Department for Transport

IA12301f
NaPTAN - National Public Transport Access Node database

http://www.dft.gov.uk/naptan

NaPTAN3.0 using CEN NeTEx / IFOPT Practical Subset - Schema Guide.

"NaPTAN-X"

DRAFT FOR REVIEW

NaPTAN v.3.0a

Version History

Version	Contents	Date		Audience
IA12301a	Rough Draft from NaPTAN 3.0 paper	28.12.2010	NJSK	internal
IA12301b	Revised Draft with	05.01.2011	NJSK	internal
IA12301c	Revised Draft with added schema element section	2001.2011	NJSK	internal
IA12301f	Number allocated	2011.02.03	NJSK	review

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1 INTRODUCTION

1.1 This Document

This document describes a format to exchange basic UK *NaPTAN* accessibility data, using the *NaPTAN 3.0* format based on the CEN *IFOPT / NeTEx /Transmodel* standard

The NeTEx extended format allows the addition to the *NaPTAN* data set of many further information elements, including transfer times, accessibility properties, navigation paths through an interchange, and details of equipment available in the interchange. The full format has many additional data elements that enable much richer information services - but it will require some considerable effort to populate it on a national scale. This document therefore summarises a smaller set of priority data elements that would still significantly improve macro journey planning. It is hoped that data can be captured at this level more quickly. For brevity we refer to this Practical subset as "*NaPTAN-X"*.

This document is a technical paper intended for a technical audience familiar with XML. For a high level overview of the business context, see the accompanying papers [Napt-Strat-1]. For a further details on using *NaPTAN* with *NeTEx* see [Napt-3.0-2011]

1.2 Status of this Document

This document has been drafted by the Transport Direct (TD) unit of the UK Department for Transport, in the context of the London 2012 Olympics. The work on use of *NaPTAN* 3.0 accessibility is being done as a pilot and does not yet constitute a stable national standard.

The *NeTEx* Model and XSD schema is not yet finalized by the CEN Process and there may be further minor changes to the XML schema

1.3 Document Structure

This document is intended for developers and other technically aware readers and includes technical terminology and notations. It is organised into the three main sections. The first two provide an extract of the [Napt-3.0-2011] guide. Part III provides a guide to the XML schema.

Part I

(i) Introduction and standards context.
- Provides a high level overview of the relationship of current and extended NaPTAN data.

(ii) Overview of NaPTAN 3.0 approach.
- Provides a high level overview of the relationship of current and extended NaPTAN data.

(iii) Introduction to NaPTAN2 & 3 equivalences.
- Provides a summary of the model mapping between 2.0 & 3.0.

Part II

(iv) Short overview of the NeTEx / IFOPT model
- An overview of the IFOPT model.

(v) Populating the Model
- Notes on populating the model.

Part III

(vi) NeTEx Schema.
- XML schema guide for the subset.

1.4 Context

The National Public Transport Access Nodes (*NaPTAN)* database is a UK nationwide system for uniquely identifying all the points of access to public transport in the UK. *NaPTAN* seeks to provide a comprehensive data set of all of the stopping places used by public transport services. *NaPTAN* data can be exchanged as XML documents using a publically available schema provided by the DfT.

NaPTAN (together with the National Public Transport Gazetteer, NPTG) enables computerised public transport information systems to provide stop finding and referencing capabilities using consistent, meaningful names for places and stops. The points of the *NaPTAN* system provide a coherent national framework of reference for integrating all kinds of public transport data including journey planning and real-time information. Other UK standards such as *TransXChange* are built upon this standard.

To date the scope of the *NaPTAN* model has been to describe basic point based information about the names and locations of all on street stops, and station entrances. It has not included accessibility information, or information about paths into and out of stations or other sites. Path data requires a considerably richer and more complex model (of which the current *NaPTAN* point model can nonetheless be regarded as a simpler subset) – but is important for a full description of accessibility. The UK has a strategic requirement to develop a richer stop model that includes an accessibility model and navigation data, and also transfer times at an interchange by the different. This data set would underpin an enhanced *JourneyWeb* protocol capable of providing full accessibility information.

Transmodel is a European CEN standard that provides an abstract reference model of the data of interest to organisations providing transport related information systems. It has provided a conceptual rationale for *TransXChange* and other UK PT standards and is of great use in mapping concepts between different data models and for harmonising data systems. At the time *NaPTAN* was developed (c2000), *Transmodel* did not have a concrete XML schema for actual data exchange, nor did it have a detailed model of Stations, Airports and other physical interchanges that covering their pathways, accessibility, equipment, etc. Since then, *Transmodel* has been further evolved by the addition of a conceptual model for physical interchanges: *IFOPT* (Identification of Fixed Objects) which draws on extensively on *NaPTAN* as well as the experience of other European nations. Furthermore the *IFOPT* model is being implemented as an XML schema as part of a larger CEN XML schema, *NeTEx* (Network Exchange) that also includes multimodal timetables and many other data entities. *NeTEx* is being developed in three stages; *Part-1* Network including Transport Interchanges; *Part-2* Timetables and tactical planning; and *Part-3* Simple fares and advanced real-time data.

The *NeTEx / IFOPT* model allows the detailed paths through a complex interchange to be described, including accessibility. The same model can also be used for other types of sites, such as sports venues and points of interest allowing a proper “last mile” treatment of journeys for journey planning. It uses a general purpose representation that can be used for many different kinds of passenger information application.

It is proposed to use the *NeTEx / IFOPT* XML model as a concrete format for this.

1.5 Motivation

The practical subset of *NaPTAN 3.0, NaPTAN-X,* should enable new application capabilities, including:

- Accessibility aware distributed Journey planning, with the ability to plan journeys to take into account accessibility of stations
- Full information on accessibility routes for a wide variety of user needs at an interchange or other site, including platform level descriptions of rail stations.
- Improved journey planning results through interchanges with more precise interchange times.
- Improved processing of impact of real-time delays for journey planning and journey repair.
- Step by step navigation through complex interchanges .
- Personal navigation applications.

- Improved integration of interchange & transport data with Map data sets.

1.6 Related documents

This paper accompanies another more detailed technical paper. It repeats some material from that paper.

- *[Napt-3.0-2011] NeTEx Stop & Venue Data - UK Naptan 3.0 PROFILE*

See the *[Napt-3.0-2011]* paper for references to base standards such as *NaPTAN*, *Transmodel* & *NeTEx*

The following paper describes the Wimbledon *NaPTAN* example in detail, and is accompanied by XML data;:

- [WIM2010] -Wimbledon data example paper.
  - IA09301h *Accessible Journey Planning - Wimbledon Station*. Transport Direct (June 2010, Revised Dec 2010).
  - Wimbledon NaPTAN XML example (June 2010).
  - Wimbledon NeTEx XML example (June 2010, Revised Dec 2010).
  - Wimbledon NeTEx XML practical subset example (Jan 2011).

1.7 Presentation Conventions

The presentation of technical terms in this document follows normal presentation conventions for UK standards:

- *Transmodel* / *NeTEx* / *IFOPT* conceptual model elements are shown in UPPER CASE.
- Concrete XML elements are shown in ***bold italic***. Compound words are camel cased, e.g. ***StopPoint.***
- Where helpful, a Namespace is used to distinguish, models, for example ***naptan***:***StopPoint***, ***Quay.***
- The terms *NeTEx* and *IFOPT* are used more or less interchangeable in this model, in particular to refer to the Transmodel XML schema.
- Standard UML notation is used for structure diagrams.

2 NAPTAN 3.0 APPROACH

2.1 Scope of this document

This *NaPTAN-X* profile document provides guidance on a practical subset of the *NeTEx* / *IFOPT* schema to support accessibility and other additional capabilities using UK data - in particular:

(i) Which additional *NeTEx* elements not found in current *NaPTAN* should be used to support added function such as paths and accessibility?
(ii) How to map existing *NaPTAN* elements into the *NeTEx* schema?

This document is accompanied by two example XML files based on Wimbledon [WIM-2010]. These include; (i) data for Wimbledon in *NaPTAN* format; and (b) the same data in *NeTEx* format, with hypothetical data added for additional element.

2.2 Capability levels

The *NaPTAN-3.0* profile paper *[Napt-3.0-2011]* distinguishes six different levels of capability for applications supporting advanced interchange information and accessibility information for passengers - see Table 2-1. Each successive level depends on the previous. However **CapLvl5** and **CapLvl6** do not depend on **CapLvl4**.

CapLvl0 corresponds to the existing *NaPTAN*. The *NaPTAN* 3.0 Practical subset is concerned with **CapLvl1, CapLvl2, CapLvl3** and **CapLvl5.**

CapLvl	Capability	Summary	Example capability enabled by capability
CapLvl0	**Stop Identification:** current NaPTAN capability	Identification of entrance, stations, platforms as points.	Integrated multimodal journey planning (computable). Examples: • Current *Transport Direct & TfL* point to point journey planners. Note however that rail platform data needs populating.
CapLvl1	**Connection aware Journey Planning**	Ability to state the explicit average transfer times at a all interchanges and at a specific interchange Addition of Pints of interests and access as well as Stop places	Journey plans that more accurately reflect connection times. Example: • (Data not currently exchanged for *Transport Direct* but implemented internally to various degrees by each journey planner using system parameters).
CapLvl2	**Point aware Accessibility Journey Planning**	Allows simple tagging of stop points with summary accessibility characteristics. enabling basic journey planning	Journey planning that uses accessible interchanges (computable). Examples: • TfL Journey planning with accessibility constraints. • TfL. • New *Journey Web* 2.4 accessibility attributes on input and results.
CapLvl3	**Navigation Path aware Accessibility Journey planning.**	Support for point to point path connections within interchange according to accessibility characteristics	Detailed journey planning advice on accessible use of an interchange. Constraints (computable) Examples: • *NRE Direct Enquiries* micro journey planner provides a local. • New *JourneyWeb* 2.4 leg path details query.
CapLvl4	**Delay aware Journey planning.**	Support for process delays	Detailed Journey planning able to include process delays at particular points at particular times.
CapLvl5	**Path link level**	Support for	Detailed visualisation of journeys (narrative).

	In station navigation	detailed paths.	• TfL access exit paths on web site.
CapLvl6	**Full In station passenger information**	Data support for visualisation tools such as schematic maps with hover points that connect to details.	Location and visualisation of facilities in a station including accessibility (narrative). • NRE Direct enquiries station browser with maps and hover points showing images and attributes.

Table 2-1 – Capability Levels and NaPTAN 3.0 data content

2.3 Relationship between Elements & Capability Levels

Figure 2-1 outlines the relationship between capability levels and the *NeTEx* model elements. Current *NaPTAN* capability (***CapLvl0***) is to represent certain key places of a stop or interchanges as a point – as indicated by the topmost horizontal box. There is data for on-street stops and for station entrances as indicated by the pink oval. However currently platform data is not fully populated in the *NaPTAN* database (as indicated in Figure 2-1 by a dotted oval below the horizontal line dividing the topmost box).
The additional capability levels of the *NaPTAN-X* profile add successive groups of elements that describe the interchange in more detail – these fall into three main groups, as indicated by the three diagonal boxes; (a) transfer times between modes/areas; (b) detailed paths; and (c) Process Check constraints & delays. All three make use of common definitions of accessibility elements (Blue vertical box on left) which defines standardised accessibility attributes such as '*wheelchair', 'lift free'*, etc; and various equipment elements (Green vertical box on the right) which define the detailed properties of lifts, ticket machines, barriers and other objects found in a station.

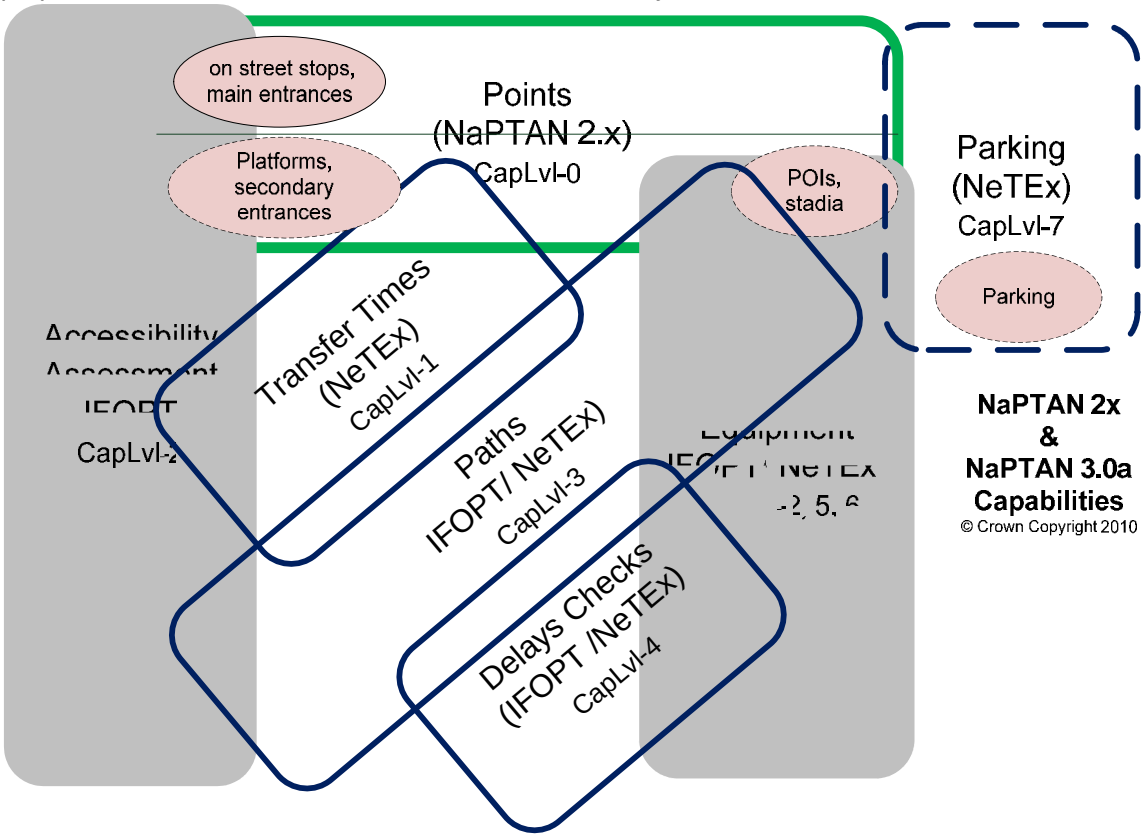


Figure 2-1 – Capability level interdependencies

2.4 *NaPTAN-X* Practical Subset versus NaPTAN 2.0 – High level example

The following two diagrams give a simple way of visualising the added scope of *NeTEx*-X using the example of a specific station, Wimbledon from [WIM2010]. Figure 2-2 shows the data elements currently modelled by the *NaPTAN* 2.0 representation – there is a *NaPTAN* point for each platform or stop and for the overall station as a simple point. Figure 2-3 shows most of the additional elements modelled by *NAPTAN* 3.0, including entrances, paths, equipment and accessibility information.

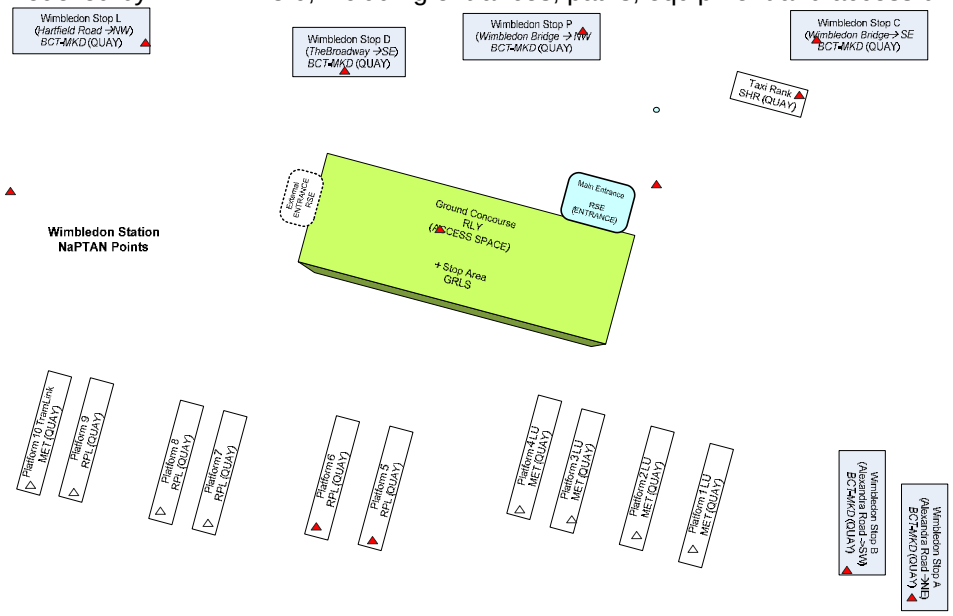


Figure 2-2 – NaPTAN 2.0 elements used to represent Wimbledon Station

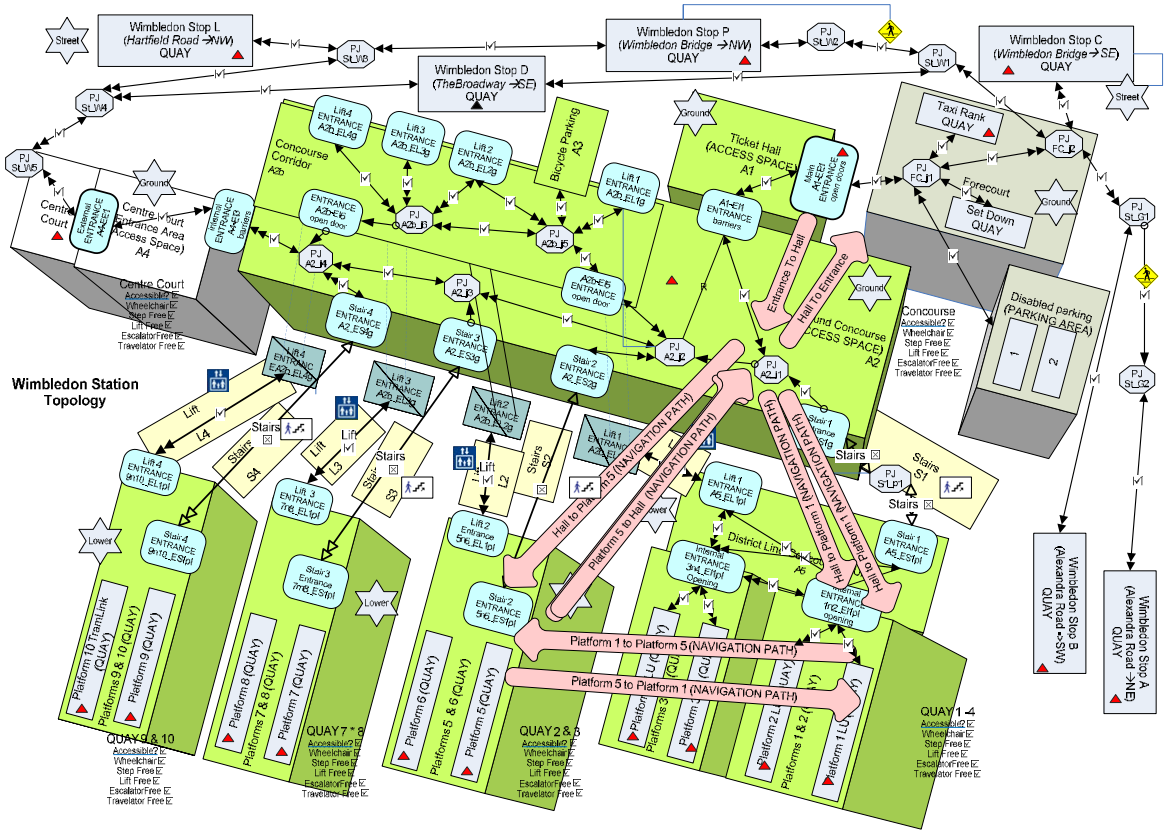


Figure 2-3– NaPTAN 3.0 elements used to represent Wimbledon Station

3 INTRODUCTION TO NAPTAN & NETEX EQUIVALENCES

3.1 Summary of NaPTAN 3.0 NeTEx Profile elements

3.1.1 *NaPTAN* 3.0 Profile *NeTEx* elements (CANDIDATE)

CapLvl5	In station navigation	Site	LEVEL, PATH LINK, PATH JUNCTION,	
	Detailed Properties of accessibility	Equip	ENTRANCE EQUIPMENT RAMP EQUIPMENT, STAIRCASE EQUIPMENT, ESCALATOR EQUIPMENT, TRAVELATOR EQUIPMENT, ROUGH SURFACE, CROSSING EQUIPMENT, QUEUING EQUIPMENT, PLACE LIGHTING	EQUIPMENT, EQUIPMENT PLACE

Table 3-1 summarises the *NeTEx* entities that are in the *NaPTAN-X* profile. As previously, capability CapLvl0 corresponds to existing *NaPTAN* 2.x use. The majority of elements needed for CapLvl2 to CapLvl6 are additional to the current *NaPTAN* set. The entities are explained further in Part II of this document.

Level	Name	Type	Primary Entities	Ancillary Entities
CapLvl0	Current *NPTG* capability (***AdministrativeArea***, ***NptgLocality***)	Ref	TOPOGRAPHIC PLACE, RESPONSIBILITY SET,	ORGANISATION, ADMINISTRATIVE ZONE
	Current *NaPTAN* capability (***StopPoint***, ***StopArea***)	Site	STOP PLACE, QUAY, ACCESS SPACE, ENTRANCE	ALTERNATIVE NAME, ADDRESS, COUNTRY SITE, SITE COMPONENT CONDITION
		Ref	SCHEDULED STOP POINT	PASSENGER STOP ASSIGNMENT
CapLvl1	Connection aware	Infra	ACCESS, CONNECTION, DEFAULT CONNECTION	(PLACE)
	Point of interest	Site	POINT OF INTEREST,	POINT OF INTEREST CLASSIFICATION, SITE
CapLvl2	Point aware Accessibility Journey Planning	Site	ACCESSIBILITY ASSESSMENT	USER NEED, LIMITATION
		Equip	ASSISTANCE SERVICE	EQUIPMENT
CapLvl3	Path aware Accessibility Journey planning.	Site	NAVIGATION PATH	PATH LINK IN SEQUENCE
CapLvl5	In station navigation	Site	LEVEL, PATH LINK, PATH JUNCTION,	
	Detailed Properties of accessibility	Equip	ENTRANCE EQUIPMENT RAMP EQUIPMENT, STAIRCASE EQUIPMENT, ESCALATOR EQUIPMENT, TRAVELATOR EQUIPMENT, ROUGH SURFACE, CROSSING EQUIPMENT, QUEUING EQUIPMENT, PLACE LIGHTING	EQUIPMENT, EQUIPMENT PLACE

Table 3-1 – Capability Levels and NaPTAN-X and NeTEx elements

3.2 Outline Mapping of NaPTAN-X elements

All of the existing *NaPTAN* elements can be mapped into *NeTEx*. By way of introduction we summarise the mapping of existing *NaPTAN* 2.x to *NaPTAN-X*, relevant for CapLvl0 use of the *NaPTAN* 3.0 profile, that is, exchange of current data in *NeTEx* / IFOPT format. See

CapLvl5	In station navigation	Site	LEVEL, PATH LINK, PATH JUNCTION,	
	Detailed Properties of accessibility	Equip	ENTRANCE EQUIPMENT RAMP EQUIPMENT, STAIRCASE EQUIPMENT, ESCALATOR EQUIPMENT, TRAVELATOR EQUIPMENT, ROUGH SURFACE, CROSSING EQUIPMENT, QUEUING EQUIPMENT, PLACE LIGHTING	EQUIPMENT, EQUIPMENT PLACE

Table 3-1 in [NaPT-3.0] for a tabular representation. See [NaPT-3.0] later for a full mapping.

3.2.1 Mapping of *NaPTAN* Stop Points

Each *NaPTAN* point type is mapped to a *NeTEx* / *IFOPT* entity type, and identified with the same identifier i.e. ***AtcoCode***. The NaPTAN ***StopClassification*** and ***StopType*** can be used to determine how each type of stop is handled

- *NaPTAN* ***StopPoint*** (AccessArea) ➔ ***StopPlace.***
- *NaPTAN* ***StopPoint*** (Entrance) ➔ Stop Place / ***Entrance.***
- *NaPTAN* ***StopPoint*** (Physical Stop) ➔ Stop Place / ***Quay.***

Additional logical associations of timetable references with the stop (e.g. TIPLOCs and CRS codes for rail) are mapped as stop assignments:

- *NaPTAN* ***AnnotatedModeRef*** (StopAssignment) ➔ ***StopPlaceAssignment.***

Any aliases are mapped as alternative names.

- *NaPTAN* ***AlternativeDescriptor*** (Stop) ➔ ***AlternativeName.***

3.2.2 Mapping of NaPTAN Stop Areas

NaPTAN stop areas may be used to obtain an indication of grouping of *NeTEx* stop place components, in particular for organising hierarchies of areas at a multimodal interchange. In some cases it, may also be relevant to create a NeTEx ***StopArea*** as well.

- *NaPTAN* ***ParentStopAreaRef*** ➔ ***ParentStopPlaceRef.***
- *NaPTAN* ***StopArea*** members ➔ ***StopPlace*** members.

3.2.3 Use of identifiers

Existing *NaPTAN* identifiers are used: the namespace can be declared in a document and indicated by a prefix e.g. '*napt:49007856473'*.

3.2.4 Mapping of NPTG Localities and Admin Areas

NPTG data does not need to be defined, but should be referenced

- *NaPTAN* ***NptgLocalityRef*** ➔ ***TopographicPlaceRef***
- *NaPTAN* ***AdminAreaRef*** ➔ ***ResponsibilitySetRef***

3.3 Additional elements to be populated

To describe the detailed structure of an interchange including its accessibility attributes, paths and equipment, additional data elements need to be sourced and populated.

3.3.1 Additional elements to be populated from industry sources

- *NeTEx* Full coverage of ***Quays*** for Railway ***platforms***.

3.3.2 Additional elements to be populated from accessibility sources

- *NeTEx* ***Coverage*** of ***Nested Quays*** and internal ***Entrances.***
- *NeTEx* ***PlaceAccessibility*** attributes for ***Quays***, ***Entrances***, ***Stop Places*** (CapLvl2).
- *NeTEx* ***NavigationPaths*** (CapLvl3).
- *NeTEx* ***PathLink*** & ***PathJunction (***CapLvl5).

3.3.3 Additional elements to be populated to allow capture Connection times

- *NeTEx* / **Access** (CapLvl2).
- *NeTEx* / ***Connection*** (CapLvl2).
- *NeTEx* / Default***Connection*** (CapLvl2).

4 SHORT OVERVIEW OF NETEX / IFOPT

This section provides a short summary of the NeTEx /IFOPT model, focusing on the elements relevant for the UK *NaPTAN-X* profile. For a full treatment, refer to:

- The *UK NaPTAN 3.0 PROFILE [Napt-3.0-2011]*
- The CEN *IFOPT* detailed specification.
- The *NeTEx* UML model
- The prCEN NeTEx technical specification. (draft in progress)

4.1 NeTEx / IFOPT Introduction

The *NeTEx* standard enables the modelling of all the different elements of a physical point of access to transport, such as a stop or station. For a complex interchange, such as a station, this includes all the component areas of the station; the entrances, concourses, platforms; the levels they are on, the paths through the station and the various types of equipment found in the station such as ticket machines and lifts, barriers, signs and seating. It also allows detailed accessibility attributes to be recorded at both the element and the station level.

4.2 Basic Elements of a Stop Place

4.2.1 *NeTEx* Stop Places, Quays, Entrances

The core element of the *NeTEx* mode for representing stops and stations is the STOP PLACE, along with the various spaces of which it is comprised, such as platforms (QUAYs), and concourses (ACCESS SPACEs), etc. See Figure 4-1. A STOP PLACE identifies a named stop, pair of stops, or a station on a line. The physical point of access to transport is always a QUAY. There may be designated STOP PLACE ENTRANCEs to describe the public internal and external entrances to the STOP PLACE and its spaces.
Furthermore:

- Specific labelled points on a QUAYs can be identified as BOARDING POSITIONs, for example the positions to board Eurostar coaches, or the doorways points to an enclosed metro line like the TfL Jubilee Line.
- STOP PLACEs can be organised into a hierarchy (as with the current use of *NaPTAN* stop areas) so that clusters of transport interchanges, such as a paired rail and tube station, can be described.
- QUAYs can be nested; this allows one to represent composite platforms with two or more sides or named sections. One can thus journey plan to any level of detail. See later below for examples. Similarly ACCESS SPACEs can be nested – within another ACCESS SPACE.
- STOP PLACE ENTRANCEs describe points at which a passenger can access a stop place, normally on foot – an Access mode can be used to identify other permitted modes of entry such as cycle or car. ENTRANCEs can be external, for example the main entrance (corresponding to some types of *NaPTAN* point) or internal, for example from an entrance concourse to a platform, (typically not described by *NaPTAN* 2.x).

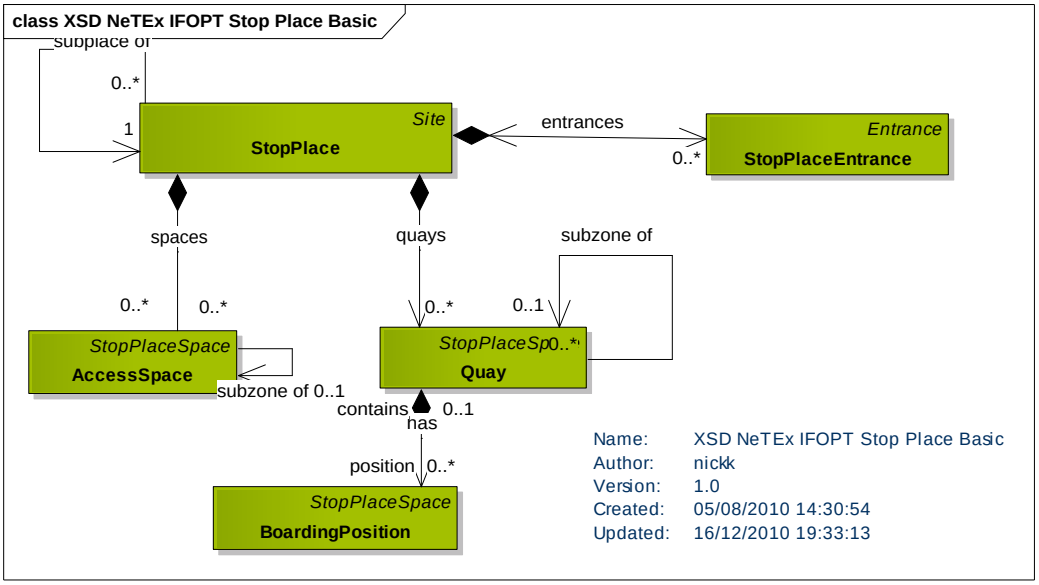


Figure 4-1 – UML Diagram of StopPlace model fundamentals

QUAYs can be given a type - See Table 4-1.

QUAY Type	Description	NaPTAN Stop Type	NaPTAN
airlineGate	Airline Gate	--	--
railPlatform	Rail Platform	RPL	1.0
metroPlatform	Metro Platform	PLT	1.0
coachStop	Coach Stop	BCT	1.0
busStop	Bus Stop	BCT	1.0
busBay	Bus Bay	BCS, BCQ	1.0
tramPlatform	Tram Platform	PLT	1.0
tramStop	Tram Stop	BCT	1.0
boatQuay	Boat Quay	BTH	1.0
ferryLanding	Ferry Landing	BTH	1.0
telecabinePlatform	Telecabine or cable car Platform	LPL	2.4
taxiStand	Taxi Stand	TXR	1.0
setDownPlace	Set Down Place	SDA	2.4
other	other	--	2.0

Table 4-1 – IFOPT Quay Types

➔ ***UK NOTE:*** The fundamental *NeTEx* elements correspond to the various classification of *NaPTAN* stop points (Entrances, Platforms, and Access Areas) found in the *NaPTAN* schema, variously populated for each mode. For example for rail, the main entrance is identified in NaPTAN, for bus the pole. *NaPTAN* does not currently have the concept of a BOARDING POSITION. See **Error! Reference source not found.** earlier for a summary of equivalences. See **Error! Reference source not found.** later for a detailed mapping of *NaPTAN* stop elements.

NaPTAN 2.4 Introduces new *NaPTAN* Stop types for Telecabine (LCB, LSE, LPL) and for car set down (SDN).

4.2.1.1*NeTEx* Example cases

Table 4-2 shows how *NeTEx* elements would be used to represent different types of stop.

	Stop	IFOPT	Comment
On street	Single bus stop	1 STOP PLACE + 1 QUAY	EQUIPMENT for stop furniture
	Pair of bus stops on a route bus stop	1 STOP PLACE + 2 QUAYs	
	On street bus cluster	1 STOP PLACE + n QUAYs	

	Hail & Ride Zone	1 STOP PLACE + 1 FLEXIBLE QUAY	
	FlexibleZone	1 STOP PLACE + 1 FLEXIBLE QUAY	Zone projection for flexible area
Off-street	Single mode rail station	1 STOP PLACE + n QUAYs + x ACCESS SPACES + y ENTRANCEs.	Use PATH LINKs + NAVIGATION PATHs for connectivity. EQUIPMENT
	Single mode metro station	1 STOP PLACE + n QUAYs + x ACCESS SPACES + y ENTRANCEs.	
	Bus or Coach station	1 STOP PLACE + n QUAYs + x ACCESS SPACES + y ENTRANCEs.	
	Airport	1 STOP PLACE + n QUAYs + x ACCESS SPACES + y ENTRANCEs.	
Multi modal interchange	Discrete places for each mode	As for single mode either PARENT STOP PLACEREFs to link to main	
	Shared use of platforms by different modes	1 STOP PLACE + n QUAYs + x ACCESS SPACES + y ENTRANCEs. Distinct SCHEDULED STOP POINTs for each mode, with STOP ASSIGNMENTs	See example

Table 4-2 – Common IFOPT stop elements combinations

4.2.1.2 Examples of simple on street STOP PLACEs

Figure 4-2 shows an on street bus stop pair named '*St George's Road'* as a simple STOP PLACE with two QUAYs, one for each direction.

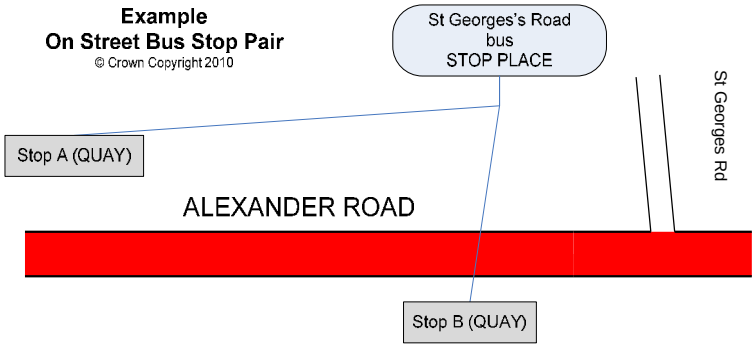


Figure 4-2 – Example pair of bus stops on street

4.2.1.3XML Example of Stop Place and Quay for an On-Street stop

The following XML code fragment shows an on street bus stop as a simple STOP PLACE with two QUAYs (only one of which is shown), using data from an equivalent *NaPTAN* 2.x representation.

```
<StopPlace created="2006-09-11T15:42:00">
        <Id>napt:490G0019043</Id>
        <Name>St George's Road (SW19)</Name>
        <Location srsName="UKOS">
                <Coordinates>524811   170666 </Coordinates>
        </Location>
        <types>
                <TypeOfPointRef>GPBS</TypeOfPointRef>
        </types>
        <ShortName>Wimbledon </ShortName>
        <TopographicPlaceView>
                <TopographicPlaceRef>nptg:E0034695</TopographicPlaceRef>
                <Name>Wimbledon</Name >
        </TopographicPlaceView>
        <TypeOfStopPlace>onstreetBus</TypeOfStopPlace>
        <TransportMode>bus</TransportMode>
        <ParentStopPlaceRef>napt:490G00272P</ParentStopPlaceRef>
        <quays>
                <Quay created="2010-04-17T09:30:47Z" dataSourceRef="NaPTAN">
                        <ResponsibilitySetRef>nptg:082</ResponsibilitySetRef>
                        <Id>napt:490014734A</Id>
                        <Name>Alexandra Road, Stop A</Name>
                        <Centroid>
                                <Location>
                                        <Longitude>-0.2067466166</Longitude>
                                        <Latitude>51.4222367962</Latitude>
                                </Location>
                        </Centroid>
```

```
                    <types>
                        <TypeOfPointRef>BCT</TypeOfPointRef>
                    </types>
                    <zoneTypes>
                        <TypeOfZoneRef>MKD</TypeOfZoneRef>
                    </zoneTypes>
                    <ShortName>Alexandra Road</ShortName>
                    <RoadAddress>
                        <Id>Rd_Addr_08</Id>
                        <RoadName>Alexandra Road</RoadName>
                        <BearingCompass>N</BearingCompass>
                    </RoadAddress>
                    <SiteRef>napt:490G0019043</SiteRef>
                    <LevelRef>tbd:9100WIMBLDN_Lvl_S0</LevelRef>
                    <Description>Stop A is paired with Stop B on Alexandra Road St Georges Road</Description>
                    <BoardingUse>true</BoardingUse>
                    <AlightingUse>true</AlightingUse>
                    <PublicCode>1-2345</PublicCode>
                    <Label>Stop A</Label>
                    <CompassOctant>N</CompassOctant>
                    <QuayType>busStop</QuayType>
                </Quay>
.....
                <Quay>                    …

            </quays>
        </StopPlace>
```

Figure 4-3 – XML Example of StopPlace

4.2.2 *NeTEx* Further Stop Place properties

Figure 4-4 show further properties of a SITE within the *NeTEx* model.

- QUAYs and ACCESS SPACES can be connected to each other using PATH LINKs.
- SITE and SITE COMPONENT inherit common properties from SITE ELEMENT, including ACCESSIBILITY characteristics, and the ability to specify ALTERNATIVE NAMEs, ACCESSIBILITY, PATH LINKs, CHECK CONSTRAINTs and EQUIPMENT, all of which are discussed further below. It is also possible to specify whether the component is indoors or outdoors, or with a gated area.
- SITEs may have LEVELs. Complex interchanges are often on multiple levels, each with a name. E.g. '*Arrivals', 'Departures', 'Platform Level', 'Entrance Level',* etc. IFOPT allows the definition of named LEVELs, which may be topologically significant. Other elements can then be assigned a LEVEL that indicates their relative position.

➔**UK NOTE:** *NaPTAN* supports alternative names, but ACCESSIBILITY, PATH LINKs, CHECK CONSTRAINTs, EQUIPMENT, etc, are additional function found only in *NeTEx*.

LEVELs only need be specified if (a) there are more than one, or (b) the level is different from street level. Otherwise it will be assumed there is a single level.

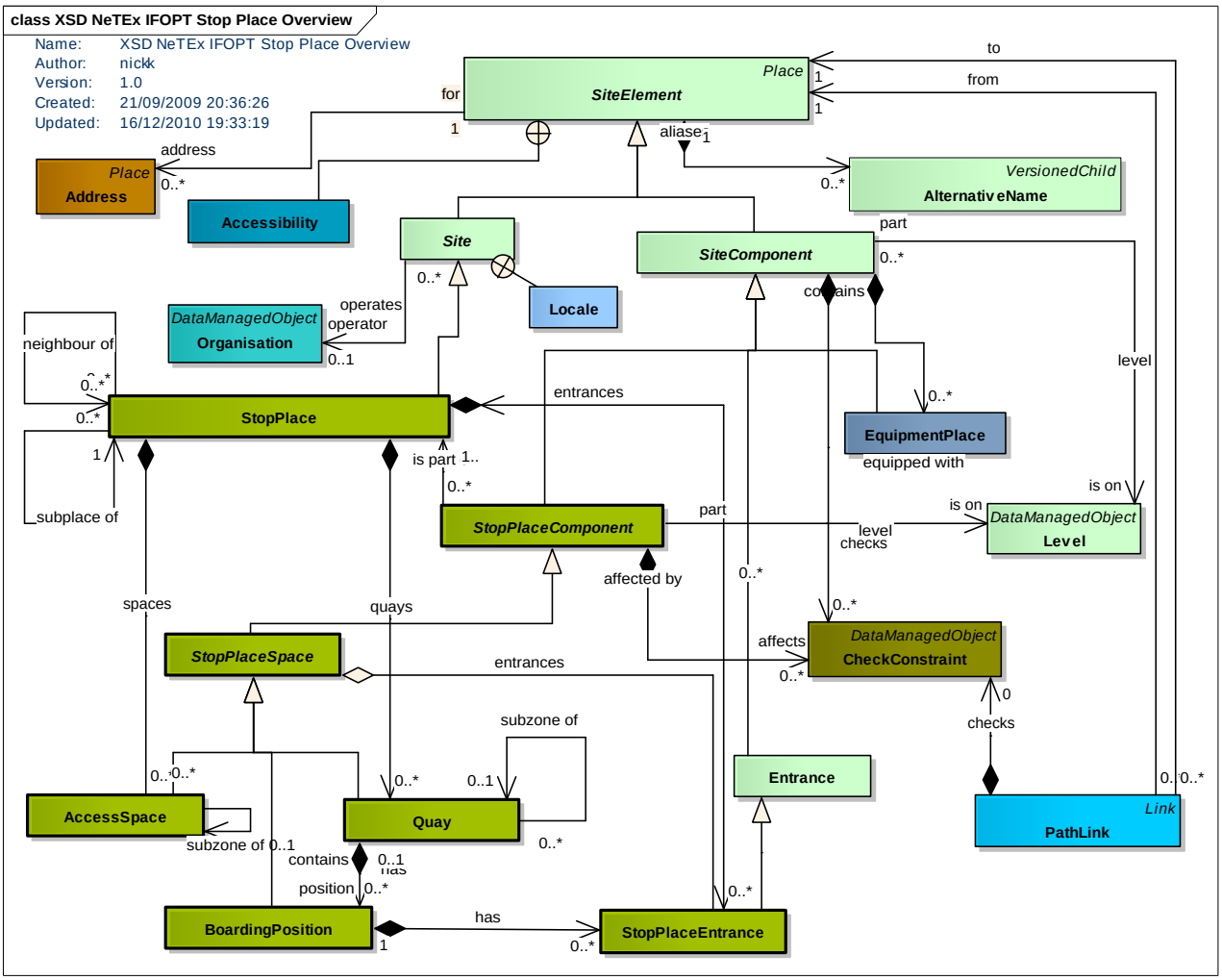


Figure 4-4 – UML Diagram of StopPlace Model

4.2.2.1 Simple Examples of Stations

Figure 4-5 shows an example of a rail station (STOP PLACE) with four platforms (QUAYs) connected by a bridge (or subway) and two STOP PLACE ENTRANCEs on different LEVELs. The middle two platforms can be nested within a parent QUAY to group them

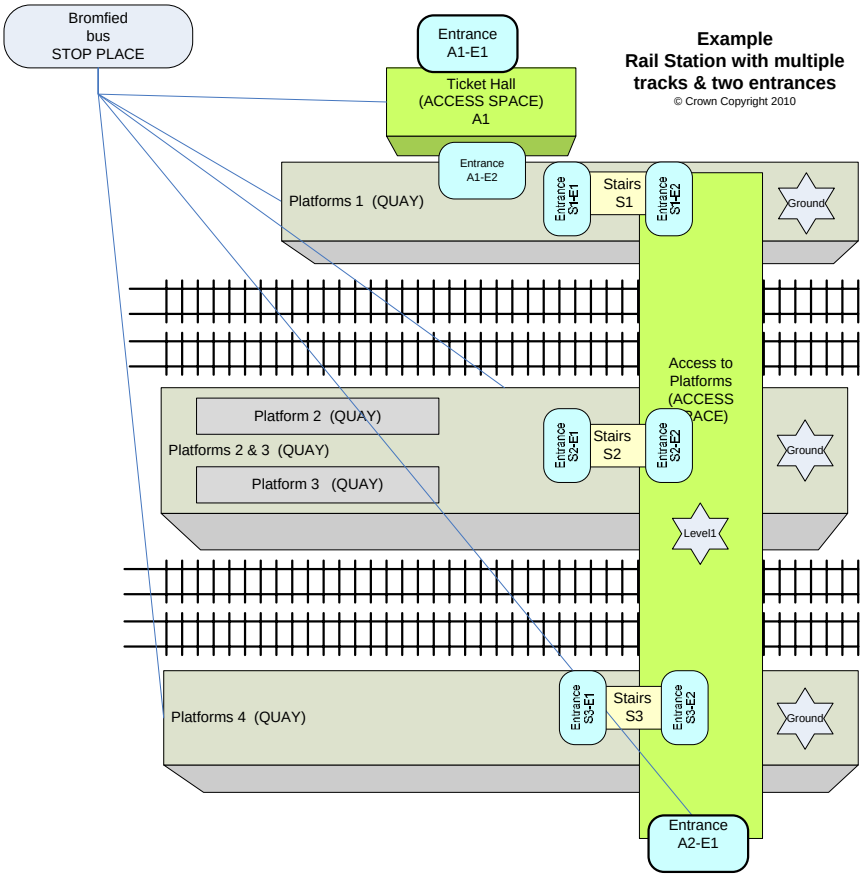


Figure 4-5 – Rail Station example with multiple platforms

4.2.2.2XML Example of a Stop Place for a Station with platforms

The following XML code fragment shows part of a STOP PLACE for a station, including a definition of a single ENTRANCE (further ones have been omitted from the fragment shown) and one of its platforms. The platform is two sided, so is described as a pair of QUAY instances nested inside another QUAY – see discussion of nested QUAYs in [NaPTAN 3.0]**.** The station is on two LEVELs. (Only the definition of the first is shown***.)***

The example uses actual *NaPTAN* data for Wimbledon, augmented with realistic data based on the Wimbledon example [WIM-2010].

Some other points of remark in the example code:

- The station's overall accessibility rating is described by an ACCESSIBILITY ASSESSMENT**.**
- The station has an ALTERNATIVE NAME.
- The station is tagged as being the main terminus for a TOPOGRAPHIC PLAC.(Corresponding to a reference to a *NTPG* Locality as the *NPTG* main locality).
- Individual ENTRANCEs and QUAY's are also tagged with an ACCESSIBILITY ASSESSMENT**.**

```
<StopPlace created="2006-09-11T15:42:00" modification="revise" dataSourceRef="NaPTAN">
        <ResponsibilitySetRef>napt:RS_110</ResponsibilitySetRef>
        <Id>napt:910GWIMBLDN</Id>
        <Name>Wimbledon Rail Station</Name>
        <Location srsName="UKOS">
                <Coordinates>524811 170666 </Coordinates>
        </Location>
        <types>
                <TypeOfPointRef>GRLS</TypeOfPointRef>
        </types>
        <AccessibilityAssessment>
```

```
        <MobilityImpairedAccess>true</MobilityImpairedAccess>
        <limitations>
            <AccessibilityLimitation created="2010-05-17T09:30:47Z>
                <WheelchairAccess>true</WheelchairAccess>
                <StepFreeAccess>true</StepFreeAccess>
                <EscalatorFreeAccess>true</EscalatorFreeAccess>
                <LiftFreeAccess>true</LiftFreeAccess>
                <AudibleSignalsAvailable>false</AudibleSignalsAvailable>
                <VisualSignsAvailable>true</VisualSignsAvailable>
            </AccessibilityLimitation>
        </limitations>
</AccessibilityAssessment>
 <ShortName>Wimbledon Station</ShortName>
<alternativeNames modificationSet="all">
        <AlternativeName created="2010-05-17T09:30:47Z" modification="new">
            <NameType>label</NameType>
            <Name>Wimbledon+ </Name>
        </AlternativeName>
</alternativeNames>
<Covered>mixed</Covered>
<TopographicPlaceView>
            <TopographicPlaceRef>nptg:E0034695</TopographicPlaceRef>
            <Name>Wimbledon</Name >
        </TopographicPlaceView>

<RoadAddress created="2010-05-17T09:30:47Z" modification="new">
        <Id>tbd:RdAddr_01</Id>
        <RoadName>Wimbledon Bridge +</RoadName>
</RoadAddress>
<!-- ============LEVELS ===================- -->
<levels>
        <Level created="2010-04-17T09:30:47Z">
            <Id>tbd:9100WIMBLDN_Lvl_G0</Id>
            <Name>Ground </Name>
            <LevelCode>G</LevelCode>
        </Level>
.....

</levels>
<!-- ============ENTRANCEs ===================- -->
<entrances>
        <Entrance created="2010-05-17T09:30:47Z">
            <Id>tbd:9100WIMBLDN_A3_EE1</Id>
            <Name>External Entrance to Centre Court Ticket Hall from forecourt</Name>
            <validityConditions>
                <AvailabilityConditionRef>AC_01_Main_Opening</AvailabilityConditionRef>
            </validityConditions>
            <ParentZoneRef>tbd:9100WIMBLDN_A3</ParentZoneRef>
            <AccessibilityAssessment>
                <MobilityImpairedAccess>true</MobilityImpairedAccess>
                <limitations>
                    <AccessibilityLimitation>
                        <WheelchairAccess>true</WheelchairAccess>
                        <StepFreeAccess>true</StepFreeAccess>
                    </AccessibilityLimitation>
                </limitations>
            </AccessibilityAssessment>
            <LevelRef>tbd:9100WIMBLDN_Lvl_G0</LevelRef>
            <placeEquipments>
                <EntranceEquipment>
                    <Door>true</Door>
                    <KeptOpen>true</KeptOpen>
                    <WheelChairPassable>true</WheelChairPassable>
                </EntranceEquipment>
            </placeEquipments>
            <EntranceType>openDoor</EntranceType>
            <isExternal>true</isExternal>
            <isEntry>true</isEntry>
            <isExit>true</isExit>
            <Width>1.0</Width>
            <Height>2.0</Height>
        </Entrance>
 .........
```

```
        </entrances>
            <!-- ============QUAYs ====================- -->
        <quays>
            <Quay created="2010-04-17T09:30:47Z">
                <Id>tbd:9100WIMBLDN5n6</Id>
                <Name>Platforms 5 &amp;amp; 6</Name>
                <Location srsName="UKOS">
                    <Coordinates>524811 170666 </Coordinates>
                </Location>
                <AccessibilityAssessment created="2010-05-17T09:30:47Z" modification="new">
                    <MobilityImpairedAccess>true</MobilityImpairedAccess>
                    <limitations>
                        <AccessibilityLimitation created="2010-05-17T09:30:47Z" modification="new">
                            <WheelchairAccess>true</WheelchairAccess>
                            <StepFreeAccess>true</StepFreeAccess>
                            <EscalatorFreeAccess>true</EscalatorFreeAccess>
                            <LiftFreeAccess>true</LiftFreeAccess>
                            <AudibleSignalsAvailable>false</AudibleSignalsAvailable>
                            <VisualSignsAvailable>true</VisualSignsAvailable>
                        </AccessibilityLimitation>
                    </limitations>
                </AccessibilityAssessment>
                <Covered>covered</Covered>
                <LevelRef>tbd:9100WIMBLDN_Lvl_U1</LevelRef>
                <Description>Platforms 5 &amp;amp; 6 </Description>
                <BoardingUse>true</BoardingUse>
                <AlightingUse>true</AlightingUse>
                <Label>5 and 6</Label>
                <destinations>
                    <DestinationDisplay>Clapham Junction</DestinationDisplay>
                    <DestinationDisplay>Waterloo</DestinationDisplay>
                </destinations>
                <QuayType>railPlatform</QuayType>
                <quayEntrances>
                    <EntranceRef>tbd:9100WIMBLDN5n6_EL1</EntranceRef>
                    <EntranceRef>tbd:9100WIMBLDN5n6_ES1</EntranceRef>
                </quayEntrances>
            </Quay>

            <Quay created="2010-04-17T09:30:47Z">
                <Id>napt:9100WIMBLDN5</Id>
                <Name>Platform 5</Name>
                <Description>Platform 5 is paired with platform 6 with separate lift and stair access </Description>
                <Label>5</Label>
                <QuayType>railPlatform</QuayType>
                <ParentQuayRef>tbd:9100WIMBLDN5n6</ParentQuayRef>
            </Quay>

            <Quay created="2010-04-17T09:30:47Z">
                <Id>napt:9100WIMBLDN6</Id>
                <Name>Platform 6</Name>
                <Description>Platform 5 is paired with platform 6 with separate lift and stair access</Description>
                <Label>5</Label>
                <QuayType>railPlatform</QuayType>
                <ParentQuayRef>tbd:9100WIMBLDN5n6</ParentQuayRef>
            </Quay>
             .....
</StopPlace>
```

Figure 4-6 – XML Example of StopPlace – Rail Station with Platforms

4.2.3 Nesting Stop Places

Sometimes a complex SITE is made up of a number of different SITEs, for example a large rail STOP PLACE may contain a metro station as a child STOP PLACE and have associated STOP PLACEs for the stops of the bus routes that pass by it – See Figure 4-7.

- There should be a separate STOP PLACE for each transport mode (But see discussion below of shared multimodal use of platforms).
- A separate STOP PLACE should be created if an area of a station can be referenced as a separate station by a timetable or other passenger information usage. For example "*St Pancras Domestic"* and "*St Pancras International*".

- There should be a separate STOP PLACE for each pair of bus or tram stops (or isolated stop) on street.

➔**UK NOTE**: The same precedence rules as are used for *NaPTAN* ***StopAreas*** should be used for nesting StopPlaces, thus: (i) Air, (ii) Ferry, (iii) Rail, (iv) Metro, (v) Bus/Coach.

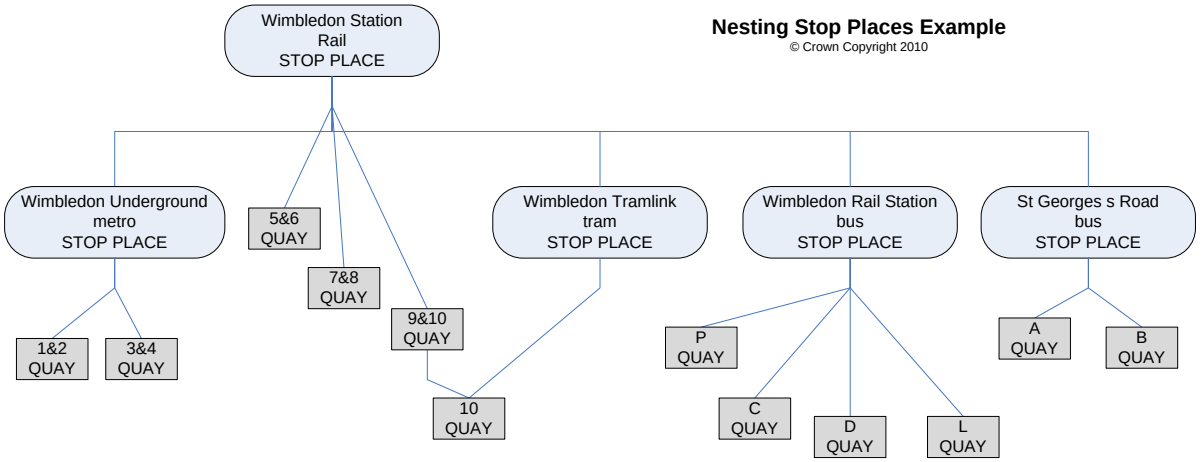


Figure 4-7 – Example Nesting of Stop Places

4.2.3.1XML Example of a Nested Stop Place

The following XML code fragment shows a STOP PLACE for a *metro* station that is itself a subsidiary part of another *rail* STOP PLACE (defined in the previous example)*.*

```
<StopPlace created="2006-09-11T15:42:00" modification="revise" changed="2009-02-26T15:47:00">
        <Id>napt:940GZZLUWIM</Id>
        <Name>Wimbledon Underground Station </Name>
        <Centroid>
                <Location>
                        <Longitude>-0.2065219984</Longitude>
                        <Latitude>51.4213610557</Latitude>
                </Location>
        </Centroid>
        <types>
                <TypeOfPointRef>GTMU</TypeOfPointRef>
        </types>
        <ShortName>Wimbledon</ShortName>
        <TopographicPlaceRef>nptg:E0034695</TopographicPlaceRef>
        <entrances>
……..
        </entrances>
        <PrivateCode>86286</PrivateCode>
        <TypeOfStopPlace>metroStation</TypeOfStopPlace>
        <TransportMode>metro</TransportMode>
        <ParentStopPlaceRef>napt:910GWIMBLDN</ParentStopPlaceRef>
        <quays>
                …
        </quays>
        <accessSpaces>
…..
        </accessSpaces>
</StopPlace>
```

Figure 4-8 – XML Example of Nested StopPlaces

4.2.4 Multimodal use of the same platform

Usually there will be a separate STOP PLACE for each transport mode at an interchange, each with its own QUAYs, and with distinct ENTRANCEs. Sometimes however STOP PLACEs for different modes may be intermingled, with the same platform being shared; for example between rail, tram or metro, or between bus and coach.
For example, in the Wimbledon example [WIM-2010] there are distinct *Wimbledon Rail Station* and *Wimbledon Tram link* STOP PLACEs, even though they both share a platform 10 - see Figure 4-7.

- Where platforms are shared between modes, a single definition of the platform i.e. QUAY can be made. The STOP PLACE for the major mode (e.g. *rail*) can contain the QUAY definition. Two alternative approaches are possible.
  (i) Create a separate STOP PLACE for the additional mode; the STOP PLACE mode can reference the QUAY definition.
  (ii) Simply specify multiple modes for the STOP PLACE and the QUAY (e.g. *rail, metro*).
- The rail STOP PLACE can state *tram* as another mode and vice versa.
- There will typically be separate SCHEDULED STOP POINTS for the Tram and fro the Rail timetables.
- In addition there can be separate PASSENGER STOP ASSIGNMENTs to assign different SCHEDULED STOP POINTs for each mode to the same QUAY.

➔**UK NOTE:** NaPTAN uses a separate point for each mode to a separate STOP PLACE should be created as per (i) above.

4.2.4.1XML Example of a Multimodal use of the same platform

The following XML code fragment shows a rail STOP PLACE with a shared use QUAY.

```
<StopPlace created="2006-09-11T15:42:00" modification="revise" changed="2009-02-26T15:47:00">
        <Id>napt:910GWIMBLDN</Id>
        <Name>Wimbledon Rail Station</Name>
        <Location srsName="UKOS">
                <Coordinates>524811   170666 </Coordinates>
        </Location>
        <types>
                <TypeOfPointRef>GRLS</TypeOfPointRef>
        </types>
……
        <TypeOfStopPlace>railStation</TypeOfStopPlace>
        <TransportMode>rail</TransportMode>
        <otherModes>
                <OtherTransportMode>metro</OtherTransportMode>
                <OtherTransportMode>tram</OtherTransportMode>
        </otherModes>
…..
        <quays>
 ……
                <Quay created="2010-04-17T09:30:47Z">
                        <Id>napt:9100WIMBLDN10</Id>
                        <Name>Platform 10</Name>
                        <TransportMode>rail</TransportMode>
                        <otherModes>
                                <VehicleMode>tram</VehicleMode>
                        </otherModes>
                        <Description>Platform 10 is paired with platform 9 with separate lift and stair access. It has shared use
for tram</Description>
                        <Label>10</Label>
                        <destinations>
                                <DestinationDisplay>London</DestinationDisplay>
                        </destinations>
                        <QuayType>tramPlatform</QuayType>
                        <ParentQuayRef>tbd:9100WIMBLDN9n10</ParentQuayRef>
                </Quay>

                <QuayRef>tbd:9100WIMBLDN10</QuayRef>
        </quays>
```

The following XML code fragment shows an additional STOP PLACE for a tram station that references the same shared use platform defined above.

```
<StopPlace created="2006-09-11T15:42:00" modification="revise" changed="2009-02-26T15:47:00">
        <Id>napt:940GZZCRWIM</Id>
        <Name>Wimbledon Tramlink Station </Name>
        <Centroid>
                <Location>
                        <Longitude>-0.2065219984</Longitude>
                        <Latitude>51.4213610557</Latitude>
                </Location>
        </Centroid>
        <types>
                <TypeOfPointRef>GTMU</TypeOfPointRef>
        </types>
        <ShortName>Wimbledon</ShortName>
        <TopographicPlaceRef>nptg:E0034695</TopographicPlaceRef>
        <TypeOfStopPlace>tramStation</TypeOfStopPlace>
        <TransportMode>tram</TransportMode>
        <ParentStopPlaceRef>napt:910GWIMBLDN</ParentStopPlaceRef>
        <quays>
                <QuayRef>tbd:9100WIMBLDN10</QuayRef>
        </quays>
</StopPlace>
```

Figure 4-9 – XML Example of Shared Quay in a Rail StopPlace

4.3 Paths

4.3.1 IFOPT Path Links

- The *IFOPT* model represents the allowed paths between the parts of an interchange as PATH LINKs. PATH LINKs connect the parts of an interchange creating a network of possible pathways. Each PATH LINK connects with a QUAY (i.e. platform or stop), ACCESS SPACE (i.e. hall, concourse or passage) or an intermediate PATH JUNCTION.
- Each end of a PATH LINK may specify an ENTRANCE to indicate the point of connection. There doesn't have to be an ENTRANCE: for example, a ticket hall may have a well defined entrance, but a platform or on-street stop may well not have an entrance, but rather be accessible over a whole edge.
- Each PATH LINK also describes any change in LEVEL, for example, between the concourse and lower ground platforms, as well as any EQUIPMENT (lift, steps etc) associated with that path link and the time taken for the path link. PATH LINKs state in which direction they can be used, and can have accessibility attributes.
- Where a QUAY is nested, for example, '*Platform 3 & 4'* is made up of '*Platform 3'* and '*Platform 4*'. It is sufficient to have only PATH LINKs to the containing QUAY and to infer the connectivity to the contained children. Thus a smaller number of links and paths are needed to describe an interchange.

PATH LINKs are intended to describe a detailed topology for a station. For an outline topology NAVIGATION PATHs and/or CONNECTIONs should be used instead.

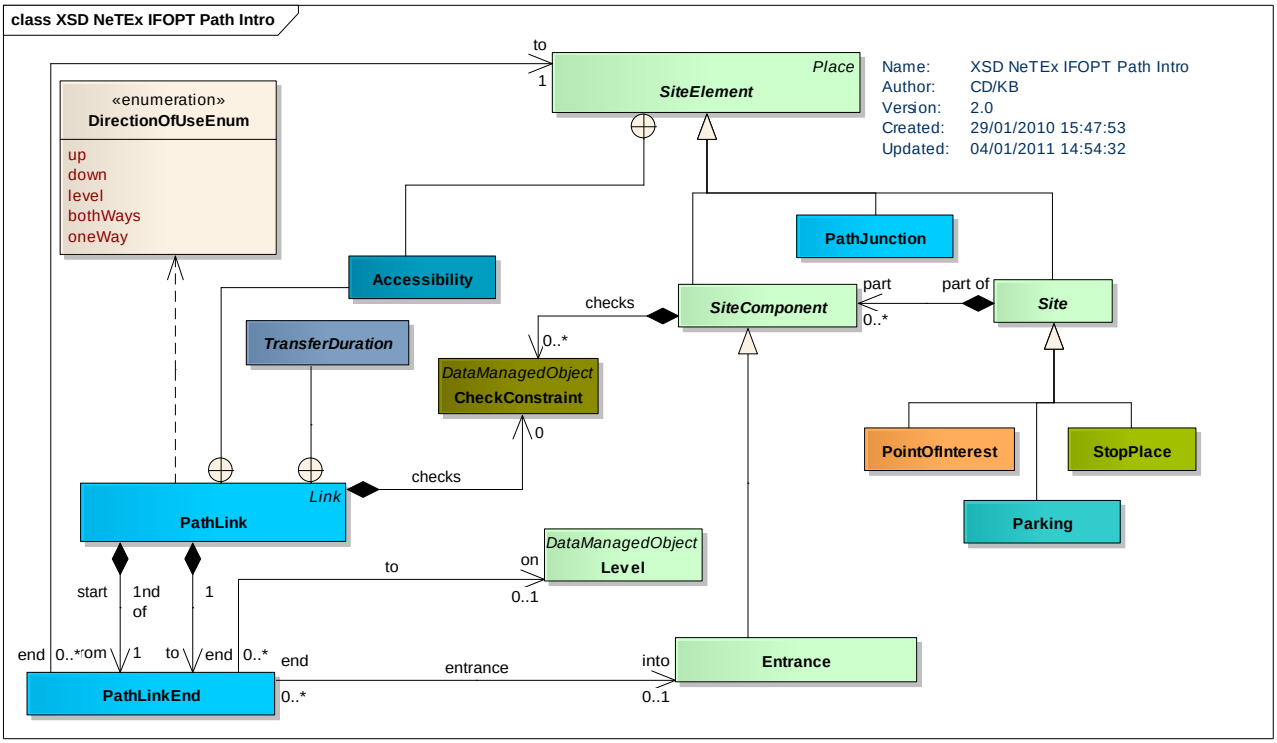


Figure 4-10 – UML Diagram of Path Link

4.3.1.1Simple examples of Path Links

Each end of a PATH LINK can optionally indicate an ENTRANCE and a LEVEL. Figure 4-11 shows a single path link between two parts of a STOP PLACE.

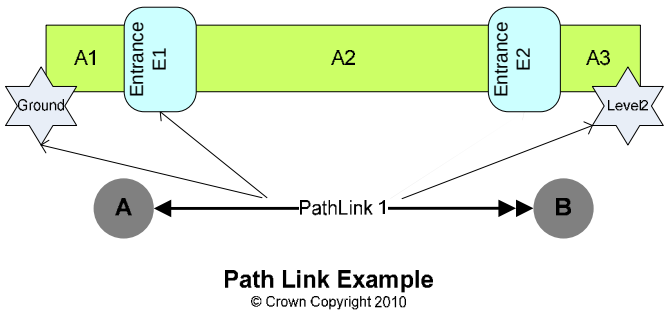


Figure 4-11 – Example of a single Path Link

PATH LINKs can be connected up in sequences either to STOP COMPONENTS or to intermediate PATH JUNCTION points.

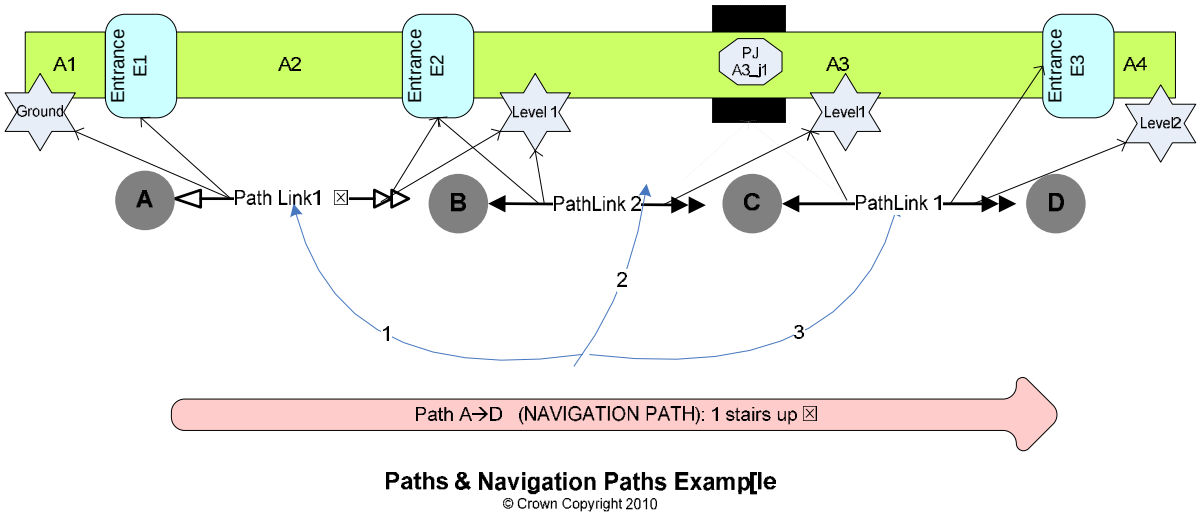


Figure 4-12 – Example of a sequence of Path Links

4.3.1.2Simple examples of Path Links in a Stop place

Figure 4-13 shows an example of the use of path links to describe the topology of a simple station. There are two external entrances to a ticket hall and then a stairway to the platforms. There are two platforms, the furthest of which is reached using a barrow crossing over the tracks.

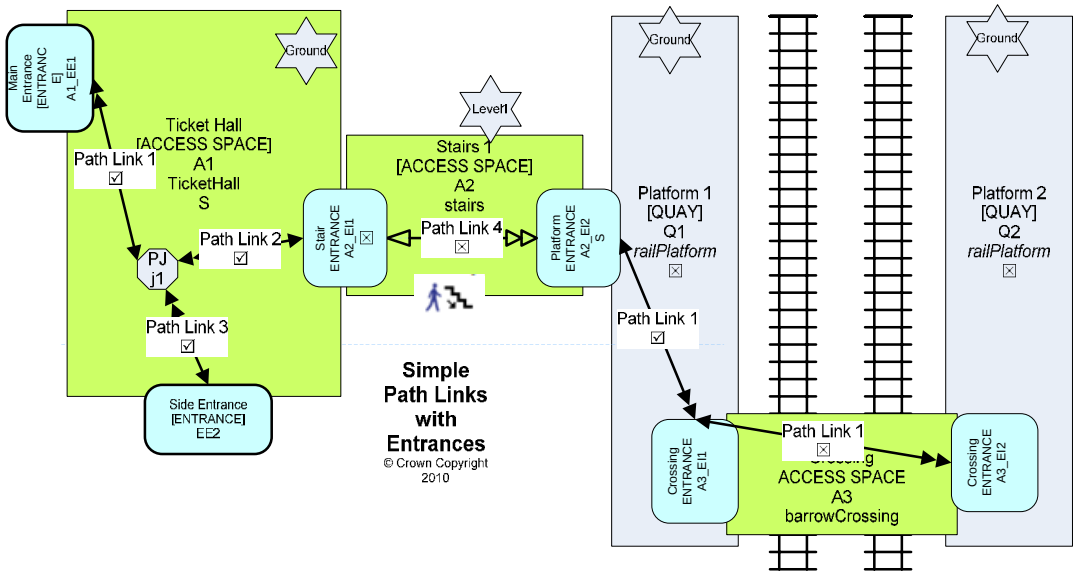


Figure 4-13 – Example of Path Links used to connect Access and platforms

4.3.1.3XML example of a Path Link – Indoors

The following XML code fragment shows a PATH LINK that connects an external ENTRANCE of a Station to an internal ENTRANCE within the station. It is further marked with accessibility attributes.

```
<SitePathLink created="2010-05-17T09:30:47Z">
        <Id>tbd:9100WIMBLDN_lnk_A1-EE1_A1-EI1</Id>
        <Name>From Ticket hall external entrance to Upper concourse internal entrance</Name>
        <AccessibilityAssessment created="2010-05-17T09:30:47Z">
                <MobilityImpairedAccess>true</MobilityImpairedAccess>
                <limitations>
                        <AccessibilityLimitation created="2010-05-17T09:30:47Z">
                                <Id> tbd:9100WIMBLDN_lnk_A1-EE1_A1-EI1-acc01</Id>
                                <WheelchairAccess>true</WheelchairAccess>
```

```
                                    <StepFreeAccess>true</StepFreeAccess>
                                    <EscalatorFreeAccess>true</EscalatorFreeAccess>
                                    <LiftFreeAccess>true</LiftFreeAccess>
                                </AccessibilityLimitation>
                        </limitations>
                </AccessibilityAssessment>
                <Covered>indoors</Covered>
                <From>
                        <PlaceRef>tbd:9100WIMBLDN_A1</PlaceRef>
                        <EntranceRef>tbd:9100WIMBLDN_A1_EE1</EntranceRef>
                        <LevelRef>tbd:9100WIMBLDN_Lvl_ST</LevelRef>
                </From>
                <To>
                        <PlaceRef>tbd:9100WIMBLDN_A1</PlaceRef>
                        <EntranceRef>tbd:9100WIMBLDN_A1_EI1</EntranceRef>
                        <LevelRef>tbd:9100WIMBLDN_Lvl_G0</LevelRef>
                </To>
                <Distance>4.0</Distance>
                <AllowedUse>twoWay</AllowedUse>
                <FromToUpDown>level</FromToUpDown>
                <MaximumFlowPerMinute>200</MaximumFlowPerMinute>
                <LevelRef>tbd:9100WIMBLDN_Lvl_G0</LevelRef>

        </SitePathLink>
```

Figure 4-14 – XML Example of PathLink within a Station

4.3.2 IFOPT Navigation Paths

Sequences of PATH LINKs can be assembled into named NAVIGATION PATHs to guide the user through an interchange. The model for NAVIGATION PATHs is thus two-level (Figure 4-15).

