or rail) NETWORK

Note 1 to entry: A ROUTE may pass through the same POINT more than once.

Note 1 to entry: Each JOURNEY PATTERN may be associated with a particular ROUTE.

3.26
Situation – Trident
disruption to the planned operation of services

3.27
Situation Element – Trident
record of SITUATION STATE at particular time or over a particular period

Note 1 to entry: A SITUATION is represented by one or more SITUATION ELEMENTs.

Note 2 to entry: A SIRI SITUATION ELEMENT corresponds to a DATEX2 'Situation Record'.

3.28
Situation Identifier – SIRI-SX
unique identifier of a SITUATION ELEMENT made up of several parts, the Country code, Participant Code, Situation Number and Version number

3.29
Scheduled Stop Point – IFOPT & NeTEx
POINT in a VEHICLE JOURNEY where passengers can board or alight from vehicles

Note 1 to entry: SCHEDULED STOP POINT refines the primary Transmodel sense of a STOP POINT, which is that of the logical stop point within a scheduled VEHICLE JOURNEY, rather than a physical point in the infrastructure where boarding and alighting, may take place, for which the terms for specific STOP PLACE COMPONENTS such as QUAY or BOARDING POSITION are used. Although the same identifiers are often used for both SCHEDULED STOP POINT and STOP PLACE COMPONENT, a practice which provides significant benefits for data management, they nonetheless represent distinct concepts. A STOP POINT ASSIGNMENT is used to associate a SCHEDULED STOP POINT with a STOP PLACE COMPONENT.

3.30
Stop Place – IFOPT & NeTEx
place comprising one or more locations where vehicles may stop and where passengers may board or leave vehicles or prepare their trip

Note 1 to entry: A STOP PLACE will usually have one or more well-known names.

3.31
Stop Point – Transmodel
POINT where passengers can board or alight from vehicles

3.32
Suitability – IFOPT & NeTEx
whether a particular facility such as a STOP PLACE COMPONENT or VEHICLE can be used by a passenger with a particular USER NEED

3.33
Transport Mode – Transmodel & NeTEx
characterisation of the operation according to the means of transport (e.g. bus, tram, metro, train, ferry, ship)

3.34
Traffic Element – Datex2
type of Datex2 Situation Record (i.e. Situation Element) used to describe a road SITUATION

3.35
Update Situation Element– SIRI-SX
record of a change to a particular SITUATION, originally established by a BASE SITUATION ELEMENT

3.36
Unplanned Incident – SIRI-SX
cause of a SITUATION that is not known about in advance

3.37
User Need – IFOPT & NeTEx
ACCESSIBILITY requirement of a PASSENGER

Note 1 to entry: For example, that they are unable to navigate stairs, or lifts, or have visual or auditory impairments.

3.38
Validity Condition – Transmodel & NeTEx
condition used in order to characterise a given VERSION of a VERSION FRAME

Note 1 to entry: A VALIDITY CONDITION consists of a parameter (e.g. date, triggering event, etc.) and its type of application (e.g. for, from, until, etc.).

3.39
Vehicle Journey – Transmodel & NeTEx
planned movement of a public transport vehicle on a DAY TYPE from the start point to the end point of a JOURNEY PATTERN on a specified ROUTE

4   Symbols and abbreviations

The common symbols and abbreviations used in the SIRI document set are presented in EN 15531-1. In addition the following terms are used:

- DATEX2   Data Exchange Version 2
- EBU   European Broadcasting Union
- ICS   Incident Capture System
- QoS   Quality of Service
- TISA   Traveller Information Services Association
- TPEG-PTI   Transport Protocol Experts Group Public Transport Information
- SIRI-SX   SIRI Situation Exchange
- SIRI-FM   SIRI Facilities Management

5   Situations as Software Entities

5.1 General

In a travel information system, 'Situations' are data objects describing an incident, typically an unplanned event such as a disruption, but also planned events that affect public transport or its use, such as engineering works, or major public events that will affect use of transport. They will be captured and recorded on one system and then be transmitted to other systems to convey information about the current status to travellers and to transport operator staff. Those other systems will need to transform the data to suit different delivery channel requirements. At any time, further developments may occur that need to be represented by updates to the original SITUATION (or as further related SITUATIONs), and a distributed SITUATION model shall allow for the propagation and reconciliation of these changes across systems.

To support distributed processing of SITUATION a number of basic principles need to be followed:

- use of a rich **structured Situation** representation that can be emitted in standards compliant renderings such as the TISA Transport Protocol Experts Group (TPEG) specification;

- assignment of a persistent **Identity** to SITUATIONs within a global namespace; so they may pass into and out of different systems and still be matched with previous instantiations;

- use of **write-only updates** suitable for store and forward processing in a distributed environment;

- use of a **lifecycle model** with well-defined edit-version-release states;

— use of well-defined data reference systems. SIRI-SX uses a conceptual model for the scope of the application domain – Public Transport SITUATIONs – based on open standards (CEN Transmodel), allowing the sharing of references with other Transmodel based systems and services.

We elaborate on these below.

5.2 Structured Situations

A Situation object needs to be both machine readable and human readable (see Figure 1). To be machine readable requires a set of structured elements with precise meaning as to the nature and scope of the Situation, in particular as to its temporal and network scope (indicated by a location model) and its categorization that can be interpreted by agents such as station displays, journey planners and alert engines. To be human readable, the Situation shall be renderable on different devices in different formats as a textual and graphic representation that a human can understand. The text may be generated automatically from the structured elements, be explicitly encoded, or both.

The Situation shall also include identity and cross- referencing information that can be used to track its progress across different systems.
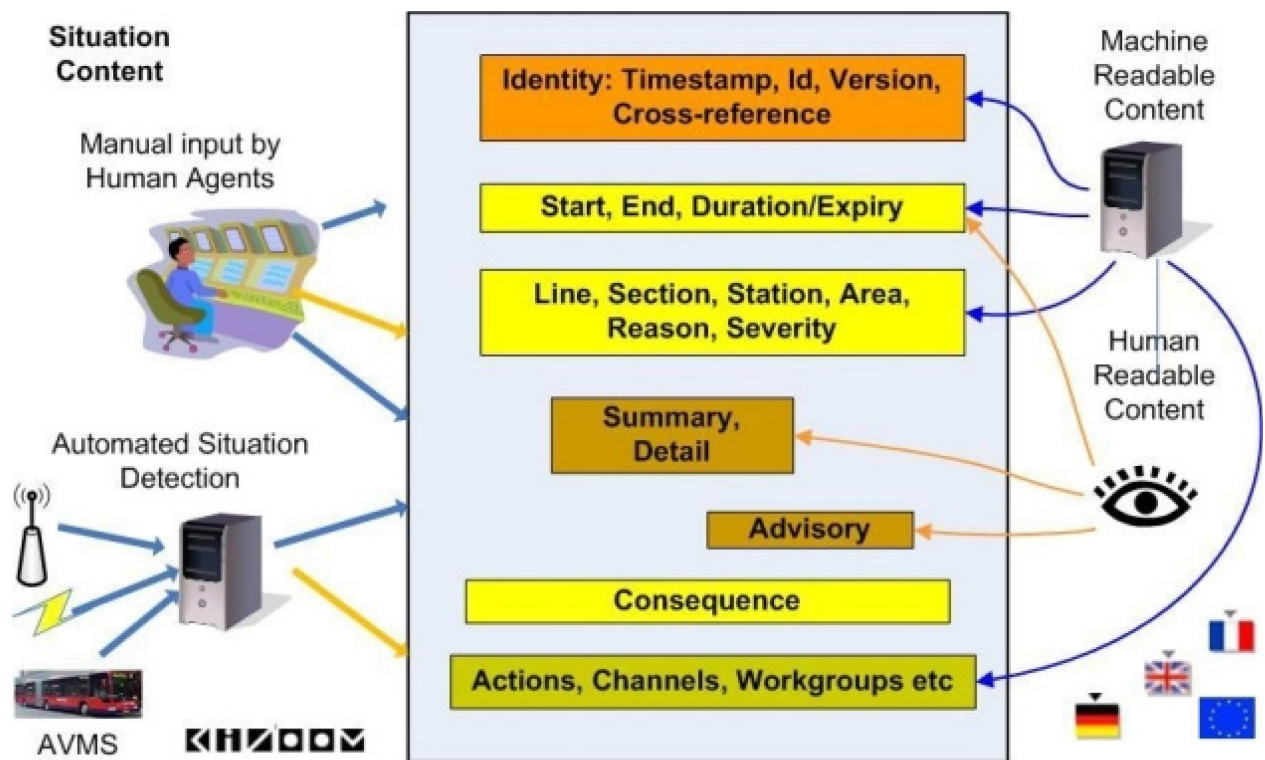
Figure 1 — Situation Structure elements

The actual structured Situation model needs to have components to describe its import, including:

— **Identity**: elements to identify and manage the SITUATION and its components;

— **Cross-reference**: elements to relate the SITUATION to other SITUATIONs to which it is related;

— **Audit**: elements to identify the source of the SITUATION;

— **Situation body**: elements – a set of structured details characterizing the nature and processing of the SITUATION, including its current status, **scope** of effect, **classification**, human readable **description**, consequence and suggested **distribution**.

5.3 Distributed Situation processing

5.3.1 Identity and Write-Only Updates

A distributed SITUATION data model represents SITUATIONs as information objects that may be distributed over many different systems, typically being created on one system and then displayed and sometimes augmented by others. Distributed systems raise considerations of identity and concurrency of data objects.

A particular case in point arises when the same Situation may reach a particular dissemination system via different ROUTEs; in which case the consumer needs to be able to establish that the data refers to the same event and not two different instances of a similar event. The same Situation may also return to the originating system and need to be recognized as a known Situation and not a new instance.

In order for updates to be propagated and reconciled in a distributed processing environment, a unique persistent identity shall be maintained across these systems for the Situation and its updates, and there shall be a means of identifying the most recent content. This makes it possible for different systems to recognize repeated references to the same Situation.

A unique identifier allows the tracking and reconciliation of updates to a given SITUATION that has been recognized as a specific single event and is being managed as such. A more complicated question of recognition of similarity and identity reconciliation arises from the fact that a real world disruption may give rise to a number of separate Situation Objects on different systems, with different unique identifiers. These may be subsequently recognized as related and consolidated Cross-referencing mechanisms are needed to allow this to be represented in the data. Both human and computer aided processes may be used to undertake the recognition and consolidation.

A distributed processing model also raises questions of currency – how does a consumer system determine which is the latest information about a SITUATION? What should a dissemination system do if the communication link is lost? How can one distinguish between absence of information and absence of information service? Typically both metadata and built-in mechanisms such as heartbeats are needed to address this need. Synchronisation to a universal clock is also necessary.

Figure 2 illustrates the store and forward processing typical of Situation handling whereby SITUATIONs and updates reach downstream systems via number of different ROUTEs with different intermediate steps. Each system holds its own representation of a SITUATION model and *it is only the SITUATION element* (i.e. an account of changes to the SITUATION), *and not the SITUATION itself which is exchanged.*
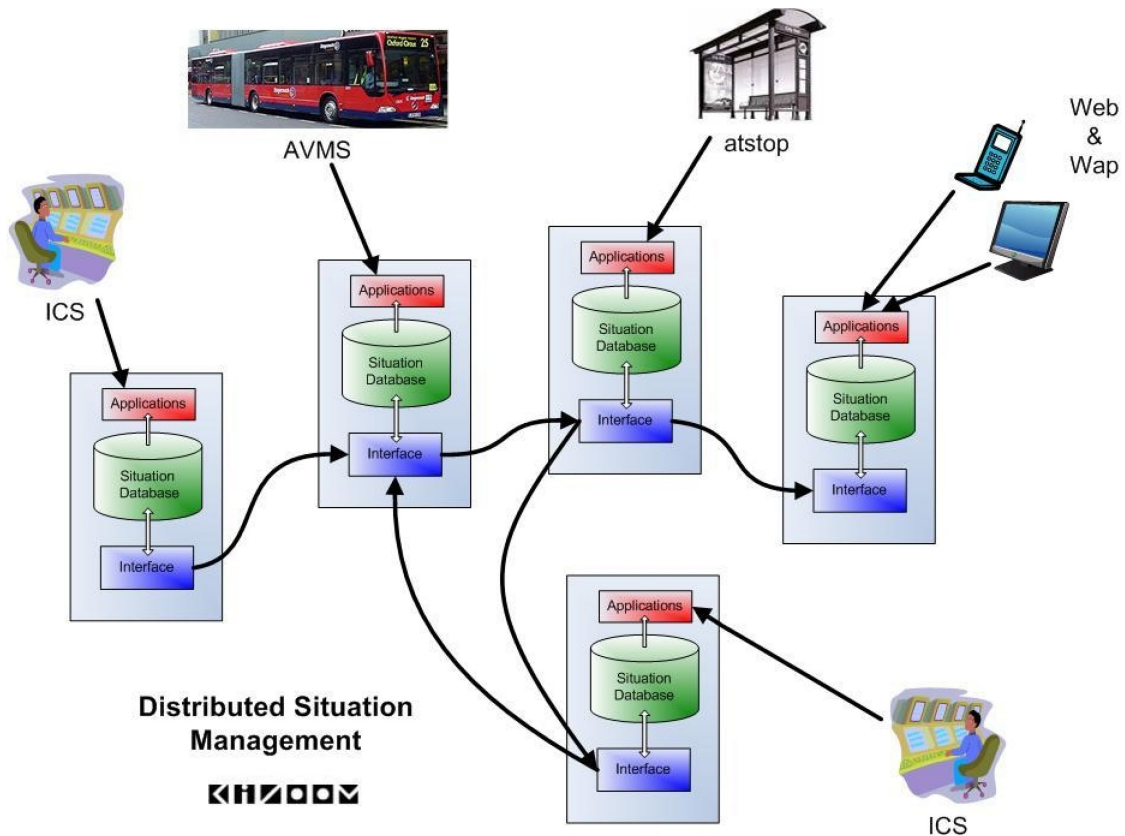
Figure 2 — Distributed Message Management

5.3.2 Currency and the Situation Life Cycle

SITUATIONs typically undergo a life cycle that will take them from initial capture as a new live SITUATION, through additional verification and dissemination stages, followed possibly by one or more updates, and finally closure. However, as soon as a representation of a SITUATION exists in more the one incident management system (perhaps even on the same computer), each of which might wish to make further updates to the Situation content, issues of coordination arise. How do changes get propagated and reconciled?

Furthermore, there is often also a need to maintain an exact audit trail of the information flow in incident management systems, recording when each update was entered into the system, along with data about where it came from. This can be used both to improve operational processes, and to monitor adherence to operating procedures and performance targets.

Another consideration is that the communication links are potential points of failure, so the system shall allow for efficient resynchronisation after loss of connection, as well as allowing consumer systems to make suitable judgements as to the continued currency of SITUATIONs during a prolonged interruption.

Together these considerations lead to the need for a "write-only" content model which uses a formal edit-version-release process to progress an initial SITUATION and its updates through a managed lifecycle.

This lifecycle occurs at two levels: a "macro" level progression of the overall SITUATION, and a "micro" level of the individual updates to the SITUATION.

5.3.3 Representational model for Situation Elements

Figure 3 shows a fundamental UML class model for representing distributed SITUATION elements as a conceptual model. A Situation comprises one or more Situation Element instances. In effect there are two types of Situation Element object; the original **base** Situation Element, then one or more **update** Situation Element updates.

Both types of element undergo an edit-version-release process to control their use; this is marked by a versioning time: for an element in draft the time is empty. Once populated, the Situation element is considered fixed.

In SIRI-SX, as in TPEG and other incident management systems, we model the relationship between base and updates by allocating a unique **SITUATION number** that is common to both base and update entities, and use a **version number** to distinguish each further update. Numbers are unique within participant – each of whom has a unique identifier within country. This means that we can group a base SITUATION element and its updates simply by their common identifier parts, and can exchange an update independently of the base SITUATION and without explicitly referencing all previously known updates.

To indicate a relationship with a completely separate SITUATION element of a different Situation, an element may also contain one or more *RelatedSituation* references that link the Situation element with other Situation elements; in this case the association is explicit.

Note that the model in principle allows updates for the same SITUATION to be created on more than one system if desired. This can give rise to branches in the update chain. It is up to a given consumer system to serialise and reconcile all the updates it has available in order to arrive at a consolidated view of a given Situation (see discussion of branching below).

The model allows for different types of **SITUATION body** to be used to for **public transport** and for **road** related SITUATIONs (which typically have different properties). SIRI-SX is primarily concerned with PT SITUATIONs that affect the PT network and services described by the other SIRI services, but to support interoperability with Datex2 can also embed a Datex2 Traffic Element.
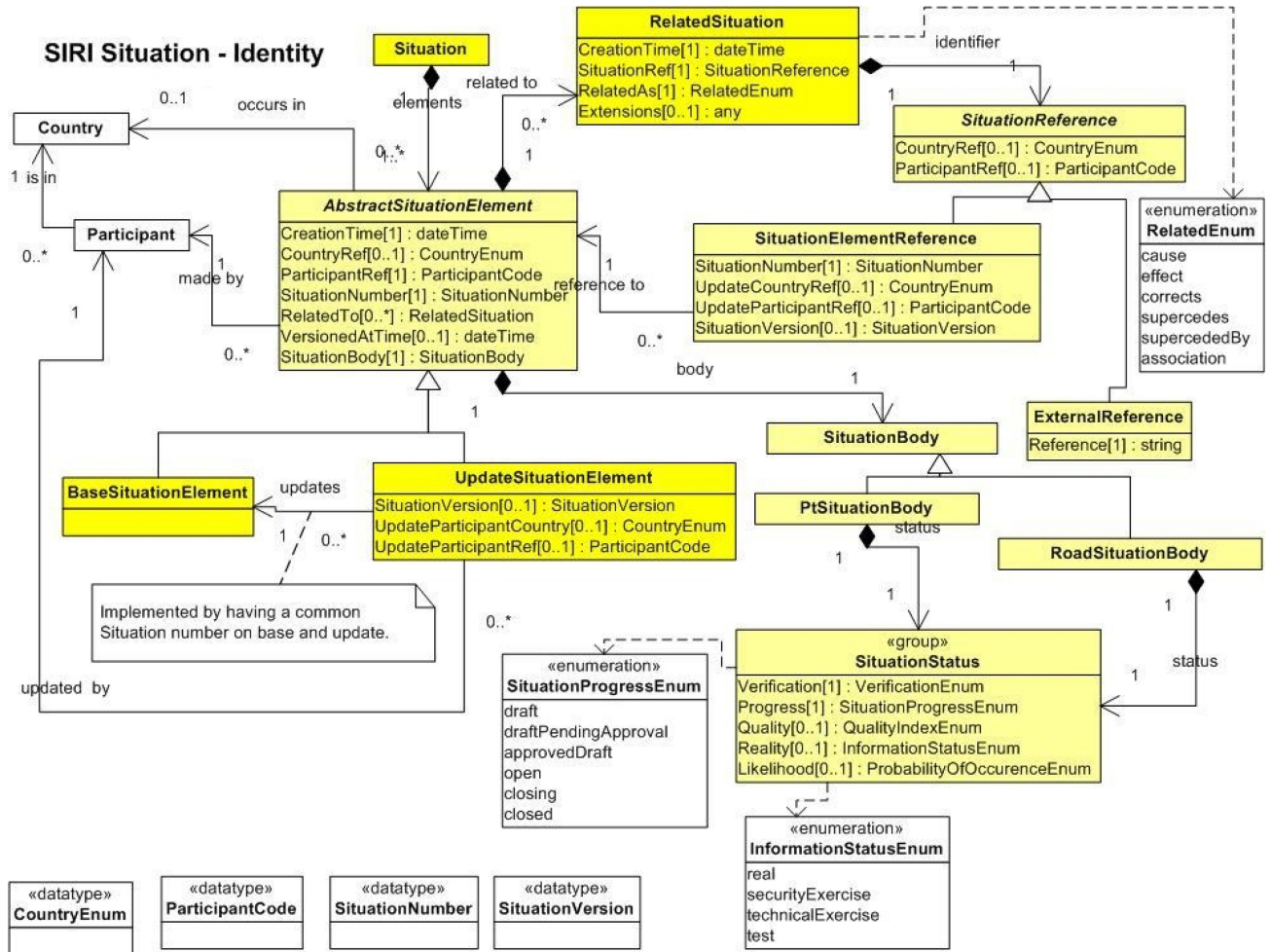
Figure 3 — UML Diagram of Situation Identity Elements

5.3.4 Update chains – Causal chains

A Situation may thus be represented as a successive chain of situation elements, possibly created on different systems. Figure 4 shows some object instances for situation headers that illustrate this. The base element *Sit00987* and update versions *Sit00987-01* and *Sit00987-02* are created by Participant system *TfL01*. The last update, *Sit00987-03* was created on a separate system by participant *LUL2,* and so has a separate **UpdateParticipantRef**.
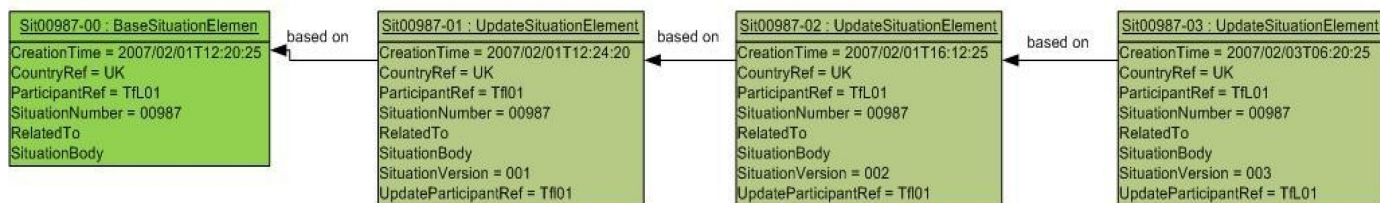
Figure 4 — Situation Instance example

Each Situation Element instance will have a SITUATION body associated with it (not shown). Any values specified for an attribute on an update element, e.g. a change of temporal or NETWORK scope, supersede any previous values as the current values for the SITUATION.

In effect, SIRI-SX exchanges the detailed history of updates to a SITUATION. In practice, the producer and consumer systems may create additional views of the SITUATION representing a current consolidated view of the SITUATION as an aggregation of the separate updates.

5.3.5 Cross-referencing Situations – Causal chains

SITUATION elements can include explicit references to other SITUATIONs that explain them. This allows SITUATION threads to be merged or split into a chain of cause and effect. Adding or removing a cross reference between two different SITUATION element chains should follow the same edit-version-release model for other changes; i.e. to add a link between two SITUATIONs requires an new SITUATION update element being added to the SITUATION that wishes to establish the reference. This allows links to be propagated to other systems.

Figure 5 shows this: an update *Sit00456-02* to SITUATION *Sit00456* adds as one of its properties a Related to reference that associates it with *Sit00987-02* and by implication Sit00987 overall. This can be used to find earlier and later updates to *Sit00987* as well.
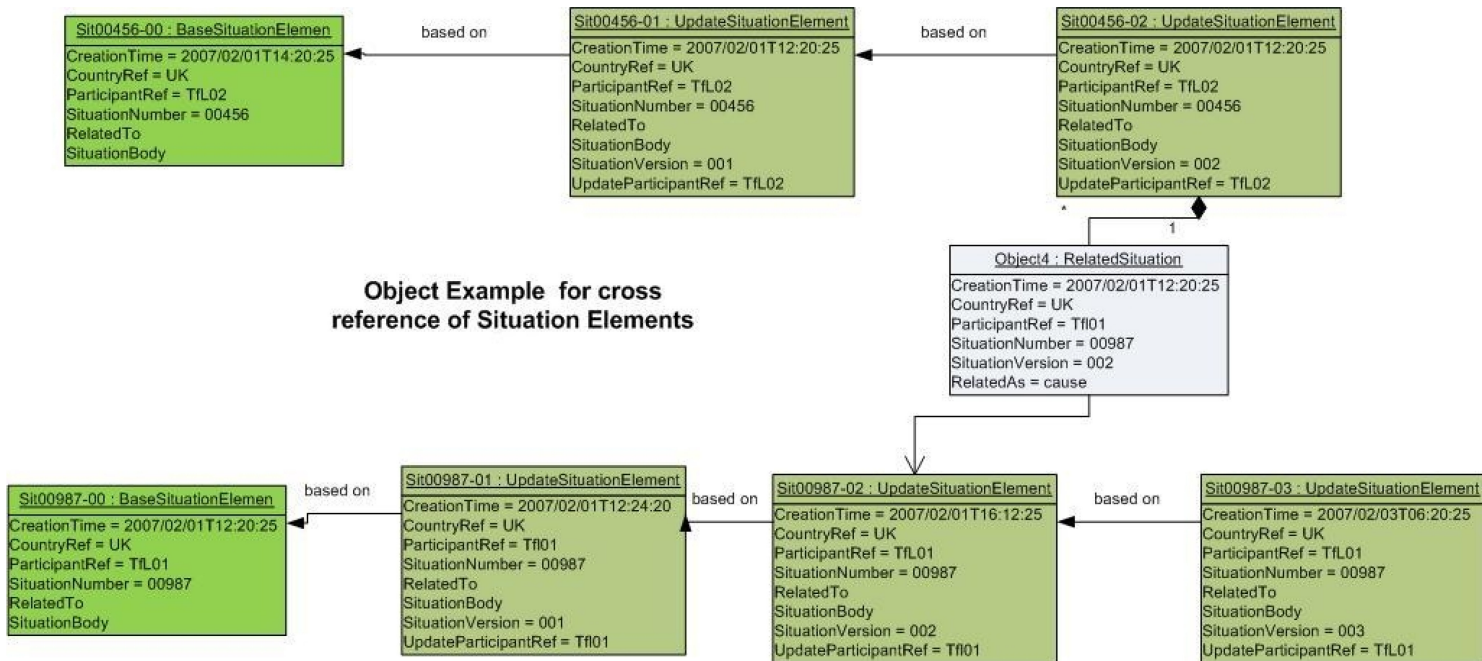
Figure 5 — Instance example – Situation cross-reference chains

5.3.6 Branching and distributed updates

5.3.6.1 General

Normally a SITUATION and its updates will be originated on a given computer and distributed to others. It is possible that alternative updates will be created on two different machines, giving rise to a branch in the chain of situation elements (Figure 6). In this case, if and when elements of the alternative branch are returned to the original machine (or indeed any downstream machine) it will be up to it to reconcile the two branches, either by discarding the obsolete branch, or by creating a new situation element that merges the data in to a revised update. This may be done either by a simple automated policy of using the most recent timestamp, or may be done by manual reconciliation, by an OPERATOR who chooses

one or other element as more current. If there is new information unknown to the original machine then a new update will be created reconciling the branch.

It is possible as an implementation policy to constrain the creation of updates such that an update can only be created on the system on which it originated, thus avoiding branching (except by the creation of completely separate instances).
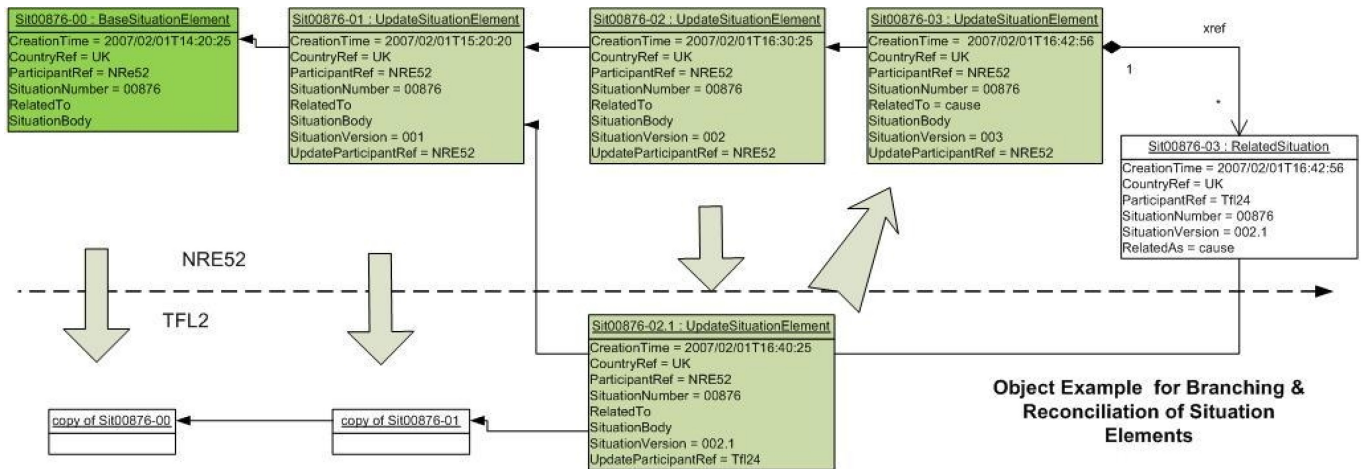
Figure 6 — Instance Example – Situation branching

5.3.6.2 Situation Element Life Cycle: Editable and Versioned States

Each Situation element starts out as an editable draft on an originating system: once capture is complete it is versioned, freezing content fields from further change, and then may be released to other systems.

Once released to other systems, if a SITUATION ends before its specified end time a further update situation element may need to be distributed to rescind it.

Note that this mechanism is distinct from the version number (which may also be used to version drafts) Within a database it would be possible to save a succession of draft versions with an incrementing number, before finally saving a version with the status set to versioned.
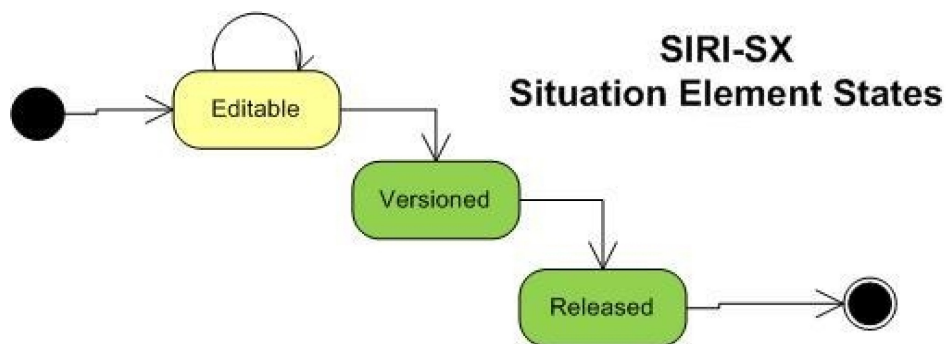
Figure 7 — Edit release cycle of an individual Situation Element

5.3.6.3 Situation Life Cycle: Situation Progress States

The overall state of a SITUATION progresses through a number of states (Figure 8). In a *Draft* state, the initial content of the SITUATION is being captured or verified. Once capture is completed, the draft may optionally be submitted to a second authority to review or approve, in which case it will pass through *PendingApproval* and *ApprovedDraft* States. Once in an *ApprovedDraft* state, the SITUATION is available

to be picked up and published, at which point it becomes *Open*, that is, in effect or about to come into effect, during which time further SITUATION updates may be created. Eventually the SITUATION will be *Closed*, that is, ready to remove from the distribution system. Closure may be immediate, or be done via an intermediate *Closing* state that indicates the SITUATION is resolved but a notice should be retained for a while in order that passengers see an "all clear" notice.

A given Situation element may record the current **progress state** of the SITUATION at the time it is versioned. To record a new state for the SITUATION, a new SITUATION update element is needed. Thus a *Closed* SITUATION may be reopened by the addition of a further update.

Note that the lifecycle states shown in Figure 8 do not necessarily correspond to a simple attribute value in the situation elements. In the SIRI-SX model, the overall status of the SITUATION is encoded by a combination of an explicit enumerated **progress state** value in the SITUATION body, and the temporal scope. Thus a SITUATION that has passed its termination time is automatically deemed to be *Closed*.
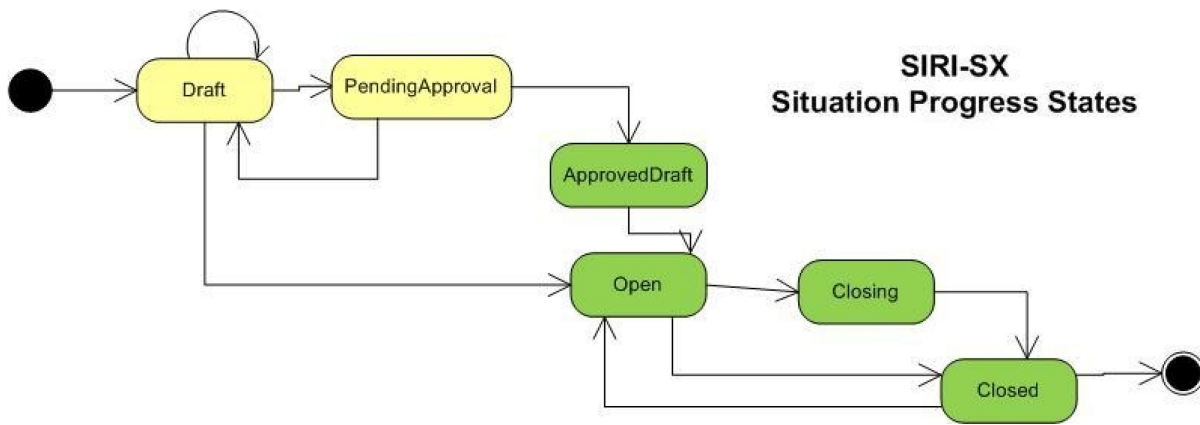
Figure 8 — Overall Life cycle Progress States of a Situation

5.3.7 Archiving

Once closed, situation elements may be maintained in a database indefinitely as documents of record. The content includes source and timestamp data suitable for audit purposes.

5.4 Summary of Situation Management

5.4.1 General

Together the above requirements dictate a particular approach to modelling SITUATIONs as software entities in SIRI-SX (and corresponding to the approach to managing message identity used in TPEG and DATEX2). The model is fundamental to using SIRI-SX messages and can be summarized as follows:

5.4.2 Situation Identity

1) Every SITUATION has a unique **identifier**, which is unique within all SITUATION management systems participating in the exchange of SITUATIONs.

2) A **Situation number** is allocated for the **base** situation element which creates the SITUATION; this is unique within the issuing system, as identified by its SIRI **Participant** identifier.

3) SITUATIONs may have SITUATION **update elements**, which reflect further change to the SITUATION. Updates are also processed through clearly defined states, being first edited, then versioned and released.

4) For an update element the **Situation number** shall be qualified by a **version number**. The version numbers issued are monotonically increasing. The version numbers of updates issued by systems other than the one which created the base situation element are qualified by the system identifier of that other system and shall be unique within that other system.

5) Participant codes should be unique within a given country.

Thus situation elements in effect have a compound identifier:

The full logical identifier of a Base Situation element comprises:

(*CountryCode* +) *ParticipantCode* + *SituationNumber*.

The full logical identifier of an Update Situation element comprises the above with a version number added, and if the system creating the update is different from the original system, also a participant code.

(*CountryCode* +) *ParticipantCode* + *SituationNumber* +
((*VersionCountryCode* +) *VersionParticipantCode* +) *VersionNumber.*

Not all of the identifier parts necessarily need to be cited in all contexts in order to identify a given situation element. For example if the country code or participant code is common to all SITUATIONs it does not need to be cited explicitly. In implementations, the Country code may often be derived for example, to be the same as the OPERATOR, etc.

5.4.3 Situation Life Cycle

1) An edit-version-release cycle is used for situation elements. Content may only be changed when still in draft state. Once versioned, *the contents of a given version of a SITUATION or update are never changed*. If a change is needed after release, a further update is created with modified contents.

2) Every situation element has a workflow progress status which may have at least the following states: *draft*, (i.e. in edit): *versioned, open, closed*. Some other intermediate states, for example *pendingApproval*, *approvedDraft* and *closing* may also be useful. Note that the progress status reflects the status at the time the situation element is versioned. The overall status of a SITUATION cannot necessarily be determined just from the progress status value as if for example it has a validity set by a time window, the SITUATION will no longer be open, even if there has been no explicit update

5.4.4 Situation Update Content

1) An update need only contain those additional content values for the situation element which have changed since previous ones. All other values will be assumed to be as in the original base situation element together with previous cumulative updates. A consumer system may create a consolidated view of the current status of a SITUATION by successively applying intervening update situation elements. Depending on the application, the consumer may wish to present the full history or just a consolidated view.

2) Updates may be created on more than one system, version numbers being additionally identified by the participant reference of the system that is creating the update. It is up to the consumer system to reconcile different branches. All updates contain a creation time which can be used to assess which is the most recent.

3) A situation element will have a number of content values describing its currency including a validity period and a publication date. These can be used by consumer systems to judge the staleness of a SITUATION.

5.4.5 Example of identifier allocation

Table 1 shows and example of Situation Identifier values issued for base situation element *tfl0001:00023* and three subsequent update elements. The first two updates on the same system (*Tfl001*), the last on a different system (*rail04*).

Note that the actual choice of identifier values and numbering systems is an implementation choice. Version numbers of a given incident should preferably be monotonically increasing within each Participant system, e.g. *0001, 0002* as this provides a cross check against failures in synchronising system clocks. For update situation elements created on a different system the version number may either introduce a sub digit e.g. *0002.1, 0002.1.1,* etc, or simply increment the previous number e.g. 003, 004, etc.

Table 1 — Situation Numbering Example

	Situation Number		Version identifier		Timestamp
	Creator ParticipantRef	SituationId	Update ParticipantRef	Update Version	
Initial base situation element on system TfL001	Tfl001	00023	(Tfl001)	0000	2007–02–23T12:20:13Z
Update situation element 1 on system TfL001	Tfl001	00023	(Tfl001)	0001	2007–02–23T12:40:23Z
Update situation element 2 on system TfL001	Tfl001	00023	(Tfl001)	0002	2007–02–23T16:30:57Z
Update situation element 3 on System Rail 04	Tfl001	00023	Rail04	0002.1	2007–02–23T16:30:57Z

5.4.6 Date time stamps as identifiers

All situation elements and updates are also time stamped. Assuming all participant systems use synchronised time, this provides an additional alternative way to identify and sequence updates.

5.5 Interoperability of Situation management systems

5.5.1 General

In a complex transport network, systems will wish to integrate both public and private transport data, and will need to exchange data with many different systems in many different formats. SIRI-SX attempts to use a general SITUATION model that will allow the round-trip exchange of SITUATIONs with the other main SITUATION models, notably Datex2 and TPEG.

Some types of road SITUATION affect certain PT networks that make use of the road network, such as bus and coach. Although certain generic aspects of SITUATIONs, such as identifiers, temporal validity, severity, etc are common to both Road and PT SITUATION models, there are very significant differences in the detailed models needed to describe Road SITUATIONs from those needed to describe PT SITUATIONs, and in particular each requires quite distinct representations for key aspects such as nature of SITUATION, network and location scope, advice, etc. It would indeed be very undesirable for SIRI-SX to introduce its own separate model for road SITUATIONs. Instead SIRI-SX attempts to achieve interoperability with Datex2 and TPEG by establishing an explicit correspondence between the SITUATION models (See Annex). This allows the exchange of messages between different systems to

describe SITUATIONs with content that is sufficiently uniform to achieve a useful level of computation and to support cross modal inferences.
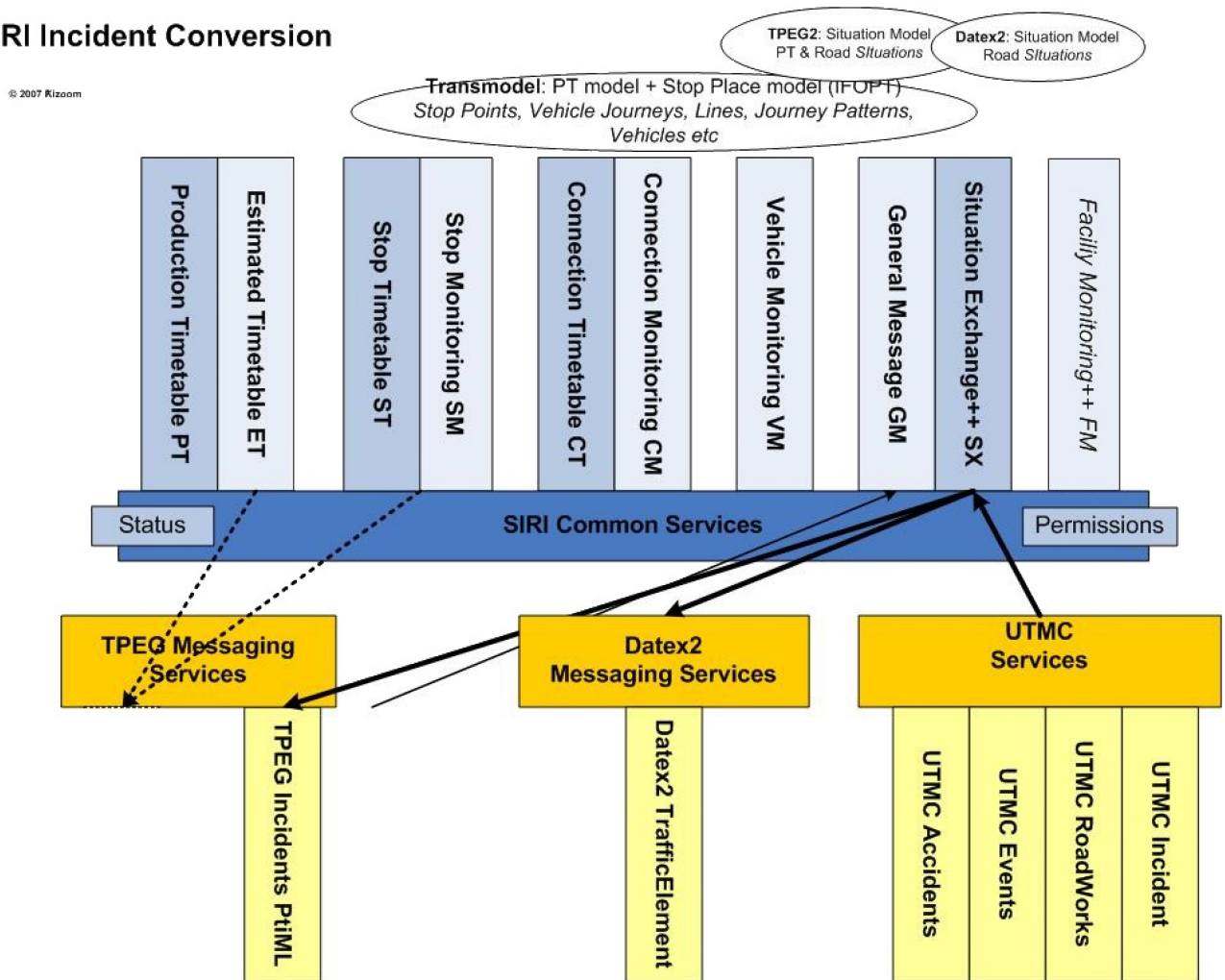
Figure 9 — Interoperability of message services

In principle the adoption of interoperable models should make it possible to use SIRI to DATEX2 SITUATION records and vice versa. It should also facilitate the creation of adaptors to transform SITUATION content. For example, one might want certain types of datex2 road network SITUATION to create an equivalent SITUATION that affects certain ROUTEs of the bus network.

5.5.2 Datex2 Interoperability

To support interoperability with Datex2, SIRI-SX includes the following mechanisms:

1. A formal correspondence between most generic SIRI-SX and Datex2 Situation elements (see Annex B), allowing a uniform approach to managing both road and PT SITUATIONs. The SIRI-SX schema has equivalent elements (and in some cases reuses actual Datex2 elements), so that the creation of adaptors to exchange SITUATIONs is simplified, and it is possible to establish uniform business rules for processing SITUATIONs.

2. Allowing the reuse of a Datex2 *TrafficElement* to describe a road SITUATION that can be exchanged as a SIRI SITUATION, or linked with a PT SITUATION in a causal chain.

3. Allowing the annotation of SIRI-SX PT SITUATIONs with Datex2 Locations.

5.5.3 TPEG Interoperability

To support interoperability with TPEG, SIRI-SX includes the following mechanisms:

1. A correspondence can be seen between a subset of generic SIRI-SX and TPEG message elements, allowing a uniform approach to managing both TPEG PTI messages and PT SITUATIONs, and making the construction of adaptors straightforward.

2. TPEG reason codes are used to categorize SIRI-SX messages. See 7.8.5.7.8.

5.5.4 Communications Bandwidth

As with other SIRI functional services, the SIRI-SX service is intended primarily for server to server communication over broadband IP between back end control systems and distribution hubs. It uses a XML structure that is relatively verbose and includes both a rich structured content and textual descriptions. It is not optimised for over the air communication with vehicles using communication over constrained bandwidth, although it compresses well. It should however be straightforward to make a one-way transform of SIRI-SX messages (or a subset of their content) into a more concise format suitable for such transmission if required.

6 The Situation Model

6.1 General

SIRI-SX includes a structured model of SITUATIONs. A SITUATION describes a disruption to services, using data elements whose identifiers relate directly to the entities of other information services. SITUATIONs can thus be directly linked to SCHEDULED STOP POINTs, LINEs, VEHICLE JOURNEYs, pathways: as the cause of disruption or as the result of service problems. This tagging makes it possible to process SITUATIONs automatically, for example to support journey planners or alert services.

The SIRI-SX SITUATION model is described with UML class diagrams in this section.

— Summary of SITUATION Model.

— SITUATION Body.

— SITUATION Body Details.

— SITUATION Reason (TPEG).

— SITUATION Consequence.

— SITUATION Affects Scope.

    — Overview of Affects Scope.

    — Affects Scope for Scheduled Services.

    — Affects Scope for STOP PLACE.

    — Common Accessibility Elements.

— Publishing Actions.

— Data Types.

There are separate descriptions of the PT SITUATION body and the Road SITUATION Body.

The UML class diagrams in this document follow presentation conventions intended to make clear the mapping of elements to a concrete XML schema. See Annex A for a full discussion. The attributes used to implement associates are shown explicitly. In most cases, each UML Class is implemented as an explicit XML element of the same name. In some cases the XML schema simplifies, in particular a << group >> stereotype is used to indicate that a class is implemented as a reusable XML group embedded within another element, rather than as a first-class element.

6.2 Representing a PT Situation in SIRI-SX

6.2.1 Summary of PT Situation model

Figure 10 introduces the SIRI-SX SITUATION model for Public Transport SITUATIONs as a UML diagram. The SITUATION model has four main concepts: *PtSituationBody*, *AffectsScope*, *Consequence* and *Actions*.

— The *PtSituationBody* brings together the information about a Public Transport SITUATION and is made up of a number of structured parts, including the temporal scope; a systematic classification (based on TPEG); and set of text descriptions.

— The *AffectsScope* element specifies the scope of the SITUATION – the location model in TPEG terms. This can be stated in terms of the network, and/or particular LINEs, stations or VEHICLE JOURNEYs or points in line with a Transmodel representation.

— A *Consequences* element describes the effect of the SITUATION on services.

— A *PublishingActions* element suggests processing options for the SITUATION for use by downstream systems, for example whether it should appear on the web or not. This allows the SITUATION provider to tag the SITUATION with information guiding the business rules for different workflow steps in the subsequent use of the SITUATION.

Figure 10 — UML Diagram of Overview of SIRI-SX Model for PT Situations

6.2.2 PT Situation Element Body

Figure 11 elaborates Figure 10 to add in basic information about the properties of a PT SITUATION.

— The **PtSituationBody** groups the descriptive properties of SITUATIONs that are common to both Base SITUATIONs and updates.

— **SituationStatus** describes the current status of the SITUATION, including **Verification**, **Progress. Reality** and **QualityIndex.**

— **SituationSource** describes the information source from which the SITUATION was obtained.

— A Group of Temporal elements describes the Temporal scope of the SITUATION, including **ValidityPeriod**, (when the SITUATION occurs) **Repetitions** (if it recurs at a regular periodicity) and **PublicationWindow.** (If the period for informing customers is different from the validity period).

— A Group of Classifier elements describes the Classification of the SITUATION by **Reason**, **Severity**, **Priority**, **Audience**.

— A Group of Descriptor elements provides a set of textual descriptions of the SITUATION. This can contain different components, for example **Summary**, **Description**, **Details**, **Advice**, **Internal** as well as **Image** and **InfoLinks.**
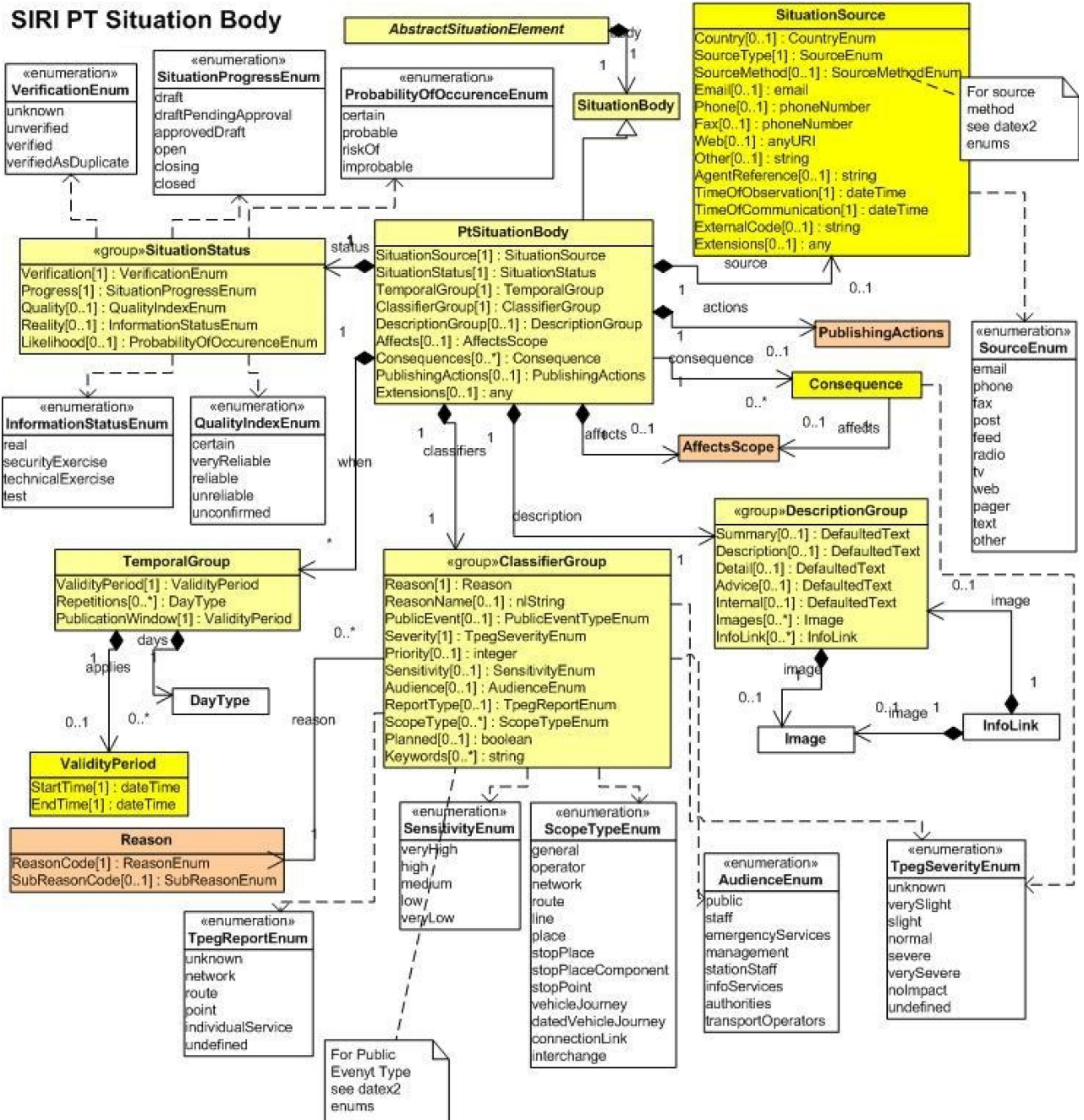
Figure 11 — UML Diagram of PT Situation Body Summary

6.2.3 PT Situation Body Details

Figure 12 elaborates Figure 11 with further details about the types and allowed values for them. These are also described in tabular form later in 7.8.5 below.

The diagram introduces the subcomponents of the ***AffectsScope*** element which can be used to specify the scope of a SITUATION as a collection of annotated references to NETWORK and service elements.

Consequences: Describes specific effects of the SITUATION, including additional ***AffectsScope*** specific to the consequence. May have a separate ***ValidityPeriod***, ***Severity***, ***Advice*** as well as additional structured information such as ***Delay***, ***Casualties***, and specific effects on accessibility – ***Suitability, Boarding*** possibilities, ***Easements.***

Some components, such as ***Reason, AffectsScope, Consequence*** and ***PublishingActions***, are further elaborated in additional diagrams (See Figure 13, Figure 14, Figure 15, Figure 16, Figure 20).

Situation

SIRI Situation

related to

RelatedSituation
CreationTime[1] : dateTime
SituationRef[1] : SituationReference
RelatedAs[1] : RelatedEnum
Extensions[0..1] : any

«enumeration»
RelatedEnum
cause
effect
corrects
supercedes
supercededBy
association

SituationReference
CountryRef[0..1] : CountryEnum
ParticipantRef[0..1] : ParticipantCode

AbstractSituationElement
CreationTime[1] : dateTime
CountryRef[0..1] : CountryEnum
ParticipantRef[1] : ParticipantCode
SituationNumber[1] : SituationNumber
RelatedTo[0..*] : RelatedSituation
VersionedAtTime[0..1] : dateTime
SituationBody[1] : SituationBody

SituationElementReference
SituationNumber[1] : SituationNumber
UpdateCountryRef[0..1] : CountryEnum
UpdateParticipantRef[0..1] : ParticipantCode
SituationVersion[0..1] : SituationVersion

«enumeration»
SourceMethodEnum

BaseSituationElement

UpdateSituationElement
SituationVersion[0..1] : SituationVersion
UpdateParticipantCountry[0..1] : CountryEnum
UpdateParticipantRef[0..1] : ParticipantCode

Participant

updated by

SituationSource
Country[0..1] : CountryEnum
SourceType[1] : SourceEnum
SourceMethod[0..1] : SourceMethodEnum
Email[0..1] : email
Phone[0..1] : phoneNumber
Fax[0..1] : phoneNumber
Web[0..1] : anyURI
Other[0..1] : string
AgentReference[0..1] : string
TimeOfObservation[1] : dateTime
TimeOfCommunication[1] : dateTime
ExternalCode[0..1] : string
Extensions[0..1] : any

«enumeration»
VerificationEnum
unknown
unverified
verified
verifiedAsDuplicate

«group»**SituationStatus**
Verification[1] : VerificationEnum
Progress[1] : SituationProgressEnum
Quality[0..1] : QualityIndexEnum
Reality[0..1] : InformationStatusEnum
Likelihood[0..1] : ProbabilityOfOccurenceEnum

SituationBody

«enumeration»
SourceEnum
email
phone
fax
post
feed
radio
tv
web
pager
text
other

«enumeration»
ProbabilityOfOccurrenceEnum
certain
probable
riskOf
improbable

«enumeration»
QualityIndexEnum
certain
veryReliable
reliable
unreliable
unconfirmed

PtSituationBody
SituationSource[1] : SituationSource
SituationStatus[1] : SituationStatus
TemporalGroup[1] : TemporalGroup
ClassifierGroup[1] : ClassifierGroup
DescriptionGroup[0..1] : DescriptionGroup
Affects[0..1] : AffectsScope
Consequences[0..*] : Consequence
PublishingActions[0..1] : PublishingActions
Extensions[0..1] : any

PublishingActions

AffectsScope

«enumeration»
SituationProgressEnum
draft
draftPendingApproval
approvedDraft
open
closing
closed

Consequence
Period[0..1] : HalfOpenTimestampRange
Condition[0..1] : TpegServiceConditionEnum
Severity[1] : TpegSeverityEnum
Affects[0..1] : AffectsScope
Suitabilities[0..*] : Suitability
Advice[1] : Advice
Blocking[0..1] : Blocking
Boarding[0..1] : Boarding
Delays[0..1] : Delays
Casualties[0..1] : Casualties
Easements[0..*] : Easement
Extensions[0..1] : any

«group»**ClassifierGroup**
Reason[1] : Reason
ReasonName[0..1] : nlString
PublicEvent[0..1] : PublicEventTypeEnum
Severity[1] : TpegSeverityEnum
Priority[0..1] : integer
Sensitivity[0..1] : SensitivityEnum
Audience[0..1] : AudienceEnum
ReportType[0..1] : TpegReportEnum
ScopeType[0..*] : ScopeTypeEnum
Planned[0..1] : boolean
Keywords[0..*] : string

«enumeration»
SensitivityEnum
veryHigh
high
medium
low
veryLow

«enumeration»
TpegSeverityEnum
unknown
verySlight
slight
normal
severe
verySevere
noImpact
undefined

Reason

«group»**DescriptionGroup**
Summary[0..1] : DefaultedText
Description[0..1] : DefaultedText
Detail[0..1] : DefaultedText
Advice[0..1] : DefaultedText
Internal[0..1] : DefaultedText
Images[0..*] : Image
InfoLink[0..*] : InfoLink

«enumeration»
ScopeTypeEnum
general
operator
network
route
line
place
stopPlace
stopPlaceComponent
stopPoint
vehicleJourney
datedVehicleJourney
connectionLink
interchange

«enumeration»
TpegReportEnum
unknown
network
route
point
individualService
undefined

TemporalGroup
ValidityPeriod[1] : ValidityPeriod
Repetitions[0..*] : DayType
PublicationWindow[1] : ValidityPeriod

«enumeration»
AudienceEnum
public
staff
emergencyServices
management
stationStaff
infoServices
authorities
transportOperators

DayType

ValidityPeriod
StartTime[1] : dateTime
EndTime[1] : dateTime

DefaultedText
nlString[1]
overridden[0..1]

Image
ImageRef[0..1]
ImageBinary[0..1]
ImageContent[0..1]

InfoLink
Uri[1]
Label[1]
image[1]
LinkContent[1]

Figure 12 — UML Diagram of SIRI-SX Situation Body

6.2.4 PT Situation Reason

A SITUATION *Reason* is part of the SITUATION classifier content and provides taxonomic information about the cause of the SITUATION. Each SITUATION is assigned a Reason type.

In the SIRI-SX SITUATION model, for Pt SITUATIONs a two level classification system is used, corresponding to the TPEG PTI ontology. Each main reason type (***PersonnelReason***, ***EquipmentReason***, ***EnvironmentReason*** etc) contains a set of subtypes that explain the reason in more detail; for example for ***EnvironmentReason***, includes *heavySnow, rain, fog, flooding,* etc.

Note that TPEG in fact has two sets of Reason codes; one in TPEG-Loc and one in TPEG–PTI There are some minor differences but not conflicts. SIRI-SX uses a union of both sets.

SIRI-SX makes some additional distinctions to identify a number of additional SITUATION reasons not currently recognized by TPEG – each of these additional reasons is mapped to an existing TPEG category so that an SIRI-SX schema is fully compatible for export to TPEG. For example SIRI-SX distinguishes between 'Fire on Track' and a plain 'Fire'.

Figure 13 summarizes the SIRI-SX Reason codes. The codes are listed in tabular form in 7.8.5.7.8.

tpeg pti_19

tpeg pti_20

tpeg pti_21

tpeg pti_22

«enumeration»
TpegMiscellaneousReasonEnum
unknown
incident
bombExplosion
securityAlert
fire
vandalism
accident
overcrowded
insufficientDemand
lightingFailure
leaderBoardFailure
serviceIndicatorFailure
operatorCeasedTrading
operatorSuspended
congestion
routeBlockage
personOnTheLine
vehicleOnTheLine
objectOnTheLine
animalOnTheLine
routeDiversion
roadClosed
roadworks
specialEvent
bridgeStrike
overheadObstruction
undefinedProblem

«enumeration»
TpegPersonnelReasonEnum
unknown
staffSickness
staffAbsence
staffInWrongPlace
staffShortage
industrialAction
workToRule
undefinedPersonnelProblem

«enumeration»
TpegEquipmentReasonEnum
unknown
pointsProblem
pointsFailure
signalProblem
signalFailure
derailment
breakdown
technicalProblem
repairWork
constructionWork
maintenanceWork
powerProblem
fuelProblem
swingBridgeFailure
escalatorFailure
liftFailure
gangwayProblem
closedForMaintenance
fuelShortage
deicingWork
wheelProblem
luggageCarouselProblem
undefinedEquipmentProblem

«enumeration»
TpegEnvironmentReasonEnum
unknown
fog
roughSea
blizzardConditions
heavyRain
tidalRestrictions
highTide
lowTide
ice
frozen
sleet
highTempatures
flooding
waterlogged
lowWaterLevel
highWaterLevel
fallenLeaves
fallenTree
landslide
undefinedEnvironmentalProblem

**SIRI-SX
TPEG Situation
Reasons**

«enumeration»
ReasonEnum

Reason
ReasonCode[1] : ReasonEnum
SubReasonCode[0..1] : SubReasonEnum

«enumeration»
SubReasonEnum

«datatype»
MiscellaneousSubreasonEnum

«enumeration»
PersonnelSubreasonEnum
staffSickness
staffInjury
unofficialIndustrialAction

«enumeration»
WeatherSubreasonEnum
heavySnowFall
strongWinds
stormConditions
stormDamage
hail
lightningStrike
avalanches
flashFloods

«enumeration»
PassengerSubreasonEnum
passengerAction
staffAssault
railwayCrime
assault
theft
altercation
illVehicleOccupants

«enumeration»
AccidentSubreasonEnum
collision
fatality
personUnderTrain
personHitByTrain
personIllOnVehicle

«enumeration»
RoadObstructionSubreason
problemsOnLocalRoad

«enumeration»
TrainSafetySubreasonEnum
nearMiss
safetyViolation
signalPassedAtDanger
stationOverun
trainDoor

«enumeration»
SecuritySubreasonEnum
unattendedBag
telephonedThreat
suspectVehicle
policeRequest
fireBrigatedSafetyChecks
emergencyServicesCall
civilEmergency
airRaid
sabotage
bombAlert
attack
evacuation
terroristIncident
gunfireOnRoadway
explosion
explosionHazard
securityIncident

«enumeration»
TrainObstructionSubreasonEnum
levelCrossingIncident
fallenTreeOnTheLine
vegetation
trainStruckAnimal
trainStruckObject
linesideFire

«enumeration»
EquipmentSubreasonEnum
tractionFailure
trainWarningSystemProblem
trackCircuitProblem
engineFailure
brokenRail
poorRailConditions
wheelImpactLoad
lackOfOperationalStock
defectivePlatformEdgeDoors
defectiveCcTV
defectivePublicAnnouncementSystem
ticketingSystemNotAvailable
defectiveFireAlarmEquipment
emergencyEngineeringWork
lateFinishToEngineeringWork

«enumeration»
SpecialEventSubreasonEnum
march
procession
demonstration
publicDisturbance
filterBlockade
sightseersObstructingAccess

«enumeration»
EnvironmentSubreasonEnum
mudslip
rockfalls
subsidence
earthquakeDamage
sewerOverflow
grassFire

«enumeration»
BorderProcessSubreason
problemsAtBorderPost
problemsAtCustomsPost

Figure 13 — UML Diagram of TPEG Situation Reason Values

6.2.5 Situation Consequence

The SITUATION *Consequence* element represents the likely effect or effects of a SITUATION on transport services. A SITUATION may have multiple consequences, each of which may have a different scope.

Figure 14 elaborates just the Consequence part of the previous UML diagrams. See 7.8.5.9 for a tabular representation. *Consequence* is made up of an *AffectsScope* and other properties:

— *Suitability:* describes the consequence for accessibility.

— *Blocking* describes whether the ROUTEs and services described in the *AffectsScope* element should be blocked, i.e. shown as unavailable in Journey Planner and real-time departure systems.

— *Boarding* describes the consequence for alighting and boarding at the Affected Stops

— *Advice*: Additional guidance to passengers

— *Casualties*: the number of

— **AffectsScope**: Identifies which parts of the network and which services are affected by the consequence. (See 6.2.6 below)

— **Easements**: Describes fare exceptions allowed because of the disruption.

The *Consequence* elements are described in tabular form in 7.8.5.9.
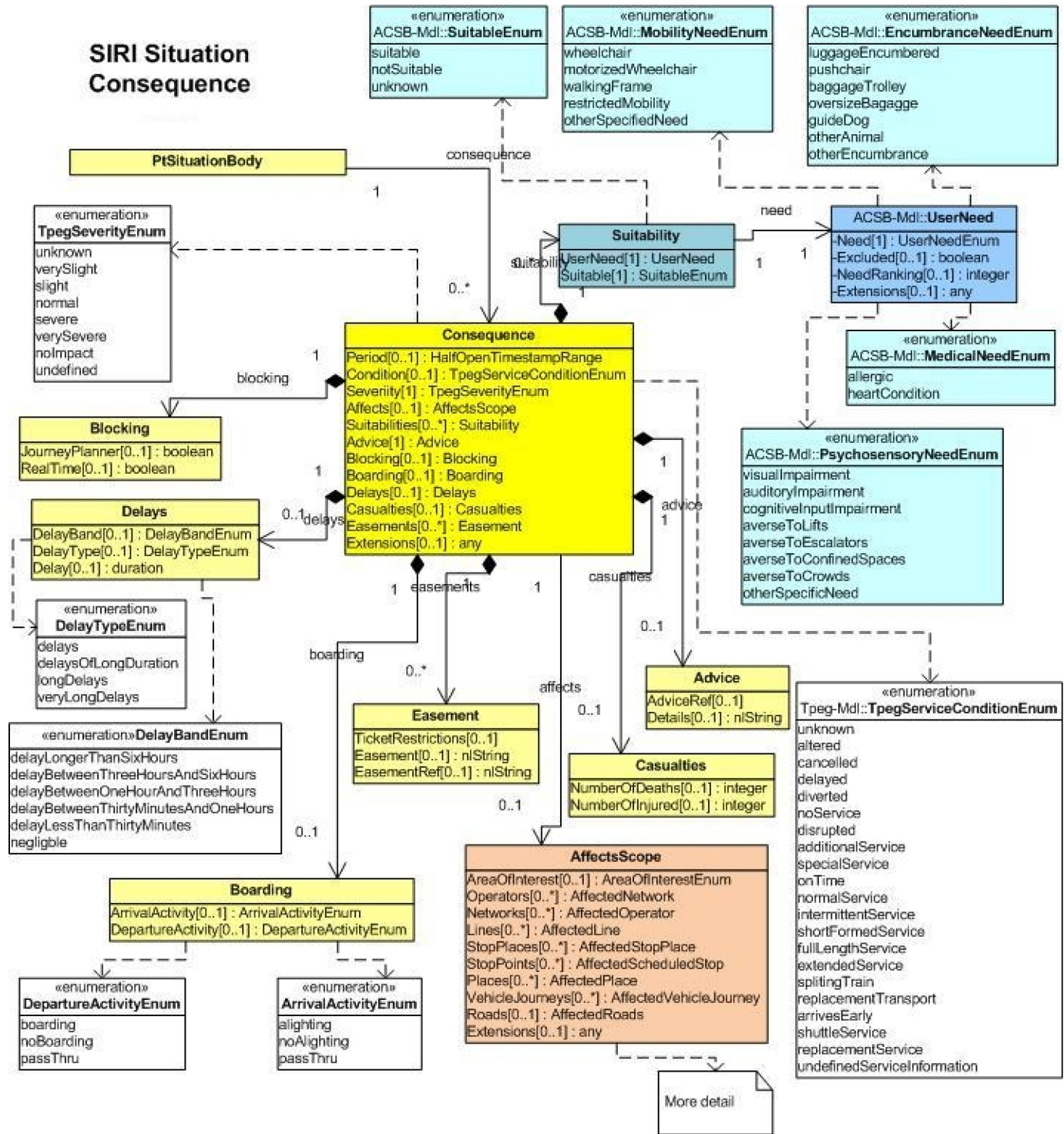
Figure 14 — UML Diagram of SIRI-SX Situation Consequence

6.2.6 The PT AffectsScope

6.2.6.1 Overview of AffectsScope

The **AffectsScope** element describes the scope of a SITUATION or scope of the **Consequence** of a PT SITUATION. It allows the use of tagged references to the identifiers of Transmodel entities. The same

references to data elements can be shared with other SIRI services, allowing the efficient exchange of information.

It can also be used to associate IFOPT STOP PLACE entities with a SITUATION in order to describe the precise scope of a SITUATION within a physical interchange.

Figure 15 introduces the *AffectsScope* model. The scope can be specified at different levels – e.g. the whole network, part of network, a station, etc. Annotations such as the name, direction etc that are useful for SITUATION processing and presentation can be included along with the basic entity references.

The scope of effect on the NETWORK and on scheduled services is made using *AffectedNetwork*, *AffectedOperator*, *AffectedLine*, *AffectedRoute*, *AffectedVehicleJourney*, *AffectedScheduledStop*, and *AffectedCall* elements, each of which may reference specific Transmodel entities. This is elaborated in Figure 16.

The scope of effect on PLACE and STOP PLACE usage is made using *AffectedPlace*, *AffectedStopPlace,* and *AffectedStopPlaceComponent*. This is elaborated in Figure 17.

For a discussion of the distinction between a *ScheduledStopPoint*, a *StopPlace* and a *StopPlaceComponent*, see the IFOPT documentation.

Figure 15 — UML Diagram of AffectsScope Summary

6.2.6.2 AffectsScope for Scheduled Services

Figure 16 shows that part of the **AffectsScope** that pertains to scheduled service elements. The AffectsScope may contain multiple instances of any of the following (some of which provide a context for other child elements):

— **AffectedNetwork** describes a NETWORK level scope, such as might apply to weather conditions or a special holiday.

— **AffectedOperator** describes an OPERATOR wide scope, such as a strike.

— **AffectedLine** describes a LINE or line section scope for SITUATIONs affecting part of a NETWORK, such as a LINE undergoing delays because of signalling problems. A line section is an arbitrary list of identifiers of **RouteLink** instances or other parts of a LINE.

— **AffectedRoute**, describes a ROUTE or line section scope for SITUATIONs affecting all or part of a ROUTE of a NETWORK (and hence all VEHICLE JOURNEYs that use that ROUTE), such as a section undergoing delays because of road works.

— **AffectedVehicleJourney** describes a scope of a specific VEHICLE JOURNEY, such as a delayed or cancelled service. The VEHICLE JOURNEY may be a DATED VEHICLE JOURNEY – i.e. one particular instance on a particular calendar day, or undated, it which case it specifies a particular VEHICLE JOURNEY in the timetable.

— **AffectedCall** describes a scope of a CALL at a SCHEDULED STOP POINT within a VEHICLE JOURNEY, such as a cancelled CALL at stop.

— **AffectedInterchange** describes a scope of an INTERCHANGE between two VEHICLE JOURNEYs at a SCHEDULED STOP POINT, such as a cancelled connection.

— **AffectedScheduledStop** describes a scope of an individual SCHEDULED STOP POINT, such as for a closed station. Note that this is a timetable reference and does not necessarily distinguish between the whole STOP PLACE or a specific QUAY – this can be done using the **AffectedStopPlace** elements – see Figure 17.

— **AffectedConnectionLink** describes a scope of an individual a CONNECTION LINK between two SCHEDULED STOP POINTs, such as the possibility of transfer between rail and metro at a station.

— **AccessibilityAssessment** describes the specific effects on ACCESSIBILITY at a point in the NETWORK or on use of a VEHICLE JOURNEY. See later below.

— **AffectedFacility** describes facilities affected, for a VEHICLE JOURNEY, a SCHEDULED STOP POINT or a STOP PLACE, such as a buffet car not being available. (Not shown)

— **AffectedRoads** describes those parts of the road NETWORK affected using a Datex2 **GroupOfLocations**. See Datex2 for further details. The **AffectedRoads** can be used to describe a road scope for PT SITUATIONs – for **RoadSituationBody** it would typically be specified on a **TrafficElement** of.
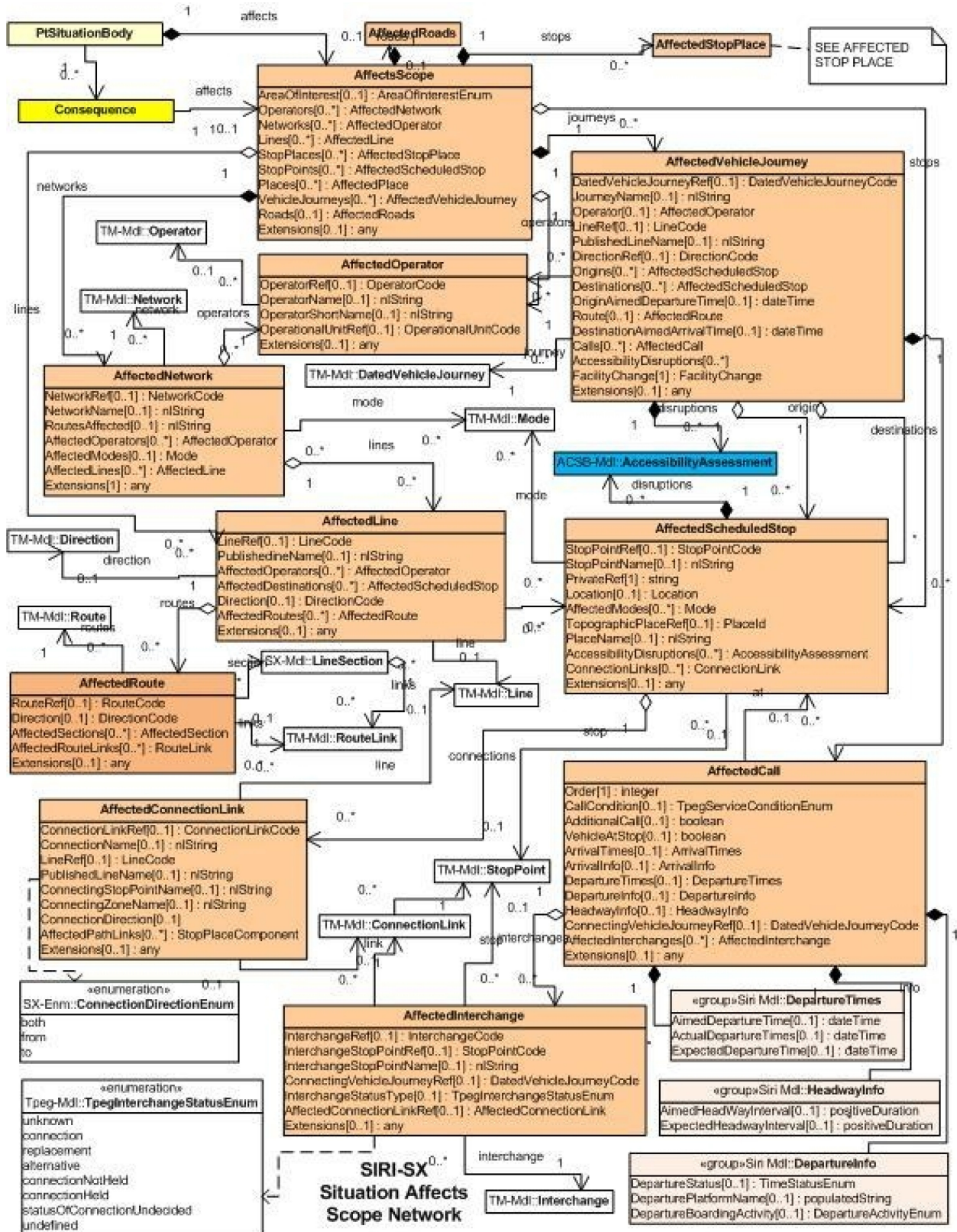
Figure 16 — UML Diagram of Situation AffectsScope: Scheduled Timetable Elements

6.2.6.3 AffectsScope for Stop Place

Figure 17 shows that part of the ***AffectsScope*** model that pertains to the STOP PLACE elements. It can be used to indicate that the scope of a SITUATION is all of STOP PLACE, or a specified part of it, such as a particular QUAY, ACCESS AREA, BOARDING POSITION, ENTRANCE or EQUIPMENT PLACE, or PATH LINK between them. For further details see the IFOPT technical specification.

— ***AffectedStopPlace*** describes a station or interchange level scope, such as might apply to SITUATIONs caused by a security alert at a station.

— ***AffectedStopPlaceComponent*** describes a scope of an element within a STOP PLACE, such as a QUAY, an ENTRANCE or an ACCESS SPACE.

— ***AffectedPlace*** describes a scope for SITUATIONs affecting other PLACEs (i.e. other than STOP PLACEs) such as POINTs OF INTEREST. This can also be used to specify an arbitrary point location

— ***AccessibilityAssessment:*** specifies an effect in terms of change to a SUITABILITY or LIMITATION, such as lack of use of a lift. This might arise from the SIRI-FM service.

Figure 17 — UML Diagram of Situation AffectsScope: Stop Place and Suitability Elements

6.3 Representing a Road Situation in SIRI-SX

6.3.1 Summary of Road Situation model

Figure 18 introduces the SIRI-SX SITUATION model for Road SITUATIONs as a UML diagram. The SITUATION model has four main concepts: **RoadSituationBody**, **AffectsScope**, **TrafficElement** and

Actions. It is intended primarily to indicate how interoperability with Datex2 to describe road SITUATIONs can be achieved.

— The **RoadSituationBody** brings together the information about a Road SITUATION and is made up of a number of structured parts, including the temporal scope; a systematic classification (based on TPEG); and set of text descriptions. Most of the elements are the same as described earlier under **PtSituationBody**

— The **AffectsScope** element specifies the scope of the SITUATION – the location model in TPEG terms. This can be stated in terms of the NETWORK, and/or particular lines, stations or VEHICLE JOURNEYs or points in line with a Transmodel representation. See earlier.

— A **TrafficElement** element describes the effect of the SITUATION on services. It embeds a Datex2 Traffic Element. Note that a number of the generic SITUATION elements such as severity, status, probability, etc can be specified using either the Traffic Element, or in the SIRI-SX elements or both.