(i) The NAVIGATION PATH itself is a high level container that can be given a meaningful name that identifies a route to the user – e.g. "*Entrance Hall to Platform 1'.* NAVIGATION PATHs can also be given accessibility attributes so that searches can be filtered according to the specific needs of the users, for example to avoid steps or escalators, and summary data such as the number of lifts, escalators and traversal time.

A NAVIGATION PATH normally contains a sequence of on ore more one simple point to point PATH LINKs that link nodes: nodes may be QUAYs or ACCESS SPACEs or PATH JUNCTIONs – intermediate branch points. PATH JUNCTIONs make it possible to use the same links in many different NAVIGATION PATHS.

It is possible for a NAVIGATION PATH to be used just as a summary – i.e. with out PATH LINKs, in order to record transfer times.

NAVIGATION PATHs and PATH LINKs are normally specified as properties of the overall SITE for example STOP PLACE or POINT OF INTEREST, rather than a specific component such as a QUAY.

➔UK Note: In *JourneyWeb* 2.4 a LegPath response is added that can return a Navigation path. This consists of a sequence of points.

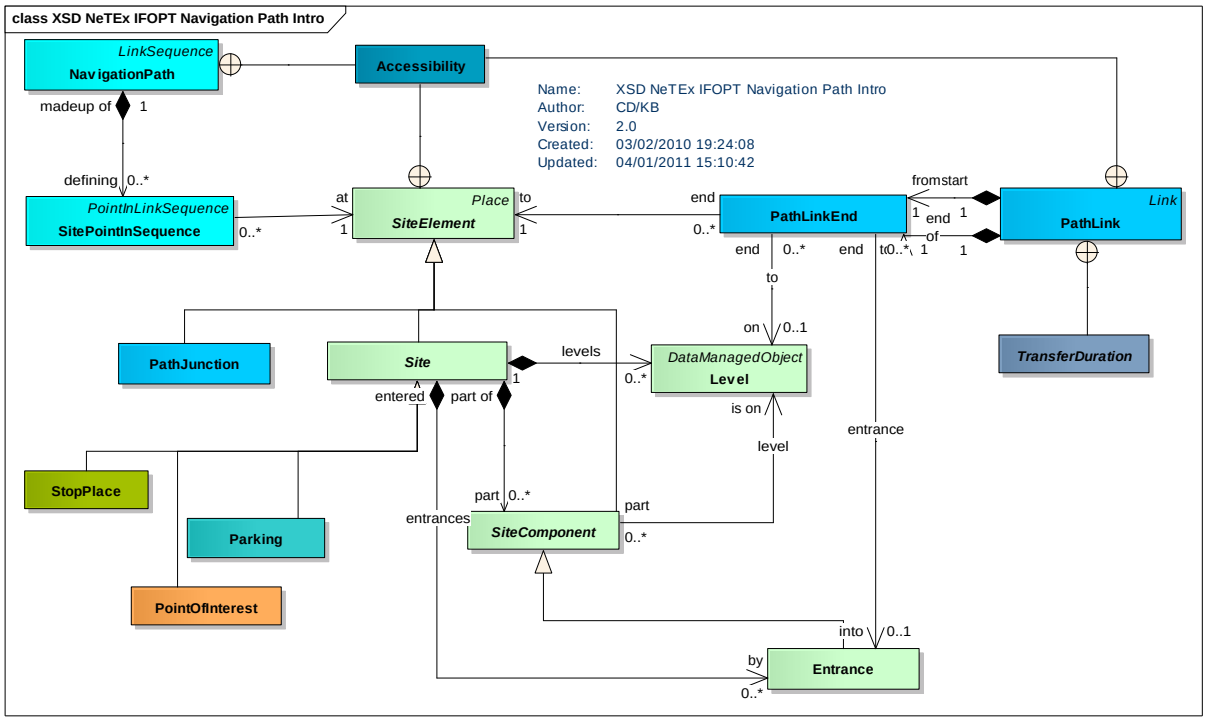


Figure 4-15 – UML Diagram of Navigation Path

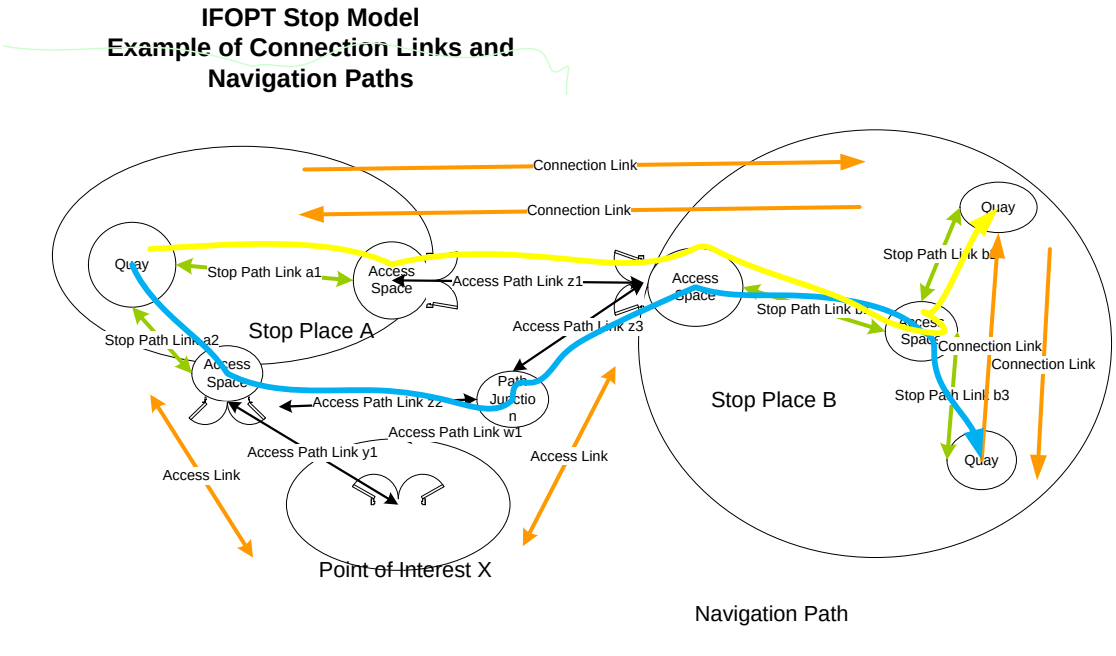
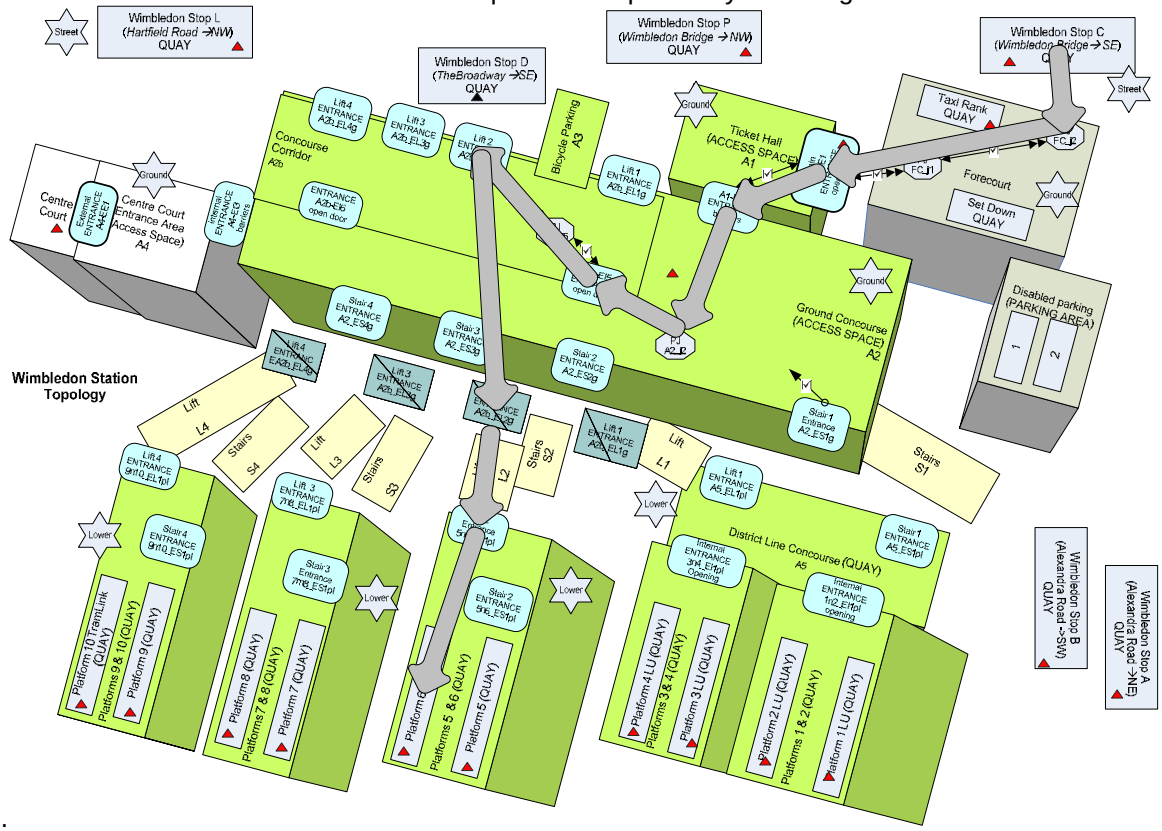


Figure 4-16 – IFOPT Path Links & Navigation Paths

4.3.2.1 Wimbledon example Navigation Path

Figure 4-17 shows an example of a NAVIGATION PATH from a bus stop to a platform: it describes an accessible route that traverses a sequence of spaces by following PATH LINKS. It uses a lift.



.

Figure 4-17 – Wimbledon Example path from Bus Stop Q to Rail Platform 6

4.3.2.2Creating Navigation paths

In an implementation, NAVIGATION PATHs can either be predefined statically by hand (as in the Wimbledon example [WIM-2010], where a number of named paths between the entrances and each platform have been created, or be computed dynamically from path links by a micro journey planner, (as for the TfL local access search engine on DirectEnquiries.com). Since the number of permutations of point to paths for different accessibility characteristics can be large even for a small station, a computational approach is preferable.

Where NAVIGATION PATHs are created manually it is possible to use NAVIGATION paths at a summary level only, that is, not to have detailed PATH LINKs; this at least gives an indication of overall accessibility, albeit without step by step navigation. There may be more than one NAVIGATION PATH between the same two nodes: corresponding to different routes.

Navigation Type	Description	Used
quayToQuay	Quay to Quay	STOP PLACE
streetToQuay	Street to Quay	STOP PLACE
quayToStreet	Quay to Street	STOP PLACE
hallToQuay	Ticket Hall to Quay	STOP PLACE, POI
quayToHall	Quay to Ticket Hall or Entrance Gallery	STOP PLACE, POI
streetToHall	Street to Ticket Hall	STOP PLACE, POI
hallToStreet	Ticket Hall to Street	STOP PLACE, POI

Table 4-3 – Types of Navigation Path

4.3.3 IFOPT Path Link & Navigation Path direction

A PATH LINK connects any two spaces) or PATH JUNCTIONs within a SITE that can be traversed by a passenger, also optionally indicating an ENTRANCE if the end point is a QUAY or ACCESS SPACE.

- The same PATH LINK may be reused in many different NAVIGATION PATHs.
- A PATH LINK is **directional** in that it always has a 'from' end and a 'to' end – however it may by used in either direction, unless tagged to indicate it is one way – as say an escalator or one-way subway tunnel might be tagged to indicate that it can only used in one sense.
- A NAVIGATION PATH references a sequence of PATH LINKs. For each path link, the NAVIGATION PATH indicates whether the use is forwards (i.e. from origin to destination) or backwards (i.e. from destination to origin).
- A NAVIGATION PATH has a single direction from origin to destination.

This is shown in Figure 4-18 where two different NAVIGATION PATHs (*A→D* and *D➔A*) use the same three PATH LINKs (*Path Link 1:A→B, Path Link 2 B→C* and *Path Link 3: C→D*) in two different directions. The directionality of the path link is indicated by a double arrowhead on the forward end.

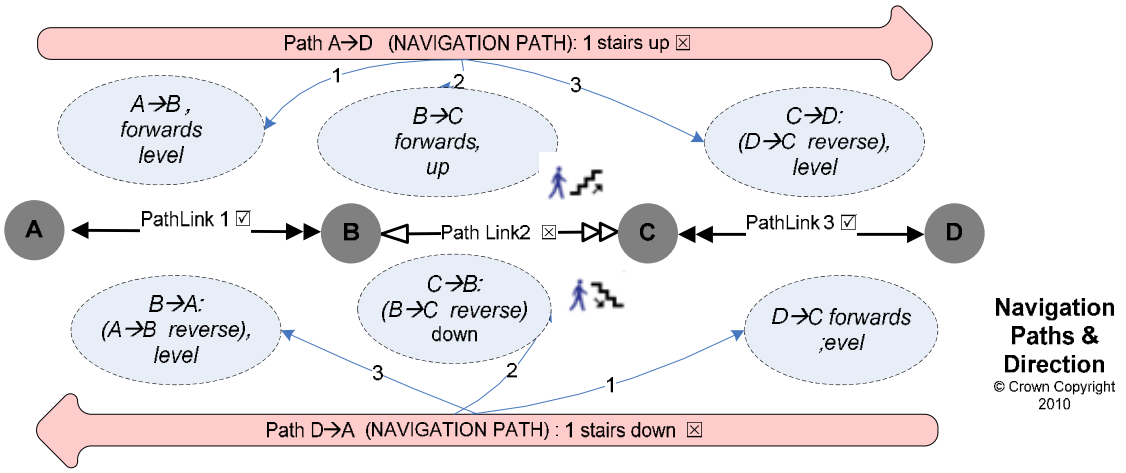


Figure 4-18 – IFOPT Direction of Path Links and Navigation Paths

4.3.3.1XML example of a Navigation Path

The following XML code fragment shows a NAVIGATION PATH from hall to quay using a lift (*Platform 5* to *Platform 6* in the Wimbledon example). It references six PATH LINKs (shown in the subsequent XML fragment below). The NAVIGATION PATH has overall accessibility attributes based on the properties of individual links.

XML fragment for Navigation Path

```
<NavigationPath created="2010-05-17T09:30:47Z" modification="new">
        <Id>tbd:9100WIMBLDN_A1-EE1_to_5n6-acc</Id>
        <AccessibilityAssessment created="2010-05-17T09:30:47Z" >
                <MobilityImpairedAccess>true</MobilityImpairedAccess>
                <limitations>
                        <AccessibilityLimitation>
                                <Id>tbd:9100WIMBLDN_A1-EE1_to_5n6-acc_01</Id>
                                <WheelchairAccess>true</WheelchairAccess>
                                <StepFreeAccess>true</StepFreeAccess>
                                <EscalatorFreeAccess>true</EscalatorFreeAccess>
                                <LiftFreeAccess>false</LiftFreeAccess>
                        </AccessibilityLimitation>
                </limitations>
        </AccessibilityAssessment>
        <features>
                <AccessSummary>
                        <AccessFeatureType>lift</AccessFeatureType>
                        <Count>1</Count>
```

```
                    <Transition>down</Transition>
                </AccessSummary>
        </features>
        <Name>Street to Platform 5 and 6 - Accessible</Name>
        <TypeOfNavigation>hallToQuay</TypeOfNavigation>

        <pathLinksInSequence>
                <PathLinkInSequence order="1">
                    <PathLinkRef>tbd:9100WIMBLDN_lnk_A2-EI1_A2-J2</PathLinkRef>
                    <Description>From Upper Concourse Main Entrance to Path Junction 2</Description>
                    <Reverse>false</Reverse>
                    <Transition>level</Transition>
                </PathLinkInSequence>

                <PathLinkInSequence order="2">
                    <PathLinkRef>tbd:9100WIMBLDN_lnk_A2b-EI5_A2-J2</PathLinkRef>
                    <Description>From Upper Concourse Internal Entrance 5 to Path Junction 2 in upper
concourse</Description>
                    <Reverse>true</Reverse>
                    <Heading>right</Heading>
                    <Transition>level</Transition>
                </PathLinkInSequence>

                <PathLinkInSequence order="3">
                    <PathLinkRef>tbd:9100WIMBLDN_lnk_ A2b-EI5_A2b-J5</PathLinkRef>
                    <Description>From Upper Concourse Lift area Internal Entrance 5 to Path Junction 5 in lift area
</Description>
                    <Reverse>false</Reverse>
                    <Transition>level</Transition>
                </PathLinkInSequence>

                <PathLinkInSequence order="4">
                    <PathLinkRef>tbd:9100WIMBLDN_lnk_A2b-EL2g_A2b-J5</PathLinkRef>
                    <Description>From Upper Concourse Lift Entrance 2 to Path Junction 5 in lift area</Description>
                    <Reverse>true</Reverse>
                    <Heading>left</Heading>
                    <Transition>level</Transition>
                </PathLinkInSequence>

                <PathLinkInSequence order="5">
                    <PathLinkRef>tbd:9100WIMBLDN_lnk_A2b-EL2g_5n6-EL1_by-L2</PathLinkRef>
                    <Description>From Upper Concourse to platform 5 and 6 by Lift </Description>
                    <Reverse>false</Reverse>
                    <Transition>down</Transition>
                </PathLinkInSequence>
        </pathLinksInSequence>
</NavigationPath>
```

Figure 4-19 – XML Example of Navigation Path

XML fragment for Path Links used in Navigation Path

The following XML code fragment shows the single PATH JUNCTION and six PATH LINKs referenced by the NAVIGATION PATH above.

```
<pathJunctions>
        <PathJunction created="2010-05-17T09:30:47Z">
                <Id>tbd:9100WIMBLDN_A2_J2</Id>
                <Name>Branch from main entrance to Rail stairs to 5 and 6</Name>
                <Centroid>
                        <Location>
                                <Longitude>-180</Longitude>
                                <Latitude>-90</Latitude>
                        </Location>
                </Centroid>
                <ParentZoneRef>tbd:9100WIMBLDN_A2</ParentZoneRef>
                <Covered>indoors</Covered>
        </PathJunction>
 </pathJunctions>

<pathLinks>

        <SitePathLink created="2010-05-17T09:30:47Z">
```

```
            <Id>tbd:9100WIMBLDN_lnk_A1-EI1_A2-J2</Id>
            <Name>From Upper Concourse Internal Entrance 1 to lift area to Path Junction 2 in Upper
concourse</Name>
            <AccessibilityAssessment>
                  <MobilityImpairedAccess>true</MobilityImpairedAccess>
                  <limitations>
                        <AccessibilityLimitation
                              <WheelchairAccess>true</WheelchairAccess>
                              <StepFreeAccess>true</StepFreeAccess>
                              <EscalatorFreeAccess>true</EscalatorFreeAccess>
                              <LiftFreeAccess>true</LiftFreeAccess>
                        </AccessibilityLimitation>
                  </limitations>
            </AccessibilityAssessment>
            <Covered>indoors</Covered>
            <From>
                  <PlaceRef>tbd:9100WIMBLDN_A2</PlaceRef>
                  <EntranceRef>tbd:9100WIMBLDN_A2b-EIb2</EntranceRef>
            </From>
            <To>
                  <PlaceRef>tbd:9100WIMBLDN_A2_J2</PlaceRef>
            </To>
            <Distance>5.00</Distance>
            <NumberOfSteps>0</NumberOfSteps>
            <AllowedUse>twoWay</AllowedUse>
            <FromToUpDown>level</FromToUpDown>
            <TransferDuration>
                  <DefaultDuration>PT30S</DefaultDuration>
            </TransferDuration>
            <MaximumFlowPerMinute>200</MaximumFlowPerMinute>
            <LevelRef>tbd:9100WIMBLDN_Lvl_G0</LevelRef>
      </SitePathLink>

      <SitePathLink created="2010-05-17T09:30:47Z">
            <Id>tbd:9100WIMBLDN_lnk_A2b-EIb1_A2-J2</Id>
            <Name>From Upper Concourse Lift area Entrance 5 to Path Junction 2</Name>
            <AccessibilityAssessment>
                  <MobilityImpairedAccess>true</MobilityImpairedAccess>
                  <limitations>
                        <AccessibilityLimitation
                              <WheelchairAccess>true</WheelchairAccess>
                              <StepFreeAccess>true</StepFreeAccess>
                              <EscalatorFreeAccess>true</EscalatorFreeAccess>
                              <LiftFreeAccess>true</LiftFreeAccess>
                        </AccessibilityLimitation>
                  </limitations>
            </AccessibilityAssessment>
            <Covered>indoors</Covered>
            <From>
                  <PlaceRef>tbd:9100WIMBLDN_A2b</PlaceRef>
                  <EntranceRef>tbd:9100WIMBLDN_A2b-EI5</EntranceRef>
            </From>
            <To>
                  <PlaceRef>tbd:9100WIMBLDN_A2_J2</PlaceRef>
            </To>
            <Distance>5.00</Distance>
            <NumberOfSteps>0</NumberOfSteps>
            <AllowedUse>twoWay</AllowedUse>
            <FromToUpDown>level</FromToUpDown>
            <TransferDuration>
                  <DefaultDuration>PT30S</DefaultDuration>
            </TransferDuration>
            <MaximumFlowPerMinute>200</MaximumFlowPerMinute>
            <LevelRef>tbd:9100WIMBLDN_Lvl_G0</LevelRef>
      </SitePathLink>


      <SitePathLink created="2010-05-17T09:30:47Z">
            <Id>tbd:9100WIMBLDN_lnk_A2b-EI5_A2b-J5</Id>
            <Name>From Upper Concourse Lift area Entrance 5 to Lift area Path Junction 5</Name>
            <AccessibilityAssessment>
                  <MobilityImpairedAccess>true</MobilityImpairedAccess>
                  <limitations>
```

```
                        <AccessibilityLimitation
                            <WheelchairAccess>true</WheelchairAccess>
                            <StepFreeAccess>true</StepFreeAccess>
                            <EscalatorFreeAccess>true</EscalatorFreeAccess>
                            <LiftFreeAccess>true</LiftFreeAccess>
                        </AccessibilityLimitation>
                    </limitations>
                </AccessibilityAssessment>
                <Covered>indoors</Covered>
                <From>
                    <PlaceRef>tbd:9100WIMBLDN_A2b</PlaceRef>
                    <EntranceRef>tbd:9100WIMBLDN_A2b-EIb2</EntranceRef>
                </From>
                <To>
                    <PlaceRef>tbd:9100WIMBLDN_A2b_J5</PlaceRef>
                </To>
                <Distance>5.00</Distance>
                <NumberOfSteps>0</NumberOfSteps>
                <AllowedUse>twoWay</AllowedUse>
                <FromToUpDown>level</FromToUpDown>
                <TransferDuration>
                    <DefaultDuration>PT30S</DefaultDuration>
                </TransferDuration>
                <MaximumFlowPerMinute>200</MaximumFlowPerMinute>
                <LevelRef>tbd:9100WIMBLDN_Lvl_G0</LevelRef>
            </SitePathLink>

            <SitePathLink created="2010-05-17T09:30:47Z">
                <Id>tbd:9100WIMBLDN_lnk_A2b-EL2g_5n6-EL1_by-L2</Id>
                <Name>From Upper Concourse Lift Area to Platforms 5 and 6 by lift 2</Name>
                <AccessibilityAssessment>
                    <MobilityImpairedAccess>true</MobilityImpairedAccess>
                    <limitations>
                        <AccessibilityLimitation created="2010-05-17T09:30:47Z">
                            <WheelchairAccess>true</WheelchairAccess>
                            <StepFreeAccess>true</StepFreeAccess>
                            <EscalatorFreeAccess>true</EscalatorFreeAccess>
                            <LiftFreeAccess>false</LiftFreeAccess>
                        </AccessibilityLimitation>
                    </limitations>
                </AccessibilityAssessment>
                <From>
                    <PlaceRef>tbd:9100WIMBLDN_L2</PlaceRef>
                    <LevelRef>tbd:9100WIMBLDN_Lvl_G0</LevelRef>
                    <EntranceRef>tbd:9100WIMBLDN_A2b-EL2g</EntranceRef>
                </From>
                <To>
                    <PlaceRef>tbd:9100WIMBLDN_L2</PlaceRef>
                    <LevelRef>tbd:9100WIMBLDN_Lvl_PL</LevelRef>
                    <EntranceRef>tbd:9100WIMBLDN_5n6_EL1pl</EntranceRef>
                </To>
                <Distance>0</Distance>
                <NumberOfSteps>0</NumberOfSteps>
                <AllowedUse>twoWay</AllowedUse>
                <FromToUpDown>down</FromToUpDown>
                <AccessFeatureType>lift</AccessFeatureType>
                <TransferDuration>
                    <DefaultDuration>PT3M</DefaultDuration>
                    <FrequentTravellerDuration>PT5M</FrequentTravellerDuration>
                    <OccasionalTravellerDuration>PT5M</OccasionalTravellerDuration>
                    <MobilityRestrictedTravellerDuration>PT10M</MobilityRestrictedTravellerDuration>
                </TransferDuration>
                <MaximumFlowPerMinute>200</MaximumFlowPerMinute>
                <checks>
                    <CheckConstraint>
                        <Id>tbd:9100WIMBLDN_lnk_A2b-EL2g_5n6-EL1_by-L2_C1</Id>
                        <validityConditions>
                            <AvailabilityCondition
                                <Id>tbd:Av_openingHrs01</Id>
                                <Description>Opening hours for Station</Description>
                            </AvailabilityCondition>
                        </validityConditions>
                        <CheckProcess>none</CheckProcess>
```

```
                        <CheckService>selfserviceMachine</CheckService>
                        <AccessFeatureType>lift</AccessFeatureType>
                        <Congestion>queue</Congestion>
                        <MinimumLikelyDelay>P1Y2M3DT10H30M</MinimumLikelyDelay>
                        <AverageDelay>P1Y2M3DT10H30M</AverageDelay>
                        <MaximumLikelyDelay>P1Y2M3DT10H30M</MaximumLikelyDelay>
                    </Check>
                </checks>
                <placeEquipments>
                    <LiftEquipment>
                        <Id>tbd:9100WIMBLDN_A2b_L2</Id>
                        <Name>Lift to Platforms 5 and 6</Name>
                        <Width>1.5</Width>
                        <WheelchairTurningCircle>1</WheelchairTurningCircle>
                        <ThroughLoader>false</ThroughLoader>
                        <Automatic>true</Automatic>
                    </LiftEquipment>
                </placeEquipments>
            </SitePathLink>

            <SitePathLink created="2010-05-17T09:30:47Z">
                <Id>tbd:9100WIMBLDN_lnk_A2b-EL2g_A2b-J5</Id>
                <Name>From Upper Concourse Lift Entrance 2 to Lift Area Path Junction 5</Name>
                <AccessibilityAssessment>
                    <MobilityImpairedAccess>true</MobilityImpairedAccess>
                    <limitations>
                        <AccessibilityLimitation
                            <WheelchairAccess>true</WheelchairAccess>
                            <StepFreeAccess>true</StepFreeAccess>
                            <EscalatorFreeAccess>true</EscalatorFreeAccess>
                            <LiftFreeAccess>true</LiftFreeAccess>
                        </AccessibilityLimitation>
                    </limitations>
                </AccessibilityAssessment>
                <Covered>indoors</Covered>
                <From>
                    <PlaceRef>tbd:9100WIMBLDN_A2b</PlaceRef>
                    <EntranceRef>tbd:9100WIMBLDN_A2b-EL2g</EntranceRef>
                </From>
                <To>
                    <PlaceRef>tbd:9100WIMBLDN_A2b_J5</PlaceRef>
                </To>
                <Distance>5.00</Distance>
                <NumberOfSteps>0</NumberOfSteps>
                <AllowedUse>twoWay</AllowedUse>
                <FromToUpDown>level</FromToUpDown>
                <AccessFeatureType>confinedSpace</AccessFeatureType>
                <TransferDuration>
                    <DefaultDuration>PT30S</DefaultDuration>
                </TransferDuration>
                <MaximumFlowPerMinute>200</MaximumFlowPerMinute>
                <LevelRef>tbd:9100WIMBLDN_Lvl_G0</LevelRef>
            </SitePathLink>
        </pathLinks>
```

Figure 4-20 – XML Example of Navigation Path PathLinks

4.4 Use of IFOPT with partial data

The IFOPT / NeTEx Model is designed so that the same data model may be used for an initial data set that is only partially populated, say just with basic stop names and locations, and for a fully populated data set that has all stop details including detailed PATH LINKs and EQUIPMENT. This allows for the incremental development of data sets over time. Different degrees of population enable different levels of function:

1. **Point**: Just the entrance and the platform is populated, implicit navigation paths can be inferred between entrance and platform, but accessibility may be unknown (Capability Level0).
2. **Structural/Geospatial**: Summary level accessibility is defined (Capability Level2) the rooms and platforms are identified and located in space, but the exact topology is not specified.

3. **Topological:** The rooms and platforms are identified and located in space, exact path links are provided through the interchange, with entrances and accessibility attributes all identified. (Capability Level3, Level5, Level6).

Figure 4-21, Figure 4-22 and Figure 4-23 illustrate this. Figure 4-21 shows a barebones description of a station as just an ENTRANCE and a platform i.e. QUAY. The QUAY might be additionally tagged with accessibility data to show for example that it can be reached without use of stairs or without use of lifts.

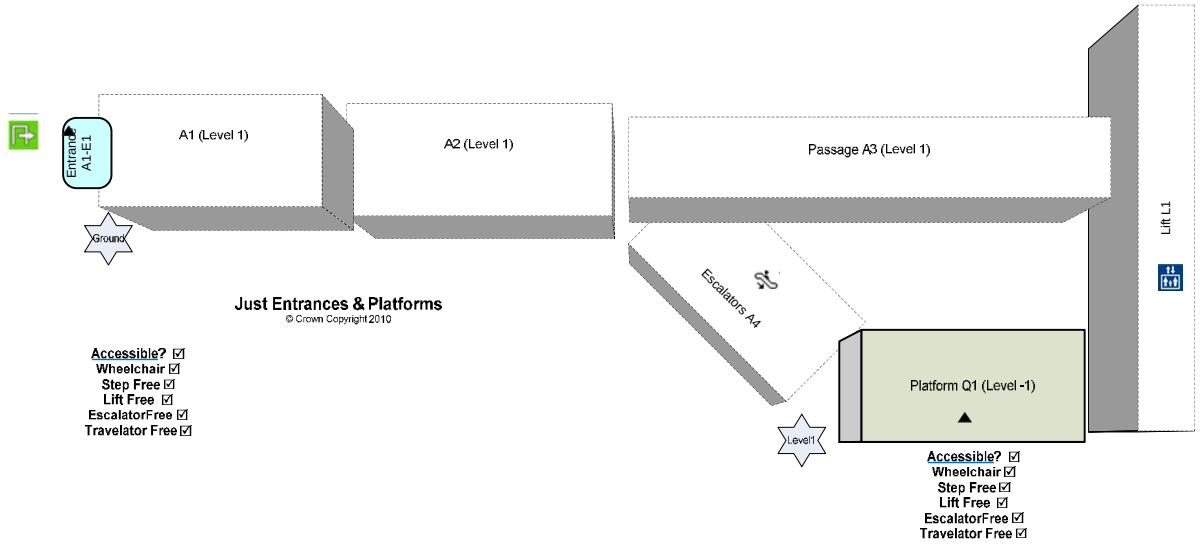


Figure 4-21 – Detail 1: Populating with Entrances and Quays only

Figure 4-22 shows in addition a summary level NAVIGATION PATH that indicates the accessibility of the platform regardless of route. In this case the NAVIGATION PATH is used at a summary level without detailed PATH LINKs.

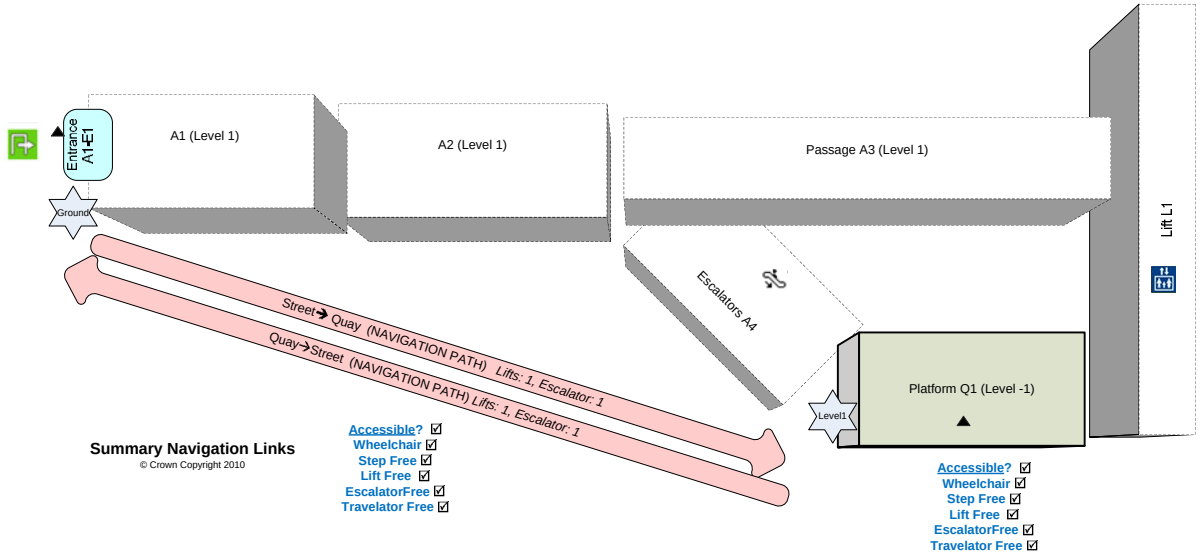


Figure 4-22 – Detail 2: Populating with summary navigation paths

Figure 4-23 shows the same station more fully populated with PATH LINKs and separately routed NAVIGATION PATHs for different accessibility conditions (*Lift free, Step free* etc).

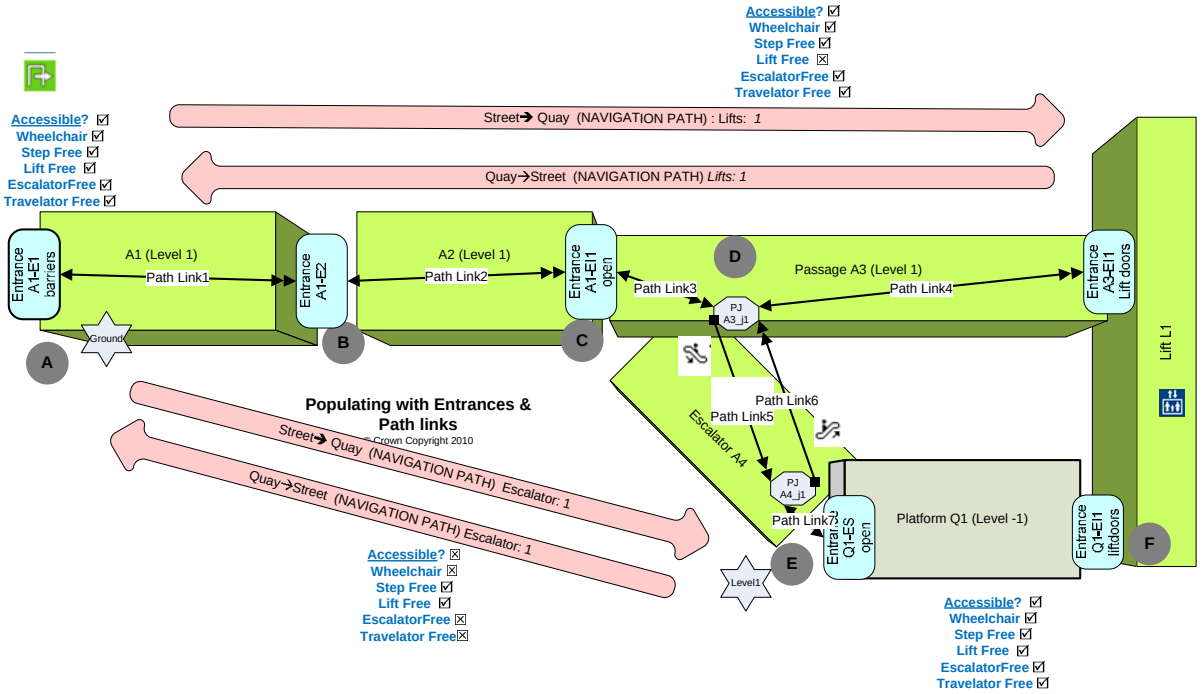


Figure 4-23 – Detail 3: Populating with links and branch points

4.5 NeTEx Stop Assignment

Historically there has been some confusion in transport models between *a stop as identified in the timetable* (a logical construct, for example, that a timetabled service going in a particular direction stops at a station at a particular time regardless of platform); *a stop as a physical point* (i.e. an actual pole beside the road, or platform within a station), and the *stop as a point on a line regardless of a timetable or direction (*for example, a rail or metro station, or a pair of physical stops either side of a road on a bus route that are depicted as being a single "stop" on a route map).
Figure 4-24 attempts to convey this distinction by showing the same three stops (a) as points on a line; (b) as the stops of some journeys of a timetable; and (c) as physical points at which the vehicles may visit.

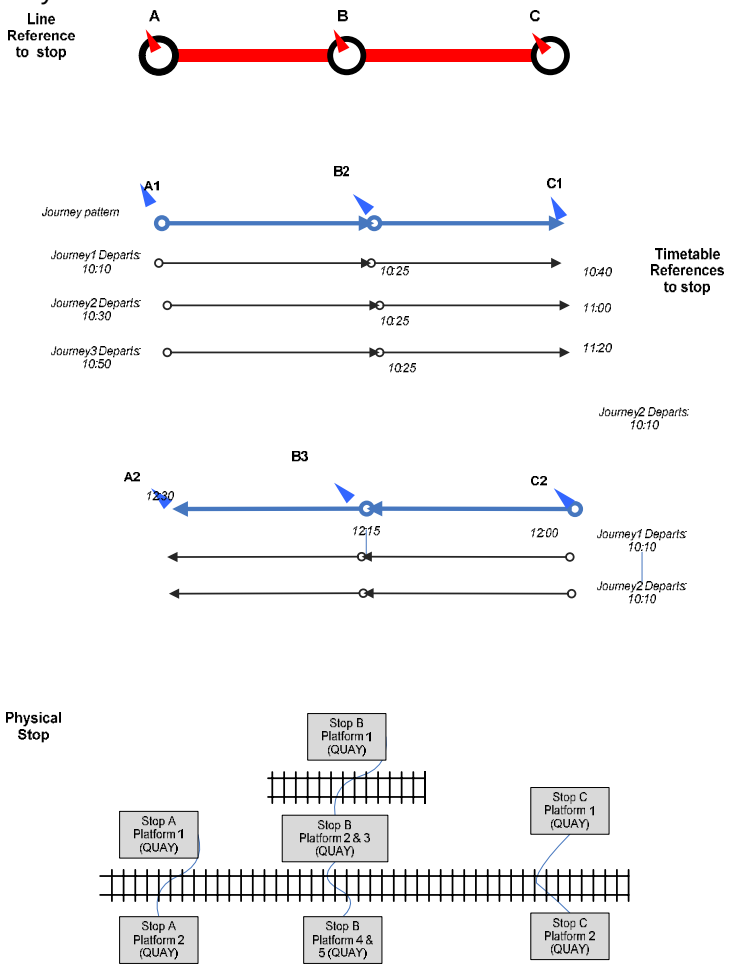


Figure 4-24 – Stops as places and in the timetable

IFOPT clarifies these various possible relationships. It represents the logical stop in the timetable as a distinct concept, the SCHEDULED STOP POINT. It represents the physical point of access as a QUAY i.e. platform or pole. It adds a STOP PLACE as a named representation of a physical interchange that may group QUAYs - for example a station, or a pair of bus stops on a street with the same name. Then to associate a timetable or real-time data for a particular service with a physical stop, IFOPT uses the concept of a STOP ASSIGNMENT, which associates a SCHEDULED STOP POINT with a STOP PLACE. An assignment can be just to the whole station (STOP PLACE), or to a specific platform (QUAY) within the station (thus allowing for detailed platform allocation and also platform changes).

In the trivial case where the SCHEDULED STOP POINT has the same identifier as the STOP PLACE or QUAY, the assignment can be implicit (i.e. because they have the same codes, the association between the SCHEDULED STOP POINT and the QUAY or STOP PLACE can be inferred). In other cases, where the code is different an explicit assignment needs to be used.

There can potentially be multiple assignments of the same STOP PLACE.

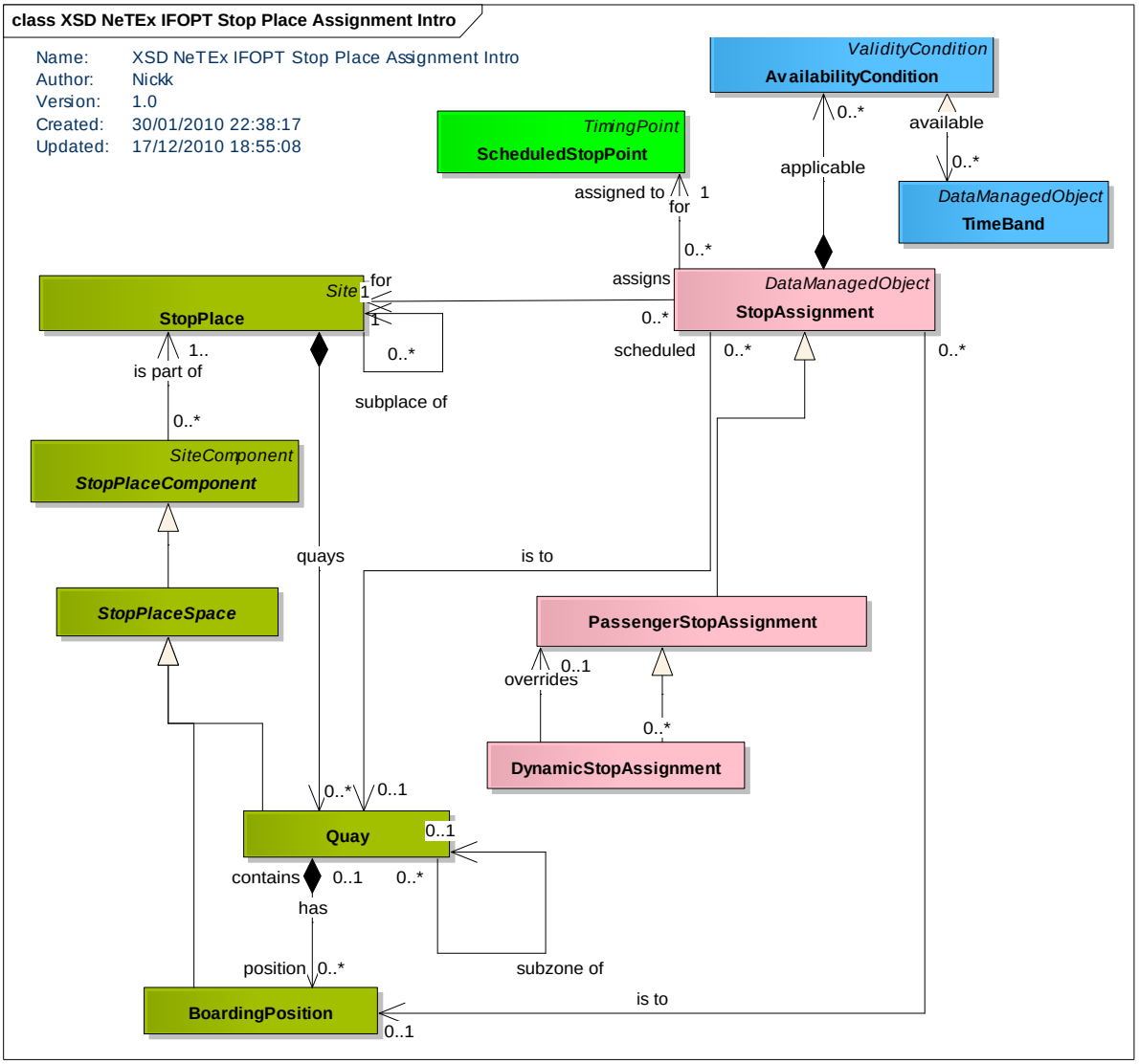


Figure 4-25 – UML Diagram of Stop Assignment: UML Model summary

➔ **UK NOTE:** Most current *NaPTAN* stop assignments for bus are implicit – the same code is used for the SCHEDULED STOP POINT and the QUAY.

For Rail and Metro, the explicit stop assignments are in effect currently described in the *NaPTAN* data set by the *NaPTAN annotated references.* For example for rail stations ***AnnotatedRailRef (***which holds TIPLOCS and CRS codes for the NaPTAN point***)***, for metro stations ***AnnotatedMetro-Ref***, etc, elements. These can be used to translate the codes used to reference the stop in the timetable to the NaPTAN equivalents. For example, for rail, one can use the CRS code to create a corresponding STOP ASSIGNMENT: so that the *'WIM'* SCHEDULED STOP POINT is assigned to 9100WIMBLEDON *'Wimbledon'*. . However a further platform level stop assignment would be needed to state more specifically that a train will stop at say *Platform 3* within the Wimbledon stop place.

Most UK rail and metro stop identifier actually encode the identifier SCHEDULED STOP POINT in the NaPTAN code so that that one may be derived from the other without an explicit assignment.

The NaPTAN stop type of a variable bay corresponds to a STOP ASSIGNMENT – a DYNAMIC STOP ASSIGNMENT can be used to assign to a variable bay to a specific bay.

4.5.1 Example of a Stop Assignment

Figure 4-26 shows some of the PASSENGER STOP ASSIGNMENTs for the Wimbledon Example. The Tram Link and bus stop SCHEDULED STOP POINTs correspond to specific QUAYs. The Rail SCHEDULED STOP POINTs correspond to the STATION as a whole (but could potential be assigned in more detail to a specific platform, i.e. QUAY within the station.

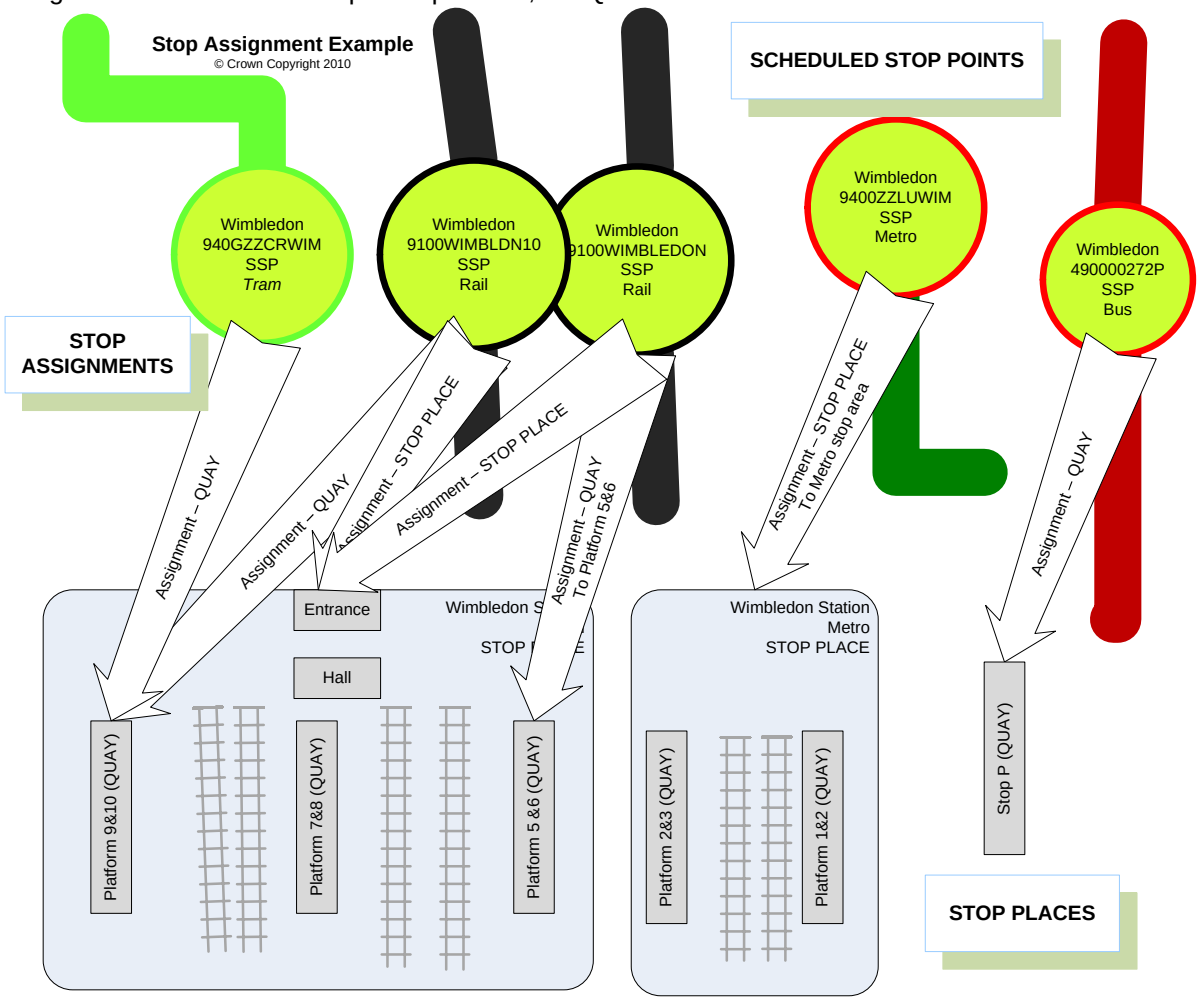


Figure 4-26 – Some Stop Assignments for the Wimbledon example

4.5.2 XML Example of a Stop Assignment

The following XML code fragment shows several PASSENGER STOP ASSIGNMENTs for a rail station.

The first example assigns a second train timetable reference i.e. SCHEDULED STOP POINT for the station (‘*napt:9100WIMBLDN10*’) that has a different code from that of STOP PLACE for the station *(‘napt:9100WIMBLDN’*).

```
<PassengerStopAssignment>
        <Id>tbd:wimass_01</Id>
        <Description>Rail Assignment</Description>
        <StopPlaceRef>napt:9100WIMBLDN</StopPlaceRef>
        <ScheduledStopPointRef>9100WIMBLDN10</ScheduledStopPointRef>
</PassengerStopAssignment>
```

The second example assigns a rail SCHEDULED STOP POINT to a specific platform i.e. QUAY of the rail station.

```
<PassengerStopAssignment>
```

```
        <Id>tbd:wimass_02</Id>
        <Description>Rail Assignment of n9100WIMBLDN10 to platform 5 and 6 </Description>
        <StopPlaceRef>napt:9100WIMBLDN</StopPlaceRef>
        <QuayRef>napt: 9100WIMBLDN5n6</QuayRef>
        <ScheduledStopPointRef>n9100WIMBLDN10</ScheduledStopPointRef>
</PassengerStopAssignment>
```

The third example assigns a Tram SCHEDULED STOP POINT to one of the rail platforms of the rail station STOP PLACE.

```
<PassengerStopAssignment>
        <Id>tbd:wimass_03</Id>
        <Description>Tram Assignment</Description>
        <StopPlaceRef>napt:9100WIMBLDN</StopPlaceRef>
        <QuayRef>napt:9100WIMBLDN10</QuayRef>
<ScheduledStopPointRef>napt:9400ZZCRWIM</ScheduledStopPointRef>
</PassengerStopAssignment>
```

Figure 4-27 – XML Example of Stop Assignment

4.6 NeTEx Transfers, Access and Connections

NeTEx can describe the general connectivity of places and sites. Figure 4-28 shows three different types of TRANSFER, each connecting two points:

1. ACCESS – the possibility of a transfer between any two points or places. This can be used to state the best STOP PLACE to use to reach a particular a POINT of INTEREST or other distinct SITE.
2. CONNECTION – The possibility of making a connection between two SCHEDULED STOP POINTs or STOP AREAs. Used to define allowed points of connection between public transport access points.
3. SITE CONNECTION – The possibility of making a connection between two SITE / SITE COMPONENTs and / or SCHEDULED STOP POINTs and STOP AREAs. Used to define points of connection between areas of a SITE for reaching public transport.

In addition, as shown earlier in (Figure 4-15), a NAVIGATION PATH indicates the existence of a path between two points and can include an overall transfer time..

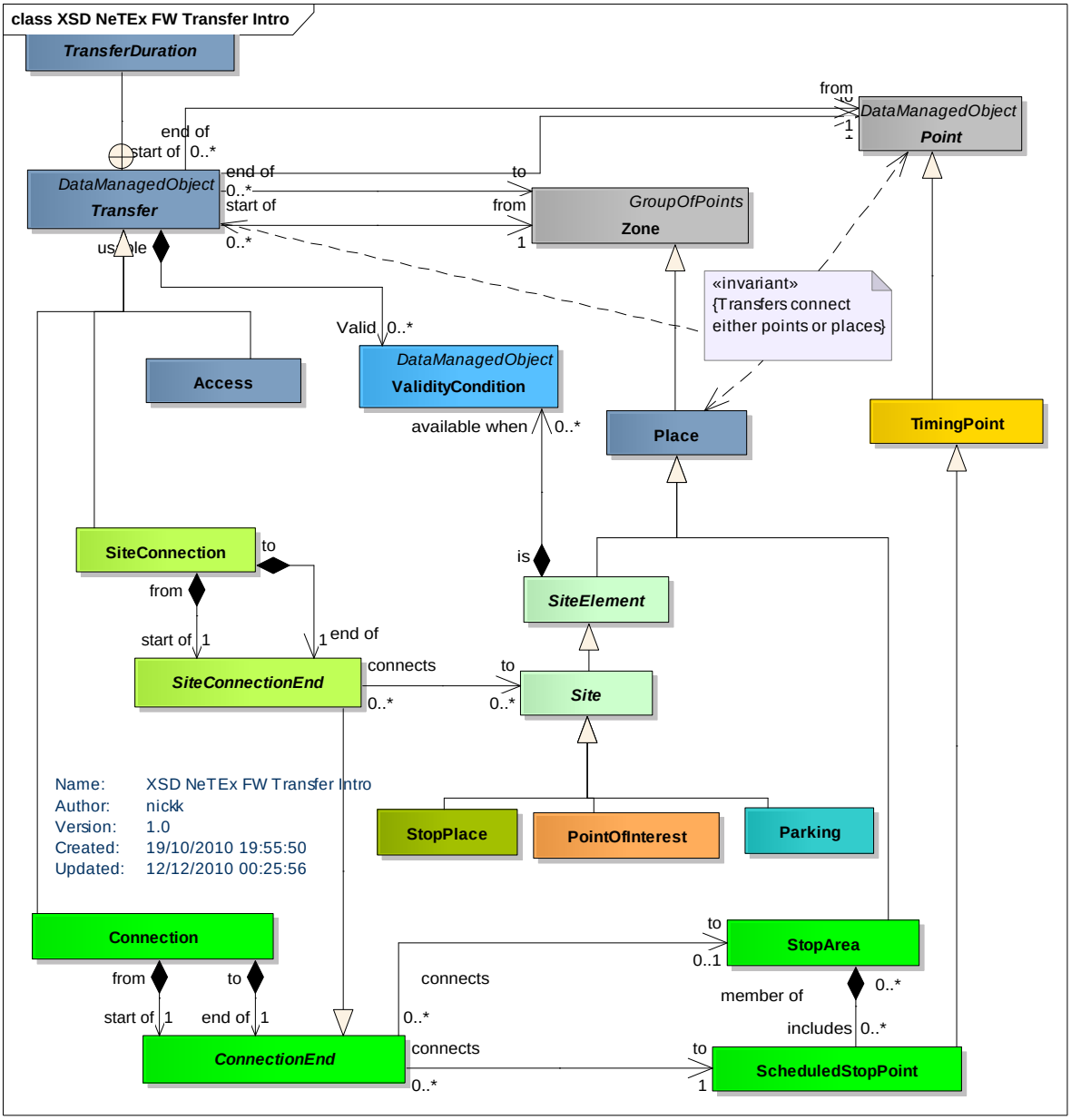


Figure 4-28 – UML Diagram of Access and Connections

4.6.1 NeTEx Connections and Transfer times

Most journey planners allow transfer times for an interchange to be specified to some degree – usually as default exchange times to use either all or at a specific station. The CEN *NeTEx* model allows a set of TRANSFER DURATIONs for journey planning to be exchanged with successive levels of precision: for example:

1. ACCESS –a default time for making it between two sites – this will be regardless of the time needed to reach a particular point within a large site. This can be used to state the average time needed to reach a POINT of INTEREST or other distinct SITE.
2. DEFAULT CONNECTION –a default time for a transfer between modes on any SITE in a region (which might be the whole country), to be used if there is no more specific value for the site. This may be specific to an OPERATOR.
3. CONNECTION –a default time for a transfer between two SCHEDULED STOP POINTs or STOP AREAs. **This allows logical connections in the timetable to be computed independently of a STOP PLACE model**, for example, '*King's Cross to St Pancras International*'.

- A CONNECTION can also be used to state an average contingency time to change at a given interchange regardless of the actual point to point transition – by making the 'from' and the 'to' SCHEDULED STOP POINTs the same. (Some journey planners support only this level of precision).
- A CONNECTION can also be used to state an average contingency time to change at a given interchange between any two modes regardless of the actual point to point transition – by using the 'from' and the 'to' SCHEDULED STOP POINTs for the respective modes.

4. SITE CONNECTION –a default time for a transfer between a part of a SITE (which may also correspond to a SCHEDULED STOP POINTs or STOP AREAs).

In addition a third level of precision is possible:

5. A NAVIGATION PATH may state a transfer time for using a specific path to make a transfer between two physical points within the context of a SITE. For example '*District Line Platform 1 to Tramlink Platform 10'* via lift, allowing a very detailed calculation of journey times for a specific accessibility constraint if desired.

    - Each PATH LINK may have a TRANSFER DURATION specified on it.
    - A NAVIGATION PATH may have a total TRANSFER DURATION – this should be the sum of the individual links if present.
    - There can be more than one NAVIGATION PATH between the same points with different times.
    - A NAVIGATION PATH may reference an ACCESS or CONNECTION for which it provides more detailed information. Several different NAVIGATION PATHs may be associated with the same CONNECTION, representing alternative paths.

CONNECTION times are typically created as part of tactical planning of routes and timetables. NAVIGATION PATH times are derived from a bottom up assessment of the Physical STOP PLACE. The following should be emphasized:

> **CONNECTION transfer times relate to the timetabled connection times (and can be used without reference to actual platforms). NAVIGATION PATH transfer times relate to the known times to traverse between the physical stop. Whilst these may be the same, they are not necessarily so.**

➔ **UK Note:** Current UK standards do not cover the exchange of these values, though they are used in some journey planners.

The DIVA model in effect provides connection times.

4.6.2 UML Diagram of connections

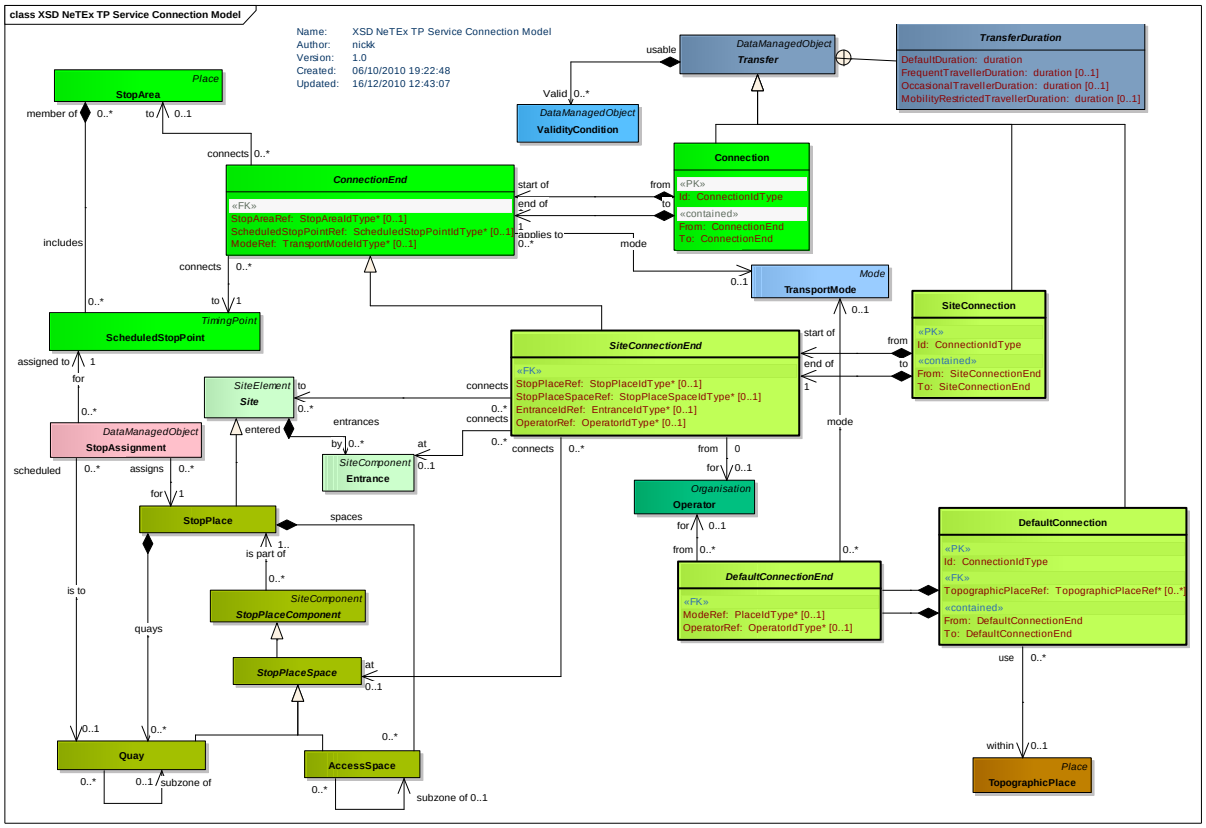


Figure 4-29 – UML Diagram of Connections

4.6.3 Example of Transfer Times

Figure 4-30 attempts to show the use of the different Transfer Times with an example based on [WIM-2010]. In the top half of the diagram are SCHEDULED STOP POINTs and CONNECTION LINKs. There are in fact two separate rail SCHEDULED STOP POINTs for Wimbledon. In the bottom half of the model some of the QUAYs, PATH LINKs (simplified) and a few NAVIGATION paths.

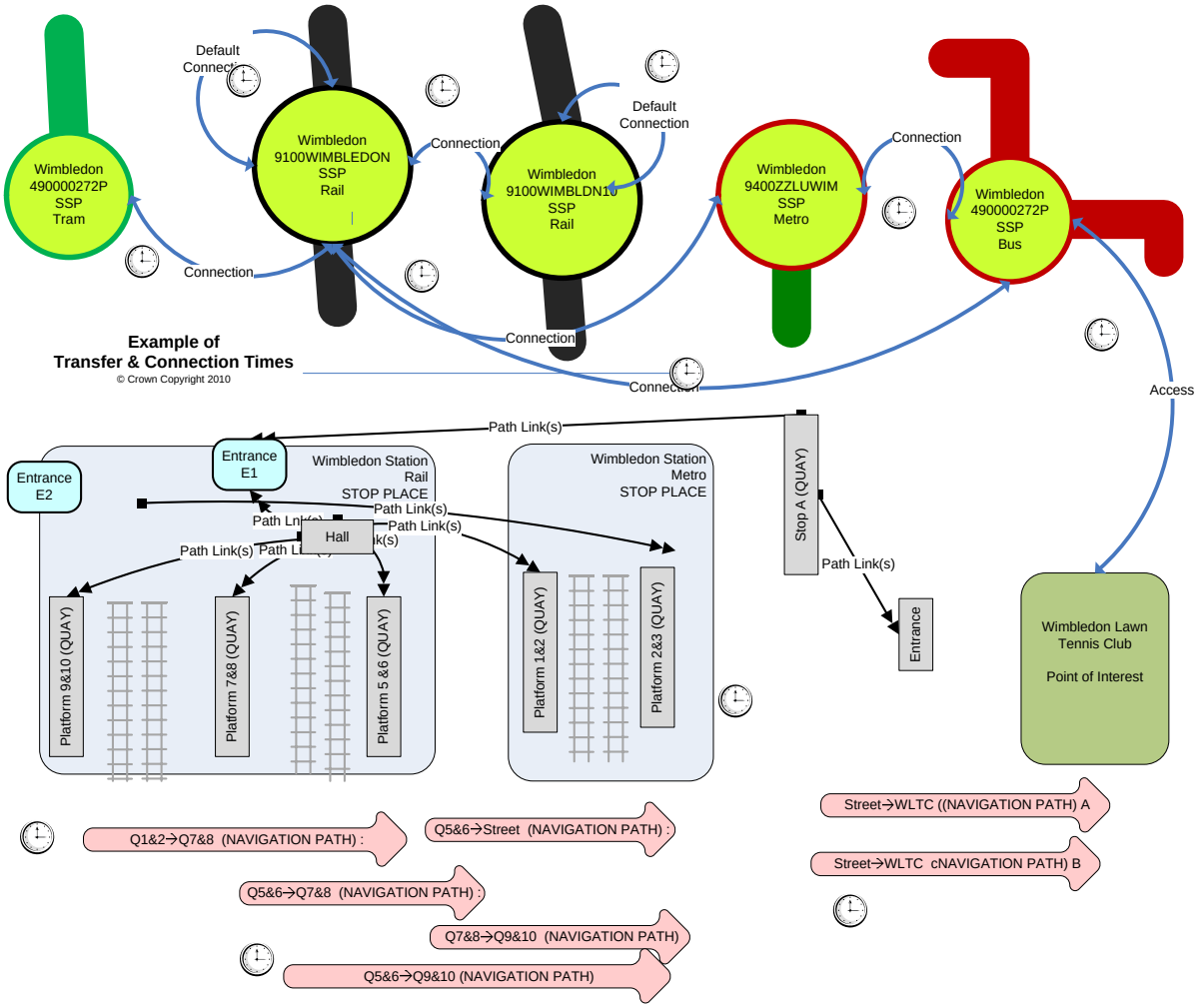


Figure 4-30 – Example of Transfer and connection times

4.6.4 Types of Transfer times

Up to four different transfer times may be specified in a given TRANSFER DURATION, though it is usually sufficient to have a single time and to use weighting factors to derive the others.

Value	Definition	
DefaultDuration	Default average transfer time	Always
FrequentTravellerDuration	Transfer time for a traveller familiar with the interchange	
OccasionalTravellerDuration	Transfer time for a traveller unfamiliar with the interchange	
MobilityRestrictedTravellerDuration	Transfer time for a mobility impaired traveller	

Table 4-4 – Transfer times in a TRANSFER DURATION

Two sets of times of travel times are available

- A default set to use for journey planning.
- An additional set to use for walk times, if different from the journey planning set.

➔ **UK Note:** UK practice is to use a single time – the Default Duration and to use weighting factors to derive the others.

In the MDV dataset is equivalent to NAVIGATION PATH time between SPACES and QUAYs (The Parent Quay is used

4.6.5 Transfer times between Places

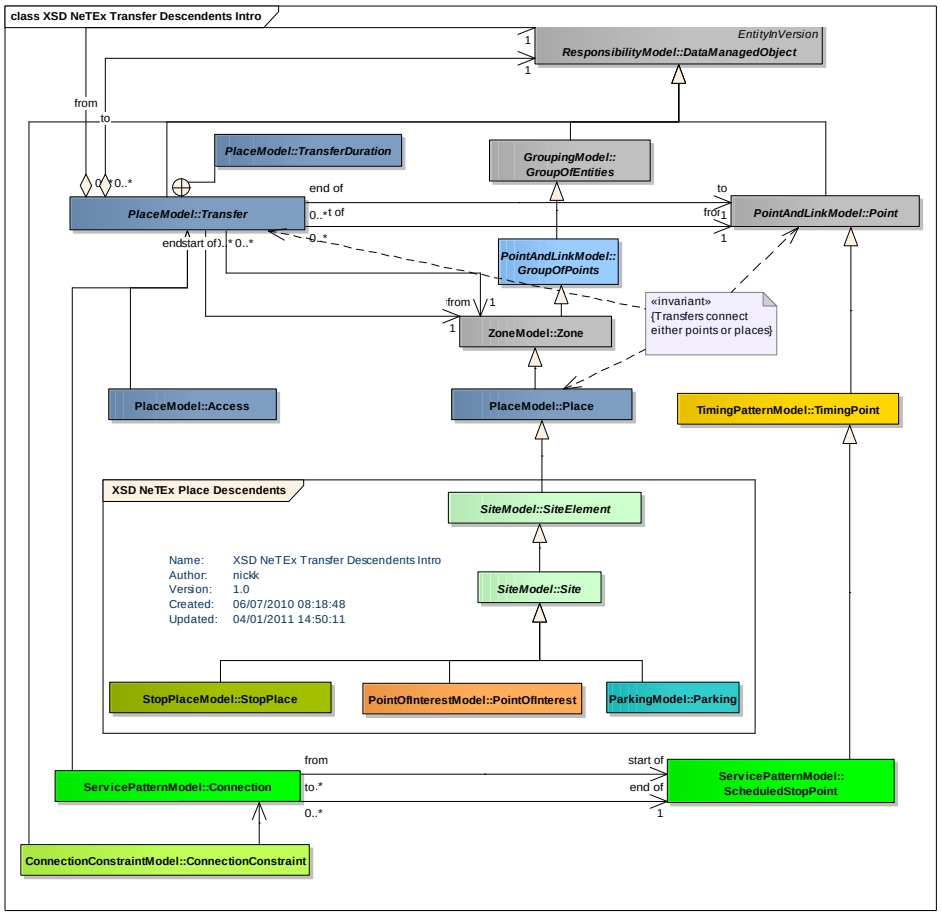


Table 4-5 – UML Diagram of Transfer times

4.6.6 Transfer times between Site components

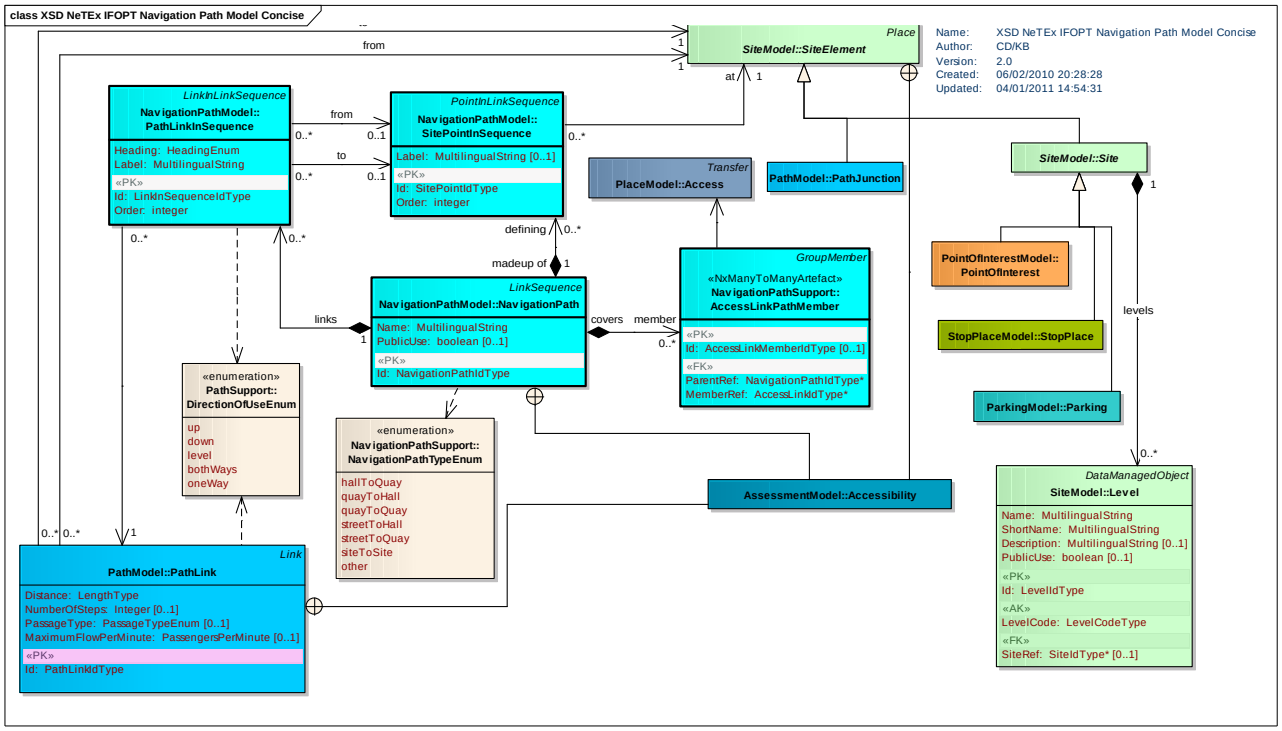


Figure 4-31 – UML Diagram of Site components with Access times

4.6.7 Data Examples of Transfer times within a Station

Table 4-6 (Courtesy of SELTA) lists the nodes used to represent Wimbledon in DIVA. Table 4-7 shows a connection to the nearby but distinct stop pair on Alexandra Road. These nodes correspond to most of the NaPTAN points, with the addition of some additional nodes that allow the description of a basic topology of the station for making transfers. The table has a level and the relation to a TOID in a mapping system.