— A **PublishingActions** element suggests processing options for the SITUATION for use by downstream systems, for example whether it should appear on the web or not. This allows the SITUATION provider to tag the SITUATION with information guiding the business rules for different workflow steps in the subsequent use of the SITUATION.
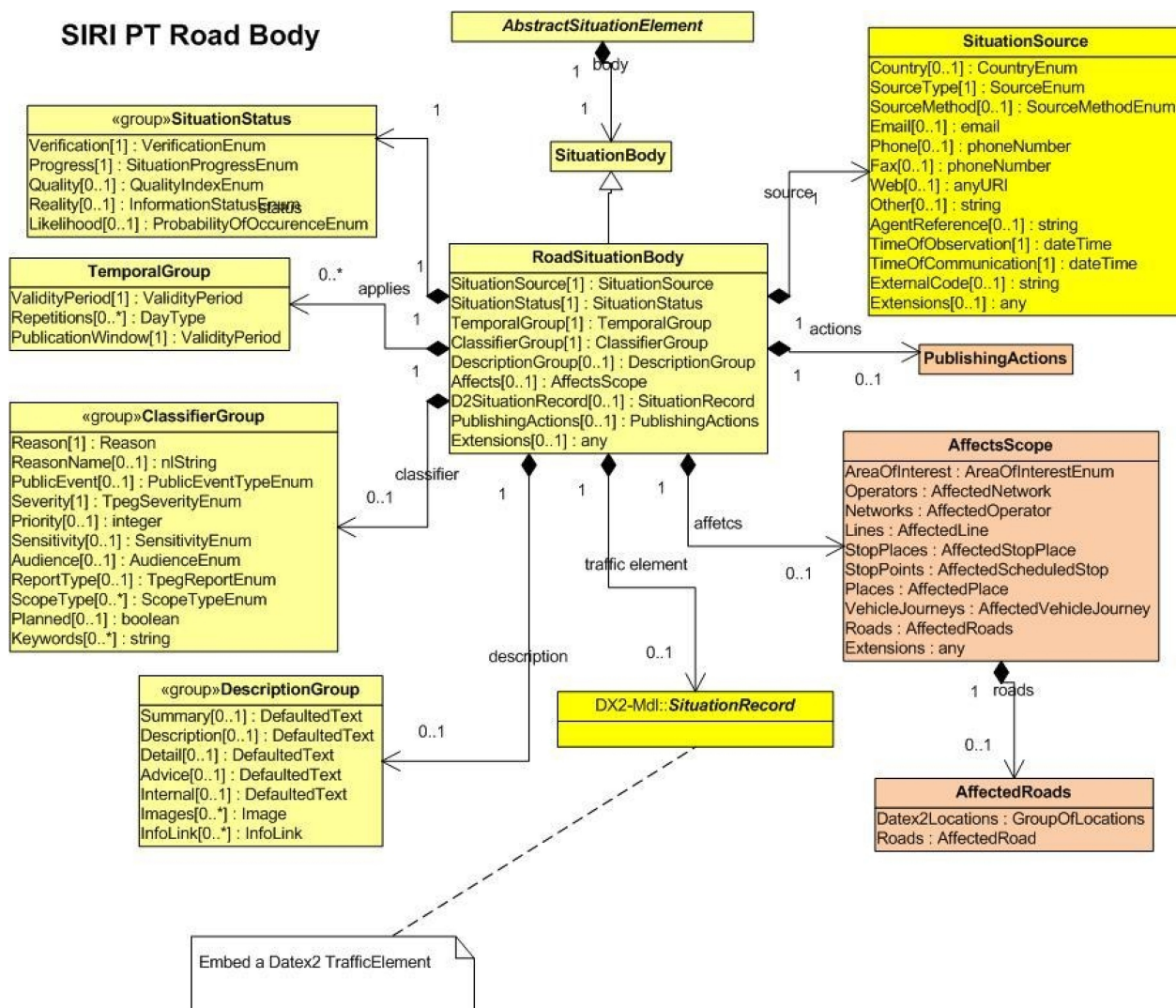

Figure 18 — UML Diagram of Overview of SIRI-SX Model for Roads

6.3.2 Road Situation Element Body

The **RoadSituationBody** groups the descriptive properties of Road SITUATIONs. It has many common properties with **PtSituationBody.**

— *SituationStatus* describes the current status of the SITUATION, including *Verification*, *Progress. Reality* and *QualityIndex.*

— *SituationSource* describes the information source from which the SITUATION was obtained. Some aspects of the source may additionally be specified using the *TrafficElement*.

— A Group of Temporal elements describes the Temporal scope of the SITUATION, including *ValidityPeriod*, (when the SITUATION occurs) *Repetitions* (if it recurs at a regular periodicity) and *PublicationWindow.* (If the period for informing customers is different from the validity period). Some aspects of the temporal scope may alternatively or as well be specified using the *TrafficElement*.

— A Group of Classifier elements describes the Classification of the SITUATION by *Reason*, *Severity*, *Priority*, *Audience*. Some aspects of the Classification may alternatively or as well be specified using the *TrafficElement*.

— A Group of Descriptor elements provides a set of textual descriptions of the SITUATION. This can contain different components, for example *Summary*, *Description*, *Details*, *Advice*, *Internal* as well as *Image* and *InfoLinks.*

— An embedded DATEX2 *TrafficElement* specifies the road location model, and other DATEX2 elements.

— An *AffectsScope* allows the additional impact on PT NETWORK VEHICLE JOURNEYs to be stated.

6.3.3 Common Accessibility

The **AccessibilityAssessment** element describes the effect of a SITUATION on Accessibility. The effect may be stated either as a change to a **Limitation**, or as a change to a **Suitability** to a specific **UserNeed**.

A **Limitation** describes the accessibility attributes of an element of the infrastructure (fixed or moving) in terms of a number of standard properties.

A **Suitability** explicitly defines whether an element of the infrastructure is suitable for use by someone with a specific **UserNeed.**

Limitations may imply specific suitabilities – it is up to applications to decide the correspondence.
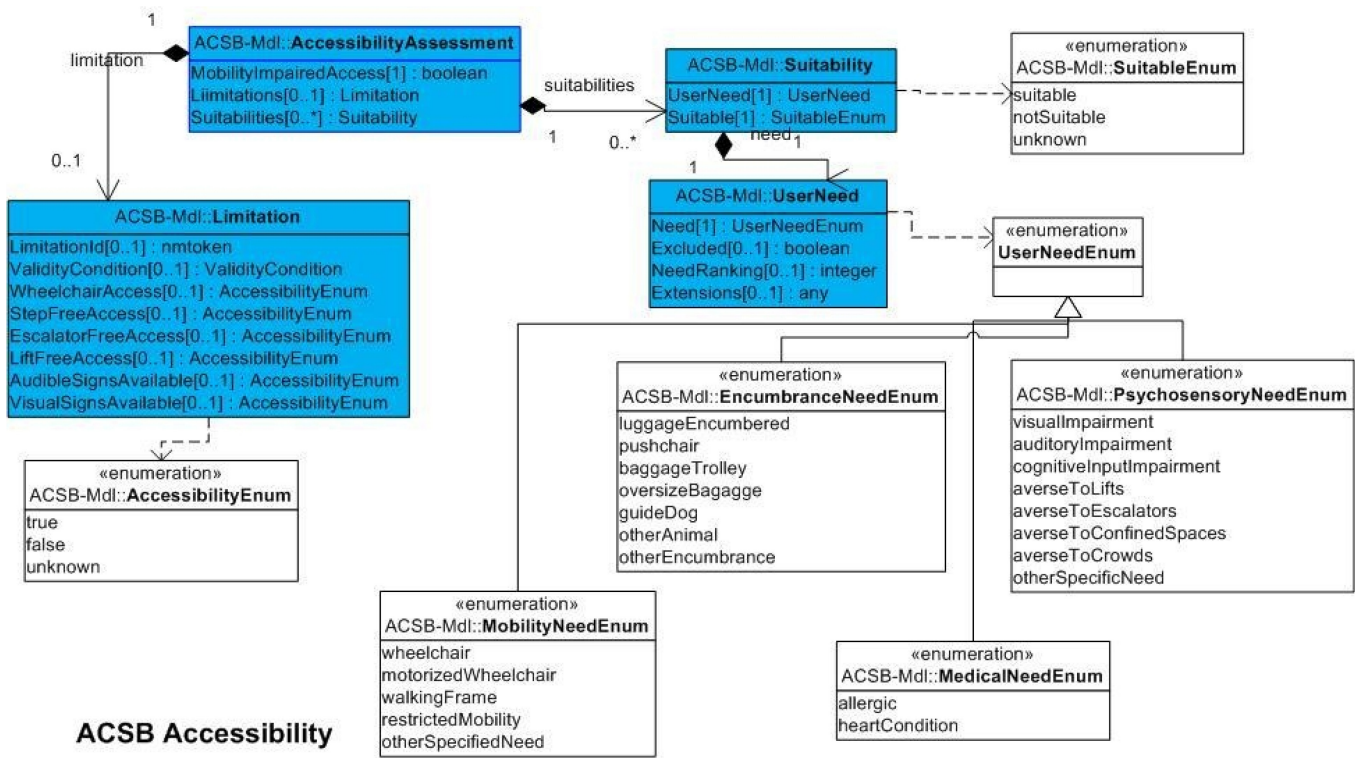
Figure 19 — UML Diagram of Common Accessibility Types

6.3.4 Publishing Actions

The ***PublishingActions*** (Figure 20) annotate the SITUATION with information to direct its distribution by dissemination systems. Each action type specifies use in a particular channel. The values are intended as guidance to filtering and consumer systems to drive automated rule driven processing of SITUATIONs for electronic dissemination.

The actions are grouped into two categories: demand channels, indicating that the data should be made available through the channels on demand:

— ***PublishToWebAction*** indicates that the SITUATION should be published on the web (other elements such the ***Audience*** and ***Sensitivity*** can be used to decide whether the SITUATION should be on private intranets only or on the public internet).

— ***PublishToMobileAction*** indicates that the SITUATION should be published on mobile delivery channels (other elements such the ***Audience*** and sensitivity can be used to decide whether the SITUATION should be on private mobile intranets only or the public mobile internet.

— ***PublishToTvAction*** indicates that the SITUATION should be published to broadcasting dissemination channels such as Teletext.

— ***PublishToDisplayAction*** indicates that the SITUATION should be published to in station and onboard displays channels.

— ***OtherPublishAction*** can be used for arbitrary dissemination channels.

The second group constitutes the push channels. For SITUATIONs that are published with push systems, additional information on the scheduling of messages to handle and clear the SITUATION can be specified. Thus for example, for a planned engineering works, a SITUATION could be tagged with a

publication schedule that states that reminders should be sent at say three week, one week, one day intervals before the works start, and at the end of the of the works.

SITUATIONs can also be tagged with information for individually targeted distribution. Each different type of channel may be tagged with different attributes.

— **PublishToAlertsAction** indicates that the SITUATION should be published on generic alert channels.

— **NotifyByEmailAction** indicates that the SITUATION should be published as an Email to a specific named user.

— **NotifyBySmsAction** indicates that the SITUATION should be published as an SMS to a specific named user.

— **NotifyByPagerAction** indicates that the SITUATION should be published as Pager message to a specific named user.

— **NotifyUserAction** indicates that the SITUATION should be published by some other means to a specific named user.
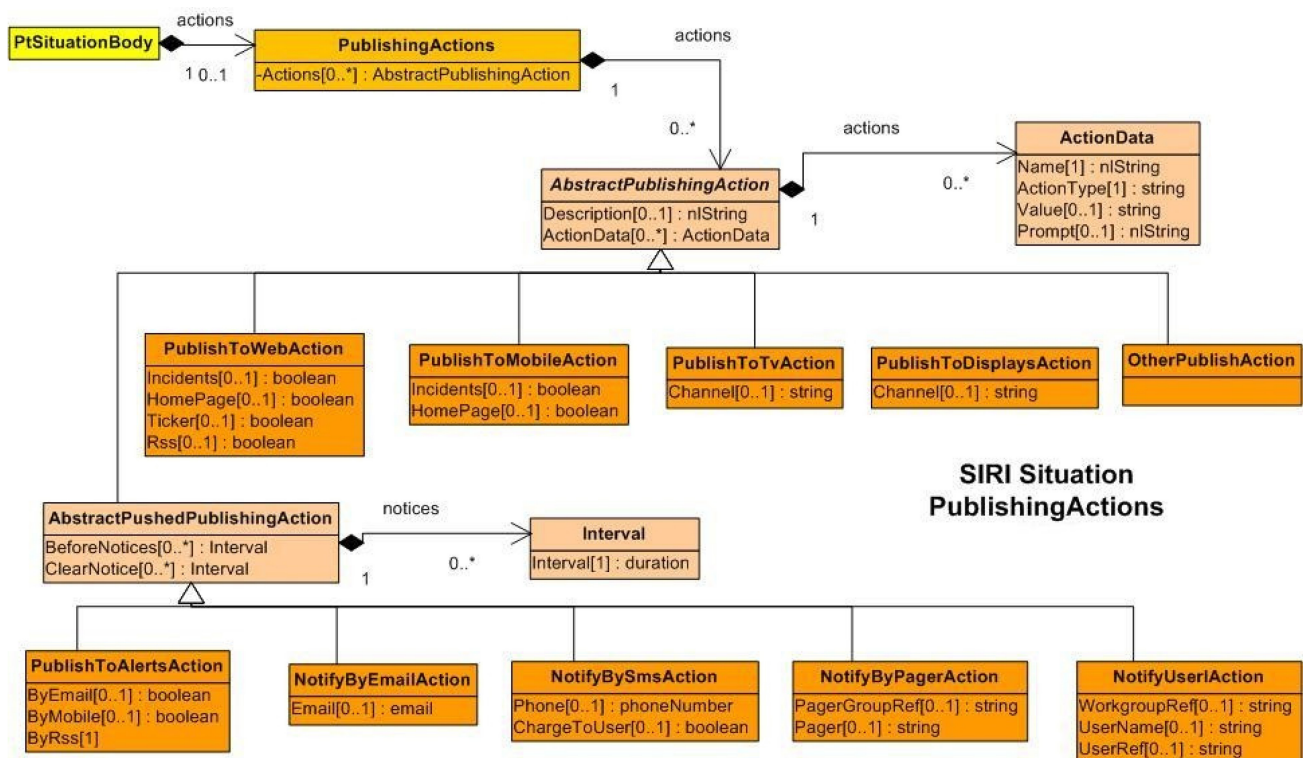
Figure 20 — UML Diagram of SIRI-SX Publishing Actions

6.3.5 Common Types

6.3.5.1 Common SIRI Data Types

The SIRI-SX services use a number of common SIRI data types. The common SIRI data types are listed in Figure 21.
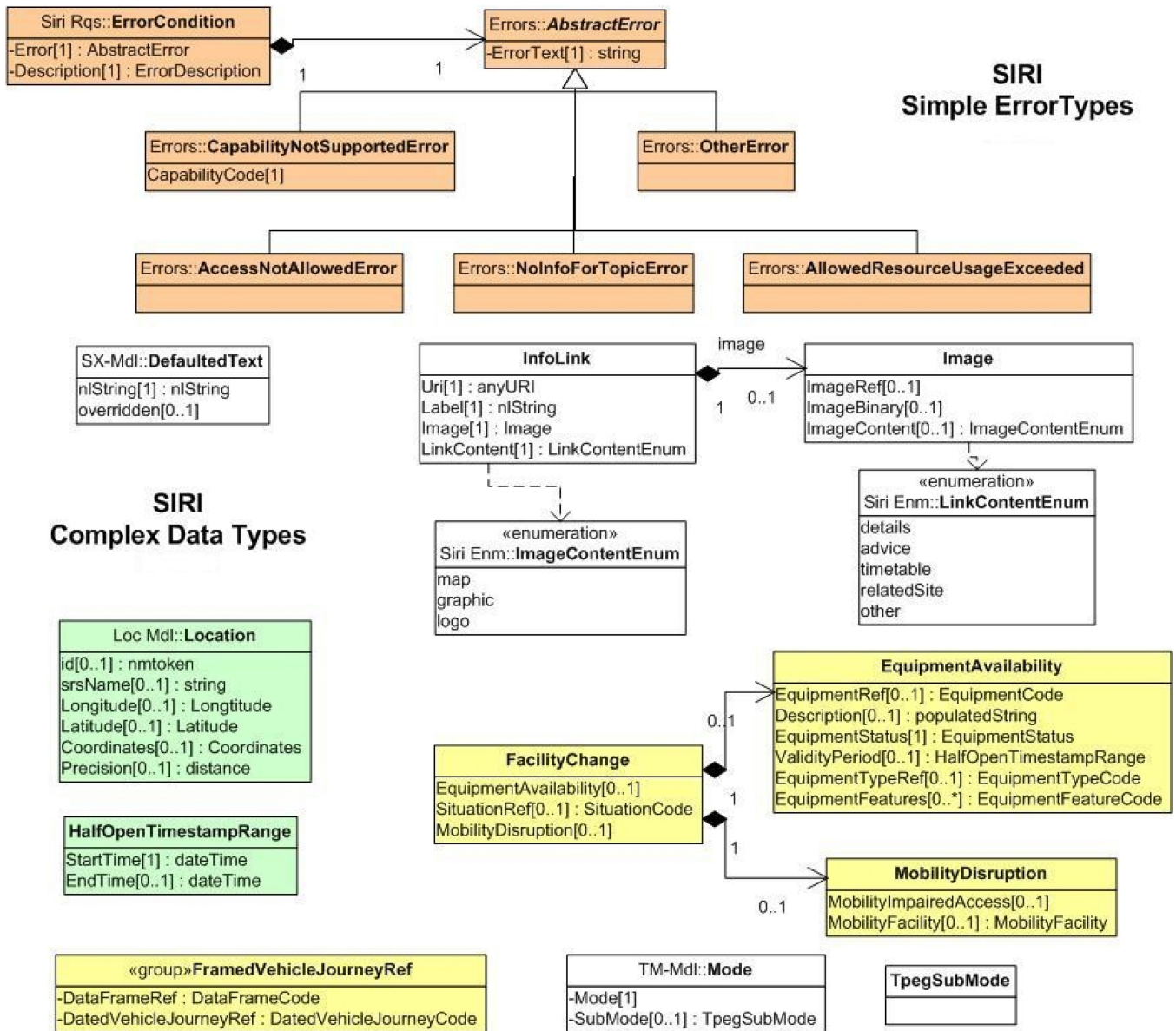
Figure 21 — UML Diagram of Common SIRI Data Types

6.3.5.2 Common General SIRI Enumerations

The SIRI-SX services use a number of common SIRI enumerations. The common SIRI enumerations are listed in Figure 22.
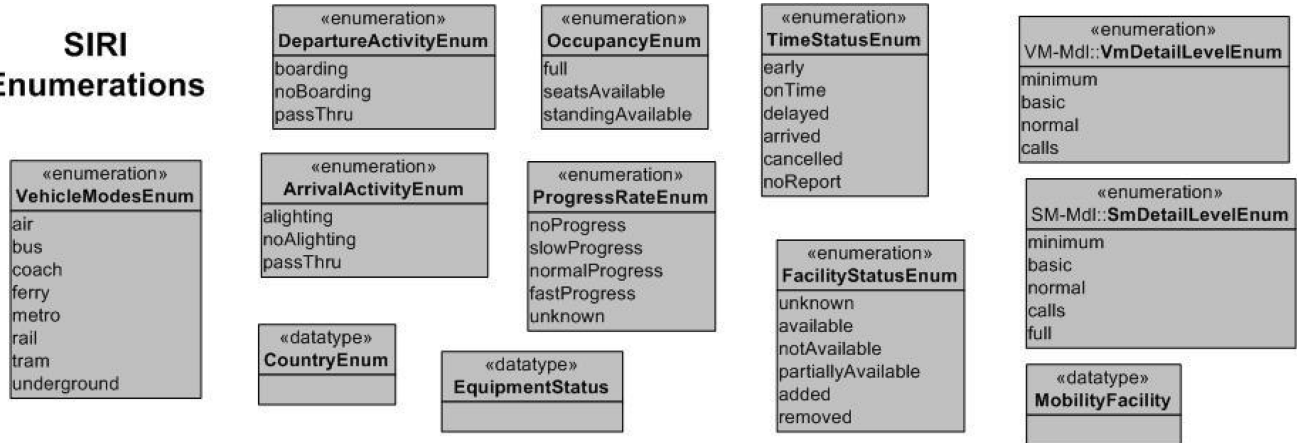
Figure 22 — UML Diagram of SIRI enumerations

6.3.5.3 SIRI-SX Enumerations

Figure 23 summaries the enumerations that are specific to SIRI-SX. These also appear in context on individual diagrams.
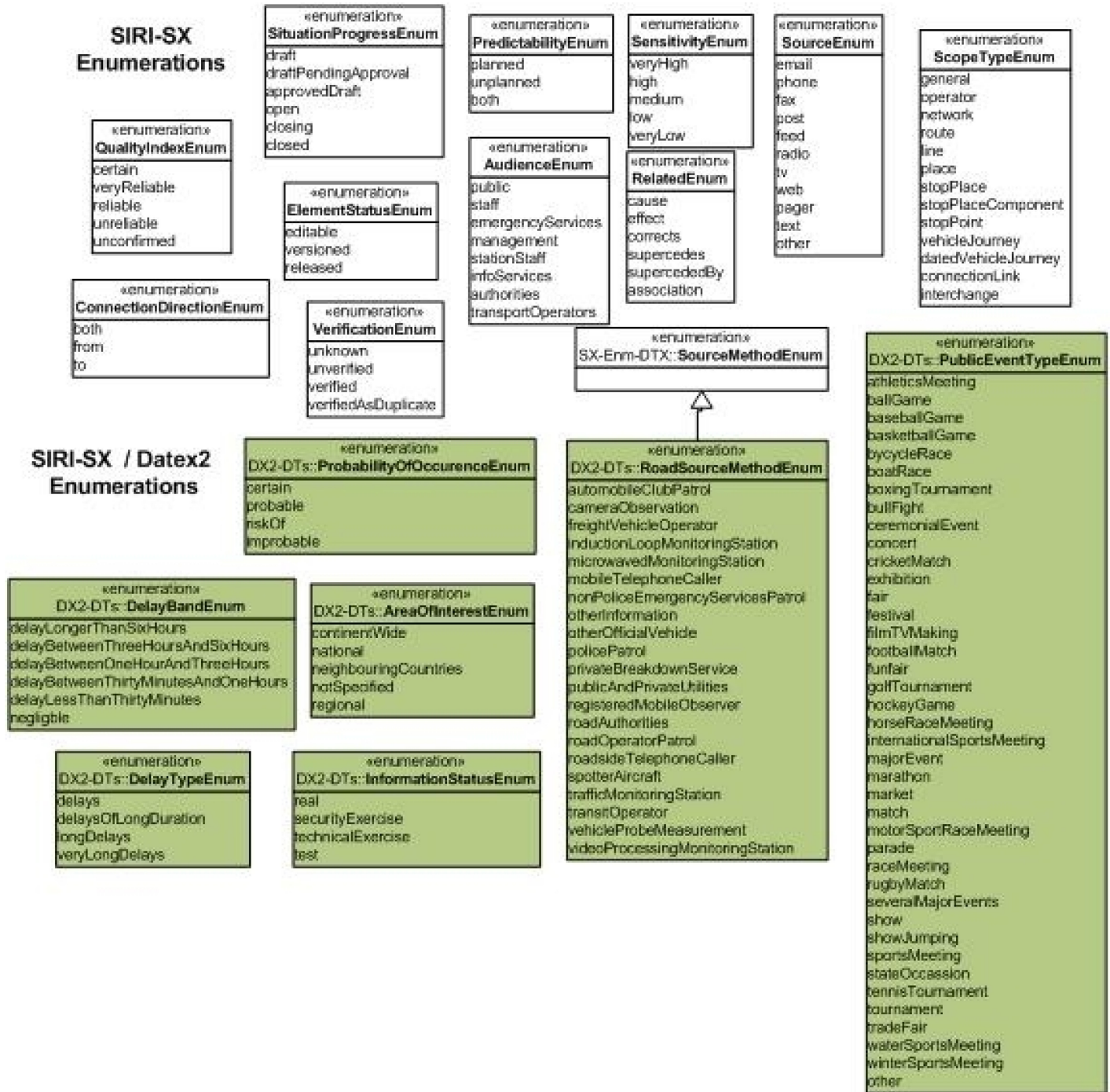
Figure 23 — UML Diagram of SIRI-SX Enumerations

6.3.5.4 IFOPT Enumerations

Figure 24 summarizes the IFOPT STOP PLACE enumerations that are used in SIRI-SX. These mostly also appear in context on individual UML diagrams.
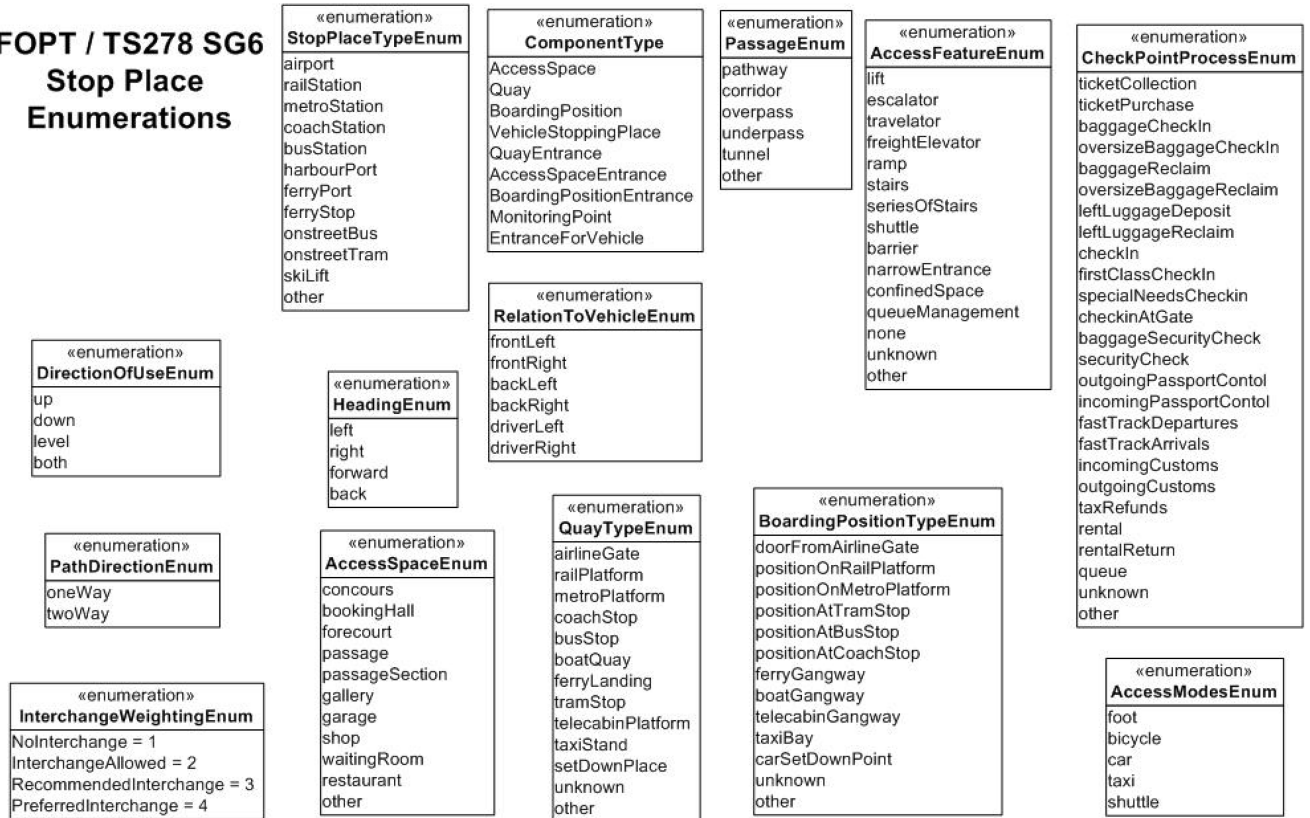
Figure 24 — UML Diagram of IFOPT Stop Place Enumerations

6.3.5.5 TPEG Miscellaneous Enumerations

Figure 25 summarizes the miscellaneous TPEG enumerations that are used in SIRI-SX. These mostly also appear in context on individual UML diagrams.
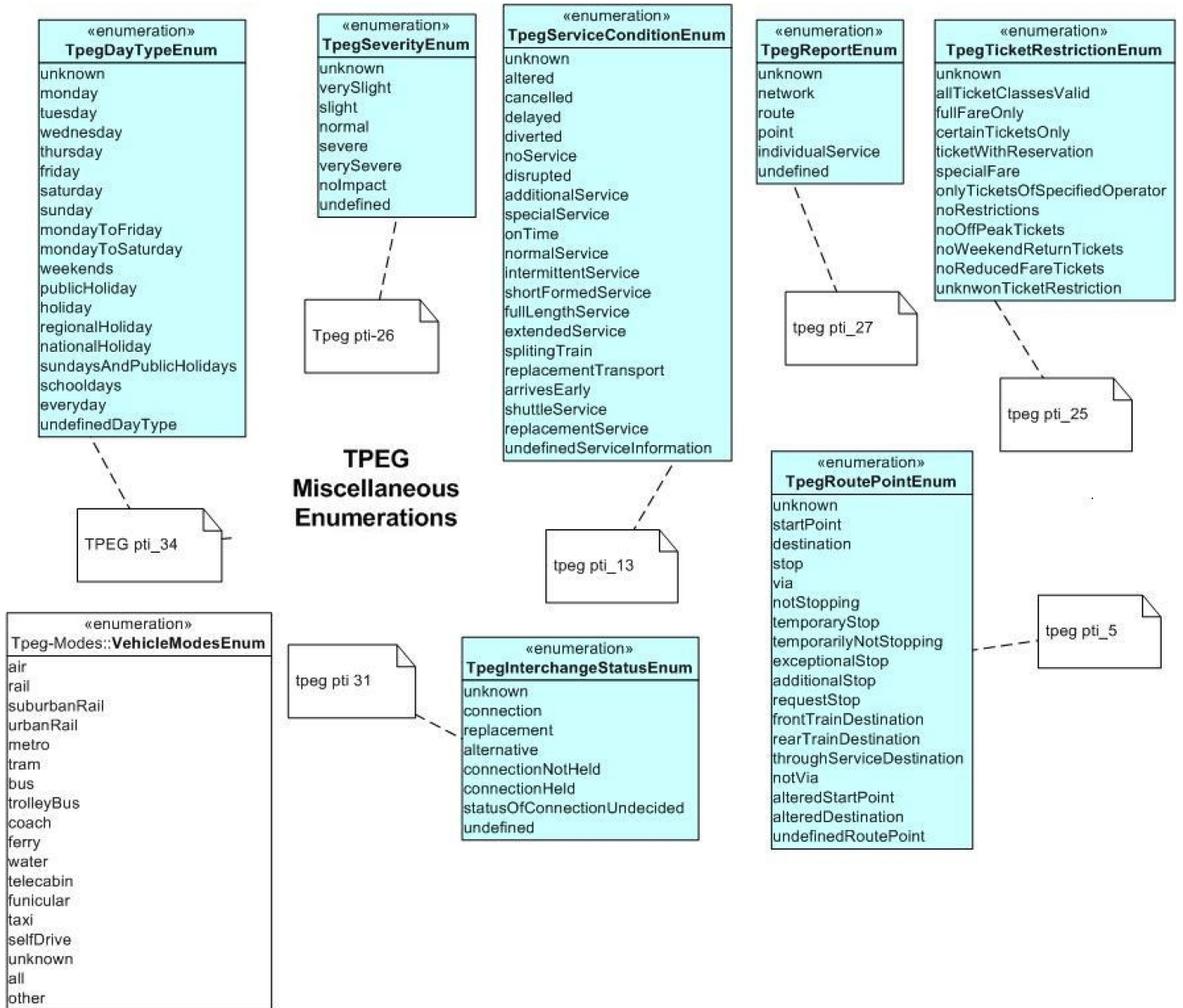
Figure 25 — UML Diagram of TPEG Enumerations

6.3.5.6 TPEG Mode Enumerations

Figure 26 summarizes the TPEG MODE enumerations that are used in SIRI-SX. These mostly also appear in context on individual UML diagrams.
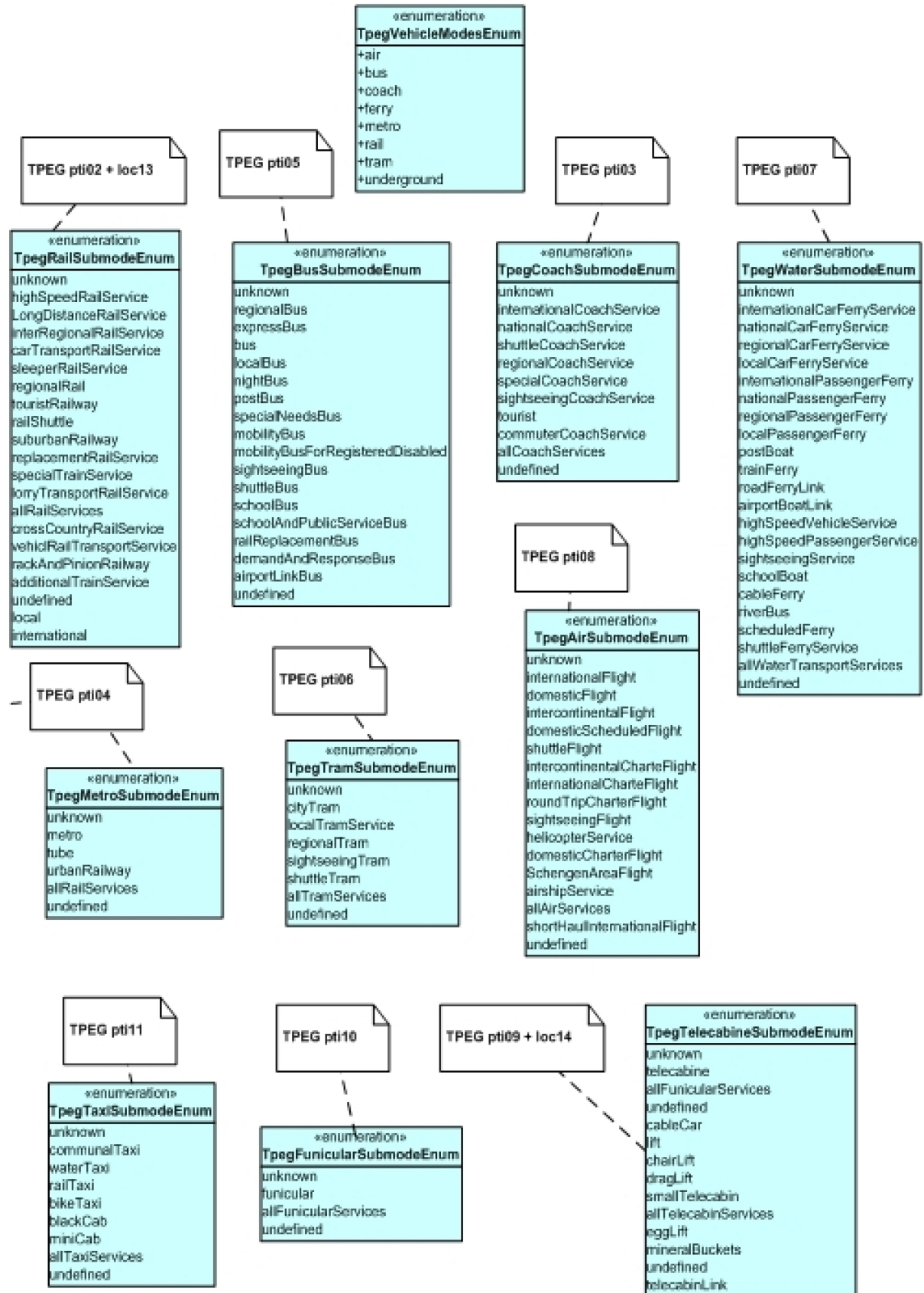
Figure 26 — UML Diagram of TPEG submodes

7 Situation Exchange Service [SX]

7.1 Purpose

The SIRI-SX Service is for exchanging SITUATION content in real-time. It uses a structured SITUATION model for describing disruptions to services that includes element references that relate directly to the Public Transport model entities used by other SIRI services. SITUATIONs can thus be directly linked to stops, LINEs, VEHICLE JOURNEYs, pathways, etc: and provide an explanation of the disruption. As a corollary, the entities of other information services may be referenced to provide further details about a SITUATION.

7.2 Description

The Situation Exchange Service comprises the **SituationExchangeRequest** message used to specify the contents of request or subscription messages, and the **SituationExchangeDelivery** message, used to deliver the response. The **SituationExchangeSubscription** message allows a subscriber to request asynchronous updates for the service: it contains an embedded **SituationExchangeRequest**, along with further parameters controlling the asynchronous delivery.

SituationExchangeRequest has *topic* parameters to filter the information by OPERATOR, NETWORK, VEHICLE, LINE, and STOP POINT, etc, and *policy* parameters to control the amount of data returned.

The **SituationExchangeDelivery** returns information about one or more SITUATIONs and their associated status as one or more **SituationElements**. Each **SituationElement** is made up of a number for structured parts including the source, temporal scope, a systematic classification, a layered text description, etc. See Clause 6. It also includes:

— The **AffectsScope** element provides a location model of the scope of the SITUATION. This can be stated in terms of the NETWORK, and / or particular LINEs, stations or VEHICLE JOURNEYs or points, this location is provided as a reference to a Transmodel object (STOP POINT, LINE, VEHICLE, etc.) or to an IFOPT object.

— One or more **Consequences**, describing the effect the SITUATION will have.

— The **PublishingActions** describe a suggest processing of the SITUATION, for example whether it should appear on the web or not. This allows the SITUATION provider to tag the SITUATION with information guiding the business rules for different workflow steps in the subsequent use of the SITUATION.

7.3 Reference Data

The **SituationExchangeRequest** requires the participants to have agreed data reference models for any Affect scope references that are used: LINEs, STOP POINTs, VEHICLE JOURNEYs, CONNECTION LINKs, INTERCHANGEs and VEHICLEs, STOP PLACEs, STOP PLACE COMPONENTs, etc. Not all elements need to be used.

7.4 Capability and Permission Matrices

7.4.1 Capability Matrix

The following set of required and optional capabilities is defined for the Situation Exchange service. If the service supports Capability Discovery the **SituationExchangeCapabilitiesRequest / SituationExchangeCapabilitiesResponse** message pair can be used to determine the implementation's capabilities.

Table 2 — SituationExchangeCapabilities Matrix

SituationExchangeCapabilities			+Structure	Capabilities describing implementation of Situation Exchange service.
inherit	:::		0:1	See xxxCapability Response	See SIRI Part 2–12.4 for Common Capability attributes.
Topic	TopicFiltering		0:1	+Structure	Which optional filtering features are supported.
		DefaultPreviewInterval	0:1	Xsd:duration	Default preview interval. Default is 60 min.
		FilterByFacilityRef	0:1	xsd:boolean	Whether results can be filtered by FACILITY. Default is true
		FilterByLocationRef	0:1	xsd:boolean	Whether results can be filtered by LOCATION. Default is true
		FilterByVehicleRef	0:1	xsd:boolean	Whether results can be filtered by VEHICLE. Default is true
		FilterByMode	0:1	xsd:boolean	Whether results can be filtered by MODE. Default is true. (+SIRI v2.0)
		FilterByNetworkRef	0:1	xsd:boolean	Whether results can be filtered by NETWORK. Default is true
		FilterByLineRef	0:1	xsd:boolean	Whether results can be filtered by LINE and or DIRECTION. Default is true
		FilterByStopPointRef	0:1	xsd:boolean	Whether results can be filtered by STOP POINT. Default is true
		FilterByStopPlaceRef	0:1	xsd:boolean	Whether results can be filtered by StopPlace. Default is false. (+SIRI v2.0).
		FilterByVehicleJourneyRef	0:1	xsd:boolean	Whether results can be filtered by VEHICLE JOURNEY. Default is false.
		FilterByConnectionLinkRef	0:1	xsd:boolean	Whether results can be filtered by CONNECTION LINK. Default is false.
		FilterByInterchangeRef	0:1	xsd:boolean	Whether results can be filtered by INTERCHANGE Default is false.
		FilterBySpecificNeeds	0:1	xsd:boolean	Whether results can be filtered by Accessibility Needs. Default is true.
		FilterByKeyword	0:1	xsd:boolean	Whether results can be filtered by keyword. Default is false
Request Policy	RequestPolicy		0:1	+Structure	Which features of **RequestPolicy** are supported by service?
		NationalLanguage	1:*	xsd:language	National languages used by service.
		Translations	0:1	xsd:boolean	Whether the producer supports translations. SIRI 2.0 Default is false.
		Coordinates		choice	Location coordinate system for results.
		GmlCoordinateFormat	0:1	SrSNameType	Use GML format
		WgsDecimalDegrees	0:1	EmptyType	Default coordinate data system is WGS 84 latitude and longitude.
		MaximumNumberOfSituations	0:1	xsd:boolean	Whether Maximum number of SITUATIONs to returned can be specified,

SubscriptionPolicy	**SubscriptionPolicy**		0:1	*+Structure*	Which features of **SubscriptionPolicy** are supported by service?
		HasIncrementalUpdates	0:1	*xsd:boolean*	Whether incremental updates can be specified for updates Default is *true*.
		HasChangeSensitivity	0:1	*xsd:boolean*	Whether change threshold can be specified for updates. Default is *true*.
Access Control	**AccessControl**		0:1	*+Structure*	Which optional Access Control features are supported by service?
		RequestChecking	**1:1**	*xsd:boolean*	Whether access control of requests is supported. Default is *false*.
		CheckOperatorRef	0:1	*xsd:boolean*	If access control is supported, whether access control by OPERATOR is supported. Default is *true*.
		CheckLineRef	0:1	*xsd:boolean*	If access control is supported, whether access control by LINE is supported. Default is true.
Response	**ResponseFeatures**		0:1	*+Structure*	Which features of Response data are supported by service?
any	**Extensions**		0:1	*any*	Placeholder for user extensions.
Request Policy	**RequestPolicy**		0:1	*+Structure*	Which optional features of the Request Policy are supported by the service?

7.4.2 Permission Matrix

If the implementation supports both Capability Discovery and Access Controls, then the **SituationExchangeCapabilitiesResponse** response can include the access permissions for the requestor participant to access data.

Table 3 — SituationExchange Service Permissions

SituationExchangePermission			*+Structure*	Permissions to use implementation of Situation Exchange service.
Inherit	*:::*	**1:1**	*xxxServicePermissions*	See SIRI Part 2–12.5 for Common Permission elements.
Topic	**OperatorPermissions**	0:1	*+Structure*	Operator permissions for participant. See Part
	LinePermissions	0:1	*+Structure*	LINE permissions for participant. See Part 2.

7.5 UML Diagrammatic Representation

7.5.1 General

The **SituationExchangeRequest**, **SituationExchangeSubscription** and the **SituationExchangeDelivery** elements are summarized in the following three of diagrams.

UML Summary Diagram of SituationExchangeRequest

Figure 27 shows a summary diagram of **SituationExchangeRequest.** The request Topic specifies a number of Filters which control the values to be returned.
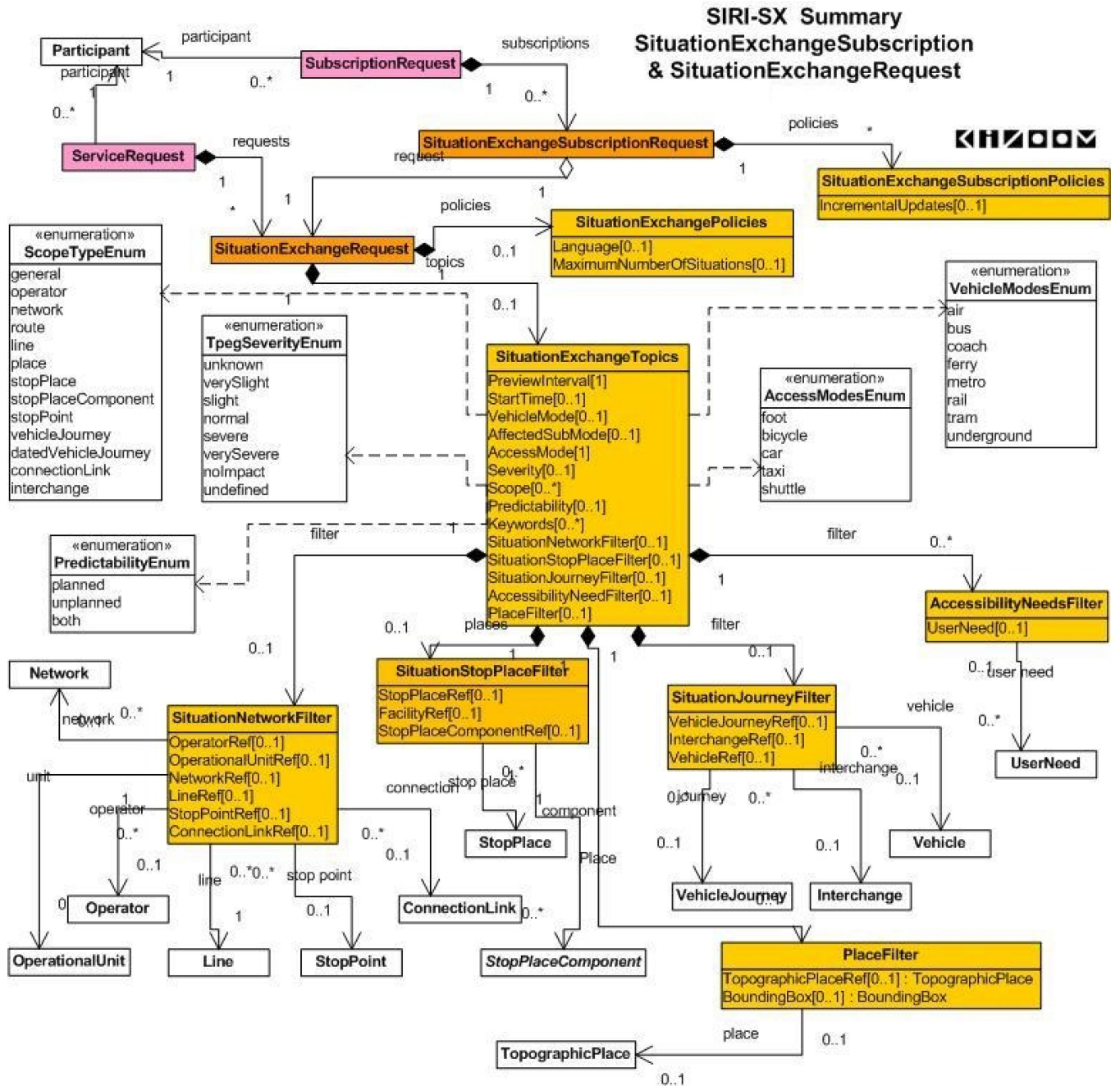
Figure 27 — UML Diagram of SituationExchangeRequest Summary

7.5.2 UML Detailed Diagram of SituationExchangeRequest

Figure 28 elaborates Figure 27 to include details about types and values.
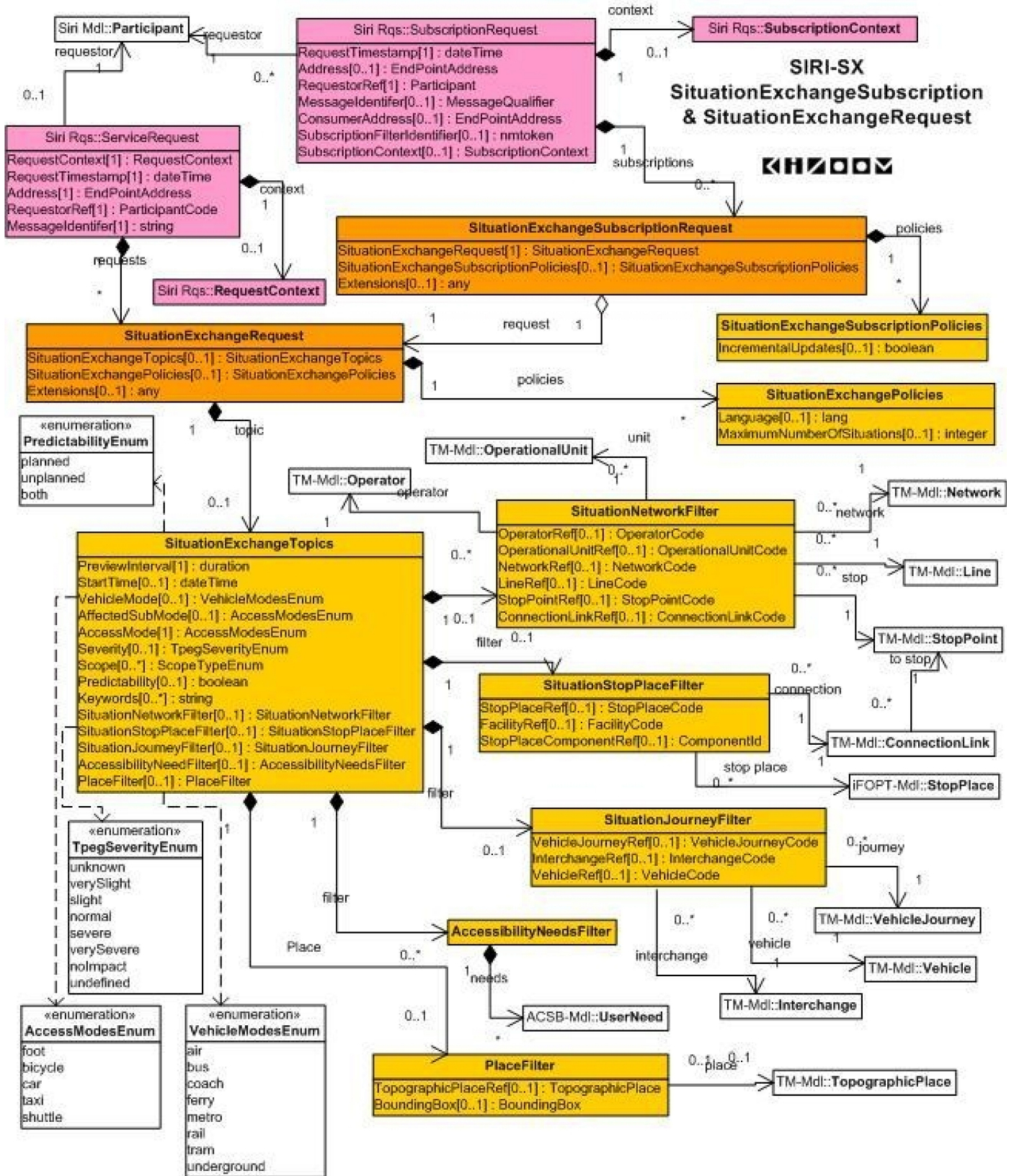
Figure 28 — UML Diagram of SIRI-SX Request

7.5.3 UML Diagram of SituationExchangeDelivery - Summary

Figure 29 summarizes the **SituationExchangeDelivery,** in particular for a PT SITUATION The SITUATION model is described further in Clause 6.
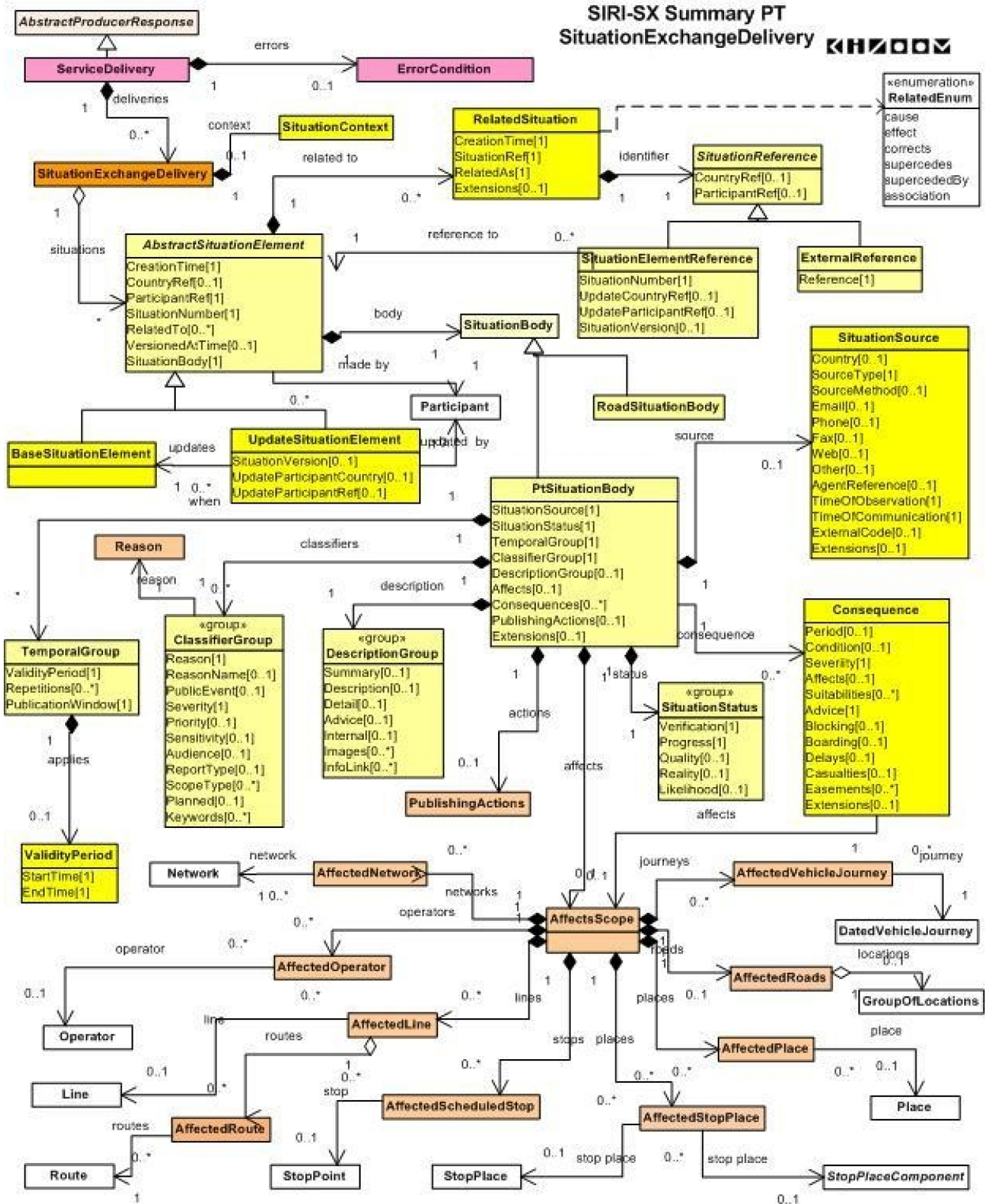
Figure 29 — UML Diagram of SIRI-SX Delivery

7.5.4 UML Diagram of SituationExchangeDelivery - Detail

Figure 29 shows the detailed attributes of a **SituationExchangeDelivery.** The SITUATION model is described further in Clause 6.
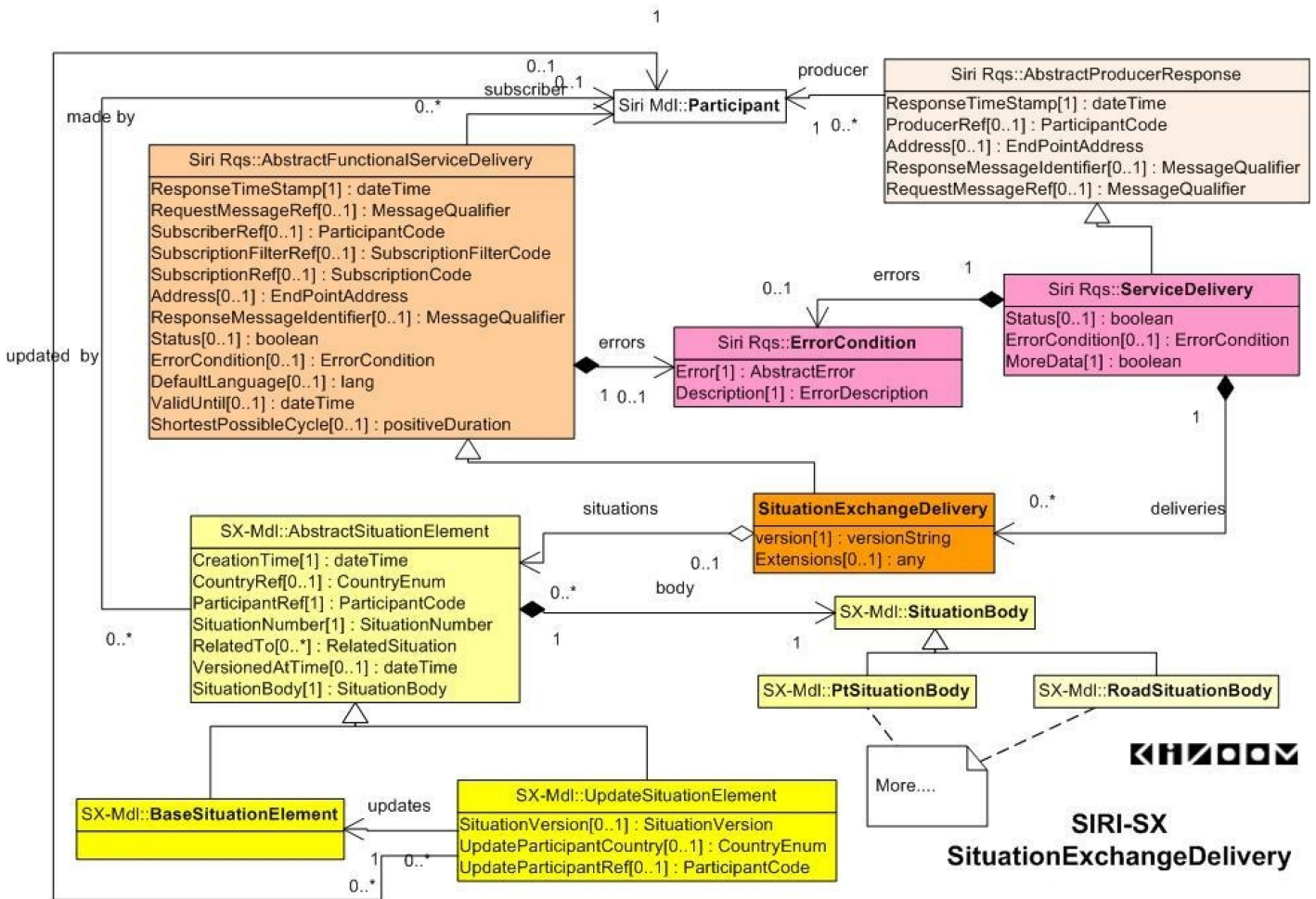
Figure 30 — UML Diagram of SIRI-SX Delivery detail

7.5.5 UML Diagram of SituationContext

Very often, all of the SITUATIONs in a delivery will be published by the same system (i.e. **Participant**), and be for the same specific city (i.e. **Place**) and transport NETWORK run by the same **Operator**. The **SituationContext** which includes a **NetworkContext**, provides an optional means of specifying common defaults that apply to all SITUATION elements in the delivery unless overridden on a specific. Figure 31 illustrates this by showing the relationship of **PtSituationBody** elements to the corresponding **SituationContext** elements.
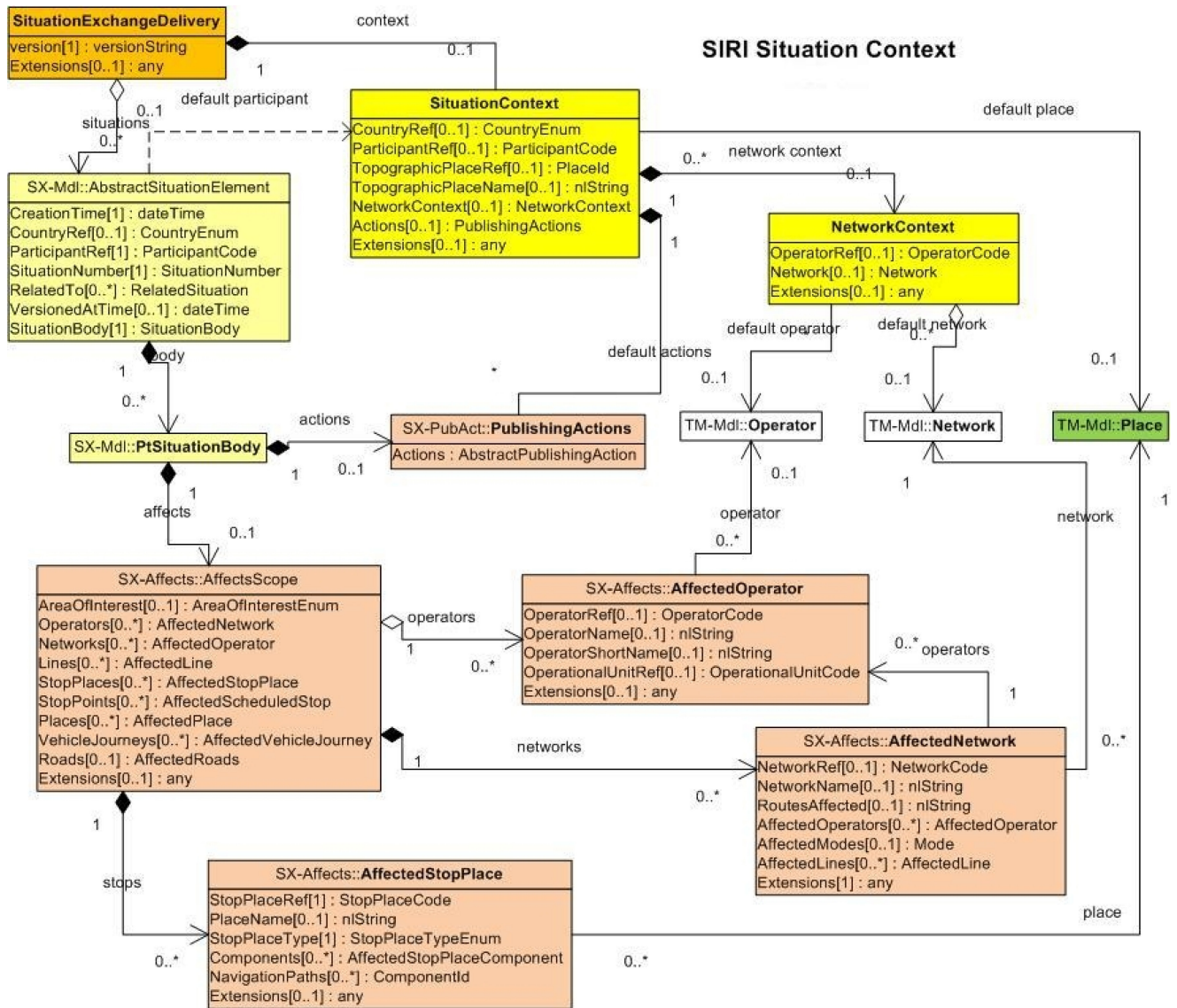
Figure 31 — UML Diagram of SituationContext

7.6 SituationExchangeRequest

7.6.1 SituationExchangeRequest Definition

The **_SituationExchangeRequest_** (Table 4) can be used in both a direct request, and for a subscription. If used for a subscription, additional Subscription Policy parameters apply.

SITUATIONs can be filtered by classification, NETWORK scope or a combination of both.

Table 4 — ExchangeRequest Elements

SituationExchangeRequest			*+Structure*	Request for information about facilities status
Attributes	*Version*	**1:1**	*VersionString*	Version Identifier of Stop Monitoring Service, e.g. '1.0c'.
Message Id	*RequestTimestamp*	**1:1**	*xsd:dateTime*	See SIRI Part 2 Common properties of SIRI Functional Service Requests.
	MessageIdentifier	0:1	*MessageQualifier*	
Topic - Temporal	*PreviewInterval*	0:1	*PositiveDurationType*	Forward duration for which SITUATIONs should be included, that is, only SITUATIONs that start before the end of this window time will be included. Normally used for subscriptions to keep a sliding window of interest.
	StartTime	0:1	*xsd:dateTime*	Initial start time for *PreviewInterval*. If absent, then current time is assumed. Shall be within data Horizon. of system Only SITUATIONs or updates created after this time will be sent. This enables a restart without resending everything.
	ValidityPeriod	0:1	*→structure*	Temporal range for incidents to be included all current incidents will be included (Siri 2.0++). .
		StartTime	1:1	*xsd:dateTime*	Start time for incidents. Incidents with a start time after this time will be included.
		EndTime	0:1	*xsd:dateTime*	End time for incidents. Incidents with an end time before this time, or no end time this time will be included
		EndTimePrecision	0:1	*Enum: day | hour| second | millisecond*	Precision with which to interpret the inclusive end time. Default is to the second. (Siri 2.0++).
	IncludeOnlyIfInPublicationWindow	0:1	*Xsd:boolean*	SITUATIONs should only be included if they are live and within their publication window. Within the specified *ValidityPeriod* or *PreviewInterval*. Otherwise all incidents will be returned, i.e. including those not in their window. Default is false.
Topic	*VehicleMode*	0:1	*→ModeCode*	The MODE for which SITUATIONs will be returned. Default is all
	SubMode	0:1	*→SubModeCode*	The Submode for which SITUATIONs will be returned. Default is all
	AccessMode	0:1	*Foot | bicycle | car | taxi | shuttle*	Access MODE for which incidents should be considered. This can be used to include additional SITUATIONs from that of the primary mode. (Documentation added SIRI v2.0)
	Severity	0:1	*enums*	Severity filter value to apply: only SITUATIONs with a severity greater than or equal to the specified value will be returned. See TPEG severities. Default is all.
	Scope	ALL PT |	*General | operator | network | route |line| place | stopPlace| stopPlace Component| stopPoint | vehicleJourney| datedVehicleJourney | connectionLink | interchange | road*	Include only incidents with the specified scope. If not specified include all types of incident. (Documentation added SIRI 2.0)

	Predictabilit y	0:1	*planned | unplanned | all*	Whether just planned, unplanned or both SITUATIONs will be returned.
	Keywords	0:*	*string*	Any arbitrary filter keywords to use. Only incidents containing these words in their texts all be returned.
	SituationSta tusFilter	0:1	→*structure*	Filter the results to include only SITUATIONs relating to the Status filter elements. See below.
	SituationNet workFilter	0:1	→*structure*	Filter the results to include only SITUATIONs relating to the NETWORK filter elements. See below.
	SituationSto pPlaceFilter	0:1	→*structure*	Filter the results to include only SITUATIONs for the given STOP PLACE filter elements. See below.
	SituationJou rneyFilter	0:1	→*structure*	Filter the results to include only SITUATIONs relating to the given VEHICLE JOURNEY filter elements. See below.
	SituationPla ceFilter	0:1	→*structure*	Filter the results to include only SITUATIONs relating to the given Place filter elements.
	SituationRo adFilter	0:1	→*structure*	Filter the results to include only SITUATIONs relating to the given Road filter elements.
	Accessibility NeedFilter	0:*	User	Filter the results to include only SITUATIONs marked as affecting these needs
Request Policy	**Language**	0:1	*xml:lang*	Preferred language in which to return text values. Optional SIRI capability: *NationalLanguage.*
	IncludeTran slations	0:1	*xsd:boolean*	Whether additional translations of text names are to be included in elements. If false, then only one element should be returned. Default is false. Where multiple values are returned The first element returned will be used as the default value. (+SIRI v2.0)
	MaximumNu mberOfSitua tionElement s	0:1	*xsd:positiveInteger*	The maximum number of **SituationElements** to includes in a given delivery. The n most recent Events within the look ahead window are included.
any	**Extensions**	0:1	any	Placeholder for user extensions.

7.6.2 SituationStatusFilter Definition

The **SituationStatusFilter** (Table 5) can be used in both a direct request, and for a subscription. It specifies any status filtering parameters. Values are logically ANDed together

Table 5 — SituationStatusFilter Elements

SituationStatusFilter			*+Structure*	Filter values for NETWORK elements
Filter	**Verification**	0:1	verified | unverified | verifiedAsDuplicat e| unknown	Whether incident has been verified or not. If not specified return all.
	Progress	0:*	closed | closing | open | published	ProgressStatus. One of a specified set of overall processing states assigned to SITUATION. For example, 'Draft' for not yet published; 'Published' for live SITUATIONs; 'Closed' indicates a completed SITUATION. If not specified return open, published, closing and closed. l
	Reality	0:1	Real | test | security Exercise | technicalExercise	Whether SITUATION is real or a test. If not specified return all.

7.6.3 SituationNetworkFilter Definition

7.6.3.1 General

The **SituationNetworkFilter** (Table 6) can be used in both a direct request, and for a subscription. It specifies any NETWORK filtering parameters. Values are logically ANDed together.

Table 6 — SituationNetworkFilter Elements

SituationNetworkFilter			*+Structure*	Filter values for NETWORK elements
	OperatorRef	0:1	→*OperatorCode*	Filter the results to include only SITUATIONs relating to the Operator.
	OperationalUnitRef	0:*	→*OperationalUnitCode*	Filter the results to include only SITUATIONs relating to the Operational Unit.
	NetworkRef	0:1	→*NetworkCode*	Filter the results to include only SITUATIONs relating to the Operational Unit.
		0:*	*choice*	Filter the results to include only SITUATIONs along the given LINEs
	LineRef	0:*	→*LineCode*	Filter the results to include only results for the given LINE. If no *LineRef* is specified as a subscription filter, this implicitly implies transmission of data for all LINEs in the AVMS.
	Lines	0:*	*LineDirection*	Filter the results to include only SITUATIONs along the given LINEs. See **LineDirection** below. (+SIRI v2.0) SIRI V2.0
	StopPointRef	0:*	→*StopPointCode*	Filter the results to include only SITUATIONs relating to the STOP POINTs
	ConnectionLinkRef	0:*	→*ConnectionLinkCode*	Filter the results to include only SITUATIONs relating to the given Connection Link
	FacilityRef	0:*	→*FacilityCode*	Filter the results to include only SITUATIONs relating to the specific facilities.

7.6.3.2 LineDirection Element (+SIRI v2.0)

The **LineDirection** element (Table 7) can be used to restrict the request to specific LINEs in a specific direction.

Table 7 — *LineDirection* Element

LineDirection			*+Structure*	Filter values for NETWORK elements
Filter	*LineRef*	0:*	→*LineCode*	Filter the results to include only results for the given LINE. If no *LineRef* is specified as a subscription filter, this implicitly implies transmission of data for all LINEs in the AVMS.
	DirectionRef	0:1	→*DirectionCode*	Filter the results to include only results for the given LINE for vehicles running in a specific relative direction, for example, "inbound" or "outbound". (Direction does not specify a destination.)

7.6.4 SituationStopPlaceFilter Definition

The **SituationStopPlaceFilter** (Table 8) can be used in both a direct request, and for a subscription. It specifies any StopPlace filtering parameters. Values are logically ANDed together

Table 8 — SituationStopPlaceFilter Elements

SituationStopPlaceFilter			+Structure	Filter values for NETWORK elements
Filter	**StopPlaceRef**	0:1	→StopPlaceCode	Filter the results to include only SITUATIONs relating to the StopPlace.
	StopPlaceComponentRef	0:1	→OperationalUnitCode	Filter the results to include only SITUATIONs relating to the STOP PLACE Component..

7.6.5 SituationJourneyFilter Definition

The **SituationJourneyFilter** (Table 9) can be used in both a direct request, and for a subscription. It specifies any journey filtering parameters. Values are logically ANDed together

Table 9 — SituationJourneyFilter Elements

SituationJourneyFilter				+Structure	Filter values for VEHICLE JOURNEY elements
Filter			0:1	choice	Filter the results to include only SITUATIONs relating to the given VEHICLE JOURNEY.
	a	**FramedVehicleJourneyRef**	0:1	+Structure	Reference to a VEHICLE JOURNEY framed by the day.(+SIRI v2.0)
	b	**VehicleJourneyRef**	0:1	→:VehicleJourneyCode	Simple reference to a VEHICLE JOURNEY. Deprecated
		InterchangeRef	0:1	→InterchangeCode	Filter the results to include only SITUATIONs relating to the given Interchange.
		VehicleRef	0:1	→VehicleCode	Filter the results to include only SITUATIONs relating to the given VEHICLE

7.6.6 SituationPlaceFilter Definition

The **SituationPlaceFilter** (Table 10) can be used in both a direct request, and for a subscription. It specifies any Place filtering parameters. Values are logically ANDed together. If more than one filter is specified they are ORed together.

Table 10 — SituationPlaceFilter Elements

SituationStopPlaceFilter			+Structure	Filter values for STOP PLACE elements
Filter	**CountryRef**	0:1	→CountryCode	Unique identifier of a Country where incident takes place. If specified only incidents that affect this place country will be returned.
	PlaceRef	0:1	→PlaceCode	Identifier of Topographic Locality. Only incidents which are deemed to affect this place will be returned.
	Location	0:2	→location	Bounding box of an arbitrary area . Only incidents geocoded as falling within area will be included.

7.6.7 SituationRoadFilter Definition

The SituationRoadFilter (Table 11) can be used in both a direct request, and for a subscription. It specifies any road filtering parameters. Values are logically ANDed together. If more than one filter is specified they are ORed together.

Table 11 — SituationRoadFilter Elements

SituationRoadFilter			+Structure	Filter the results to include only SITUATIONs relating to the given Road filter elements.
	roadNumber	0:1	nlString	Filter the results to include only SITUATIONs relating to the given Road number.
	DirectionBound	0:*	enums	Filter the results to include only SITUATIONs marked as affecting roads in this direction
	referencePointidentifier	0:1	referencePointIdentifier	Filter the results to include only SITUATIONs marked as affecting this reference point

7.6.8 AccessibilityNeedFilter Definition

The AccessibilityNeedFilter (Table 12) can be used in both a direct request, and for a subscription. It specifies any Accessibility filtering parameters. Values are logically ORed together

Table 12 — AccessibilityNeedFilter Elements

AccessibilityNeedFilter t			+Structure	Filter the results to include only SITUATIONs marked as affecting these needs
	UserNeed	0:*	UserNeed	Filter the results to include only SITUATIONs marked as affecting this User need. User Need can include exclude/include flag.

7.6.9 SituationExchangeRequest Example

The following is an example of a **SituationExchangeRequest** to obtain all the SITUATIONs for a LINE.

```
<ServiceRequest>
   <!-======ENDPOINT REFERENCES============================->
   <RequestorRef>NADER</RequestorRef>
   <RequestTimestamp>2004-12-17T09:30:47-05:00</RequestTimestamp>
<SituationExchangeRequest version="1.1" >
   <RequestTimestamp>2004-12-17T09:30:47-05:00</RequestTimestamp>
 <!-======TOPIC =================================== ->
   <NetworkRef>LUL</NetworkRef>
</SituationExchangeRequest>
 </ServiceRequest>
```

7.7 SituationExchangeSubscriptionRequest

7.7.1 SituationExchangeSubscriptionRequest Definition

The **SituationExchangeSubscriptionRequest** Table 13) requests the asynchronous delivery of the information described by a **SituationExchangeRequest**. The **SituationExchangeSubscriptionRequestPolicy** parameters control the processing of the subscription.

Table 13 — SituationExchangeSubscriptionRequest Parameters

Situation ExchangeSubscriptionRequest			*+Structure*	Request for a subscription to the Situation Exchange Service.
Identity	***SubscriberRef***	0:1	*→ParticipantCode*	See SIRI Part 2 Common ***SubscriptionRequest*** parameters.
	SubscriptionIdentifier	1:1	*SubscriptionQualifier*	
Lease	***InitialTerminationTime***	1:1	*xsd:dateTIme*	
Request	***SituationExchangeRequest***	1:1	*+Structure*	See ***SituationExchangeRequest***.
Policy	***IncrementalUpdates***	0:1	*xsd:boolean*	Whether the producer should only provide updates to the last data returned, i.e. additions, modifications and deletions, or always return the complete set of current data. Default is true, i.e. once the initial transmission has been made, return only incremental updates. If *false* each subscription response will contain the full information as specified in this request. Optional SIRI capability: *IncrementalUpdates.*

7.7.2 SituationExchangeSubscriptionRequest Example

The following is an example of a ***SituationExchangeSubscriptionRequest***.

```
<SubscriptionRequest>
   <!-=====ENDPOINT REFERENCES===============================->
   <RequestorRef>NADER</RequestorRef>
   <RequestTimestamp>2004-12-17T09:30:47-05:00</RequestTimestamp>
   <!- Subscription 1 for SPR55 ->
   <SituationExchangeSubscriptionRequest>
      <SubscriptionIdentifier>00000456</SubscriptionIdentifier>
      <InitialTerminationTime>2004-12-17T09:30:47-
05:00</InitialTerminationTime>
      <!- ====== ENDPOINT REFERENCE =====================->
< SituationExchangeRequest version="1.1" >
   <RequestTimestamp>2004-12-17T09:30:47-05:00</RequestTimestamp>
   <!-======TOPIC ==================================== ->
   <Severity>high</ Severity >
   <AccessibilityNeedFilter><UserNeed>wheelChair><UserNeed></
AccessibilityNeedFilter >
</SituationExchangeRequest>
   </SituationExchangeSubscriptionRequest>
   <!- Subscription 2 for SPR56 ->
   <SituationExchangeSubscriptionRequest>
      <SubscriptionIdentifier>00000456</SubscriptionIdentifier>
      <InitialTerminationTime>2004-12-17T09:30:47-
05:00</InitialTerminationTime>
      <!- ====== ENDPOINT REFERENCE =====================->
   </SubscriptionRequest>
```

7.8 SituationExchangeDelivery

NOTE   The ***SituationExchangeDelivery*** returns the SITUATIONs which meet the filter criteria.

7.8.1 ServiceDelivery with a SituationExchangeDelivery

One or more **SituationExchangeDelivery** elements (Table 14) may be returned as part of a SIRI **ServiceDelivery**, with a common **ResponseTimestamp**.

Table 14 — ServiceDelivery / SituationExchangeDelivery Elements

ServiceDelivery			*+Structure*	
HEADER	*:::*	**1:1**	See ServiceDelivery	
Payload	**SituationExchangeDelivery**	**1:***	*+Structure*	See **SituationExchangeDelivery** element.

7.8.2 SituationExchangeDelivery Element

A **SituationExchangeDelivery** (Table 15) is made up of zero, one or many **Situation** elements, each representing a SITUATION or an update to a SITUATION.

The **PtSituationContext** can be used to declare values that are common to all SITUATIONs, for example the network.

Table 15 — SituationExchangeDelivery Elements

SituationExchangeDelivery			*+Structure*	Describes the status of facilities.
Attributes	**version**	**1:1**	*VersionString*	Version Identifier of Situation Exchange Service. Fixed, e.g. '1.1a'.
LEADER	*:::*	**1:1**	*xxxServiceDelivery*	See SIRI Part 2–7.2.1.1 xxx**ServiceDelivery**.
Payload	**PtSituationContext**	0:1	*+Structure*	Describes values that are common to all SITUATIONs in the delivery
	PtSituationElement	0:*	*+Structure*	Describes a SITUATION.
any	**Extensions**	0:1	any	Placeholder for user extensions.

7.8.3 SituationContext Element

The **PtSituationContext** (Table 16) can be used optionally to declare default values that are common to all SITUATIONs within the **SituationDelivery**, for example the **Participant**, **Network** and common **PublishingActions**.