Type	Area	Point	Name1	Name2	Ext Name	Coord	(OSGR)	GeoRef	Usage	Lvl
Area	1		Bus	Bus	490G00272P	524830	170614	25421942	Entrance and PT	0
Point	C		WIMBLEDON STATION (SW19)	490000272C		524805	170643	25489596+		
Point	D		WIMBLEDON STATION (SW19)	490015472D		524883	170618	25422046+		
Point	L		WIMBLEDON STATION (SW19)	490015472L		524798	170556	25503472+		
Point	P		WIMBLEDON STATION (SW19)	490000272P		524777	170609	25489596+		
Area	2		Tram	Croydon Tramlink	9400ZZCRWMB1	524839	170650	2006005249	Only PT	-1
Point		20026		WMB SN	524837	170651		2006005249+		
Area	3		MAIN	MAIN STATION ENTR	490000272003	524777	170639	25489596	Entrance and B+R	0
Area	4		Under	Underground	9400ZZLUWIM1	524793	170673	2006005082	Only PT	-1

Point		86386	Wimbledon			524793	170673	2006005082+		
Area	5		BookH	Booking	Hall	524787	170649	1999503402	Mezzanine	0
Area	6		RPL-R	RPL >RaynesPark	9100WDON1	524825	170680	1999503402	Only PT	-1
Area	7		RPL-S	RPL->Sutton	9100WIMBLDN1	524836	170670	1999502965	Only PT	-1

Table 4-6 – Wimbledon nodes in DIVA (SELTA database)

#	Type	Stop	Name	PlaceId	PlaceName				
1	connected	19043	Wimbledon,	St	Georges	Road	(SW19)	31117132	Wimbledon

Table 4-7 – Wimbledon nodes in DIVA (SELTA database) - Bus

The nodes are then connected with a “Footpath matrix” of point-to-point transfers between nodes, including transfer times that can be used when planning a journey. There can be separate transfers by Lift, Stairs**,** or that are Step free. These in effect define a set of topological links between nodes.

From	Stop	272	272	272	272	272	272	272	19043
To	Area	1	2	3	4	5	6	7	
Stop	Area	Name	Bus	Tram	MAIN	Under	BookH	RPL-R	RPL-S
272	1	Bus	2.0	4.0	1.0	4.0	2.0	5.0	5.0
272	2	Tram	4.0	2.0	3.0	4.0	2.0	5.0	5.0
272	3	MAIN	1.0	3.0	3.0	1.0	4.0	4.0	
272	4	Under	4.0	4.0	3.0	2.0	2.0	5.0	5.0
272	5	BookH	2.0	2.0	1.0	2.0	3.0	3.0	
272	6	RPL-R	5.0	5.0	4.0	5.0	3.0	6.0	6.0
272	7	RPL-S	5.0	5.0	4.0	5.0	3.0	6.0	6.0
19043	0	5.0	7.0	4.0	7.0	5.0	8.0	8.0	

When using the TfL Journey Planner, any or all of four accessibility limitations

4.6.8 XML Examples of Transfer Times

4.6.8.1XML Example of Default Transfer Times for a Stop Place

The following XML code fragment of a CONNECTION shows an example of a default TRANSFER DURATION at a SCHEDULED STOP POINT regardless of platform - the ‘from’ and ‘to’ points are the same.

```
<Connection>
    <Id>tbd:wimcon_01</Id>
    <FromPointRef>910GWIMBLDN</FromPointRef>
    <ToPointRef>910GWIMBLDN</ToPointRef>
    <Name>Default transfer duration for Wimbledon</Name>
    <TransferDuration>
        <DefaultDuration>PT5M</DefaultDuration>
        <FrequentTravellerDuration>PT2M</FrequentTravellerDuration>
        <OccasionalTravellerDuration>PT5M</OccasionalTravellerDuration>
        <MobilityRestrictedTravellerDuration>PT15M</MobilityRestrictedTravellerDuration>
    </TransferDuration>
</Connection>
```

Figure 4-32 – XML Example of Default Transfer times

4.6.8.2XML Example of Default Transfer Times between two points

The following XML code fragment shows an example of a default TRANSFER DURATION for transferring between a tram SCHEDULED STOP POINT and a tube SCHEDULED STOP POINT.

```
<Connection>
```

```
        <Id>tbd:wimcon_01</Id>
        <FromPointRef>napt:9400ZZCRWIM</FromPointRef>
        <ToPointRef>mapt:9940GZZLUWIM</ToPointRef>
        <Name>Default transfer duration for Wimbledon between tram and Tube</Name>
        <TransferDuration>
            <DefaultDuration>PT8M</DefaultDuration>
            <FrequentTravellerDuration>PT4M</FrequentTravellerDuration>
            <OccasionalTravellerDuration>PT8M</OccasionalTravellerDuration>
            <MobilityRestrictedTravellerDuration>PT19M</MobilityRestrictedTravellerDuration>
        </TransferDuration>
    </Connection>
```

Figure 4-33 – XML Example of Transfer Times between two points

4.6.8.3XML Example of Navigation Path specific Transfer Time

The following XML code fragment shows an example of a NAVIGATION PATH with a summary TRANSFER DURATION set. The times this should be derived from the sum of it's the times of the individual PATH LINKs.

```
    <NavigationPath created="2010-05-17T09:30:47Z" modification="new">
        <Id>tbd:9100WIMBLDN_5n6_to_7n8-acc</Id>
        <AccessibilityAssessment created="2010-05-17T09:30:47Z">
            <MobilityImpairedAccess>true</MobilityImpairedAccess>
            <limitations>
                <AccessibilityLimitation created="2010-05-17T09:30:47Z" modification="new">
                    <Id>tbd:9100WIMBLDN_5n6_to_7n8-acc_01</Id>
                    <WheelchairAccess>true</WheelchairAccess>
                    <StepFreeAccess>true</StepFreeAccess>
                    <EscalatorFreeAccess>true</EscalatorFreeAccess>
                    <LiftFreeAccess>false</LiftFreeAccess>
                </AccessibilityLimitation>
            </limitations>
        </AccessibilityAssessment>
        <features>
            <AccessSummary>
                <AccessFeatureType>lift</AccessFeatureType>
                <Count>1</Count>
                <Transition>down</Transition>
            </AccessSummary>
        </features>
        <TransferDuration>
            <DefaultDuration>PT5M</DefaultDuration>
            <MobilityRestrictedTravellerDuration>PT10<</MobilityRestrictedTravellerDuration>
        </TransferDuration>
        <Name>Platform 5 and 6 to Platform 7 and 8 - Accessible</Name>
        <TypeOfNavigation>quayToQuay</TypeOfNavigation>
        <pathLinksInSequence>
            <PathLinkInSequence order="1">


            <SitePathLink created="2010-05-17T09:30:47Z">
                <Id>tbd:9100WIMBLDN_lnk_A2b-EI5_A2-J2</Id>
                <Name>From Upper Concourse Lift area Entrance EI1 to Path Junction
2</Name>
                <Covered>indoors</Covered>
                <From>
                    <PlaceRef>tbd:9100WIMBLDN_A2b</PlaceRef>
                    <EntranceRef>tbd:9100WIMBLDN_A2b_EI5</EntranceRef>
                </From>
                <To>
                    <PlaceRef>tbd:9100WIMBLDN_A2_J2</PlaceRef>
                </To>
                <Distance>5.00</Distance>
                <NumberOfSteps>0</NumberOfSteps>
                <AllowedUse>twoWay</AllowedUse>
                <FromToUpDown>level</FromToUpDown>
                <AccessFeatureType>confinedSpace</AccessFeatureType>
                <TransferDuration>
                    <DefaultDuration>PT30S</DefaultDuration>
                </TransferDuration>
```

```
                    <LevelRef>tbd:9100WIMBLDN_Lvl_G0</LevelRef>
                </SitePathLink>
```

Figure 4-34 – XML Example of Transfer Times on a Navigation Path

4.7 NeTEx Accessibility

NeTEx supports a detailed description of the accessibility of a SITE for both computable and browsing/navigation uses.

- For **computable** use the data can be used by a journey planner when calculating a journey that meets a given set of user criteria, for example, both to choose stations or paths that are wheelchair accessible when planning a point-to-point journey and to direct a user to the entrances and exits most suitable according to their needs.
- For **browsing/navigation** use the data can be used to show the exact properties of a given interchange so that a user may rehearse a trip ahead of making it and make their own judgement as to the best path through an interchange..

If one is aiming to journey plan across systems then one needs to use a uniform set of summary assessment criteria for the end-to-end journey planning to establish possible routes of an equivalent level of accessibility – and *NaPTAN-X* proposes these.

4.7.1.1Types of Accessibility information

To describe accessibility, *NeTEx* models as separate and distinct aspects: (a) the description of the USER'S NEEDs – for example *wheelchair, hearing impaired, vision impaired, lift-averse* etc; and (b) the ACCESSIBILITY LIMITATION, i.e. description of the limitations of a SITE ELEMENT to support a specific need, for example *Wheelchair, Step free, Escalator free, Lift free* – the last two also corresponding to some cognitive aversions (e.g. claustrophobia..

In addition, further information relevant for detailed accessibility is contained on many of the different EQUIPMENT elements – See Table 4-11 later below. For example, Lift dimensions and controls, Step heights , handrails and the number of steps in a staircase, Ramp gradients, whether barriers are wheelchair passable, etc.

4.7.2 *NeTEx* Accessibility

The accessibility of SITE components is described using an ACCESSIBILITY ASSESSMENT: this allows any SITE COMPONENT to be described both in terms of suitability for specific USER NEEDs (using a SUITABILITY element) and in terms of LIMITATIONs. USER NEEDs allow a richer description.

➔***UK Note***: For simplicity, only LIMITATIONs are used to describe ACCESSIBILITY ASSESSMENT of a STOP PLACE in JourneyWeb. **Not** SUITABILITies Thus matching is done directly see below.

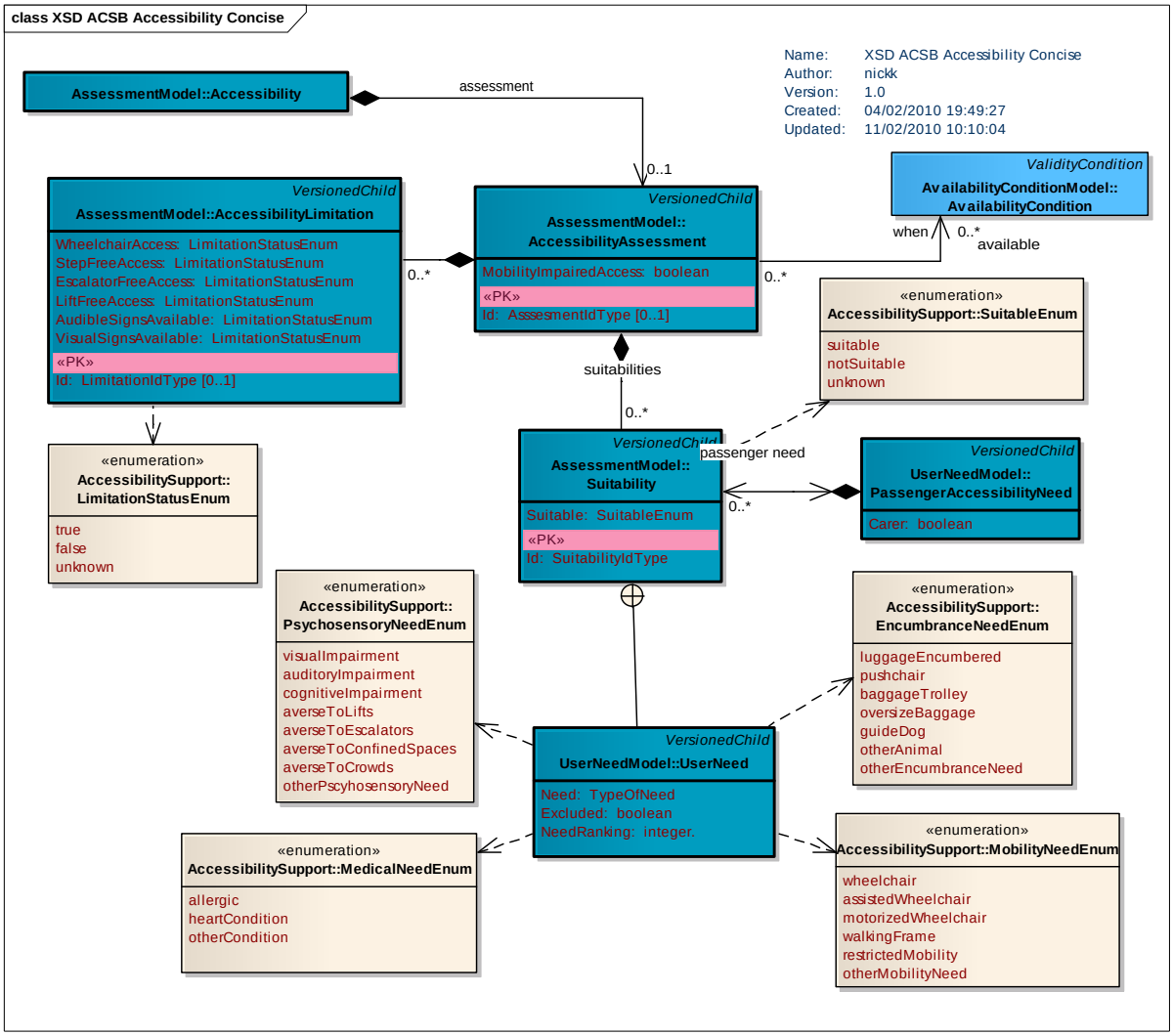


Figure 4-35 – UML Diagram of Accessibility elements

4.7.2.1Associating Accessibility Assessments with Site Components

IFOPT allows accessibility criteria to be associated with both SITE COMPONENTS, PATH LINKs and NAVIGATION PATHs – see Figure 4-36.

In order to be able to search for the optimum path for a given set of user accessibility needs it is desirable to specify accessibility data at the most detailed level – on every PATH LINK and QUAY and ACCESS SPACE within a SITE. However in order to provide efficient journey planning it is helpful to summarise at various levels. Thus for example, if all the QUAYs of a STOP PLACE are wheelchair accessible, the STOP PLACE may be marked as wheelchair accessible; if all the PATH LINKs of a NAVIGATION PATH are accessible, then the whole NAVIGATION PATH can be marked as accessible; or if there is at least one wheelchair accessible NAVIGATION PATH between two QUAYs, then the CONNECTION can be marked as accessible.
Summarisation can in principle be derived automatically from the bottom up by looking at the EQUIPMENT and other properties of PATH LINKs and SITE COMPONENTs. For example if a PATH LINK in a NAVIGATION PATH involves the use of a *Lift,* then the PATH should be flagged as ***not*** *LiftFree*.

- Nested QUAYs and ACCESS PLACEs must always be on the same level as their parent and can be assumed to have the same accessibility assessment.

➔UK NOTE: All QUAYs, ACCESSes, Path LINKs should be flagged with an accessibility

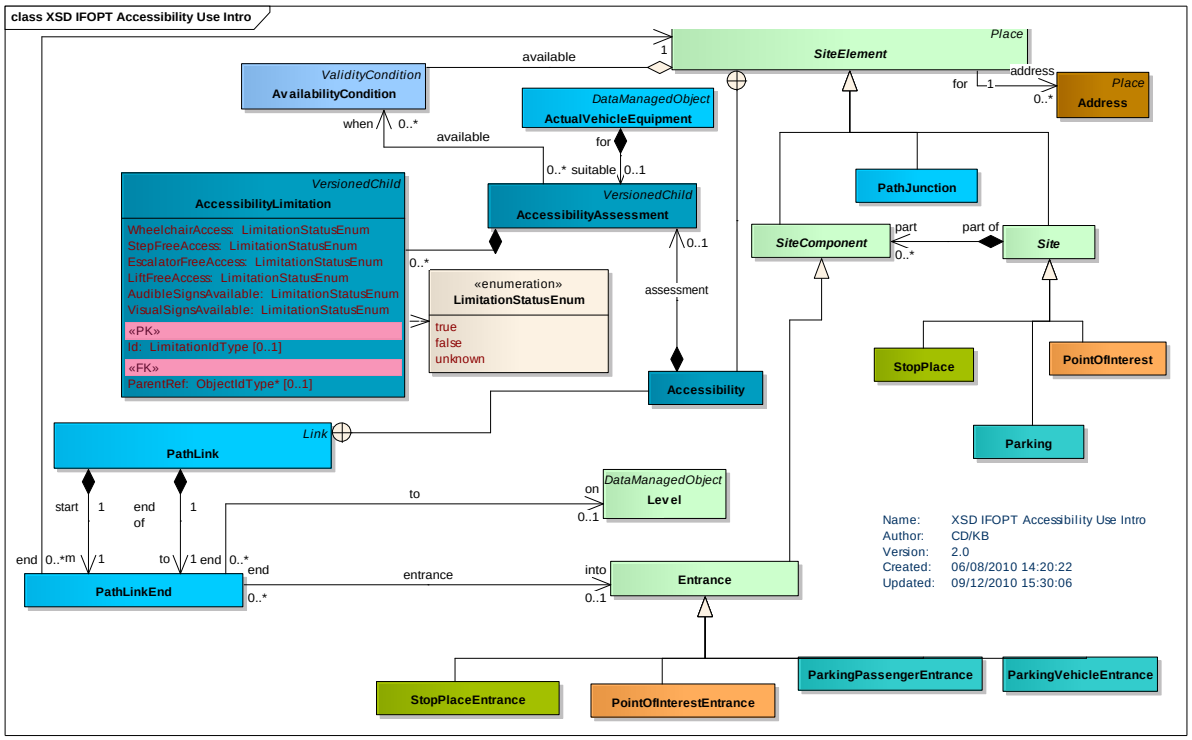


Figure 4-36 – UML Diagram of Accessibility Associations

4.7.2.2Use of Accessibility Limitations on Site components

FOR NAAPTAN-X TThe limitations should be assessed for individual SITE COMPONENTs as shown in Table 4-8.

	Place i.e. ACCESS SPACE, QUAY	PATH, PATH LINK, STOP PLACE
WheelchairAccess	May be reached by someone in a wheelchair. (possibly using a Lift)	May be traversed by someone in a wheelchair.
LiftFreeAccess	Does not require the use of a Lifts to reach it.	Does not require the use of a Lift to traverse it.
StepFreeAccess	Does not require the use of Steps to reach it.	Does not require the use of Steps to traverse it.
EscalatorFreeAccess	Does not require the use of Escalators to reach it.	Does not require the use of Escalators to traverse it.
TravelatorFreeAccess	Does not require the use of Travelators to reach it.	Does not require the use of Travelators to traverse it.

Table 4-8 – Accessibility Limitations for Site Components

4.7.3 Accessibility Coverage

All ENTRANCEs, QUAYs, ACCESS SPACEs and STOP PLACEs should be given the basic ACCESSIBILITY LIMITATION attributes for each of the five standard criteria.

These take one of three values *true, false or unknown.*

It is important to distinguish between absence of data and absence of accessibility, so if no data is available an element should nonetheless be tagged as unknown.

4.7.4 Stop Place Accessibility Coverage

A STOP PLACE should be classified as one of the three values.

- A STOP PLACEI s accessible (*true*) for a given criteria if **all** of its QUAYs can be reached from an external entrance by at least one NAVIGATION PATH that fulfils that criteria.
- A STOP PLACE is **not** accessible (*false*) STOP PLACE for a given criteria if at least one of its QUAYs can **not** be reached from an external entrance by at least one NAVIGATION PATH that fulfils that criteria.

4.7.4.1 Default Accessibility values for a Stop Place:

- STOP PLACEs should be stated as accessible ***unknown*** unless explicitly known otherwise.

4.7.5 Quay and Access Space Accessibility Coverage

SITE COMPONENTs within a STOP PLACE should be classified as one of the three values:

- A QUAY or ACCESS SPACE is accessible (*true*) for a given criteria if it can be reached from an external entrance by at least one NAVIGATION PATH that fulfils that criteria.
- A QUAY or ACCESS SPACE is **not** accessible for a given criteria (*false*) if it **cannot** be reached from an external entrance by at least one NAVIGATION PATH that fulfils that criteria.

4.7.5.1 Defaulting values

- On street QUAYs should be stated as accessible ***true*** unless known otherwise.
- Off street QUAYs (e.g. stations), should be stated as accessible ***unknown*** unless explicitly known otherwise.

	Rail / Metro			**On Street Bus**	
	STOP PLACE	**QUAY**		**QUAY**	
Wheelchair	*unknown*	*unknown*		*true*	
LiftFree	*unknown*	*unknown*		*true*	
StepFree	*unknown*	*unknown*		*true*	
EscalatorFree	*unknown*	*unknown*		*true*	
TravelatorFree	*true*	*true*		*true*	

Table 4-9 – Accessibility Attributes for level 1

4.7.6 Path Link Accessibility Coverage

PATH LINKs within a STOP PLACE should be classified as one of the three values:

- A PATH LINK is accessible (*true*) for a given criteria if it can be traversed according to that criteria.
- A PATH LINK is not accessible (*false*) for a given criteria if it cannot be traversed according to that criteria.

4.7.6.1 Default Accessibility values for a Path Link

- A PATH LINK is should be stated as accessible ***true*** unless known otherwise.

4.7.7 Navigation Path Accessibility Coverage

NAVIGATION PATHs should be classified as one of the three values:

- A NAVIGATION PATH is accessible (*true*) for a given criteria if it **can** be traversed along at least one branch according to that criteria.
- A NAVIGATION PATH is not accessible (*false*) for a given criteria if it **cannot** be traversed along **any** branch according to that criteria.

The accessibility of a NAVIGATION PATH can be derived from its PATH LINKs. Figure 4-37 shows an example of summarizing the individual links of an access path to derive the overall accessibility of a path. The second link involves steps – this sets the minimum accessibility of the whole path :

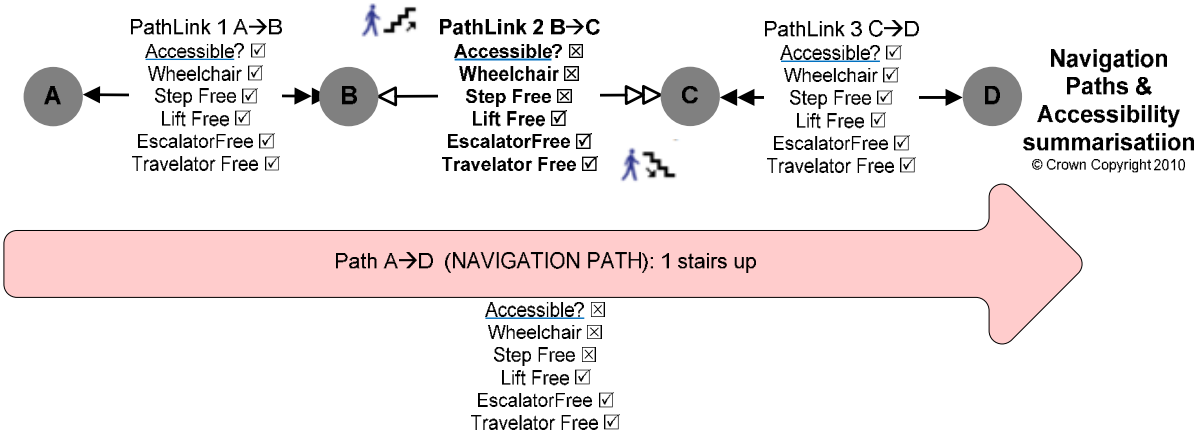


Figure 4-37 – Example of simple NAVIGATION PATH accessibility

Figure 4-38 shows an example of the derivation of the accessibility of a branched NAVIGATION PATH. One branch requires the use of steps, the other of an escalator. The NAVIGATION PATH may thus be described overall as having Lift Free and Escalator Free (If lift is used) access but is not wheelchair accessible.

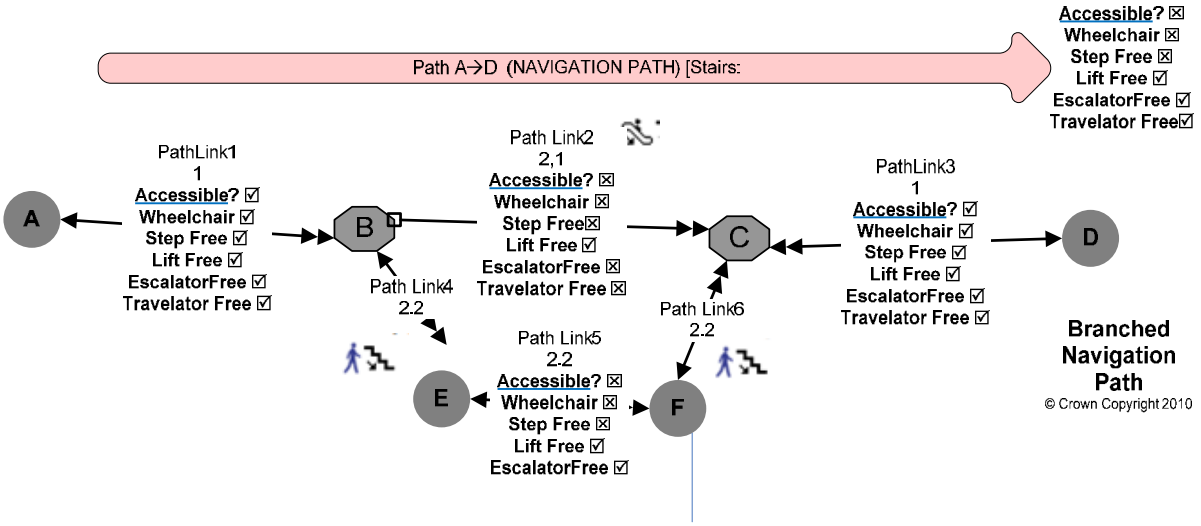


Figure 4-38 – Example Accessibility Criteria for a Navigation path

4.7.7.1Default Accessibility values for a Stop Place

- NAVIGATION PATHs should be stated as accessible ***unknown*** unless explicitly known otherwise.

4.7.7.2Accessibility Limitation constraints

Certain of the Accessibility LIMITATIONs are mutually exclusive – See Table 4-10.

	LiftFree	StepFree	EscalatorFree	TravelatorFree	Criterion
Wheelchair	***Wheelchair*** access may involve the use of lifts	***Wheelchair*** access must be step free	***Wheelchair*** access must be escalator free	***Wheelchair*** access must be travelator free	*To be able to drive a wheelchair unassisted*
LiftFree	--	***LiftFree***	***LiftFree***	***LiftFree*** access	*To avoid*

		access may involve the use of steps	access may involve the use of escalators	may involve the use of travelators	*being enclosed in a lift*
StepFree	***StepFree*** access may involve the use of lifts	--	***StepFree*** access must be escalator free too	***StepFree*** access may still involve the use of travelators	*To avoid routes that demand high mobility*
EscalatorFree	***EscalatorFree*** access may involve the use of lifts	***EscalatorFree*** access may involve the use of steps	--	**EscalatorFree** *access may still* involve the use of *travelators*	*To avoid routes that demand high mobility*
TravelatorFree	***TravelatorFree*** access may involve the use of lifts	***TravelatorFree*** access may involve the use of steps	***TravelatorFree*** access must be escalator free	--	*To avoid routes that demand high mobility*

Table 4-10 – Accessibility Attribute constraints

4.7.7.3XML Example of QUAY Accessibility Assessment Limitation

The following code fragment shows an ACCESSIBILITY ASSESSMENT for a QUAY using only ACCESSIBILITY LIMITATIONs (not SUITABILITies) Other examples of ACCESSIBILITY ASSESSMENT can be seen elsewhere in context for PATH LINKs, NAVIGATION PATHs, ENTRANCEs, etc.

```
<Quay created="2010-04-17T09:30:47Z">
        <Id>tbd:9100WIMBLDN5n6</Id>
        <Name>Platforms 5 &amp;amp; 6</Name>
        <Location srsName="UKOS">
                <Coordinates>524811 170666 </Coordinates>
        </Location>
        <AccessibilityAssessment created="2010-05-17T09:30:47Z" modification="new">
                <MobilityImpairedAccess>true</MobilityImpairedAccess>
                <limitations>
                        <AccessibilityLimitation created="2010-05-17T09:30:47Z" modification="new">
                                <WheelchairAccess>true</WheelchairAccess>
                                <StepFreeAccess>true</StepFreeAccess>
                                <EscalatorFreeAccess>true</EscalatorFreeAccess>
                                <LiftFreeAccess>true</LiftFreeAccess>
                                <AudibleSignalsAvailable>false</AudibleSignalsAvailable>
                                <VisualSignsAvailable>true</VisualSignsAvailable>
                        </AccessibilityLimitation>
                </limitations>

        </AccessibilityAssessment>
```

Figure 4-39 – XML Example of Accessibility on a Quay

4.7.7.4

4.7.8 Accessibility & Equipment

As well as ACCESSIBILITY ASSESSMENTs, a number of different other types of element are relevant for accessibility. These include (see Figure 4-40) various types of EQUIPMENT (see later below) such as stairs, Lifts etc which describe detailed properties and CHECK CONSTRAINTs,.

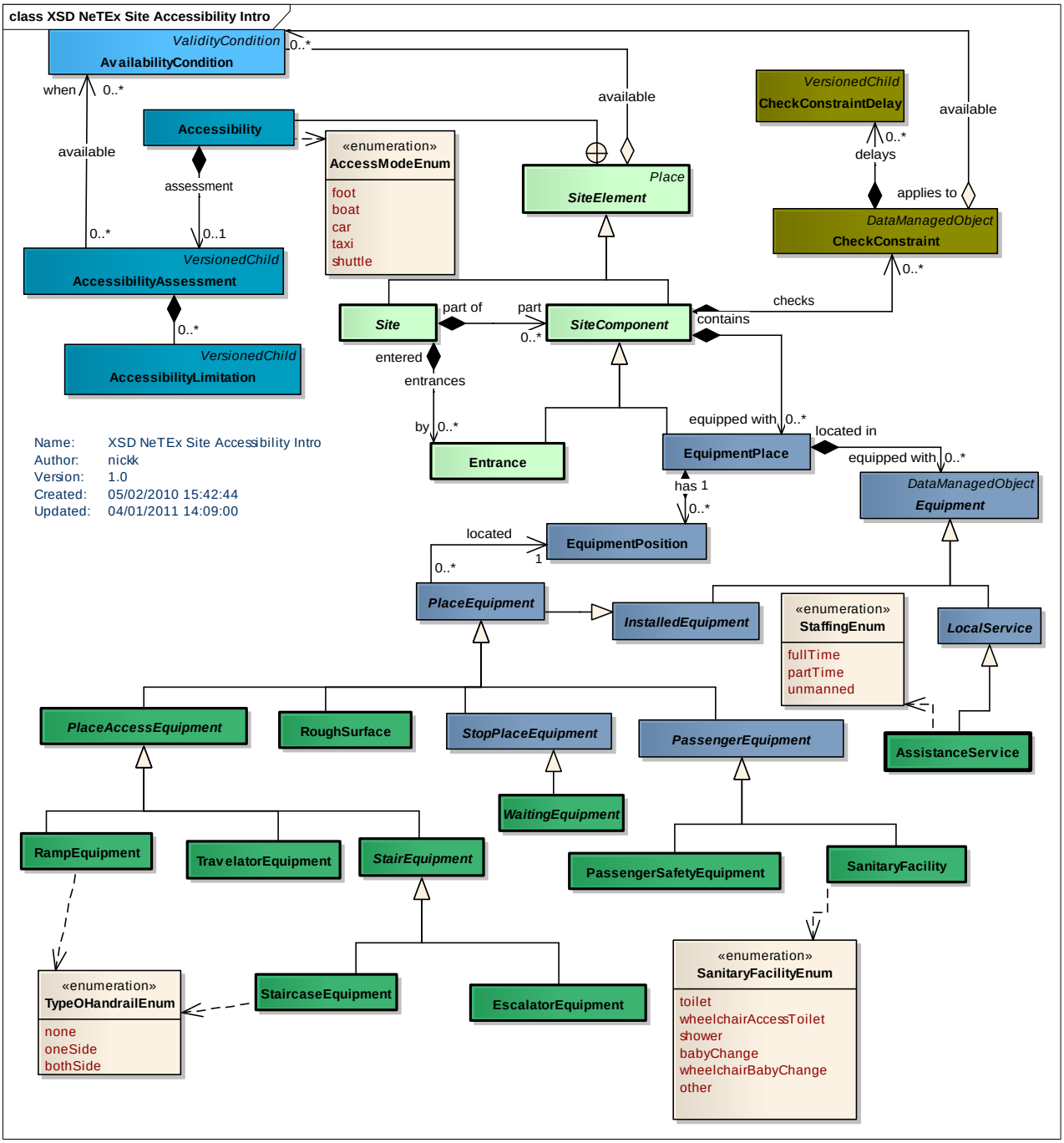


Figure 4-40 – UML diagram of Accessibility related elements

4.8 *NeTEx* Equipment

The topological components of a STOP PLACE such as QUAYs, ACCESS SPACES, ENTRANCEs and PATH LINKs can be annotated with equipment, images and other attributes that describe the detailed properties of the interchange, for example, lifts, or stairs, ticket barriers, surfaces, and their accessibility properties. IFOPT provides a systematic set of standardised EQUIPMENT objects, describing different types of equipment including ticket machines, doors, gates, ramps, seats, phones and information displays with standardised attributes.

4.8.1 Types of Equipment

The different types of equipment are summarised in Figure 4-41. and listed in Table 4-11 Each of these may have specific attributes.

Figure 4-41 – UML Overview of Equipment types

4.8.2 Associating Equipment with Places

EQUIPMENT can be located within a SITE with an EQUIPMENT PLACE using both relative (e.g. 6m along a link) or absolute (e.g. WGS coordinates). In many cases it is sufficient just to associate equipment with a SITE COMPONENT. In other cases it is useful to give a precise location.
Certain types of equipment are LOCAL SERVICEs that are not placed but rather associated with the STOP PLACE as a whole.

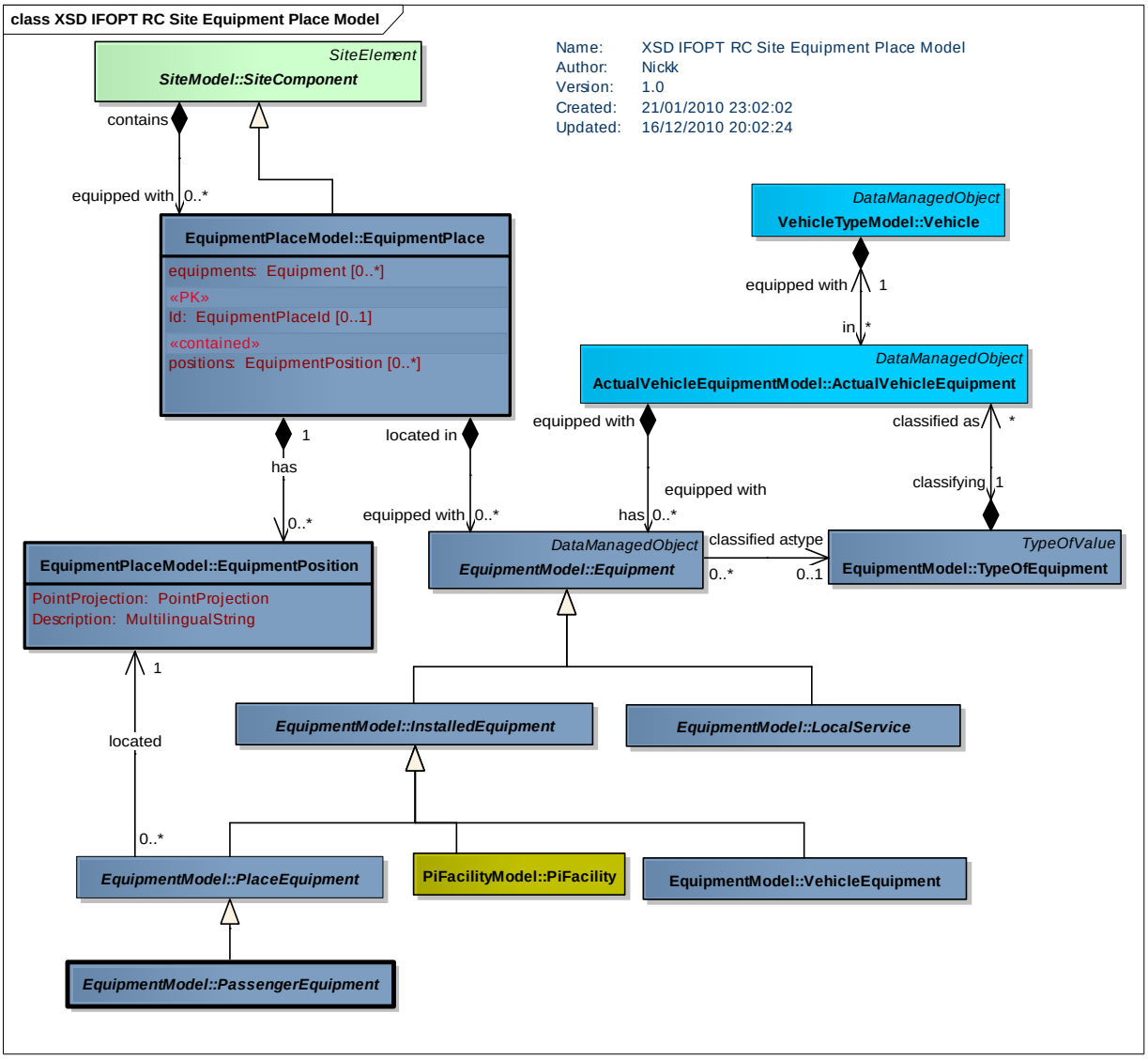


Figure 4-42 – UML diagram of Equipment Hierarchy

4.8.3 Equipment types and NaPTAN 3.0

Table 4-11 shows the relevance of different types of equipment for different levels of capability in *NaPTAN* 3.0. The Accessibility Attributes column lists specific properties of ***Equipment*** that are relevant for accessibility.

➔UK NOTE: Items shown in bold should always be populated for Capability Level3 , i.e. to enable proper computation of paths.

Group	Subgroup	Equipment	Use	Accessibility attributes
Place-Equipment	Access-Equipment	***RoughSurface***	Level3	SurfaceType
		EntranceEquipment	Level3	**Dimensions**, **wheelchair passable,** controls, acoustic sensor, automatic
		StaircaseEquipment	Level3	Handrail, handrail height, **step height, number of steps**
		LiftEquipment	Level3	**Dimensions**, **wheelchair passable, Wheelchair turning circle**

		EscalatorEquipment	Level3	**Width**
		TravelatorEquipment	Level3	**Width**
		RampEquipment	Level3	**Dimensions, gradient,** handrail, bands, strips
		QueuingEquipment	Level6	
		CrossingEquipment	Level3	Strips, sounds, sensors, acoustic aids dropped curb
	SignEquipment	***StopPlaceSign***	(Level5)	
		HeadingSign	(Level5)	
		OtherSign	(Level5)	
	Ticketing	***TicketingEquipment***	Level3	Low Counter Access
		TicketValidatorEquipment	Level6	
	StopPlace	***LuggageLockerEquipment***	Level6	
		ShelterEquipment	Level6	Number of seats, Dimensions, StepFree, Wheelchair Area Width, Wheelchair Area Depth
		TrolleyStandEquipment	Level6	
		WaitingRoomEquipment	Level6	Number of seats, Dimensions, StepFree, Wheelchair Area Width, Wheelchair Area Depth
	Passenger-Equipment	***PassengerInfoEquipment***	Level3	AccessibilityInfo
		PassengerSafetyEquipment	Level3	ccTV, Panic button, Sos Phones, Height of Sos Panel, Acoustic Announcements
		SanitaryFacility	Level6	Gender, Type Of Sanitary Facility Wheelchair turning circle
Loca-IService	Customer	***AssistanceService***	Level3	
		CustomerService	Level6	

Table 4-11 – Equipment types for use in NaPTAN 3.0

4.8.4 XML Examples of Equipment

Further Examples of Equipment can be seen on the section on representing Stairs & Lifts.

4.8.4.1XML Example of Entrance Equipment

The following XML code fragment shows an ***Entrance*** barrier with ***EntranceEquipment*** for six non-wheelchair accessible gates and one wheelchair accessible gate. The Equipment is not precisely located.

```
<
        <Entrance created="2010-05-17T09:30:47Z">
                <Id>tbd:9100WIMBLDN_A1_EI1</Id>
                <Name>Internal Entrance to Upper Concourse from Ticket Hall</Name>
                <ParentZoneRef>tbd:9100WIMBLDN_A2</ParentZoneRef>
                <LevelRef>tbd:9100WIMBLDN_Lvl_G0</LevelRef>
                <placeEquipments>
                        <EntranceEquipment>
                                <Id>tbd:9100WIMBLDN_A2_EE1_B1</Id>
                                <Width>0.5</Width>
                                <NumberOfGates>6</NumberOfGates>
                                <EntranceRequiresTicket>true</EntranceRequiresTicket>
                                <WheelChairPassable>false</WheelChairPassable>
                        </EntranceEquipment>
                        <EntranceEquipment>
                                <Id>tbd:9100WIMBLDN_A2_EE1_B2</Id>
                                <Width>2</Width>
                                <NumberOfGates>1</NumberOfGates>
                                <EntranceRequiresTicket>true</EntranceRequiresTicket>
                                <WheelChairPassable>true</WheelChairPassable>
                        </EntranceEquipment>
                </placeEquipments>
                <EntranceType>ticketBarrier</EntranceType>
                <isExternal>false</isExternal>
                <isEntry>true</isEntry>
                <isExit>true</isExit>
                <Width>1.0</Width>
```

```
        <Height>2.0</Height>
    </Entrance >
```

Figure 4-43 – XML Example of Entrance Equipment

4.8.4.2XML Example of Local Services

The following XML code fragment shows a TICKETING SERVICE describing available ticketing that might be associated with a STOP PLACE.

```
<TicketingService created="2010-05-17T09:30:47Z">
        <validityConditions>
                <AvailabilityCondition created="2010-05-17T09:30:47Z">
                        <Id> tbd:AC_01_Main_Opening </Id>
                </AvailabilityCondition>
        </validityConditions>
        <TicketCounterService>true</TicketCounterService>
        <PaymentMethod> cash creditCard debitCard cheque </PaymentMethod>
        <TicketType>all</TicketType>
        <TicketingServiceType>all</TicketingServiceType>
</TicketingService>
```

Figure 4-44 – XML Example of Local Service Equipment

4.8.4.3Equipment Visualisation examples for browsing

EQUIPMENT and LOCAL SERVICE items can be used to adorn a schematic map or other interactive visualisation of data on a mobile or fixed device.

Examples of using equipment data are shown in Figure 4-45.

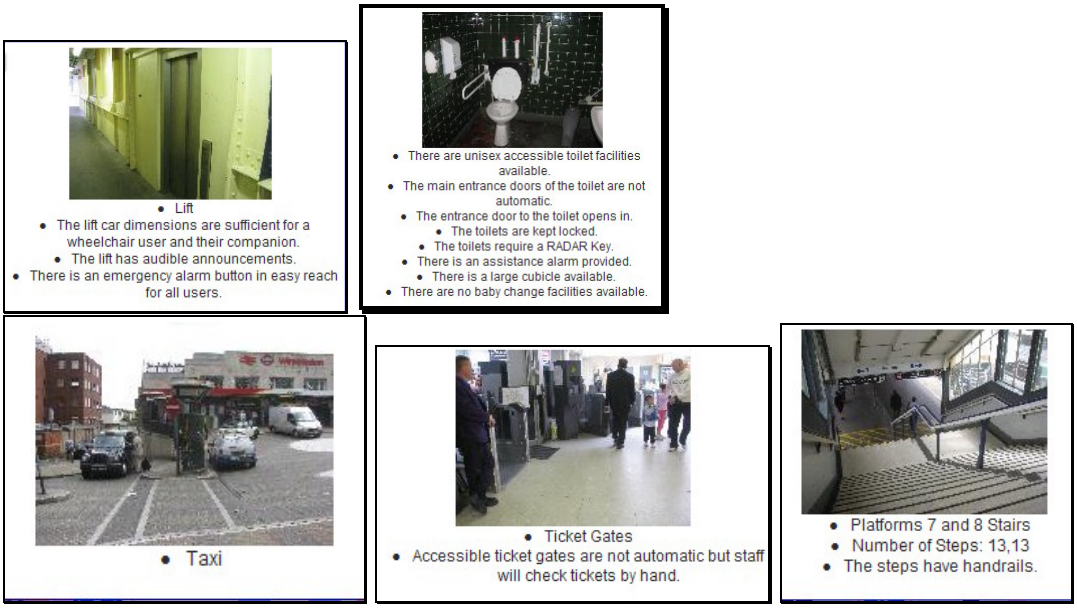


Figure 4-45 – Hover windows for selected Equipment (NRE Stations Made Easy)

IFOPT Validity Conditions

There may be elements in the STOP PLACE or SITE that are only available at certain times. For example a given ENTRANCE of a SITE might be open only at certain times. Knowledge of these conditions allows journey planners and other applications to give more correct times.

NeTEx includes a general purpose VALIDITY CONDITION which can be used to specify temporal constraints for many different purposes, including for the availability of IFOPT elements This can be refined with a more precise AVAILABILITY CONDITION to specify specific temporal properties. Each AVAILABILITY CONDITION is composed of one or more DAY TYPES. Each DAY TYPE is described in terms of the PROPERTIEs OF DAY

➔ ***UK Note***: Some validity conditions can be found in the Direct Enquiries data set. Some aspects of the NaPTAN Stop Validity can also be described through use of an availability condition

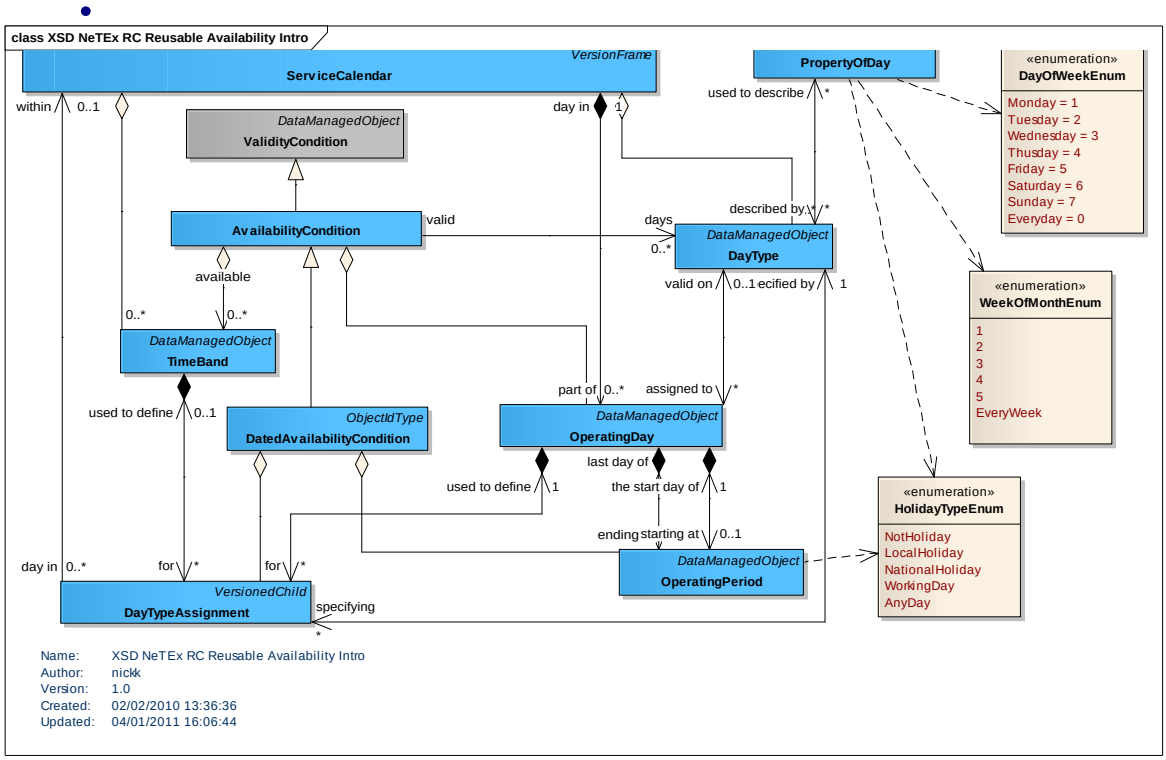


Figure 4-46 – UML Diagram of Availability condition model

4.8.5 Scope of Validity Conditions

Validity conditions apply to their elements

- A VALIDITY CONDITION on a SITE is assumed to apply to all of its children unless overridden.
- A VALIDITY CONDITION on a nested QUAY or nested ACCESS SPACE is assumed to apply to all its children unless explicitly overridden.
- A VALIDITY CONDITION on EQUIPMENT is assumed to be the same as its containing place unless explicitly overridden.

A VALIDITY CONDITION on any single element of a NAVIGATION PATH such as a ENTRANCE or individual PATH LINK means the at the whole NAVIGATION PATH is similarly constrained.

4.8.6 XML Example of Validity Condition

The following XML code fragment shows a VALIDITY CONDITION On an ENTRANCE barrier which is open during opening hours.

4.8.6.1Availability Condition associated with Element

```
<Entrance created="2010-05-17T09:30:47Z">
        <Id>tbd:9100WIMBLDN_A1_EE1</Id>
        <Name>External Entrance to Ticket Hall</Name>
        <validityConditions>
                <AvailabilityConditionRef> tbd:AC_01_Main_Opening</AvailabilityConditionRef>
        </validityConditions>
        <ParentZoneRef>tbd:9100WIMBLDN_A1</ParentZoneRef>
        <LevelRef>tbd:9100WIMBLDN_Lvl_G0</LevelRef>
                <EntranceType>openDoor</EntranceType>
        <isExternal>true</isExternal>
        <isEntry>true</isEntry>
        <isExit>true</isExit>
        <Width>3.0</Width>
        <Height>2.0</Height>
</Entrance>
```

4.8.6.2Availability Condition definitions

The condition is made up of a number of day types

```
<AvailabilityCondition>
        <Id> tbd:AC_01_Main_Opening</Id>
        <dayTypes>
                <DayTypeRef> tbd:DT001Open_MF</DayTypeRef>
                <DayTypeRef> tbd:DT002Open_Sat</DayTypeRef>
                <DayTypeRef> tbd:DT003Open_Sun</DayTypeRef>
        </dayTypes>
</AvailabilityCondition>

<AvailabilityCondition>
        <Id> tbd:AC_02_CC_Opening</Id>
        <dayTypes>
                <DayTypeRef> tbd:DT004Open_MFS</DayTypeRef>
                <DayTypeRef> tbd:DT005Open_Sun</DayTypeRef>
        </dayTypes>

</AvailabilityCondition>
```

4.8.6.3Day types definitions

Each day type defines

```
<DayType>
        <Id> tbd:DT004Open_MFS</Id>
        <properties>
                <PropertyOfDay>
                        <DaysOfWeek>Monday Tuesday Wednesday Thursday Friday Saturday</DaysOfWeek>
                        <HolidayTypes>WorkingDay</HolidayTypes>
                        </PropertyOfDay>
        </properties>
        <timebands>
                <Timeband>
                        <StartTime>08:30:00</StartTime>
                        <EndTime>20:00:00</EndTime>
                </Timeband>
        </timebands>
</DayType>

<DayType>
        <Id> tbd:DT005Open_Sun</Id>
        <properties>
                <PropertyOfDay>
                        <DaysOfWeek>Sunday</DaysOfWeek>
```

```
                </PropertyOfDay>
            </properties>
            <timebands>
                <Timeband>
                    <StartTime>10:30:00</StartTime>
                    <EndTime>18:00:00</EndTime>
                </Timeband>
            </timebands>
        </DayType>
```

4.9 Grouping elements in NeTEx for data exchange

NeTEx includes VERSION FRAME elements that allow the grouping of compatible sets of instances that together form a coherent version that may be exchanged and used as a whole. There are a number of different types of VERSION FRAME. For NaPTAN 3.0, two are relevant: the SITE FRAME and the SERVICE CALENDAR. Figure 4-47 shows the elements of a SITE FRAME.

The SITE FRAME contains elements relating to a stop including the STOP PLACE and SCHEDULED STOP POINTs. A SITE FRAME may reference a SERVICE CALENDAR frame for its calendar - see earlier.

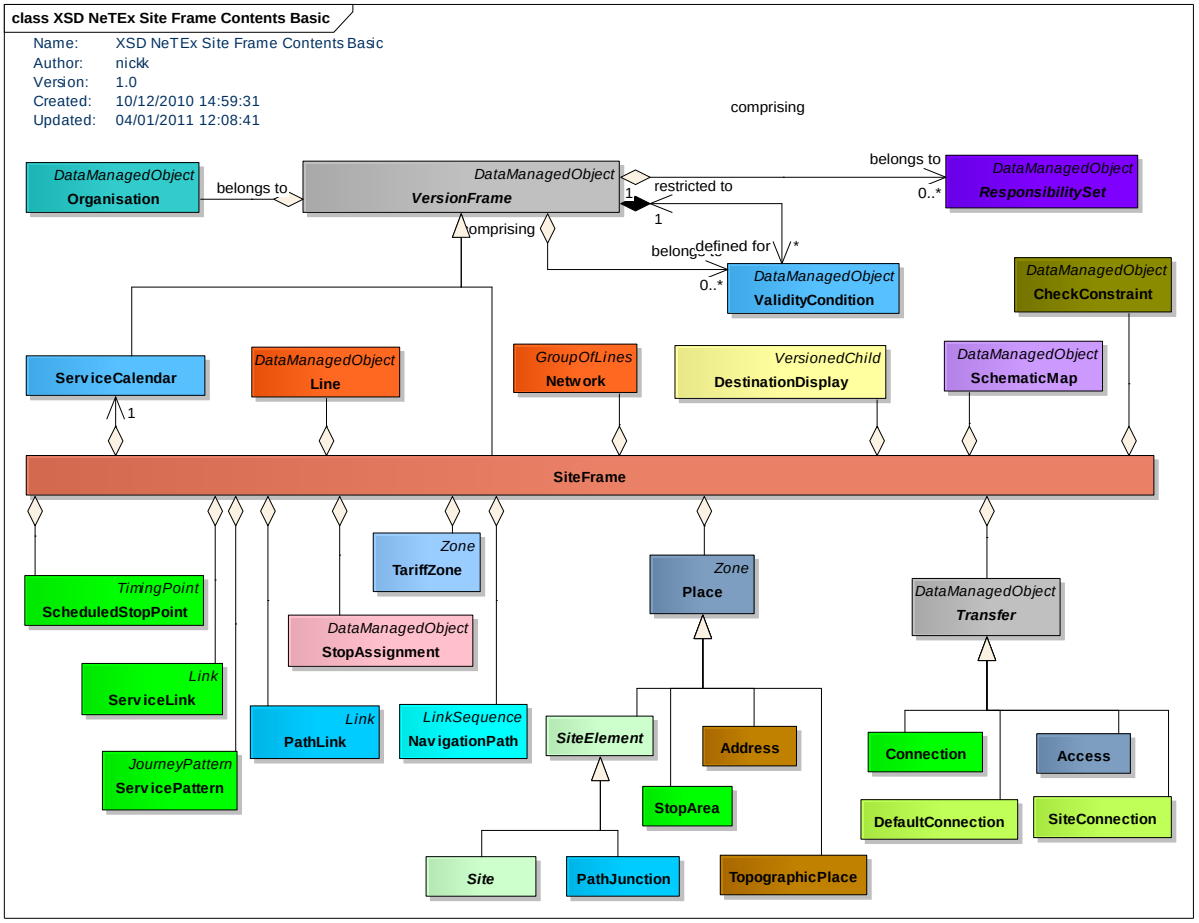


Figure 4-47 – UML Diagram of Site Frame Elements

4.9.1 Example XML documents

The following XML code fragment shows part of a SITE FRAME that contains many child elements

```
<SiteFrame>
            <!-- ==  For each NPTG Admin area   responsibility  is created : = -->
```

```
        <responsibilitySets>
            <!-- Generalisation of NPTG ability to associate data with an area and Equivalent to NPTG areas = -->
            <ResponsibilitySet created="2010-05-17T09:30:47Z" modification="revise" changed="2010-05-
17T09:30:47Z" version="1.0" id="napt:RS_82">
                <ResponsibilitySetRef ref="napt:RS_nptg">..</ResponsibilitySetRef>
                <roles>
                .....
            </ResponsibilitySet>
        </responsibilitySets>
        <organisations>
            <Authority>
                <Id>tbd:Org_Tfl</Id>
                <Name>Transport For London</Name>
                <ShortName>TfL</ShortName>
                <OrganisationType>authority</OrganisationType>
            </Authority>
              .....
        </organisations>
        <contentValidityConditions>
            <AvailabilityCondition>
                <Id>tbd:AC_02_CC_Opening</Id>
                <dayTypes>
                    <DayTypeRef ref="tbd:DT004Open_MFS">..</DayTypeRef>
                    <DayTypeRef ref="tbd:DT005Open_Sun">..</DayTypeRef>
                </dayTypes>
            </AvailabilityCondition>
         .....
        </contentValidityConditions>
        <!-- ===Topographic places - equivalent to NPTG Regions == -->
        <topographicPlaces>
            <TopographicPlace created="2005-10-05T10:52:25" changed="2005-10-05T10:52:25">
                <Id>nptg:Region_L</Id>
                <Name lang="en">Greater London</Name>
                ……..
            </TopographicPlace>
            <!-- ===Topographic places - equivalent to NPTG Districts == -->
        </topographicPlaces>
            <!-- == Schematic Maps ========== -->
        <schematicMaps>
            <SchematicMap created="2001-12-17T09:30:47Z">
                <Id>tbd:WimMap_001</Id>
                <Name>Map of Wimbledon Station - Upper Level</Name>
                <ImageUri>http://www.tbde.com/Wimbledonplan1.jpg</ImageUri>
                .....
            </SchematicMap>
        </schematicMaps>
        <!-- ===STATION S=== -->
        <stopPlaces>
            <!-- ========== RAIL========= -->
            <StopPlace created="2006-09-11T15:42:00" modification="revise" dataSourceRef="NaPTAN"
hanged="2009-02-26T15:47:00">
                <!--              <StopAreaCode>910GWIMBLDN</StopAreaCode> -->
                <!--      <AdministrativeAreaRef> -->
                <Id>napt:910GWIMBLDN</Id>
                <Name>Wimbledon Rail Station</Name>
                .....
            </StopPlace>
            <!-- ========== UNDERGROUND ========= -->
        </stopPlaces>
        <scheduledStopPoints>
            <!-- Scheduled stop ponts -->
            <ScheduledStopPoint>
                <Id>napt:9100WIMBLDN</Id>
                <Name>Wimbledon  Rail Station</Name>
                <VehicleModes>rail</VehicleModes>
                <ForAlighting>true</ForAlighting>
                <ForBoarding>true</ForBoarding>
            </ScheduledStopPoint>
            .....
        </scheduledStopPoints>
        <stopAreas>
            <StopArea>
                <Id>napt:490G00272</Id>
```

```
                        <Name>Wimbledon Bus</Name>
                        <StopAreaCode/>
                    </StopArea>
                </stopAreas>
                <!-- ==Connections ========== -->
                <connections>
                    <SiteConnection>
                        <Id>tbd:wimcon_01</Id>
                        <Name>Default transfer duration for wimbledon</Name>
                        ……
                    </SiteConnection>
                    <!-- === bus-->
                </connections>
                <!-- == Stop Assignments =========== -->
                <stopAssignments>
                    <PassengerStopAssignment>
                        <Id>tbd:wimass_r01</Id>
                        <Description>Rail Assignment - could be implicit </Description>
                        <StopPlaceRef ref="napt:9100WIMBLDN">..</StopPlaceRef>
                        <QuayRef ref=" ">..</QuayRef>
                        <ScheduledStopPointRef ref="napt:9100WIMBLDN">..</ScheduledStopPointRef>
                    </PassengerStopAssignment>
                    ......
                </stopAssignments>

        </SiteFrame>
```

5 POPULATING THE NAPTAN 3.0 DATABASE

This section provides some guidance on entering data into the *NaPTAN 3.0* model to cover additional elements (Basic elements are covered by the NaPTAN 2.xschema guide)

- ***Level0*** : All ENTRANCEs, concourses (ACCESS SPACEs) and Platforms (QUAYs) should be populated and assigned to a STOP PLACE.

- ***Level2***: Basic Accessibility date should be specified for the elements above.
  - At the STOP PLACE level this indicates whether the STOP PLACE is rated as accessible or not according to each ACCESSIBILITY LIMITATION criteria (wheelchair, LiftFreeUse etc).
  - At the QUAY, ACCESS SPACE whether the component can be reached from the exterior.

- ***Level3***: Concourses which represent internal routing points within the station should be populated, and NAVIGATION PATHs added
  - There should be a named NAVIGATION PATH from each main ENTRANCE to each platform *QUAY*, and between each platform (*QUAY*).Where platforms are adjacent a single Parent QUAY can be used.
  - The NAVIGATION PATH should be given ACCESSIBILITY LIMITATION attributes, indicating whether it meets the standard limitations.

- ***Level5***: PATH JUNCTIONs should be added and explicit PATH LINKs should be added between all Nodes, indicating the ENTRANCE where relevant.
  - Each PATH LINK should be given ACCESSIBILITY LIMITATION attributes, indicating whether it meets the standard limitations.

In general the minimum number of nodes, links and paths to describe the topology should be used. For example, where QUAYs are nested, PATH LINKs should connect to the parent QUAY, rather than to individual links.

5.1.1 Choosing NaPTAN 3.0 Paths

To develop a path data set for an interchange will typically involve the following preparatory processes

1. A site survey to locate and describe a site, identify features and equipment and collect images.
2. Creation of a schematic map with which to label and describe the relative positions of elements.

The data collected can be used to populate a software model. Adding detailed path information for an interchange will involve using an interactive tool with the ability to draw nodes and links over a map and typically will involve steps to:

1. Identify the end points corresponding to existing *NaPTAN* points: as ENTRANCEs, QUAYs, (and possibly ACCESS AREAs)
2. Identify the other additional ACCESS SPACEs needed to describe the Interchange – for example upper concourse, lower concourse, tunnel to platform, lift shafts etc. and add instances.
3. Identify the additional entrances to the ACCESS SPACEs that are internal to the interchange and add ENTRANCEs.
4. Add PATH JUNCTIONs for waypoints where a branch is needed, or an intermediate PATH LINK for example landings.
5. Create PATH LINKs between each node (i.e. ACCESS SPACE or PATH JUNCTION), noting the ENTRANCE where relevant
6. Add detailed ACCESSIBILITY LIMITATION attributes for each ENTRANCE, ACCESS SPACE and QUAY

7. Add summary ACCESSIBILITY LIMITATION attributes for each STOP PLACE
8. Add detailed ACCESSIBILITY LIMITATION attributes for each PATH LINK.
9. Add summary ACCESSIBILITY LIMITATION attributes for each NAVIGATION PATH.
10. Add EQUIPMENT elements for each ENTRANCE, (e.g. doors, barriers,)
11. Add ACCESS EQUIPMENT elements ACCESS SPACE, eg Lifts, Ramps.
12. Add EQUIPMENT elements to PATH LINKs, e.g. stairs.

5.1.2 Hierarchy of Stop Places

In NAPTAN a Hierarchy is applied to the nesting of stop places (i) Air (ii) Rail (iii) Ferry (iv) Metro (v) Bus /Coach. This should be followed when nesting STOP PLACEs.

5.2 Accessibility

5.2.1 Accessibility Coverage

All ENTRANCEs, QUAYs, ACCESS SPACES and STOP PLACEs should be given the basic ACCESSIBILITY LIMITATION attributes – see below.

5.2.2 Deriving Accessibility Values

A default set of values for the Standard ACCESSIBILITY LIMITATION can be inferred from the presence of specific types of ACCESS EQUIPMENT such as lifts, stairs or escalators.
from

Derivation	**Wheelchair**	**LiftFree**	**StepFree**	**Escalator Free**	**TravelatorFree**
Equipment					
Lift	*true*	*false*	--	--	--
Stairs	false	--	false	--	--
Escalator	*unknown*	*unknown*	false	*false*	*false*
Travelator	*unknown*	*unknown*	--	-	*false*

Figure 5-1 – Deriving Attributes from Equipment for QUAYS and ACCESS SPACES

5.2.3 Accessibility attributes

To populate an ACCESSIBILITY ASSESSMENT the ACCESSIBILITY LIMITATION attributes should always be populated.

Provision of ACCESSIBILITY SUITABILITY is optional and additional.

If unavailable ACCESSIBILITY LIMITATION should be defaulted as shown by Table 5-1.

	Rail / Metro			**On Street Bus**
	STOP PLACE	**QUAY**		**QUAY**
Wheelchair	*unknown*	*unknown*		*true*
LiftFree	*unknown*	*unknown*		*true*
StepFree	*unknown*	*unknown*		*true*
EscalatorFree	*unknown*	*unknown*		*true*
TravelatorFree	*true*	*true*		*true*

Table 5-1 – Default Accessibility Attributes for STOP PLACE

6 NAPTAN 3.0 SCHEMA

This section provides a summary of *NeTEx* Schema elements relevant for *NaPTAN*-X 3.0. It uses the NeTEx ***SiteFrame*** as the basic container element. This can be embedded in a *NeTEx* Publication (see NeTEx schema).

Discussion of elements is organised as follows

1. The SiteFrame container which holds the actual elements.
2. Concrete elements such as ***StopPlaces*** and ***Connections.***
3. Framework elements of which the concrete elements are subtypes.
4. Ancillary reusable elements.

6.1 SiteFrame

6.1.1 SiteFrame – element

SiteFrame contains a set of elements related to fixed stops and other sites, such as stops places, stop areas, points of interest and parking areas. It can be used to exchange stop and point of interest data for a region or individual interchange. It is a subtype of ***CommonFrame.***

Element Name	Element Type	Card-inality	Comment
Id	*SiteFrameIdType*	**1:1**	Identifier of ***SiteFrame***.
		::>	***SiteFrame*** is a subtype of ***CommonVersionFrame***– See framework.
SiteVersion-FrameGroup	***SiteVersionFrameGroup***	1:1	Contents specific to ***SiteFrame*** – see next section.

Table 2 — SiteFrame elements

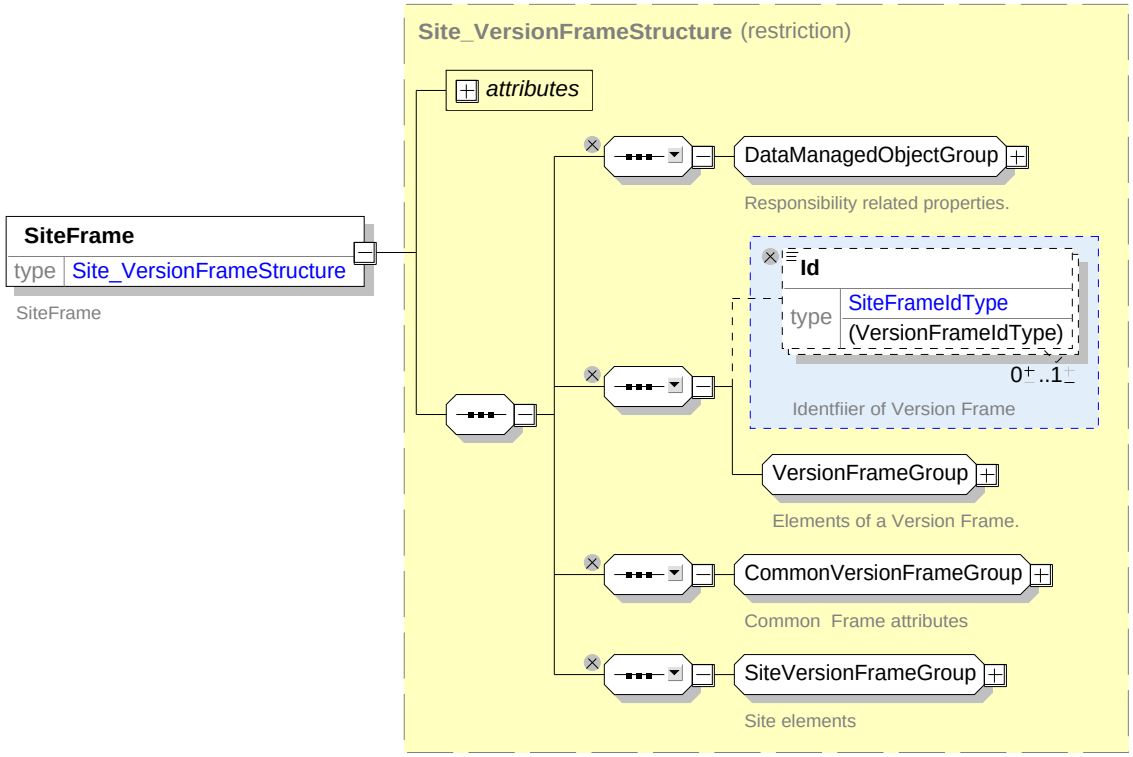


Figure 2 — SiteFrame XSD

6.1.2 SiteVersionFrameGroup – group

SiteVersionFrame groups a set of stops and their associated properties. It is a subtype of ***CommonFrame.***

➔Omitted from Naptan3.0 X: ***Line, GroupOfLines, TopographicPlace, Access, SchematicMap, PointOfInterest, Parking***

	Element Name	Element Type	Card-inality	Comment
LineFrame-roup	***lines***	*GroupOfLines* | *Line*	**0:***	***Line*** instances in frame..
Place-Frame-Group	***topographicPlaces***	*TopographicPlace*	**0:***	***TopographicPlace*** instances in frame.
	addresses	*PostalAddress* | *RoadAddress*	**0:***	***Address*** instances in frame.
	accesses	*Access*	**0:***	***Access*** link instances in frame.
	schematicMaps	*SchematicMap*	**0:***	***SchematicMap*** instances in frame.
SiteFrame-Group	***stopPlaces***	*StopPlace* | *FlexibleStopPlace*	**0:***	***StopPlace*** instances in frame.
	pointsOfInterest	*PointOfInterest*	**0:***	***PointOfInterest*** instances in frame.
	parkings	*Parking*	**0:***	***Parking*** instances in frame.
PointOf-Interest-Group	***pointOfInterest-Classifications***	*PointOfInterest-Classification*	**0:***	***PointOfInterestClassification*** instances in frame.
	classification-Hierarchies	*PointOfInterest-ClassificationHierarchy*	**0:***	***PointOfInterestClassification*****Hierarchy** instances in frame.
--	***ServiceUseFrame-Group***	***ServiceUse-FrameGroup***	1:1	Further elements: see below.