Table 16 — PtSituationContext Elements

PtSituationContext			*+Structure*	Describes a Context
Identity		0:1	*enum*	Unique identifier of system publishing SITUATION. If SITUATIONs from other participants are included in delivery, then of immediate publisher- shall be given here.
Place	*TopographicPlace Refo*	0:1	➔ *TopographicPlace Code*	Topographic Place that applies to SITUATIONs, e.g. London
	PlaceName	0:1	*nlString*	Name of Place
	NetworkContext	0:1	*+Structure*	NETWORK context. See below
Actions	*PublishingActions*	0:*	*many*	One or more publishing actions to apply to all SITUATIONs.
	PublishingActi on	0:1	*+Structure*	Distribution actions to disseminate SITUATION. Defaults to apply to all SITUATIONs. See below.
any	*Extensions*	0:1	any	Placeholder for user extensions.

7.8.4 SituationNetworkContext Element

The **NetworkContext** (Table 17) can be used optionally to declare network values that are common to all SITUATIONs within the **SituationDelivery.** These in effect provide defaults.

Table 17 — NetworkContext Elements

PtNetworkContext			*+Structure*	Describes a Context
Operator	*Operators*	0:*	*+Structure*	
	Operator	0:1	*+Structure*	Affected Operator. See Below
Network	*Network*	0:1	*+Structure*	NETWORK about which SITUATIONs apply. See AffectedNetwork Element below
	NetworkRef	0:1	➔*NetworkCode*	Identifier of NETWORK
	NetworkName	0:1	*NLString*	Name of NETWORK
Mode	*VehicleMode*	0:1	*enum*	VEHICLE MODE. See later below
	Submode	0:1	*enum*	Transport SUB MODE. See later below
	AccessMode	0:1	*enum*	Access MODE. See later below
any	*Extensions*	0:1	*any*	Placeholder for user extensions.

7.8.5 PtSituationElement

7.8.5.1 General

In the SIRI-SX model, the **PtSituation** element (see Table 18) is the main container for all the SITUATION content of a PT SITUATION and aggregates the **SituationElement (BaseSituationElement, or UpdateSituationElement)**, **SituationStatus, PtSituationBody**, **TemporalGroup**, **ClassifierGroup**, as shown in Figure 12.

Table 18 — Situation Element

PtSituationElement			+Structure	Disruption affecting services.
Log	CreationTime	1:1	dateTime	Time of creation of SITUATION
Identity	CountryRef	0:1	→CountryCode	Country code of Participant
	ParticipantRef	1:1	→ParticipantCode	Identifier of participant system that creates SITUATION. See Part 2. Unique within Country
	SituationNumber	1:1	SituationNumberr	Unique Identifier of SITUATION within Participant
	UpdateCountryRef	0:1	→CountryCode	Country code of Participant that creates Update if different from **CountryRef**.
	UpdateParticipantRef	0:1	→ParticipantCode	Identifier of participant system that creates Update if different from **ParticipantRef**. See Part 2.
	SituationVersion	0:1	Version	Version of Update SITUATION element
Xref	References	0:1	many	Associations with other SITUATIONs.
	RelatedToRef	0:*	+RelatedSituation	A reference to another SITUATION with an indication of the nature of the association, e.g. a cause, a result.
Source	SituationSource	0:1	+Structure	Source of SITUATION content. See below.
Status	Verification	0:1	enum	Whether the SITUATION has been verified.
	Progress	0:1	enum	Status of SITUATION. See below.
	QualityIndex	0:1	enum	Assessment of likely correctness of data.
	Reality	0:1	enum	Whether SITUATION is real or a test.
	Likelihood	0:1	enum	Likelihood to ascribe to a future SITUATION.
Temporal Group	ValidityPeriod	0:*	range	One or more Overall inclusive Period of applicability of SITUATION
	Start	0:1	dateTime	The (inclusive) start time stamp.
	End	0:1	dateTime	The (inclusive) end time stamp. If omitted, the range end is open-ended, that is, it should be interpreted as "forever".
	EndTimeStatus	0:1	Enum: undefined | longTerm | shortTerm	If end time not provided, whether to interpret it as a long, term, short-term or unknown length of SITUATION. Default is undefined (Siri 2.0++)
	Repetitions	0:*	DayType	Situation applies only on the repeated day types within the overall validity period(s). For example Sunday.
	DayType	1:1	enum	Tpeg DayType pti 34
	PublicationWindow	0:1	range	Publication Window for SITUATION if different from validity period. Period during which audience is informed of SITUATION may start before or after SITUATION.
	Start	0:1	dateTime	The (inclusive) start time stamp.
	End	0:1	dateTime	The (inclusive) end time stamp. If omitted, the range end is open-ended, that is, it should be interpreted as "forever".
	EndTimeStatus	0:1	Enum: undefined | longTerm |	If end time not provided, whether to interpret it as a long, term, short-term or unknown length of SITUATION. Default is undefined (Siri 2.0++)

			shortTerm	
Classifier Group	**Reason**		*enum*	Nature of SITUATION – TPEG Reason Code See below.
	SubReason	0:1	*enum*	Subclassification of Nature of SITUATION. See below.
	PublicEventReason	0:1	*enum*	Datex2 reasons.
	ReasonName	0:1	*string*	Text explanation of SITUATION reason. Not normally needed.
	Severity	0:1	*enum*	Severity of SITUATION. Corresponds to TPEG Pti26 severities. Default is normal.
	Priority	0:1	*enum*	Arbitrary rating of priority of message if different from severity 1-High. Note this can be used for Datex2 **Urgency** levels. 1 = extremelyUrgent. 2 = urgent. 3 = normal.
	Sensitivity	0:1	*enum*	Confidentiality of SITUATION.
	Audience	0:1	*enum*	Intended audience of SITUATION.
	ReportType	0:1	*enum*	Report type of SITUATION Corresponds to TPEG Pti27.
	ScopeType	0:1	*enum*	Scope type of SITUATION. See below.
	Planned	0:1	*boolean*	Whether the SITUATION was planned (e.g. engineering works) or unplanned (e.g. service alteration). Default is false, i.e. unplanned.
	Keywords	0:*	*string*	Arbitrary application specific classifiers.
Description Group	**Language**	0:1	*lang*	Default Language of descriptions
	Summary	0:1	*DefaultedText*	Summary of SITUATION. If absent should be generated from structure elements / and or by condensing Description. For use of defaulted text see below.
	Description	0:1	*DefaultedText*	Description of SITUATION. Should not repeat any strap LINE included in Summary. See below.
	Detail	0:1	*DefaultedText*	Additional descriptive details about the SITUATION. For use of defaulted text see below.
	Advice	0:1	*DefaultedText*	Further advice to passengers. For use of defaulted text see below.
	Internal	0:1	*DefaultedText*	Decryption of the SITUATION for company (internal) use. For use of defaulted text see below.
	Image	0:*	*Image*	Image for description. See below.
	InfoLink	0:*	*InfoLink*	Further web links. See below.
Scope	**AffectsScope**	0:1	*+Structure*	Scope model identifying parts of transport NETWORK affected by SITUATION. See below.
Consequence	**Consequences**	0:1	*many*	One or more consequences.
	Consequence	0:*	*+Structure*	Consequence of the SITUATION. See below.
Actions	**PublishingActions**	0:1	*many*	One or more publishing actions.
	PublishingAction	0:*	*+Structure*	Distribution actions to disseminate SITUATION. See below.
any	**Extensions**	0:1	any	Placeholder for user extensions.

7.8.5.2 EndTimeStatus

For allowed values of **EndTimeStatus** see Table 19.

Table 19 — Allowed Values for EndTimeStatus

Name	*Description*
undefined	Uncertain whether long term or short-term
longTerm	Treat as a long term incident that will continue until further notice, usually for many days.
shortTerm	Treat as a short-term incident that may end at any time.

7.8.5.3 RelatedSituation Element

7.8.5.3.1 General

The **RelatedSituation** element (Table 20) can be used to cross-reference the SITUATION with other SITUATIONs:

Table 20 — RelatedSituation Element

RelatedSituation			*+Structure*	Cross-reference
Log	*Creation Time*	0:1	*dateTime*	Time of creation of 'related to' association.
Identity	*CountryRef*	0:1	→*CountryCode*	Country code of Participant
	ParticipantRef	1:1	→*ParticipantCode*	Identifier of participant system that creates SITUATION. See Part 2. Unique within country.
	SituationNumber	1:1	*SituationNumberr*	Identifier of SITUATION.
	UpdateCountryRef	0:1	→*CountryCode*	Country code of Participant that creates Update if different from **CountryRef**.
	UpdateParticipantRef	0:1	→*ParticipantCode*	Identifier of participant system that creates Update if different from **ParticipantRef**. See Part 2.
	SituationVersion	0:1	*Version*	Version of update SITUATION element.
Details	*RelatedAs*	0:1	*enum*	Relationship of reference to the referencing SITUATION.
any	*Extensions*	0:1	any	Placeholder for user extensions.

7.8.5.3.2 RelatedAs Type

The **RelatedAs** value (Table 21) describes the nature of the relationship of the Situation Element with the referenced SITUATION.

Table 21 — Allowed Values for RelatedAs Type

SIRI-SX	Description
cause	Referenced SITUATION was a cause of the referencing SITUATION.
effect	Referenced SITUATION was a result of the referencing SITUATION.
correctionTo	Referenced SITUATION contained erroneous data which is corrected by the referencing SITUATION.
update	Referenced SITUATION provides update information to the base SITUATION of the referencing SITUATION Update.
supercedes	Referenced SITUATION supersedes the referencing SITUATION.
supercededBy	Referenced SITUATION is superseded by the referencing SITUATION.
associated	Referenced SITUATION is associated with the referencing SITUATION non causally.

7.8.5.4 SituationSource Element

7.8.5.4.1 General

The **SituationSource** element (Table 22) provides information about the person or system who supplied the information contained in the SITUATION. This may have been captured as part of the logging process, and may be significant for verifying, interpreting or processing the SITUATION, as well as for audit purposes:

Table 22 — SituationSource Element

SituationSource			*+Structure*	Where the information about the SITUATION came from.
	Country	0:1	*enum*	Country of origin of source element. IANA code
	SourceType	1:1	*enum*	Nature of Source communication type. See below.
	SourceMethodType	0:1	*enum*	How the source obtained the information. See below.
	Phone	0:1	*phoneNumber*	Phone number of Supplier of information.
	Fax	0:1	*phoneNumber*	Fax number of Supplier of information.
	Web	0:1	*anyURL*	Link URL of Supplier of information.
	Other	0:1	*string*	Other information about source SITUATION.
	Name	0:1	*string*	Name of source.
	TimeOfCommunication	0:1	*dateTime*	Time of communication if later than creation time of Situation element.
	TimeOfObservation	0:1	*dateTime*	Time of observation of SITUATION, if earlier than time of communication of Situation Element.
	ExternalCode	0:1	*string*	External system reference to SITUATION.
	SourceFile	0:1	*anyURL*	External system reference to SITUATION.
	Extension	0:1	*any*	Placeholder for user extensions.

7.8.5.4.2 Situation Source Type

SourceType value describes the type of information source that provided the SITUATION information. See Table 23.

Table 23 — Allowed Values for Source Type

SIRI-SX	Description
directReport	Report came in person
email	Report came by email person
phone	Report came by phone
fax	Report came by fax
post	Report came by post
feed	Report came by automated feed
radio	Report came from radio
tv	Report came from TV
web	Report came from website
pager	Report came by pager
text	Report came by text message
other	Report came by other means

7.8.5.4.3 Situation Source Method Type

SourceMethodType value describes the type of information source that detected the SITUATION information. See Table 24.

Table 24 — Allowed Values for Source Sub type

SIRI-SX	Description	Datex2 Source Type
automobileClubPatrol	Source was an Automobile Club Patrol Source was	*automobileClubPatrol*
cameraObservation	Source was a Camera Observation	*cameraObservation*
freightVehicleOperator	Source was a Freight Vehicle Operator	*freightVehicleOperator*
inductionLoopMonitoringStation	Source was an Induction Loop Monitoring Station	*inductionLoopMonitoringStation*
microwavedMonitoringStation	Source was a Microwaved Monitoring Station	*microwavedMonitoringStation*
mobileTelephoneCaller	Source was a Mobile Telephone Caller	*mobileTelephoneCaller*
nonPoliceEmergencyServicesPatrol	Source was a Non Police Emergency Services Patrol	*nonPoliceEmergencyServicesPatrol*
otherInformation	Source was Other	*otherInformation*
otherOfficialVehicle	Source was an Official VEHICLE other than a police patrol	*otherOfficialVehicle*
policePatrol	Source was a Police Patrol	*policePatrol*
privateBreakdownService	Source was a Private Breakdown Service	*privateBreakdownService*
publicAndPrivateUtilities	Source was a Public And Private Utility	*publicAndPrivateUtilities*
registeredMobileObserver	Source was a Registered Mobile Observer	*registeredMobileObserver*
roadAuthorities	Source was a Road Authority	*roadAuthorities*
roadOperatorPatrol	Source was a Road Operator Patrol	*roadOperatorPatrol*
roadsideTelephoneCaller	Roadside Telephone Caller	*roadsideTelephoneCaller*
spotterAircraft	Source was a Spotter Aircraft	*spotterAircraft*
trafficMonitoringStation	Source was a Traffic Monitoring Station	*trafficMonitoringStation*
transitOperator	Source was a Transit Operator	*transitOperator*
vehicleProbeMeasurement	Source was a VEHICLE Probe Measurement	*vehicleProbeMeasurement*
videoProcessingMonitoring Station	Source was a Video Processing Monitoring Station	*videoProcessingMonitoring Station*

7.8.5.5 Situation Status Elements

NOTE   The **SituationStatus** provides information about the status of the SITUATION, allowing systems to process the SITUATION appropriately.

7.8.5.5.1 Verification Element Values (TPEG Pti32)

Verification describes whether the SITUATION has been verified. Values are based on TPEG pti32. See Table 25.

Table 25 — Allowed Values for Verification (TPEG Pti32)

SIRI-SX	Description	TPEG Pti32
unknown	Status is unknown	pti32_0
unverified	Situation is not verified	pti32_1
verified	Situation has been verified	pti32_255
verifiedAsDuplicate	Situation has been verified as a duplicate	v

7.8.5.5.2 Progress Element Values

Progress describes the life cycle status of the SITUATION (see 5.4.2). The values are based on TPEG pti32. See Table 26. The **Progress** status allows distributed workflow applications to coordinate their handling of live SITUATIONs.

Table 26 — Allowed Values for Situation Progress

SIRI-SX	Description	
draft	Content is being drafted	
pendingApproval	Content is pending approval	
approvedDraft	Content is approved	
open	Situation is open	
published	Situation is open and published	
closing	Situation is in the process of closing	
closed	Situation is closed	

7.8.5.5.3 QualityIndex Element Values

QualityIndex ascribes a certainty level to the information. The values are based on those used in Trident and can be equated to the Datex2 ProbabilityOfOccurrence, see Table 27.

Table 27 — Allowed Values for QualityIndex (Trident)

SIRI-SX	Description	ProbabilityOfOccurrence
certain	Information is certain	
veryReliable	Certainty is *very Reliable*	*veryReliable*
reliable	Certainty is Reliable	*reliable*
probablyReliable	Certainty is Probably Reliable	*probable*
improbable	Not confirmed	*unconfirmed*

7.8.5.5.4 Reality Element Values

Reality states whether the SITUATION is real, or is a test of either just the information system, or a process and the information system. The values are based on those used in Datex2 **InformationStatus**. See Table 28.

Table 28 — Allowed Values for Reality / InformationStatus (Datex2)

SIRI-SX	Description	Datex2 InformationStatus
real	Situation is real	*real*
securityExercise	Situation is a real-world security exercise	*securityExercise*
technicalExercise	Situation is a real-world technical exercise	*technicalExercise*
test	Situation is not real	*test*
unconfirmed	Uncertain	*unconfirmed*

7.8.5.5.5 Likelihood Element Values

Likelihood ascribes a certainty level to a future event. The values are the same as those used Datex2 **ProbabilityOfOccurrence**. See Table 29.

Table 29 — Allowed Values for ProbabilityOfOccurrence (Datex2)

SIRI-SX	Description	Datex2 ProbabilityOfOccurrence
certain	Event is will definitely happen	*certain*
probable	Event is likely is very likely	*probable*
riskOf	Risk of event happening	*riskOf*
improbable	Uncertain	*improbable*

7.8.5.6 Situation Temporal Elements

7.8.5.6.1 General

The temporal group elements provide information about the time and duration over which the SITUATION applies. The time during which a SITUATION is displayed to the public (**PublicationWindow**) can be distinct from the time of validity – for example; a SITUATION may be captured with an embargo date before which it will not be published. Note also that there can be separate validity periods on **Disruption** elements describing different effects of the SITUATION. A SITUATION may include long term SITUATIONs that are repeated on particular day types, e.g. **engineering** works on certain days of the week.

7.8.5.6.2 Day Type Element Values (TPEG Pti34)

DayType specifies a day on which the SITUATION may apply within the validity period. This can be used for example to specify the temporal scope of engineering works which repeat every repeating weekend within a six month period. The values are based on TPEG pti34. See Table 30.

Table 30 — Allowed Values for DayType (TPEG pti 34)

SIRI-SX	Pti34	TPEG
unknown	34_0	Unknown
monday	34_1	Monday
tuesday	34_2	Tuesday
wednesday	34_3	Wednesday
thursday	34_4	Thursday
friday	34_5	Friday
saturday	34_6	Saturday
sunday	34_7	Sunday
weekdays	34_8	Weekdays
weekends	34_9	Weekends
holiday	34_10	Holiday
publicHoliday	34_11	Public Holiday
religiousHoliday	34_12	Religious Holiday
federalHoliday	34_13	Federal Holiday
regionalHoliday	34_14	Regional Holiday
nationalHoliday	34_15	National Holiday
mondayToFriday	34_16	Monday To Friday
mondayToSaturday	34_17	Monday To Saturday
sundaysAndPublicHolidays	34_18	Sundays and Public Holidays
schoolDays	34_19	School Days
everyDay	34_20	Every Day
undefinedDayType	34_255	Undefined DayType

7.8.5.7 Situation Classifier Elements

7.8.5.7.1 General

The classifier elements provide detailed information about the nature and severity of the SITUATION. Where possible these are based on systematic TPEG classifications, allowing SIRI-SX SITUATIONs to be exchanged into and out of TPEG format with precise semantics.

TPEG based elements include: ***ReasonGroup***, ***Severity***, ***ReportType.***

Datex2 based elements include ***AreaOfInterest, Urgency.***

Additional elements allow further classification of the SITUATION: ***Priority***, ***Sensitivity***, ***Audience***, and ***Keywords.***

7.8.5.7.2 Severity Element Values (TPEG Pti26)

Situation ***Severity*** ascribes a severity SITUATION. The values are based on TPEG Pti36. See Table 31.

Table 31 — Allowed Values for Severity (TPEG pti26)

SIRI-SX	Description	TPEG Pti26	Datex2.OverallImpact
unknown	unknown	0	
verySlight	very slight	1	lowest
slight	slight	2	low
normal	normal	3	normal
severe	severe	4	high
verySevere	very severe	5	highest
noImpact	no impact	6	
normal	normal	255	

7.8.5.7.3 Audience

Situation **Audience** describes any limitations as to whom the SITUATION is meant to be distributed. This can be used to filter or route the distribution to interested parties. The values correspond to Datex2 **Confidentiality**. See Table 32.

Table 32 — Allowed Values for Audience

SIRI-SX	Description	Datex2 Confidentiality
public	Of interest to public.	noRestriction
emergencyServices	Primarily of interest for emergency services.	
staff	Primarily of interest for OPERATOR staff.	internalUse
stationStaff	Primarily of interest for station staff.	
management	Primarily of interest for OPERATOR management.	
authorities	Transport Authorities	restrictedToAuthorities
infoServices	Transport and Traffic OPERATORs and information service providers	restrictedToAuthoritiesTrafficOperators andPublishers
transportOperators	Transport and Traffic OPERATORs	restrictedToAuthoritiesAndTrafficOperators

7.8.5.7.4 Sensitivity

Situation **Sensitivity** describes any news sensitivity on the SITUATION content. This can be used to filter or route the distribution to interested parties. For example, security sensitive issues could be flagged. See Table 33.

Table 33 — Allowed Values for Sensitivity

SIRI-SX	Description
veryHigh	Situation is very sensitive
high	Situation is sensitive
medium	Situation is of average sensitiveness
low	Situation is not very sensitive
veryLow	Situation is not of a sensitive nature

7.8.5.7.5 ReportType (TPEG Pti27)

Situation **ReportType** describes the nature of the SITUATION. The values are based on TPEG pti27: report Types. See Table 34.

Table 34 — Allowed Values for ReportType (TPEG Pti27)

SIRI-SX	Description	Pti27
unknown	predictable	27_1
route	Situation concerns a ROUTE	27_2
network	Situation concerns a NETWORK	27_3
point	Situation concerns a point	27_4
individualService	Situation concerns an individual service	27_255
undefined		27_1

7.8.5.7.6 ScopeType

Situation **ScopeType** further describes the nature of the SITUATION. This can be used to filter or route the distribution to interested parties and to construct descriptions. It can be regarded a expanding on the **ReportType** and summarizing the nature of the references included in the **AffectsScope** element. See Table 35.

Table 35 — Allowed Values for Situation ScopeType

SIRI-SX	Description
general	Situation has a general scope.
operator	Situation scope is a specific OPERATOR.
network	Situation scope is whole NETWORK.
route	Situation scope is a specific ROUTE.
line	Situation scope is a specific LINE.
place	Situation scope is a specific PLACE.
StopPlace	Situation scope is a specific STOP PLACE.
stopPlaceComponent	Situation scope is a specific STOP PLACE COMPONENT.
stopPoint	Situation scope is a specific STOP POINT.
vehicleJourney	Situation scope is a specific VEHICLE JOURNEY.
datedVehicleJourney	Situation scope is a specific DATED VEHICLE JOURNEY.
connectionLink	Situation scope is a specific CONNECTION LINK.
interchange	Situation scope is a specific INTERCHANGE between VEHICLE JOURNEYs.

7.8.5.7.7 Situation Reason

A SITUATION **Reason** provides taxonomic information about the cause of the SITUATION. Each SITUATION is assigned to a single **Reason** type. A two level classification system is used corresponding to the TPEG PTI ontology. Each main reason type (**PersonnelReason**, **EquipmentReason**, **EnvironmentReason** etc) contains a set of subreason types that explain the reason in more detail; for example for **EnvironmentReason**, includes *heavySnow, rain, fog, flooding,* etc.

Arbitrary reasons are represented by an **OtherReason**.

The following tables show the allowed values for Reasons.

7.8.5.7.8 Mapping Reason codes to TPEG and other systems

7.8.5.7.8.1 General

Comparison of the TPEG subreason categories with a number of working systems (including DATEX2) has identified a number of additional categories of incident. These are added to SIRI-SX as additional subreason codes, however in order to be interoperable with TPEG based systems, these additional categories are each also mapped back to an existing TPEG subreason.

For example, the TPG PTI19 **MiscellaneousReason** table has just *securityAlert* (19:3). SIRI-SX can distinguish between more specific types of security alert for example, (*unattendedBag* (19: 3_3), *telephonedThreat* (19: 3_4), *suspectVehicle* (19: 3_5), *civilEmergency* (19: 3_6), *bombAlert* (19: 3_9), *terroristIncident* (19: 3_12) etc. All of these may be mapped to a simple *securityAlert* for export to a system that supports only the basic TPEG.

The following tables of SIRI-SX codes also include their TPEG and DATEX2 equivalents.

7.8.5.7.8.2 Reason list (TPEG Pti18)

There are six main Reason types as described by TPEG Pti18 - Event reason. See Table 36.

Table 36 — Types of Reason (TPEG Pti18)

SIRI-SX	TPEG	Pti18	Further Details	Datex2 CauseType
UnknownReason	unknown	18: 0		
MiscellaneousReason	miscellaneous event reason	18: 1	Pti 19	*accident, congestion, vandalism, obstruction, roadsideEvent, problemsAtBorderPost, problemsAtCustomPost*
PersonnelReason	personnel event reason	18: 2	Pti 20	
EquipmentReason	equipment event reason	18: 3	Pti 21	*equipmentFailure*
EnvironmentReason	environment event reason	18: 4	Pti 22	*poorWeather, InfrastructureFailure*
UndefinedReason	undefined event reason	255		

7.8.5.7.8.3 MiscellaneousReason (TPGE Pti19)

TPEG Pti19 (Miscellaneous Event Type) enumerates miscellaneous reasons for SITUATIONs – See Table 37.

Table 37 — Allowed Values for MiscellaneousReason (TPEG Pti19)

Group	*SIRI-SX*	Pti19	TPEG	Datex2 CauseType	Datex2 Disturbance Activity	SIRI version
Miscellaneous subreason	*unknown*	19: 0	Unknown			1.0
	incident	19: 1	Incident			1.0
	bombExplosion	19: 2	Bomb explosion	*terrorism*	*explosion*	1.0
	securityAlert	19: 3	Security alert	*securityIncident*	*securityAlert*	1.0
	fire	19: 4	Fire			1.0
	vandalism	19: 5	Vandalism	*vandalism*	*assetDestruction*	1.0
	accident	19: 6	Accident	*accident*		1.0
	overcrowded	19: 7	Overcrowded		*crowd*	1.0
	insufficientDemand	19: 8	Insufficient demand			1.0
	lightingFailure	19: 9	Lighting failure			1.0
	leaderBoardFailure	19: 10	Leader board failure			1.0
	serviceIndicatorFailure	19: 11	Service indicator failure			1.0
	serviceFailure	19: 12	Service failure			1.0
	operatorCeasedTrading	19: 13	Operator ceased trading			1.0
	operatorSuspended	19: 14	Operator suspended			1.0
	congestion	19: 15	Congestion	*congestion*		1.0
	routeBlockage	19: 16	Route blockage	*obstruction*		1.0
	personOnTheLine	19: 17	Person on the line			1.0
	vehicleOnTheLine	19: 18	Vehicle on the line			1.0
	objectOnTheLine	19: 19	Object on the line			1.0
	animalOnTheLine	19: 20	Animal on the line			1.0
	routeDiversion	19: 21	Route diversion			1.0
	roadClosed	19: 22	Road closed			1.0
	roadworks	19: 23	Roadworks			1.0
	specialEvent	19: 24	Special event	*roadsideEvent*		1.0
	bridgeStrike	19: 25	Bridge strike			1.0
	overheadObstruction	19: 26	Overhead obstruction			1.0
	undefinedProblem	19: 255	Undefined problem	*infrastructureProblem*	*other*	1.0

SIRI-SX augments these with some additional subreasons. – See Table 38.

Table 38 — Allowed Values for MiscellaneousReason Subreasons

Group	*SIRI-SX*	*--*	**Subclass of TPEG**	**Datex2 CauseType**	**Datex2 Disturbance Activity**	**SIRI version**
Miscellaneous	*previousDisturbances*	19: 0_1	unknown			1.0
Train Safety subreason	*safetyViolation*	19: 1_1	incident			1.0
	nearMiss	19: 1_2	incident			1.0
	signalPassedAtDanger	19: 1_3	incident			1.0
	stationOverrun	19: 1_4	incident			1.0
	trainDoor	19: 1_5	incident			1.0
	emergencyServicesCall	19: 1_6	incident			1.0
Security subReason	*policeRequest*	19: 3_1	security alert			1.0
	fireBrigadeSafetyChecks	19: 3_2	security alert			1.0
	unattendedBag	19: 3_3	security alert			1.0
	telephonedThreat	19: 3_4	security alert			1.0
	suspectVehicle	19: 3_5	security alert			1.0
	civilEmergency	19: 3_6	security alert		*civilEmergency*	1.0
	airRaid	19: 3_7	security alert		*airRaid*	1.0
	sabotage	19: 3_8	security alert		*sabotage*	1.0
	bombAlert	19: 3_9	security alert		*bombAlert*	1.0
	attack	19: 3_10	security alert		*attack*	1.0
	evacuation	19: 3_11	security alert		*evacuation*	1.0
	terroristIncident	19: 3_12	security alert		*terroristIncident*	1.0
	gunfireOnRoadway	19: 3_13	security alert		*gunFireOnRoadway*	1.0
	explosion	19: 3_14	security alert		*explosion*	1.0
	explosionHazard	19: 3_15	security alert		*explosionHazard*	1.0
	securityIncident	19: 3_16	security alert		*securityIncident*	1.0
	fireBrigadeOrder	19: 3_17	security alert			2.0
	policeActivity	19: 3_18	security alert			2.0
Accident subreason	*fatality*	19: 6_1	accident			1.0
	personUnderTrain	19: 6_2	accident			1.0
	personHitByTrain	19: 6_3	accident			1.0
	personIllOnVehicle	19: 6_4	accident			1.0
	emergencyServices	19: 6_5	accident			1.0
	collision	19: 6_6	accident			1.0

	linesideFire	19: 4_1	fire			1.0
TrainObstr uctionsubr eason	*fallenTreeOnTheLine*	19: 19_1	object on the LINE			1.0
	vegetation	19: 19_2	object on the LINE			1.0
	trainStruckAnimal	19: 19_3	object on the LINE			1.0
	trainStruckObject	19: 19_4	object on the LINE			1.0
	levelCrossingIncident	19: 18_1	vehicle on the LINE			1.0
Roadworks subreason	*sewerageMaintenance*	19: 23_1	roadworks			1.0
	roadMaintenance	19: 23_2	roadworks			1.0
	asphalting	19: 23_3	roadworks			1.0
	paving	19: 23_4	roadworks			1.0
Special Event Subreason	*march*	19: 24_1	special event		*March*	1.0
	procession	19: 24_2	special event		*procession*	1.0
	demonstration	19: 24_3	special event		*demonstration*	1.0
	publicDisturbance	19: 24_4	special event		*publicDisturbanc e*	1.0
	filterBlockade	19: 24_5	special event		*filterBlockade*	1.0
	sightseersObstructingAcces s	19: 24_6	special event		*sightseersObstruc tingAccess*	1.0
	holiday	19: 24_7	special event			2.0
Bridge	*viaductFailure*	19: 25_1	bridgeStrike			1.0
Passenger Subreason	*passengerAction*	19: 5_1	vandalism			1.0
	staffAssault	19: 5_2	vandalism			1.0
	railwayCrime	19: 5_3	vandalism			1.0
	assault	19: 5_4	vandalism		*assault*	2.0
	theft	19: 5_5	vandalism		*theft*	1.0
	altercation	19: 1_7	incident		*altercationOfVehi cleOccupants*	1.0
	illVehicleOccupants	19: 1_8	incident		*illVehicleOccupan ts*	1.0
Border Process Subreason	*problemsAtBorderPost*	19: 15_1	congestion	*probl emsA tBord erPos t*		1.0
	problemsAtCustomsPost	19: 15_2	congestion	*probl emsA tCust omsP ost*		1.0
	problemsOnLocalRoad	19: 15_3	congestion	*probl emsO nLoc alRoa*		1.0

				d		1.0
Indirect Subreasons	*speedRestrictions*	19: 255_1	unknown	*speed Restriction s*		1.0
	logisticProblems	19: 255_2	unknown	*logist icPro blems*		1.0

7.8.5.7.8.4 PersonnelReason (TPEG Pti20)

TPEG Pti19 (Personnel Problem) enumerates Personnel reasons for SITUATIONs – See Table 39.

Table 39 — Allowed Values for PersonnelReason (TPEG Pti20)

Group	*SIRI-SX*	Pti20	TPEG	Datex2 Disturbance Activity
Personnel Reason	*unknown*	20: 0	unknown	
	staffSickness	20: 1	staff sickness	
	staffAbsence	20: 2	staff absence	
	staffInWrongPlace	20: 3	staff in wrong place	
	staffShortage	20: 4	staff shortage	
	industrialAction	20: 5	industrial action	*strike*
	workToRule	20: 6	work to rule	*goSlowOperation*
	undefinedPersonnelProblem	20: 255	undefined personnel problem	

SIRI-SX augments these with some additional subreasons – SeeTable 40.

Table 40 — Allowed Values for Personnel Subreasons

Personne sub lReason	*staffInjury*	20: 1_1	staff sickness
	contractorStaffInjury	20: 1_1	staff sickness
	unofficialIndustrialAction	20: 5_1	industrial action

7.8.5.7.8.5 EquipmentReason (TPEG Pti21)

TPEG Pti21 (Equipment Event Type) enumerates Equipment reasons for SITUATIONs – See Table 41. SIRI-SX augments these with some additional subreasons.

Table 41 — Allowed Values for EquipmentReason (TPEG Pti21)

	SIRI-SX	Pti21	TPEG	Datex2
Equipment Reason	unknown	21: 0	unknown	
	pointsProblem	21: 1	points problem	
	pointsFailure	21: 2	points failure	
	signalProblem	21: 3	signal problem	
	signalFailure	21: 4	signal failure	
	derailment	21: 5	derailment	
	engineFailure	21: 6	engine failure	
	breakDown	21: 7	break down	
	technicalProblem	21: 8	technical problem	
	repairWork	21: 9	repair work	
	constructionWork	21: 10	construction work	
	maintenanceWork	21: 11	maintenance work	
	powerProblem	21: 12	power problem	
	fuelProblem	21: 13	fuel problem	
	swingBridgeFailure	21: 14	swing bridge failure	
	escalatorFailure	21: 15	escalator failure	
	liftFailure	21: 16	lift failure	
	gangwayProblem	21: 17	gangway problem	
	closedForMaintenance	21: 18	closed for maintenance	
	fuelShortage	21: 19	fuel shortage	
	deicingWork	21: 20	de-icing work	
	wheelProblem	21: 21	wheel problem	
	luggageCarouselProblem	21: 22	luggage carousel problem	
	undefinedEquipmentProblem	21: 255	undefined equipment problem	equipmentFailure

SIRI-SX augments these with some additional subreasons – See Table 42.

Table 42 — Allowed Values for EquipmentReason Subreasons

	SIRI-SX	*Pti21*	*TPEG*
Equipment Subreason	*tractionFailure*	21: 6_1	engine failure
	defectiveTrain	21: 6_2	engine failure
	slipperyTrack	21: 21_1	*wheelProblem* failure
	trainWarningSystemProblem	21: 3_1	signal problem
	trackCircuitProblem	21: 3_2	signal problem
	Signal and Switch Failure	21: 4_1	signal failure
	brokenRail	21: 8_1	technical problem
	poorRailConditions	21: 8_2	technical problem
	wheelImpactLoad	21: 8_3	technical problem
	lackOfOperationalStock	21: 8_4	technical problem
	defectiveFireAlarmEquipment	21: 8_5	technical problem
	defectivePlatformEdgeDoors	21: 8_6	technical problem
	defectiveCctv	21: 8_7	technical problem
	defectivePublicAnnouncementSystem	21: 8_8	technical problem
	ticketingSystemNotAvailable	21: 8_9	technical problem
	levelCrossingFailure	21: 8_10	technical problem
	trafficManagementSystemFailure	21: 8_11	technical problem
	emergencyEngineeringWork	21: 11_1	maintenance work
	lateFinishToEngineeringWork	21: 11_2	maintenance work
	overheadWireFailure	21: 12_1	powerProblem

7.8.5.7.8.6 EnvironmentReason (TPGE Pti22 Environment Event Type)

TPEG Pti21 enumerates Environmental reasons for SITUATIONs – See Table 43.

Table 43 — Allowed Values for EnvironmentalReason (TPEG Pti22)

Group	SIRI-SX	Pti22	TPEG	Datex2 Environmental Obstruction Type
Environment Reason	unknown	22: 0	unknown	
	fog	22: 1	fog	
	roughSea	22: 2	rough sea	
	heavySnowFall	22: 3	heavy snow fall	
	heavyRain	22: 4	heavy rain	
	strongWinds	22: 5	strong winds	
	tidalRestrictions	22: 6	tidal restrictions	
	highTide	22: 7	high tide	
	lowTide	22: 8	low tide	
	ice	22: 9	ice	
	frozen	22: 10	frozen	
	hail	22: 11	hail	
	highTemperatures	22: 12	high temperatures	
	flooding	22: 13	flooding	flooding
	waterlogged	22: 14	waterlogged	
	lowWaterLevel	22: 15	low water level	
	highWaterLevel	22: 16	high water level	
	fallenLeaves	22: 17	fallen leaves	
	fallenTree	22: 18	fallen tree	fallenTrees
	landslide	22: 19	landslide	landslips
	undefinedEnvironmentalProblem	22: 255	poorWeather	other

SIRI-SX augments these with some additional subreasons. See Table 44.

Table 44 — Allowed Values for EnvironmentalReason Subreasons

Group	SIRI-SX	Pti22	TPEG	Datex2 Environmental Obstruction Type
Environment Weather Subreason	driftingSnow	22: 3_1	heavy snow fall	
	blizzardConditions	22: 3_2	heavy snow fall	
	stormDamage	22: 5_1	strong winds	stormDamage
	stormConditions	22: 5_1	strong winds	
	slipperiness	22: 9_1	ice	
	iceDrift	22: 9_2	ice	
	glazedFrost	22: 9_3	ice	
	lightningStrike	22: 255_1	undefined environmental problem	
	avalanches	22: 3_1	heavy snow fall	avalanches
	flashFloods	22: 13_1	flooding	flashFloods
Environment ground Subreason	mudslide	22: 19_1	landslide	mudslide
	rockfalls	22: 19_2	landslide	rockfalls
	subsidence	22: 19_3	landslide	subsidence
	earthquakeDamage	22: 19_4	landslide	earthquakeDamage
	sewerOverflow	22: 255_2	undefined environmental problem	sewerOverflow
	grassFire	22: 255_3	undefined environmental problem	grassFire

7.8.5.7.8.7 PublicEvent Type

A SITUATION *PublicEventType* provides further taxonomic information about a public event which may be the cause or affect the SITUATIONs.

Public Event Type (Datex2))

There are a number of event types as described by **Datex2 CauseType**

- Event reason. See Table 45.

Table 45 — Types of PublicEvent (Datex2 PublicEventType)

SIRI-SX	Description	Datex2 CauseType
athleticsMeeting	Athletics Meeting	*athleticsMeeting*
ballGame	Ball Game	*ballGame*
baseballGame	Baseball Game	*baseballGame*
basketballGame	Basketball Game	*basketballGame*
bicycleRace	Bicycle Race	*bicycleRace*
boatRace	Boat Race	*boatRace*
boxingTournament	Boxing Tournament	*boxingTournament*
bullFight	Bull Fight	*bullFight*
ceremonialEvent	Ceremonial Event	*ceremonialEvent*
concert	Concert	*concert*
cricketMatch	Cricket Match	*cricketMatch*
exhibition	Exhibition	*exhibition*
fair	fair	*fair*
festival	festival	*festival*
filmTVMaking	Film or TV on location	*filmTVMaking*
footballMatch	Football Match	*footballMatch*
funfair	funfair	*funfair*
golfTournament	Golf Tournament	*golfTournament*
hockeyGame	Hockey Game	*hockeyGame*
horseRaceMeeting	Horserace Meeting	*horseRaceMeeting*
internationalSportsMeeting	International Sports Meeting	*internationalSportsMeeting*
majorEvent	Major Event	*majorEvent*
marathon	marathon	*marathon*
market	market	*market*
match	match	*match*
motorSportRaceMeeting	Motor Sport Race Meeting	*motorSportRaceMeeting*
parade	Parade	*parade*
raceMeeting	Race Meeting	*raceMeeting*
rugbyMatch	Rugby Match	*rugbyMatch*
severalMajorEvents	Several Major Events	*severalMajorEvents*
show	show	*show*
showJumping	Show Jumping	*showJumping*
sportsMeeting	Sports Meeting	*sportsMeeting*
stateOccasion	State Occasion	*stateOccasion*
tennisTournament	Tennis Tournament	*tennisTournament*

tournament	tournament	*tournament*
tradeFair	Trade Fair	*tradeFair*
waterSportsMeeting	Water Sports Meeting	*waterSportsMeeting*
winterSportsMeeting	Winter Sports Meeting	*winterSportsMeeting*
other	*other*	*other*
flowerParade	*Flower Parade*	*(parade)*
rummageSale	*Rummage Sale*	*(market)*
carnival	*Carnival*	*(parade)*
fete	*Fete*	*(fair)*
royalBirthday	*Royal Birthday*	*majorEvent*
massWalk	*Mass Walk*	*(sportsMeeting)*
cycleTour	*Cycle Tour*	*(bicycleRace)*
organisedWalk	*Organized Walk*	*(sportsMeeting)*

7.8.5.8 Description Elements

7.8.5.8.1 General

The set of description elements provide a human readable text description of the SITUATION. The provision of separate summary and detail elements enables a layered presentation in different formats and devices and for different contexts and audiences. Separate **Summary**, **Description**, **Details**, **Advice** and **Internal** elements are provided

The **Image** and **InfoLinks** allow the association of other electronic presentation resources with the textual description.

7.8.5.8.2 Defaulted Text

In many cases it is possible to generate descriptive text for a SITUATION automatically from the other structured elements such as the **Reason** and **AffectsScope**. One of the benefits of a structured incident capture system is that in many cases the text explanation can be generated automatically from the structured content elements, allowing OPERATORs to produce consistent, high quality, error free explanations. Generation is also desirable as it allows for the automatic translation into different human languages.

For each descriptive text element a **DefaultedText** data type i(Table 46) is used which can indicate whether the text is the default text or a manually entered override.

Table 46 — DefaultedText Element

DefaultedText			+Structure	Overridable Text element
Identity	**lang**	0:1	lang	Language for text content.
	overridden	0:1	boolean	Whether the default text phrase has been overridden. The **overridden** attribute indicate whether the text has been changed from the computer generated default - And therefore cannot be regenerated or translated automatically. This is useful to know because a text that has not been modified may be regenerated in different languages, and also may be processed in IVR speech systems using pre-recorded elements.
	string	0:1	string	Text content

7.8.5.8.3 Images

Each descriptive text element can be associated with one or more **Image** elements providing graphical resources relating to the SITUATION. The images may be given a simple classification – See Table 47.

Table 47 — Image Element

Image			+Structure	Graphic Resource
	ImageRef	0:1	anyUrl	Reference to an image
	ImageBinary	0:1	Base64Binary	Embedded image in binary form
	ImageContent	0:1	enum	Classification of image. See below

Table 48 — Allowed Values for ImageContent

SIRI-SX	Description
map	Image is a map
logo	Image is a logo
graphic	Image is other graphic

7.8.5.8.4 InfoLinks

Each descriptive text element can be associated with one or more **InfoLink** elements providing structured links to the resources relating to the SITUATION. The links may be given a simple classification. See Table 49. Each link may have a single image associated with it.

Table 49 — Infolink Element

InfoLink			+Structure	Web Link
	Uri	1:1	anyUrl	Link url
	Label	0:1	nlString	label for link
	Image	0:1	Image	Image associated with link
	LinkContent	0:1	enum	Classification of link content. See Table 45

Table 50 shows classifcations of link content.

Table 50 — Allowed Values for LinkContent

Value	Description
other	Other
timetable	Link is to a timetable
relatedSite	Link is to a related SITE
details	Link is to a page of further details

7.8.5.9 Consequence Element

7.8.5.9.1 General

The SIRI-SX ***Consequence*** element (See Table 51) represents a specific consequence for a PT incident. It aggregates the ***Consequence***, ***Blocking***, ***Boarding***, ***Advice***, ***Casualties*** and ***Easement*** elements shown in Figure 14.

Table 51 — SituationConsequence Element

Consequence			*+Structure*	Effect of a SITUATION on services.
Time	***Period***	0:*	*range*	On or more overall inclusive Period of applicability of consequence
	StartTime	0:1	*dateTime*	The (inclusive) start time stamp.
	EndTime	0:1	*dateTime*	The (inclusive) end time stamp. If omitted, the range end is open-ended, that is, it should be interpreted as "forever".
	EndTimeStatus	0:1	*Enum: undefined | longTerm | shortTerm*	If end time not provided, whether to interpret it as a long, term, short-term or unknown length of SITUATION. Default is *undefined* (Siri 2.0++)
Classi fiers	***Condition***	0:*	*enum*	Classification of effect on service. TPEG Pti13 Service Condition values. It can be overridden by the JourneyCondition in the ***AffectedVehicleJourney***
	Severity	0:1	*enum*	Severity of SITUATION. Corresponds to TPEG Pti26 severities. Default is normal.
Scope	***Affects***	0:1	*AffectsScope*	Structured model identifying parts of transport affected by consequence. See Below
	Suitabilities	0:*	*many*	Effect on different passenger needs.
	Suitability	0:1	*Suitability*	Effect on a passenger need. See Below.
Advic e	***Advice***	0:1	*+Structure*	Advice to passengers.
	AdviceRef	0:1	*id*	Identifier of standard Further advice message to passengers.
	Details	0:1	*nlString*	Further Textual advice to passengers.
Block ing	***Blocking***	0:1	*+Structure*	How Disruption should be handled in Info systems
	JourneyPlanner	0:1	*boolean*	Whether information about parts of the NETWORK identified by ***AffectsScope*** should be blocked from the Journey Planner. Default is false; do not suppress.

	RealTime	0:1	*boolean*	Whether information about parts of the NETWORK identified by **AffectsScope** should be blocked from real-time departure info systems. Default is false; do not suppress.
Activity	**Boarding**	0:1	*+Structure*	Intended audience of SITUATION.
	ArrivalBoardingActivity	0:1	*enum*	Type of boarding and alighting allowed at stop. Default is Alighting
	DepartureBoardingActivity	0:1	*enum*	Type of boarding and alighting allowed at stop. Default is Alighting
Delay	**Delays**	0:1	*+Structure*	Predicted delays
	DelayBand	0:1	*enum*	Name of predefined Time band into which delay will fall.. Based on Datex values see below.
	DelayType	0:1	*enum*	Nature of delay.
	Delay	0:1	*duration*	Additional journey time needed to overcome disruption.
Description Group	**NumberOfDeaths**	0:1	*integer*	Number of fatalities
	NumberOfInjured	0:1	*integer*	Number of injured persons.
Easements	**Easements**	*0:*	*+Structure*	Description of fare exceptions allowed because of disruption.
	TicketRestriction	0:1	*enum*	Ticket restriction conditions in effect. TPEG pti table pti25.
	Easement	0:1	*nlString*	Description of fare exceptions allowed because of disruption.
	EasementRef	0:1	*nlString*	Identifier of a fare exceptions code allowed because of the disruption.
any	**Extensions**	0:1	any	Placeholder for user extensions.

7.8.5.9.2 Service Condition (TPEG Pti13)

The SITUATION **Consequence ServiceCondition** describes the nature of the consequence. The values are based on TPEG pti13. See Table 52.

Table 52 — Allowed Values for Service Condition (TPEG Pti13)

SIRI-SX	Description	Pti13
unknown	unknown	0
altered	altered	1
cancelled	cancelled	2
delayed	delayed	3
diverted	diverted	4
noService	no service	5
disrupted	disrupted	6
additionalService	additional service	7
specialService	special service	8
onTime	on time	9
normalService	normal service	10
intermittentService	intermittent service	11
shortFormedService	short formed service	12
fullLengthService	full length service	13
extendedService	extended service	14
splittingTrain	splitting train	15
replacement Transport	replacement transport	16
arrivesEarly	arrives early	17
shuttleService	shuttle service	18
replacementService	replacement service	19
alternateTrack	redirected to an alternate track	20
undefined	undefined service information	255

7.8.5.9.3 Suitability

Suitability (Table 53) describes the consequence of the SITUATION for accessibility and user special needs. The data type is the same as used in prCEN IFOPT.

A **Consequence** can have multiple **Suitability** instances, each of which specifies whether the effect of the Consequence (as specified by the **AffectsScope** element) is a change that makes accessibility suitable or unsuitable for a specific **UserNeed**

Status is specified by the **Suitable** value – see Table 54.

User needs are specified by the **UserNeed** – see Table 55 for allowed values.

Note that changes to **Suitability** s and **Limitations** can be specified by the **AffectsStopPlace** element using the **AccessibilityAssessment** element.

Table 53 — Suitability Element

Suitability				+Structure	Overridable Text element
Identity	**Suitable**		1:1	*enum*	Language for text content.
	UserNeed		1:1	*choice*	
	a	**MobilityNeed**	1:1	*enum*	Specific USER NEED see below
	b	**MedicalNeed**	1:1	*enum*	Specific USER NEED see below
	c	**PsychoSensoryNeed**	1:1	*enum*	Specific USER NEED see below
	d	**EncumbranceNeed**	1:1	*enum*	Specific USER NEED see below

Table 54 — Allowed values for Suitable

SIRI-SX	Description
suitable	Suitable for specified user need
notSuitable	Not suitable for specified user need
unknown	Suitability is unknown

Table 55 — Allowed values for User Need

Need Group	SIRI-SX	Description
MobilityNeed	*wheelchair*	User needs wheelchair
	motorizedWheelchair	User needs motorized wheelchair
	walkingFrame	User needs walking frame
	restrictedMobility	User has limited mobility
	otherSpecificNeed	User has other need
MedicalNeed	*allergic*	User has severe allergies
	heartCondition	User has heart condition
PsychosensoryNeed	*visualImpairment*	User has visual impairment
	auditoryImpairment	User has Auditory impairment
	cognitiveImpairment	User has cognitive impairment
	averseToLifts	Use is averse to lifts
	averseToEscalators	User is averse to Escalators
	averseToConfinedSpaces	User dislikes confined spaces
	averseToCrowds	User dislikes Crowds
	otherSensoryNeed	User has other need
EncumbranceNeed	*luggageEncumbered*	User has luggage encumbered
	pushchair	User has pushchair
	baggageTrolley	User has Baggage trolley
	oversizeBaggage	User has Oversize baggage
	guideDog	User has Guide dog
	otherAnimal	User has Other animal
	otherEncumbrance	User has Other encumbrance

7.8.5.9.4 ArrivalBoardingActivity (SIRI)

Boarding describes any effect of the consequence on boarding or alighting at the Stop. See Table 56 (alighting) and Table 57 (boarding).

Table 56 — Allowed Values for ArrivalBoardingActivity (Siri)

SIRI-SX	Description	
alighting	Passengers may alight at stop	
noAlighting	Passengers may not alight at stop	
passThrough	Passengers may pass through at stop	

7.8.5.9.5 DepartureBoardingActivity (SIRI)

Table 57 — Allowed Values for DepartureBoardingActivity (Siri)

SIRI-SX	Description	
boarding	Passengers may board at stop	
noBoard	Passengers may not board at stop	
passThrough	Passengers may pass through at stop	

7.8.5.9.6 DelayBand (Datex2 DelayCode)

DelayBand describes the nature of the delay. The values are based on Datex2 *DelayCode*. See Table 58.

Table 58 — Allowed Values for DelayBand (Datex2)

SIRI-SX	Description	Datex2 DelayCode
delayLongerThanSixHours	> 6 Hours	longerThanSixHours
delayBetweenThreeHouraAndSixHours	3–6 Hours	betweenThreeHousrAndSixHours
delayBetweenOneHourAndThreeHours	1–3 Hours	betweenOneHourAndThreeHours
delayBetweenThirtyMinutesandOneHour	30min-1 Hour	bBetweenThirtyMinutesandOneHour
delayLessThanThirtyMinutes	< 30 min	lessThanThirtyMinutes
delayLessThanTwentyMinutes	< 20 min	lessThanTwentyMinutes
delayLessThanFifteenMinutes	< 15 min	lessThanFifteenMinutes
delayLessThanTenMinutes	< 10 min	lessThanTenMinutes
delayLessThanFiveMinutes	< 5 min	Negligible
Negligible	Negligible	Negligible
delayLessTwoMinues	< 2 Minutes	Negligible
delayLessThreeMinutes	< 3 Minutes	Negligible
delayLessFourMinutes	< 4 Minutes	Negligible
delayLessFiveMinues	< 5 Minutes	Negligible
delayLessEightMinues	< 8 Minutes	Negligible
delayTwoToFiveMinutes	2 - 5 Minutes	Negligible
delayFiveToTenMinutes	5- 10 Minutes	Negligible

7.8.5.9.7 DelayType (Datex2 DelaysType)

DelayType describes the nature of the delay. The values are based on Datex2:*DelaysType*. See Table 59.

Table 59 — Allowed Values for DelayType (Datex2)

SIRI-SX	Description	Datex2 DelaysType
delays	Material delays	*delays*
delaysOfUncertainDuration	Delays Of Uncertain Duration	*delaysOfUncertainDuration*
longDelays	Long Delays	*longDelays*
veryLongDelays	Very Long Delays	*veryLongDelays*

7.8.5.9.8 TicketRestrictions (TPEG Pti25)

Situation **ServiceCondition** describes the nature of the consequence. The values are based on TPEG pti13. See Table 60.

Table 60 — Allowed values for Ticket Restriction

SIRI-SX	Description	TPG Pti 25
unknown	unknown	pti25_0
allTicketClassesValid	All Ticket Classes Valid	pti25_1
fullFareOnly	Full Fare Only	pti25_2
certainTicketsOnly	Certain Tickets Only	pti25_3
ticketWithReservation	Ticket with Reservation	pti25_4
specialFare	Special Fare	pti25_5
onlyTicketsOfSpecifiedOperator	Only Tickets of Specified Operator	pti25_6
noRestrictions	No Restrictions	pti25_7
noOffPeakTickets	No Off-peak Tickets	pti25_8
noWeekendReturnTickets	No Weekend Return Tickets	pti25_9
noReducedFareTickets	No Reduced Fare Tickets	pti25_10
unknownTicketRestriction	Unknown Ticket Restriction	pti25_255

7.8.5.10 AffectsScope Element

7.8.5.10.1 General

The **AffectsScope** element (Table 61) brings together more detailed elements describing the scope of a SITUATION or consequence, that is the elements or elemenst affected by the SITUATION or its consequences.

Table 61 — AffectsScope Element

AffectsScope				+Structure	The scope of the SITUATION or consequence
Operat ors	**Operators**		0:1	choice	NETWORKs scope.
		a	**AllOperators**	0:1	empty	All OPERATORs are affected
		b	**AffectedOperator**	0:*	+Structure	Annotated reference to Operator of services affected by SITUATION. See Below.
Stop	**StopPoints**		0:*	+Structure	Scheduled STOP POINT affected by SITUATION.
		AffectedStopPoint	0:1	+Structure	Scheduled STOP POINT scope. See below.
networ k	**Networks**		0:*	+Structure	NETWORKs affected by SITUATION..
		AffectedNetwork	0:1	+Structure	NETWORK scope. See below.
Journey	**VehicleJourneys**		0:*	+Structure	VEHICLE JOURNEYs affected by SITUATION.. See below.
		AffectedVehicleJourne y	0:1	+Structure	VEHICLE JOURNEY affected by SITUATION.
Place	**StopPlaces**		0:*	+Structure	STOP PLACEs affected by SITUATION.
		AffectedStopPlace	0:1	+Structure	Annotated reference to STOP PLACE. See below.
Vehicles	**Vehicles**		0:*	+Structure	VEHICLEs affected by SITUATION.
		AffectedVehicle	0:1	+Structure	Annotated reference to VEHICLE. See below.
Level	**AreaOfInterest**		0:1	enum	High level geographic scope – TOPOGRAPHIC PLACE REF
Roads	**AffectedRoads**		0:1	+Structure	Roads affected by SITUATION.
any	**Extensions**		0:1	any	Placeholder for user extensions.

7.8.5.10.2 AreaOfInterest (Datex2)

Situation ***AreaOfInterest*** describes the geographical area of the SITUATION. The values are based on Datex2 AreaOfInterest values. See Table 62.

Table 62 — Allowed Values for ReportType (TPEG Pti27)

SIRI-SX	Description	Datex2
continentWide	Applies to whole continent	continentWide
national	Affects a whole country	national
neighbouringCountries	Affects a country and its neighbours	neighbouringCountries
regional	Affects a region within a country	regional
notSpecified	Situation concerns an individual service	notSpecified

7.8.5.10.3 AffectedNetworks Element

7.8.5.10.3.1   General

The ***AffectedNetwork*** (Table 63) element groups information about the MODEs, NETWORKs and any LINEs or parts of a LINE (Sections) affected by the SITUATION The OPERATOR, MODE and NETWORK will default to the values in the ***Context.***

Table 63 — Affected Network Element

AffectedNetwork			+Structure	The scope of the SITUATION or consequence
Operators	Operators	0:*	choice	OPERATORs affected by SITUATION.
	b AffectedOperator	0:1	+Structure	Annotated reference to Operator of services affected by SITUATION. See below.
network	NetworkRef	0:1	NetworkCode	NETWORK of affected LINE. If absent, may be taken from context.
	NetworkName	0:1	nlString	Name of NETWORK.
	RoutesAffected	0:1	nlString	Textual description of overall ROUTEs affected. Should correspond to any structured description.
	VehicleMode		enum	MODEs Affected VEHICLE mode- Tpeg ModeType pti1.
Mode	Submode		Choice	
	a AirSubmode	0:1	enum	TPEG pti08 Air submodes.
	b BusSubmode	0:1	enum	TPEG pti05 Bus submodes.
	c Coach	0:1	enum	TPEG pti03 Coach submodes.
	d MetroSubmode	0:1	enum	TPEG pti04 Metro submodes.
	e RailSubmode	0:1	enum	TPEG pti02 Rail submodes loc13.
	f TramSubmode	0:1	enum	PEG pti06 Tram submodes.
	g WaterSubmode	0:1	enum	TPEG pti07 Water submodes.
	h TelecabineSubmode	0:1	enum	TPEG pti09 Telecabin submodes.
	i TaxiSubmode	0:1	enum	TPEG pti11 Taxi submodes.
network	Lines	0:1	choice	LINE scope.
	a AllLines	0:1	emptyType	All LINEs in the NETWORK are affected.
	b SelectedRoutes	0:1	emptyType	Only some ROUTEs are affected, LINE level information not available. See the AffectedRoutes element for textual description.
	c AffectedLine	0:*	+Structure	LINE affected by SITUATION. See Below.
any	Extensions	0:1	any	Placeholder for user extensions.

7.8.5.10.3.2 AffectedOperator Element

The **AffectedOperator** element (Table 64) groups information about the Operator affected by the SITUATION.

Table 64 — AffectedOperator Element

AffectedOperator			+Structure	Annotated reference to OPERATOR and Unit affected by SITUATION.
Operator	OperatorRef	0:1	→Operator Code	Identifier of OPERATOR.
	OperatorName	0:1	nlString	Name of OPERATOR.
	OperatorShortName	0:1	nlString	ShortName for OPERATOR. E.g. TfL, LUL
Unit	OperationalUnitRef	0:*	→UnitCode	Identifier of OPERATIONAL UNIT responsible for managing services
any	Extensions	0:1	any	Placeholder for user extensions.

7.8.5.10.3.3 AffectedLine Element

The **AffectedLine** element (Table 65) groups information about the LINEs affected by the SITUATION.

Table 65 — AffectedLine Element

AffectedLine			+Structure	Annotated reference to LINE affected by SITUATION.
Operators	Operators	0:*	choice	OPERATORs of LINE affected by SITUATION..
	AffectedOperator	0:1	+Structure	Annotated reference to OPERATOR of services affected by SITUATION. See Below.
Operator	LineRef	1:1	→LineCode	Identifier of LINE.
	PublishedLineName	0:1	nlString	Public number or name of LINE.
	Destinations	0:*	choice	DESTINATIONs affected.
	AffectedStopPoint	0:1	+Structure	Annotated reference to destination STOP POINT affected by SITUATION.
	Directions	0:*	+Structure	DIRECTIONs affected.
	DirectionRef	0:1	→DirectionCode	Identifier of DIRECTION.
	DirectionName	0:1	nlString	Name of DIRECTION.
Routes	Routes	0:*	choice	ROUTEs of LINE affected by SITUATION.
	AffectedRoute	0:1	→AffectedRoute Structure	ROUTE affected by SITUATION.
Sections	Sections	0:*	choice	SECTION of LINE affected by SITUATION..
	SectionRef	0:1	→SectionCode	Identifier of SECTION affected by SITUATION.
any	Extensions	0:1	any	Placeholder for user extensions.

7.8.5.10.3.4 AffectedRoute Element

The **AffectedRoute** element (Table 66) groups information about the ROUTEs affected by the SITUATION.

Table 66 — AffectedRoute Element

AffectedRoute			*+Structure*	Annotated reference to ROUTE affected by SITUATION.
Operator	*RouteRef*	0:1	→*RouteCode*	Identifier of ROUTE.
	Directions	0:*	*+Structure*	DIRECTIONs affected.
	DirectionRef	0:1	→*DirectionCode*	Identifier of DIRECTION.
	DirectionName	0:1	*nlString*	Name of DIRECTION.
Sections	*Sections*	0:*	*choice*	Section of ROUTE affected.
	SectionRef	0:1	→*SectionCode*	Identifier of Section affected by SITUATION.
StopPoints	*StopPoints*	0:1	*+Structure*	SCHEDULED STOP POINTS of the ROUTE. Can be either all or only affected by SITUATION.
	AffectedOnly	0:1	*boolean*	Indicates whether the list of STOP POINTS contains all STOP POINTS of ROUTE or only those affected by SITUATION. Default "false"
	AffectedStopPoint	1:*	*AffectedStopPoint Structure*	SCHEDULED STOP POINT of the ROUTE. See below
	LinkProjectionToNextStopPoint	0.*	*ifopt:LinkProjectionStructure*	GIS projection of LINK to the next provided SCHEDULED STOP POINT. NB LINE here means Geometry Polyline, not Transmodel Transport LINE.
Routes	*RouteLinks*	0:*	*choice*	ROUTE LINKs affected by SITUATION..
	RouteLinkRef	0:1	→*RouteCode*	Identifier of ROUTE LINK affected by SITUATION.
any	*Extensions*	0:1	*any*	Placeholder for user extensions.

7.8.5.10.4 AffectedStopPoint Element

7.8.5.10.4.1 General

The ***AffectedStopPoint*** element (Table 67) groups information about the SCHEDULED STOP POINTs affected by the SITUATION.

Table 67 — AffectedStopPoint Element

AffectedStopPoint			*+Structure*	Annotated reference to SCHEDULED STOP POINT affected by SITUATION.
Stop	**StopPointRef**	0:1	→*StopPointCode*	Identifier of SCHEDULED STOP POINT.
	PrivateRef	0:1	*string*	Additional external code of
	StopPointName	0:1	*nlString*	Name of SCHEDULED STOP POINT.
	StopPointType	0:1	*enum*	Type Of SCHEDULED STOP POINT. See below
	Location	0:1	*Location*	Point Projection to use for SCHEDULED STOP POINT.
Modes	**AffectedModes**	0:1	*choice*	MODE scope.
	a **AllModes**	0:1	*emptyType*	All MODEs for the SCHEDULED STOP POINT.are affected.
	b **mode**	0:*	*+Structure*	Annotated reference to OPERATOR of services affected by SITUATION. See Below.
Zone	**PlaceRef**	0:1	*PlaceId→PlaceId*	Identifier of Place in which SCHEDULED STOP STOP lies.
	PlaceName	0:1	*nlString*	Name of SCHEDULED STOP POINT.
	AccessibilityAssessment	0:1	*+Structure*	ACCESSIBILITY ACCESSMENT for SCHEDULED STOP POINT.
	StopCondition	0:*	*enum*	Status of SCHEDULED STOP POINT.– TPEG value Multiple Condtions can be valid at the same time.
	ConnectionLinks	0:*	*choice*	CONNECTION links of SCHEDULED STOP POINT affected by SITUATION
	AffectedConnectionLink	0:1	*+Structure*	Annotated reference to CONNECTION link affected by SITUATION
any	**Extensions**	0:1	*any*	Placeholder for user extensions.

7.8.5.10.4.2 StopPointType (TPEG Pti17 Stop)

Situation **StopPointType** describes the type of the STOP POINT. The values are based on IFOPT and have equivalences in the TPEG pti27 service delivery point type. See Table 68.

Table 68 — Allowed Values for StopPointType (IFOPT / TPEG Pti17)

SIRI-SX	TPEG	TPEG Pti 17
–	unknown	pti17_0
railPlatform	Platform Number	pti17_1
metroPlatform	(platformNumber)	
airlineGate	Terminal Gate	pti17_2
boatQuay	Ferry Berth	pti17_3
(boatQuay)	Harbour Pier	pti17_4
ferryLanding	Landing Stage	pti17_5
busStop	Bus Stop	pti17_6
coachStop	(bus Stop)	
tramStop	(bus Stop)	
taxiStand	undefined	
setDownPlace	undefined	
telecabinePlatform	undefined	
unknown	undefined	pti17_255

7.8.5.10.4.3   AffectedConnectionLink Element

The ***AffectedConnectionLink*** element (Table 69) groups information about the CONNECTION links affected by the SITUATION.

Table 69 — AffectedConnectionLink Element

AffectedConnectionLink			*+Structure*	Annotated Reference to CONNECTION LINK affected by SITUATION.
Stop	***ConnectionLink*Ref**	0:1	*→ConnectionLinkCode*	Identifier of SCHEDULED STOP POINT.
	***Connection*Name**	0:1	*nlString*	Name of SCHEDULED STOP POINT.
	Location	0:1	*Location*	Point Projection to use for STOP POINT.
Lines	***Lines***	0:1	*choice*	MODE scope.
	a ***AllLines***	0:1	*→LineCode*	All lines
	b ***LineRef***	0:*	*nlString*	Identifier of LINE.
	PublishedLineName	0:1	*nlString*	Public Nnmber or name of LINE.
To Stop	***ConnectingStopPointRef***	0:1	*StopPointCode*	Identifier of Connecting SCHEDULED STOP POINT.
	ConnectingStopPointName	0:1	*nlString*	Name of Connecting SCHEDULED STOP POINT.
	ConnectingZoneRef	0:1	*→ZoneCode*	Identifier of Zone in which Connecting Stop lies
Operator	***ConnectionDirection***	0:1	*from | to | both*	Direction of CONNECTION link. Default is both
Links	***AffectedLinks***	0:*	*choice*	CONNECTION link affected by SITUATION..
	AffectedConnectionLink	0:1	*+Structure*	Annotated reference to CONNECTION lLink affected by SITUATION
any	***Extensions***	0:1	*any*	Placeholder for user extensions.

7.8.5.10.5 AffectedStopPlace Element

7.8.5.10.5.1 General

The ***AffectedStopPlace*** element (Table 70) groups information about the STOP PLACEs places affected by the SITUATION.

Table 70 — AffectedStopPlace Element

AffectedStopPlace			*+Structure*	Annotated Reference to STOP PLACE affected by SITUATION.
	AccessibilityAssessment	0:1	*+Structure*	ACCESSIBILITY ASSESMENT of STOP PLCAE >
Operators	*Operators*	0:*	*choice*	OPERATOR scope.
	AffectedOperator	0:1	*+Structure*	Annotated reference to OPERATOR of services affected by SITUATION. See AffectedOperator Element.
Stop Place	*StopPlaceRef*	0:1	*→OperatorCode*	Identifier of STOP PLACE.
	StopPlaceName	0:1	*nlString*	Public number or nme of STOP PLACE.
	StopPlaceType	0:1	*enum*	Type of STOP PLACE. See below.
Facilities	*Facilities*	0:*	*sequence*	Facilities for JOURNEY. (+2.0)
	AffectedFacility	0:1	*+Structure*	Faciities and/or changes to facilities for VEHICLE JOURNEY. See *AffectedFacility* below. (+2.0)
Routes	*AffectedComponents*	0:*	*choice*	STOP PLACE COMPONENTs affected by SITUATION..
	AffectedComponent	0:1	*→RouteCode*	Identifier of STOP PLACE Component affected by SITUATION. See below.
Sections	*AffectedNavigationPaths*	0:*	*choice*	NAVIGATION PATH scope.
	NavigationPathRef	0:1	*→PathId*	Identifier of a NAVIGATION PATH affected by SITUATION.
any	*Extensions*	0:1	*any*	Placeholder for user extensions.

7.8.5.10.5.2   StopPlaceType (TPEG Pti17 Stop)

Situation ***StopPlaceType*** describes the type of the STOP PLACE. The values are from IFOPT. See Table 71.

Table 71 — Allowed Values for StopPlaceType (IFOPT)

SIRI-SX	**Description**
airport	Airport
railStation	Rail Station
metroStation	Metro Station
coachStation	Coach Station
busStation	Bus Station
shipPort	Ship Port
ferryPort	Ferry Port
ferryStop	Ferry Stop
onStreetBus	On Street Bus
onStreetTram	On Street Tram
skiLift	Ski Lift
other	other

7.8.5.10.5.3   AffectedStopPlace Component

The **AffectedStopPlaceComponent** element (Table 72) groups information about the STOP PLACE COMPONENTs affected by the SITUATION**.** It can be used to indicate that the scope of a SITUATION is a specified part of a STOP PLACE such as a QUAY, ACCESS AREA, BOARDING POSITION, ENTRANCE or EQUIPMENT PLACE.

Table 72 — AffectedStopPlaceComponent Element

AffectedStopPlaceComponent			+*Structure*	Annotated Reference to a STOP PLACE Component
	AccessibilityAssessment	0:1	+*Structure*	Accessibility Disruption to Component
Compoent	**ComponentRef**	0:1	→ComponentId	Identifier of Component.
	ComponentName	0:1	*nlString*	Public Number or Name of Component.
	ComponentType	0:1	*enum*	Type of STOP PLACE Component. See below
Projection	**PointProjection**	0:1	+*Structure*	Point Projection inidicating effect of SITUATION.
	Features	0:*	*GisFeatureRef*	GIS Features affected by SITUATION.
	Location	0:1	*Structure*	Location affected by SITUATION.
	LinkProjection	0:1	+*Structure*	Projection as a geospatial polyline indicating effect of SITUATION.
	Features	0:*	*GisFeatureRef*	GIS Features affected by SITUATION.
	Line	0:*	*PointProjection*	Ordered sequence of POINTs.
	ZoneProjection	0:1	+*Structure*	Projection as a geospatial zone indicating LINE of effect of SITUATION.
	Features	0:*	*GisFeatureRef*	GIS Features affected by SITUATION.
	Boundary	0:*	*PointProjection*	Ordered sequence of Points indicating boundary of effect of SITUATION.
	Offset	0:1	+*Structure*	Further qualifcation of affected part of Link projection,
	DistanceFromStart	0:*	*xsd:unsignedint*	Distance in metres from start of link at which SITUATION is to be shown. I f absent use start of link.
	DistanceFromEnd	0:*	*unsignedint*	Distance in metres from end of link at which SITUATION is to be shown. I f absent use start of link.
	AccessFeatureType	0:1	*enum*	Access Feature of STOP PLACE Component. See below. (+2.0 Schema corrected to include)
Facilities	**AffectedFacilities**	0:*	*sequence*	Facilities for STOP PLACE COMPONENT. (+SIRI 2.0)
	AffectedFacility	0:1	+*Structure*	Faciities and/or changes to facilities for COMPONENT. See **AffectedFacility** below. (+SIRI 2.0)
any	**Extensions**	0:1	*any*	Placeholder for user extensions.

7.8.5.10.5.4   StopPlaceComponentType

Situation **StopPlaceComponentType** describes the type of the **StopPlaceComponent**. The values are from IFOPT. See Table 73.

Table 73 — Allowed Values for StopPlaceComponentType (IFOPT)

SIRI-SX	Description
quay	Quay
accessSpace	Access Space
boardingPosition	Boarding Position
stoppingPlace	Stopping Place
stoppingPosition	Stopping Position
entrance	Entrance
stopPathLink	Stop Path Link
accessPathLink	Access Path Link
other	other

7.8.5.10.5.5   StopPlaceAccessFeatureType

Situation **StopAccessFeatureType** describes the access feature type of the **StopPlaceComponent**. The values are from IFOPT. See Table 74.

Table 74 — Allowed Values for StopPlaceAccessFeatureType (IFOPT)

SIRI-SX	Description
lift	Lift
escalator	Escalator
travelatorr	Travelator
ramp	Ramp
stairs	Stairs
shuttle	Shuttle
barrier	Barrier
narrowEntrance	Narrow Entrance
confinedSpace	Confined Space
queueManagement	Queue Management
unknown	Unknown

7.8.5.10.6 AffectedVehicleJourney Element

7.8.5.10.6.1   General

The **AffectedVehicleJourney** element (Table 75) groups information about the VEHICLE JOURNEYs affected by the SITUATION.

Table 75 — AffectedVehicleJourney Element

AffectedVehicleJourney				*+Structure*	Annotated reference to VEHICLE JOURNEY affected by the SITUATION.
Operators			0:1	*choice*	Identifier of a service VEHICLE JOURNEY.
		FramedVehicleJourneyRef	0:1	*+Structure*	Reference to a VEHICLE JOURNEY framed by the day. . (+SIRI 2.0)
	b	*VehicleJourneyRef*	0:1	*→:VehicleJourneyCode*	Simple identifier of VEHICLE JOURNEYDeprecated.
		DatedVehicleJourneyRef	0:1	*→DatedVehicleJourneyCode*	Identifier of a specific VEHICLE JOURNEY.
		JourneyName	0:1	*nlString*	Name of VEHICLE JOURNEY
		Operator	0:1	*AffectedOperator*	Annotated reference to OPERATOR of services affected by SITUATION. See AffectedOperator Element.
Operator	*LineRef*		0:1	*→OperatorCode*	Identifier of LINE.
	PublishedLineName		0:1	*nlString*	Public number or name of LINE.
	DirectionRef		0:1	*→DirectionCode*	Direction of the VEHICLE JOURNEY.
	BlockRef		0:1	*→BlockCode*	Identifier of Block including this VEHICLE JOURNEY. (+SIRI 2.0)
	TrainNumbers		0:*	*sequence*	TRAIN NUMBERa of VEHICLE JOURNEY (+SIRI 2.0).
		TrainNumber	0:1	*- > TrainNumber Code*	TRAIN NUMBER of VEHICLE JOURNEY (+SIRI 2.0).
	JourneyParts		0:*	*sequence*	JOURNEY PARTs of VEHICLE JOURNEY (+SIRI 2.0).
		JourneyPart	0:1	*Structure*	See JourneyPartInfo (+SIRI 2.0).
	Origins		0:*	*sequence*	Origin scope within VEHICLE JOURNEY,
		AffectedStopPoint	0:1	*+Structure*	Annotated reference to origin STOP POINT affected by SITUATION. See Above.
	Destinations		0:*	*sequence*	Destination scope within VEHICLE JOURNEY,
		AffectedStopPoint	0:1	*+Structure*	Annotated reference to destination STOP POINt affected by SITUATION
Routes	*RouteRef*		0:1	*→RouteCode*	Identifier of ROUTE affected by SITUATION.
Times	*OriginAimedDepartureTime*		0:1	*dateTime*	Timetabled departure time from origin.
	DestinationAimedArrivalTime		0:1	*dateTime*	Timetabled arrival time at destination.
	DestinationDisplayAtOrigin		0:*	*nlString*	DESTINATION name shown for VEHICLE JOURNEY at the origin. Can be overwritten section by section by the entry in an individual CALL.
	JourneyCondition		0:*	*enum*	Status of service for this VEHICLE JOURNEY - TPEG value. Multiple condtions can be valid at the same time. (+SIRI 2.0)
	AccessibilityAssessm		0:1	*+Structure*	Accessibility Disruption status ofto JOURNEY, as

				affected by SITUATION.
Section s	**Calls**	0:*	*sequence*	Scope within VEHICLE JOURNEY.
	AffectedCall	0:1	*+Structure*	Annotated reference to CALL affected by SITUATION.
Facilitie s	**Facilities**	0:*	*sequence*	Facilities for VEHICLE JOURNEY. (+2.0)
	AffectedFacility	0:1	*+Structure*	Faciities and/or changes to facilities for VEHICLE JOURNEY. See **AffectedFacility** below. (+2.0)
any	**Extensions**	0:1	*any*	Placeholder for user extensions.

7.8.5.10.6.2 AffectedCall Element

The **AffectedCall** element (Table 76) groups information about a CALL at a SCHEDULED STOP POINTs affected by the SITUATION.

Table 76 — AffectedCall Element

AffectedCall			*+Structure*	Annotated Reference to CALLs affected by SITUATION.
Stop	**StopPointRef**	0:1	→*StopPointCode*	Identifier of STOP POINT.
	PrivateRef	0:1	*string*	Additional external code of SCHEDULED STOP POINT.
	StopPointName	0:1	*nlString*	Name of SCHEDULED STOP POINT.
	StopPointType	0:1	*enum*	Type of SCHEDULED STOP POINT.
	Location	0:1	*Location*	POINT PROJECTION to use for STOP PINT
Modes	**AffectedModes**	0:1	*choice*	MODEs affected by SITUATION..
	a **AllModes**	0:1	*emptyType*	All MODEs for the SCHEDULED STOP POINT are affected.
	b **mode**	0:*	*+Structure*	Annotated reference to OPERATOR of services affected by SITUATION. See Below.
Zone	**PlaceRef**	0:1	→*ZoneCode*	Identifier of TOPOGRAPHIC PLACE in which SCHEDULED STOP POINT lies.
	PlaceName	0:1	*nlString*	Name of PLACE.
	AccessibilityAssess ment	0:1	*+Structure*	Assesment of current ACCESSIBILITY of the STOP POINT as affected by the SITUATION.
	ConnectionLinks	0:*	*choice*	CONNECTION links affected by SITUATION..
	AffectedConnect ionLink	c	*+Structure*	Annotated reference to CONNECTION link affected by SITUATION
	Order	0:1	*Xsd:integer*	Order of visit to SCHEDULED STOP POINT within VEHICLE JOURNEY.
Status	**CallCondition**	0:*	*enum*	Status of CALL – TPEG value Multiple Condtions can be valid at the same time.
Realtim e	**VehicleAtStop**	0:1	*boolean*	Whether VEHICLE is currently located at SCHEDULED STOP POINT. (_SIRI v2.0)
	VehicleLocationAtSt op	0:1	*Location*	Location of VEHICLE at SCHEDULED STOP POINT.
CallPro pertyGr	**TimingPoint**	0:1	*boolean*	Whether this CALL is a TIMING POINT.
	BoardingStretch	0:1	*boolean*	Whether this is a Hail and Ride stop. Default is

oup					'false'.
	RequestStop	0:1	*boolean*		Whether VEHICLE stops only if requested explicitly by passenger. Default is 'false'.
	OriginDisplay	0:*	*nlString*		Origin to show for the VEHICLE at the specific SCHEDULED STOP POINT (vehicle signage), if different to the origin name for the full VEHICLE JOURNEY.
	DestinationDisplay	0:*	*nlString*		Destination to show for the VEHICLE at the specific SCHEDULED STOP POINT (vehicle signage), if different to the destination name for the full VEHICLE JOURNEY.
Times	*ArrivalTimes*	0:1	*+Structure*		Arrival times of CALL See SIRI-Part3
	ArrivalInfo	0:1	*+Structure*		Arrival info of CALL See SIRI- Part3
	DepartureTimes	0:1	*+Structure*		Departure times of CALL See SIRI-Part3
	DepartureInfo	0:1	*+Structure*		Departure info of CALL See SIRI- Part3
	HeadwayInfo	0:1	*+Structure*		Headway info of CALL See SIRI- Part3
	AffectedConnection LinkRef	0:	➜ *ConnectionLinkC ode*		Reference to CONNECTING link affected by SITUATION
	AffectedInterchang es	0:*	*sequence*		Journey INTERCHANGEs affected by SITUATION.
		AffectedIntercha nge	0:1	*+Structure*	Journey INTERCHANGE affected by SITUATION. See *AffectedInterchange* below.
any	*Extensions*	0:1	*any*		Placeholder for user extensions.