Table 3 — SiteVersionFrame elements

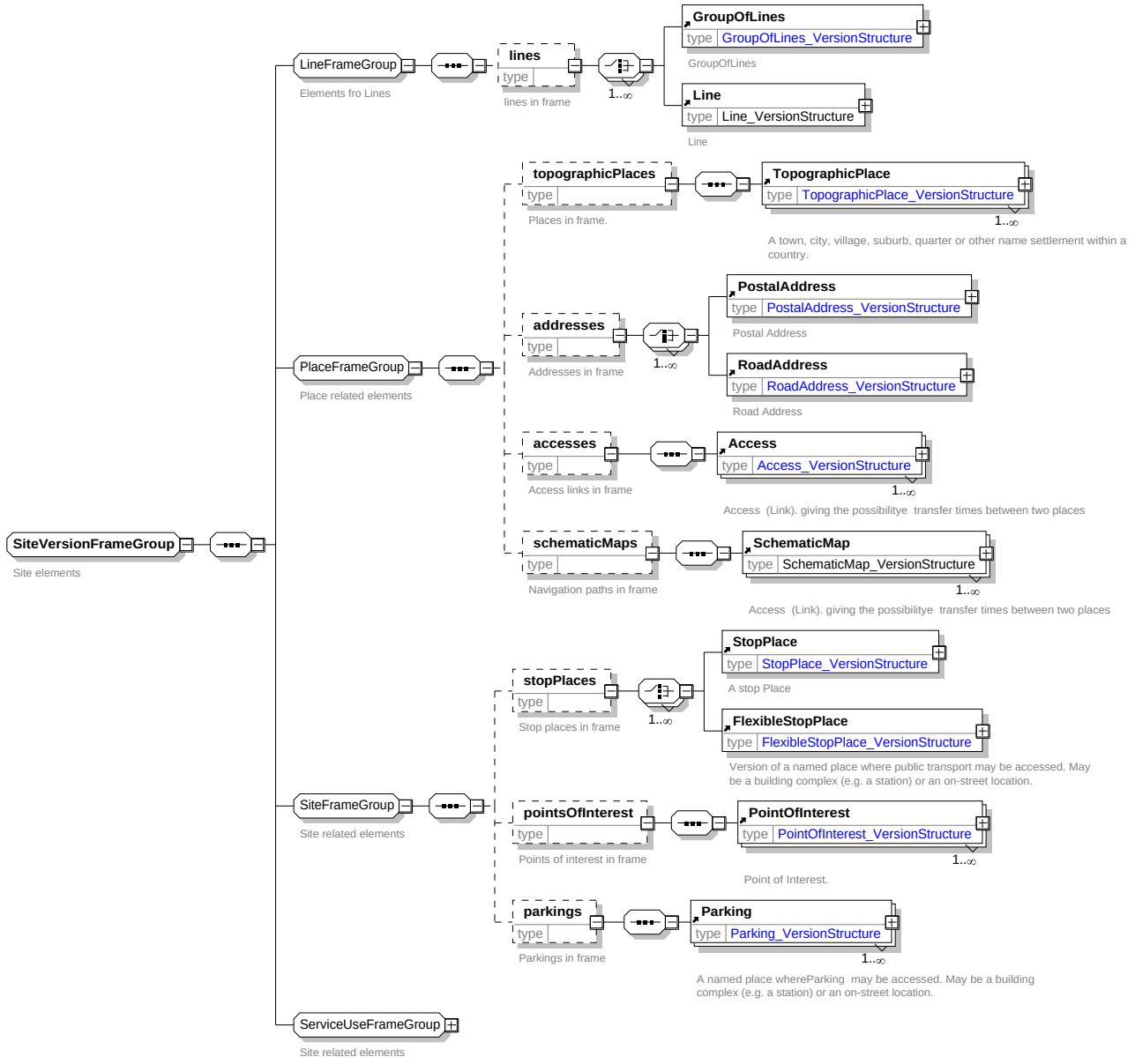


Figure 3 — SiteVersionFrameGroup XSD

6.1.3 ServiceUseFrameGroup – group

ServiceUseFrameGroup groups the two main groups of service related elements. See ***ServiceFrameGroup*** and ***StopAssignmentGroup*** below.

Element Name	Element Type	Cardinality	Comment
ServiceFrameGroup	***ServiceFrameGroup***	**1:1**	ServicePattern related elements in frame.
StopAssignmentGroup	***StopAssignmentGroup***	**1:1**	***StopAssignment*** related elements in frame.

Table 4 — ServiceUseFrameGroup elements

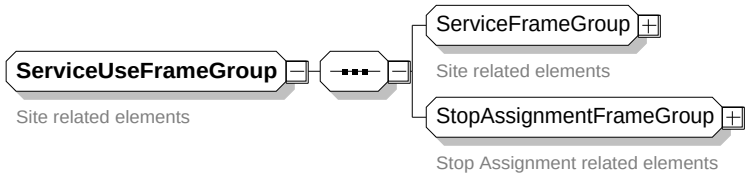


Figure 4 — ServiceUseFrameGroup XSD

6.1.4 ServiceFrameGroup – group

ServiceFrameGroup groups the ***ServicePattern*** related elements in the frame.
➔Omitted from Naptan3.0 X: ***ServiceLink, ServicePattern.***

Element Name	Element Type	Card-inality	Comment
scheduledStopPoints	*ScheduledStopPoint*	**0:***	***ScheduledStopPoint*** instances in frame.
serviceLinks	*ServiceLink*	**0:***	***ServiceLink*** link instances in frame.
servicePatterns	*ServicePattern*	**0:***	***ServicePattern*** instances in frame.
stopAreas	*StopArea*	**0:***	***StopArea*** instances in frame.
connections	*Access* | *Connection* | *DefaultConnection* | *SIteConnection*	**0:***	***Connection*** instances in frame. See individual elements elsewhere.
tariffZones	*TariffZone*	**0:***	***TariffZone*** instances in frame.

Table 5 — ServiceFrameGroup elements

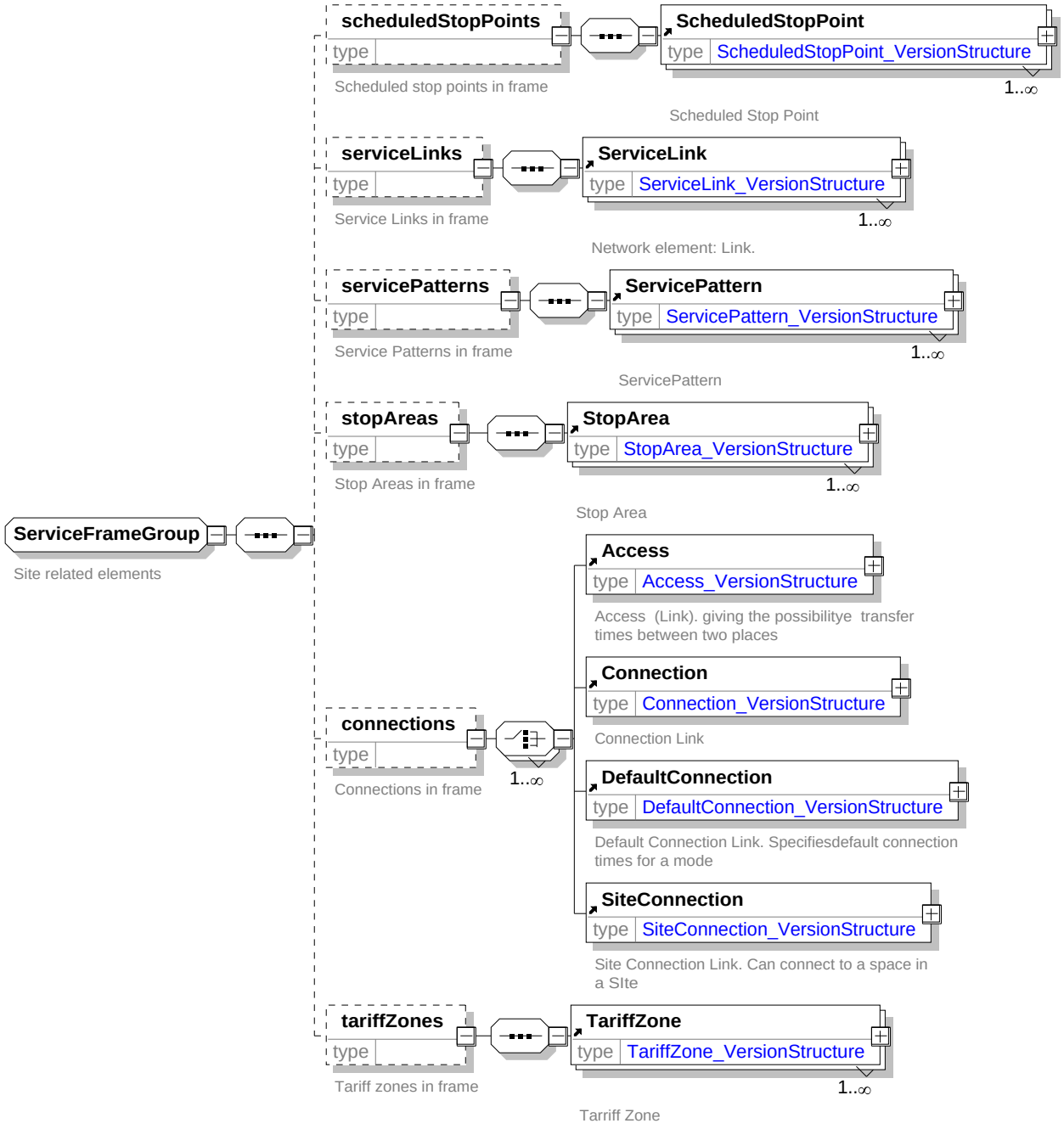


Figure 5 — ServiceFrameGroup XSD

6.1.5 StopAssignmentGroup – group

StopAssignmentGroup groups the ***StopAssignment*** related elements.
➔Omitted from Naptan3.0 X: ***VehicleStopAssignment.***

Element Name	Element Type	Card-inality	Comment
stopAssignments	*DynamicStopAssignment* | *PassengerStopAssignment* |	0:*	***Assignment*** instances in frame.

VehicleStopAssignment

Table 6 — StopAssignmentFrameGroup elements

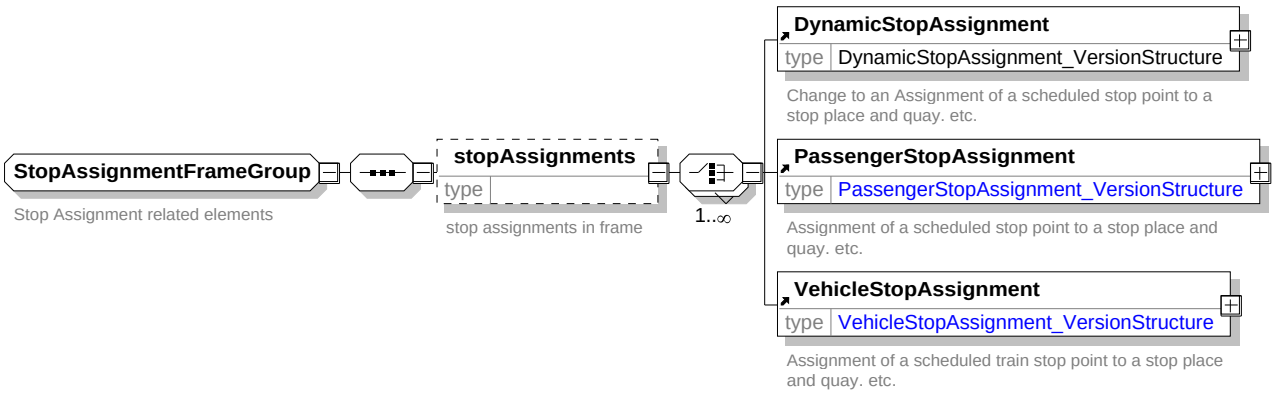


Figure 6 — StopAssignmentFrameGroup XSD

6.2 Stop related elements

6.2.1 Stop Place

6.2.1.1StopPlace – element

StopPlace describes a Transport Interchange such as a Station, Bus Stop, Airport, or Ferry Port.

Element Name	Element Type	Card-inality	Comment
Id	*StopPlaceIdType*	**1:1**	Identifier of ***StopPlace***.
		::>	***StopPlace*** is a subtype of ***Site.*** *See later.*
StopPlaceGroup	***StopPlaceGroup***	1:1	Contents specific to ***StopPlace*** – see next section.

Table 7 — StopPlace elements

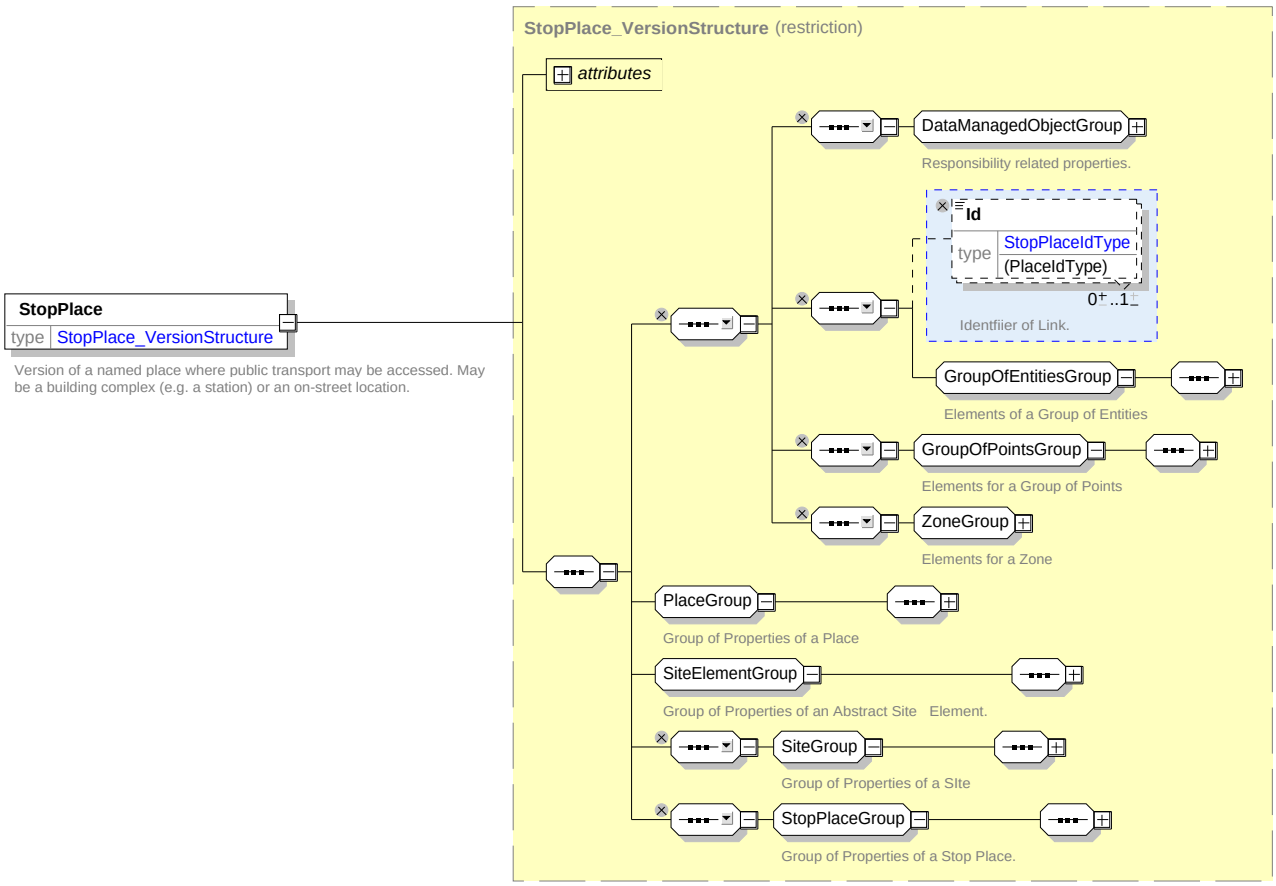


Figure 7 — StopPlace XSD

6.2.1.2StopPlaceGroup – elements

StopPlaceGroup describes the specific properties of a Transport Interchange.

	Element Name	Element Type	Card-inality	Comment
Identifier	***PublicCode***	*xsd:normalizedString*	0:1	Alternative Identifier of ***StopPlace.***
StopPlace-Component Property-Group	***TransportMode***	*TransportMode*	0:1	Primary Transport modes for ***StopPlace.***
	otherTransport-Modes	*TransportMode*	0:1	Other Modes founding StopPlace***.***
	tariffZones	*TariffZone*	0:*	Tariff zones in which ***StopPlace*** lies.
StopPlace Property-Group	***StopPlaceType***	*Enumeration*	0:1	Type of ***StopPlace***. See below.
	unlocalised-Equipments	*PlaceEquipment*	0:*	Unlocalised ***Place*** equipment to ***Site***.
StopPlace Topographic-Group	***servesPlaceRefs***	*TopographicPlaceRef*	0:*	***TopographicPlace*** which this ***StopPlace.*** Serves.
	mainTerminus-	*TopographicPlaceRef*	0:*	***TopographicPlace*** for which this is a main

	ForPlace			terminus.
	LimitedUse	*Enumeration*	0:*	Classification of limited uses ***StopPlace*** - See below.
Routing-Group	***Weighting***	*Enumeration*	0:*	Relative weighting to give to ***StopPlace***.
	StopPlace-PassengerGroup	***StopPlace-PassengerGroup***	0:1	See below.
	SiteAccessGroup	***SiteAccessGroup***	0:1	See below.
	StopPlace-VehicleGroup	***StopPlace-VehicleGroup***	0:1	See below.

Table 8 — SiteElementPropertiesGroup elements

Value	Description
onstreetBus	On street Bus Stop
onstreetTram	On street Tram Stop
ferryStop	Ferry Stop
airport	Airport
railStation	Rail Station
metroStation	Metro Station
tramStation	Tram Station
coachStation	Coach Station
ferryPort	Ferry Port
harbourPort	Harbour Port
ferryStop	Ferry Stop
skiLift	Ski Lift
other	Other

Table 9 — StopPlaceType: allowed values

Value	Description
preferredInterchange	Interchange is a preferred point for transfers by Journey Planners
recommendedInterchange	Interchange is recommended for use by Journey planners.
interchangeAllowed	Interchange may be used for transfers by Journey Planners but is not desirable
noInterchange	No Interchange should be made by Journey Planners

Table 10 — InterchangeWeighting: allowed values

Value	Description
interchangeOnly	Stop may only be used for interchange, not for entrance or exit.
noDirectRoadAccess	Stop may not be reached from road by a paved path.
longWalkToAccess	Stop may only be accessed by a long (200m) walk from road.
isolated	Stop is an island or ferry stop that does not connect to road network
limitedService	Stop has a very limited service.

Table 11 — LimitedUse: allowed values

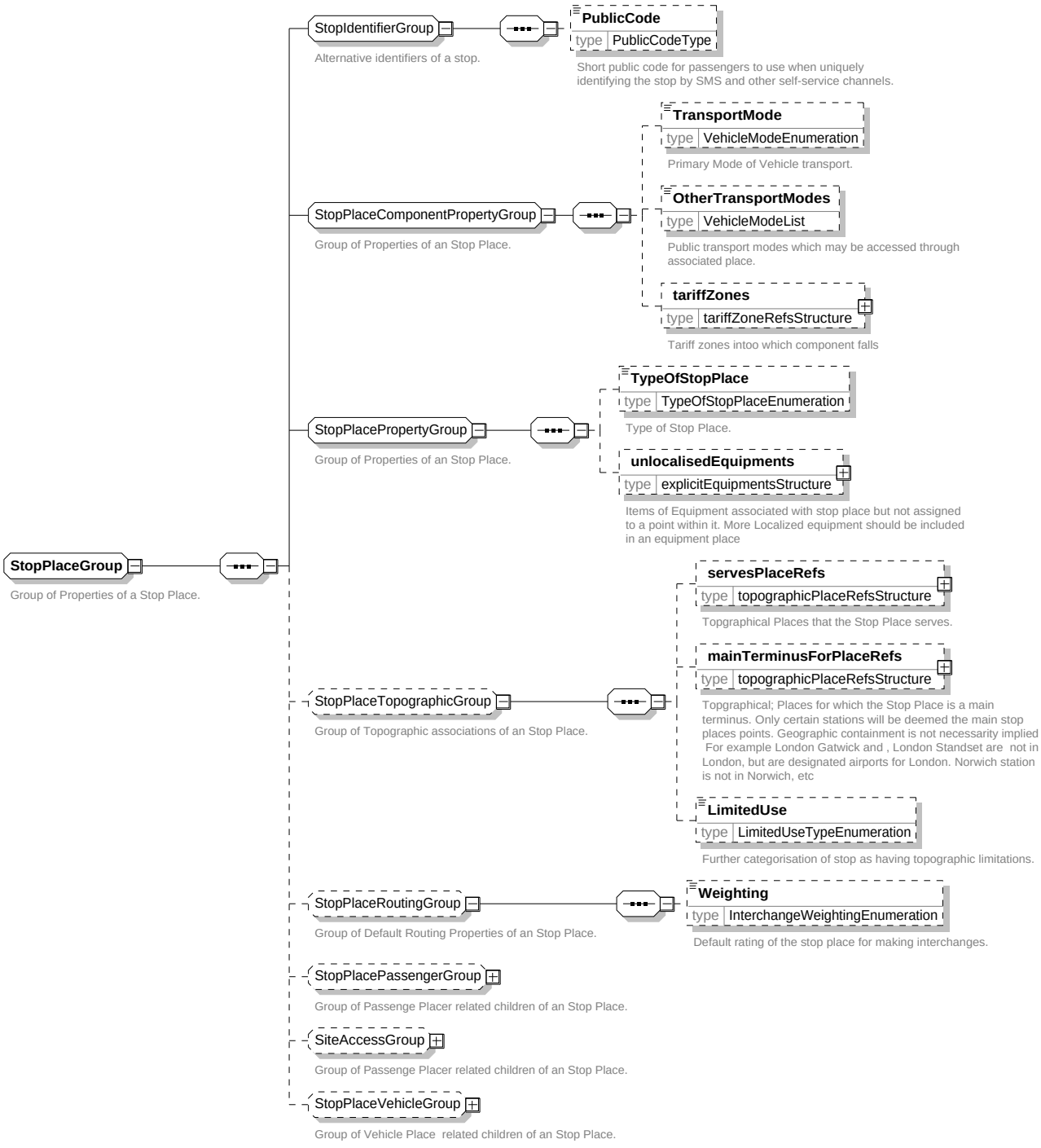


Figure 8 — StopPlaceGroup XSD

6.2.1.3StopPlacePassengerGroup – elements

StopPlacePassengerGroup describes the ***Quays*** and ***AccessSpace*** that are found within a ***StopPlace***

Element Name	Element Type	Card-inality	Comment
quays	*Quay* | *QuayRef*	**0:***	***Quay*** instances for ***StopPlace.***
accessSpaces	*AccessSpace* | *AccessSpaceRef*	**0:***	***AccessSpace*** instances for ***StopPlace.***

Table 12 — StopPlacePassengerGroup elements

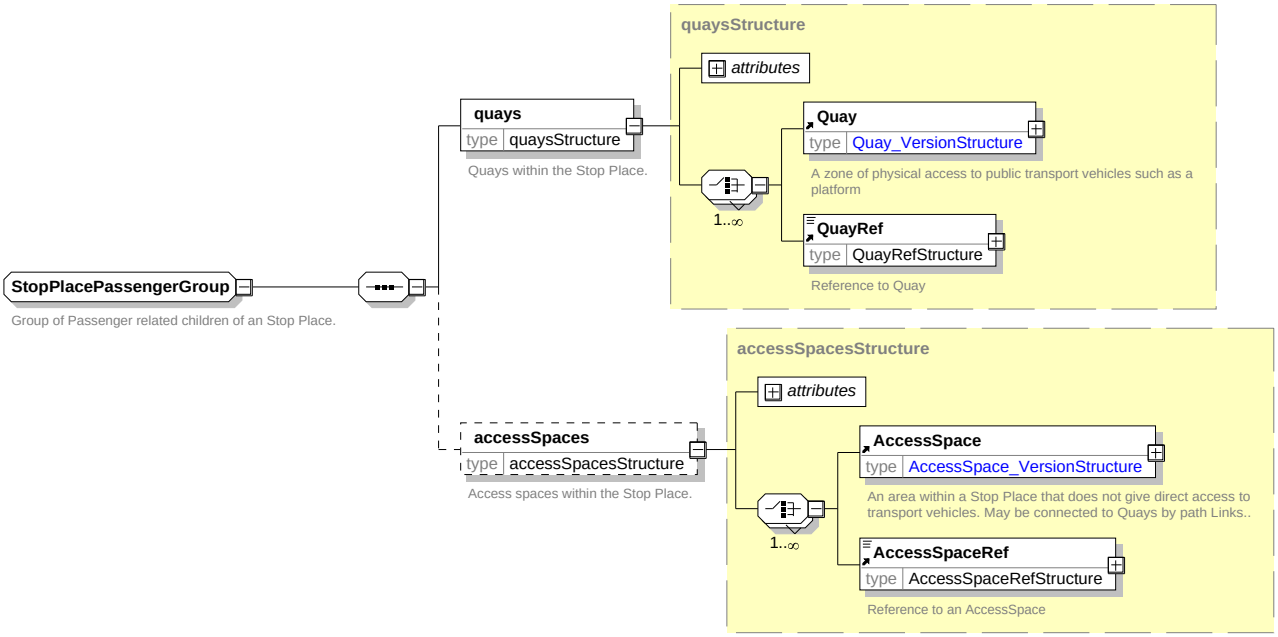


Figure 9 — StopPlacePassengerGroup XSD

6.2.1.4StopPlaceVehicleGroup – elements

StopPlaceVehicleGroup describes the ***VehicleEntrance*** and ***VehicleStoppingPlace*** elements that are found within a ***StopPlace.***

Element Name	Element Type	Card-inality	Comment
vehicleEntrances	*VehicleEntrance* | *VehicleEntranceRef*	**0:***	***VehicleEntrance*** instances for ***StopPlace.***
vehicleStoppingPlaces	*VehicleStoppingPlace*	**0:***	***VehicleStoppingPlace*** instances for ***StopPlace.***

Table 13 — StopPlaceVehicleGroup elements

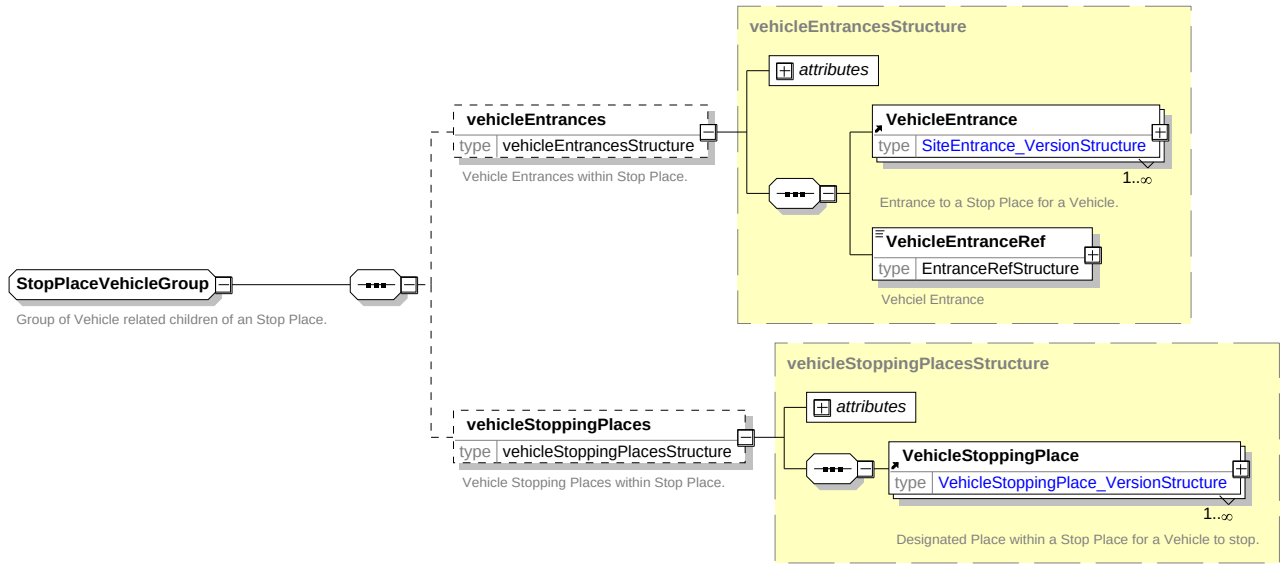


Figure 10 — StopPlaceVehicleGroup XSD

6.2.1.5StopPlaceSpace – elements

StopPlaceSpace describes the common properties of Spaces within a StopPlace.

Element Name	Element Type	Card-inality	Comment
Id	*PlaceIdType*	**0:1**	Identifier of ***StopPlaceSpace***.
		::>	***StopPlaceSpace*** is a subtype of ***SiteComponent.***
TransportMode	*TransportMode*	0:1	Primary Vehicle modes for ***StopPlaceSpace.***
otherTransportModes	*TransportMode*	0:*	Other Vehicle modes for ***StopPlaceSpace***.
tariffZones	*TariffZone*	0:*	***TariffZone*** instance to which ***StopPlaceSpace*** belongs.
BoardingUse	*xsd;boolean*	**0:1**	Whether ***StopPlaceSpace*** may be used for boarding.
AlightingUse	*xsd;boolean*	**0:1**	Whether ***StopPlaceSpace*** may be used for alighting.

Table 14 — StopPlaceSpace elements

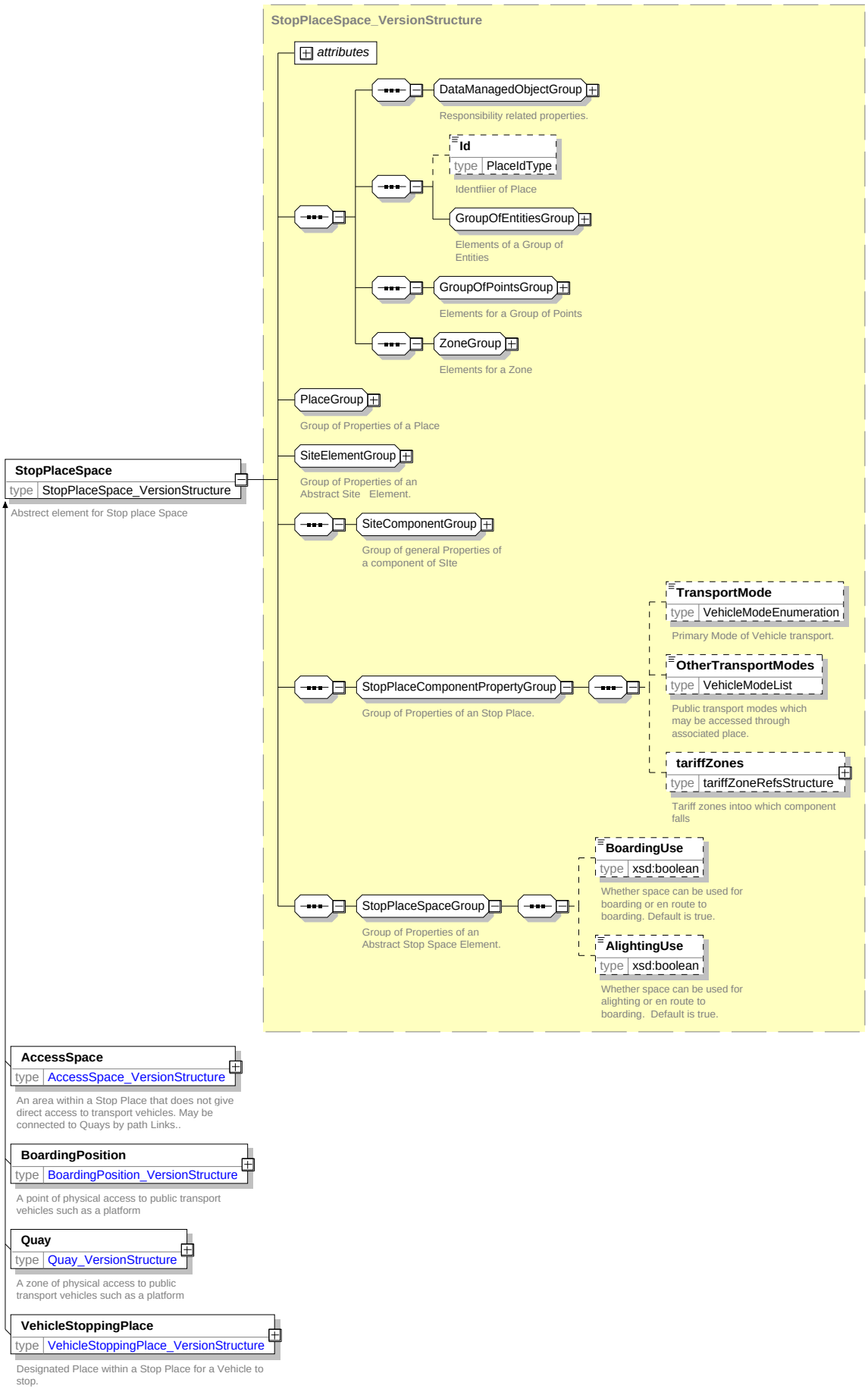

StopPlaceSpace_VersionStructure
attributes
DataManagedObjectGroup
Responsibility related properties.
Id
type PlaceIdType
Identfiier of Place
GroupOfEntitiesGroup
Elements of a Group of Entities
GroupOfPointsGroup
Elements for a Group of Points
ZoneGroup
Elements for a Zone
PlaceGroup
Group of Properties of a Place
SiteElementGroup
Group of Properties of an Abstract Site Element.
SiteComponentGroup
Group of general Properties of a component of SIte
TransportMode
type VehicleModeEnumeration
Primary Mode of Vehicle transport.
OtherTransportModes
type VehicleModeList
Public transport modes which may be accessed through associated place.
tariffZones
type tariffZoneRefsStructure
Tariff zones intoo which component falls
StopPlaceComponentPropertyGroup
Group of Properties of an Stop Place.
BoardingUse
type xsd:boolean
Whether space can be used for boarding or en route to boarding. Default is true.
StopPlaceSpaceGroup
Group of Properties of an Abstract Stop Space Element.
AlightingUse
type xsd:boolean
Whether space can be used for alighting or en route to boarding. Default is true.
StopPlaceSpace
type StopPlaceSpace_VersionStructure
Abstrect element for Stop place Space
AccessSpace
type AccessSpace_VersionStructure
An area within a Stop Place that does not give direct access to transport vehicles. May be connected to Quays by path Links..
BoardingPosition
type BoardingPosition_VersionStructure
A point of physical access to public transport vehicles such as a platform
Quay
type Quay_VersionStructure
A zone of physical access to public transport vehicles such as a platform
VehicleStoppingPlace
type VehicleStoppingPlace_VersionStructure
Designated Place within a Stop Place for a Vehicle to stop.

Figure 11 — StopPlaceSpace XSD

6.2.1.6Quay – elements

Quay describes a physical point of access to Public Transport such as a platform, ferry quay, airline gate, bus stop pole, or bus or coach bay.

Element Name	Element Type	Card-inality	Comment
Id	*QuayIdType*	**0:1**	Identifier of ***Quay***.
		::>	***Quay*** is a type of ***StopPlaceSpace***.
QuayGroup	***QuayGroup***	1:1	Contents specific to ***Quay*** – see next section.

Table 15 — Quay elements

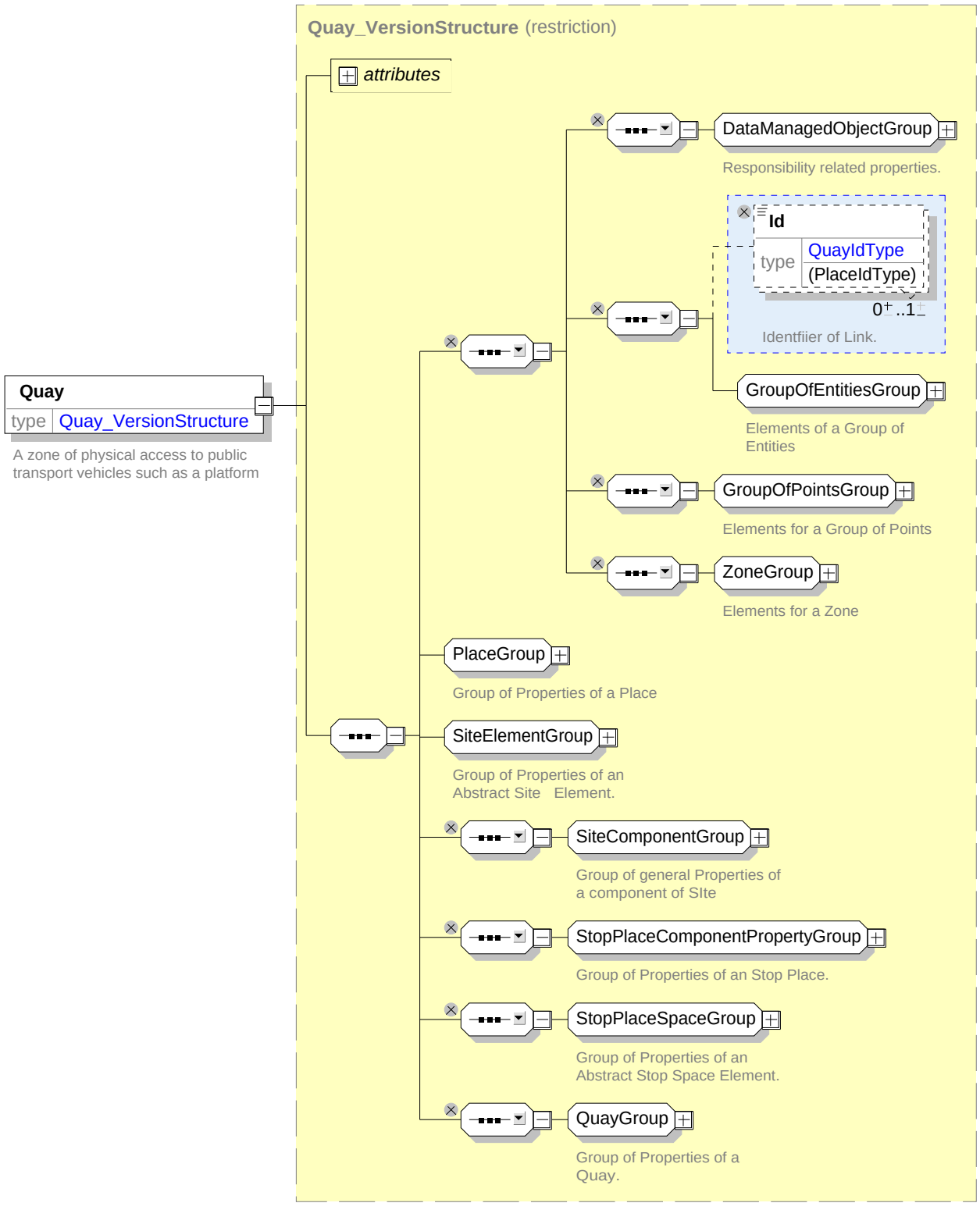


Figure 12 — Quay XSD

QuayGroup – elements

QuayGroup describes the properties of a ***Quay***.

	Element Name	Element Type	Cardinality	Comment
Identifier	***PublicCode***	*xsd:normalizedString*	0:1	Alternative code for ***Quay.***
	PlateCode	*xsd:normalizedString*	0:1	Asset code associated with ***Quay.***
	ShortCode	*xsd:normalizedString*	0:1	Short code for ***Quay.***
Quay-Descriptor-Group	***Label***	*MultilingualString*	0:1	Label for ***Quay.***
	Destinations	*DestinationDisplay*	0:*	Destinations to which ***Quay*** goes.
	BearingCompass	*CompassBearing*	0:1	Approximate Bearing of Quay to road as Compass octant.
	BearingDegrees	*xsd:integer*	0:1	Bearing of Quay to road at address in degrees.
	QuayType	*Enumeration*	0:*	Type of ***Quay*** – see below.
--	***ParentQuayRef***	*ParentQuayRef*	0:1	Parent ***Quay*** which nests this ***Quay.***
--	***boardingPositions***	*BoardingPosition*	0:*	***BoardingPositions*** contained in ***Quay.***
--	***entrances***	*EntranceRef*	0:*	References to entrances to ***Quay.***

Table 16 — QuayGroup elements

Value	Description
airlineGate	Airline Gate
metroPlatform	Metro Platform
busStop	Bus Stop
tramPlatform	Tram Platform
boatQuay	Boat Quay
telecabinePlatform	Telecabine Platform
setDownPlace	Set Down or Pick up Place
airlineGate	Airline Gate
metroPlatform	Metro Platform
busStop	Bus Stop
tramPlatform	Tram Platform
boatQuay	Boat Quay
telecabinePlatform	Telecabine Platform

Table 17 — QuayType: allowed values

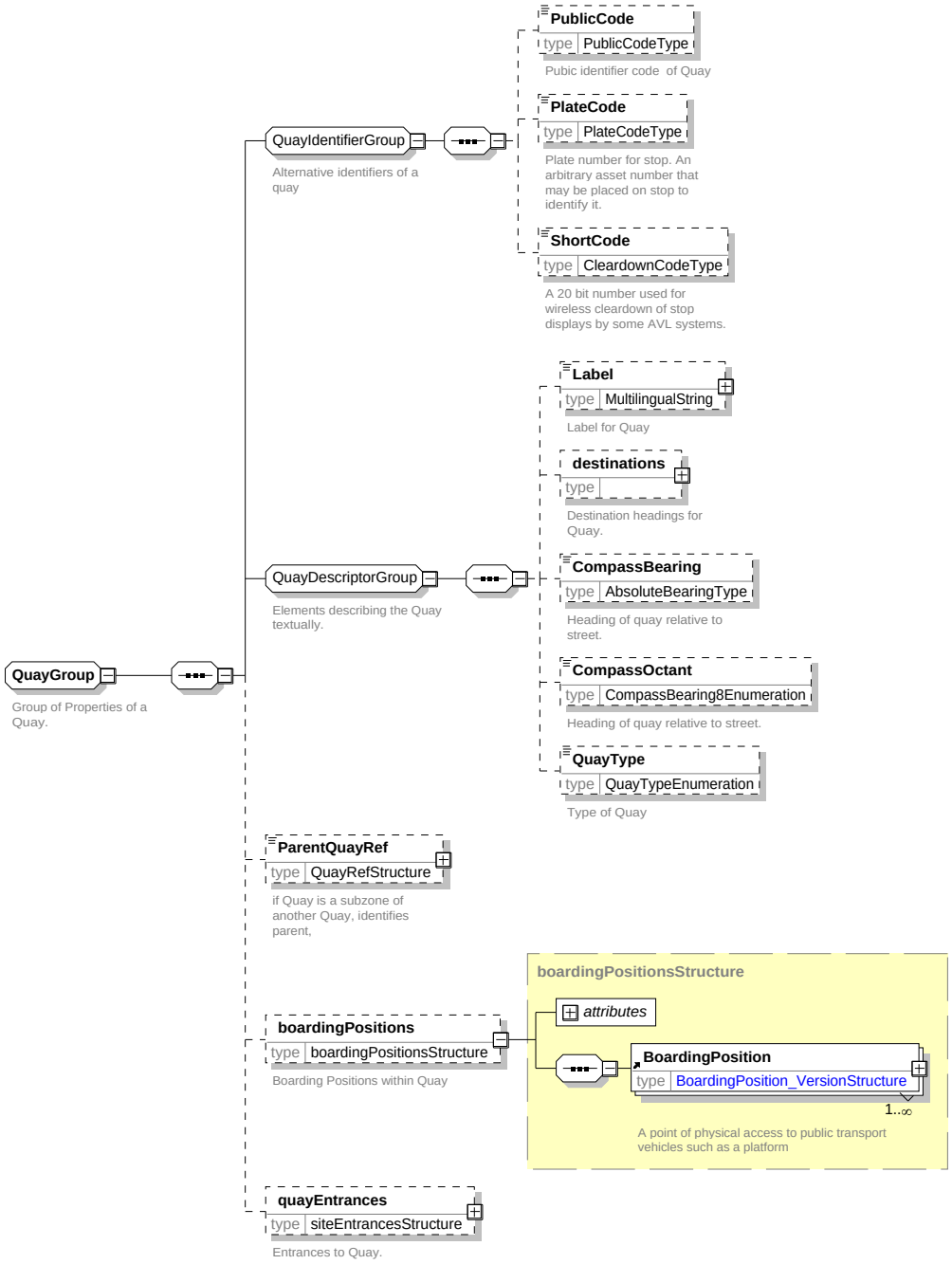


Figure 13 — QuayGroup XSD

DestinationDisplayView – element

DestinationDisplayView references the properties of a named Destination. May reference one of a set of defined destinations, but include data derived from that element in the ***QuayGroup.***

Element Name	Element Type	Card-inality	Comment
DestinationDisplayRef	***DestinationDisplayRef***	0:1	Reference to a ***DestinationDisplay.***
Name	*MultilingualString*	0:1	Name for ***DestinationDisplay***.

ShortName	*MultilingualString*	0:1	Short Name for ***DestinationDisplay***.
PublicCode	*xsd:normalizedString*	0:1	Public code associated with ***DestinationDisplay***.

Table 18 — DestinationDisplayView elements

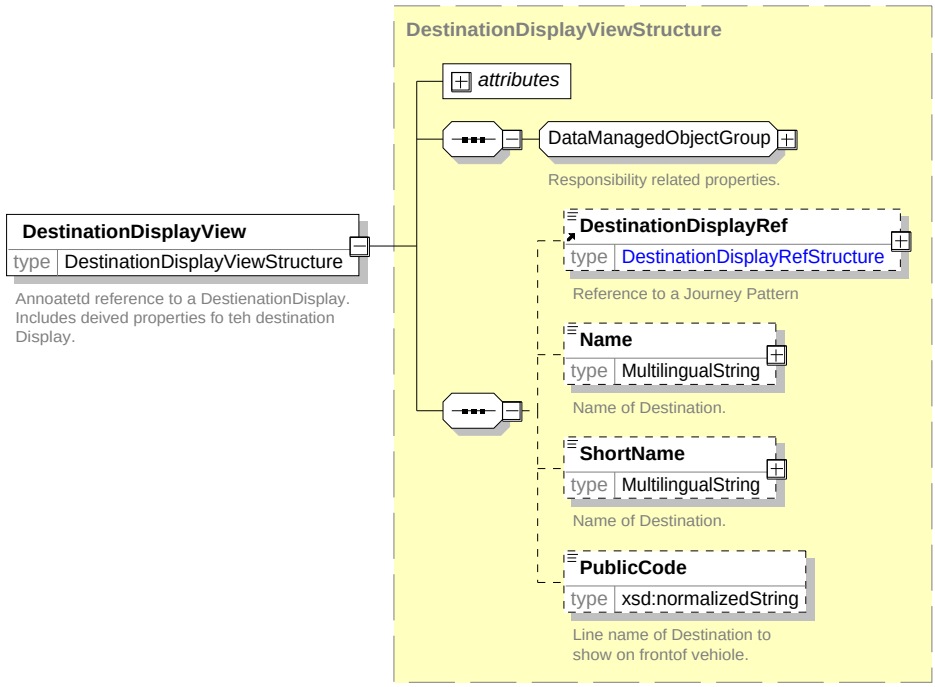


Figure 14 — DestinationDisplay XSD

6.2.1.7BoardingPosition – elements

BoardingPosition describes a designated point on a ***Quay***, from which a vehicle can be entered. For example “Stand here for Coach7” on a rail platform, or an enclosed door to a metro.

Element Name	Element Type	Card-inality	Comment
Id	*BoardingPositionIdType*	0:1	Identifier of ***BoardingPosition***.
		::>	***BoardingPosition*** is a type of ***StopPlaceSpace***.
PublicCode	*xsd:normalizedString*	0:1	Alternative Public code ***BoardingPosition.***
BoardingPosition Type	*Enumeration*	0:1	Type of ***BoardingPosition***.
Label	*MultilingualString*	0:1	Label for ***BoardingPosition***.
entrances	*EntranceRef*	0:*	References to entrances to ***BoardingPosition.***

Table 19 — BoardingPosition elements

Value	Description		
doorFromAirlineGate	Door from Airline Gate	*boatGangway*	Boat Gangway
positionOnRailPlatform	Position on Rail Platform	*ferryGangway*	Ferry Gangway
positionOnMetroPlatform	Position on Metro Platform	*telecabineplatform*	Telecabine platform
positionAtCoachStop	Position at Coach Stop	*setDownPoint*	Set Down Point
positionAtBusStop	Position at Bus Stop	*taxiBay*	Taxi Bay
		unknown	unknown
		other	other

Table 20 — BoardingPositionType: allowed values

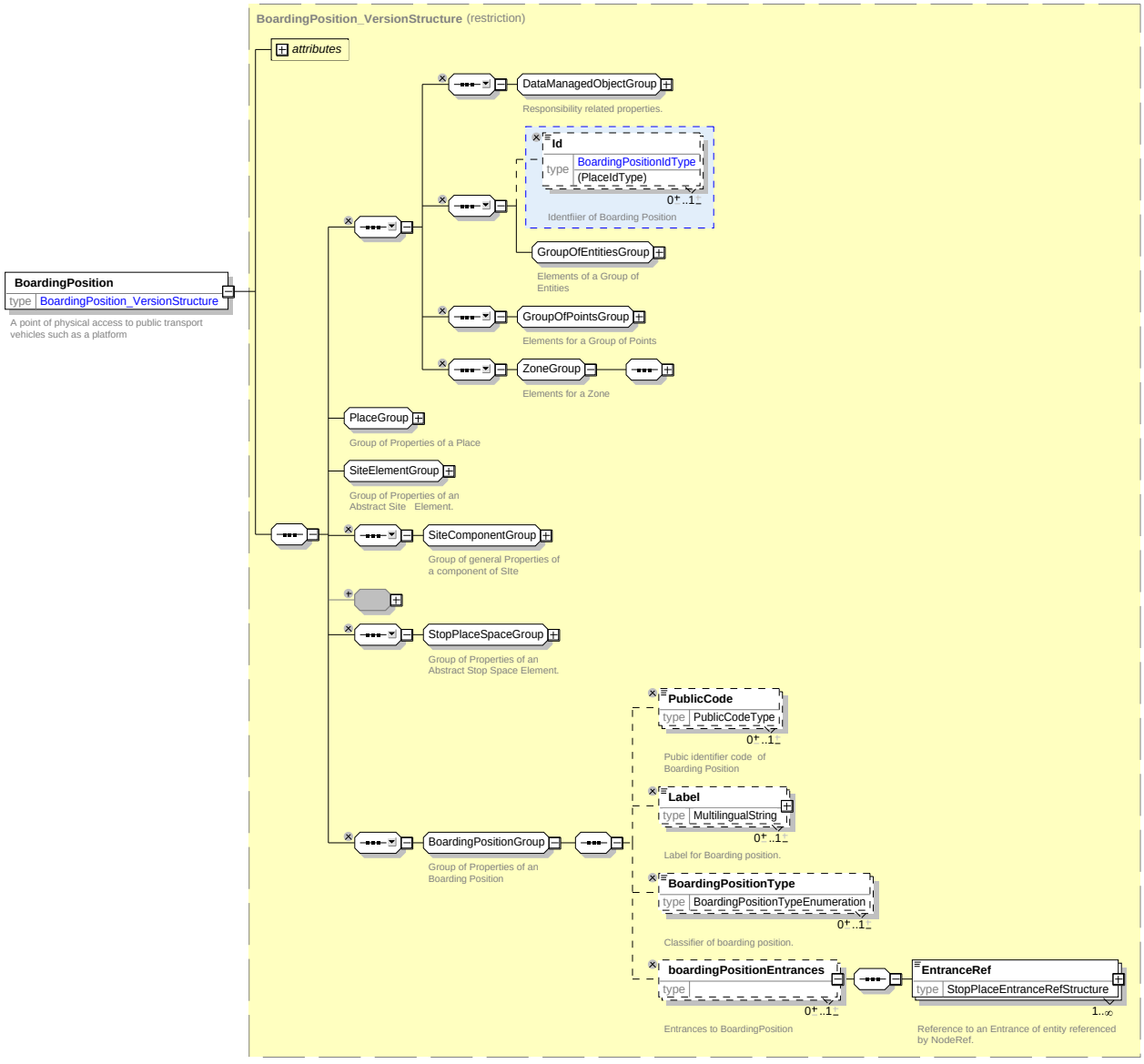


Figure 15 — BoardingPosition XSD

6.2.1.8AccessSpace – elements

AccessSpace describes a part of a ***StopPlace*** that is not an actual ***Quay***, for example, a ticket hall, concourse, stairs, etc.

Element Name	Element Type	Cardinality	Comment
Id	*AccessSpaceIdType*	**0:1**	Identifier of ***AccessSpace***.
		::>	***AccessSpace*** is a type of ***StopPlaceSpace***.
AccessSpaceType	*Enumeration*	0:*	Type of ***AccessSpace***.
PassageType	*Enumeration*	0:*	Type of Passage. – Additional classification of ***AccessSpace***.
ParentAccess-SpaceRef	*ParentAccessSpaceRef*	0:1	Reference to parent ***AccessSpace*** that nests this space.
entrances	*Entrance*	0:*	Entrances to ***AccessSpace***.

Table 21 — AccessSpace elements

Value		
concourse	*overpass*	*shop*
bookingHall	*passage*	*waitingRoom*
forecourt	*passageSection*	*restaurant*
underpass	*lift*	*other*
wc	*gallery*	*staircase*
	garage	

Table 22 — AccessSpaceType: allowed values

Value		
none	pathway	underpass
tunnel	corridor	
	overpass	
	other	

Table 23 — PassageType: allowed values

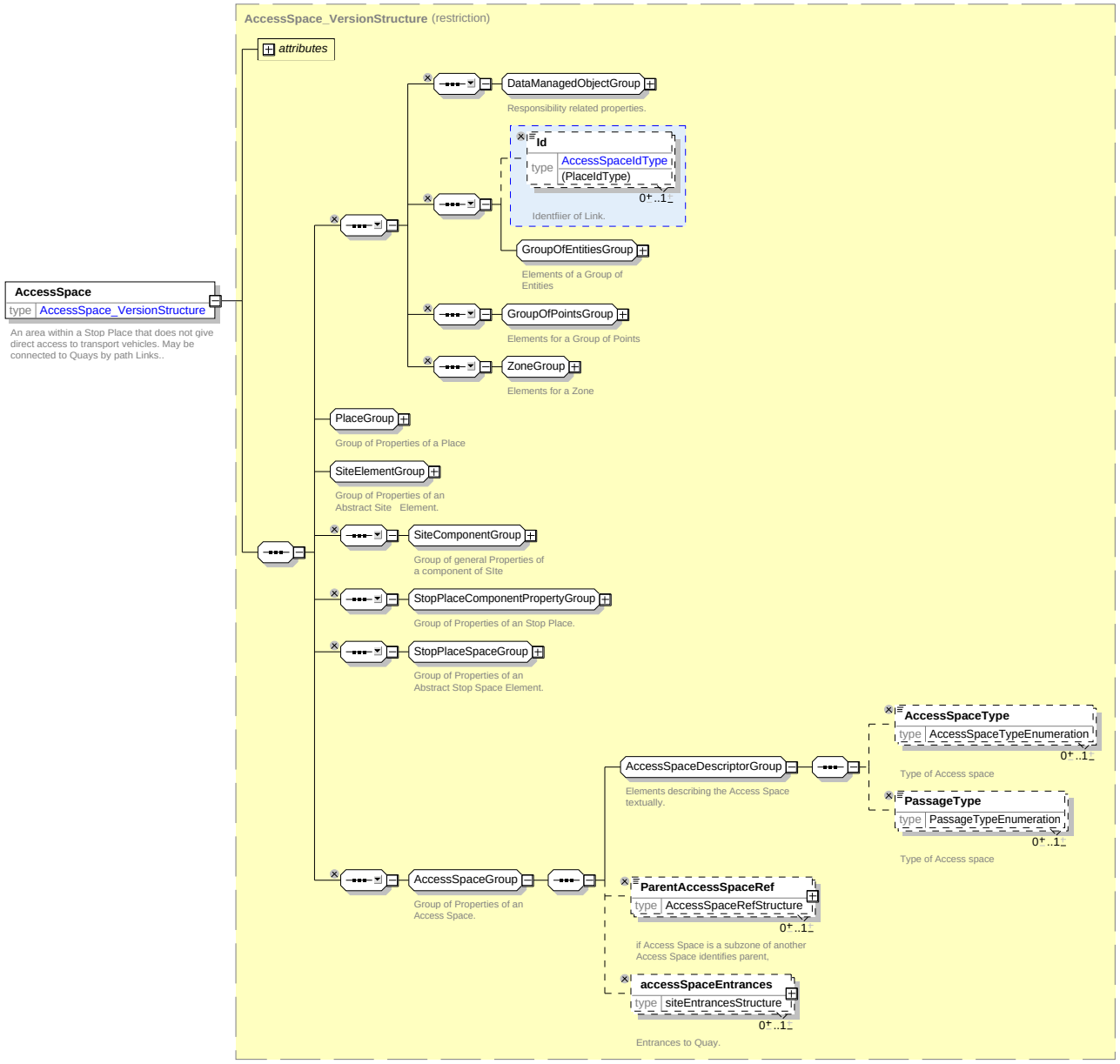


Figure 16 — AccessSpace XSD

6.2.1.9StopPlaceEntrance - elements

StopPlaceEntrance describes an ***Entrance*** to a ***StopPlace*** or to a ***StopPlaceComponent*** within a ***StopPlace***, such as a ***Quay***,

Element Name	Element Type	Card-inality	Comment
Id	*StopPlaceEntranceIdType*	**0:1**	Identifier of ***StopPlaceEntrance***.
		::>	***StopPlaceEntrance*** is a type of ***SiteEntrance***.

Table 24 — StopPlaceEntrance elements

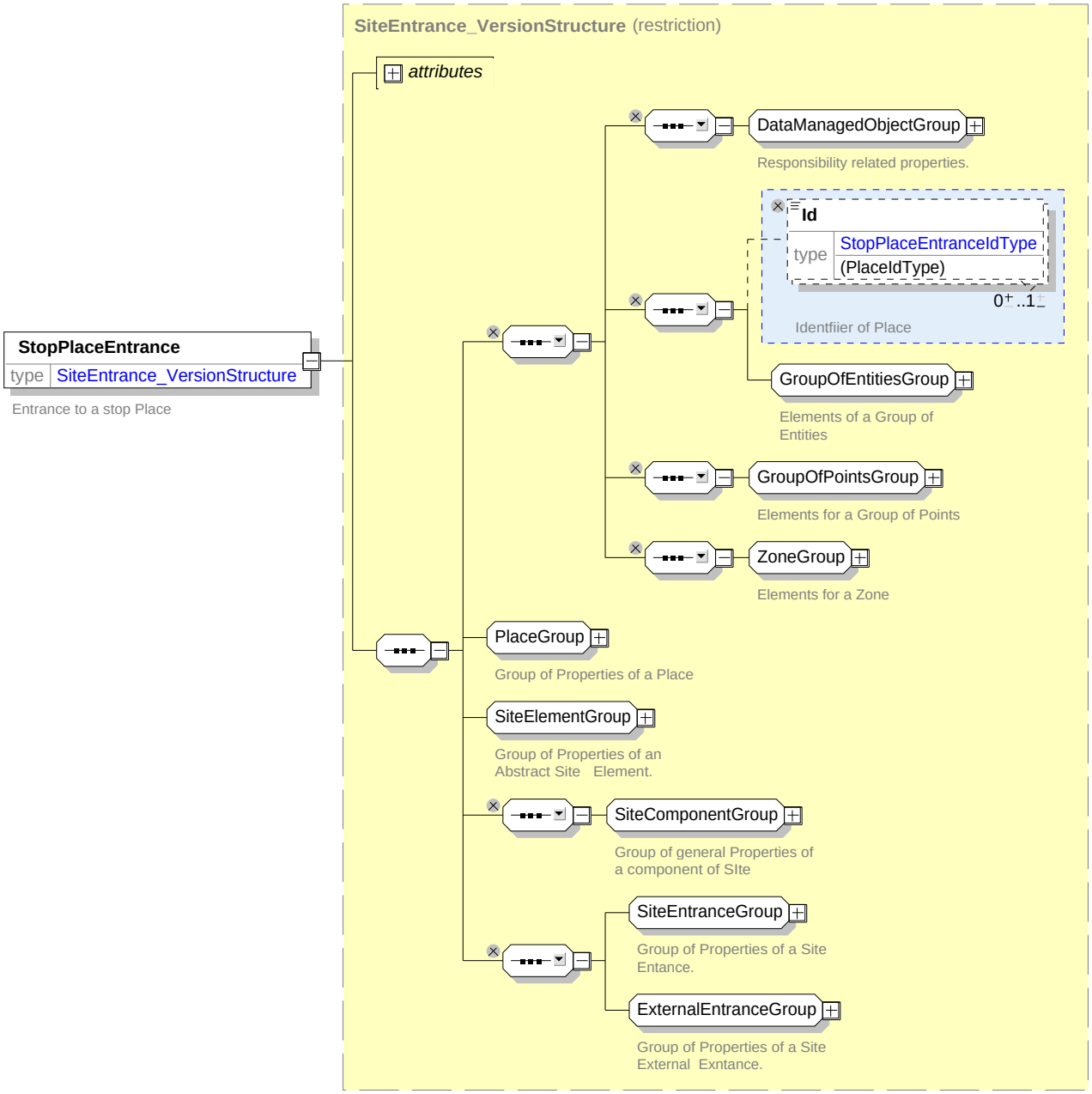


Figure 17 — StopPlaceEntrance XSD

6.2.2 FlexibleStopPlace

FlexibleStopPlace describes a named coverage zone for a flexible service.

6.2.2.1FlexibleStopPlace – element

FlexibleStopPlace describes a named area of operation of a flexible transport system.

Element Name	Element Type	Card-inality	Comment
Id	*FlexibleStopPlaceIdType*	**1:1**	Identifier of ***FlexibleStopPlace***.
		::>	***FlexibleStopPlace*** is a subtype of ***Zone.*** *See later.*
ShortName	*MultilingualString*	0:1	Short name for ***FlexibleStopPlace***.
NameSuffix	*MultilingualString*	0:1	Suffix to name, e.g. *'opp', 'adj'.*
alternativeNames	***AlternativeName***	0:*	Alternative names for ***FlexibleStopPlace***.
Image	*xsd:anyUri*	0:1	Image associated with ***FlexibleStopPlace.***
PublicCode	*xsd:normalizedString*	0:1	*Alternative code for* ***FlexibleStopPlace****.*
areas	*FlexibleArea* **|** *FlexibleAreaRef* | *HailAndRideArea* *HailAndRideAreaRef*	0:*	Areas within ***FlexibleStopPlace***.

Table 25 — FlexibleStopPlace elements

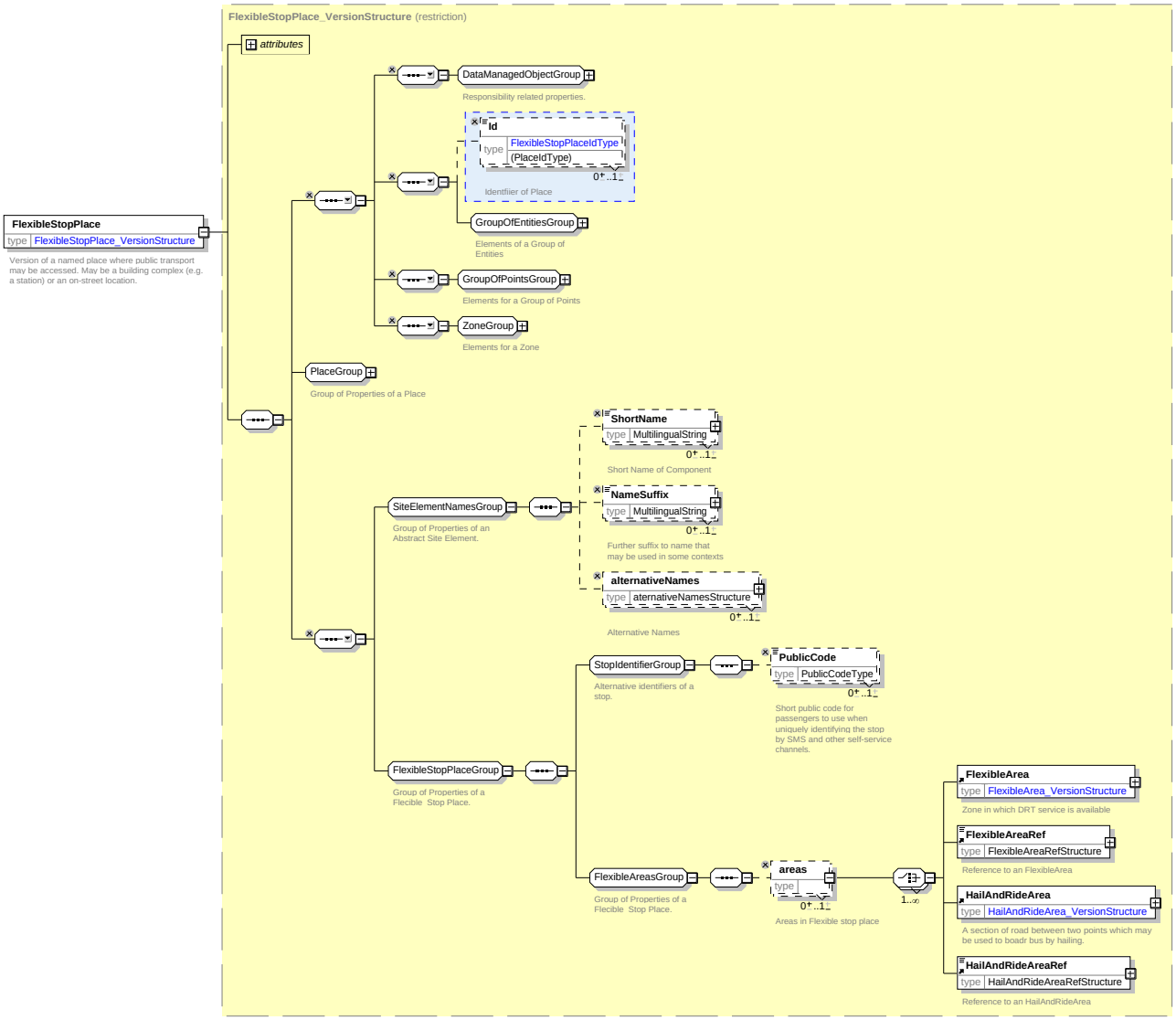


Figure 18 — FlexibleStopPlace XSD

6.2.2.2FlexibleQuay – abstract element

FlexibleQuay describes common properties of an area of operation of a flexible transport system.

Element Name	Element Type	Card-inality	Comment
Id	*FlexibleQuayIdType*	**1:1**	Identifier of ***FlexibleQuay***.
		::>	***FlexibleQuay*** is a subtype of ***Place.*** *See later.*
ShortName	*MultilingualString*	0:1	Short name for ***FlexibleQuay***.
NameSuffix	*MultilingualString*	0:1	Suffix to name, e.g. *'opp', 'adj'*
alternativeNames	***AlternativeName***	0:*	Alternative names for ***FlexibleQuay***.
TransportMode	*TransportMode*	0:1	Transport modes of ***FlexibleQuay***

tariffZones	*TariffZone*	0:*	Tariff zones in which ***FlexibleQuay*** lies.
BoardingUse	*xsd;boolean*	**0:1**	Whether ***FlexibleQuay*** may be used for boarding.
AlightingUse	*xsd;boolean*	**0:1**	Whether ***FlexibleQuay*** may be used for alighting.
PublicCode	*xsd:normalizedString*	0:1	*Alternative code for* ***FlexibleQuay.***

Table 26 — FlexibleQuay elements

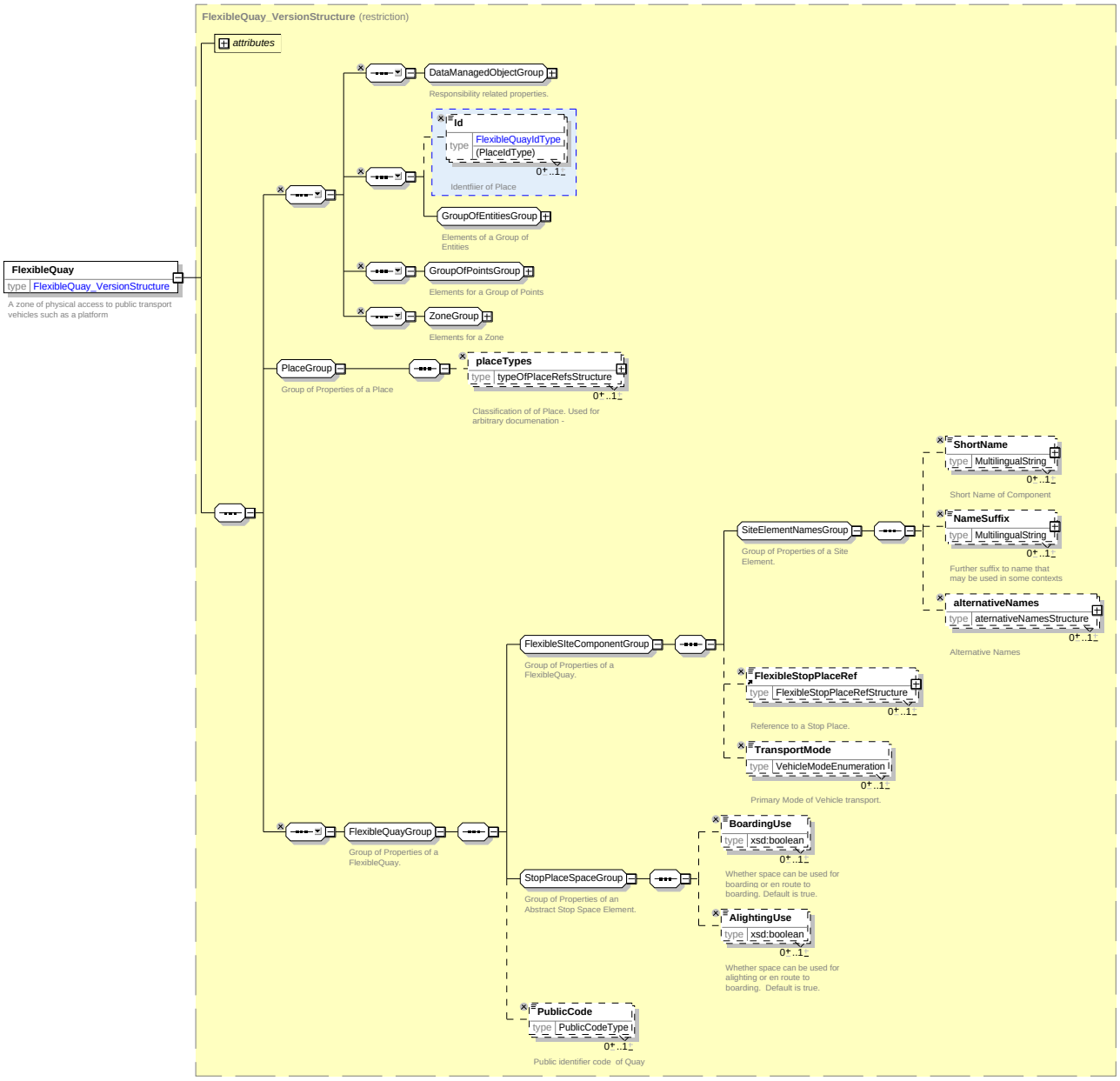


Figure 19 — FlexibleQuay XSD

6.2.2.3FlexibleArea – element

FlexibleArea describes an area of operation of a flexible transport system.