7.8.5.10.6.3   AffectedInterchange Element

The *AffectedInterchange* element (Table 77) provides information about any journey INTERCHANGEs of a CALL that are affected by the SITUATION.

Table 77 — AffectedInterchange Element

*Affected*Interchange			*+Structure*	Annotated Reference to an INTERCHANGE.
Identity	*InterchangeRef*	0:1	→InterchangeId	Identifier of Journey INTERCHANGE
	InterchangeStopPoi ntRef	0:1	→StopPointCode	Identifier of STOP POINT to which interchange connects
	InterchanegStopPoi ntName	0:1	*nlString*	Name of interchange STOP POINT.
	ConnectingVehicleJ ourneyRef	0:1	→DatedVehicleJo runeyCode	Reference to Connnecting VEHICLE JOURNEY affected by SITUATION
	InterchangeStatusT ype	0:1	*enum*	TpegInterchangeStatusCode
	AffectedConnection LinkRef	0:1	➜ *ConnectionLinkC ode*	Reference to CONNECTING link affected by SITUATION
any	*Extensions*	0:1	*any*	Placeholder for user extensions.

7.8.5.10.7 AffectedFacility Element

7.8.5.10.7.1   General

The *AffectedFacility* element (Table 78) groups information about any FACILITies of a VEHICLE JOURNEY that are affected by the SITUATION.

Table 78 — AffectedFacility Element (+SIRI 2.0)

*Affected*Facility			*+Structure*	Annotated Reference to a FACILITY
Identity	*FacilityRef*	0:1	→InterchangeId	Identifier of FACILITY.
	StartStopPointRef	0:1	→*StopPointCode*	Identifier of STOP POINT at which availability first applies.
	EndStartStopPointRef	0:1	→*StopPointCode*	Identifier of STOP POINT at which availability last applies.
	Facility Name	0:1	*nlString*	Name of FACILITY
	FacilityStatus	0:1	*enum*	FACILITY status.
any	*Extensions*	0:1	*any*	Placeholder for user extensions.

7.8.5.10.7.2   FacilityStatus

The *FacilityStatus* element (Table 79) specifies allowed values for the availability of a FACILITY.

Table 79 — Allowed Values for Facility Status

SIRI-SX	Pti 8
unknown	Availability of FACILITY not known.
removed	Published FACILITY no longer available.
added	Additional FACILITY available.
notAvailable	FACILITY not available as published.
available	FACILITY available as published.

7.8.5.10.8 AffectedPlace Element

The *AffectedPlace* element (Table 80) groups information about the affected PLACE such as a POI affected by the SITUATION.

Table 80 — AffectedPlace Element

AffectedPlace			*+Structure*	Annotated Reference to a PLACE affected by SITUATION.
Identity	*PlaceRef*	0:1	→PlaceIde	Identifier of PLACE
	PlaceName	0:1	*nlString*	Name of PLACE.
	Location	0:1	*Location*	Point reference for PLACE.
	PlaceCategory	0:1	*nmtoken*	Type of Place. See below
	AccessibilityAssessment	0:1	*+Structure*	Accessibility ASSESMENT to PLACE as affected by SITUATION.
any	*Extensions*	0:1	*any*	Placeholder for user extensions.

7.8.5.10.9AffectedVehicle Element (+SIRI v2.0)

The *AffectedVehicle* element (Table 81) groups information about an individual VEHICLE affected by the SITUATION.

Table 81 — AffectedVehicle Element

AffectedVehicle			*+Structure*	Annotated Reference to VEHICLE affected by SITUATION.
Vehicle	*VehicleRef*	1:1	→*VehicleCode*	Identifier of VEHICLE.
	VehicleRegistration NumberPlate	0:1	*xsd:normalizedStri ng*	Number plate of affected VEHICLE.
Commu nication Group	*PhoneNumber*	0:1	*PhoneType*	Phone number on which the VEHICLE can be called
	IPAddress	0:1	*string*	IP Address of VEHICLE.
	RadioAddress	0:1	*string*	Radio address of VEHICLE.
Journey	*FramedVehicleJour neyRef*	0:1	*+Structure*	Reference to a VEHICLE JOURNEY framed by the day which the VEHICLE is running.
	DestinationDisplay	0:1	*string*	Destination to show for the VEHICLE.
	Location	0:1	*Location*	Location where the vehicle was when the SITUATION arose.
	CurrentLocation	0:1	*Location*	Location where the vehicle is located at the moment
	AccessibilityAssess ment	0:1	*+Structure*	Current Accessibility assessment of vehicle.. See Acccessibilirty Assessment element.
ServiceI nfoGrou p	*:::*	*0:1*	*ServiceInfoGroup*	See SIRI Part 2 *ServiceInfoGroup*.
TrainBl ockPart	*TrainBlockPart*	0:1	*TrainBlockPartStru cture*	Associates VEHICLE with a part of a TRAIN: for use when trains split or merge. *DetailLevel*: <u>normal</u>.
		NumberOfBloc kParts	0:1	*xsd:positiveInteger*	Total number of BLOCK PARTs making up the TRAIN of which this is part.
		TrainPartRef	0:1	→*TrainPartCode*	Identifier of TRAIN BLOCK PART.
		PositionOf TrainBlockPar t	0:1	*NLString*	Description of position of *TrainBlockPart* within Train to guide passengers where to find it. E.g. 'Front four coaches'.
	InCongestion	0:1	*bollean*	Whether VEHICLE is currently in congestion
	InPanic	0:1	*boolean*	Whether VEHICLE is currently in emergency mode.
Headwa y	*HeadwayService*	0:1	*boolean*	Whether VEHICLE is running as a Headway Service, that is shown as operating at a prescribed interval rather than to a fixed timetable. Default is 'false'.
Extensio n	*Extensions*	0:1	*any*	Placeholder for user extensions.

7.8.5.10.10 AffectedRoads Element

The *AffectedRoads* element (Table 82) groups information about the affected roads. It can use either a Datex2 GroupOfLocations element. It is used to annotate a PT SITUATION. For a road incident, locations will normally be specified as part of the em.eedded DATEX element::

Table 82 — AffectedRoads Element

AffectedRoads			+Structure	Annotated reference to one or more roads affected by SITUATION.
	Datex2Locations	0:1	D2LogicalModel: GroupOfLocations	Group of Locations. See Datex2 specification
any	AffectedRoad	0:1	+Structure	Road affected by SITUATION.

7.8.5.10.11 AffectedRoad Element

The *AffectedRoad* element (Table 83) groups information about the affected roads. It can a Datex2 *RoadsideReferencePointLinear* element or a simple list of GIS features and or points. It is used to annotate a PT SITUATION.

Table 83 — AffectedRoad Element

AffectedRoad			+Structure	Annotated reference to a road affected by SITUATION.
	Road	0:1	D2LogicalModel: RoadsideReferencePointLinear	Affected Road as described by a Date2x location.
Projection	LinkProjection	0:1	+Structure	Projection as a geospatial polyline indicating effect of SITUATION.
		Features	0:*	GisFeatureRef	GIS Features affected by SITUATION.
		Line	0:*	PointProjection	Ordered sequence of POINTs.
	Offset		0:1	+Structure	Further qualifcation of affected part of LINK PROJECTION,
		DistanceFromStart	0:*	xsd:unsignedint	Distance in metres from start of LINK at which SITUATION is to be shown. I f absent use start of link.
		DistanceFromEnd	0:*	unsignedint	Distance in metres from end of LINK at which SITUATION is to be shown. I f absent use start of link.
any	Extensions		0:1	any	Placeholder for user extensions.

7.8.5.10.12 AccessibilityAssessment Element

The *AccessibilityStatus* element (Table 84) describes the accessibility properties associated with another element such as a STOP PLACE component.

Table 84 — AccessibilityAssessment Element

AccessibilityStatus			+Structure	ACCESSIBILITY ASSESMENT.
Operators	**MobilityImpairedAccess**	0:1	boolean	Whether stop or service is accessible to mobility impaired users. This may be further qualified by one ore more Limitation and Suitability instances to specify which types of access are available
Limitation	**Limitation**	0:1	+Structure	Limitation of entity
	WheelchairAccess		true / false / unknown	Whether a SITE is wheelchair accessible.
	StepFreeAccess		true / false / unknown	Whether a SITE has step free access.
	EscalatorAccess		true / false / unknown	Whether a SITE has escalator free access.
	LiftFreeAccess		true / false / unknown	Whether a SITE has lift free access.
	AudibleSignsAvailable		true / false / unknown	Whether a SITE has Audible signals for the visually impaired.
	VisualSignsAvailable		true / false / unknown	Whether a SITE has visual signals for the hearing impaired.
Suitability	**Suitabilities**	0:*	many	Suitabilities of facility for specific passenger needs
	Suitability	0:1	+Structure	Suitability of facility for a specific passenger need. See earlier
any	**Extensions**	0:1	any	Placeholder for user extensions.

7.8.5.10.13 Transport Modes and Submodes

7.8.5.10.13.1 General

The Transport MODEs attribute classifies the type of transport. A two level classification system is used corresponding to the TPEG PTI ontology. **TransportMode** defines top level MODEs. Each main MODE type (**AirMode**, **RailMode**, **BusMode** etc) contains a set of subtypes that explain the MODE in more detail; for example for **BusMode**, includes *highSpeed, rain, fog, flooding,* etc.

Arbitrary reasons are represented by an **OtherReason**.

The following tables show the allowed values for Reasons

7.8.5.10.13.2 TransportMode (TPGE Pti 21)

These are Main Transport types as described by TPEG Pti21. See Table 85.

Table 85 — Allowed Values for VehicleMode (TPEG Pti21)

SIRI-SX	Pti 01	Loc 05	Submodel	Datex 2 TransitServiceType
unknownSubmodel	0	0	< none >	
railwayServiceSubmode	1	02	**pti02_x**	rail
coachServiceSubmode	2	03	**pti03_x**	
suburbanRailwayServiceSubmode	3	04	< none >	
urbanRailwayServiceSubmode	4	–	pti04_x	
metroServiceSubmode	5	16	< none >	undergroundMetro
undergroundServiceSubmode	6	05	< none >	undergroundMetro
busServiceSubmode	7	06	**pti05_x**	bus
trolleyBusServiceSubmode	8	–	< none >	
tramServiceSubmode	9	07	**pti06_x**	tram
waterTransportServiceSubmode	10	08	**pti07_x**	
airServiceSubmode	11	09	**pti08_x**	air
ferryServiceSubmode	12	–	< none >	farry, hydrofoil
telecabinServiceSubmode	13	10	**pti09_x**	
funicularServiceSubmode	14	11	**pti10_x**	
taxiServiceSubmode	15	12	**pti11_x**	
selfDriveSubmode	16	13	**pti12_x**	
allServicesSubmode	17	–	< none >	
cableDrawnBoat	–	14	–	
monoRail	–	15	–	
allServicesExceptSubmode	18	255	< none >	

The submodes are described by TPEG Tables (Se Table 86-96)

7.8.5.10.13.3 AirSubmode (TPEG Pti08 air_type, Loc15/air link)

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Table 86 — Allowed Values for AirSubmode (TPEG Pti08)

</div>

SIRI-SX	Pti 8	Loc 15
unknown	0	0
internationalFlight	1	2
domesticFlight	2	(4)
intercontinentalFlight	3	1
domesticScheduledFlight	4	4
shuttleFlight	5	9
intercontinentalCharterFlight	6	5
internationalCharterFlight	7	6
round-tripCharterFlight	8	(6)
sightseeingFlight	9	8
helicopterService	10	10
domesticCharterFlight	11	7
SchengenAreaFlight	12	(2)
airshipService	13	(255)
allAirServices	14	
shortHaulInternationalFlight	(1)	3
undefinedAircraftService	255	255

7.8.5.10.13.4 BusSubmode (TPEG Pti05 bus_type, Loc10/bus type)

Table 87 —Allowed Values for BusSubmode (TPEG Pti05)

SIRI-SX	Pti 05	Loc 10
unknownBusType	0	0
regionalBus	1	06
expressBus	2	01
bus	3	–
localBusService	4	05
nightBus	5	02
postBus	6	04
specialNeedsBus	7	08
mobilityBus	8	(08)
mobilityBusForRegisteredDisabled	9	(08)
sightseeingBus	10	09
shuttleBus	11	
schoolBus	12	07
schoolAndPublicServiceBus	13	03
railReplacementBus	14	–
demandAndResponseBus	15	–
allBusServices	16	–
airportLinkBus	(11)	10
undefinedBusService	255	255

7.8.5.10.13.5 CoachSubmode (TPEG Pti03 coach_type)

Table 88 — Allowed Values for CoachSubmode (TPEG Pti03)

SIRI-SX	Pti 03	Loc
unknownCoachType	0	
internationalCoachService	1	
nationalCoachService	2	
shuttleCoachService	3	
regionalCoachService	4	
specialCoachService	5	
sightseeingCoachService	6	
touristCoachService	7	
commuterCoachService	8	
allCoachServices	9	
undefinedCoachService	255	

7.8.5.10.13.6 MetroSubmode (TPEG Pti04 urban_railway_type / Loc11 metro rail link)

Table 89 — Allowed Values for MetroSubmode (TPEG Pti04)

SIRI-SX	Pti04	Loc11
unknownUrbanRailwayType	0	*0*
metro	1	*3*
tube	2	*1*
urbanRailway	3	*2*
allUrbanRailwayServices	4	*–*
airportRailLink	(3)	*4*
monoRailLink	(255)	*5*
undefinedUndergroundService	255	*255*

7.8.5.10.13.7 RailSubmode (TPEG Pti02 railway_type)

Table 90 — Allowed Values for RailSubmode (TPEG Pti1102)

SIRI-SX	Pti 02	Loc 13
unknownRailwayType	0	*00*
highSpeedRailService	1	*–*
longDistanceTrain	2	*03*
interRegionalRailService	3	*02*
carTransportRailService	4	*–*
sleeperRailService	5	*–*
regionalRail	6	*04*
touristRailway	7	*07*
railShuttle	8	*–*
suburbanRailway	9	*05*
replacementRailService	10	*–*
specialTrainService	11	*–*
lorryTransportRailService	12	*–*
allRailServices	13	*–*
crossCountryRailService	14	*–*
vehicleRailTransportService	15	*–*
rackAndPinionRailway	16	*08*
additionalTrainService	17	
local	(3)	*06*
international	(9)	*01*
undefinedRailService	255	*255*

7.8.5.10.13.8 TramSubmodel (TPEG Pti06)

Table 91 — Allowed Values for TramSubmodel (TPEG Pti06)

SIRI-SX	Pti6	Loc12
unknown	0	–
cityTramService	1	1
localTramService	2	(1)
regionalTramService	3	(1)
sightseeingTramService	4	2
shuttleTramService	5	(1)
allTramServices	6	–
undefinedTramService	255	255

7.8.5.10.13.9 WaterSubmode (TPEG Pti07 WaterTransportType)

Table 92 — Allowed Values for WaterSubmode (TPEG Pti07)

SIRI-SX	Pti7	Loc 15	Datex2
unknown	0	0	
internationalCarFerryService	1	8	ferry
nationalCarFerryService	2	7	ferry
regionalCarFerryService	3	6	ferry
localCarFerryService	4	5	ferry
internationalPassengerFerryService	5	4	ferry
nationalPassengerFerryService	6	3	ferry
regionalPassengerFerryService	7	2	ferry
localPassengerFerryService	8	1	ferry
postBoatService	9	9	ferry
trainFerryService	10	10	ferry
roadLinkFerryService	11	12	ferry
airportLinkBoatService	12	13	ferry
carHighSpeedFerryService	13		hydrofoil
passengerHighSpeedFerryService	14		hydrofoil
sightseeingBoatService	15	14	ferry
schoolBoat	16	15	ferry
cableDrawnBoatService	17		ferry
riverBusService	18		ferry
scheduledFerryService	19		ferry
shuttleFerryService	20		ferry
allWaterTransportServices	21		ferry
undefinedWaterTransport	255	255	

7.8.5.10.13.10 TelecabinSubmode) TPEG Pti09 TelecabinType

Table 93 — Allowed Values for TelecabineSubmode (TPEG 9Pti11)

SIRI-SX	Description	Pti 9	Loc 14
unknown	unknown	0	0
telecabinService	Telecabin Service	1	1
cableCarService	Cable Car Service	2	3
elevatorService	Elevator Service	3	4
chairLiftService	Chair lift Service	4	5
dragLiftService	Drag Lift Service	5	6
smallTelecabinService	Small Telecabin Service	6	
allTelecabinServices	All Telecabin Services	7	
funicular	funicular		2
eggLift	Egg Lift		7
MineralBuckets	Mineral Buckets		8
undefinedTelecabinType	Undefined Telecabin Type	255	255

7.8.5.10.13.11 FunicularSubmode (TPEG Pti10 FunicularType)

Table 94 — Allowed Values for FunicularSubmode (TPEG Pti11)

SIRI-SX	Description	Pti 10	Loc 14
unknown	unknown	0	
funicularService	Funicular Service	1	2
allFunicularServices	All Funicular Services	2	
Undefined	Undefined Funicular	255	

7.8.5.10.13.12 TaxiSubmode (TPEG Pti11 TaxiType)

Table 95 — Allowed Values for TaxiSubmode (TPEG Pti11)

SIRI-SX	Description	Pti 11
Unknown	Unknown	0
communalTaxiService	Communal Taxi Service	1
waterTaxiService	Water Taxi Service	2
railTaxiService	Rail Taxi Service	3
bikeTaxiService	Bike Taxi Service	4
licensedTaxiService	Licensed Taxi Service	5
privateHireVehicleService	Private Hire Vehicle Service	6
allTaxiServices	All Taxi Services	7
Undefined	Undefined Taxi Service	255

7.8.5.10.13.13 SelfDriveSubmode (TPEG Pti12 Self-Drive Vehicle)

Table 96 — Allowed Values for SelfDriveMode (TPEG Pti12)

SIRI-SX	Description	Pti 12
unknown	Unknown	0
hireCar	Hire Car	1
hireVan	Hire Van	2
hireMotorbike	Hire Motorbike	3
hireCycle	Hire Cycle	4
allSelfDriveVehicles	All Self Drive Vehicles	5
undefined	Undefined Self Drive Service	255

7.8.5.10.13.14 Access Mode (IFOPT)

Access MODEs (Table 97) describe non PT MODEs used to access an interchange. The values come from IFOPT.

Table 97 — Allowed Values for AccessMode

SIRI-SX
foot
bicycle
car
taxi
shuttle

7.8.5.11 PublishingActions Element

7.8.5.11.1General

The **PublishingActions** element (Table 98) groups information about the actions which should be undertaken by receiving system to publish the information about the SITUATION.

Table 98 — PublishingActions Element

ActionStructure			+Structure	List of actions to be carried out .
Actions Group	**PublishToWebAction**	0:1	*+Structure*	Publish to web. . See below.
	PublishToMobileAction	0:1	*+Structure*	Publish to mobile device . See below.
	PublishToTvAction	0:1	*+Structure*	Publish to tv channel. See below.
	PublishToAlertsAction	0:1	*+Structure*	Publish to alerts channel. See below.
	PublishToDisplayAction	0:1	*+Structure*	Publish to display channel. See below.
	ManualAction	0:1	*+Structure*	Publish to manual notifcation channel. See below.
	NotifyByEmailAction	0:1	*+Structure*	Publish to email channel. See below.
	NotifyBySmsAction	0:1	*+Structure*	Publish to SMS channel. See below.
	NotifyByPagerAction	0:1	*+Structure*	Publish to pager channel. See below.
	NotifyUserAction	0:1	*+Structure*	Publish to user notifcation channel. See below.
any	**Extensions**	0:1	*any*	Placeholder for user extensions.

All Actions are of the type **ParameterisedAction** (Table 99) which allows providing some additional data for every action.

Table 99 — ParameterisedAction – element

ParameterisedActionStructure			+Structure	
Simple ActionStructure	**ActionStatus**	0:1	*enum*	Status of Avtion
	Description	0:1	*nlString*	Description of action.
	ActionData	0:*	*ActionDataStructure*	Data associated with action.
	Name	1:1	*string*	Name of action data Element.
	Type	1:1	*string*	Data type of action data.
	Value	1:*	*srting*	Value for action.
	Prompt	0:*	*nlString*	Display prompt(s) for presenting action to user.

A **ParameterisedAction** action may have an ActionStatus to indicate whether it has been published (Table 100).

Table 100 — Allowed Values for ActionStatus

Value	Description
open	Action is open but not yet published.
published	Action is already published.
closed	Action is closed.

7.8.5.11.2 PublishToWebAction – element

The **PublishToWebAction** action (Table 101) indicates the SITUATION should be published to the web.

Table 101 — PublishToWebAction – element

PublishToWebActionStructure			*+Structure*	Parameters fro publishing to web channel.
Parame terised Action	*:::*	0:1	*See above*	Inherits from **ParameterisedAction**.
	Incidents	0:1	*boolean*	Include in SITUATION lists on website. Default is 'true'.
	HomePage	0:1	*boolean*	Include on home page on website.
	Ticker	0:1	*boolean*	Include in moving ticker band. Default is 'false'.
	SocialNetwork	0:*	*string*	Include in social NETWORK indicated by this name. Possible value could be "twitter.com", "facebook.com", "vk.com" and so on (SIRi v2.0)

7.8.5.11.3 PublishToMobileAction – element

The **PublishToMobileAction** action (Table 102) indicates the SITUATION should be published to mobile applications.

Table 102 — PublishToMobileAction – element

PublishToMobileActionStructure			*+Structure*	Parameters for publishing to mobile channel.
Parame terised Action	*:::*	0:1	*See above*	Inherits from **ParameterisedAction**.
	Incidents	0:1	*boolean*	Include in SITUATION lists on mobile website. Default is 'true'.
	HomePage	0:1	*boolean*	Include on the home page on mobile website.

7.8.5.11.4 PublishToTvAction – element

The **PublishToTvAction** action (Table 103) indicates the SITUATION should be published to a TV channel.

Table 103 — PublishToTvAction – element

PublishToTvActionStructure			*+Structure*	Parameters for publishing to TV channel.
Parame terised Action	*:::*	0:1	*See above*	Inherits from **ParameterisedAction**.
	Ceefax	0:1	*boolean*	Publish to Ceefax. Default is 'true'
	Teletext	0:1	*boolean*	Publish to Teletext. Default is 'true'

7.8.5.11.5 PublishToDisplayAction – element

This action indicates the SITUATION should be published on the passanger information displays.

Table 104 — PublishToDisplayAction – element

PublishToDisplayActionStructure			*+Structure*	Parameters for publishing to Display channel.
Parame terised Action	*:::*	0:1	*See above*	Inherits from ***ParameterisedAction***.
	OnPlace	0:1	*boolean*	Show SITUATION on stationary displays
	OnBoard	0:1	*boolean*	Show SITUATION on onboard displays.

7.8.5.11.6 PublishToAlertsAction – element

A ***PublishToalertsAction*** action (Table 105) indicates the SITUATION should be published via alert services as e-mail or sms.

Table 105 — PublishToAlertsAction – element

PublishToAlertsActionStructure			*+Structure*	Parameters for publishing to Alerts channel.
Parame terised Action	*:::*	0:1	*See above*	Inherits from ***ParameterisedAction***.
Pushed ActionS tructur e	***BeforeNotices***	0:1	*Structure*	Whether reminders should be sent.
	Interval	0:*	*Duration*	Intervals before validity start date to send reminders
	ClearNotice	0:1	*boolean*	Whether a clearing notice should be displayed.
	ByEmail	0:1	*boolean*	Send as email alert.
	ByMobile	0:1	*boolean*	Send as mobile alert by SMS or WAP push.

7.8.5.11.7 ManualAction – element

The ***MnaualAction*** action (Table 106) indicates the SITUATION should be published using a manual p[rocess.

Table 106 — ManualAction – element

ManualActionStructure			*+Structure*	Parameters for publishing to Manual publication channel.
Parame terised Action	*:::*	0:1	*See above*	Inherits from ***ParameterisedAction***.

7.8.5.11.8 NotifyBySmsAction – element

The ***NotifyBySmsAction*** action (Table 107) indicates the SITUATION should be published to an individual user by SMS.

Table 107 — NotifyBySmsAction – element

NotifyBySmsActionStructure			+Structure	Parameters for publishing to SMS channel.
Parame terised Action	:::	0:1	See above	Inherits from **ParameterisedAction**.
Pushed ActionS tructur e	**BeforeNotices**	0:1	Structure	Whether reminders should be sent.
	Interval	0:*	Duration	Intervals before validity start date to send reminders
	ClearNotice	0:1	Boolean	Whether a clearing notice should be displayed.
	Phone	0:1	- > PhoneType	Phone number of user to which to send messages.
	Premium	0:1	boolean	Whether content is flagged as subject to premium charge.

7.8.5.11.9 NotifyByEmailAction – element

The **NotifyByEmailAction** action (Table 108) indicates the SITUATION should be sent to an individual E-Mail or e-mail group.

Table 108 — NotifyByEmailAction – element

NotifyByEmailActionStructure			+Structure	Parameters for publishing to Email channel.
Parame terised Action	:::	0:1	See above	Inherits from **ParameterisedAction**.
Pushed ActionS tructur e	**BeforeNotices**	0:1	Structure	Whether reminders should be sent.
	Interval	0:*	DurationType	Intervals before validity start date to send reminders
	ClearNotice	0:1	Boolean	Whether a clearing notice should be displayed.
	Email	0:1	- > EmailAddressType	Email address to which notice should be sent.

7.8.5.11.10 NotifyByPagerAction – element

The **NotifyByPagerAction** action (Table 109) indicates the SITUATION should be sent to an individual user by pager or pager group.

Table 109 — NotifyByPagerAction – element

NotifyByPagerActionStructure			+Structure	Parameters for publishing to Pager channel.
Parame terised Action	:::	0:1	See above	Inherits from **ParameterisedAction**.
Pushed ActionS tructur e	**BeforeNotices**	0:1	Structure	Whether reminders should be sent.
	Interval	0:*	DurationType	Intervals before validity start date to send reminders
	ClearNotice	0:1	Boolean	Whether a clearing notice should be displayed.
	PagerGroupRef	0:1	string	Reference to a pager group to be notified.
	Pager	0:1	string	Number of pager to be notified.

7.8.5.11.11 NotifyUserAction – element

The **NotifyUserAction** action (Table 110) indicates the SITUATION should be sent to an identified user by other means.

Table 110 — NotifyUserAction – element

NotifyUserActionStructure			*+Structure*	Parameters for publishing to notifcation channel.
Parameterised Action	*:::*		0:1	*See above*	Inherits from **ParameterisedAction**.
Pushed ActionStructure	**BeforeNotices**		0:1	*Structure*	Whether reminders should be sent.
		Interval	0:*	*DurationType*	Intervals before validity start date to send reminders
	ClearNotice		0:1	*Boolean*	Whether a clearing notice should be displayed.
	WorkgroupRef		0:1	*string*	Workgroup of user to be notified.
	UserName		0:1	*string*	Name of user to be notified.
	UserRef		0:1	*string*	Reference to the user to be notified.

7.8.6 RoadSituationElement

In the SIRI-SX model, the **RoadSituation** element (see Table 111) is the main container for all the SITUATION content of a Road SITUATION and aggregates the **SituationElement (BaseSituationElement,** *or* **UpdateSituationElement)**, **SituationStatus, RoadSituationBody**, **TemporalGroup**, **ClassifierGroup**, as shown in Figure 12.

Table 111 — Road Situation Element

RoadSituationElement			*+Structure*	Disruption affecting services.
Log	***CreationTime***	1:1	*dateTime*	Time of creation of SITUATION
Identity	***CountryRef***	0:1	→*CountryCode*	Country code of Participant
	ParticipantRef	1:1	→*ParticipantCode*	Identifier of participant system that creates SITUATION. See Part 2. Unique within Country
	SituationNumber	1:1	*SituationNumberr*	Unique Identifier of SITUATION within Participant
	UpdateCountryRef	0:1	→*CountryCode*	Country code of Participant that creates Update if different from ***CountryRef***.
	UpdateParticipantRef	0:1	→*ParticipantCode*	Identifier of participant system that creates Update if different from ***ParticipantRef***. See Part 2.
	SituationVersion	0:1	*Version*	Version of Update SITUATION element
Xref	***References***	0:1	*many*	Associations with other SITUATIONs.
		RelatedToRef	0:*	*+RelatedSituation*	A reference to another SITUATION with an indication of the nature of the association, e.g. a cause, a result.
Source	***SituationSource***	0:1	*+Structure*	Source of SITUATION content. See below.
Status	***Verification***	0:1	*enum*	Whether the SITUATION has been verified.
	Progress	0:1	*enum*	Status of SITUATION. See below.
	QualityIndex	0:1	*enum*	Assessment of likely correctness of data.
	Reality	0:1	*enum*	Whether SITUATION is real or a test.
	Likelihood	0:1	*enum*	Likelihood to ascribe to a future SITUATION.
Temporal Group	***ValidityPeriod***	0:*	*range*	On or more Overall inclusive Period of applicability of SITUATION
		Start	0:1	*dateTime*	The (inclusive) start time stamp.
		End	0:1	*dateTime*	The (inclusive) end time stamp. If omitted, the range end is open-ended, that is, it should be interpreted as "forever".
	Repetitions	0:*	*DayType*	Situation applies only on the repeated day types within the overall validity period(s). For example Sunday.
		DayType	1:1	*enum*	Tpeg DayType pti 34
	PublicationWindow	0:1	*range*	Publication Window for SITUATION if different from validity period. Period during which audience is informed of SITUATION may start before or after SITUATION.
		Start	0:1	*dateTime*	The (inclusive) start time stamp.
		End	0:1	*dateTime*	The (inclusive) end time stamp. If omitted, the range end is open-ended, that is, it should be interpreted as "forever".
Classifier Group	***Reason***		*enum*	Nature of SITUATION – TPEG Reason Code See below.
	SubReason	0:1	*enum*	Subclassification of Nature of SITUATION. See below.
	ReasonName	0:1	*string*	Text explanation of SITUATION reason. Not normally needed.

	Severity	0:1	*enum*	Severity of SITUATION. Corresponds to TPEG Pti26 severities. Default is normal.
	Priority	0:1	*enum*	Arbitrary rating of priority of message if different from severity 1-High. Note this can be used for Datex2 ***Urgency*** levels 1 = extremelyUrgent 2 = urgent 3 = normal
	Sensitivity	0:1	*enum*	Confidentiality of SITUATION.
	Audience	0:1	*enum*	Intended audience of SITUATION.
	ReportType	0:1	*enum*	Report type of SITUATION Corresponds to TPEG Pti27.
	ScopeType	0:1	*enum*	Scope type of SITUATION. See below.
	Planned	0:1	*boolean*	Whether the SITUATION was planned (e.g. engineering works) or unplanned (e.g. service alteration). Default is false, i.e. unplanned.
	Keywords	0:*	*string*	Arbitrary application specific classifiers.
Description Group	**Language**	0:1	*lang*	Default Language of descriptions
	Summary	0:1	*DefaultedText*	Summary of SITUATION. If absent should be generated from structure elements / and or by condensing Description. For use of defaulted text see below.
	Description	0:1	*DefaultedText*	Description of SITUATION. Should not repeat any strap line included in Summary See below.
	Detail	0:1	*DefaultedText*	Additional descriptive details about the SITUATION. For use of defaulted text see below.
	Advice	0:1	*DefaultedText*	Further advice to passengers. For use of defaulted text see below.
	Internal	0:1	*DefaultedText*	Further advice to passengers. For use of defaulted text see below.
	Image	0:*	*Image*	Image for description. See below.
	InfoLink	0:*	*InfoLink*	Further web links. See below.
Scope	**AffectsScope**	0:1	*+Structure*	Scope model identifying parts of transport NETWORK affected by SITUATION. See below.
Consequence	**Consequences**	0:1	*many*	One or more consequences.
	Consequence	0:*	*+Structure*	Consequence of the SITUATION. See below.
Actions	**PublishingActions**	0:1	*many*	One or more publishing actions.
	PublishingAction	0:*	*+Structure*	Distribution actions to disseminate SITUATION. See below.
any	**Extensions**	0:1	any	Placeholder for user extensions.

8 SituationExchangeDelivery Examples - SituationExchangeDelivery PT Examples

The following is an example of a ***SituationExchangeDelivery***. It shows a single facility status.

```
<ServiceDelivery>
    <!--=======ENDPOINT ================================= -->
```

```
        <RequestorRef>NADER</RequestorRef>
        <RequestRef>2004-12-17T09:30:47</RequestRef>
        <!-======FIRST SUBSCRIPTION======================= ->
<SituationExchangeDelivery version="1.1" >
   <ResponseTimestamp>2004-12-17T09:30:47</ResponseTimestamp>
        <SubscriberRef> NADER </SubscriberRef>
        <Status>true</Status>
   <MoreData>false</MoreData>
        <!-======PAYLOAD ==================================== ->
<:PtSituation xsi:schemaLocation="http://www.siri.org.uk/siri
siri_SITUATIONExchange_service.xsd"
xmlns:acsb = "http://www.ifopt.org.uk/acsb"
xmlns:siri = "http://www.siri.org.uk/siri"
xmlns:xsi = "http://www.w3.org/2001/XMLSchema-instance">
   <CreationTime>2001-12-17T09:30:47.0Z</CreationTime>
   <ParticipantRef>RAILCO01</ParticipantRef>
   <SituationNumber>000354</SituationNumber>
   <Version>0</Version>
   <References>
      <RelatedToRef>
         <CreationTime>2001-12-17T09:30:47.0Z</CreationTime>
         <ParticipantRef>RAILCO01</ParticipantRef>
         <SituationNumber>000354</SituationNumber>
         <Version>0</Version>
      </RelatedToRef>
   </References>
   <Source>
      <Phone>017654</Phone>
      <AgentReference>03274</AgentReference>
      <TimeOfCommunication>2001-12-17T09:30:47.0Z</TimeOfCommunication>
      </Source>
   <Verification>verified</Verification>
   <Progress>open</Progress>
   <QualityIndex>certain</QualityIndex>
   <ValidityPeriod>
      <StartTime>2001-12-17T09:30:47.0Z</StartTime>
   </ValidityPeriod>
   <MiscellaneousReason>bombExplosion</MiscellaneousReason>
   <Severity>severe</Severity>
   <Audience>public</Audience>
   <ReportType>point</ReportType>
   <Summary overridden="false" > Bomb at Barchester station < /Summary >
   <Description overridden="true" xml:lang = "en-us" > Building
evacuated. Avoid station until further notice < /Description >
   <Affects>
      <Operators>
         <AllOperators/>
      </Operators>
      <StopPoints>
         <AffectedStopPoint>
            <StopPointRef>BAAR0003</StopPointRef>
            <StopPointName>Barchester Station</StopPointName>
            <StopPointType>pti17_0</StopPointType>
            <Location srsName="wgs84" >
               <Longitude>-180</Longitude>
```

```
                <Latitude>-90</Latitude>
            </Location>
        </AffectedStopPoint>
    </StopPoints>
    <StopPlaces>
        <AffectedStopPlace>
            <StopPlaceRef>BArF001</StopPlaceRef>
            <AffectedComponents>
                <AffectedComponent>
                    <ComponentRef>BAR00021</ComponentRef>
                    <ComponentName>Platform 3</ComponentName>
                </AffectedComponent>
            </AffectedComponents>
        </AffectedStopPlace>
    </StopPlaces>
</Affects>
<Consequences>
    <Consequence>
        <Period>
            <StartTime>2001-12-17T09:30:47.0Z</StartTime>
        </Period>
        <Condition>pti13_0</Condition>
        <Severity>pti26_0</Severity>
        <Blocking>
            <JourneyPlanner>true</JourneyPlanner>
            <RealTime>true</RealTime>
        </Blocking>
        <Boarding>

<ArrivalBoardingActivity>noAlighting</ArrivalBoardingActivity>

<DepartureBoardingActivity>noBoarding</DepartureBoardingActivity>
        </Boarding>
    </Consequence>
</Consequences>
<PublishingActions>
    <PublishToWebAction>
        <Incidents>true</Incidents>
        <HomePage>true</HomePage>
        <Ticker>false</Ticker>
    </PublishToWebAction>
    <PublishToMobileAction>
        <Incidents>true</Incidents>
        <HomePage>false</HomePage>
    </PublishToMobileAction>
    <PublishToAlertsAction>
        <ClearNotice>true</ClearNotice>
        <ByEmail>true</ByEmail>
        <ByMobile>true</ByMobile>
    </PublishToAlertsAction>
</PublishingActions>
</PtSituation> </SituationExchangeDelivery>
    </ServiceDelivery>
```

Annex A
(normative)

Notation

A.1 General

The diagrams in this document follow normal UML notation for class diagrams, with the addition of colour (see below), and the use of certain conventions to represent composition as used in XML.

A.2 Classes

Classes are indicated by square boxes with the name of the class across the top. Operations / methods and also Visibility (public private etc) are omitted. The attribute types, or all of the attributes may be suppressed in summary diagrams, or to show a summary reference.

Typically these will correspond to XML elements of the same name.

A.3 Enumerations

Enumerations are generally shown as data types – a square box with an *<< enumeration >>* stereotype. They are included in diagrams in context if space permits, using a dependency relationship (dotted line) from the class with attributes that are constrained by the enumeration. They are also summarized on separate diagrams at the end. Visibilities are omitted.

A.4 Groups

As well as the normal use of Classes to indicate the entities of the model, classes are also used for named groups of reusable elements which occur on more than one entity, for example ***AimedArrivalInfo***, or ***ServiceInfo –*** see discussion of serialisation and containment below. In this case a stereotype of *<< group >>* is shown. These can be considered as complex data types.

A.5 Notes

Notes are indicated as boxes with turned up corners, generally connected to the class or relationship they annotate with a dotted dependency line.

A.6 Relationships

Normal UML relationships are used:

— Inheritance: line with white arrow from subtype to supertype. The subtype has all the attributes and operations of the supertype.

— Association: other unbroken lines.

   — **Cardinalities** of associations are marked using UML conventions for **multiplicities** and **optionality**, i.e. min:max, for example [0:1] indicates there may be a minimum of zero and a maximum of one, [1:*] indicates there shall be a minimum of one and there can be many. [1] by itself means [1:1]. [*] by itself means [0:*]. The multiplicities indicate if there are one

or many. The optionality indicates whether the end shall be populated if the relationship is present.

— **Aggregation** is indicated by a black diamond (this typically corresponds to direct containment in an XML document): indicating the part is created and destroyed with the whole.

— A shared **composition** is indicated by a white diamond, in which case the child element is integral to the parent component, but the child exists independently (and typically will have a unique identifier).

— Direction of **Navigability** is indicated by an arrow head in the direction of navigability.

— Dependency: Dotted Line. These are also used to show enumerated values.

A.7 Use of Colour

To facilitate reading, Classes are coloured to indicate their nature. This is purely a local Handbook convention (not part of UML) and is used as follows:

— *Purple*: Common Abstract Message Transport Framework elements. Typically these are the request and response wrapper elements. E.g. *ServiceDelivery* and are the same for all Functional services.