Element Name	Element Type	Card-inality	Comment
Id	*FlexibleAreaIdType*	**1:1**	Identifier of ***FlexibleArea***
		::>	***FlexibleArea*** is a subtype of ***FlexibleQuay.*** *See later.*
Label	*MultilingualString*	0:1	Label name for ***FlexibleArea***.
destinations	*xsd:normalizedString*	0:*	*Alternative code for* ***FlexibleArea.***

Table 27 — FlexibleArea elements

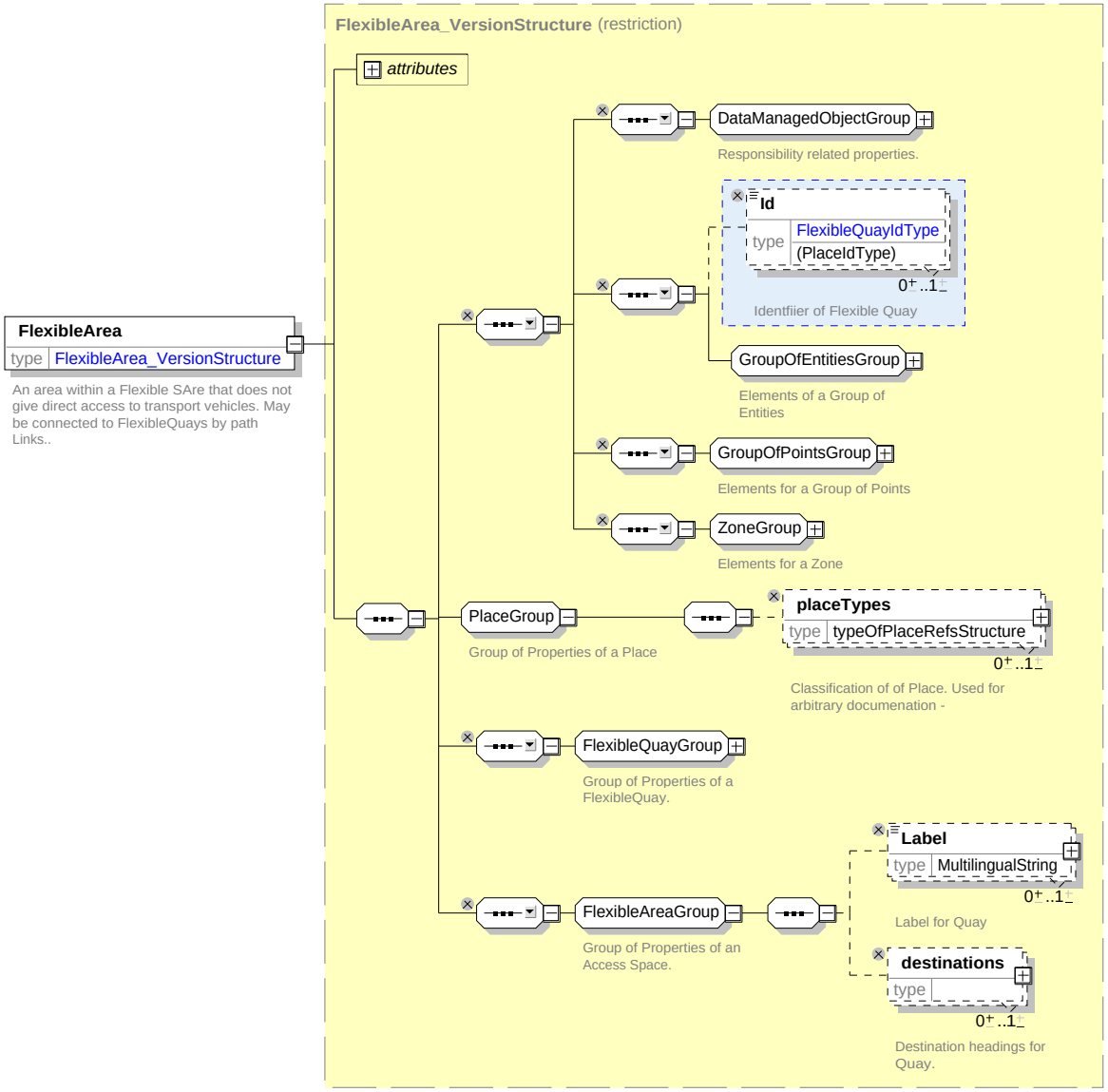


Figure 20 — FlexibleArea XSD

6.2.2.4HailAndRideArea – element

HailAndRideArea describes an area of operation of a flexible transport system.

Element Name	Element Type	Card-inality	Comment
Id	*HailAndRideAreaIdType*	**1:1**	Identifier of ***HailAndRideArea***
		::>	***HailAndRideArea*** is a subtype of ***FlexibleQuay.*** *See later.*
Label	*MultilingualString*	0:1	Label name for ***FlexibleArea***.
destinations	*xsd:normalizedString*	0:*	*Alternative code for* ***FlexibleArea.***
StartPointRef	*PointRef*	0:1	Start of ***HailAndRideArea*** section.
EndPointRef	*PointRef*	0:1	End of ***HailAndRideArea*** section.

Table 28 — HailAndRideArea elements

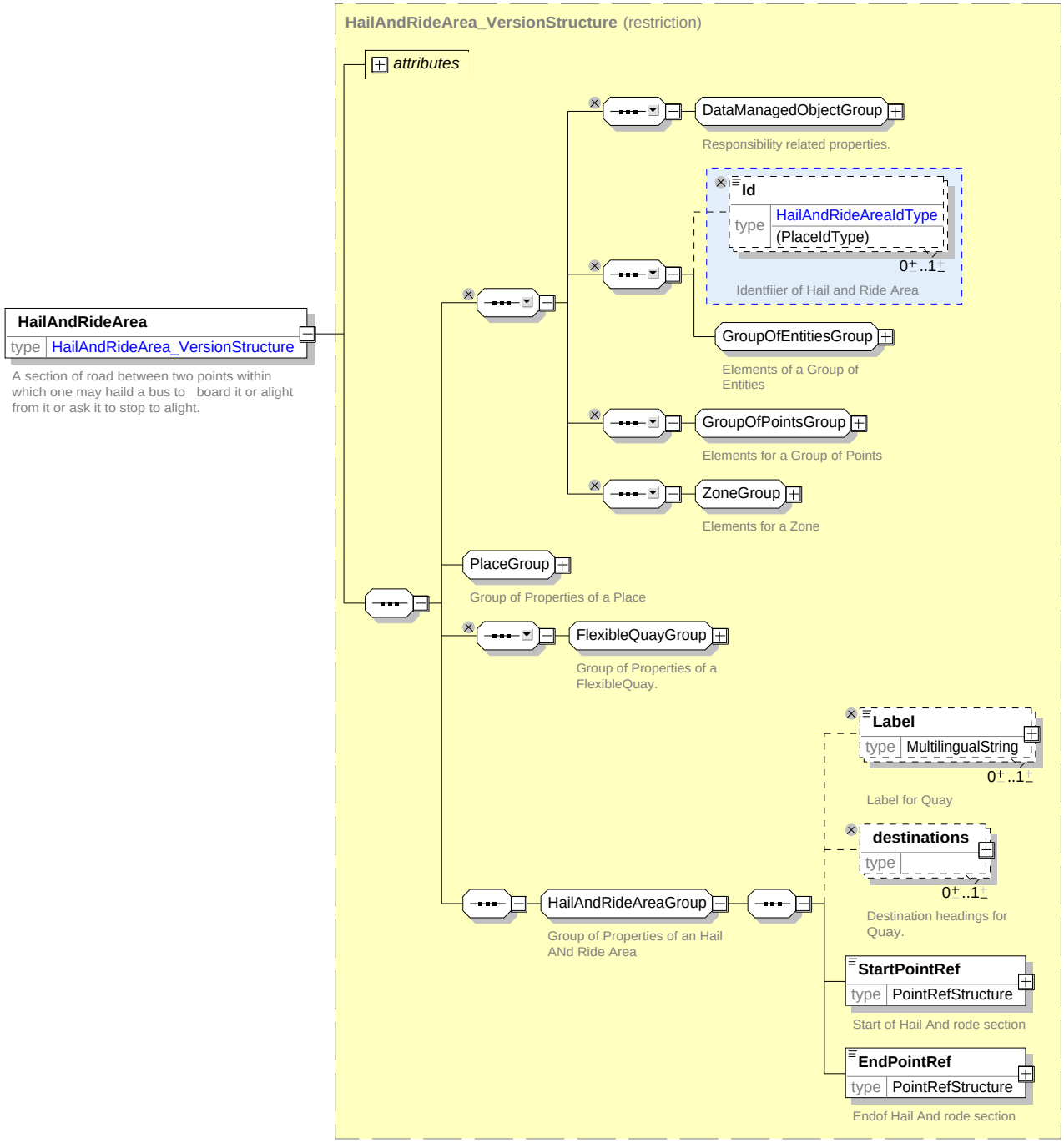


Figure 21 — HailAndRideArea XSD

6.2.3 ScheduledStopPoint element

ScheduledStopPoint describes a logical stop in a timetable. It may be associated with a physical stop using a ***StopAssignment***.

⇨ Note in Naptan-X ***trainElements***

Element Name	Element Type	Card-inality	Comment
Id	*ScheduledStopPointIdType*	**0:1**	Identifier of ***ScheduledStopPoint***.
		::>	***ScheduledStopPoint*** is a subtype of ***TimingPoint*** – See later.
AllowedWaitTime	***xsd:duration***	1:1	Default wait time for ***ScheduledStopPoint.***
ShortName	*MultilingualString*	0:1	Short Name for ***ScheduledStopPoint.***
VehicleModes	*ModeList*	0:*	Modes allowed at ***ScheduledStopPoint.***
Label	*MultilingualString*	0:1	Additional Label for ***ScheduledStopPoint.***
Description	*MultilingualString*	0:1	Description for ***ScheduledStopPoint.***
BoardingUse	*xsd;boolean*	0:1	Whether default is for Stop to be used for boarding.
AlightingUse	*xsd;boolean*	0:1	Whether default is for Stop to be used for boarding.
RequestStop	*xsd;boolean*	0:1	Whether default is for Stop to be a request stop.
PrivateCode	*xsd:normalizedString*	0:1	Private code associated with ***ScheduledStopPoint***.
Label	*MultilingualString*	0:1	Additional Label for ***ScheduledStopPoint***.
Description	*MultilingualString*	0:1	Description for ***ScheduledStopPoint.***

Table 29 — ScheduledStopPoint elements

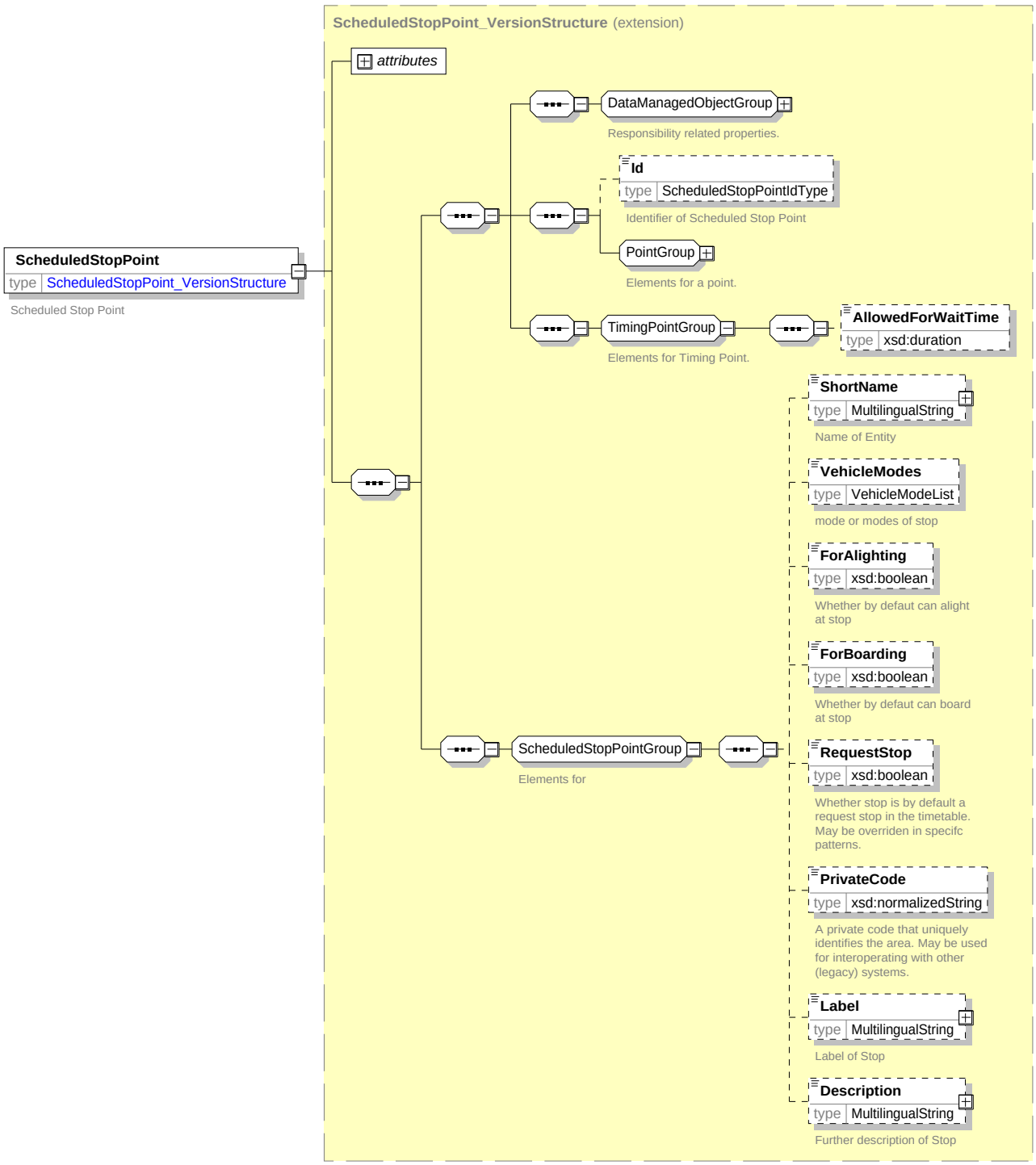


Figure 22 — ScheduledStopPoint XSD

6.2.4 StopArea- element

StopArea describes a group of ***ScheduledStopPoint*** instances.

Element Name	Element Type	Card-inality	Comment
Id	*StopAreaIdType*	**0:1**	Identifier of ***StopArea***.
		::>	***StopArea*** is a subtype of ***Zone*** – See framework.
PublicCode	*xsd:normalizedString*	1:1	Public facing code associated with ***StopArea***.
ParentStopAreaRef	*StopAreaRef*	1:1	Reference to a parent ***StopArea*** of which this ***StopArea*** is part.

Table 30 — StopArea elements

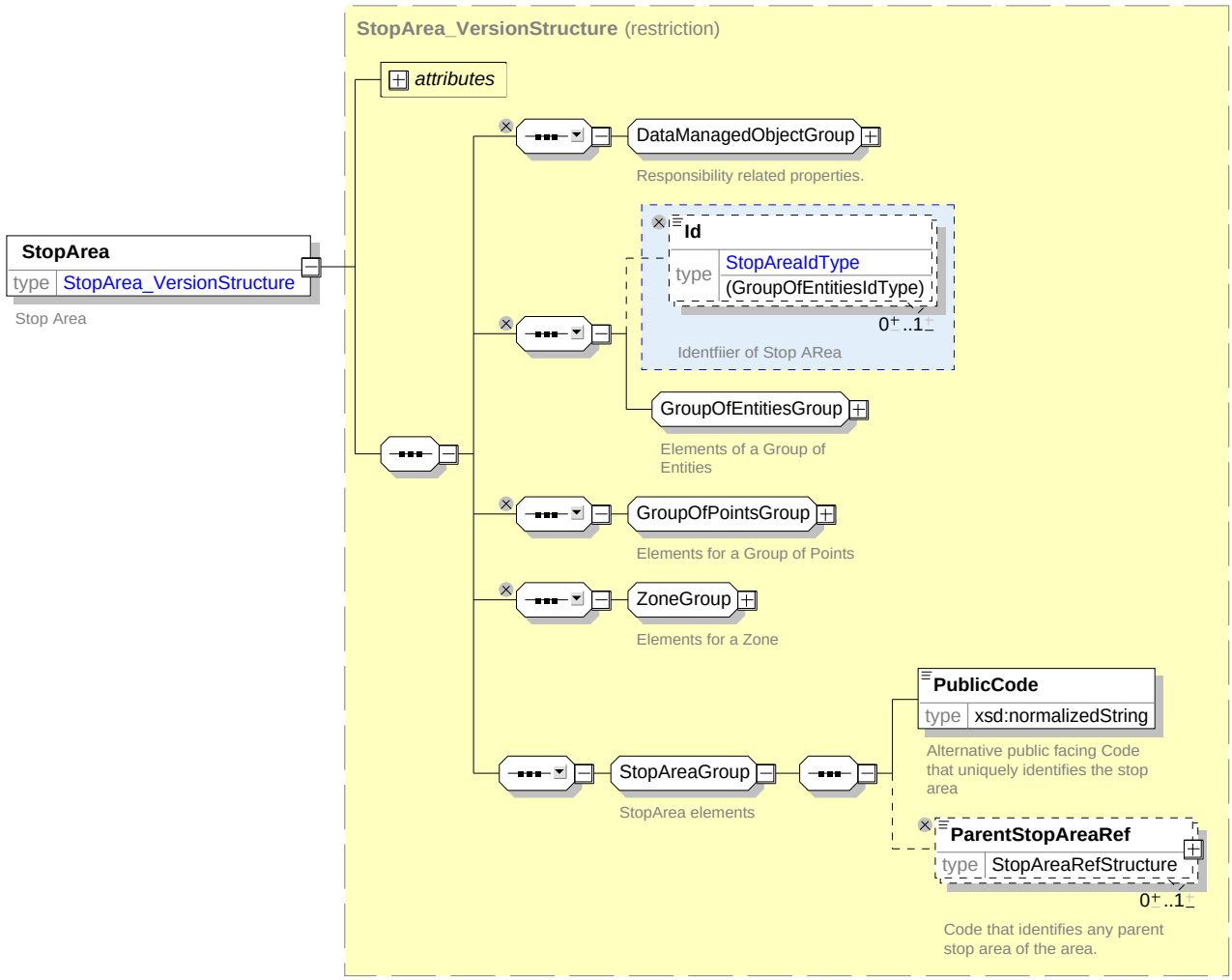


Figure 23 — StopArea XSD

6.2.5 StopAssignment

6.2.6 PassengerStopAssignment - element

PassengerStopAssignment describes the association of a logical stop in a timetable with a physical ***StopPlace*** and / or ***Quay***.

Element Name	Element Type	Card-inality	Comment
Id	*PassengerStop-AssignmenttIdType*	**0:1**	Identifier of ***PassengerStopAssignment***.
		::>	***PassengerStopAssignment*** is a subtype of ***StopAssigment***.
Description	*MultilingualString*	0:1	Description for ***PassengerStopAssignment.***
StopPlaceRef	*StopPlaceRef*	1:1	Reference to the ***StopPlace*** that is to be assigned.
ValidityCondition	*ValidityCondition*	0:1	***ValidityCondition*** controlling assignment.
QuayRef	*QuayRef*	0:1	Reference to a ***Quay*** to which to assign.
BoardingPositionRef	*BoardingPositionRef*	0:1	Reference to a ***BoardingPosition*** to which to assign.
ScheduledStop-PointRef	*ScheduledStopPointRef*	1:1	Reference to a ***ScheduledStopPoint*** to assign.
PrivateCode	*xsd:normalizedString*	0:1	Private code associated with ***ScheduledStopPoint***.
trainElements	*TrainAssignmentElement*	**0:***	***TrainElements*** being assigned.

Table 31 — StopAssignment elements

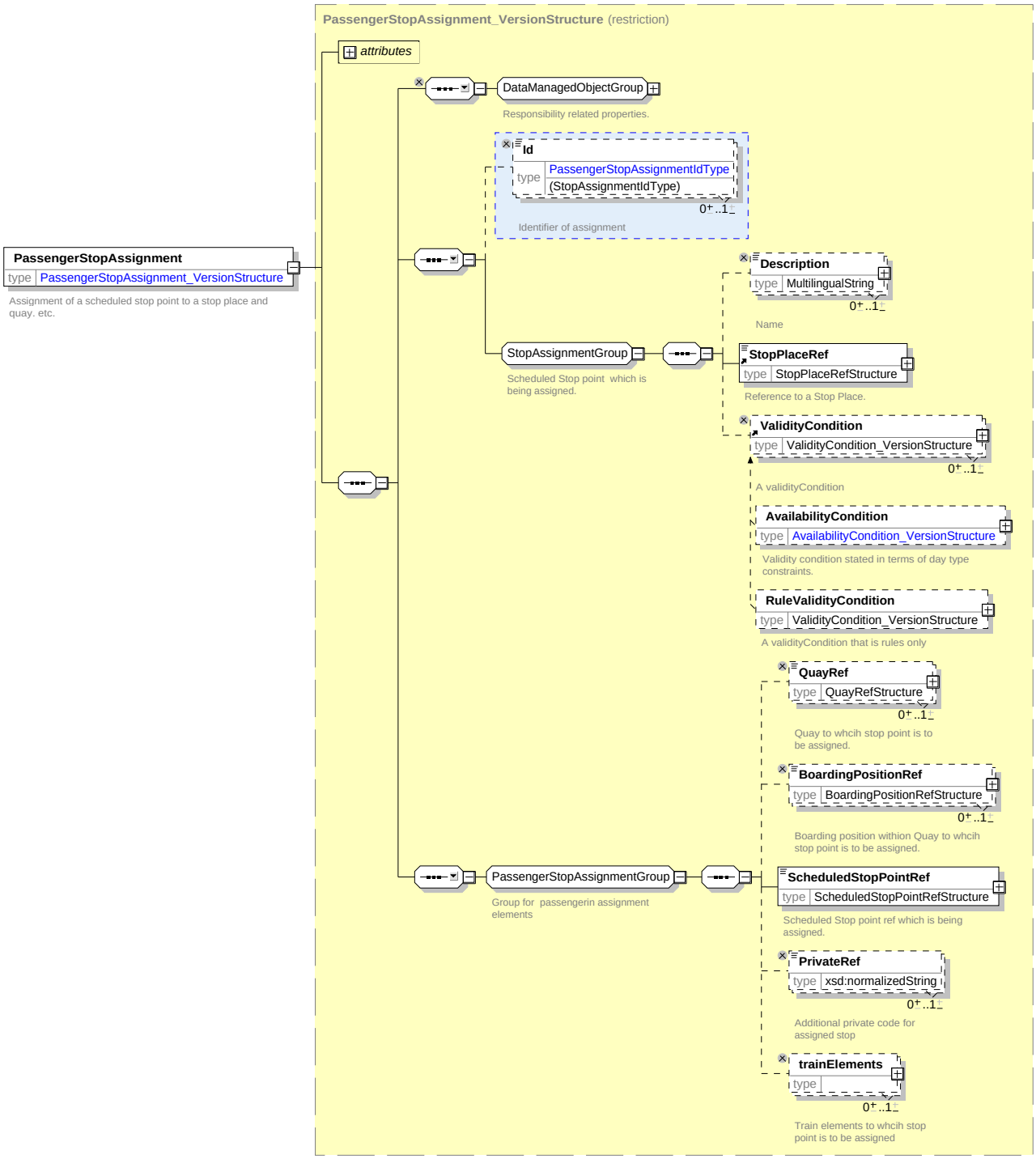


Figure 24 — StopAssignment XSD

6.2.7 DynamicStopAssignment - element

DynamicStopAssignment describes a change of association of a logical stop in a timetable with a physical ***StopPlace*** and / or ***Quay***.

Element Name	Element Type	Card-inality	Comment
Id	*PassengerStop-AssignmentIdType*	**0:1**	Identifier of ***PassengerStopAssignment***.
		::>	***DynamicStopAssignment*** is a subtype of ***PassengerStopAssignment***.
Passenger-StopAssignmentRef	*Passenger-StopAssignmentRef*	0:1	Reference to a ***PassengerStopAssignment*** that is overridden by ***DynamicStopAssignment.***

Table 32 — DynamicStopAssignment elements

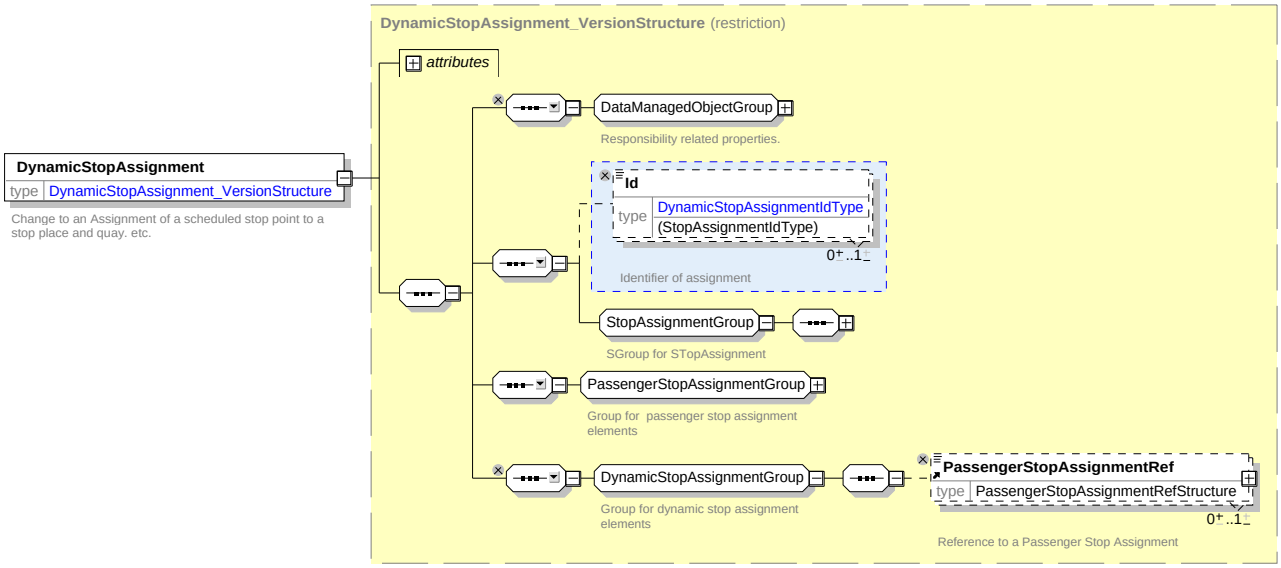


Figure 25 — DynamicStopAssignment XSD

6.2.8 Connection

6.2.9 Connection - element

Connection describes the association possibility of making a transfer between two ***ScheduledStopPoints***.

Element Name	Element Type	Card-inality	Comment
Id	*ConnectionIdType*	**0:1**	Identifier of ***Connection***.
		::>	***Connection*** is a subtype of ***Transfer***.
From	*ConnectionEnd*	1:1	Origin end of ***Connection***.
To	*ConnectionEnd*	1:1	Destination end of ***Connection***.
TransferOnly	*xsd;boolean*	**0:1**	Whether connection may be used for transfer only.

Table 33 — Connection elements

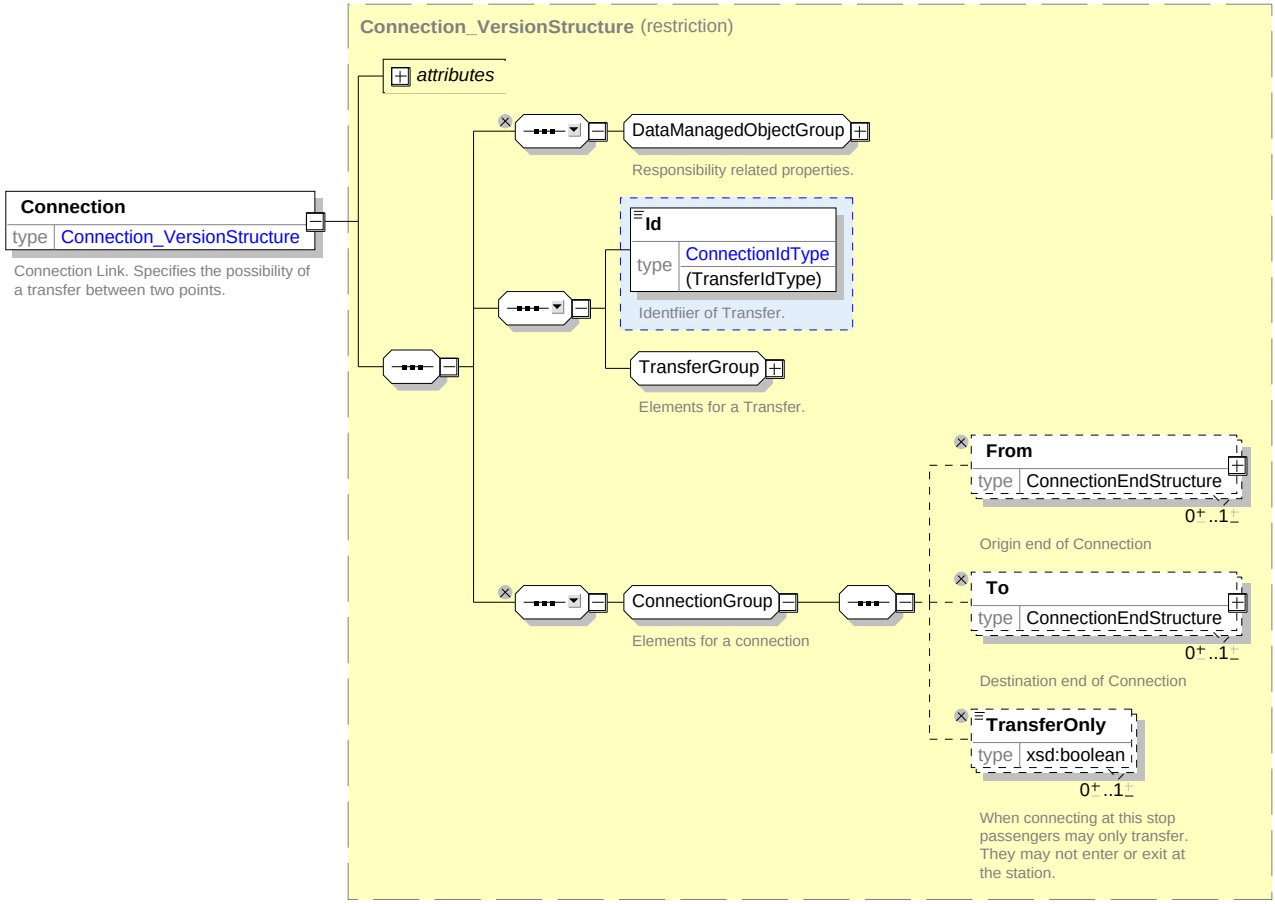


Figure 26 — Connection XSD

6.2.9.1ConnectionEnd – element

ConnectionEnd specifies the properties of one end of a ***Connection.***

Element Name	Element Type	Card-inality	Comment
ModeRef	*ModeRef*	0:1	*Mode for* ***ConnectionEnd.*** If unspecified assume all modes are available at stop point.
StopAreaRef	*StopAreaRef*	0:1	***StopArea*** to which ***ConnectionEnd*** connects.
ScheduledStop-PointRef	*ScheduledStopPointRef*	0:1	***ScheduledStopPoint*** to which ***ConnectionEnd*** connects.

Table 34 — ConnectionEnd elements

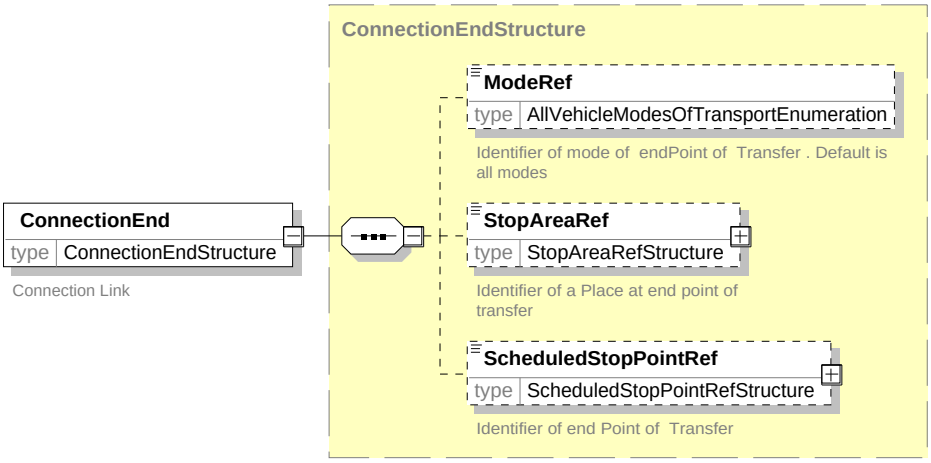


Figure 27 — ConnectionEnd XSD

6.2.10 SiteConnection – element

SiteConnection describes the association possibility of making a transfer between two parts of a ***Site***.

Element Name	Element Type	Card-inality	Comment
Id	*SiteConnectionIdType*	**0:1**	Identifier of ***SiteConnection***. A type of ***Transfer***
From	*SiteConnectionEnd*	1:1	Origin end of ***SiteConnection***.
To	*SiteConnectionEnd*	1:1	Destination end of ***SiteConnection***.
navigationPaths	*NavigationPath*	**0:***	***NavigationPaths*** that follow this connection

Table 35 — SiteConnection elements

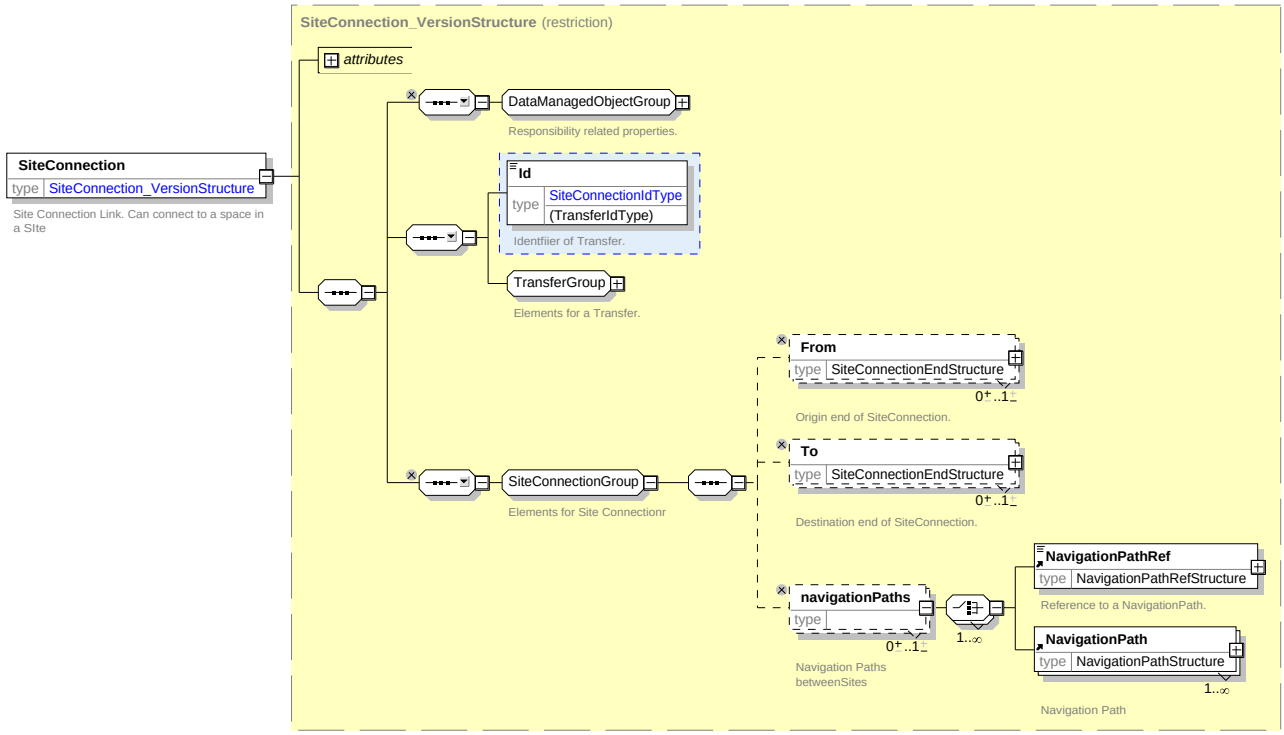


Figure 28 — SiteConnectionEnd XSD

6.2.10.1SiteConnectionEnd – element

SiteConnectionEnd specifies the properties of one end of a Site***Connection.***

Element Name	Element Type	Card-inality	Comment
ModeRef	*ModeRef*	0:1	*Mode for* ***Connection***
StopAreaRef	*StopAreaRef*	0:1	***StopArea*** to which ***Connection*** connects.
ScheduledStop-PointRef	*ScheduledStopPointRef*	0:1	***ScheduledStopPoint*** to which ***Connection*** connects.
StopPlaceRef	*StopPlaceRef*	0:1	***StopPlace*** to which ***Connection*** connects.
QuayRef	*QuayRef*	0:1	***Quay*** to which ***Connection*** connects.
EntranceRef	*EntranceRef*	0:1	***Entrance*** to which ***Connection*** connects.
PointOfInterestRef	*StopPlaceRef*	0:1	***PointOfInterest*** to which ***Connection*** connects.
EntranceRef	*EntranceRef*	0:1	***Entrance*** to which ***Connection*** connects.
ModeRef	*ModeRef*	0:1	***Mode*** *for* ***Connection.***
Label	*MultilingualString*	0:1	*Label for* ***Connection.***

Table 36 — ConnectionEnd elements

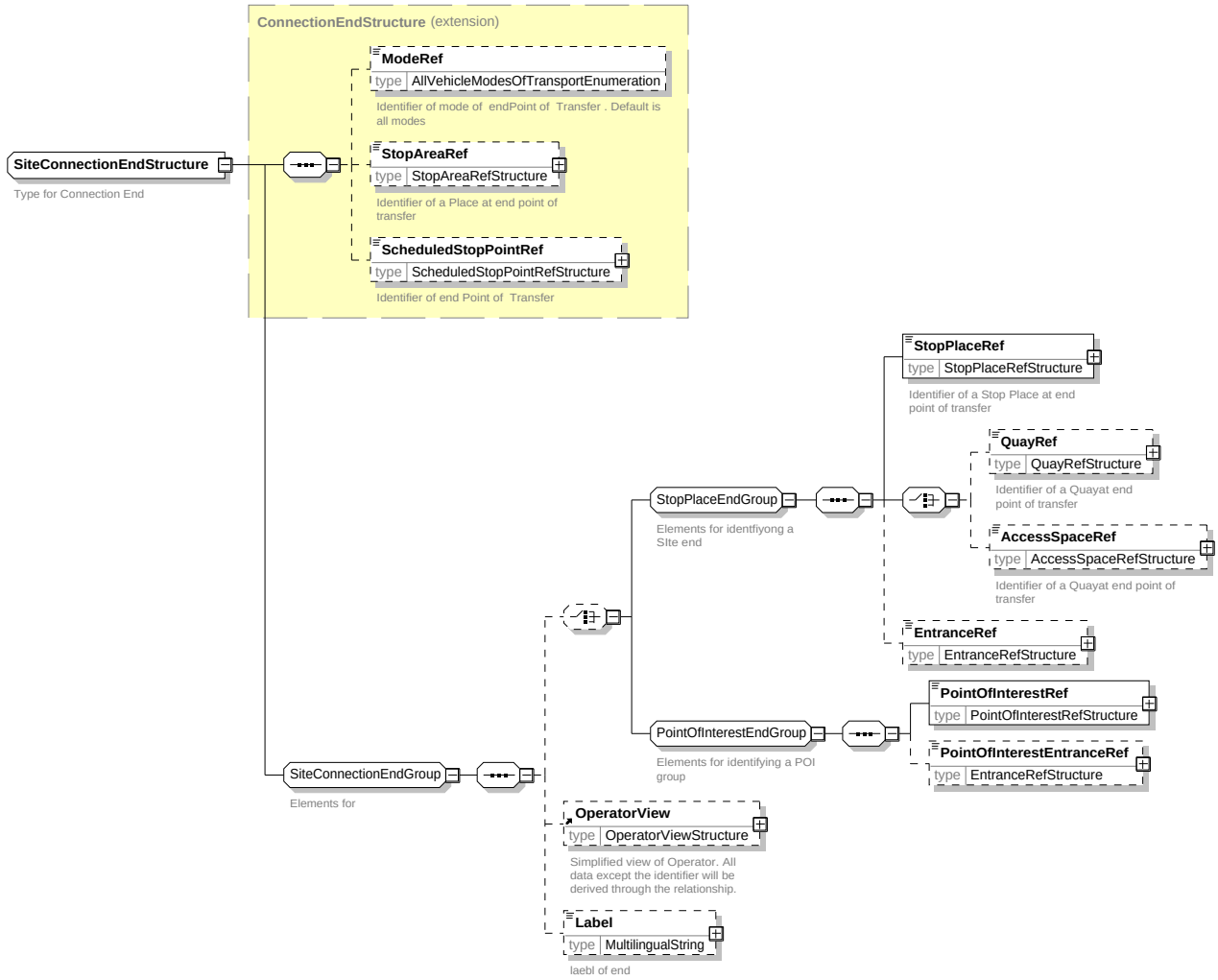


Figure 29 — SiteConnectionEnd XSD

6.2.11 DefaultConnection - element

DefaultConnection describes the default transfer times for making a connection within a given region and or mode.

Element Name	Element Type	Card-inality	Comment
Id	*ConnectionIdType*	**0:1**	Identifier of ***DefaultConnection***. A subtype of ***Transfer –*** *see framework.*
From	*DefaultConnectionEnd*	1:1	Origin end of ***DefaultConnection***.
To	*DefaultConnectionEnd*	1:1	Destination end of ***DefaultConnection***.
Topographic-PlaceView	*TopographicPlaceView*	**0:1**	***TopographicPlace*** for which ***DefaultConnection*** applies.

Table 37 — DefaultConnection elements

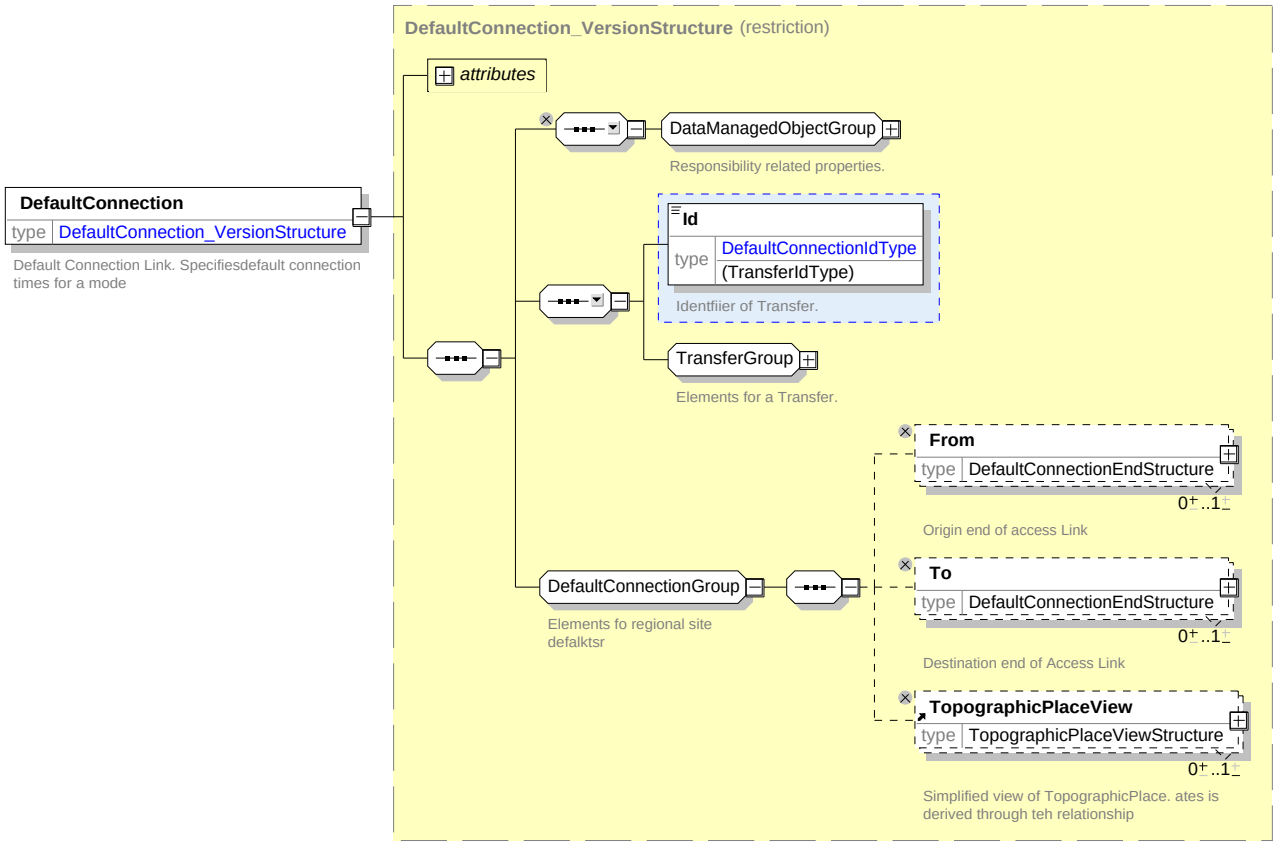


Figure 30 — DefaultConnection XSD

6.2.11.1DefaultConnectionEnd – element

DefaultConnectionEnd specifies the properties of one end of a ***DefaultConnection.***

Element Name	Element Type	Card-inality	Comment
ModeRef	*ModeRef*	0:1	*Mode for* ***DefaultConnection***
OperatorView	*OperatorView*	0:1	***OperatorView*** *for* ***DefaultConnection***

Table 38 — DefaultConnectionEnd elements

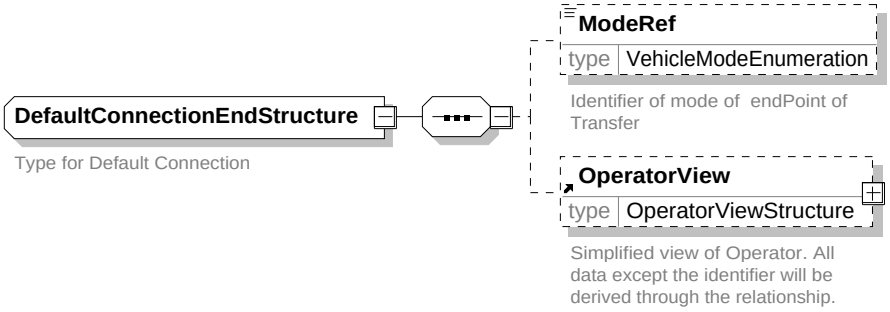


Figure 31 — DefaultConnectionEnd XSD

6.3 PointOfInterest related elements

6.3.1 PointOfInterest - element

PointOfInterest specifies access details about a named and classified place to which people may want to travel*.*

Element Name	Element Type	Card-inality	Comment
ModeRef	*ModeRef*	0:1	*Mode for* ***DefaultConnection***
OperatorView	*OperatorView*	0:1	***OperatorView*** *for* ***DefaultConnection***

Table 39 — PointOfInterest elements

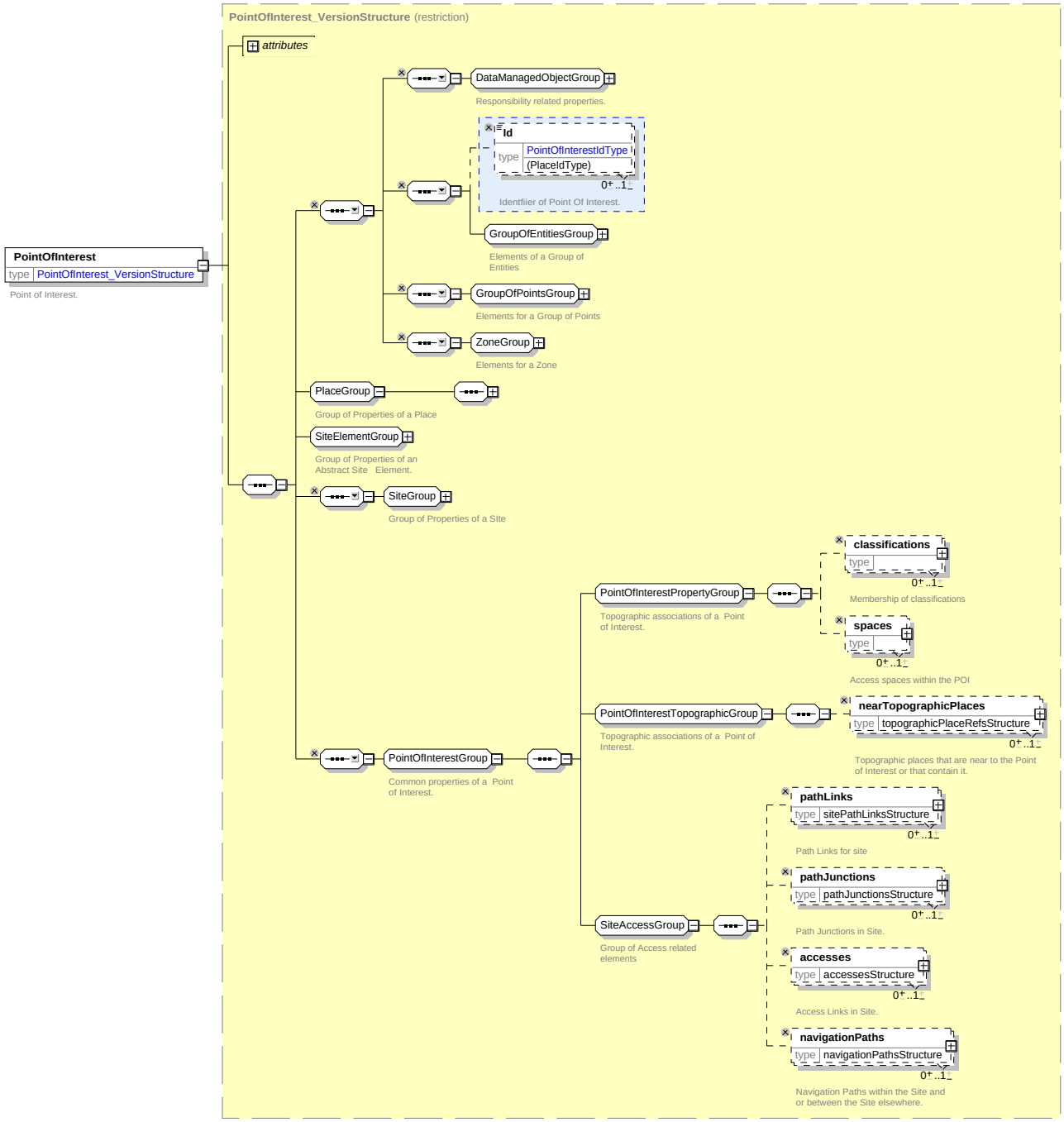


Figure 32 — PointOfInterest XSD

6.3.1.1PointOfInterestSpace - element

PointOfInterestSpace describes part of a ***PointOfInterest***.

Element Name	Element Type	Card-inality	Comment
Id	*PointOfInterestSpaceIdType*	**0:1**	Identifier of ***PointOfInterestSpace***.
		::>	***PointOfInterestSpace*** is a subtype of

			SiteComponent,
AccessSpaceType	*Enumeration*	0:1	Type of Access Space. See ***AccessSpace***
PointOfInterest-SpaceType	*Enumeration*	0:*	Type of ***PointOfInterestSpace.***
PassageType	*Enumeration*	0:*	Type of Passage
Parent-PointOfInterestRef	*ParentPointOfInterestRef*	0:1	Reference to parent ***PointOfInterest***.
entrances	*Entrance*	0:*	Entrances for ***PointOfInterestSpace.***

Table 40 — PointOfInterest elements

Value			
arena	skiboardingArea	queuingAreaForEntranc	stage
archeryArena	gates	e	ring
athleteArea	greenRoom	ridingArea	ticketing
auditorium	hospitalityZone	rowingArea	track
changingRoom	iceRink	securityScreeningArea	trackside
court	orchestralPit	sledRun	velodrome
downhillSkiingCourse	playingField	spectatorTerrace	warmUpArea
freestyleSkiingCourse	podium	spectatorSeating	waterside
	pool	spectatorStandingArea	other
	divingPool	sportsArea	
	pressArea	stabling	

Table 41 — PointOfInterestType: allowed values

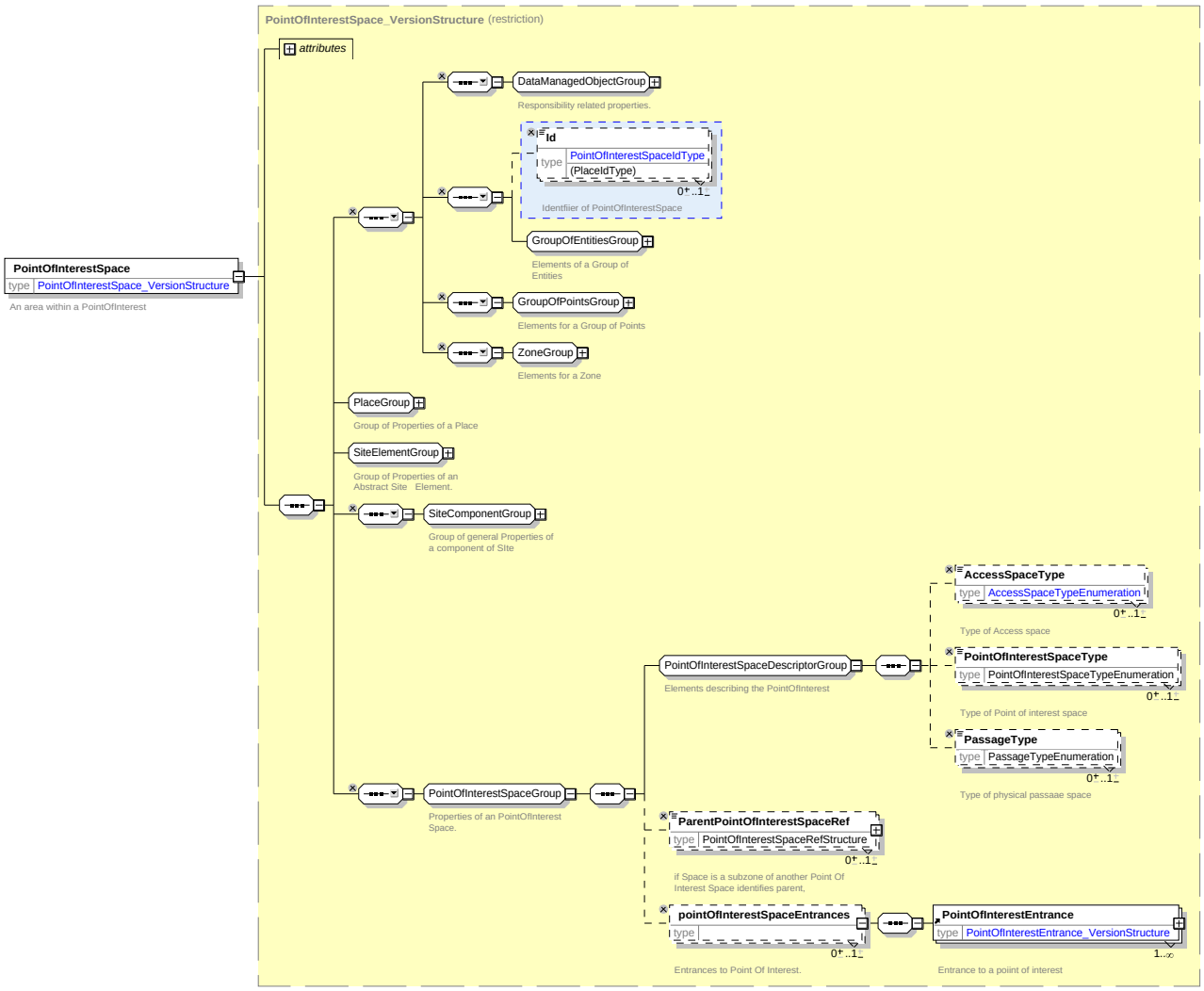


Figure 33 — PointOfInterestSpace XSD

6.3.1.2PointOfInterestEntrance - element

PointOfInterestEntrance describes an entrance to a ***PointOfInterest***.

Element Name	Element Type	Card-inality	Comment
Id	*PointOfInterestEntranceIdType*	**0:1**	Identifier of ***PointOfInterestEntrance***.
		::>	***PointOfInterestEntrance*** is a type of ***SiteEntrance***.

Table 42 — PointOfInterestEntrance elements

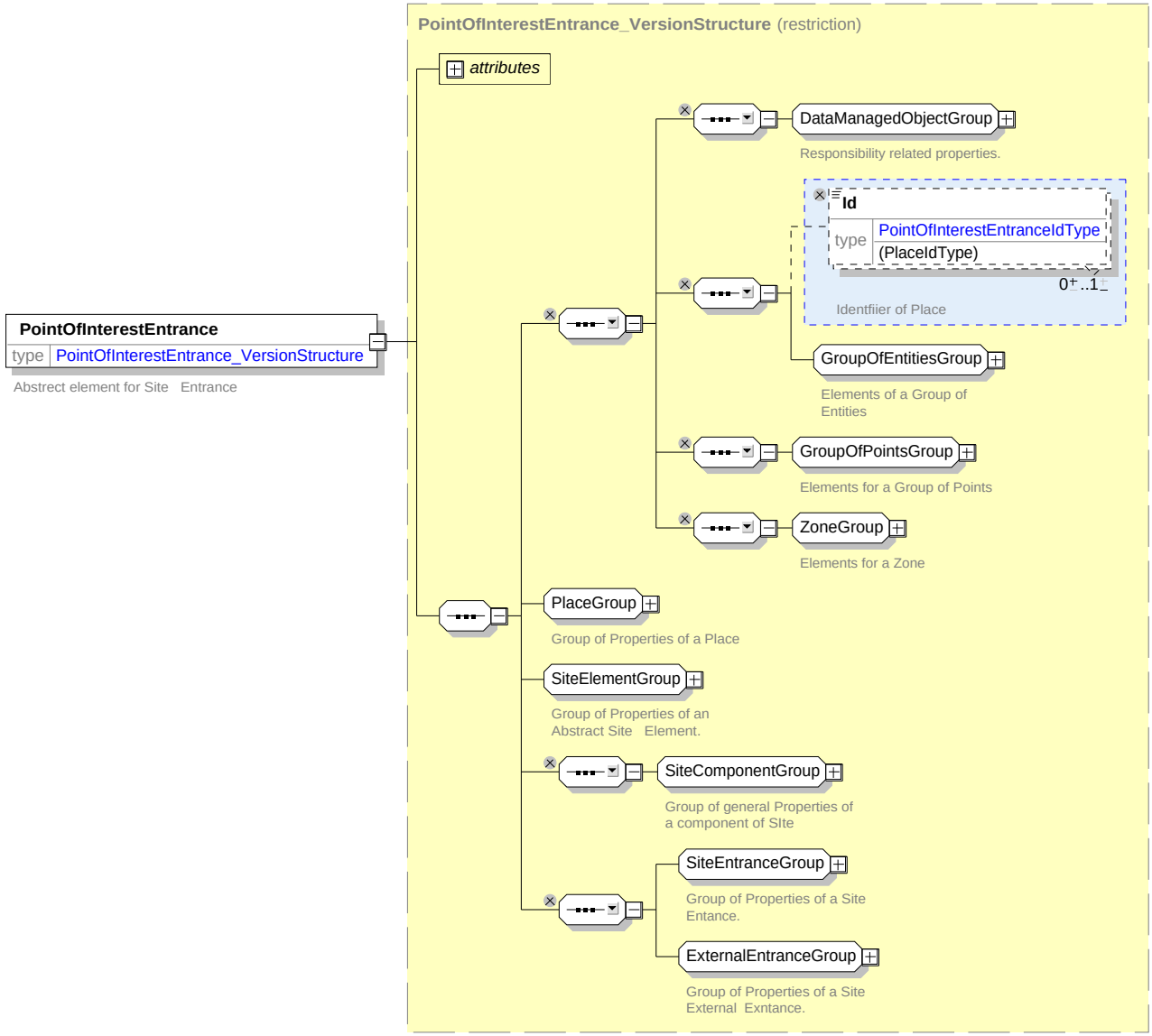


Figure 34 — PointOfInterestEntrance XSD

6.3.2 PointOfInterestClassification - element

PointOfInterestClassification specifies a category of ***PointOfInterest.***

Element Name	Element Type	Card-inality	Comment
Id	*PointOfInterestClassificationId*	0:1	Identifier for ***PointOfInterestClassification***
		::>	***PointOfInterestClassification*** is a subtype of ***DataManagedObject.***
Name	*MultilingualString*	0:1	Name of ***PointOfInterestClassification.***
ShortName	*MultilingualString*	0:1	Short name of ***PointOfInterestClassification.***

Description	*MultilingualString*	0:1	Description of ***PointOfInterestClassification.***
Image	*xsd:anyURI*	0:1	Image for ***PointOfInterestClassification.***
descriptors	*ClassificationDescriptor*	0:*	Alternative Descriptor for ***PoiClassification. See below***

Table 43 — PointOfInterestClassification elements

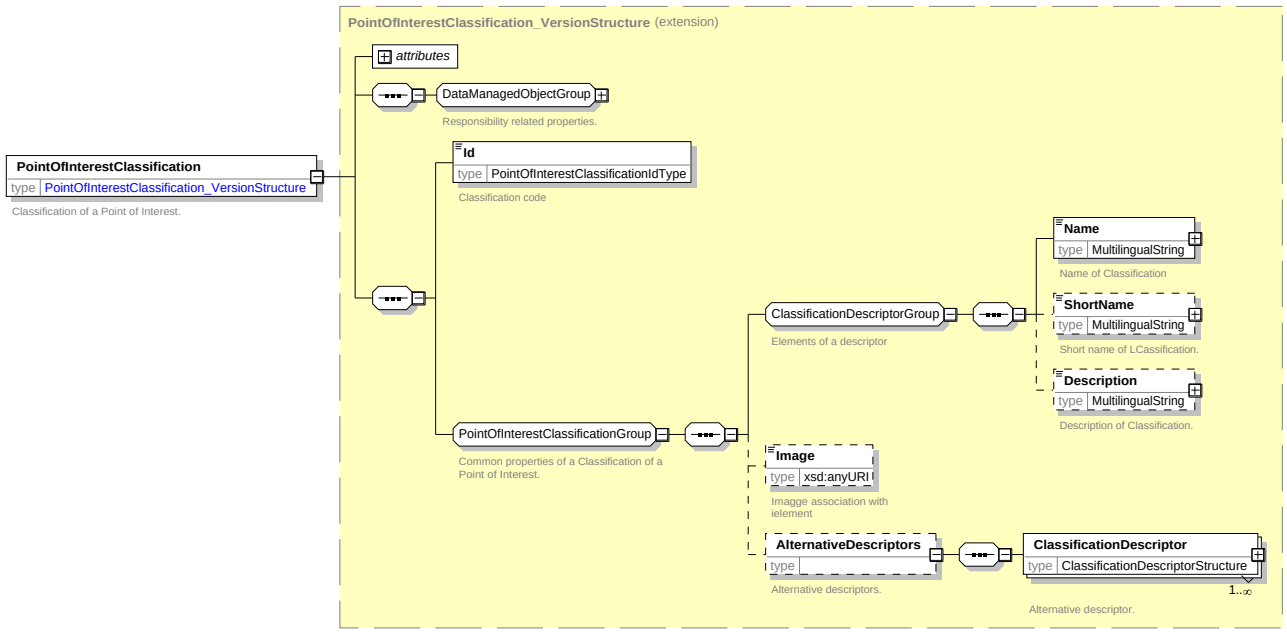


Figure 35 — PointOfInterestClassificationDescriptor XSD

6.3.2.1PointOfInterestClassificationDescriptor - element

PointOfInterestClassificationDescriptor specifies an alternative name of ***PointOfInterest.*** It can be used to support multiple language variants.

Element Name	Element Type	Card-inality	Comment
Id	*ClassificationDescriptorId*	0:1	Identifier for ***PointOfInterestClassificationDescriptor***
		::>	***PointOfInterestClassification*** is a subtype of ***Versioned-Child.***
Name	*MultilingualString*	0:1	Name of ***PointOfInterestClassification.***
ShortName	*MultilingualString*	0:1	Short name of ***PointOfInterestClassification.***
Description	*MultilingualString*	0:1	Description of ***PointOfInterestClassification.***

Table 44 — PointOfInterestClassificationDescriptor elements

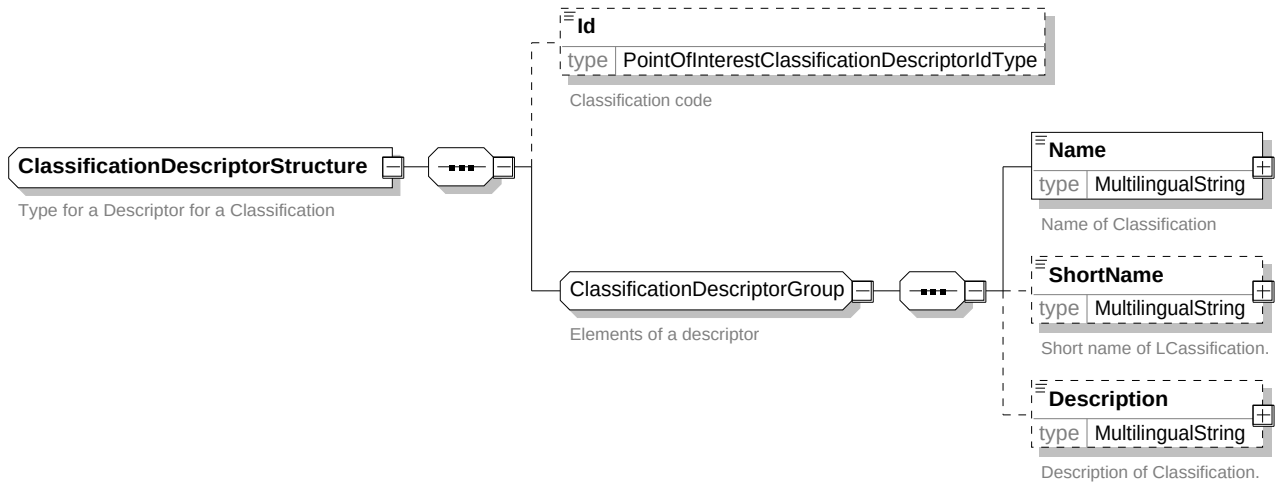


Figure 36 — PointOfInterestClassificationDescriptor XSD

6.3.3 PointOfInterestClassificationHierarchy - element

PointOfInterestClassificationHierarchy specifies a hierarchy of ***PointOfInterestClassification***. There may be more than one different ***PointOfInterestClassificationHierarchy*** that organize the same ***PointOfInterest-Classification*** instances in different ways.

Element Name	Element Type	Card-inality	Comment
Id	*PointOfInterestClassification-HierarchyIdType*	0:1	Identifier for ***PoiClassificationHierarchy***
		::>	***PoiClassificationHierarchy*** is a subtype of ***Data-ManagedObject.***
Name	*MultilingualString*	0:1	Name of ***PoiClassificationHierarchy.***
members	*HierarchyMember*	0:*	Members of ***PoiClassificationHierarchy.***

Table 45 — PointOfInterestClassificationHierarchy elements

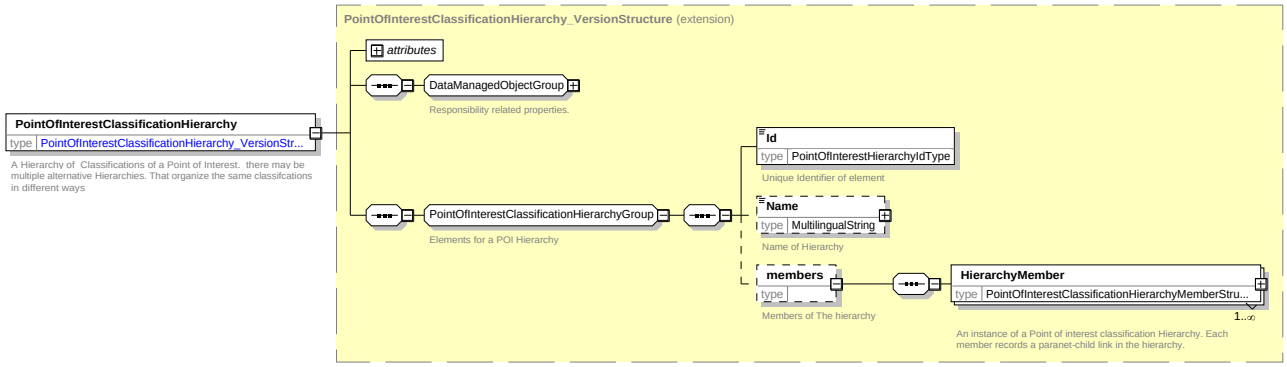


Figure 37 — PointOfInterestClassificationHierarchy XSD

6.3.3.1PointOfInterestClassificationHierarchyMember - element

PointOfInterestClassificationHierarchyMember specifies a member of hierarchy of ***PointOfInterest-Classification***. It

Element Name	Element Type	Card-inality	Comment
Id	*PointOfInterestClassification-HierarchyMemberIdType*	0:1 ::>	Identifier for ***PoiClassificationHierarchyMember*** ***PoiClassificationHierarchyMember*** is a subtype of ***VersionedChild.***
PointOfInterest-HierarchyRef	*PointOfInterestHierarchyRef*	0:1	Reference to ***PoiHierarchy*** to which this element belongs. May be omitted if available from context.
Parent-ClassificationRef	*ParentClassifcationRef*	11	Reference to parent ***PoiClassification*** in ***Poi-Hierarchy***
PointOfInterest-ClassificationRef	*PointOfInterest-ClassificationRef*	1:1	Reference to ***PoiClassification*** in ***PoiHierarchy*** to be associated as child of parent ***Poi-Classification.***

Table 46 — PointOfInterestClassificationHierarchyMember elements

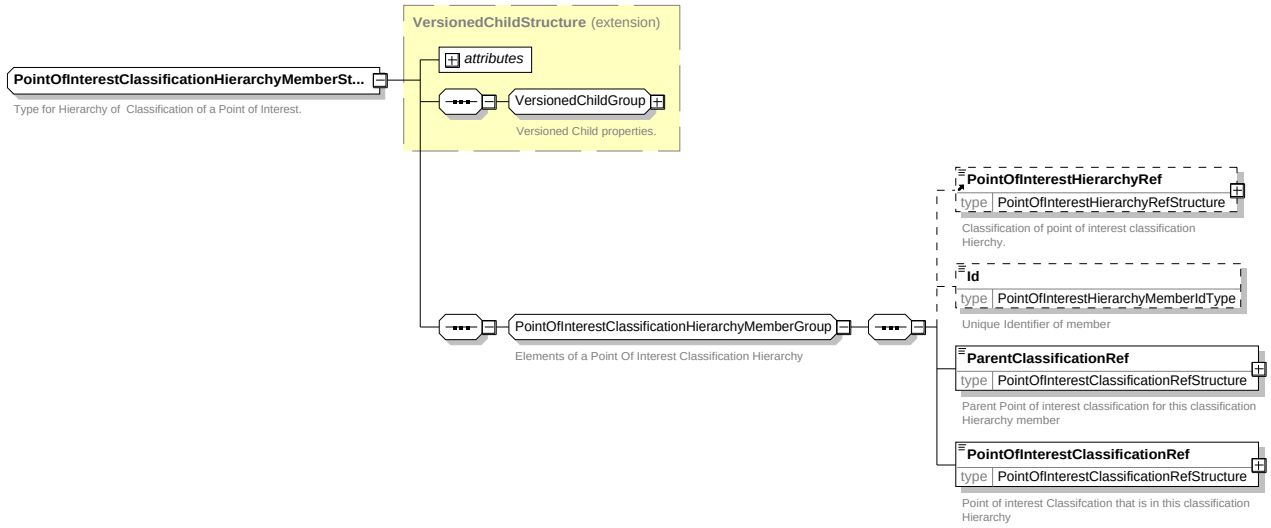


Figure 38 — PointOfInterestClassificationHierarchyMember XSD

7 PART 1 SHARED ELEMENTS

This section describes common elements of the *NeTEx* Site model

7.1 Site

7.1.1 Site

A ***Site*** is any place that a passenger might travel and about which data may be held, such as a Stop Place, Point of Interest or Parking.

7.1.1.1SiteElement – abstract element

SiteElement specifies common properties of ***Sites*** and ***SiteComponents***

Element Name	Element Type	Cardinality	Comment
Id	*SiteElementIdType*	0:1	Unique Identifier of ***SiteElement.***
		::>	***SiteElement*** is a subtype of ***Zone*** See Framework
SiteElementGroup	***SiteElementGroup***	1:1	Specific properties of a ***SiteElement*** See below.

Table 47 — SiteElement elements

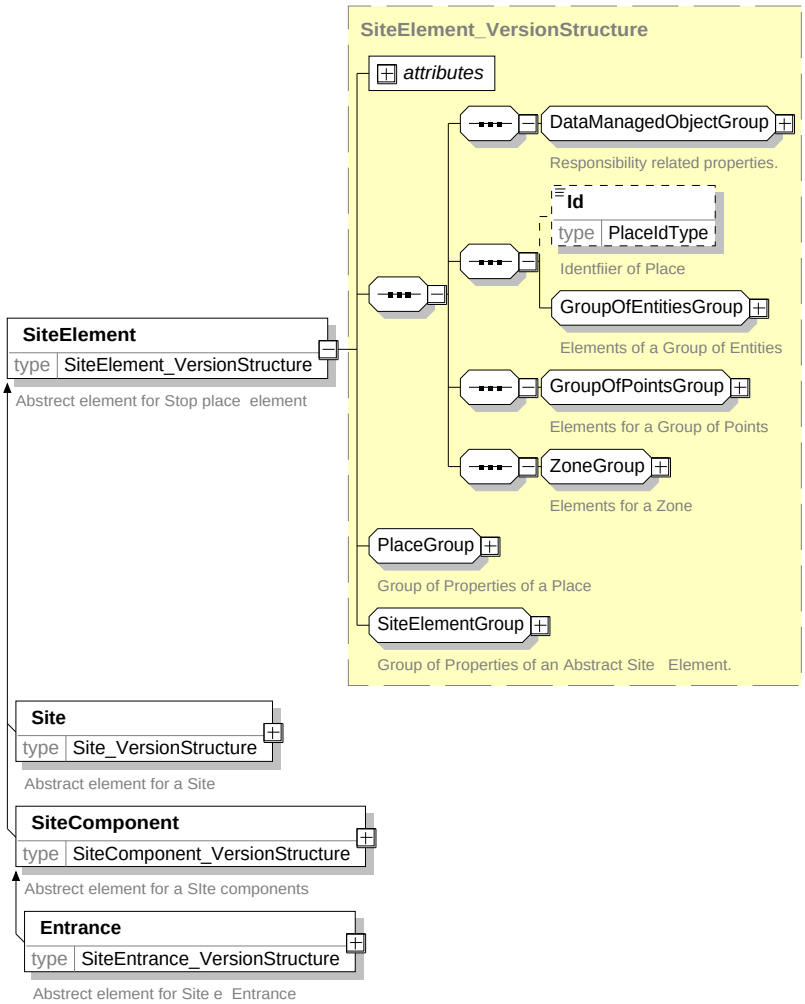


Figure 39 — SiteElement XSD

SiteElementGroup – group

SiteElementGroup specifies common elements of a ***SiteElement.***

Element Name	Element Type	Card-inality	Comment
Accessibility-Assessment	***AccessibilityAssessment***	**1:1**	***AccessibilityAssessment*** of ***SiteElement*** – See Framework
AccessModes	*AccessModeList*	0:1	Pedestrian Access modes for reaching element.
ShortName	*MultilingualString*	0:1	Short name for entity.
NameSuffix	*MultilingualString*	0:1	Suffix to name, e.g. *'opp', 'adj'*
alternativeNames	***AlternativeName***	0:*	Alternative names for ***SiteElement***.
Image	***Xsd:anyUri***	0:1	Image associated with ***SiteElement.***
CrossRoad	*MultilingualString*	0:1	Name of crossroad nearest ***Place***.
Landmark	*MultilingualString*	0:1	Name of Landmark nearest ***Place***.
SiteElement-PropertiesGroup	***SiteElement-PropertiesGroup***	1:1	Contents specific to ***SiteElement*** – see next section.

Table 48 — SiteElementGroup elements

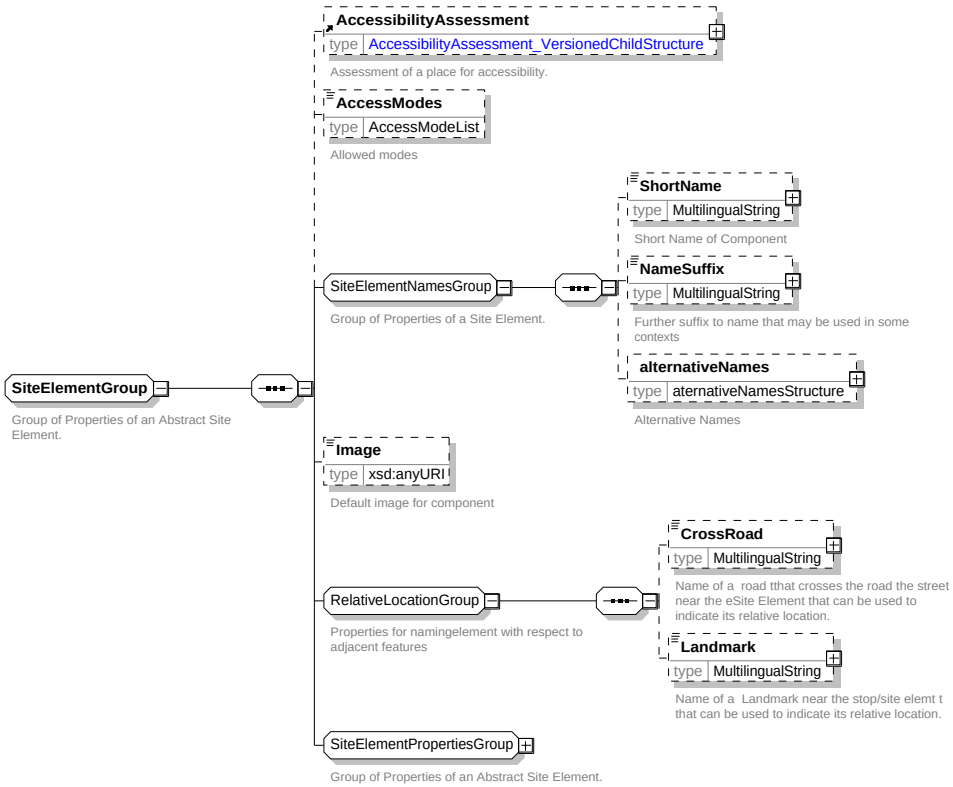


Figure 40 — SiteElementGroup XSD

SiteElementPropertiesGroup – group

SiteElementPropertiesGroup specifies common elements of a ***Site.***

Element Name	Element Type	Card-inality	Comment
PublicUse	*xsd:boolean*	0:1	Identifier of ***SiteFrame***.
Covered	*CoveredEnumeration*	0:1	Whether ***SiteElement*** is covered. See table.
Gated	*GatedEnumeration*	0:1	Whether ***SiteElement*** is within a gated area.
Lighting	*LightingEnumeration*	0:1	Whether ***SiteElement*** is lit.
AllAreasWheelchair-Accessible	*xsd:boolean*	0:*	Whether element are Wheelchair accessible.
PersonCapacity	*NumberOfPeople*	0:1	Number of people that may safely be in ***SiteElement*** at a time.

Table 49 — SiteElementPropertiesGroup elements

Value	Description
indoors	Component is indoors
outdoors	Component is outdoors
covered	Component is covered
mixed	Component is mixed
unknown	Component cover is unknown

Table 50 — Covered: allowed values

Value	Description
gatedArea	Component is within a gated section
openArea	Component is outside of any gated section
unknown	Component gated status is unknown

Table 51 — Gated: allowed values

Value	Description
wellLit	Component is well lit
poorlyLit	Component is poorly lit.
unlit	Component is not lit at all.
other	Component has other lighting
unknown	Component lighting is unknown

Table 52 — Lighting: allowed values

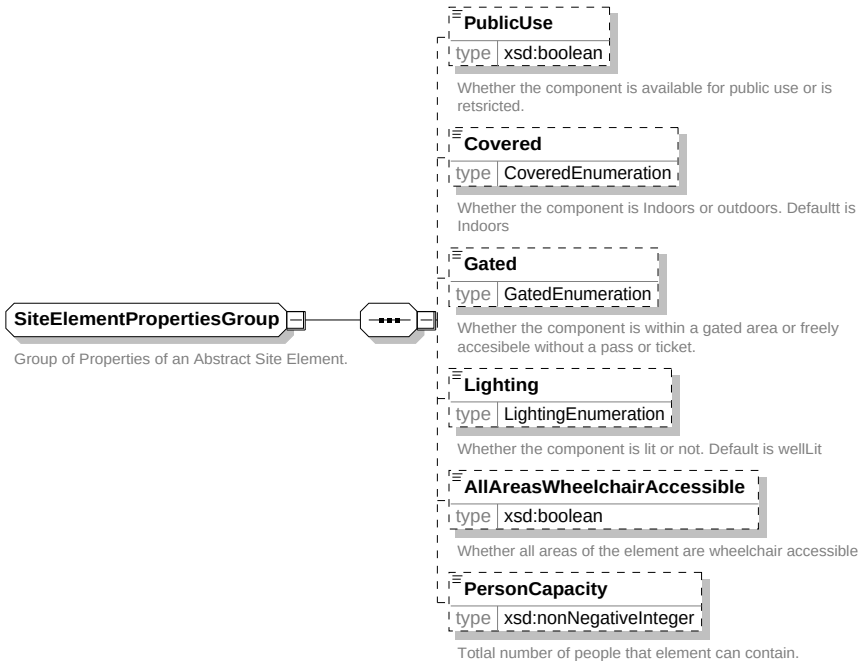


Figure 41 — SiteElementPropertiesGroup XSD

AlternativeName – element

AlternativeName allow san alternative name to be defined for a SiteElement.

Element Name	Element Type	Card-inality	Comment
Id	*AlternativeName-IdType*	0:1	Unique Identifier of ***AlternativeName.***
		::>	***AlternativeName*** is a subtype of ***VersionedChild***.
Lang	*xsd:language*	1:1	Language that name elements are in
TypeOfName	*Xsd:normalizedString*		Arbitrary categorisation of name.
Name	*MultilingualString*	0:1	Value for Name.
ShortName	*MultilingualString*	0:1	Value for short version of Name.
Abbreviation	*MultilingualString*	0:1	Value for abbreviation of Name.
QualifierName	*MultilingualString*	0:1	Name of Qualifier to be used with ***AlternativeName***

Table 53 — AlternativeName elements

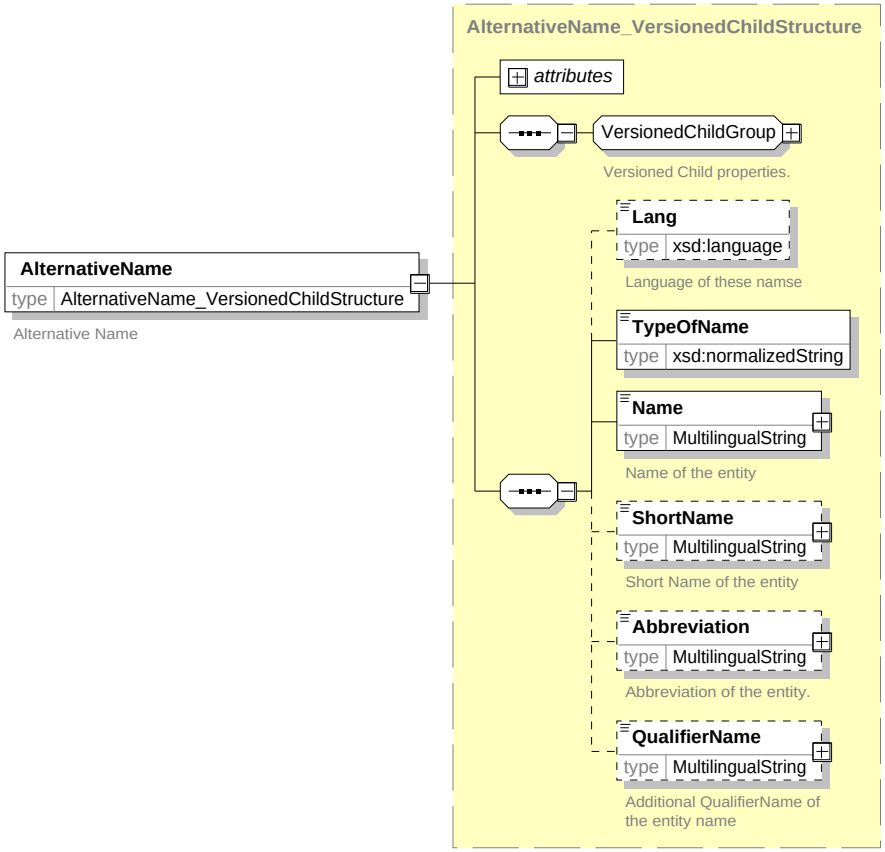


Figure 42 — AlternativeName XSD

7.1.1.2Site – element

Site describes common aspects of any place that a passenger might travel and about which data may be held, such as a Stop Place, Point of Interest or Parking.

Element Name	Element Type	Cardinality	Comment
Id	*SiteElementdType*	0:1	Unique Identifier of ***Zone.***
			Site is a subtype of ***SiteElement.*** See above.
SiteGroup	***SiteGroup***	1:1	Specific Properties of a ***Site.*** See below.

Table 54 — SiteElement elements

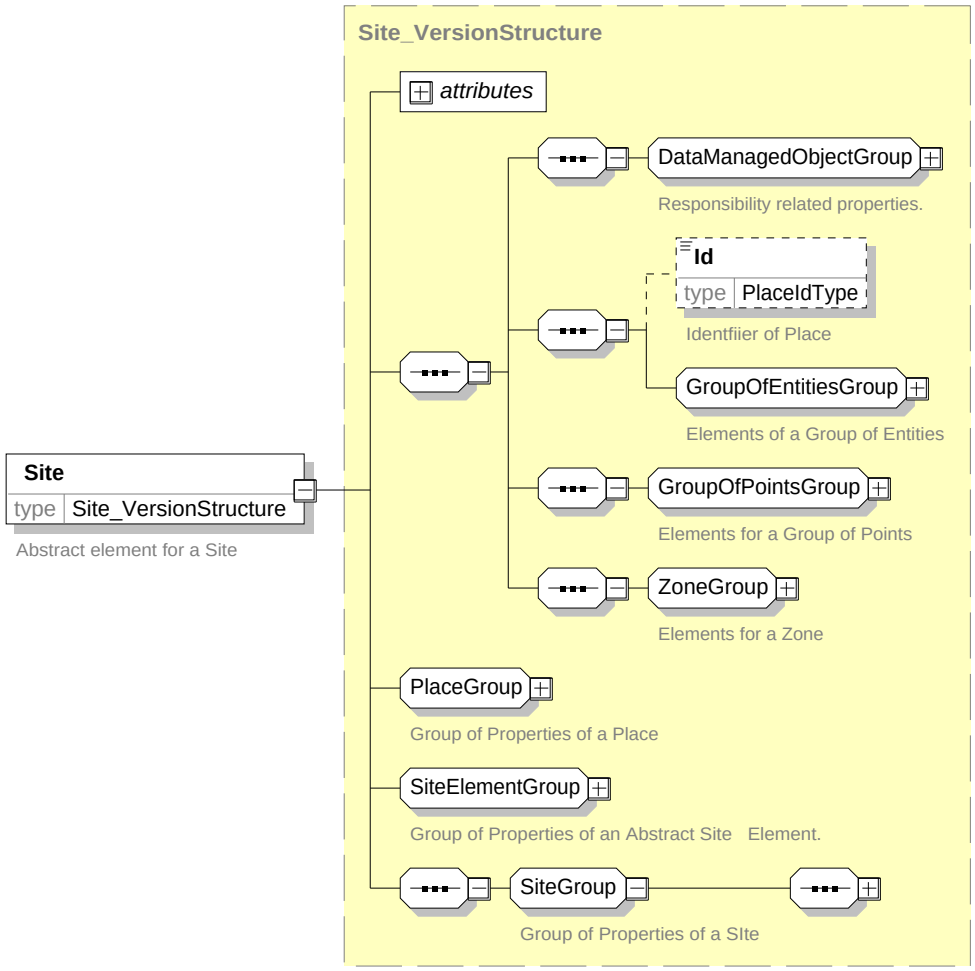


Figure 43 — Site XSD

SiteGroup - group

SiteGroup describes the specific properties of a ***Site***.

	Element Name	Element Type	Cardinality	Comment
	Topographic-PlaceView	***TopographicPlaceView***	0:1	Annotated Reference to Topographic Place within which ***Site*** resides.
Address Group	***Address Group***	***Address Group***	0:1	Address for Site – See Framework
	Locale	*Locale*	0:1	***Locale*** details for ***Site***.
	PersonCapacity	*NumberOfPeople*	0:1	Image associated with Entity.
	Operating-OrganisationView	*OrganisationView*	0:1	Annotated Reference to Organisation that operates Site.
Relations	***ParentSiteRef***	*SiteRef*	0:1	Parent of Site.

group	***AdjacentSiteRefs***	*SIteRef*	0:*	Adjacent sites.
	containedIn-PlaceRefs	*TopographicPlaceRef*	0:*	TopographicPlaces that contain Site.
	levels	*Level*	0:*	Levels in Site.
	entrances	*Entrance* | *EntranceRef*	0:*	Entrances to Site.
Equipment-Group	***placeEquipments***	*PlaceEquipment*	0:*	Place equipment to Site.
	localServices	*LocalService*	0:*	Local services on Site.

Table 55 — SiteElementPropertiesGroup elements

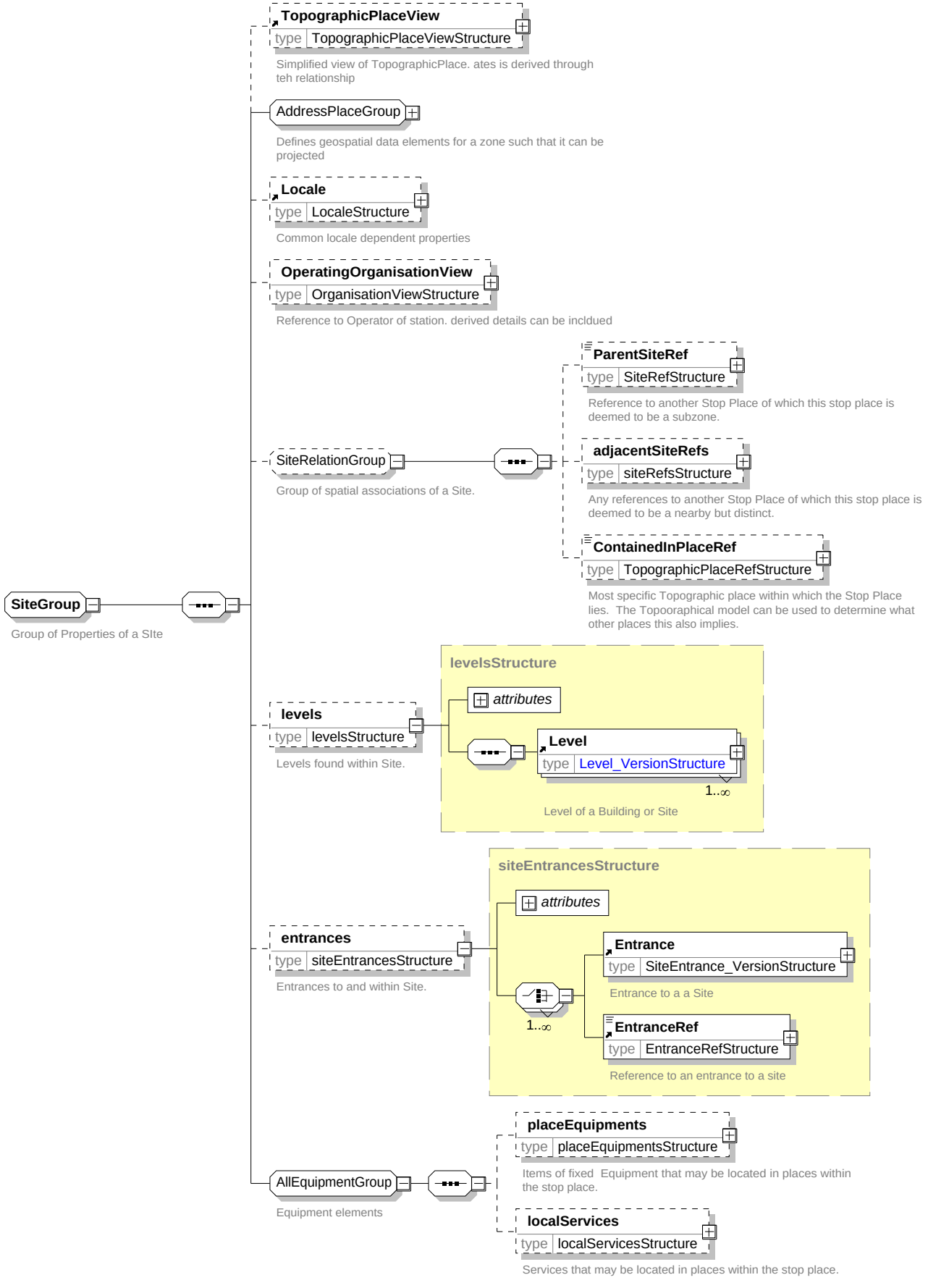

TopographicPlaceView
type TopographicPlaceViewStructure
Simplified view of TopographicPlace. ates is derived through teh relationship
AddressPlaceGroup
Defines geospatial data elements for a zone such that it can be projected
Locale
type LocaleStructure
Common locale dependent properties
OperatingOrganisationView
type OrganisationViewStructure
Reference to Operator of station. derived details can be incldued
ParentSiteRef
type SiteRefStructure
Reference to another Stop Place of which this stop place is deemed to be a subzone.
SiteRelationGroup
Group of spatial associations of a Site.
adjacentSiteRefs
type siteRefsStructure
Any references to another Stop Place of which this stop place is deemed to be a nearby but distinct.
ContainedInPlaceRef
type TopographicPlaceRefStructure
Most specific Topographic place within which the Stop Place lies. The Topooraphical model can be used to determine what other places this also implies.
SiteGroup
Group of Properties of a SIte
levelsStructure
attributes
levels
type levelsStructure
Levels found within Site.
Level
type Level_VersionStructure
1..∞
Level of a Building or Site
siteEntrancesStructure
attributes
entrances
type siteEntrancesStructure
Entrances to and within Site.
Entrance
type SiteEntrance_VersionStructure
Entrance to a a Site
1..∞
EntranceRef
type EntranceRefStructure
Reference to an entrance to a site
placeEquipments
type placeEquipmentsStructure
Items of fixed Equipment that may be located in places within the stop place.
AllEquipmentGroup
Equipment elements
localServices
type localServicesStructure
Services that may be located in places within the stop place.

Figure 44 — SiteGroup XSD

SiteAccessGroup – group

SiteAccessGroup describes the path and link aspects of a ***Site***. It may be included in specific components.

Element Name	Element Type	Card-inality	Comment
pathLinks	*PathLink*	**0:***	***SitePathLink*** instances for ***Site.***
pathJunctions	*PathJunction*	**0:***	***PathJunction*** instances for ***Site.***
accesses	*Access*	**0:***	***Access*** link instances for ***Site.***
navigationPaths	*NavigationPath*	**0:***	***NavigationPath*** instances for ***Site.***

Table 56 — ServiceFrameGroup elements

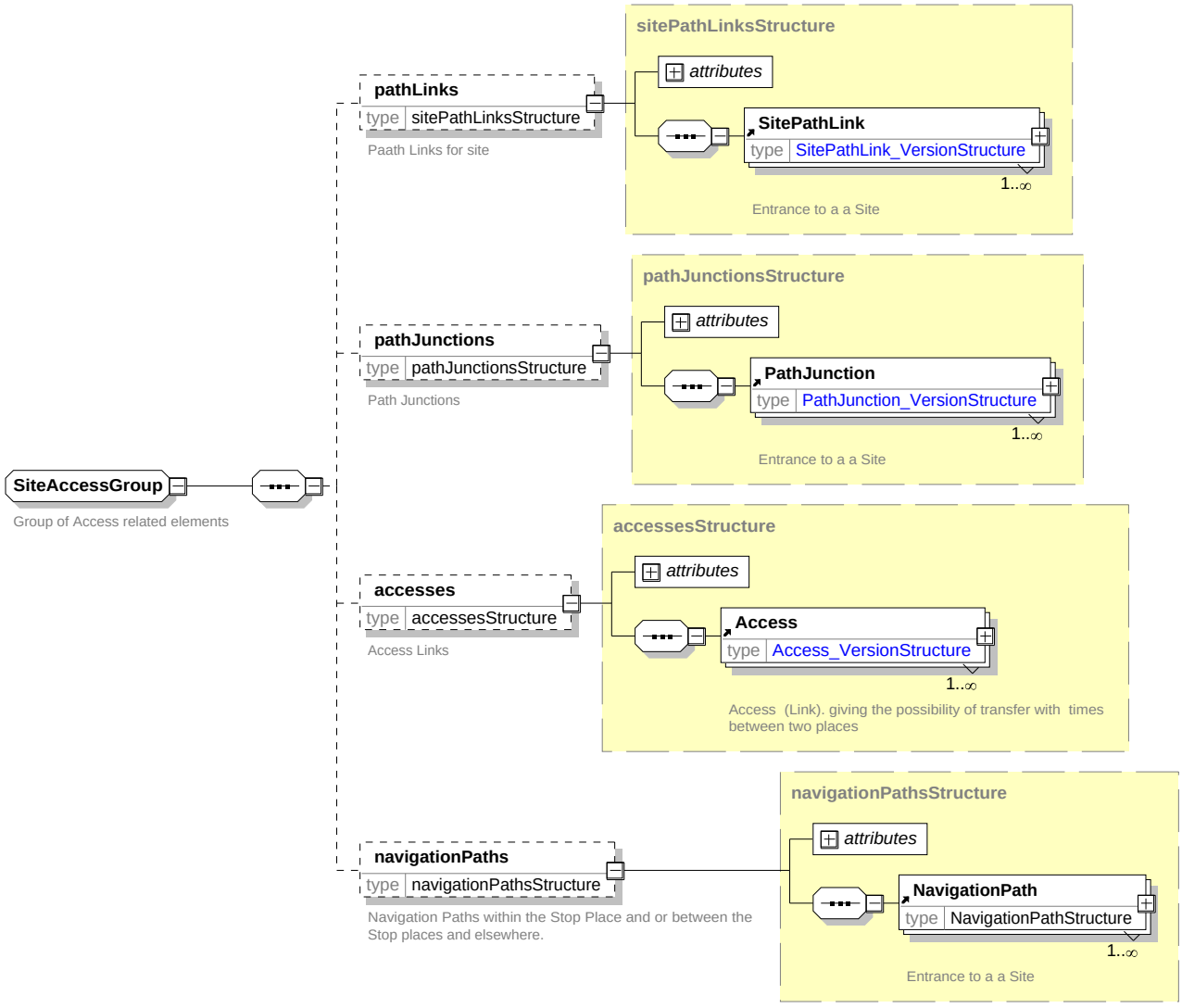


Figure 45 — SiteAccessGroup XSD

SiteComponent – element

SiteComponent specifies common elements of a SiteComponent, one of the subsidiary parts of ***Site.***

Element Name	Element Type	Card-inality	Comment
Id	*SiteComponentIdType*	0:1	Identifier of ***SiteComponent***.
AddressPlaceGroup	***AddressPlaceGroup***	0:1	Address of ***Site Component*** See Framework
SiteRef	*SiteRef*	0:1	Site to which component belongs
LevelRef	*LevelRef*	0:1	Level associated component
checkConstraints	*CheckConstraint*	0:*	Process checks associated with Component.
equip	*xsd:boolean*	0:*	Alternative names for entity
equipmentPlaces	*EquipmentPlace*	0:*	Places containing equipment in Component
placeEquipments	*PlaceEquipment*	0:*	Place equipment to Site
localServices	*LocalService*	0:*	Local services on Site

Table 57 — SiteComponent elements

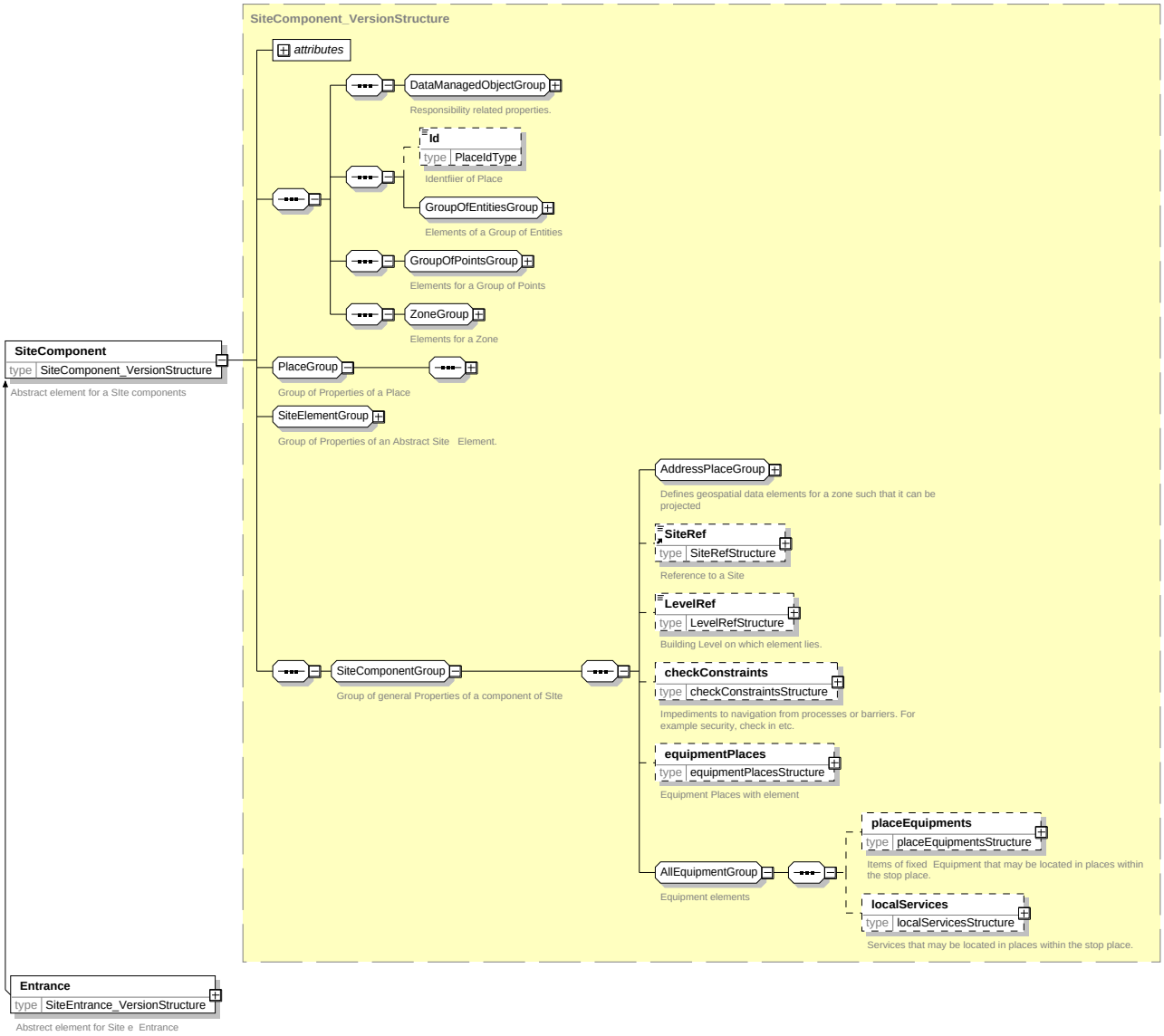


Figure 46 — SiteComponent XSD

7.1.1.3Level – element

Level specifies a named level within a ***Site.***

Element Name	Element Type	Card-inality	Comment
Id	*EntranceIdType*	0:1	Identifier of ***SiteComponent***.
Name	*MultilingualString*	0:1	Name of ***Site Component.***
ShortName	*MultilingualString*	0:1	Short Name of ***Site Component.***
Description	*MultilingualString*	0:1	Description of ***AccessibilityAssessment***
LevelRef	*LevelRef*	0:1	***Level*** associated component.
LevelCode	*LocalService*	0:*	A public Code that can be used for Level.

Accessibility-Assessment	*AccessibilityAssessment*	0:*	***AccessibilityAssessment of Level.***
AllAreasWheelchair-Accessible	*xsd:boolean*	0:*	Whether all areas on the level are wheelchair accessible.
SiteRef	*SiteRef*	0:1	Site to which component belongs.

Table 58 — Level elements

Value	Description
opening	Opening
openDoor	Open door
door	Door
swingDoor	Swing door
revolvingDoor	Revolving door
automaticDoor	Automatic door
ticketBarrier	Ticket barrier
gate	Gate
other	Other

Table 59 — EntranceType: allowed values

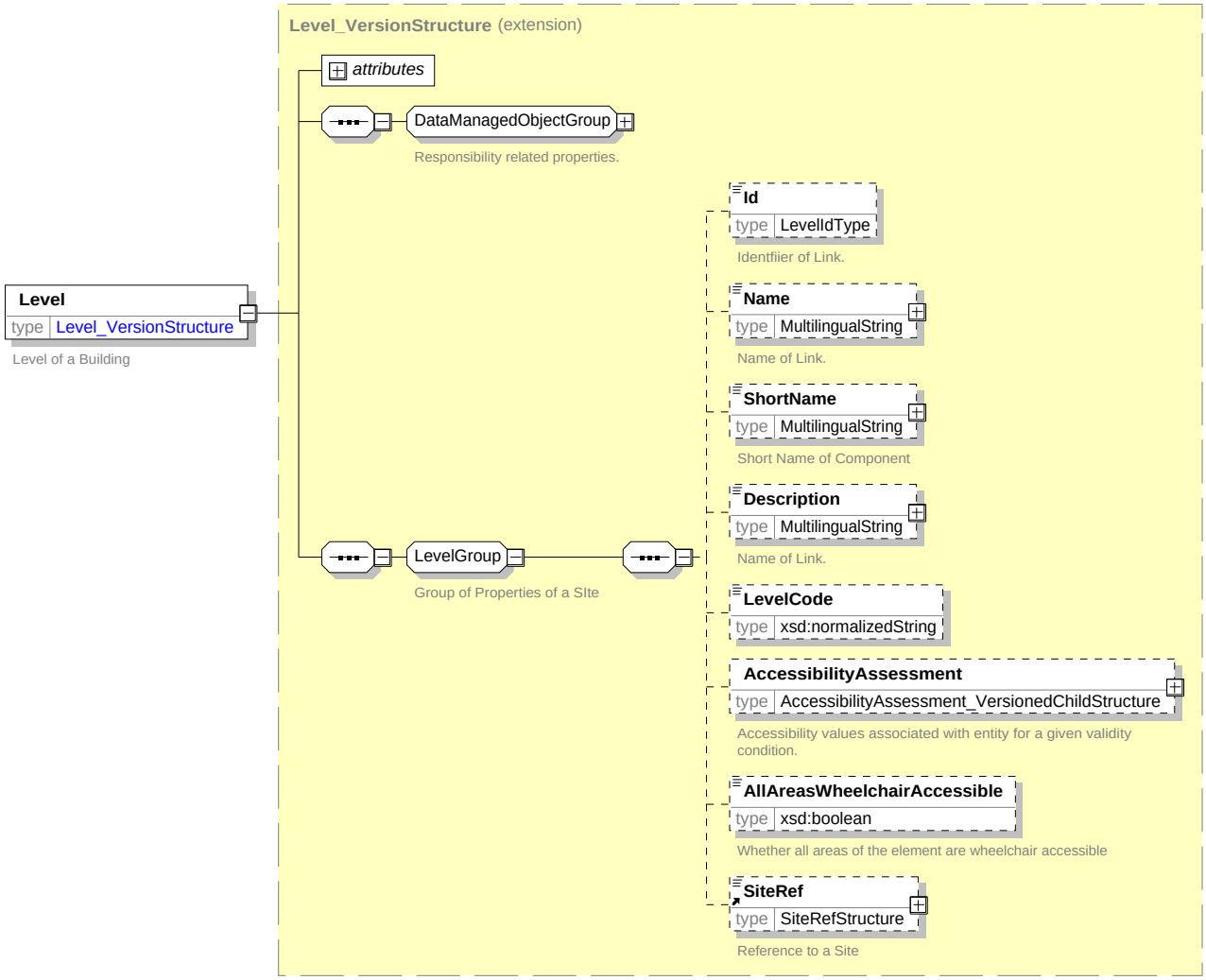


Figure 47 — Level XSD

7.1.1.4Entrance – element

Entrance specifies a named entrance to or within a ***Site.***

Element Name	Element Type	Card-inality	Comment
Id	*EntranceIdType*	0:1	Identifier of ***Entrance***.
		::>	***Entrance*** is a subtype of ***SiteComponent.***
PublicCode	*xsd:normalizedString*	0:1	Public code for ***Entrance.***
Label	*MultilingualString*	0:1	Label for ***Entrance.***
EntranceType	*Enumeration*	0:1	***Type of Entrance.***
IsExternal	*xsd:boolean*	0:1	Whether ***Entrance*** is external.
IsEntry	*xsd:boolean*	0:1	Whether ***Entrance*** can be used for entry.
IsExit	*xsd:boolean*	0:1	Whether ***Entrance*** can be used for exit.
Height	*DistanceType*	0:1	Height of ***Entrance.***
Width	*DistanceType*	0:1	Width of ***Entrance.***
DroppedKerbOutside	*xsd;boolean*	0:1	Whether there is a dropped Kerb close to entrance.
DropOffPointClose	*xsd;boolean*	0:1	Whether there is a drop off point close to entrance.

Table 60 — Entrance elements

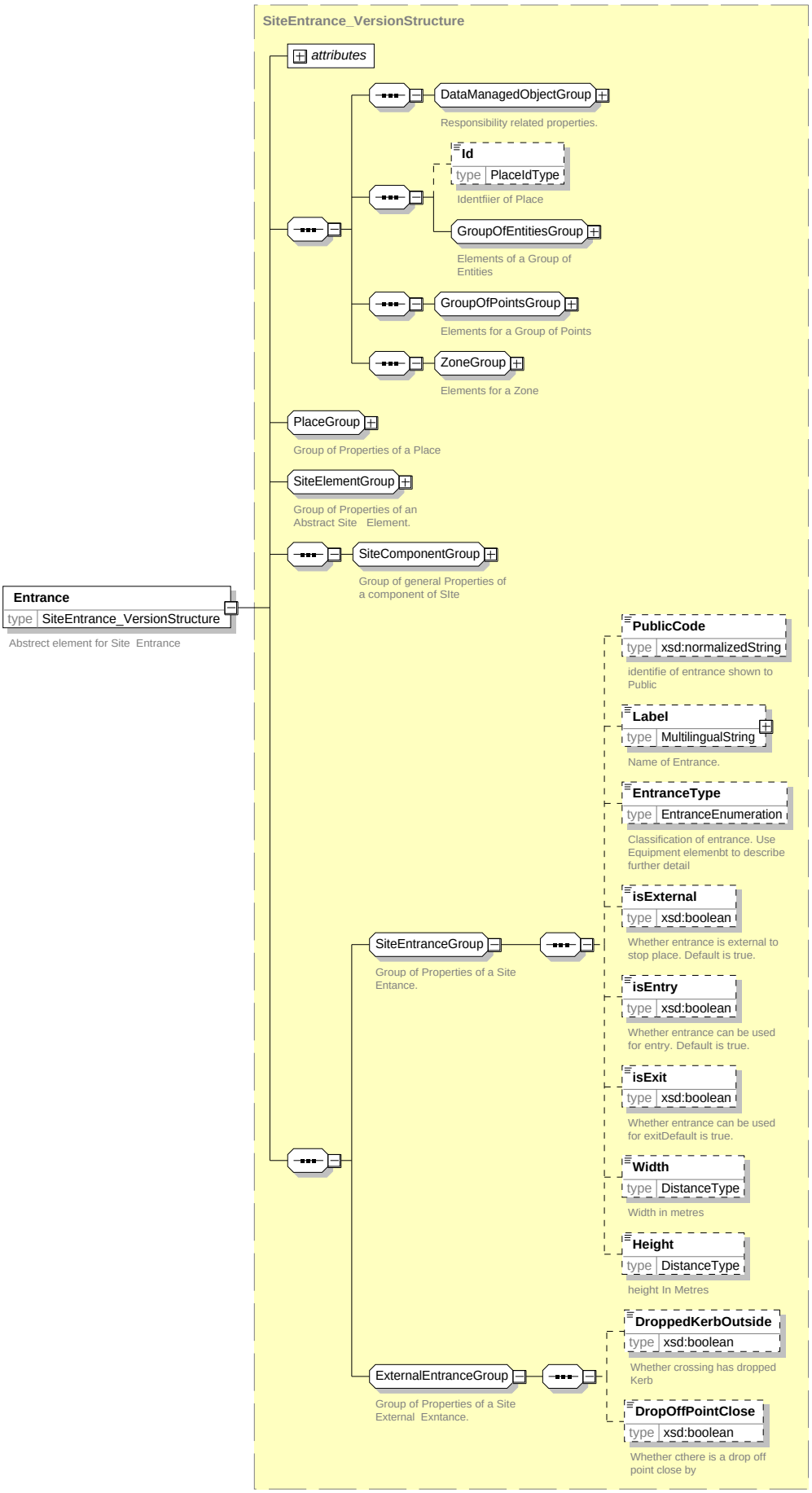

SiteEntrance_VersionStructure
attributes
DataManagedObjectGroup
Responsibility related properties.
Id
type PlaceIdType
Identfiier of Place
GroupOfEntitiesGroup
Elements of a Group of Entities
GroupOfPointsGroup
Elements for a Group of Points
ZoneGroup
Elements for a Zone
PlaceGroup
Group of Properties of a Place
SiteElementGroup
Group of Properties of an Abstract Site Element.
SiteComponentGroup
Group of general Properties of a component of SIte
Entrance
type SiteEntrance_VersionStructure
Abstrect element for Site Entrance
PublicCode
type xsd:normalizedString
identifie of entrance shown to Public
Label
type MultilingualString
Name of Entrance.
EntranceType
type EntranceEnumeration
Classification of entrance. Use Equipment elemenbt to describe further detail
isExternal
type xsd:boolean
Whether entrance is external to stop place. Default is true.
SiteEntranceGroup
Group of Properties of a Site Entance.
isEntry
type xsd:boolean
Whether entrance can be used for entry. Default is true.
isExit
type xsd:boolean
Whether entrance can be used for exitDefault is true.
Width
type DistanceType
Width in metres
Height
type DistanceType
height In Metres
DroppedKerbOutside
type xsd:boolean
Whether crossing has dropped Kerb
ExternalEntranceGroup
Group of Properties of a Site External Exntance.
DropOffPointClose
type xsd:boolean
Whether cthere is a drop off point close by

Figure 48 — Entrance XSD

7.1.1.5EquipmentPlace – element

EquipmentPlace specifies a location of equipment within a ***SiteComponent.***

Element Name	Element Type	Card-inality	Comment
Id	*EntranceIdType*	0:1	Identifier of ***EquipmentPlace***.
		::>	***EquipmentPlace*** is a subtype of ***Place.***
equipmentPositions	*EquipmentPosition*	0:*	Specifies position of ***Equipment.***
placeEquipments	*PlaceEquipments*	0:*	Specifies nature of ***Equipment.***

Table 61 — EquipmentPlace elements

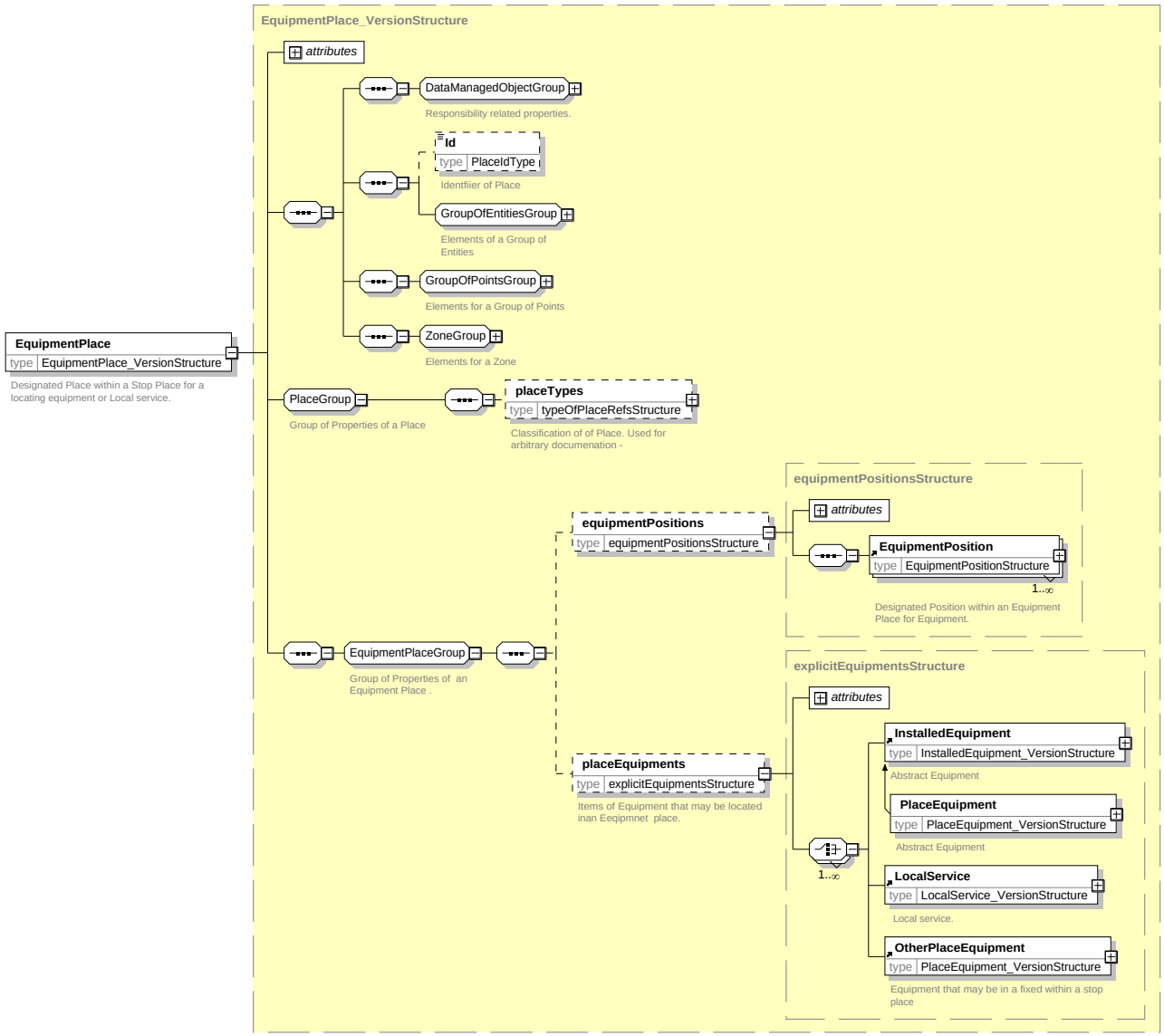


Figure 49 — EquipmentPlace XSD

7.1.1.6EquipmentPosition – element

EquipmentPosition specifies the exact location of equipment within a ***SiteComponent.***

Element Name	Element Type	Card-inality	Comment
Id	*EquipmentPositionIdType*	0:1	Identifier of ***EquipmentPosition***.
		::>	***EquipmentPosition*** is a subtype of ***Data-ManagedObject.***
EquipmentRef	*EquipmentRef*	0:*	Specifies position of ***Equipment.***
Description	*PlaceEquipments*	0:*	Specifies nature of ***Equipment.***
Location	*LocationType*	0:1	Coordinates of Type.
ReferencePointRef	*ReferencePointRef*	0:1	Reference to a point.
XOffset	*DistanceType*	0:1	Offset ion x from reference point.
YOffset	*DistanceType*	0:1	Offset ion y from reference point.

Table 62 — EquipmentPosition elements

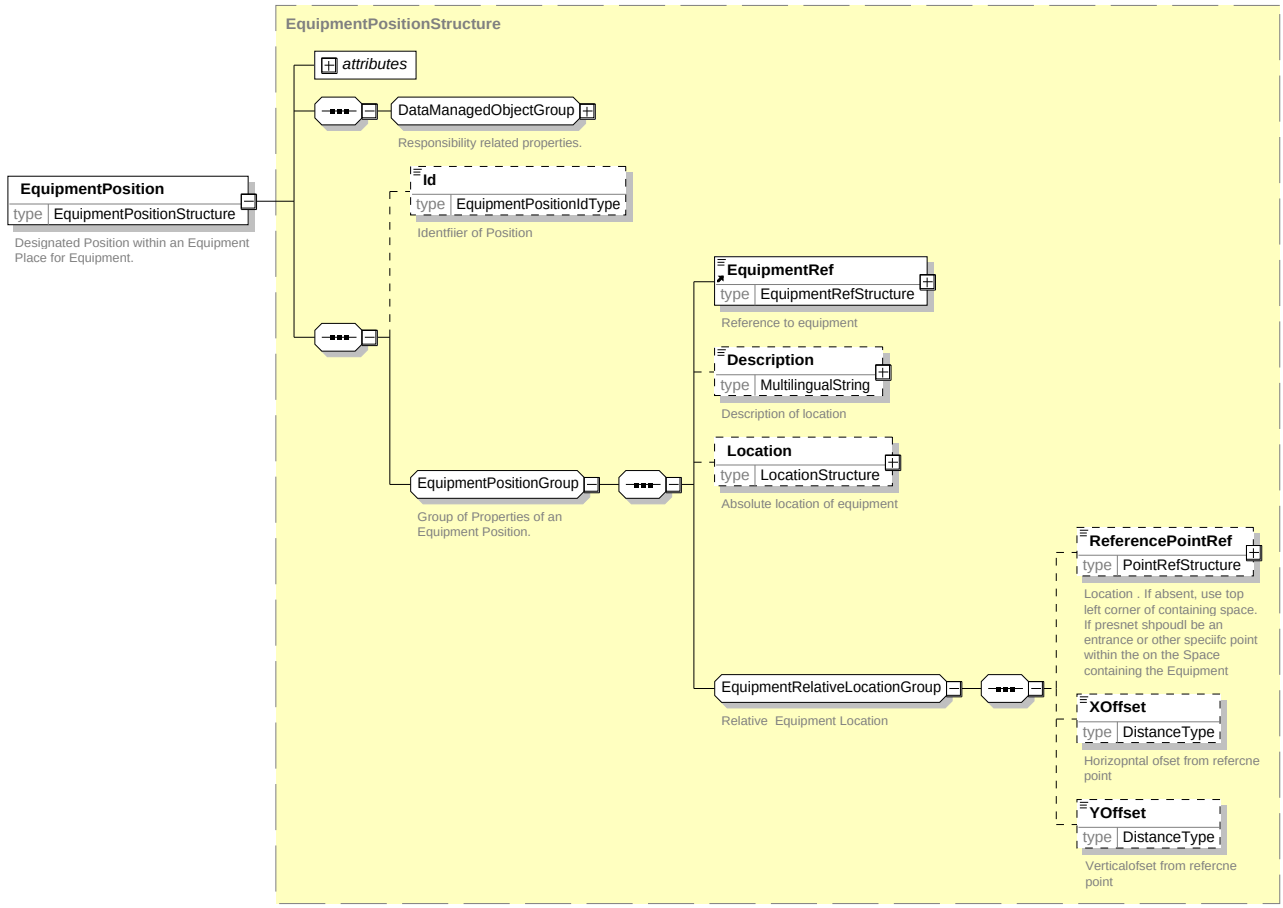


Figure 50 — EquipmentPosition XSD

7.1.2 Paths

NavigationPaths specify a sequence of ***PathLinks*** that describe a route.

7.1.2.1PathLink – element

PathLink specifies a link between two places within a ***Site.***

Element Name	Element Type	Card-inality	Comment
Id	*PathLinkIdType*	0:1	Identifier of ***PathLink***.
		::>	***PathLink*** is a subtype of ***DataManagedObject.***
LinkGroup	***LinkGroup***	0:1	Link Properties See ***Link*** in Framework
From	*PathLinkEnd*	1:1	Origin End of ***PathLink.*** See next section.
To	*PathLinkEnd*	1:1	Destination End of ***PathLink.*** See next section.
Description	*MultilingualString*	0:1	Description of ***PathLink***.
Accessibility-Assessment	*AccessibilityAssessment*	0:1	*AccessibilityAssessment* of **PathLink.**
SiteElement-PropertiesGroup	***SiteElementProperties-Group***	1:1	***SiteElementPropertiesGroup – see SiteElement.***
Towards	*MultilingualString*	0:1	Heading for ***PathLink***.
NumberOfSteps	*xsd:nonNegativeInteger*	0:1	Number of vertical steps travelled when using ***PathLink.***
AllowedUse	*Enumeration*	0:1	Allowed use of ***PathLink:*** *PathDirection values.*
Transition	*Enumeration*	0:1	Nature of transition.
AccessFeatureType	*Enumeration*	0:1	Type of access feature associated with ***PathLink.*** See ***NavigationPath.***
TransferDuration	*TransferDuration*	0:1	Transfer times see ***TransferDuration.***
MaximumFlow-PerMinute		0:1	Maximum number of people that can pass along path per minute.

Table 63 — PathLink elements

Value	Description
up	On street Bus Stop
down	On street Tram Stop
level	Ferry Stop
upAndDown	Airport
downAndUp	Rail Station

Table 64 — Transition: allowed values

Value	Description
oneWay	Path may be followed only one way
twoWay	Path may be followed both ways

Table 65 — AllowedUse: allowed values

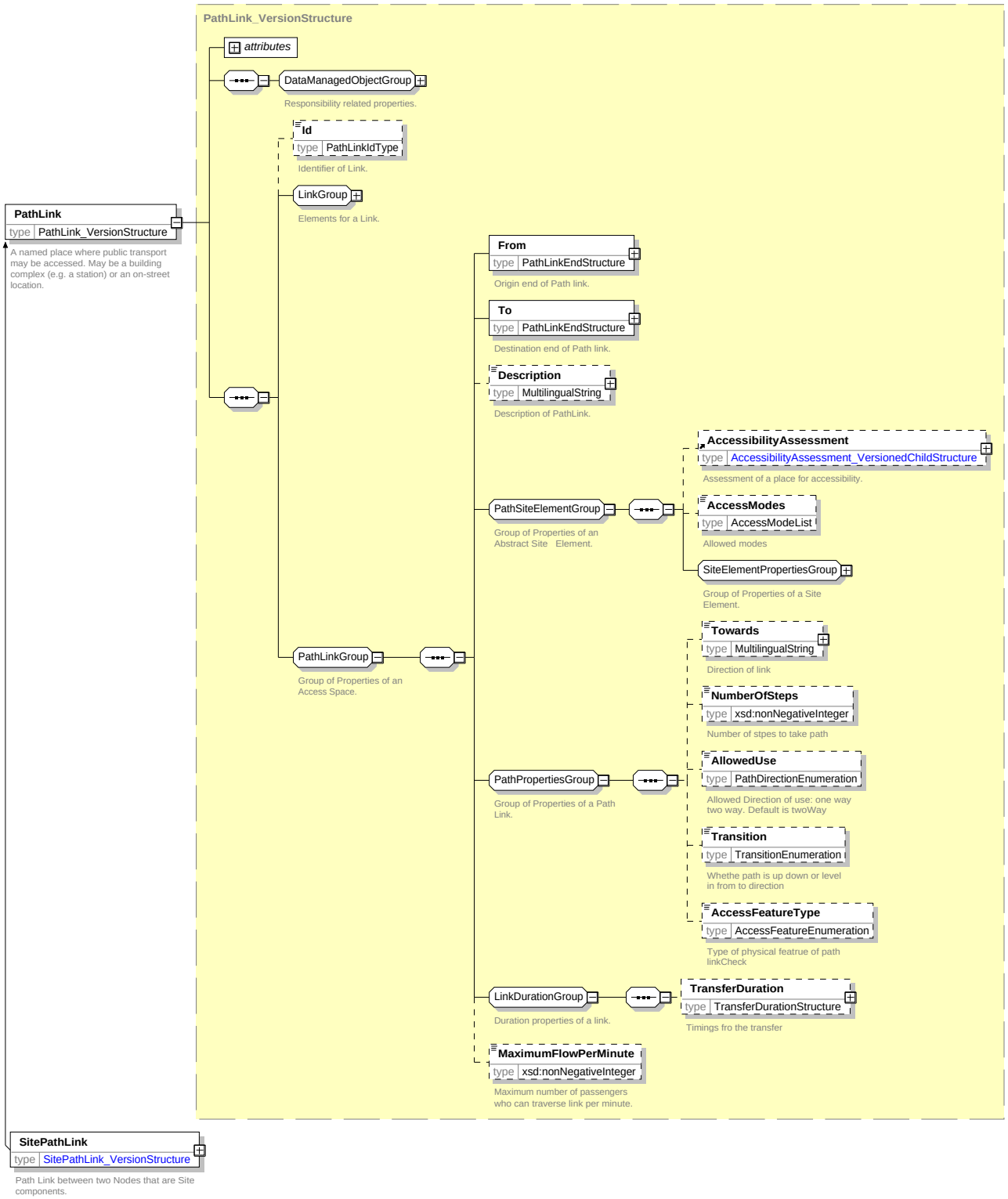


Figure 51 — PathLink XSD

PathLinkEnd – element

PathLinkEnd specifies the properties of one end of a ***PathLink.***

Element Name	Element Type	Card-inality	Comment
PlaceRef	*PlaceRef*	1:1	***Place*** to which ***PathLink*** connects.
LevelRef	*LevelRef*	0:1	***Level*** to which ***PathLink*** connects.
EntranceRef	*EntranceRef*	0:1	***Entrance*** to which ***PathLink*** connects.

Table 66 — PathLinkEnd elements

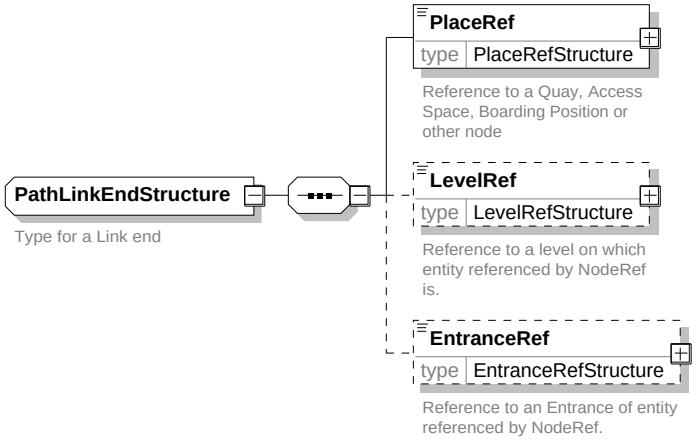


Figure 52 — PathLinkEnd XSD

7.1.2.2PathJunction - element

PathLink specifies an intermediate point between two places within a ***Site.***

Element Name	Element Type	Card-inality	Comment
Id	*PathJunctionType*	0:1	Identifier of ***PathJunction.***
		::>	***PathJunction*** is a subtype of ***SiteElement.***
Label	*MultilingualString*	0:1	*Label of point.*
SiteComponnetRef	*SiteRef*	0:1	Site to which component belongs.

Table 67 — PathJunction elements

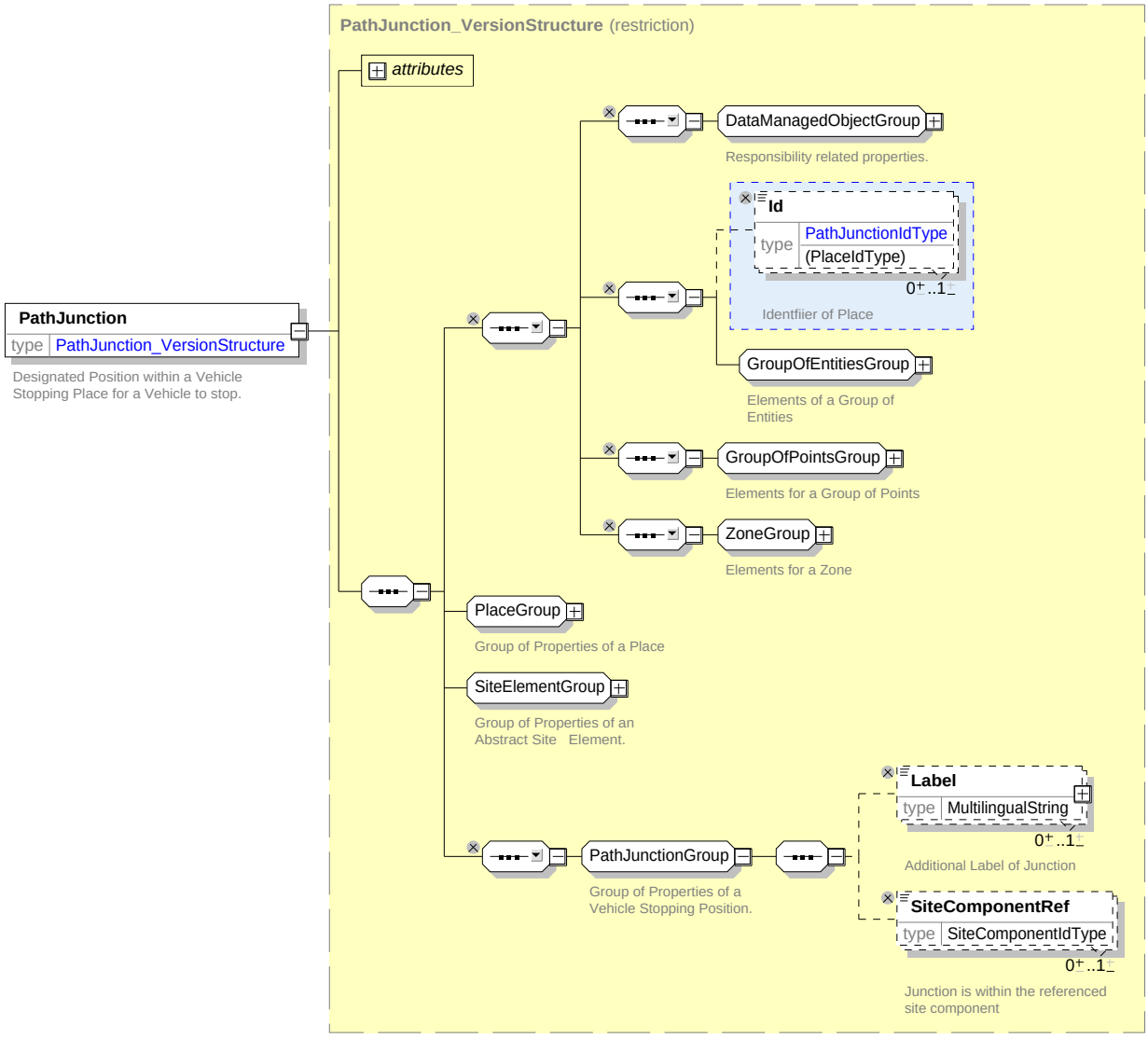


Figure 53 — PathJunction XSD

7.1.2.3NavigationPath – element

NavigationPath specifies an path between two ***Sites.*** It may include a sequence of detailed ***PathLink instances,*** or just a summary of features and accessibility..

Element Name	Element Type	Card-inality	Comment
Id	*NavigationPathIdType*	0:1	Identifier of ***NavigationPath.***
		::>	***NavigationPath*** is a subtype of ***DataManagedObject.***
NavigationPath-SummaryGroup	***NavigationPath-SummaryGroup***	1:1	See below.
SiteElementGroup	***SiteElementGroup***	1:1	See SiteElement.

AccessFeature	*List of access features*	0:1	Site to which component belongs
placesInSequence	*PlaceRefInSequence*	0:*	One or more places in sequence
pathLinksInSequence	*PathLinkInSequence*	0:*	One or more Pathlinks
transferRefs	*TransferRef*	0:*	References to access links that this NavigationPath can be used for

Table 68 — NavigationPath elements

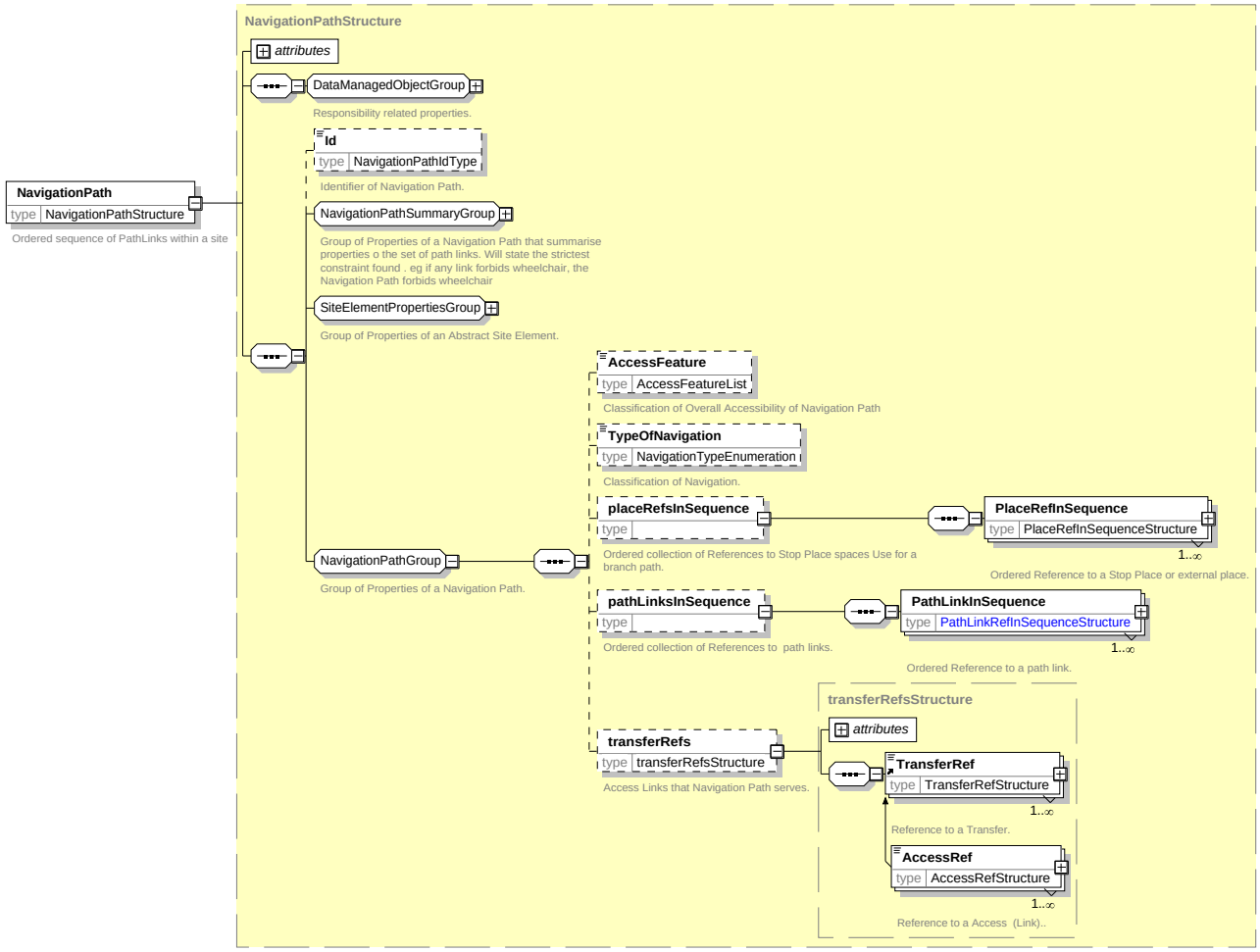


Figure 54 — NavigationPath XSD

NavigationPathSummaryGroup – group

NavigationPathSummaryGroup describes the summary properties of a summary **NavigationPath**

Element Name	Element Type	Card-inality	Comment
Name	*MultilingualString*	0:1	Description of ***NavigationPath.***
From	*PathLinkEnd*	0:1	Origin End of ***NavigationPath.***

To	*PathLinkEnd*	0:1	Destination End of ***NavigationPath.***
Accessibility-Assessment	*List of access features*	0:1	***AccessibilityAssesment*** of ***NavigationPath.***
validityConditions	*ValidityCondition*	0:*	Condition for when path is valid.
AccessModes	*AccessModeList*	0:*	List of modes that may be used on path. Default is walk.
features	*AccessSummary*	0:*	Summary of ***NavigationPath*** features.
TransferDuration	*TransferRef*	0:1	References to ***Access*** link that this ***NavigationPath*** can be used for
Distance	*DistanceType*	0:1	Length of ***NavigationPath.***

Table 69 — NavigationPathSummaryGroup elements

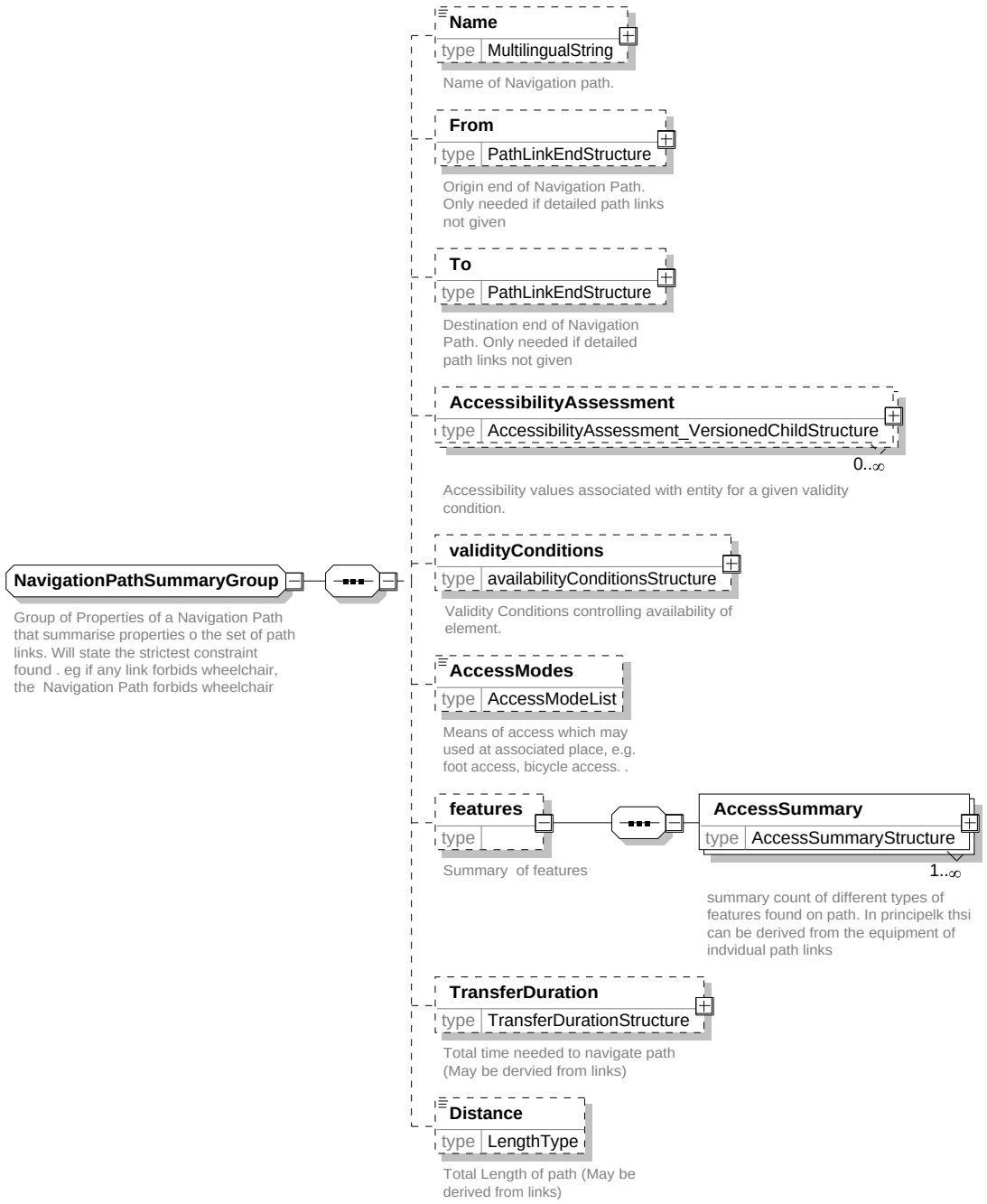


Figure 55 — NavigationPathSummaryGroup XSD

AccessSummary – elements

AccessSummary describes a feature of a **NavigationPath,** for example the number of lifts.