— *Salmon*: Common Abstract Transport Framework elements, Typically these are supertypes. E.g. *AbstractItem.*

— *Orange*: Functional Service Elements. E.g. *SituationExchangeDelivery. These are specific and different for each service,* but populated to a common pattern, e.g. with xxxTopics. xxxPolicies, xxxDeliveries etc.

— *Yellow:* Domain model elements that correspond to the main payload content of deliveries: typically these are views of Transmodel entities. *Dark yellow* indicates the concrete container class, e.g. *MonitoredVehicleJourney*. *Light Yellow* indicates an embedded reusable element that makes up part of a concrete composite (And may correspond to a Transmodel Entity).

— *White:* References to the identifiers domain model entities, corresponding to the Transmodel concepts.

A.8 Serialisation: Containment and Reference

The primary concrete expression of SIRI is as an XML schema, for which object references shall be serialised either through containment (i.e. expressing an aggregation by embedding a child entity within a parent element's tags) or reference (i.e. serialising an association by including a reference to the identifier of the associated entity. It is therefore useful to adopt diagramming and naming conventions that indicate whether a particular relationship is expressed in the SIRI XML schema by containment or by reference.

— An explicit attribute is shown on the UML diagrams to indicate an aggregation relationship is implemented as physical **containment**, using the element name indicated by the attribute. The attribute name will be in the plural if the multiplicity is 'many'. The data type of the attribute will be that of the contained element. For example, the *DatedCalls* attribute in Figure A.2. Figure A.2 below holds multiple instances of *DatedCall*.

— An explicit attribute is shown on the UML diagrams to indicate that an association is serialised as a **reference**. The attribute name on the referring entity generally ends in 'Ref' to indicate a reference to another entity, and the data type name generally ends in 'Code' or 'Id'. The data type of the

attribute will be the unique identifier of the referenced element. For example, the **StopPointRef** attribute in Figure A.2 below which implements the reference from **DatedCall** to **StopPoint** is of type **StopPointCode**.

Where attribute values are constrained to particular values a dotted line to a enumeration is shown, e.g. the line to **ArrivalActivityEnum** in Figure A.2 below.

Where attributes are grouped as XML groups and used to compose different entities, a class is used to indicate the group. Such classes are usually shown in a lighter shade of colour with a stereotype of << *group* >> . For example the **AimedArrivalInfoclass** in Figure A.2 below.

A.9 Alternative Representations of XML Structures in UML

Note that to depict a pure object model in UML one does not strictly need to show an explicit attribute in the parent for a child component (it could be represented just by an association to the contained element), but doing so helps to make clear the order in which attributes appear in the XML and the name of any wrapper tag used to group multiple child instances. In the UML diagrams for SIRI we therefore generally show an attribute with which to implement the association.

UML supports a variety of ways for depicting the reuse of data structures, corresponding to different OO programming mechanisms, for example, by *inheritance* (single or multiple) using either class inheritance or interface conformance; or by *aggregation*, embedding complex data types in more than one entity. XML allows only single parent class inheritance, so the SIRI XML schema makes greater use of composition than of inheritance, assembling standard data structures (encoded as **Groups** in XML) into concrete classes. For clarity, we therefore often show these groups in the diagrams as distinct classes with a << group >> stereotype, even though in the concrete XML they are repeated inline.

We illustrate these differences in Figure A.1 and Figure A.2 below, which show two different representations in UML of the same model of a timetable (this is a simplified version of the SIRI Dated Journey).

In Figure A.1, no attributes are shown to implement the aggregation, and all the attributes are shown in-line. References to external entities are shown as attributes though these too might be omitted (**JourneyPatternRef**, **BlockRef**, **CourseOfJourneyRef**, **StopPointRef**).
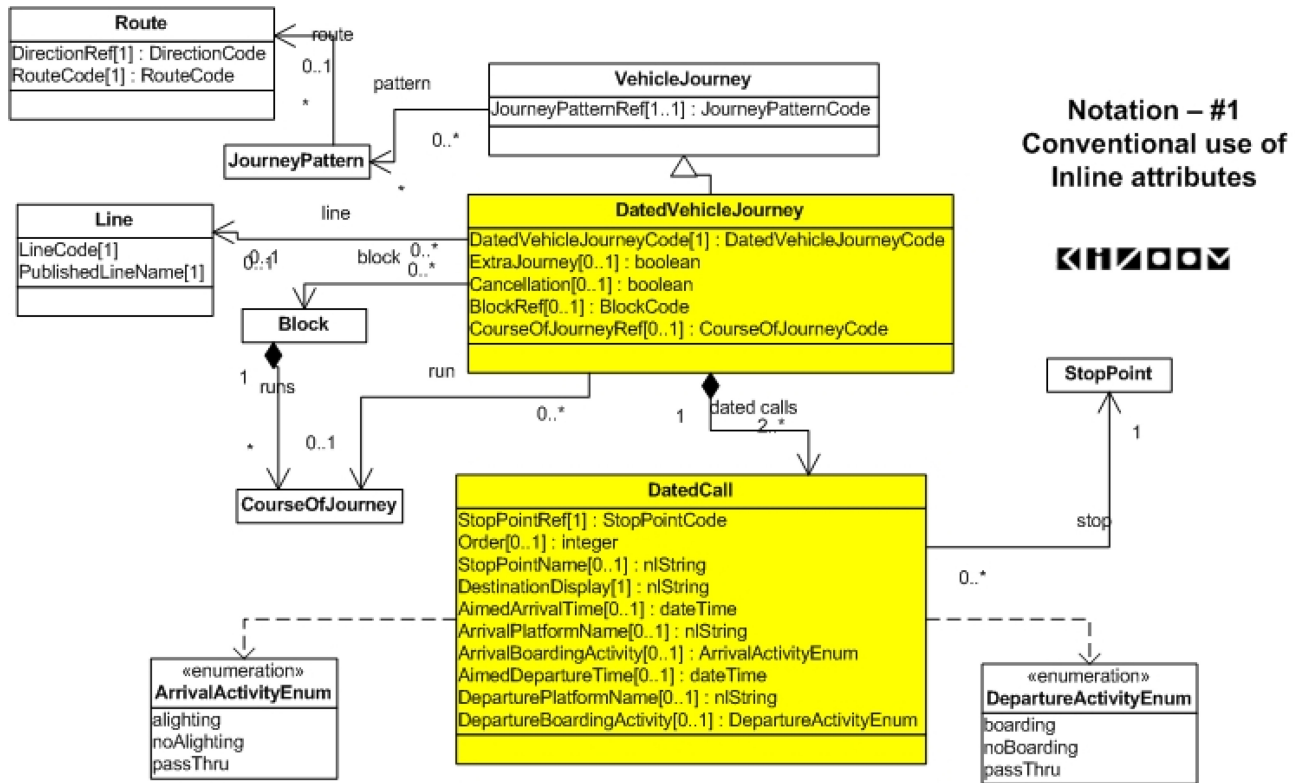
Figure A.1 — Simple Object model

In Figure A.2, an attribute *Calls* is shown on **DatedVehicleJourney** to implement the **DatedCalls** aggregation. Furthermore, certain of the attributes which occur in groups that are reused elsewhere are shown as separate 'view' classes (**JourneyPatternInfo**, **AimedArrivalInfo**, **AimedDepartureInfo**, **StopPointInSequence**), with a << group > stereotype. These are in-lined in the XML. Points where extensions may be added are indicated by an **Extensions** attribute. Operations are not shown.

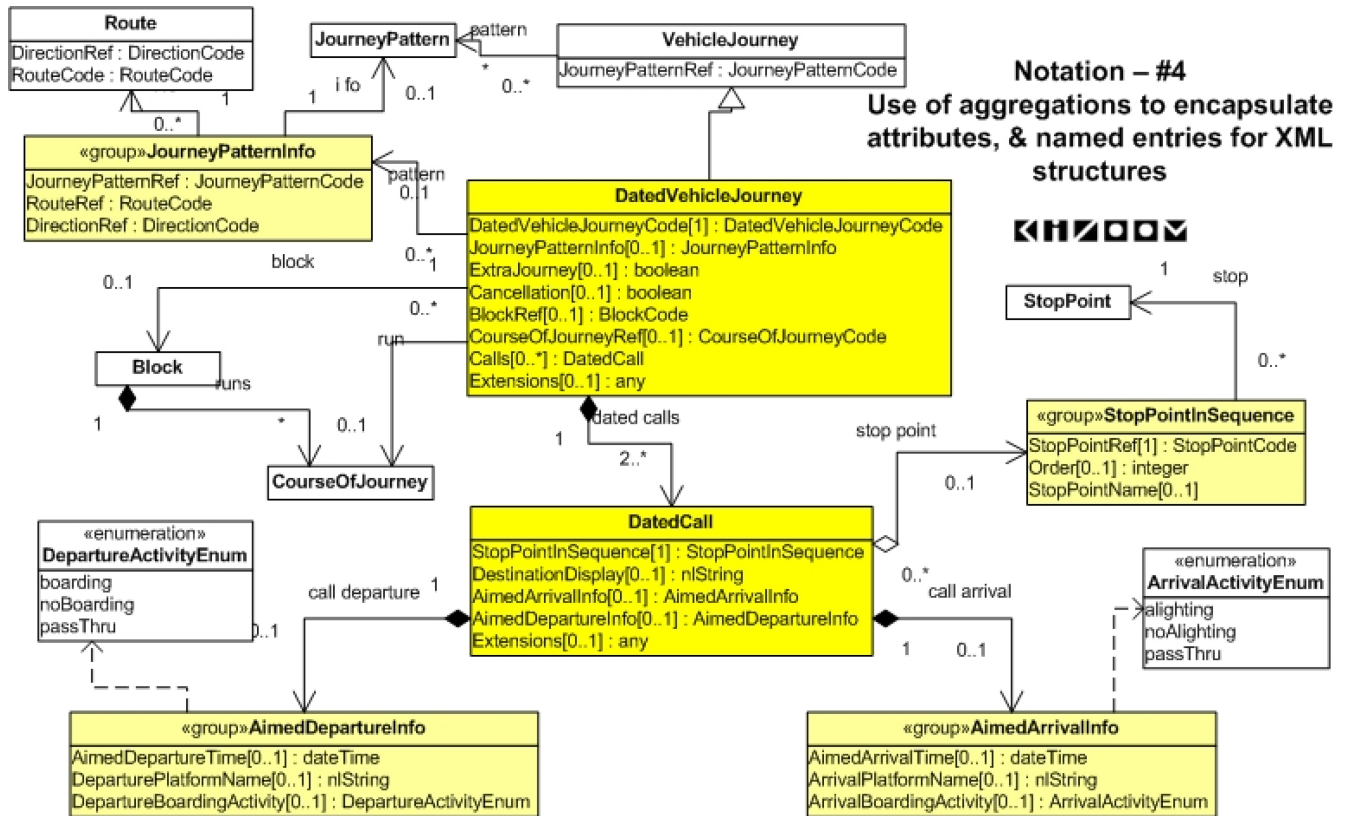The data structures are functionally equivalent.

Figure A.2 — Explicit representation of references and of groups

A.10   XML Fragment for Example

The following XML fragment shows a serialisation of some data in an XML document in accordance with Figure A.2, (This is a simplified version of the actual SIRI *DatedVehicleJourney* entity.)

```
<DatedVehicleJourney>
   <!- Inherited properties ->
   <JourneyPatternRef>JP56789T</JourneyPatternRef>
   <!- Specific properties ->
   <DatedVehicleJourneyCode>DVC0008767</DatedVehicleJourneyCode>
   <!—Journey Pattern Info ->
   <RouteRef>RT0004</RouteRef >
   <DirectionRef>Northbound</DirectionRef >
   <ExtraJourney>false</ExtraJourney>
   <!—Association to Block ->
   < BlockRef>013564</BlockRef
   <!—Contained children - Calls ->
   <Calls>
      <!- == CALL 1 == ->
      <DatedCall>
         <!—Stop point in sequence Group ->
         <StopPointRef>HLTS00101</StopPointRef>
         <StopName>Market Place</StopName >
         <DestinationDisplay>Hospital</DestinationDisplay>
         <!- Departure Info Group ->
         <AimedDepartureTime>2001-12-17T09:32:47-
05:00</AimedDepartureTime >
```

```
            <DeparturePlatformName>Stance 1</DeparturePlatformName>
        </DatedCall>
        <!- == CALL 2 ==->
        <DatedCall>
            <!—Stop point in sequence Group ->
            <StopPointRef>HLTS00102</StopPointRef>
            <StopName>Hospital</StopName>
            <DestinationDisplay>Station</DestinationDisplay>
            <!-Arrival Info Group ->
            <AimedArrivalTime>2001-12-17T09:38:47-05:00</AimedArrivalTime>
            <!- Departure Info Group ->
            <AimedDepartureTime>2001-12-17T09:39:47-
05:00</AimedDepartureTime>
        </DatedCall>
        <!- == CALL 3 == ->
        <DatedCall>
            <!—Stop point in sequence Group ->
            <StopPointRef>HLTS00103</StopPointRef>
            < StopName>Main Station</ StopName >
            <!-Arrival Group ->
            <AimedArrivalTime>2001-12-17T09:40:47-05:00</AimedArrivalTime>
            <!- Departure Info Group ->
            <AimedDepartureTime>2001-12-17T09:43:47-
05:00</AimedDepartureTime>

    <DepartureBoardingActivity>NoBoarding</DepartureBoardingActivity>
        </DatedCall>
        …..
    </Calls>
</DatedVehicleJourney>
</DatedTimetableVersionFrame>
```

A.11 Order of Attributes

Attributes appear within classes within the same order as in the XML.

A.12 Direction of Reading

Where possible a convention is followed to places parent elements above or left and child elements below, or to the right.

A.13 Simple Data Types

XML simple types are used, along with a number of common types such as string tagged with a language attribute. These are generally shown in lower Camel Case, e.g. *dateTime*.

Simple data type names that are defined for SIRI are shown in Upper Camel case.

A.14 Reusable Complex Data Types

A small number of basic complex type: **Location**, **FacilityChange**, **HalfOpenDate FramedVehicleJourneyRef** are used extensively and are not repeated on individual pages. They are shown on a separate page

Annex B
(normative)

Comparison of Terms

B.1 SIRI-SX and Datex2

Table B.1 compares the usage of terms and attribute values in SIRI-SX with those in Datex2

Table B.1 — Comparison of SIRI-SX and Datex2 terms

	SIRI-SX		DATEX2		Note	SIRI
	SituationExchangeDelivery		*SituationPublication*		*class*	*1.2*
		ResponseTime		*publicationTime*	*dateTime*	*1.2*
		DefaultLanguage		*defaultLanguage*	*enum*	*1.4*
		SourceType		*feedType*	*string*	*1.2*
	Situation		*Situation*		*class* Datex holds summary attributes	*1.2*
	SituationElement		*SituationRecord*		class	*1.0*
		CountryRef		*sourceCountry*	enum	*1.2*
		ParticipantRef		*nationalIdentifier*	string	*1.2*
		–-		*internationalIdentfiier*	string	–
		SituationNumber		*Situation/#id*	string	*1.2*
		Version		*situationRecordVersion*	*nnInteger*	*1.2*
log		*CreationTime*		*situationRecordCreationTime*	*dateTime*	*1.2*
log		*VersionedAtTime*		*situationRecordFirstSupplierVersionTime*	*dateTime*	*1.4*
log		*NA*		*situationRecordVersionTime*	Not in SIRI	*1.4*
sts		*Progress*		*Management/lifCycleManagement/end*		
sts		*Quality*		*Reliable*	enum/boolean map	*1.2*
sts		*Reality*		*InformationStatus*	*enum* exact	
sts		*ProbabilityOfOccurrence*		*ProbabilityOfOccurrence*	*enum*	*1.4*
cfy		*Severity*		*OverallImpact*	*enum* map SX/D2	*1.2*
cfy		*Priority*		*Urgency*	*enum* map SX/D2	*1.2*
cfy		*Audience*		*Confidentiality*	*enum* map SX/D2	*1.2*
cfy		*Reason*				enum	*1.2*
cfy			*ReasonCode*	*??*			*1.2*
cfy			*SubReasonCode*	*ManagedCause/ CauseType*	*enum* map SX/D2	*1.2*

dsc		Summary	GeneralPublicComment/commentValue		
dsc		Description	NonManagedCause/causeDescription		
dsc		??	GeneralPublicComment/comment/value		
dsc		Detail	GeneralPublicComment/commentValue		
dsc		Advice			
dsc		Internal	nonGeneralPublicComment/commentValue		
		SituationSource			
log		TimeOfCommunication	??	dateTime	1.2
log		TimeOfObservation	situationRecordObservationTime	dateTime	1.4
log		ExternalCode	situationRecordCreationReference	string	1.2
src		AgentReference	SourceInformation/sourceIdentification	string	12
src		Country	SourceInformation/sourceCountry	enum exact	1.2
src		Other	SituationRecord/sourceName	nlString	1.2
src		SourceType	–	enum	1.2
src		SourceMethodType	SourceInformation//sourceType	enum exact	1.4
		Quality	reliable	Enum/boolean map	1.2
xrf	RelatedSituation				1.2
xrf		SituationReference	Situation/relatedSituation		
xrf		RelatedAs	situationRecordCreationReferenceManagedCause/ Reference (cause)	DX2 single cause	
xrf			Management/lifCyclemanagement/cancel (corrects/supercedes)	Enum/boolean map	
xrf	SituationElementReference				
xrf		CountryRef			
xrf		ParticipantRef			
xrf		SituationNumber			
xrf		UpdateCountryRef			
xrf		UpdateParticipantRef			
xrf		Version			
xrf	ExternalReference		Situation/Reference		
tme	ValidityCondition		Validity	conversion possible where SIRI **ValidityCondition** is in the form of a time period	
caq	Consequence		Impact	Road and PT differ	1.0

dly	*Delays*		*SituationRecord/Impact/Delays*		1.4
dly		*DelayBands*		*delaysCode*	*enum* exact	1.4
dly		*DelayType*		*delaysType*	*enum* exact	1.4
dly		*Delay*		*delayTimeValue*	Duration / secs	*1.0*
	AffectsScope				
		AreaOfInterest		*SituationRecord/AreaOfInterest*	Enum eact	
		AffectsRoads		*GroupOLocations*	Datedx2	
	PublishingAction		*(InformationUsageEnum)*		Siri is more elaborate)	
	TrafficElement		*TrafficElement*		Emebed	

Annex C
(informative)

Use Cases for Situation Exchange

C.1 General

Situation data, including cause, effect, nature, severity, etc, has a very wide variety of uses in PT Information Systems. It may describe both planned and unplanned events of varying duration. It can describe disruptions to all or part of the NETWORK, including physical STOP POINTs, transport INTERCHANGES, LINEs, services (VEHICLE JOURNEYs) and OPERATORs, and is relevant for journey planning, real time operations and passenger information. Often SITUATIONs will provide a causal explanation of other information events, such as a delayed arrival, that allow human judgement to decide how to react. Both computer and human readable representations are needed.

The following Use Cases illustrate functional cases for using the Situation Exchange service in PT information systems and provide specific scenarios that the SIRI-SX service is intended to support. The purpose of the Use Cases is to identify specific behaviour which requires corresponding support in the SIRI-SX SITUATION model and protocol.

The Use Cases are organized under the following headings:

— Capture/Origination of SITUATIONs and incidents.

— Relating SITUATIONs to other SIRI services.

— Onwards distribution to other systems.

C.2 Use Cases: Capture and Origination of Situations

The following Use Cases describe the capture and origination of SITUATIONs using an incident management system (IMS).

C.3 CAPT#01 Situations entered manually by operator staff

Transport Operator staff may see or receive news of an SITUATION as a phone call, fax, email, or gather information from the television, radio, internet, database or other source. Information about Planned events may arrive long in advance as part of a schedule of engineering works, major events or other bulletin. Staff in a control room may enter the description of the SITUATION into an incident management system using a capture terminal. Staff in the field may use a mobile device. SITUATIONs will be captured in a structured format including a severity, time of origin, source etc. The OPERATOR may also direct the requirements for distribution of the SITUATION to other systems and to specific staff, either directly by selecting their email phone or pager ids, or by the use of business rules that despatch to particular channels according to the message content.

C.4 CAPT#02   Situations updated manually by operator staff

Once in the system, the status of live SITUATIONs will continue to be monitored by control staff who may add updates and further details. The staff will select the current SITUATION and add extra information to update its status.

C.5 CAPT#03 Situations being generated automatically from a situation analyser

SITUATIONs may be created automatically by other systems, for example SITUATION Analysers which might detect a pattern of events such a slow down in vehicle movement against plan and create a SITUATION automatically. This SITUATION can be fed into an incident management system through a structured interface. Once in the system a SITUATION may be disseminated automatically, or await review by a manual process first.

C.6 CAPT#04 Situations arising from Facility Monitoring (e.g. lift failure)

Other automated sources of SITUATIONs are equipment monitoring systems, which may give rise to SITUATION messages about the availability of specific items of equipment such as lifts and escalators, or services, such as a ticket office or accessibility assistance. The information may be tagged with location and equipment identifiers allowing it to be associated with specific ROUTEs and VEHICLE JOURNEYs.

C.7 CAPT#05 Situations arising from Control Actions (e.g. short running, platform change)

Many Control Actions, such as changing of a platform, short running, or delayed departure to wait for a late connection give rise to a corresponding SITUATION that explains the change. Such SITUATIONs may be fed automatically from a control system to an incident management system and transformed into SITUATIONs, or entered directly.

C.8 CAPT#06 Situations supplied automatically from a related PT network (e.g. rail incidents being fed to bus system) in both SIRI and TPEG formats

In multimodal transport networks, SITUATIONs arising in a one public transport NETWORK may be of relevance for operations and passengers in another connecting NETWORK. An automatic feed can be used to exchange such SITUATIONs. The identifiers used to tag the stops and services affected need to be mutually intelligible to both producer and consumer system. The same SITUATION may be passed repeatedly between systems, gathering updates along the way.

C.9 CAPT#07 Situations supplied automatically from a related Road network (e.g. road situations being fed to bus system) Datex2 formats

SITUATIONs arising in a road network may be of relevance for operations and passengers in a transport NETWORK that uses the road, such as buses or coaches, or to another connecting NETWORK whose access is affected, such as an airport. Road management systems typically have their own incident management systems. An automatic feed can be used to exchange SITUATIONs with such systems. A method is needed to relate the links and nodes of the road network model to those of the PT transport system in order to relate road SITUATIONs to specific bus services.

C.10 CAPT#08 Road work affecting bus lanes

As for CAPT#06, where buses have dedicated road lines arising in a road network SITUATIONs may be of relevance. However they may have different implications and consequences from the impact on general use of the public highway.

C.11 CAPT#09 Parking not available at an interchange to PT

Non-availability of parking is another form of disruption that can affect multi-modal transport use, having an affect on the accessibility of transport INTERCHANGEs or the travel times needed.

SITUATIONs can be used to highlight both routine – for example full up – and abnormal SITUATIONs – for example an accident. Car parks are often operated by different organisations from those that run the STOP PLACE, using different operational systems.

C.12 CAPT#10 Weather or non-network specific Situation or event

Use of the transport networks may be affected by other circumstances, such as adverse weather, or major events which may either disrupt services, increase congestion, or both. Information about such conditions may be recorded as SITUATIONs with various degrees of specificity as to its scope and consequences.

C.13 CAPT#11 Cross referencing Situations with previous Situations

A SITUATION may reveal itself as a series of disconnected events which are then realized to have a common cause and wider consequences. For example a jam may turn out to be due to a burst water main which will then need road works to repair. Incident management systems will report these as a succession of disconnected SITUATIONs which then need to be connected up as a causal chain and consolidated as a single bulletin for presentation to users. Similarly updates to a previous SITUATION need to be cross-referenced.

C.14 CAPT#12 Workflow for verification, validation and editorial correction

A transport OPERATOR may want to validate and coordinate the information given out by its dissemination systems as part of a workflow process. To do this a review process may be used to check all new messages, especially those arriving automatically from other systems before marking them as ready for wider distribution. Staff will use an incident management console to review current SITUATIONs. They may make additional checks to verify the content, add additional structured content, and also make editorial corrections to improve the human readable content. There may be different staff roles – for example data entry, data review assigned to different users with different capabilities. In order to support this operation the SITUATION model shall include various status and quality attributes.

C.15 CAPT#13 Providing of collective guidance of passengers

One of the editorial functions for message management may be to add to the SITUATION advice to passengers as to the course to take to overcome the disruption caused by the SITUATION. This may include alternative ROUTEs, alternative travel times, information about fare easements, etc.

C.16 CAPT#14 Audit trails, retrospectives and process views

The timely and accurate capture and circulation of information can be of great importance in crisis conditions and it is desirable to keep an exact audit log of all changes made. This can be used both to record the handling of the SITUATION and to improve future processes. This can include time of capture, as well as time of despatch. The SITUATION structure should record such information.

C.17 Use Cases: Relating Situations to other SIRI services

The following Use Cases describe the correlation and association of SITUATIONs with the data content of other systems, including the content of other SIRI functional services. By linking the SITUATION to the other service, the SITUATION may provide an explanation to the passenger that is important for them to understand its likely impact and to choose the best journey repair strategy.

C.18 XREF#01 Problem affecting a specific vehicle journey

The SITUATION may provide a useful explanation of the disruption of a specific dated VEHICLE JOURNEY. Each of the SIRI services that reference a dated VEHICLE JOURNEY can associate a SITUATION reference with the journey element, and a SITUATION may reference a specific VEHICLE JOURNEY identifier. This association may have been made manually, by choosing the VEHICLE JOURNEY as part of the incident capture process, or inferred automatically, for example by noting that the VEHICLE JOURNEY uses a NETWORK, LINE or station that is affected by a SITUATION (see other XREF use cases). This can be used by any information system with access to the relevant SITUATION service to obtain the SITUATION description, or by a SITUATION presentation system to provide information about the transport service.

C.19 XREF#02 Problem at a stop place affecting some or all journeys for some or all modes

A SITUATION at a STOP PLACE, such a full or partial closure, may affect access to transport, or transfer between particular LINEs or modes at the STOP PLACE. The SITUATION needs to be tagged with identifiers that can be used to automatically collate it with the references to STOP PLACEs used in other information services. Once the relevance is established, the identifier of the SITUATION can be associated with the data of the other service to allow linking of data. It may be relevant to show SITUATION data in Stop departures (e.g. as part of the SIRI-SM results), on journey planner results and in estimated VEHICLE JOURNEYs (e.g. in the SIRI-ET and VM results), and in travel news lists, localized by area or MODE or ROUTE (e.g. in the SIRI-SX results). Planned events may be associated with information long in advance and shown as warnings. Current SITUATIONs may be sent out in real-time and associated by the distribution systems.

C.20 XREF#03 Problem affecting a whole line or a section of a line between two stop places

Some SITUATIONs, such as line blockages, affect all services using a section of the NETWORK. In this case a SITUATION can be tagged as affecting a particular part of the NETWORK for a particular period. Subsequently VEHICLE JOURNEYs and trips that use the LINE section can be associated with the SITUATION, as in use case XREF#02. The SITUATION reference can be used by any information system with access to the relevant SITUATION Exchange service to obtain the SITUATION description as an explanation.

C.21 XREF#04 Problems affecting an interchange

Certain types of disruption affect not the whole STOP PLACE or INTERCHANGE, but just the ability to transfer between particular services. For example, transfer in rush hour between certain metro LINEs may be restricted during building works within a tunnel. In this case the SITUATION can be tagged with the details of the specific connection links and or VEHICLE JOURNEY INTERCHANGEs that are affected. Subsequently VEHICLE JOURNEYs and trips that use the LINE section can be associated with the SITUATION, as in use case XREF#02.

C.22 XREF#05 Problem affecting a whole network

It may be that the whole NETWORK is subject to disruption, say from a strike or adverse weather conditions. In this case a SITUATION can be tagged as affecting a particular network for a particular period as a more general case for XREF#03.

C.23   XREF#06   Disruption (e.g. partial blockage) or degradation (e.g. crowding) of normal travel

Not all disruption involves the complete loss of service; often the effect will be a reduce capacity or increased passenger load (as with a major event) leading to slower travel times. It is important to keep passengers informed about such events so they can allow extra time and if necessary make alternative plans. Often the effects are approximate and an exact quantitative treatment is not possible, however various QoS measures such as passenger load, etc can be useful if available, as can an indication whether abnormal conditions – for example a jam is underway.

C.24   XREF#07   Problems affecting particular classes of users e.g. impaired mobility

Certain types of disruption affect certain categories of passenger disproportionately. For example, lift failures affect wheelchair users, and excessive crowding affects most mobility impaired users. A systematic tagging of SITUATIONs with the effect on accessibility is important.

C.25   Use Cases: Onwards Distribution to other systems (e.g. in TPEG and Datex2)

The following Use Cases describe the distribution of SITUATIONs to different types of dissemination system.

C.26   DIST#01   Distribution of Situations to displays

An incident management system may send the SITUATIONs it captures or aggregates to in-station, at stop and onboard displays of the transport OPERATORs own systems. In some cases the SITUATIONs will be displayed as additional notes and warnings accompanying other data, such as stop departures. In other cases relevant SITUATIONs will be shown as a specific bulletin. Content on displays is typically highly filtered for a particular context, for example a station or ROUTE, so the SITUATIONs will need to be tagged with precise scope information (or be associated with other entities so tagged) so that they can to be distributed automatically.

C.27   DIST#02   Distribution of Situations to external information services, e.g. broadcasters

In order to disseminate information to the public, an incident management system may pass its SITUATION data to other distribution systems, which will format it for presentation on different types of devices and presentation channels, for example web, DAB radio, mobile internet, voice. The distribution system will often compose appropriate messages from the structured content of the SITUATION model, for example mode, stop, LINE, severity, reason etc. The distribution system may also be responsible for deciding when to start and stop displaying the SITUATION data, using embargo dates, expiry dates etc that are part of the SITUATION content to control the presentation process.

C.28   DIST#03   Distribution of Situations to staff

A transport OPERATOR may want to inform their staff about SITUATION s as they occur so that they are in a position both to conduct operations and to inform passengers. Management may need to be informed of certain types of SITUATION as well. Distribution may need to be targeted at particular staff or groups of staff, as in DIST#04. When capturing a SITUATION, it may be marked for distribution to specific users or classes of user as part of the structured content. Information about some types of SITUATION is for internal use only.

C.29 DIST#04 Distribution of Situations to alerts and travel angels

SITUATIONs typically describe exceptional events which may require action by the users to reduce the impact, so distribution systems that notify users in a timely manner are especially appropriate. Push systems which immediately notify users using pagers, email, SMS or other channels can do this. However in order to avoid spamming users with irrelevant content, SITUATIONs shall be tagged with appropriate scope, time and categorization values that allow for exact filtering for relevance. Personal incident systems may be designed for intermittent loss of access to the distribution channel (as for example when underground) so again, SITUATIONs shall have temporal values that allow the retirement of stale data after a certain time regardless of whether the distribution channel is still open.

C.30 DIST#05 Projection of Situations on maps

Distribution systems may wish to present SITUATIONs in a spatial context, for example road-works on maps. In order to be able to do this, SITUATIONs shall be spatially tagged, either directly, or through the use of references to other entities such as STOP PLACEs or LINE sections that themselves have known geospatial coordinates. It should be remarked that for some types of Public transport SITUATION, knowledge of the location alone is not sufficient to judge its impact. For example, a northbound service might be unaffected by a signal failure at a particular point, while a southbound service is suspended; or a metro service might be unaffected by a road accident; or if there is a dedicated bus lane a traffic jam may have less impact on bus services. Typically Direction, LINE and MODE are all of relevance.

C.31 DIST#06 Distribution of Situations to journey planners

Journey planners can integrate SITUATION data into their results, showing both planned and unplanned SITUATIONs that may affect a particular VEHICLE JOURNEY. In order to do this they need SITUATIONs to me tagged with identifiers that can be elated to specific VEHICLE JOURNEYs.

C.32 DIST#07 Distribution of Situations to personal navigators and smart devices

Personal navigation devices, including mobile phones and SatNav devices, may be capable of showing relevant SITUATION data as part of their journey guidance. Devices will typically obtain their real-time data from an online system which will in turn connect using a SITUATION exchange service such as SIRI-SX. In order to support such use, SITUATIONs need to be tagged with geospatial and semantic identifier values such as Stop codes that can be used to overlay the data on the device presentation.

C.33 DIST#08 Distribution of Situations to other incident management systems

An incident management system may send the SITUATIONs it aggregates to other incident management systems (that is, which also capture and originate SITUATIONs), as well as itself receiving them from other systems. In some cases the same SITUATION may make a round trip, that is, pass out to and then return from another system. The other systems may use the same or a different representation of SITUATIONs. In order to interface with other systems with minimal loss of data, messages shall have unique identity, follow a versioned lifecycle model, and establish a systematic mapping of elements, especially categories and classification codes that can be used to map between representations such as that of TPEG.

C.34 DIST#09 Distribution of updates to existing Situations

There may be updates to a previously propagated SITUATION that also need to be distributed. The update may add additional information, or supply more current versions of previous information values, or signal that the SITUATION is closed. The receiving system needs to be able to apply the

updates to its previous data. It is possible that updates may reach the consumer system via different ROUTEs and specific update may be lost. The consumer system shall therefore be able to judge which update is the most recent.

C.35   DIST#10   Aging of Situations and updates

If communication is lost between the producer and consumer SITUATION system, the consumer system shall degrade gracefully and act so as to maintain its credibility. SITUATIONs that reach their expiry point should be removed. After a while the remaining SITUATIONs may also become stale, as without regular updates, the information they contain may become out of date. In these circumstances the SITUATION store may cease to show all or certain types of SITUATION after a given duration. In order for systems to be able to do this SITUATIONs shall contain appropriate content and metadata.

Annex D
(informative)

Mapping SIRI-SX to GTFS realtime

D.1 Mapping of SIRI-SX elements to GTFS-realtime

The General Transit Feed Speciation Real-time interface (GTFS realtime) developed by Google includes an incident dissemination service that has a basic structured incident - the GTFS *Alert* . Its elements are equivalent to a subset of SIRI-SX. See Table D.1. A one for one mapping can be established which allows SIRI-SX systems to output GTFS message for publication and to receive them for input.

Table D.1 — Mapping of GTFS Alert elements to Siri-SX

GTFS Alert Field Name	GTFS cardinality	GTFS Alert Field Type	GTFS Alert Field Description	SIRI SX Element	SIRI-SX Comment
active_period	0:*	*TimeRange*	Time when the alert should be shown to the user. If missing, the alert will be shown as long as it appears in the feed. If multiple ranges are given, the alert will be shown during all of them.	***PublicationWindow***	ValidityPeriod should be set to the same – GTFS does not distinguish.
informed_entity		*EntitySelector*	Entities whose users we should notify of this alert.	***AffectedOperator*** ***AffectedRoute*** ***AffectedStopPoint*** ***AffectedVehicleJourney*** ***JourneyCondition***	GTFS:Agency = SX:Operator GTFS:route = SX:Line GTFS:Stop = SX:StopPoint GTFS:Trip = SX:SVehicleJourney ScheduleRelationship = SX: JourneyCondition. See Table D.2 below
cause	0:1	*Cause*		***Reason/ SubReason***	See Table D.3 below
effect	0:1	*Effect*		***ServiceCondition***	See Table D.4 below
url	0:1	*TranslatedString*	The URL which provides additional information about the alert.	***infoLink***	Can classify linkContent as *details*
header_text	0:1	*TranslatedString*	Header for the alert. This plain-text string will be highlighted, for example in boldface.	***Summary***	TFS Translation is used to provide alternative language versions.
description_text	0:1	*TranslatedString*	Description for the alert. This plain-text	***Description***	

			string will be formatted as the body of the alert (or shown on an explicit "expand" request by the user). The information in the description should add to the information of the header.		

D.2 Mapping of SIRI-SX Journey Condition to GTFS-realtime ScheduleRelationship

GTFS Alert can classify the vehicle journey using the TripDescriptor, corresponding to the SIRI-SX *JourneyCondition* element values and the TPEG Service Information table (PTI 13). . See Table D.2 for a mapping.

Table D.2 — GTFS Alert Effect mapping to SIRI-SX ServiceCondition and (TPEG Pti13)

GTFS Schedule Condition	SIRI-JourneyCondition	TPEG PTI13	TPEG Name
SCHEDULED	*normalService*	13: 10	normal service
ADDED	*additionalService*	13: 7	*disrupted*
UNSCHEDULED	*specialService*	13: 8	special service
CANCELED	*cancelled*	13: 2	cancelled

D.3 Mapping of SIRI-SX Situation Categories to GTFS-realtime Cause

The GTFS Alerts can be classified according to a –simple taxonomy using the GTFS *cause* element. The categories can be mapped to equivalent SIRI-Sx and TPEG values See Table D.3. DayType can also be used to specify the type of Holiday.

Table D.3 — GTFS Alert Cause mapping to SIRI-SX Reasons

GTFS Cause	SIRI-SX/TPEG Reason	TPEG Reason	SIRI-SX/ SubReason	TPEG Sub Reason	TPEG Sub Reason Name
UNKNOWN_CAUSE	*UnknownReason*	PTI08	*undefinedProblem*	08:255	Undefined Problem
OTHER_CAUSE	*MiscellaneousReason*	PTI19	*unknown*	19: 0	unknown
TECHNICAL_PROBLEM	*EquipmentReason*	PTI21	*technicalProblem*	21: 8	Technical Problem
STRIKE	*PersonnelReason*	PTI20	*industrialAction*	20: 5	Industrial Action
DEMONSTRATION	*MiscellaneousReason*	PTI19	*demonstration*	19: 24	Special event
ACCIDENT	*MiscellaneousReason*	PTI19	*accident*	19: 6	Accident
HOLIDAY	*MiscellaneousReason*	PTI19	*holiday*	19: 24 (Alias 7)	Special event
WEATHER	*EnvironmentalReason*	PTI22	*poorWeather*	22: 255	Poor Weather
MAINTENANCE	*EquipmentReason*	PTI21	*repairWork*	21: 9	Repair Work
CONSTRUCTION	*EquipmentReason*	PTI21	*constructionWork*	21: 10	Construction Work
POLICE_ACTIVITY	*MiscellaneousReason*	PTI19	*policeActivity*	19: 3 (Alias 18)	Security Alert
MEDICAL_EMERGENCY	*MiscellaneousReason*	PTI19	*incident*	19: 1	Incident

D.4 Mapping of SIRI-SX Service Conditions to GTFS Real-time Effect

The expected consequence of the SITUATION in a GTFS *Alert* can be classified with the ***effect*** according to a –simple list of values corresponding to the SIRI-SX ***ServiceCondition*** element and the TPGE Service Information table (PTI 13). . See Table D.4 for a mapping.

Table D.4 — GTFS Alert Effect mapping to SIRI-SX ServiceCondition and (TPEG Pti13)

GTFS Effect	SIRI-ServiceCondition	TPEG PTI13	TPEG Name
NO_SERVICE	*noService*	13: 5	No service
REDUCED_SERVICE	*disrupted*	13: 6	Disrupted
SIGNIFICANT_DELAYS	*delayed*	13: 3	Delayed
DETOUR	*diverted*	13: 4	Diverted
ADDITIONAL_SERVICE	*additionalService*	13: 7	Additional service
MODIFIED_SERVICE	*altered*	13: 1	Altered
OTHER_EFFECT	*undefined*	13: 255	Undefined
UNKNOWN_EFFECT	*unknown*	13: 0	Unknown
STOP_MOVED	*alternateTrack*	13: 20	*Alternate Track*

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