Element Name	Element Type	Card-inality	Comment
AccessFeatureType	*Enumeration*	1:1	Type of feature, e.g. lift.
Count	*Xsd:integer*	1:1	Number of instances of feature.

Transition	*Up* | *down*	1:1	Transition using feature.

Table 70 — AccessSummary elements

Value	Description
lift	Lift
stairs	Stairs
seriesOfStairs	Series of stairs
escalator	Escalator
travelator	Travelator
ramp	Ramp
shuttle	Shuttle
crossing	Crossing
barrier	Barrier
narrowEntrance	Narrow entrance
hall	Hall
concourse	Concourse
confinedSpace	Confined space
queueManagement	Queue management
none	None
unknown	Unknown
other	Other
openSpace	Open space
street	Street
pavement	Pavement

Table 71 — AccessFeatureType: allowed values

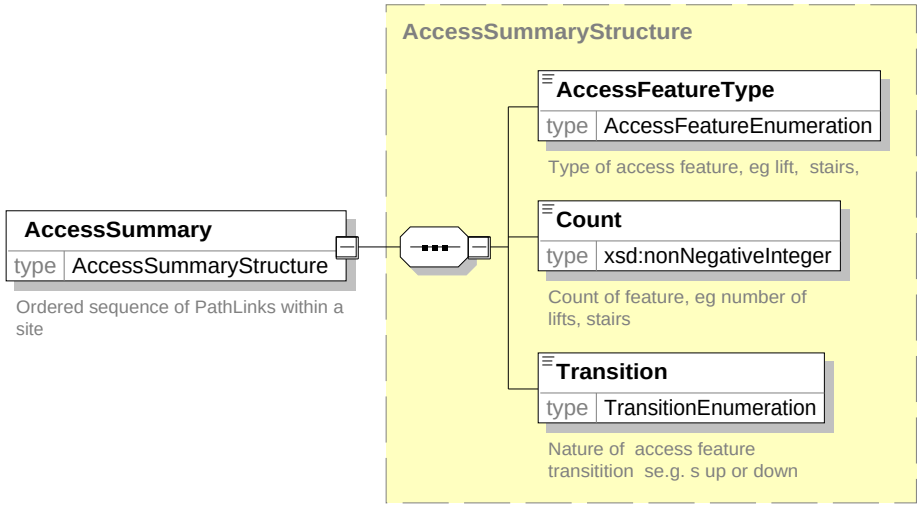


Figure 56 — AccessSummary XSD

7.1.3 CheckConstraint - element

CheckConstraint specifies a process that takes place at a point on a ***Site.***

Element Name	Element Type	Card-inality	Comment
Id	*CheckConstraintIdType*	0:1	Identifier of ***CheckConstraint.***
		::>	***CheckConstraint*** is a subtype of ***VersionedChild.***
Order	*xsd:integer*	0:1	Relative order in which to consider ***CheckConstraint.***
Name	*MultilingualString*	0:1	Name of ***CheckConstraint.***
validityConditions	*ValidityCondition*	0:*	***ValidityConditions*** affecting ***CheckConstraint.***
CheckDirection	*Enumeration*	0:1	Direction in which ***CheckConstraint*** applies.
CheckProcess	*Enumeration*	0:1	Type of Process associated with

			CheckConstraint.
CheckService	*Enumeration*	0:1	Type of Service associated with ***CheckConstraint.***
AccessFeatureType	*Enumeration*	0:1	Type of AccessFeature associated with ***CheckConstraint – See NavigationPath.***
Congestion	*Enumeration*	0:1	Congestion associated with ***CheckConstraint.***
FacilityRef	*FacilityRef*	0:1	Reference to facility associated with ***CheckConstraint.***
delays	*CheckConstraintDelay*	0:*	Delays affecting ***CheckConstraint.***
throughput	*CheckConstraintThroughput*	0:*	Throughput capacity limits for ***CheckConstraint.***

Table 72 — CheckConstraint elements

Value	Description
forwards	CheckConstraint applies only in forwards direction of associated link or Path
backwards	CheckConstraint applies only in backwards direction of associated link or Path
bothWays	CheckConstraint applies in both directions of associated link or Path

Table 73 — CheckDirection: allowed values

Value	Description
none	None
boarding	Boarding
alighting	Alighting
ticketPurchase	Ticket purchase
ticketCollection	Ticket collection
ticketValidation	Ticket validation
baggageCheckIn	Baggage check in
oversizeBaggageCheckIn	Oversize Baggage check in
oversizeBaggageReclaim	Oversize baggage reclaim
baggageReclaim	Baggage reclaim
leftLuggageDeposit	Left luggage deposit
leftLuggageReclaim	Left luggage reclaim
firstclassCheckin	First class check-in
specialNeedsCheckin	Special needs check-in
baggageSecurityCheck	Baggage security check
securityCheck	Security check
outgoingPassportControl	Outgoing passport control
incomingPassportControl	Incoming passport control
fasttrackDepartures	Fasttrack departures
fasttrackArrivals	Fasttrack arrivals
incomingDutyFree	Incoming duty free
outgoingDutyFree	Outgoing duty free
taxRefunds	Tax refunds
outgoingCustoms	Outgoing customs
incomingCustoms	Incoming customs
waitForLift	Wait for lift
ingress	Ingress
egress	Egress
queue	Queue
other	Other Process

Table 74 — CheckProcess: allowed values

Value	Description
selfService	Self Service
counterService	Counter Service
anyService	Any Service
other	Other Service

Table 75 — CheckService: allowed values

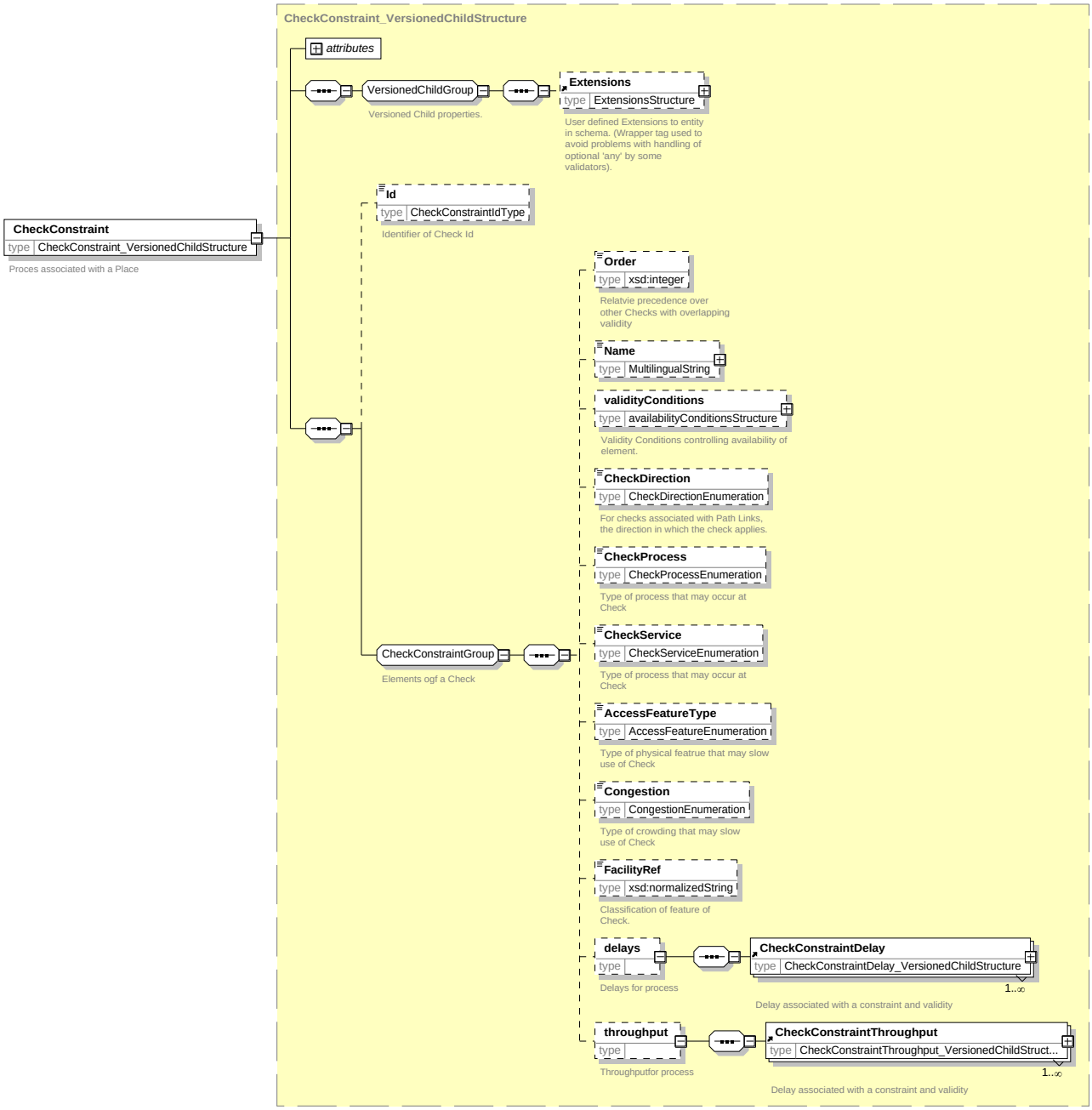


Figure 57 — CheckConstraint XSD

7.1.3.1CheckConstraintDelay - element

CheckConstraintDelay specifies a delay associated with a ***CheckConstraint*** process***.***

Element Name	Element Type	Card-inality	Comment
Id	*CheckConstraintDelayIdType*	0:1	Identifier of ***CheckConstraintDelay***

		::>	***CheckConstraintDelay*** is a subtype of ***VersionedChild.***
Order	*xsd:integer*	0:1	Relative order in which to consider ***CheckConstraint.***
CheckConstraintRef	*CheckConstraintRef*	0:1	Reference to ***CheckConstraint*** with which the delay is associated.
validityConditions	*ValidityCondition*	0:*	Validity conditions under which ***CheckConstraintDelay*** applies***.***
MinimumLikelyDelay	*xsd:duration*	0:1	Minimum likely delay associated with process and validity condition.
AverageDelay	*xsd:duration*	0:1	Average delay associated with process and validity condition.
MaximumLikelyDelay	*xsd:duration*	0:1	Maximum likely delay associated with process and validity condition.

Table 76 — CheckConstraintDelay elements

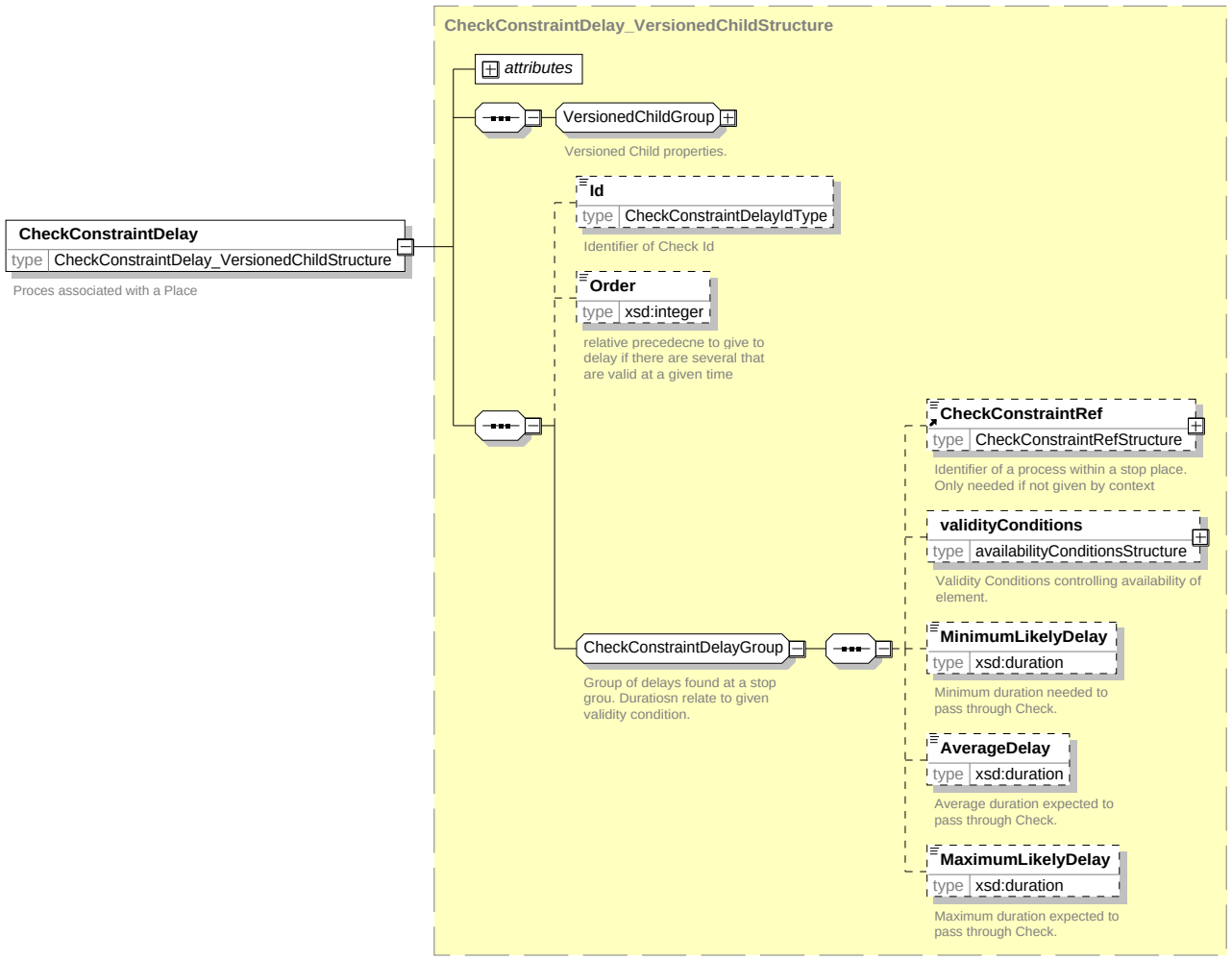


Figure 58 — CheckConstraintDelay XSD

7.1.3.2CheckConstrainThroughput- element

CheckConstraintThroughput specifies a capacity restriction associated with a ***CheckConstraint*** process***.***

Element Name	Element Type	Card-inality	Comment
Id	*CheckConstraint-ThroughputIdType*	0:1	Identifier of ***CheckConstraintDelay***
		::>	***CheckConstraintDelay*** is a subtype of ***VersionedChild.***
CheckConstraintRef	*CheckConstraintRef*	0:1	Reference to ***CheckConstraint*** with which the throughput is associated.
validityConditions	*ValidityCondition*	0:*	Validity conditions under which ***CheckConstraintDelay*** applies***.***
Period	*xsd:duration*	0:1	Interval over which capacity figures are given.
MaximumPassengers	*xsd:integer*	0:1	Maximum number of passengers that can use process under validity condition.
AveragePassengers	*xsd:integer*	0:1	Average number of passengers that can use process under validity condition.
Wheelchair-Passengers	*xsd:integer*	0:1	Maximum number of wheelchair passengers that can use process under validity condition.

Table 77 — CheckConstraintThroughPut elements

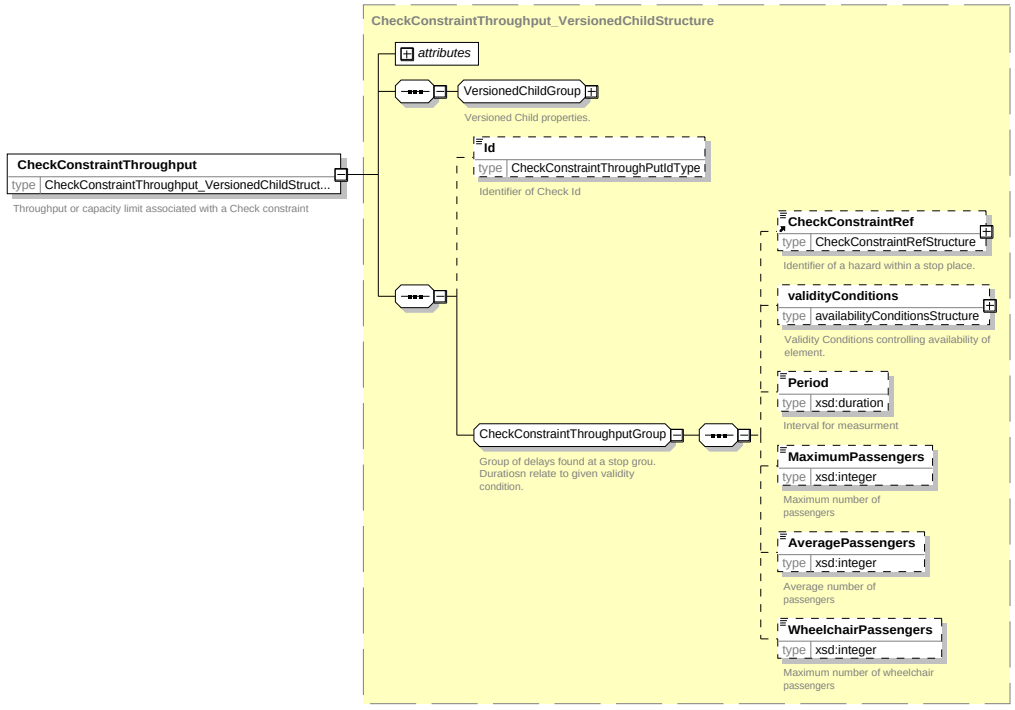


Figure 59 — CheckConstraintThroughPut XSD

8 NETEX FRAMEWORK ELEMENTS

This section describes common framework elements of the NeTEx interface

8.1 Base Objects

8.1.1 DataManagedObject - abstract element

DataManagedObject specifies common versioning and responsibility properties of NeTEx ENTITY VERSIONS. Almost all NeTEx objects are subtypes of ***DataManagedObject***.

Attribute Name	Attribute Type	Card	Comment
nameOfClass	*NameOfClass*	*0:1*	Name of Class of the entity. Allows reflection. Fixed for each entity type.
dataSourceRef	*DataSourceIdType*	*0:1*	Name of source of the data.
created	*xsd:dateTime*	*0:1*	Date entity was first created.
changed	*xsd:dateTime*	*0:1*	Date entity or version was last changed.
modification	*Modification-Enumeration: new | revise | delete*	*0:1*	Nature of last modification; new, revise, delete (default is new).
version	*VersionIdType*	*0:1*	Version number of entity.
status	*StatusEnumeration*	*0:1*	Whether entity is currently in use. Default is "released".
derivedFrom-VersionRef	*VersionIdType*	*0:1*	Version from which this version of entity was derived.

Table 78 — DataManagedObject attributes

Element Name	Element Type	Cardinality	Comment
ResponsibilitySetRef	*ResponsibilitySetRef*	0:1	Reference to a Responsibility set that defines the owner of the entity.

Table 79 — DataManagedObject elements

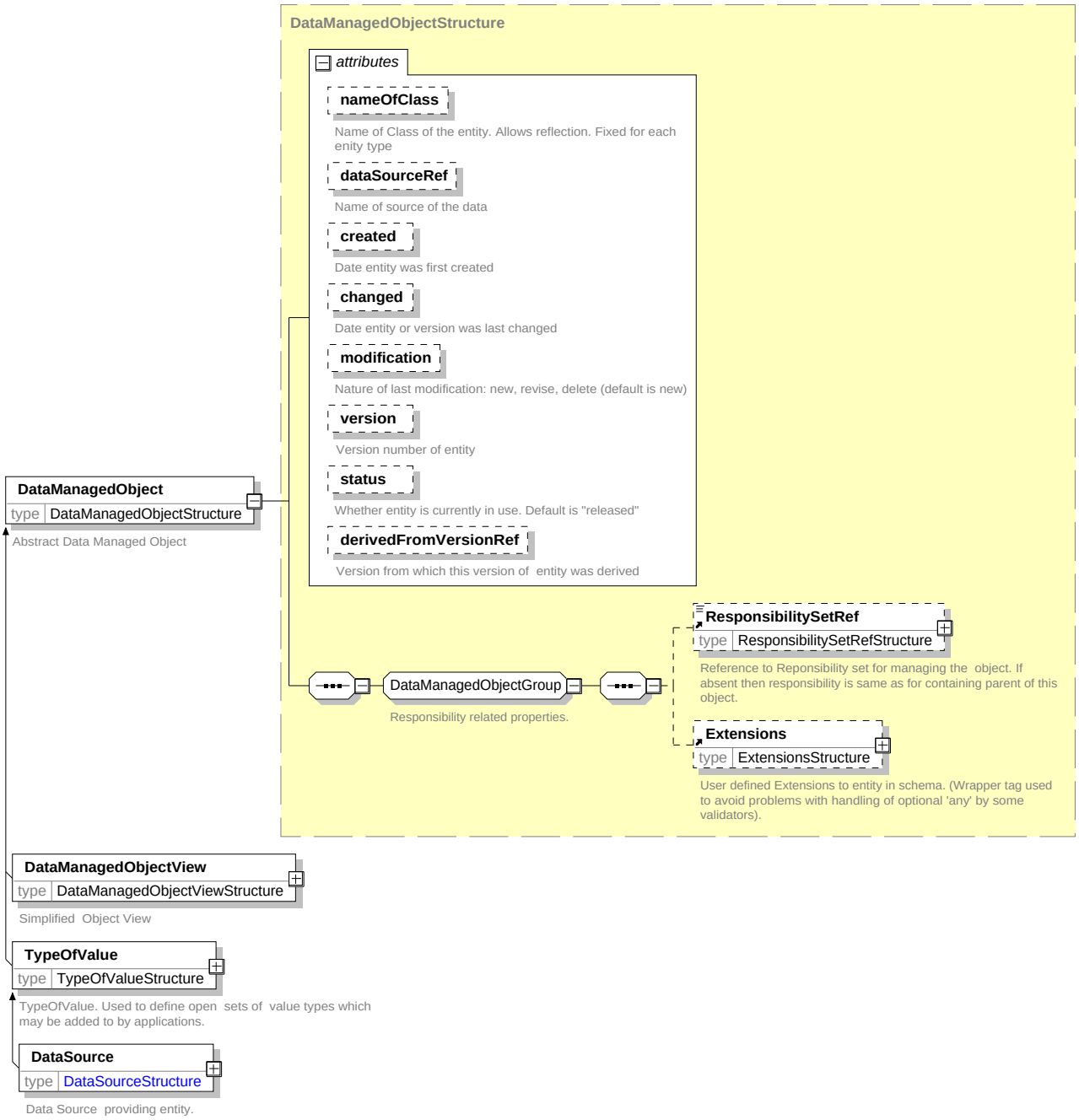


Figure 60 — DataManagedObject XSD

8.1.2 ResponsibilitySet – elements

ResponsibilitySet specifies the Responsibilities for owning and managing the Object.

Element Name	Element Type	Card-inality	Comment
Id	*VersionFrameIdType*	0:1	Unique Identifier of ***ResponsibilitySet.***
Description	MultilingualString	0:*	Description of ***ResponsibilitySet.***
responsibilityRoleAssignments	*ResponsibilityRole-Assignment*	0:*	Definitions of ***ResponsibilityRoleAssignment*** instances in the set.

Table 80 — ResponsibilitySet elements

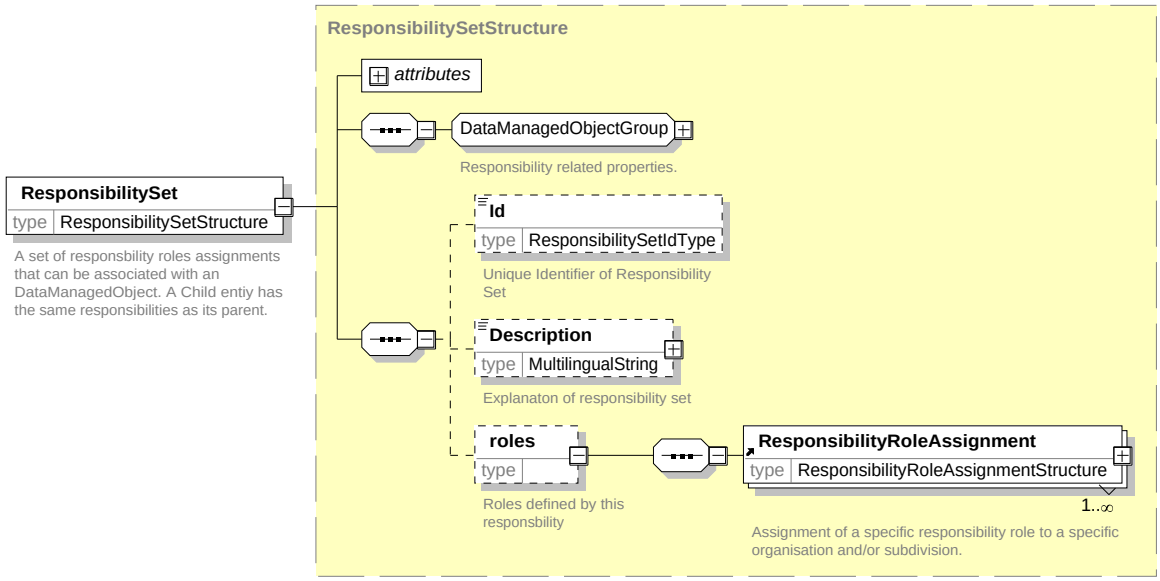


Figure 61 — ResponsibilitySet XSD

8.1.3 TypeOfValue – Abstract element

TypeOfValue specifies the properties of a NeTEx value type – a restricted list of codes and names of particular properties, for example ***TypeOfPlace***, ***PurposeOfPartition***, etc. These lists of codes allow application or region specific subclassifications of NeTEx entities. ***TypeOfValue*** is a type of ***DataManagedObject.***

Element Name	Element Type	Cardinality	Comment
Id	*TypeOfValueIdType*	0:1	Unique Identifier of ***TypeOfValue***.
Name	*MultilingualString*	1:1	Name of ***TypeOfValue***.
Description	*MultilingualString*	0:1	Description of ***TypeOfValue***.
Image	*xsd:anyUri*	0:1	Reference to an image associated with the value.

Table 81 — TypeOfValue elements

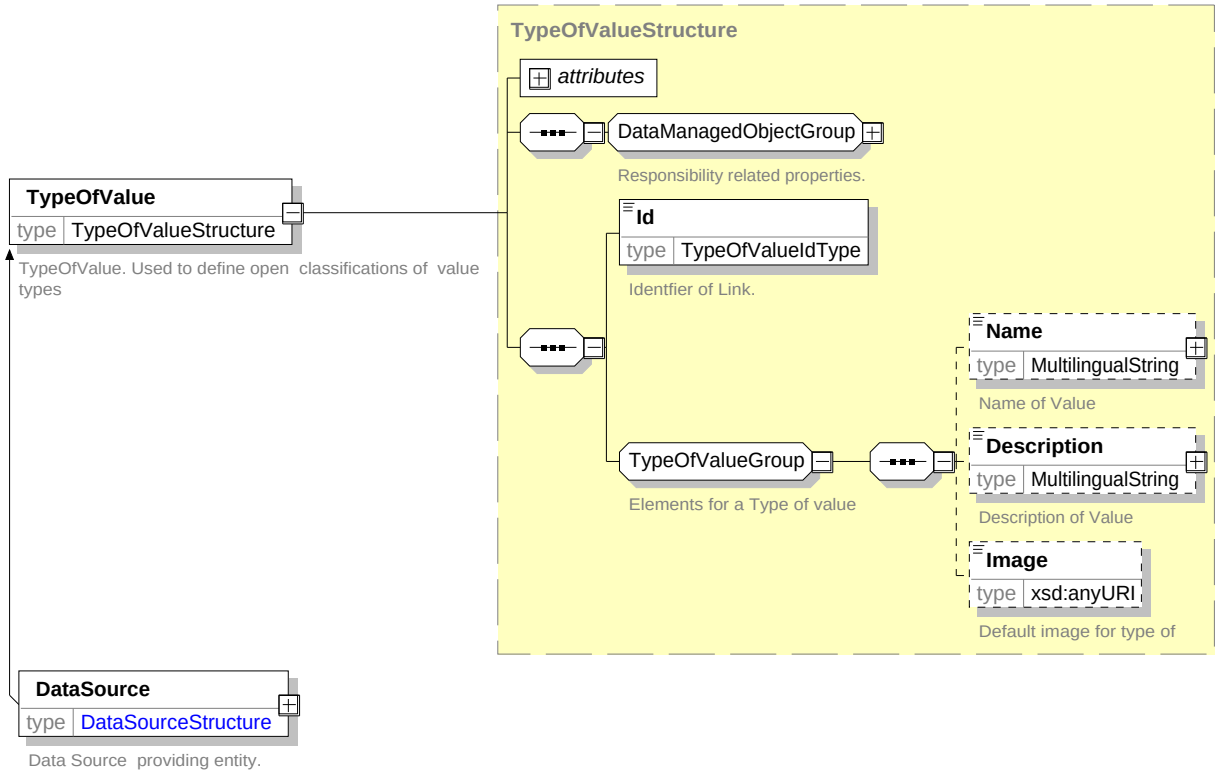


Figure 62 — TypeOfValue XSD

8.2 Version Frames

8.2.1 VersionFrame - abstract element

VersionFrame specifies the abstract properties of a NeTEx ***VersionFrame***– a container of coherent object versions that can be exchange and used as a whole.

Element Name	Element Type	Cardinality	Comment
Id	*VersionFrameIdType*	0:1	Unique Identifier of ***VersionFrame***.
		::>	***VersionFrame*** is a subtype of ***DataManagedObject.***
Name	*MultilingualString*	0:1	Name of ***VersionFrame***.
TypeOfFrameRef	*TypeOfFrameRef*	0:1	Reference to a type of ***VersionFrame***.
BaselineVersionFrameRef	*VersionRef*	0:1	Optional Reference to a prerequisite ***VersionFrame***: Frame contents are only compatible with cited version of baseline frame.

Table 82 — VersionFrame elements

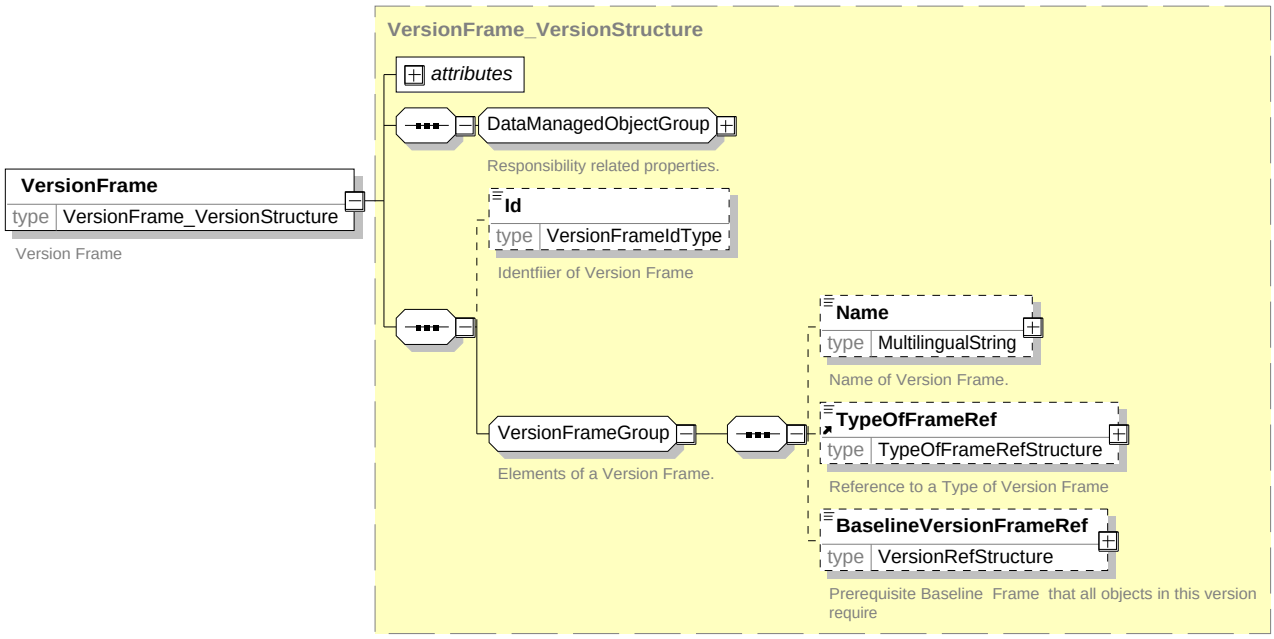


Figure 63 — VersionFrame XSD

8.2.2 CommonFrame – element

CommonFrame specifies the shared properties of all NeTEx version frame instances– a container of coherent values that can be exchange and used as a whole.

Element Name	Element Type	Cardinality	Comment
Id	*VersionFrameIdType*	0:1	Unique Identifier of Version Frame.
		::>	***CommonFrame*** is a subtype of ***VersionFrame.***
responsibilitySets	*ResponsibilitySet*	0:*	Definitions of ***ResponsibilitySets*** referenced by elements in the frame.
validityConditions	*ValidityCondition*	0:*	***ValidityCondition*** instances that specify the validity of the frame.
typesOfValue	*TypeOfValue subclass*	0:*	Type of Value instances included in frame. These will be subtypes of ***TypeOfValue*** appropriate to the frame type.
Organisation-FrameGroup	**OrganisationFrame-Group**	1:1	***Organisation*** instances referenced by elements in the Frame. See later.
contentValidity-Conditions	*ValidityCondition*	0:*	***ValidityCondition*** instances that are used by the content entities in the frame.

Table 83 — CommonFrame elements

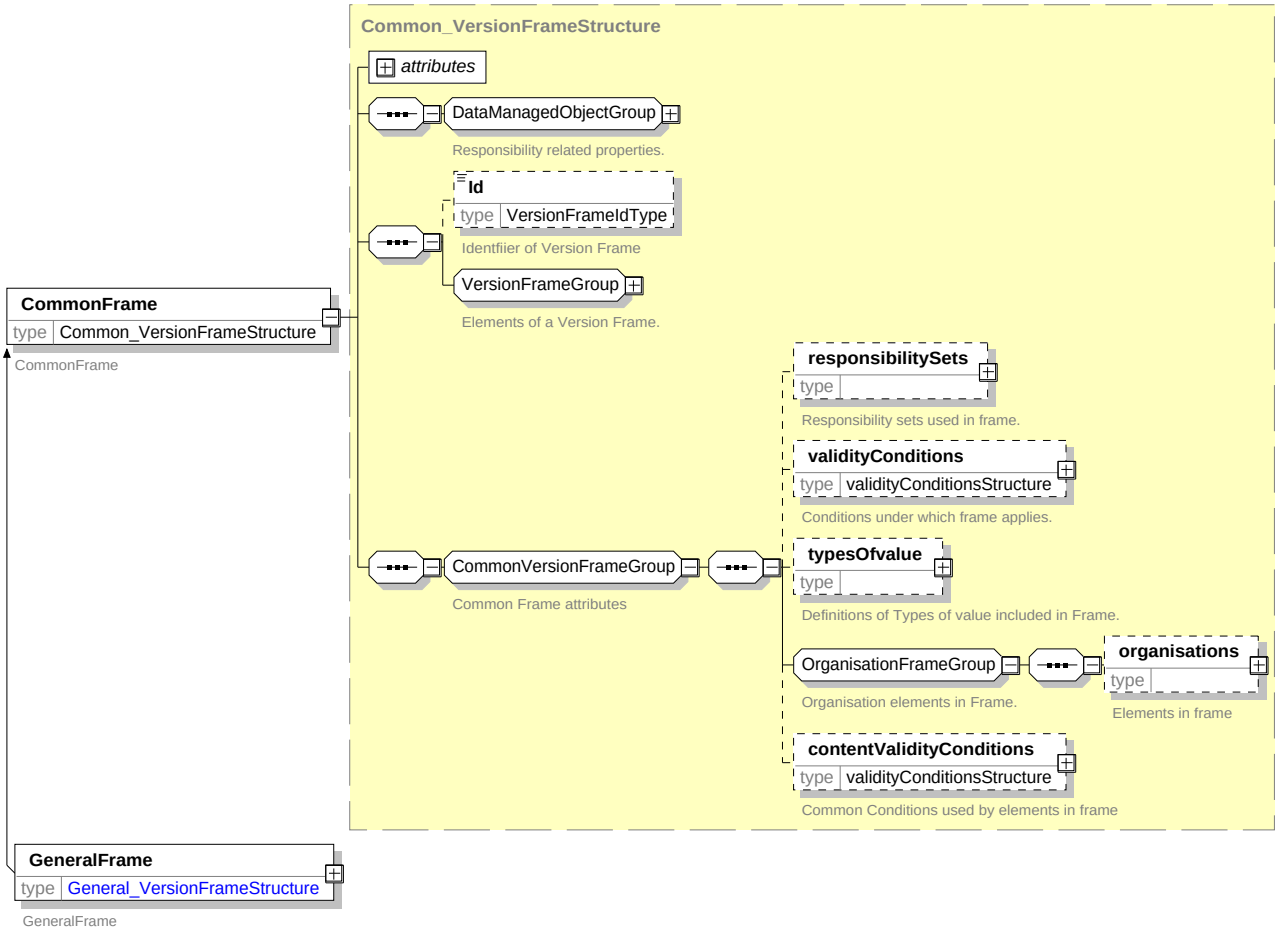


Figure 64 — CommonFrame XSD

8.2.3 OrganisationFrameGroup – group

OrganisationFrameGroup specifies the **Organisations** in the frame.

Element Name	Element Type	Card-inality	Comment
Authority	*Authority*	0:1	***Organisation*** is an **Authority.**
GroupOfOperators	*GroupOfOperators*	0:1	***Organisation*** is a named group of operators.
Operator	*Operator*	0:1	***Organisation*** is an ***Operator.***
OrganisationView	*OrganisationView*	0:1	***Organisation*** is referenced with just a simplified view of an organisation.
OtherOrganisation	*OtherOrganisation*	0:1	***Organisation*** is another type.
Department	*Department*	0:1	***Organisation*** is Department of an Organisation.

Table 84 — OrganisationFrame elements

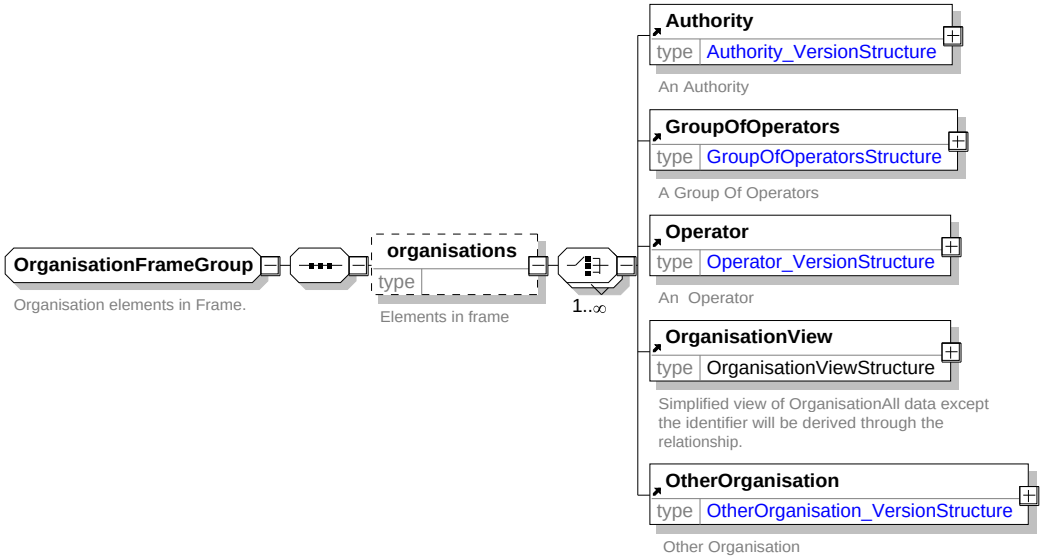


Figure 65 — OrganisationFrameGroup XSD

8.3 Point - abstract element

Point specifies a named point location.

Element Name	Element Type	Card-inality	Comment
Id	*PointIdType*	0:1	Unique Identifier of ***Point***
		::>	***Point*** is a subtype of ***DataManagedObject.***
Name	*MultilingualString*	0:1	Name of ***Point.***
Location	*Location*	0:*	Specifies a ***Point*** coordinates.
types	*TypeOfPointRef*	0:*	Classification as t ***TypeOfPoint***.
validityConditions	*ValidityCondition*	0:*	***ValidityCondition*** instances that specify the validity of the point.
projections	*Type of projection*	0:*	Reference to a ***Projection*** associated with ***Point.***
group-Memberships	*GroupRef*	0:*	Reference to a ***GroupOfPoints*** to which this point belongs.

Table 85 — Point elements

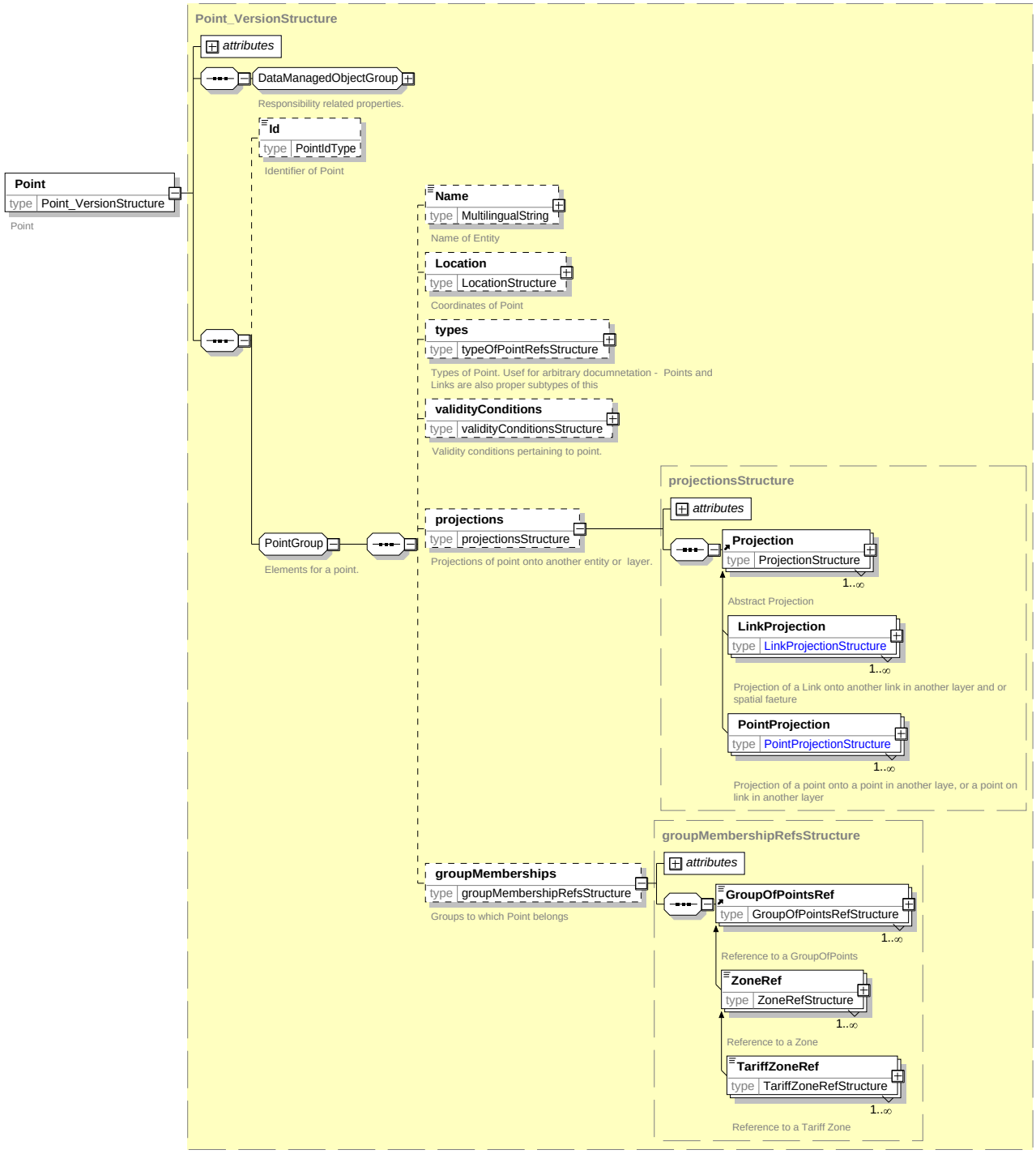


Figure 66 — Point XSD

8.4 Link - abstract element

Link specifies a link between two points.

Element Name	Element Type	Card-inality	Comment
Id	*LinkIdType*	0:1	Unique Identifier of ***Link.***
		::>	***Link*** is a subtype of ***DataManagedObject.***
FromPointRef	*PointIdType*	1:1	Start point of ***Link***.
ToPointRef	*PointIdType*	1:1	End point of ***Link***.
Name	*MultilingualString*	0:1	Name of ***Link.***
Distance	*DistanceType*	0:*	Length of ***Link***.
types	*TypeOfPointRef*	0:*	Classification as t ***TypeOfLink***.
validityConditions	*ValidityCondition*	0:*	***ValidityCondition*** instances that specify the validity of the point.
projections	*Type of projection*	0:*	Reference to a ***Projection*** associated with ***Link.***
passingThrough	*PointOnLink*	0:*	Points on ***Link***.

Table 86 — Link elements

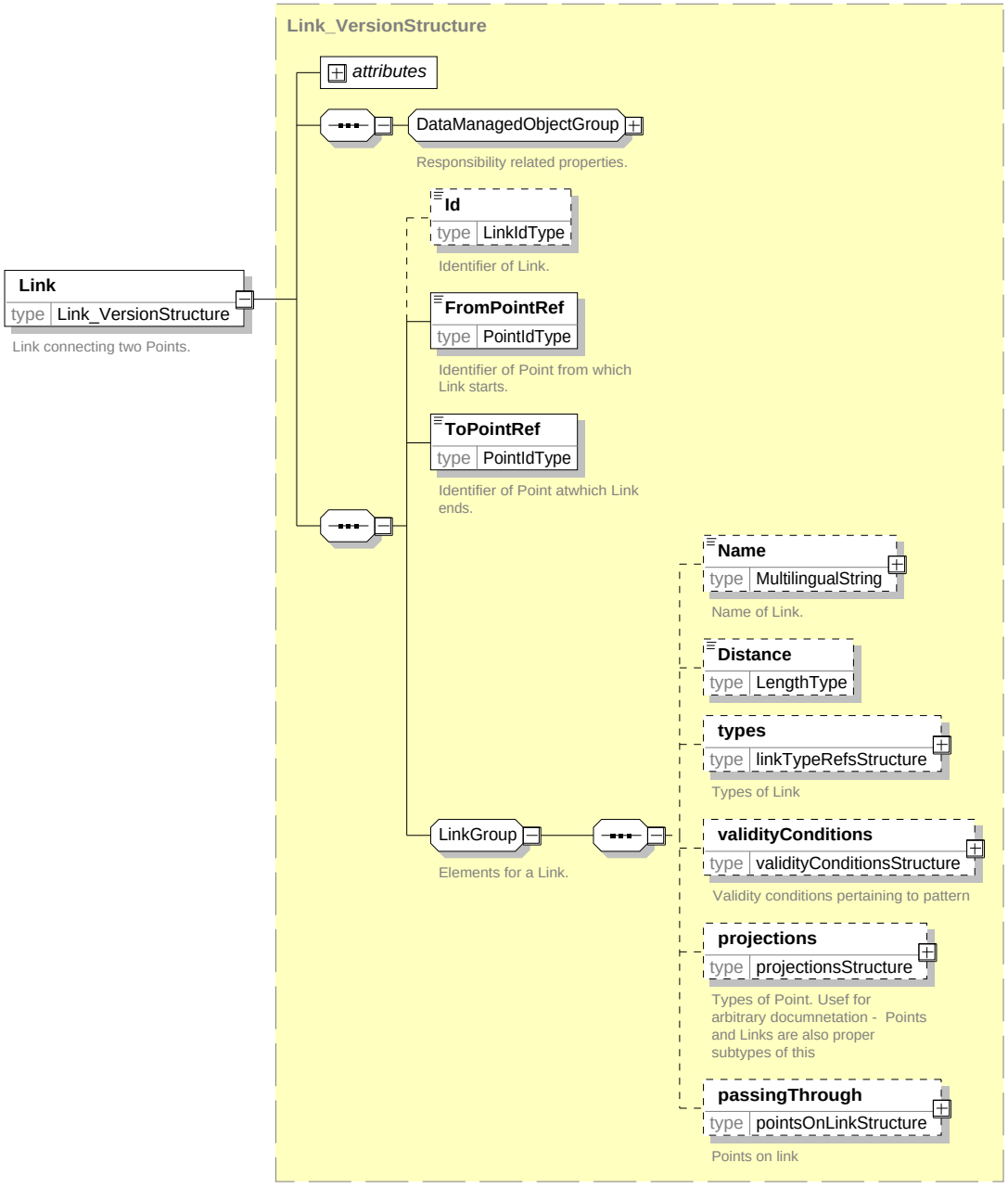


Figure 67 — Link XSD

8.5 Location – element

Location specifies a geospatial point.

Element Name	Element Type	Card-inality	Comment
Id	*xsd:normalizedString*	0:1	Unique Identifier of ***Location***.
Srsname	*xsd:normalizedString*	0:1	Name of coordinate system used.
Longitude	*MultilingualString*	0:1	Longitude in WGS84.

Latitude	*Location*	0:1	Latitude in WGS84.
Altitude	*TypeOfPointRef*	0:1	Altitude in metres.
Coordinates	*ValidityCondition*	0:1	Coordinates a GML string.
Precision	*DistanceType*	0:1	Precision to which distance is given in metres.

Table 87 — Location elements

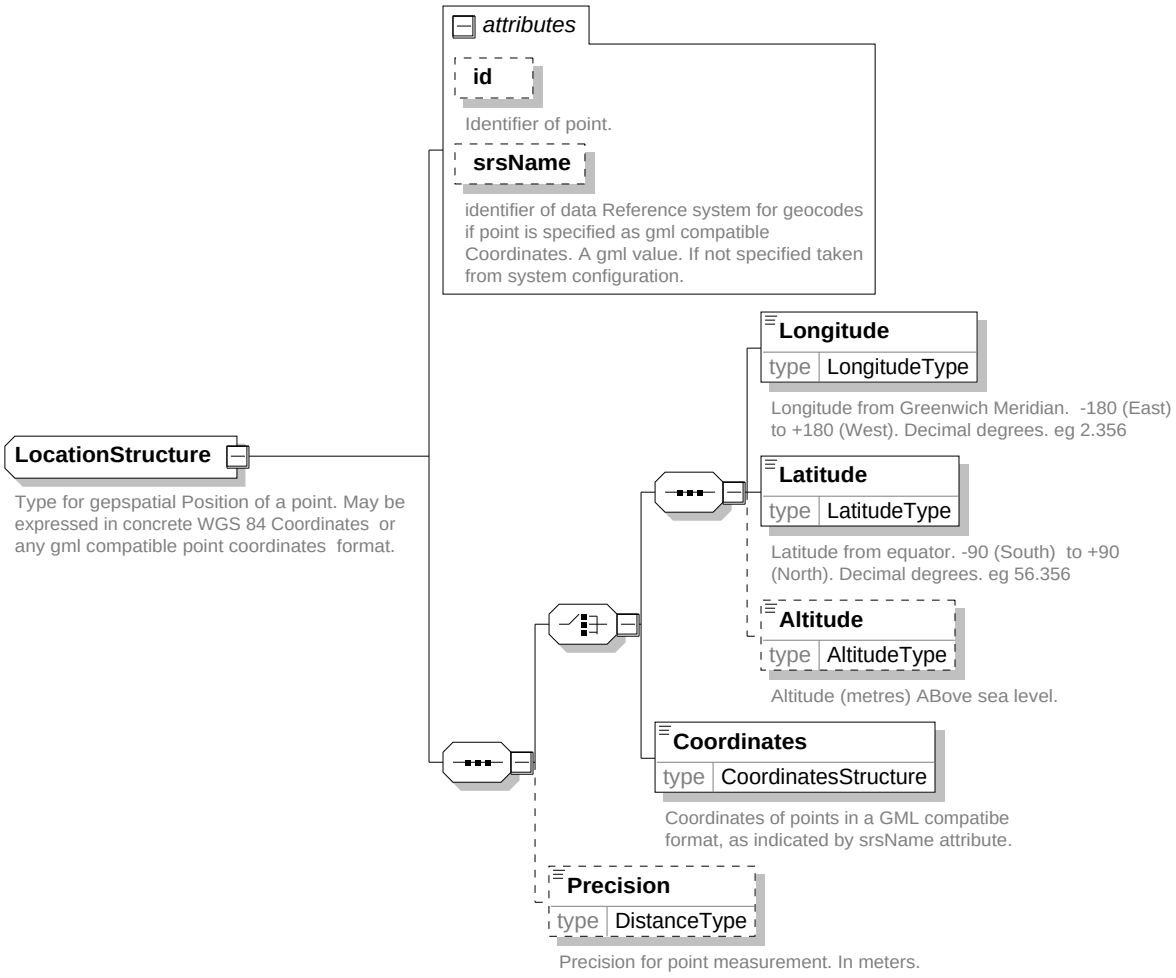


Figure 68 — Location XSD

8.6 Projections

8.6.1 Projection - element

Projection specifies a mapping of one entity onto another. It is a type of ***DataManagedObject*** (See above).

Element Name	Element Type	Card-inality	Comment
Id	*ProjectionIdType*	0:1	Unique Identifier of ***Projection.***

		::>	***Projection*** is a subtype of ***DataManagedObject.***
Order	*Xsd:positiveInteger*	0:1	Order in which to apply ***Projection***.
TypeOfProjection	*TypeOfProjectionRef*	0:1	Reference to a ***TypeOfProjection.***
Name	*MultilingualString*	0:1	Name of ***Projection.***
SpatialFeatureRef	*TypeOfFeatureRef*	0:1	Reference to a Geospatial feature.

Table 88 — Projection elements

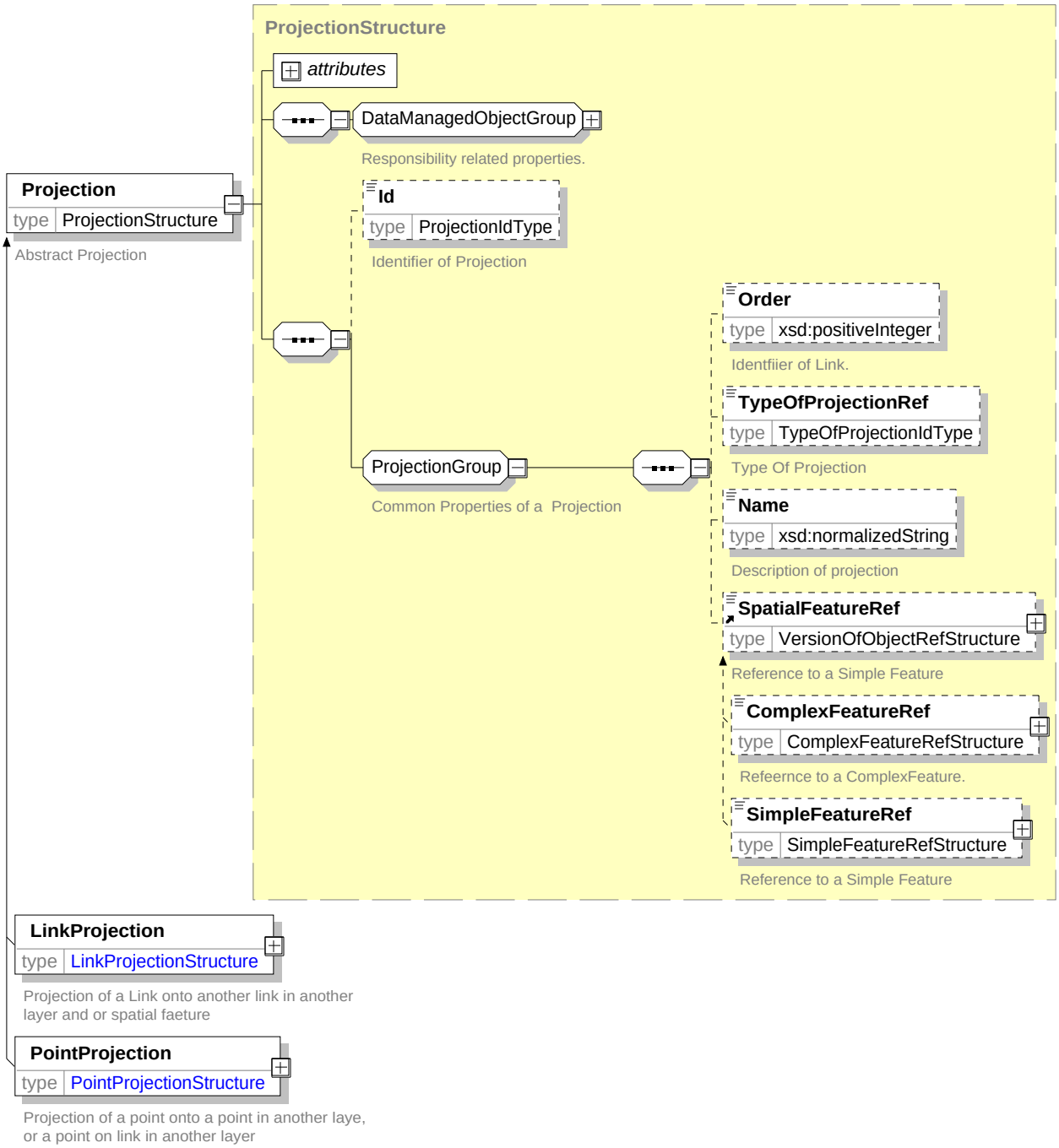


Figure 69 — Projection XSD

8.6.2 PointProjection - element

PointProjection specifies a mapping of a point onto a point or a link. It is a type of ***Projection*** (See above).

Element Name	Element Type	Card-inality	Comment
Id	*PointProjectionIdType*	0:1	Unique Identifier of ***Projection.***

		::>	Projection is a subtype of ***Projection***. See Above section.
ProjectedPointRef	*PointRef*	0:1	Reference to a ***Point*** that is being projected. If given by context need not be stated.
ProjectToPointRef	*PointRef*	0:1	Reference to a ***Point*** onto which ***Point*** is being projected.
ProjectToLinkRef	*LinkRef*	0:1	Reference to a ***Point*** onto which ***Point*** is being projected.
Distance	*DistanceType*	0:1	Distance along link to project point.

Table 89 — PointProjection elements

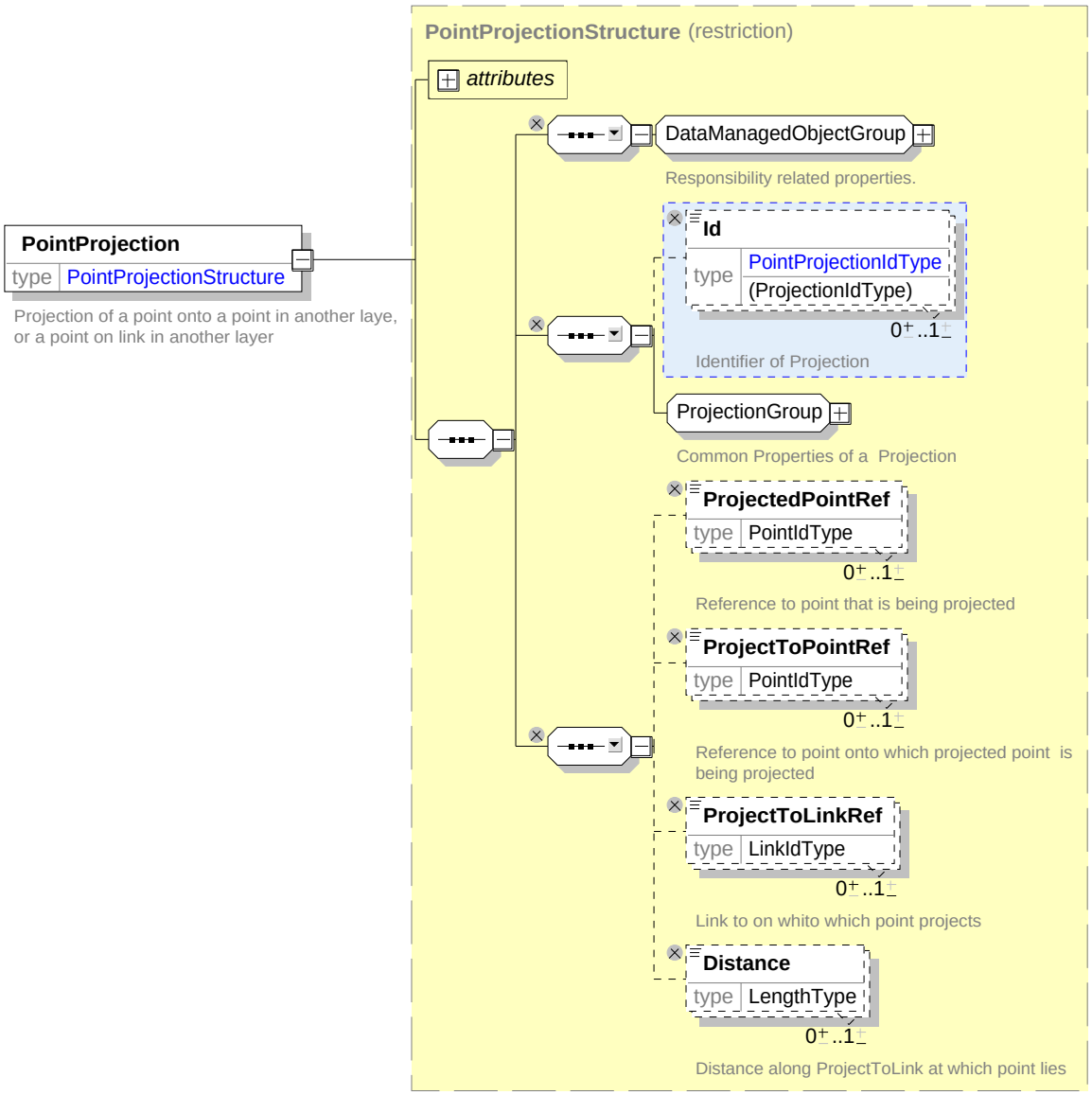


Figure 70 — PointProjection XSD

8.6.3 LinkProjection - element

LinkProjection specifies a mapping of one Link onto another. It is a type of ***Projection*** (See above).

Element Name	Element Type	Card-inality	Comment
Id	*LinkProjectionIdType*	0:1	Unique Identifier of ***LinkProjection.***
		::>	***LinkProjection*** is a subtype of ***Projection***. See Above section.
ProjectedLinkRef	*LinkRef*	0:1	Reference to a ***Link*** that is being projected. If given by context need not be stated
ProjectToLinkRef	*LinkRef*	0:1	Reference to a ***Link*** onto which ***Link*** is being projected.
StartPointOnLink	*PointOnLink*	0:1	Start ***PointOnLink*** – onto which ***Link*** is being projected. See below.
EndPointOnLink	*PointOnLink*	0:1	End ***PointOnLink*** – onto which ***Link*** is being projected. See below.

Table 90 — LinkProjection elements

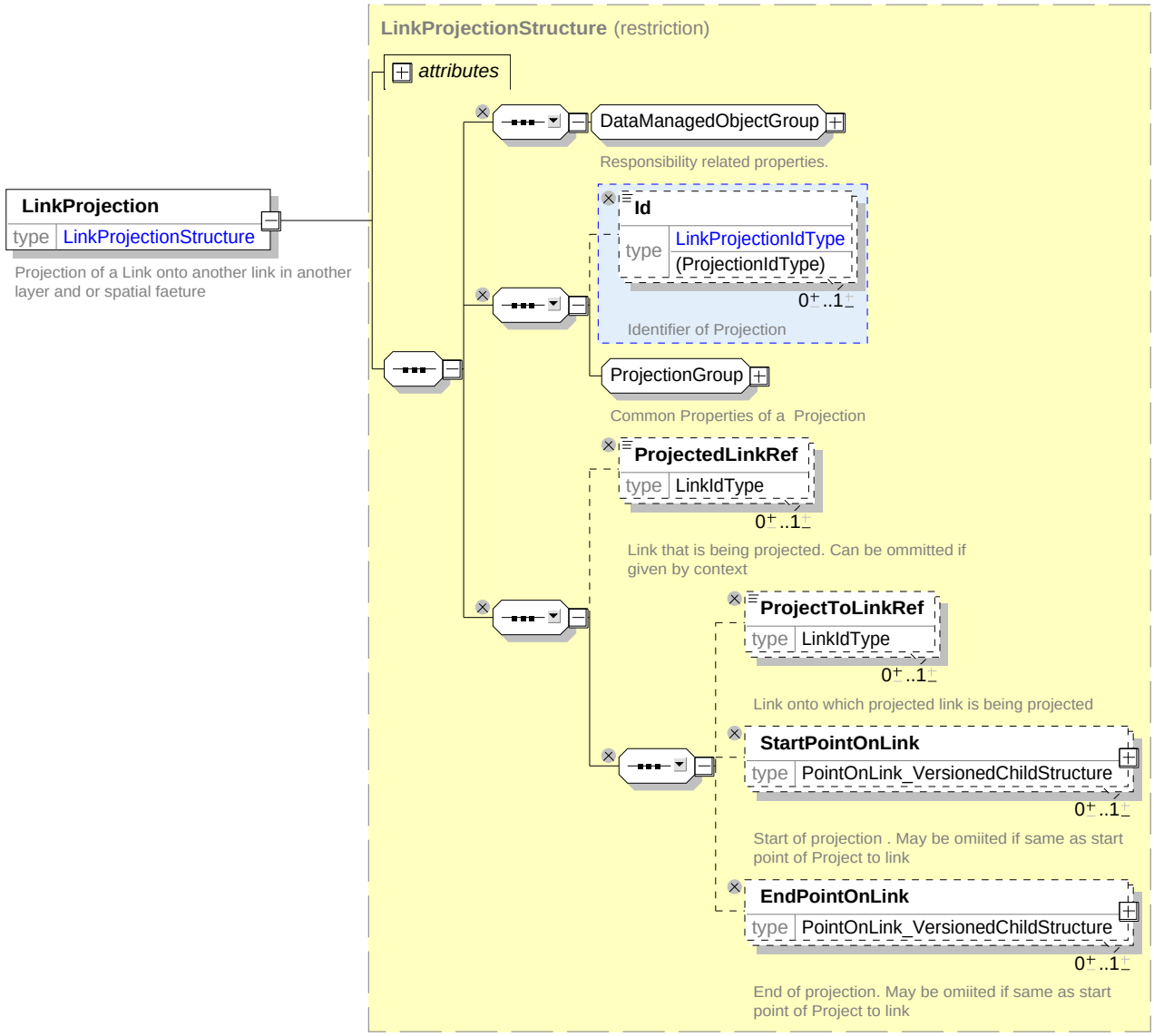


Figure 71 — LinkProjection XSD

8.6.4 ZoneProjection - element

ZoneProjection specifies a mapping of one ***Zone*** onto another. It is a type of ***Projection*** (See above).

Element Name	Element Type	Card-inality	Comment
Id	*ZoneProjectionIdType*	0:1	Unique Identifier of ***ZoneProjection.***
		::>	***ZoneProjection*** is a subtype of ***Projection***. See Above section.
ProjectedZoneRef	*ZoneRef*	0:1	Reference to a ***Zone*** that is being projected. If given by context need not be stated.
PointRef	*LinkRef*	0:1	Reference to single central ***Point*** onto which ***Zone*** is being projected.

points	*Point*	0:*	Reference to ***Points*** onto which ***Zone*** is being projected.

Table 91 — ZoneProjection elements

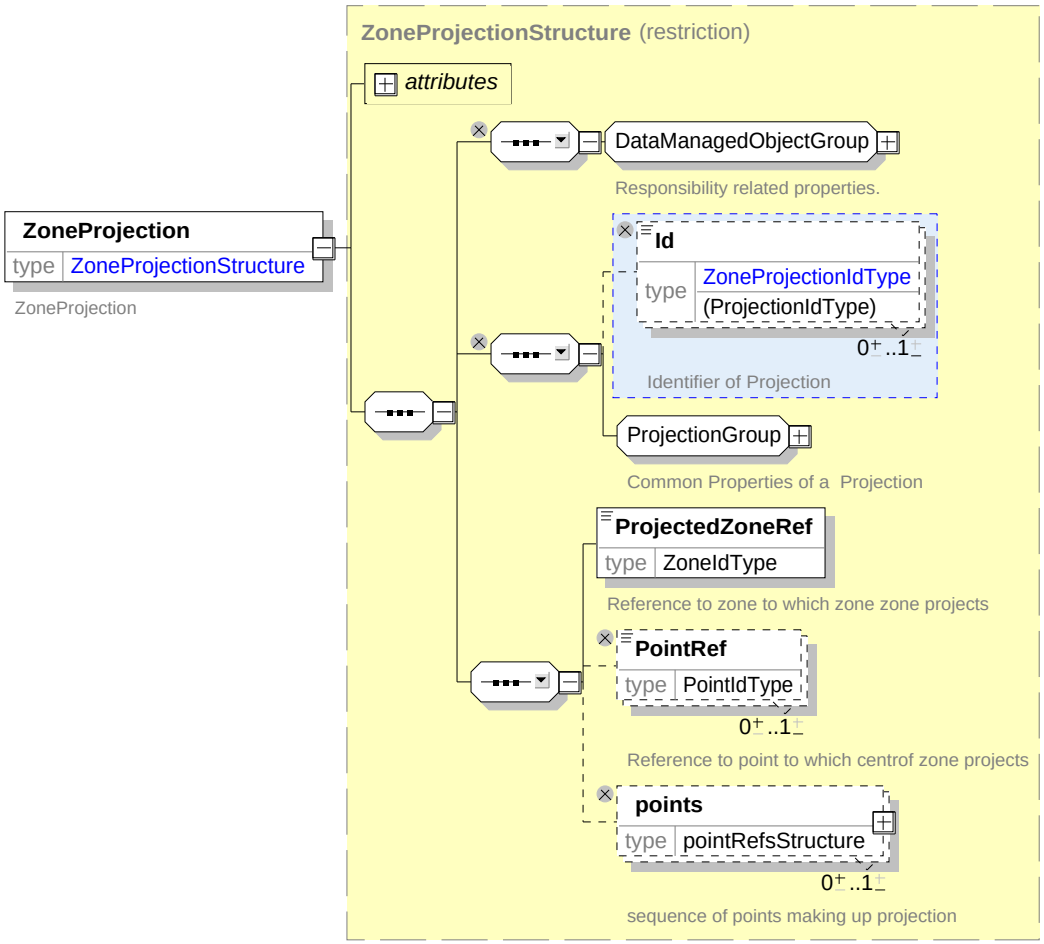


Figure 72 — ZoneProjection XSD

8.6.5 PointOnLink - element

PointOnLink specifies a point on a link. It is a type of ***VersionedChild*** (See above).

Element Name	Element Type	Card-inality	Comment
Id	*PointOnLinkIdType*	0:1	Unique Identifier of ***PointOnLink***.
		::>	***PointOnLink*** is a subtype of ***VersionedChild***.
LinkRef	*LinkRef*	0:1	Reference to a ***Link*** on which point lies. If given by context need not be stated.
Order	*xsd:positiveInteger*	0:1	Order in which ***PointOnLink*** should be used.
DistanceFromStart	*LengthType*	0:1	Distance of point from start of ***Link*** in metres.

PointRef	*PointRef*	0:1	Reference to a ***Point*** to which ***PointOnLink*** corresponds.

Table 92 — PointOnLink element

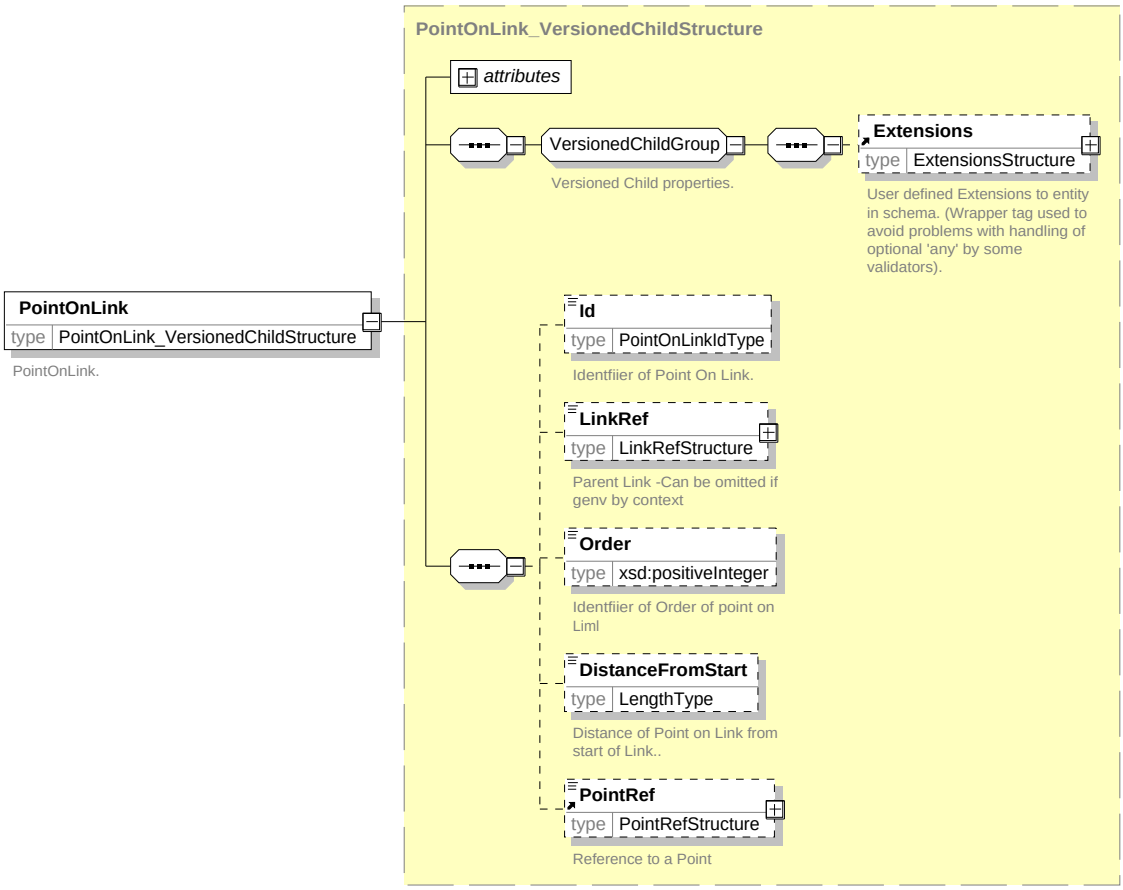


Figure 73 — PointOnLink XSD

8.7 GroupOfEntities - abstract element

GroupOfEntities specifies a named group of elements. It is a type of ***DataManagedObject*** (See above).

Element Name	Element Type	Card-inality	Comment
Id	*GroupOfEntitiesIdType*	0:1	Unique Identifier of ***GroupOfEntities.***
		::>	***GroupOfEntities*** is a subtype of ***DataManagedObject***.
Name	*MultilingualString*	0:1	Name of ***GroupOfEntities***.
Description	*MultilingualString*	0:1	Description of ***GroupOfEntities***.
PurposeOfGrouping	*PurposeOfGroupingRef*	0:1	Reference to a ***PurposeOfGrouping*** value.
PrivateCode	*xsd:normalizedString*	0:1	Alternative identifier for ***GroupOfEntities***.

Table 93 — GroupOfEntities elements

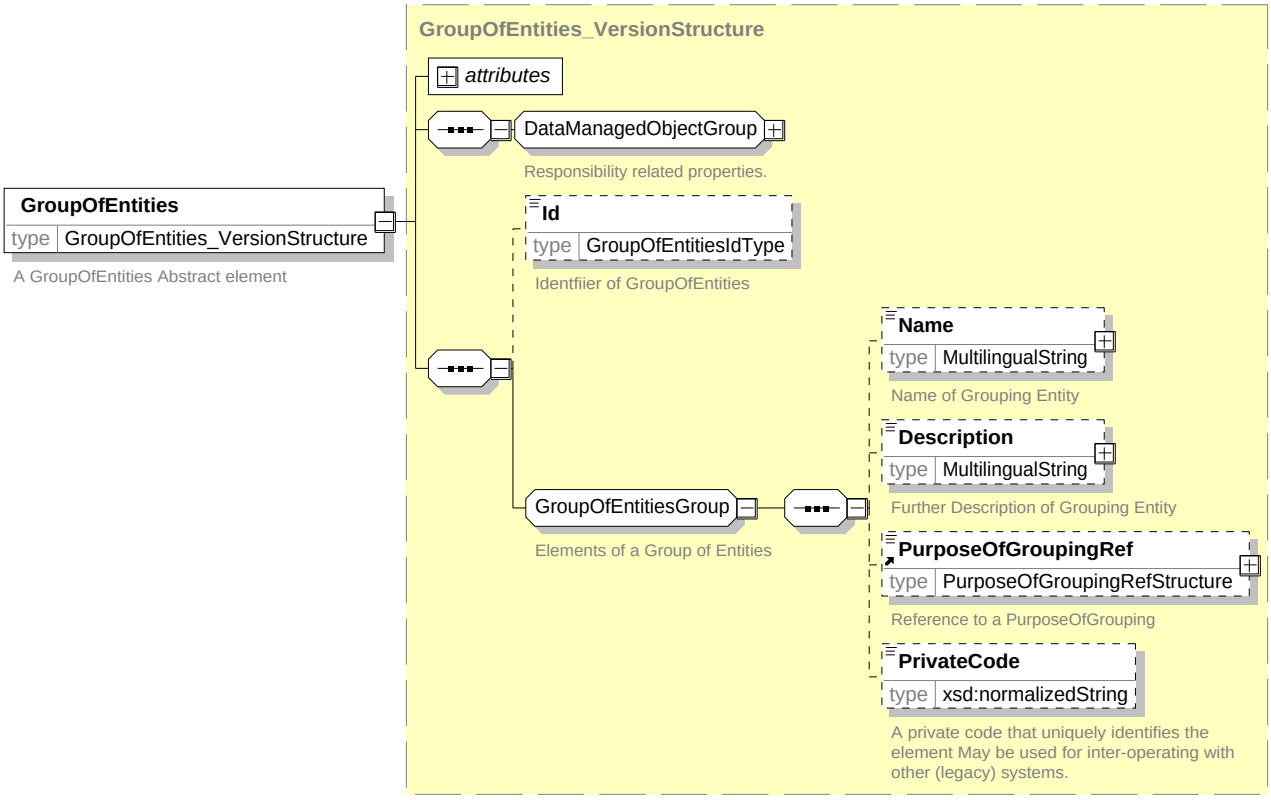


Figure 74 — GroupOfEntities XSD

8.8 GroupOfPoints - abstract element

GroupOfPoints specifies a named group of points. It is a type of ***GroupOfEntities*** (See above

Element Name	Element Type	Card-inality	Comment
Id	*GroupOfPointsIdType*	0:1	Unique Identifier of ***GroupOfPoints.***
		::>	***PointOnLink*** is a subtype of ***GroupOfEntities***.
GroupOfEntitiesGroup	***GroupOfEntitiesGroup***	1:1	Common Properties of a ***GroupOfEntities***. See Framework section.
members	*PointRef*	0::*	Reference to a ***Point*** which is in group.

Table 94 — GroupOfPoints elements

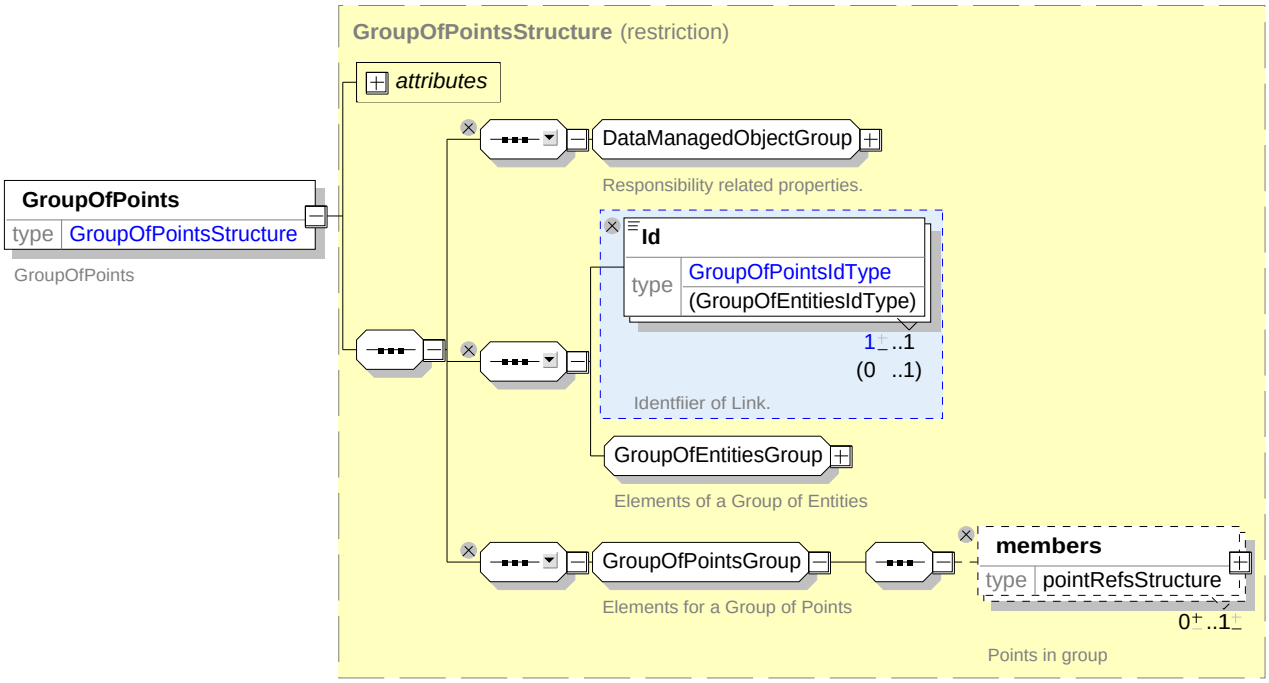


Figure 75 — GroupOfPoints XSD

8.9 Zone - abstract element

Zone specifies a named two dimensional area. It is a type of ***GroupOfPoints*** (See above).

Element Name	Element Type	Card-inality	Comment
Id	*ZoneIdType*	0:1	Unique Identifier of ***Zone.***
		::>	***Zone*** is a subtype of ***GroupOfPoints***.
Centroid	*Point*	0:1	Specifies point coordinates for centre of ***Zone.***
types	*TypeOfPointRef*	0:*	Type of ***Point*** included in frame.
validityConditions	*ValidtyCondition*	0:*	***ValidityCondition*** instances that specify the validity of the ***Point***.
projections	*ZoneProjection* | *LinkProjection* | *PointProjection*	0:*	Reference to a ***Projection*** associated with ***Zone***.
parentZoneRef	*ZoneRef*	0:1	Reference to a parent zone of which the ***Zone*** is part.

Table 95 — Zone elements

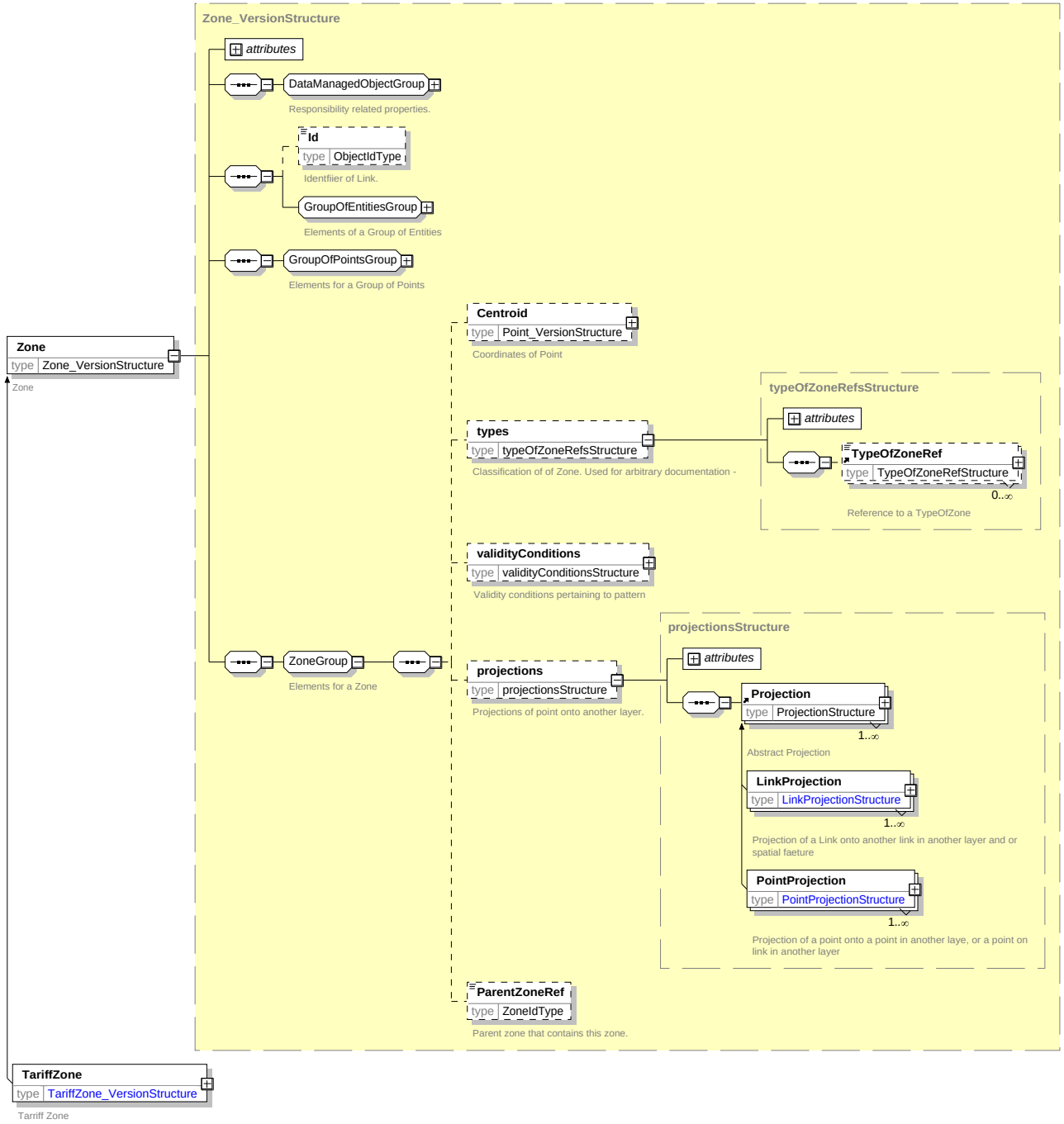


Figure 76 — Zone XSD

TariffZone - abstract element

TariffZone specifies a fare zone. It is a type of ***Zone*** (See above).

Element Name	Element Type	Card-inality	Comment
Id	*TariffZoneIdType*	0:1	Unique Identifier of ***TariffZone.***
		::>	***TariffZone*** is a subtype of ***Zone.***

Table 96 — TariffZone elements

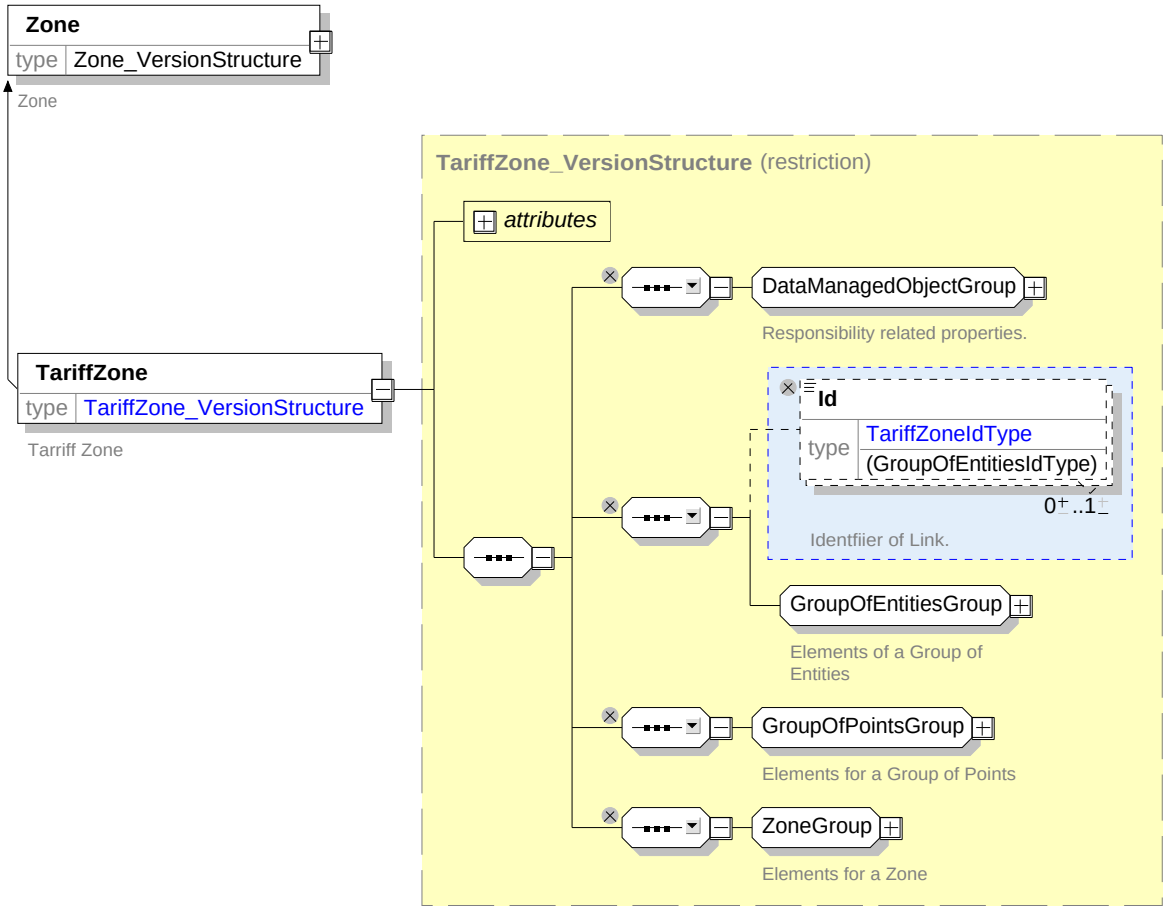


Figure 77 — TariffZone XSD

9 REUSABLE ELEMENTS

9.1 AvailabilityCondition – elements

AvailabilityCondition specifies the time related Validity of an element.
➔Not used in detail for NaPTAN-X

Element Name	Element Type	Card-inality	Comment
Id	*Availability-ConditionIdType*	0:1	Unique Identifier of ***AvailabilityCondition.***
			AvailabilityCondition is a subtype of ***ValidityCondition***– see Framework
FromDate	*TypeOfProjectionRef*	0:1	StartDate for ***AvailabilityCondition.***
ToDate	*MultilingualString*	0:1	EndDate for ***AvailabilityCondition.***

dayTypes	*DayType | DayTypeRef*	0:*	***DayTypes*** for ***AvailabilityCondition***.
timeBands	*TimeBand | TimeBand Ref*	0:*	***Timebands*** for ***AvailabilityCondition***.

Table 97 — AvailabilityCondition elements

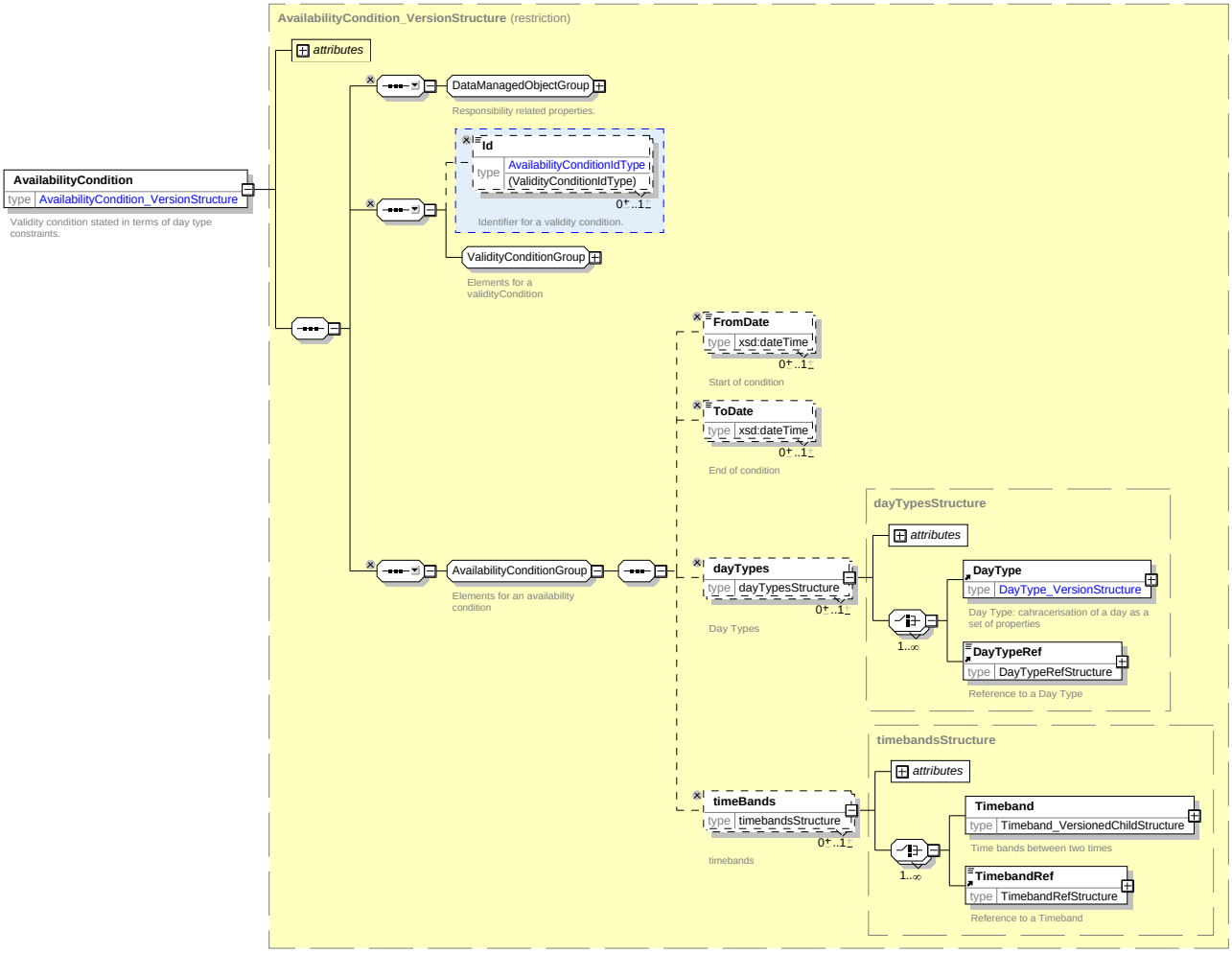


Figure 78 — AvailabilityCondition XSD

9.2 Place

9.2.1 Place – abstract element

Place specifies a named two dimensional area. It is a type of ***Zone*** (See above).

Element Name	Element Type	Card-inality	Comment
Id	*PlaceIdType*	0:1	Unique Identifier of ***Place***.

		::>	***Place*** is a subtype of ***Zone*** See Framework
placeTypes	*TypeOfPointRef*	0:*	Type of ***Place***.

Table 98 — Place elements

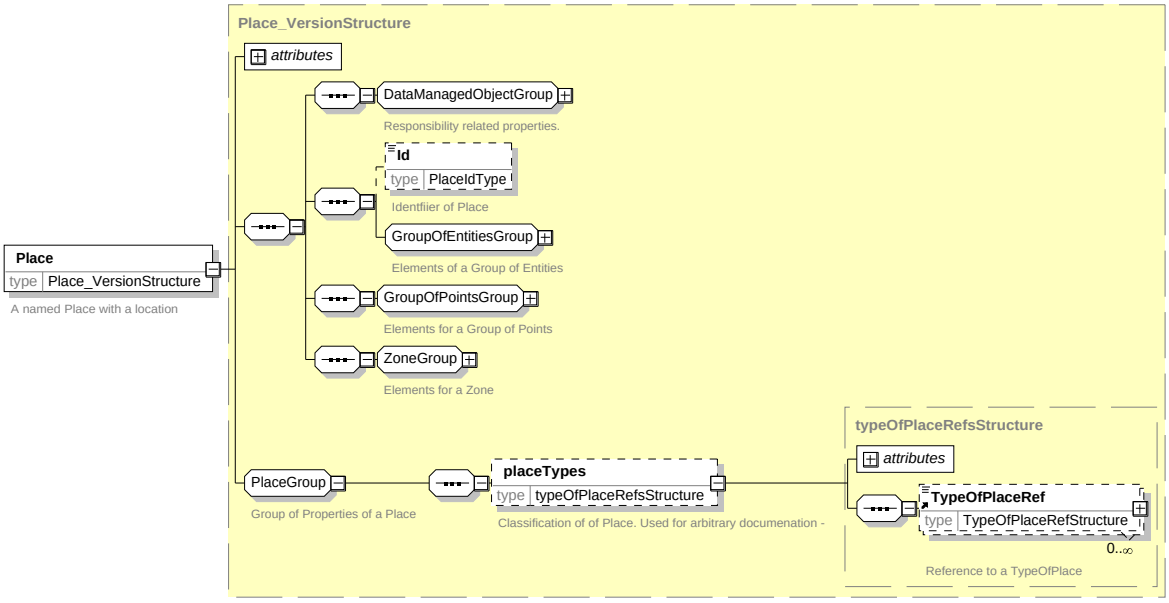


Figure 79 — Place XSD

9.2.2 TopographicPlace – element

TopographicPlace specifies a named place that is a gazetteer entry, such as a city, town, suburb, hamlet, county region etc.

Element Name	Element Type	Card-inality	Comment
Id	*TopographicPlace-IdType*	0:1	Unique Identifier of ***TopographicPlace***.
		::>	***TopographicPlace*** is a subtype of ***Place.***
IsoCode	*IsoDIvisionType*	0:1	ISO code for subdivision of country.
Descriptor	***Descriptor***	0:1	Name of ***TopographicPlace***
AlternativeName	*TypeOfPointRef*	0:*	Alternative names for ***TopographicPlace***.
TopographicPlaceType	*Enumeration*	0:1	Type of ***TopographicPlace***
PlaceCentre	*xsd:boolean*	0:1	Whether ***TopographicPlace*** is considered to be the town or city centre.
CountryRef		0:1	Country Name
ParentTopographic-PlaceRef	*TopographicPlaceRef*	0:1	

adjacentPlaceRefs	*TopographicPlaceRef*	0:*	Reference to adjacent places
accesses	*Access*	0:*	Type of ***Place***.

Table 99 — TopographicPlace elements

Value	Description
province	Province
region	Region
area	Area
connurbation	Connurbation other than City, Town etc
city	City
quarter	Quarter
suburb"	Suburb"
town"	Town"
district	District
parish	Parish
village	Village
hamlet	Hamlet
urbanCentre	Urban centre
placeOfInterest	Place of interest
other	Other
unrecorded	Unrecorded

Table 100 — TopographicPlaceType: allowed values

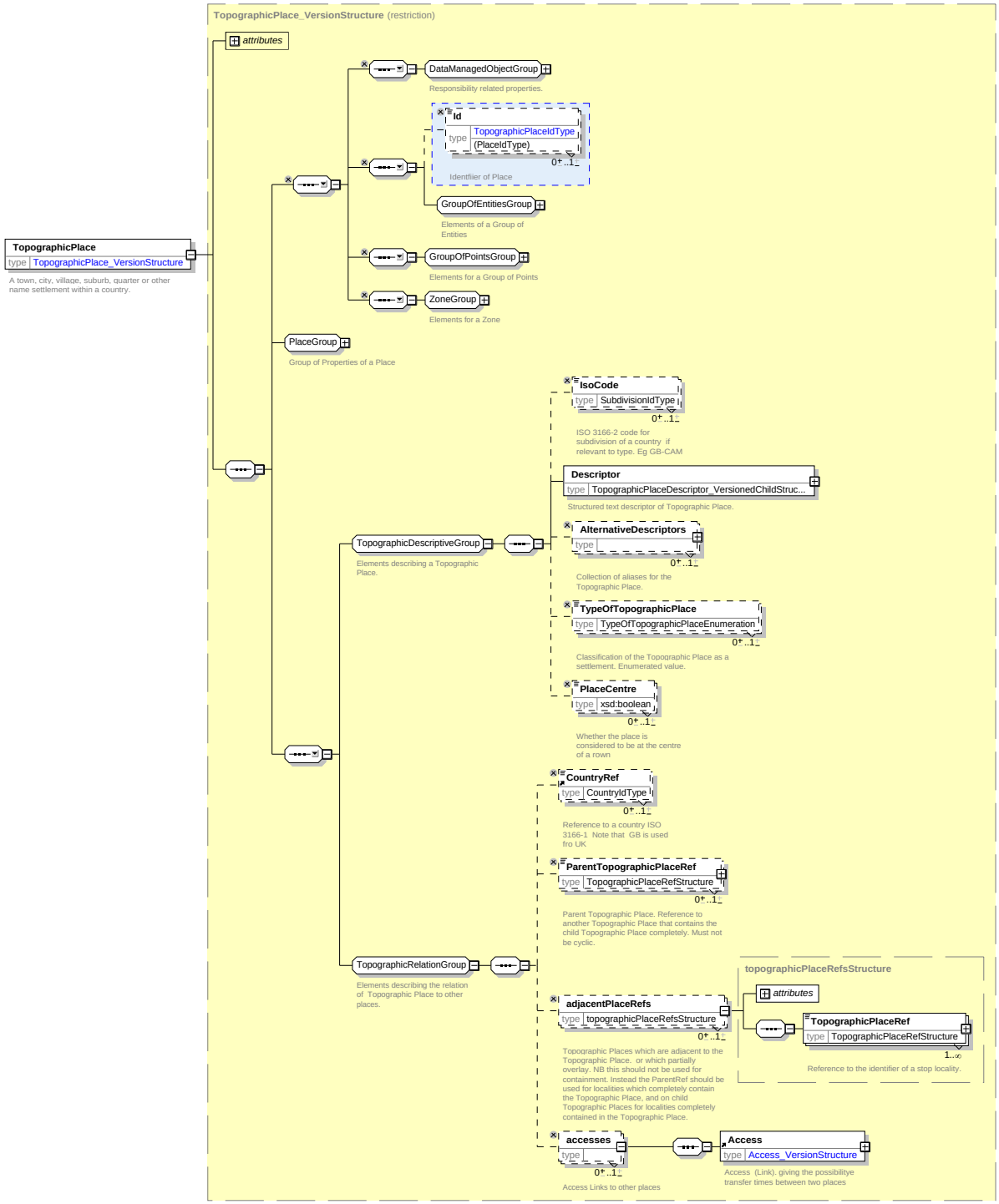


Figure 80 — TopographicPlace XSD

9.2.3 Transfer - abstract element

Transfer specifies a link between two ***Places***, with timings.

Element Name	Element Type	Card-inality	Comment
Id	*TransferIdType*	0:1	Unique Identifier of ***Transfer***.

		::>	***Transfer*** is a subtype of ***DataManagedObject*** See Framework.
Name	*MultilingualString*	1:1	Name of ***Transfer.***
TypeOfTransferRef	*TypeOfTransferRef*	1:1	Reference to a ***TypeOfTransfer*** value.
Description	*Description*	1:1	Further description of ***Transfer.***
validityConditions	*ValidityCondition*	0:*	Type of ***Transfer***.
Distance	*Distance*	0:1	Distance of ***Transfer.***
TransferDuration	*TransferDuration*	0:1	Times take to make transfer – see below.
WalkTransferDuration	*WalkTransferDuration*	0:1	Times take to walk ***Transfer*** if different from ***TransferDuration*** – see below.
BothWays	*BothWays*	0:1	Whether the ***Transfer*** can be made in both directions.

Table 101 — Transfer elements

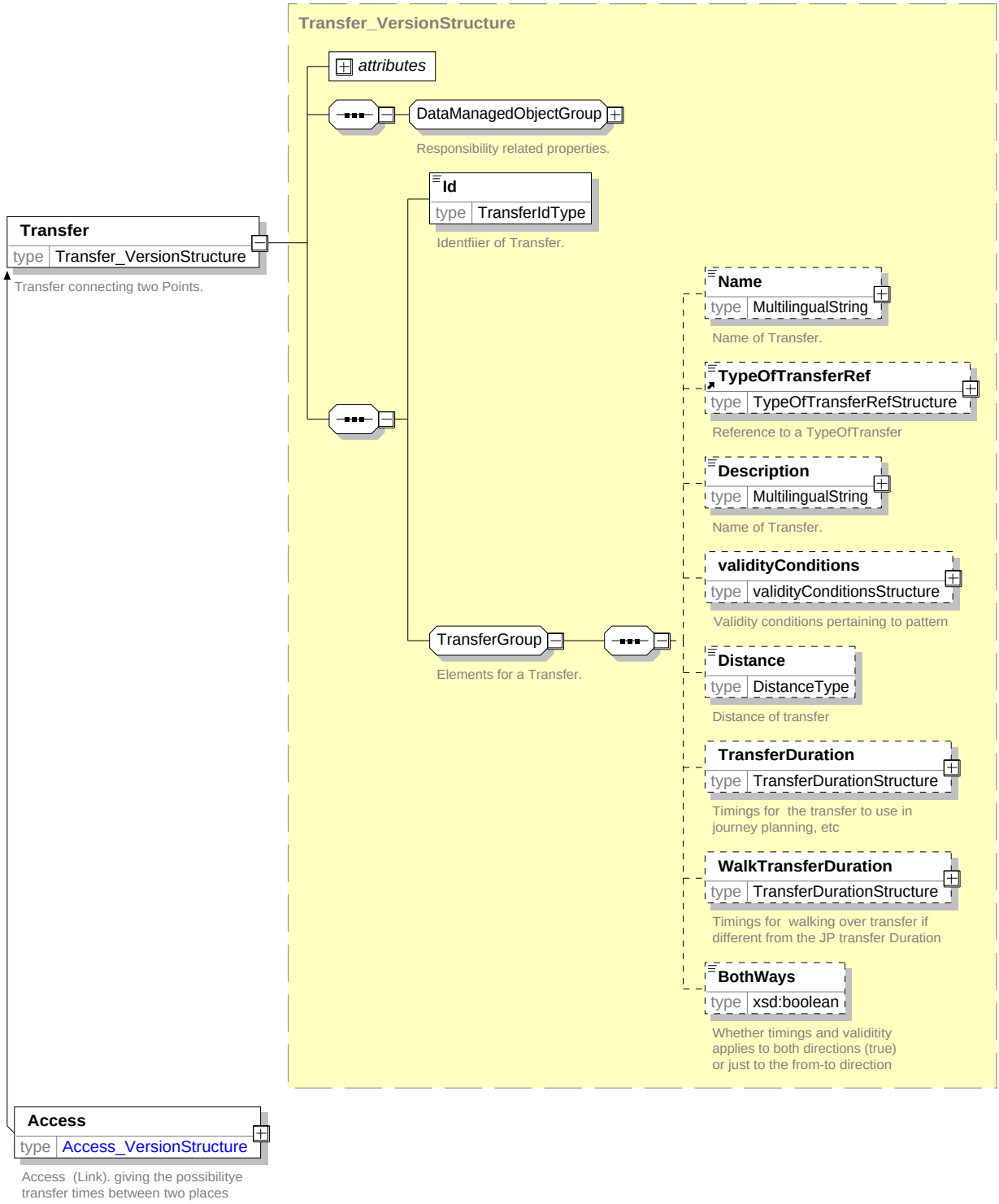


Figure 81 — Transfer XSD

9.2.3.1TransferDuration - element

TransferDuration specifies the times to move between two Places.

Element Name	Element Type	Card-inality	Comment
DefaultDuration	*xsd:duration*	0:1	Time take to make transfer by default.
FrequentTraveller-Duration	*xsd:duration*	0:1	Time take to make transfer by frequent Traveller.
OccasionalTraveller-Duration	*xsd:duration*	0:1	Time take to make transfer by occasional Traveller.
MobilityRestricted-TravellerDuration	*xsd:duration*	0:1	Time take to make transfer by mobility restricted Traveller.

Table 102 — TransferDuration elements

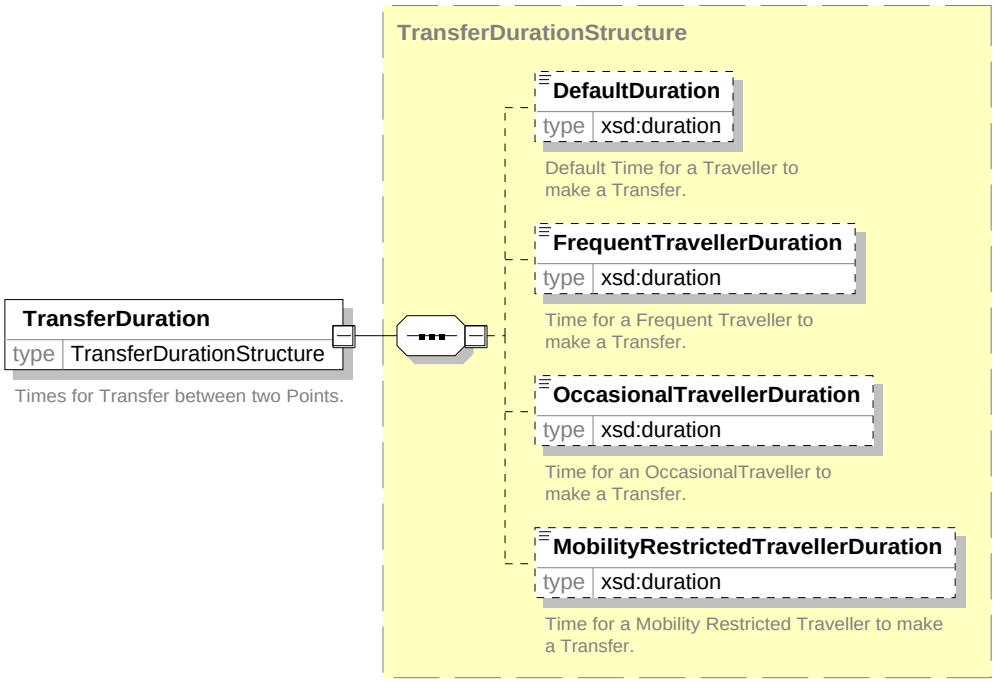


Figure 82 — TransferDuration XSD

9.2.4 Access - element

Access specifies a link between two Places, with timings

Element Name	Element Type	Card-inality	Comment
Id	*AccessIdType*	0:1	Unique Identifier of ***Access*** link.
		::>	***Access*** is a subtype of ***Transfer*** See Framework.
Name	*MultilingualString*	1:1	Name of ***Access*** link***.***

From	*AccessLinkEnd*	1:1	Origin end of ***Access*** link.
To	*AccessLinkEnd*	1:1	Origin end of ***Access*** link.

Table 103 — Access elements

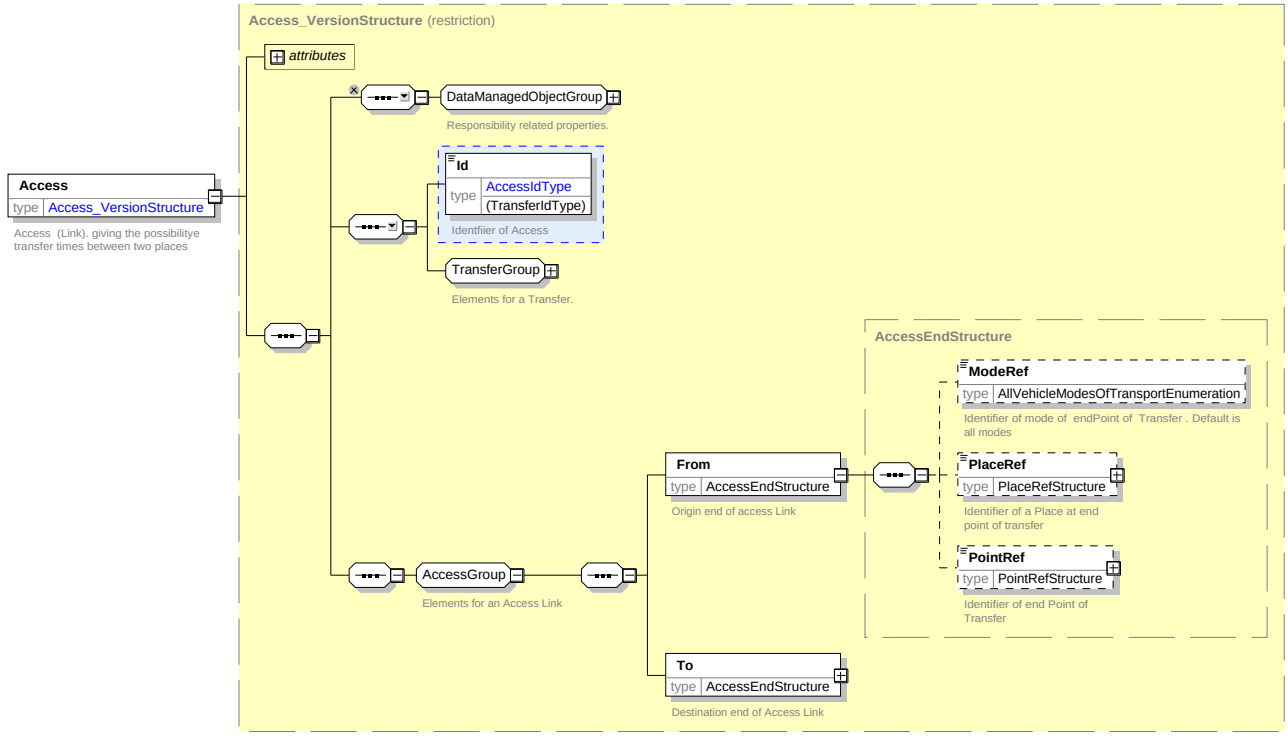


Figure 83 — Access XSD

9.2.4.1AccessLinkEnd – element

AccessLinkEnd specifies the properties of one end of an ***Access*** link***.***

Element Name	Element Type	Card-inality	Comment
ModeRef	*ModeRef*	0:1	***Mode for Access Link***.
PlaceRef	*PlaceRef*	0:1	***Place*** to which ***Access*** link connects.
PointRef	*PointRef*	0:1	***Point*** to which ***Access*** link connects.

Table 104 — AccessLinkEnd elements

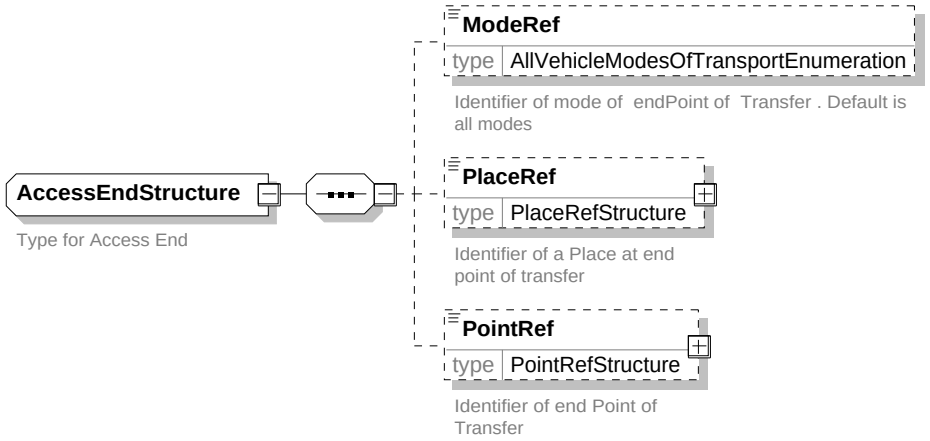


Figure 84 — AccessLinkEnd XSD

9.3 Organisation

9.3.1 Organisation - abstract element

Organisation specifies a named legal entity that undertakes transport related activities. It is a type of ***DataManagedObject*** (See above).

Element Name	Element Type	Card-inality	Comment
Id	*OrganisationIdType*	0:1	Unique Identifier of ***Organisation.***
		::>	***Organisation*** is a subtype of ***DataManagedObject.***
OrganisationGroup	*OrganisationGroup*	1:1	Elements in ***Organisation***.

Table 105 — Organisation elements

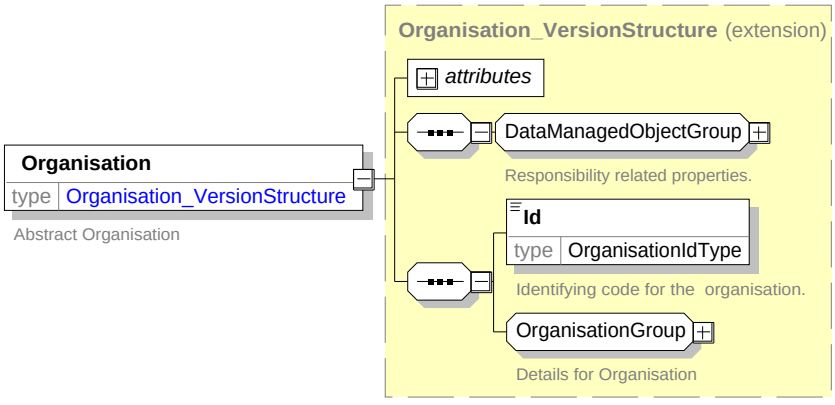


Figure 85 — Organisation XSD

9.3.1.1OrganisationGroup - group

OrganisationGroup specifies the properties of an ***Organisation***.

Group	Element Name	Element Type	Card-inality	Comment
--	***PrivateCode***	*xsd:normalizedString*	0:1	Alternative Identifier of ***Organisation***
Organis-ation-NameGroup	***Name***	*MultilingualString*	0:1	Name of Organisation.
	ShortName	*MultilingualString*	0:1	Short Name of ***Organisation***.
	LegalName	*MultilingualString*	0:1	Legal Name of ***Organisation***.
	TradingName	*MultilingualString*	0:1	Trading Name of ***Organisation***.
Organi-sation-Properties-Group	***Description***	*MultilingualString*	0:1	Description of ***Organisation***.
	Remarks	*MultilingualString*	0:1	Remarks about ***Organisation***.
	Locale	*Locale*	0:1	***Organisation*** locale.
	ContactDetails	*ContactDetails*	0	Contact details for public use.
	PrivateContact-Details	*ContactDetails*	0	Contact details for private use.
	OrganisationType	*Enum*	0	Classification of ***Organisation***.
	TypeOf-OrganisationRef	*TypeOfOrganisation-Ref*	0:1	Reference to a parent zone of which the zone is part.
--	***Status***	*TypeOfPointRef*	0:*	Status of ***Organisation***.
--	***validityPeriod***	*DateRange*	0:1	Start & End date of validity period for ***Organisation***.
--	***parts***	*OrganisationPart*	0:*	PartOfOrganisation.

Table 106 — OrganisationGroup elements

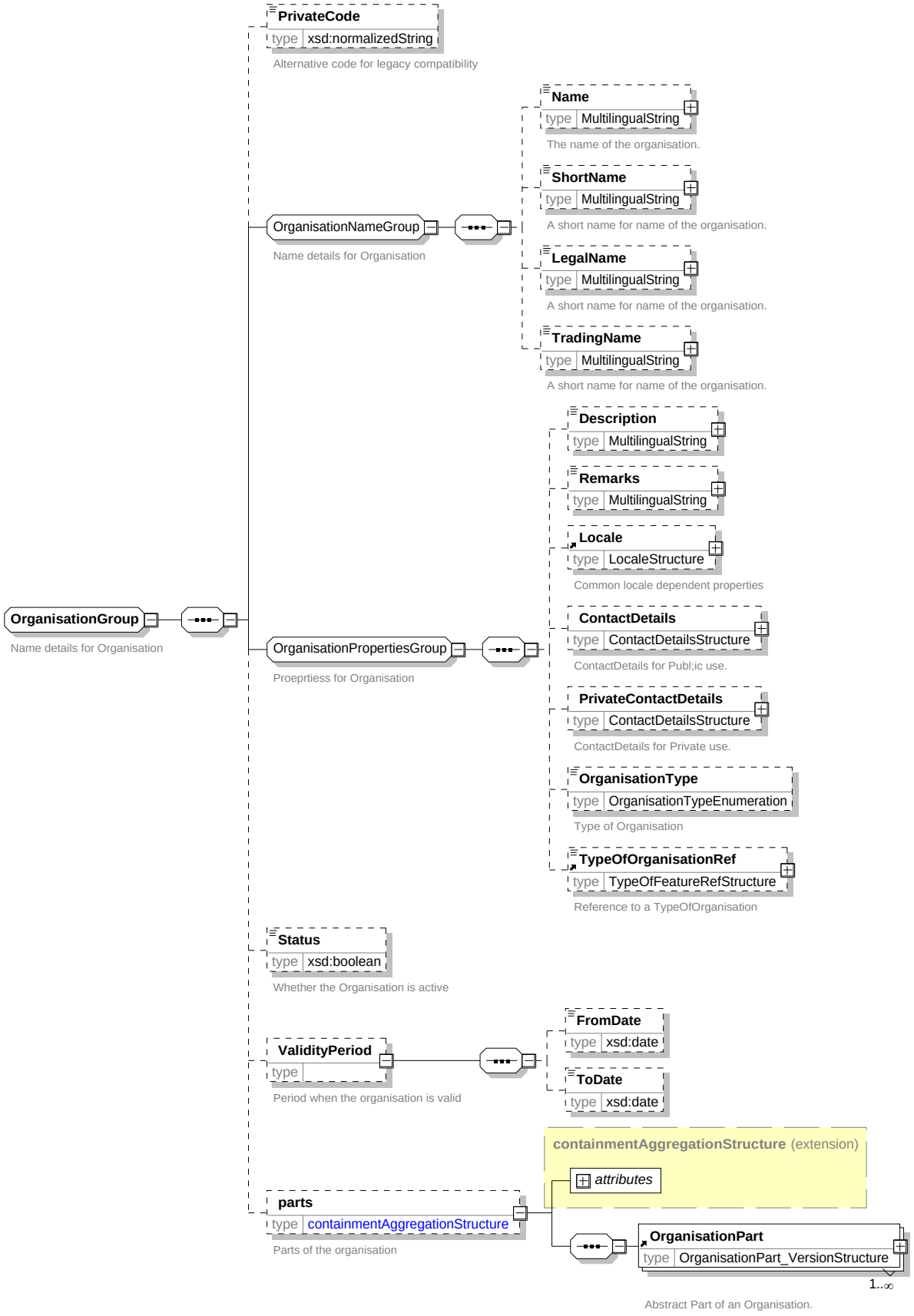


Figure 86 — OrganisationGroup XSD

9.3.1.2Locale - element

Location specifies attributes to do with a locale.

Element Name	Element Type	Card-inality	Comment
TimeZoneOffset	*TimeZoneOffsetType*	0:1	Offset of time zone from GMT.
TimeZone	*xsd:normalizedString*	0:1	Name of time zone
DefaultLanguage	*Xsd:lang*	0:1	ISO language code.
languages	*LanguageUsage*	0:1*	Language & Usage.

Table 107 — Locale elements

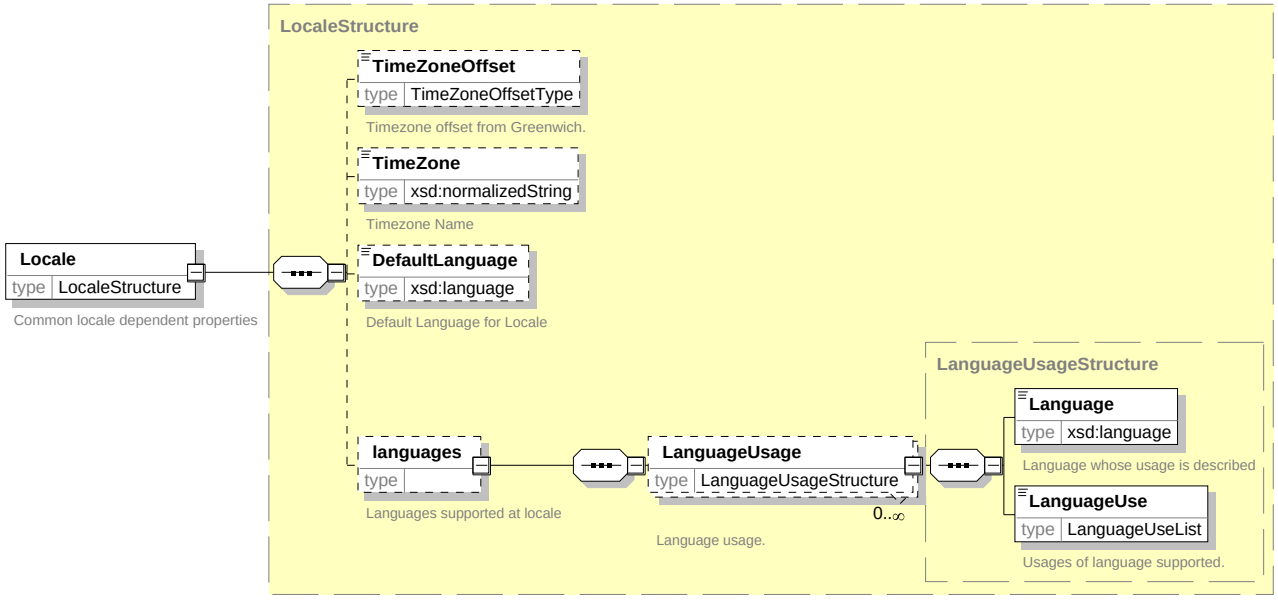


Figure 87 — Locale XSD

9.3.1.3ContactDetails - element

ContactDetails specifies attributes about a contact.

Element Name	Element Type	Card-inality	Comment
ContactPerson	*xsd:normalizedString*	0:1	Name of contact person.
EmailAddress	*emailAddressType*	0:1	Email of contact.
ContactPhone	*xsd:lang*	0:1	Phone Number of contact person.
WebSite	*xsd:anyUri*	0:1*	Web site.
FurtherDetails	*MultilingualString*	0:1*	Further details.

Table 108 — ContactDetails elements

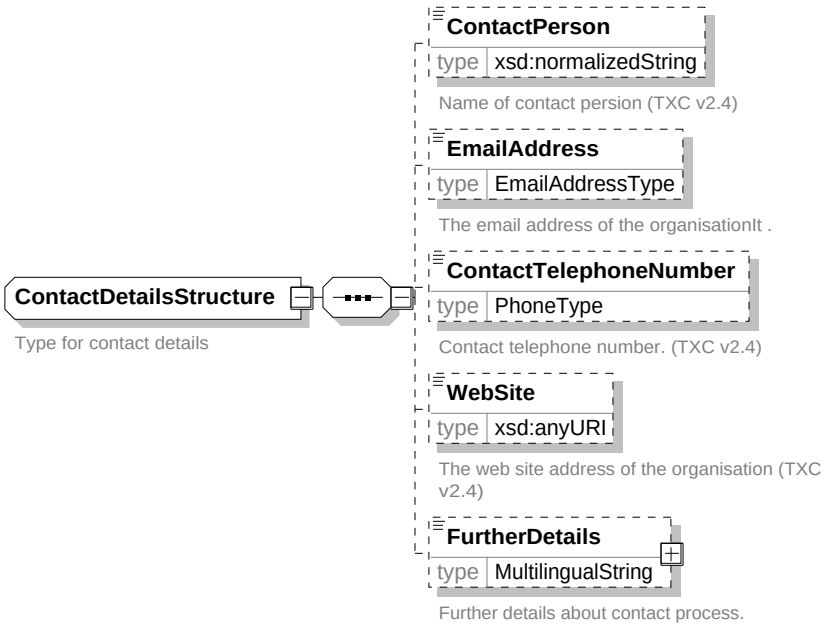


Figure 88 — ContactDetails XSD

9.3.2 Operator – element

Operator specifies a named legal entity that runs transport It is a type of ***Organisation*** (See above).

Element Name	Element Type	Card-inality	Comment
Id	*OperatorIdType*	0:1	Unique Identifier of ***Operator***.
		::>	***Operator*** is a subtype of ***DataManagedObject.***
Address	*PostalAddress*	0:1	Postal Address of ***Operator***.
operatorType	*TypeOfOrganisation-Ref*	0:*	Reference to a type of ***Operator***.
departments	*DepartmentRef*	0:*	Departments of ***Operator***.

Table 109 — Operator elements

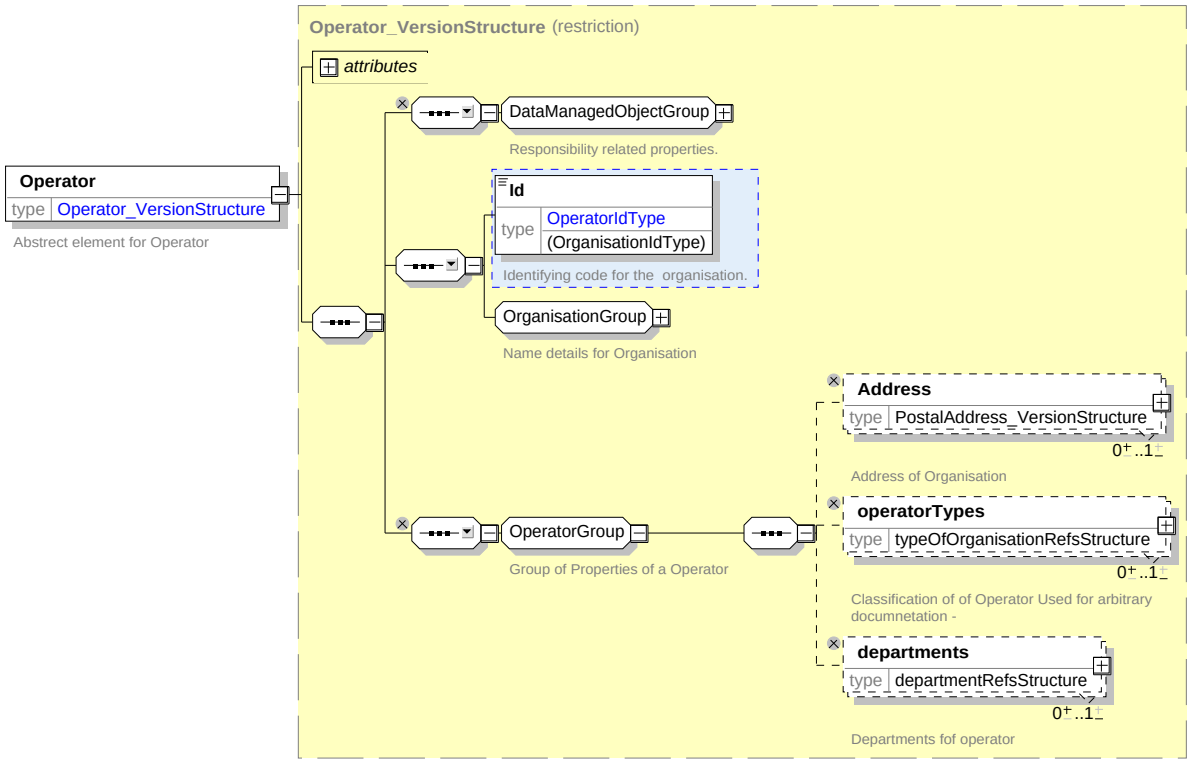


Figure 89 — Operator XSD

9.3.3 Department – element

Department specifies a unit within an ***Organisation*** (See above).

Element Name	Element Type	Card-inality	Comment
Id	*DepartmentIdType*	0:1	Unique Identifier of ***Department***.
		::>	***Department*** is a subtype of ***DataManagedObject.***
Name	*MultilingualString*	0:1	Name of ***Department***.
Location	*Location*	0:1	Location to use to show whereabouts of ***Department***. See Framework

Table 110 — Department elements

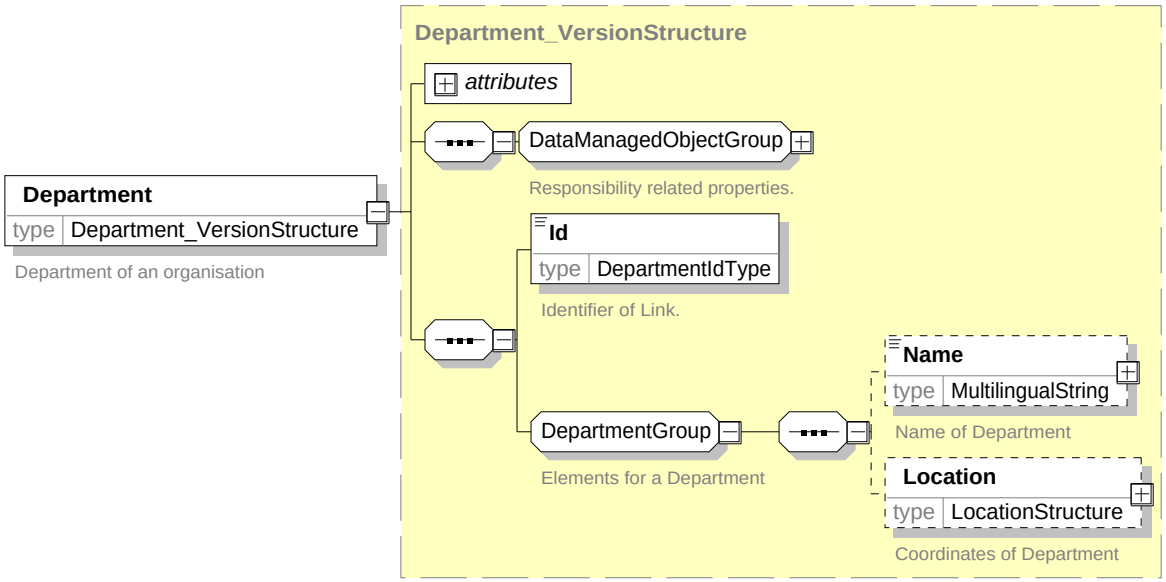


Figure 90 — Department XSD

9.4 Accessibility

9.4.1 AccessibilityAssessment – reusable element

AccessibilityAssessment specifies the accessibility properties of an entity. These may be specified in terms of the limitations on accessibility, or on the user needs that can be accommodated (Suitability)

Element Name	Element Type	Card-inality	Comment
Id	*Accessibility-AssesmentIdType*	0:1	Unique Identifier of ***AccessibilityAssessment***
		::>	***AccessibilityAssessment*** is a subtype of ***VersionedChild.***
MobilityImpaired-Access	*xsd:boolean*	1:1	Whether the element is considered accessible – summary assessment.
limitations	*AccessibilityLimitation*	0:*	One or more Limitations making up ***AccessibilityAssessment.***
suitabilities	*Suitability*	0:*	One or more ***Suitability*** instances making up ***AccessibilityAssessment.***

Table 111 — AccessibilityAssessment elements

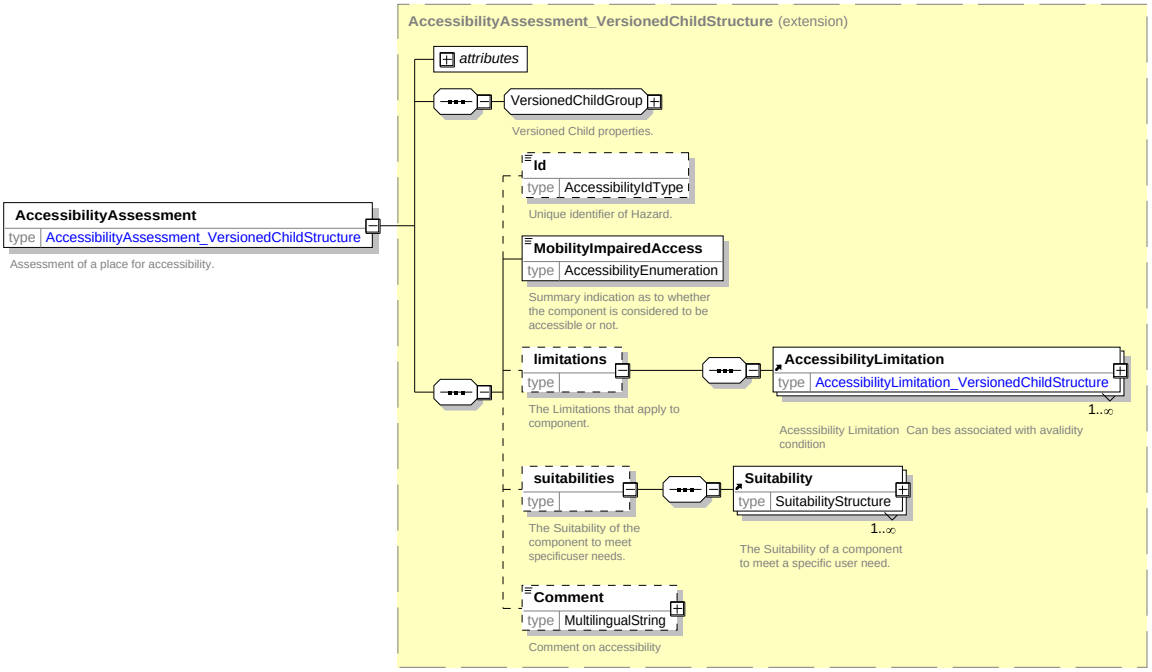


Figure 91 — AccessibilityAssessment XSD

9.4.2 AccessibilityLimitation– reusable element

AccessibilityLimitation specifies the specific limitations accessibility of a number of entities.

Element Name	Element Type	Cardinality	Comment
Id	*LimitationIdType*	0:1	Unique Identifier of ***AccessibilityLimitation***
		::>	***AccessibilityLimitation*** is a subtype of ***VersionedChild.***
ValidityCondition	*ValidityCondition*	1:1	When the ***AccessibilityLimitation*** applies.
WheelchairAccess	*true* | *false* | *unknown*	1:1	Whether the element is wheelchair accessible***.***
StepFreeAccess	*true* | *false* | *unknown*	0:1	Whether the element is accessible without use of steps.
EscalatorFreeAccess	*true* | *false* | *unknown*	0:1	Whether the element is accessible without use of escalators.
TravelatorFreeAccess	*true* | *false* | *unknown*	0:1	Whether the element is accessible without use of travelators.
AudibleSignsAvailable	*true* | *false* | *unknown*	0:1	Whether there are audible signs available***.***
VisualSignsAvailable	*true* | *false* | *unknown*	0:1	Whether there are visual signs available***.***

Table 112 — AccessibilityLimitation elements

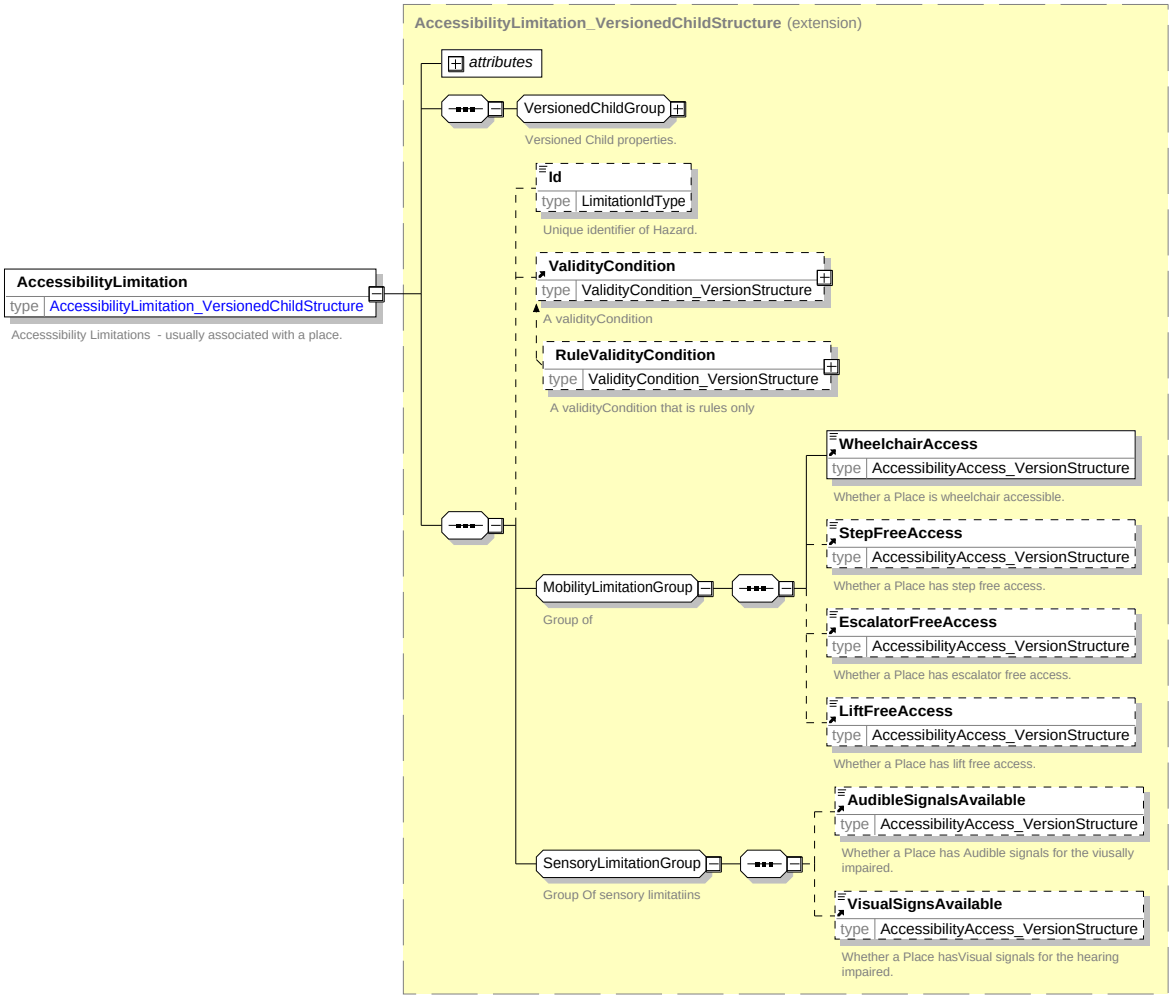


Figure 92 — AccessibilityLimitation XSD

9.5 Address

9.5.1 AddressPlaceGroup - group

AddressPlaceGroup describes an address and URL that can be associated with a ***Place*** entity.

	Element Name	Element Type	Cardinality	Comment
Address Group	***PostalAddress***	*PostalAddress*	0:1	Pedestrian Access modes for reaching element.
	RoadAddress	*RoadAddress*	0:1	Short name for entity.
	Url	*Url*	0:1	Qualifier to use on name when it needs to be distinguished.

Table 113 — AddressGroup elements

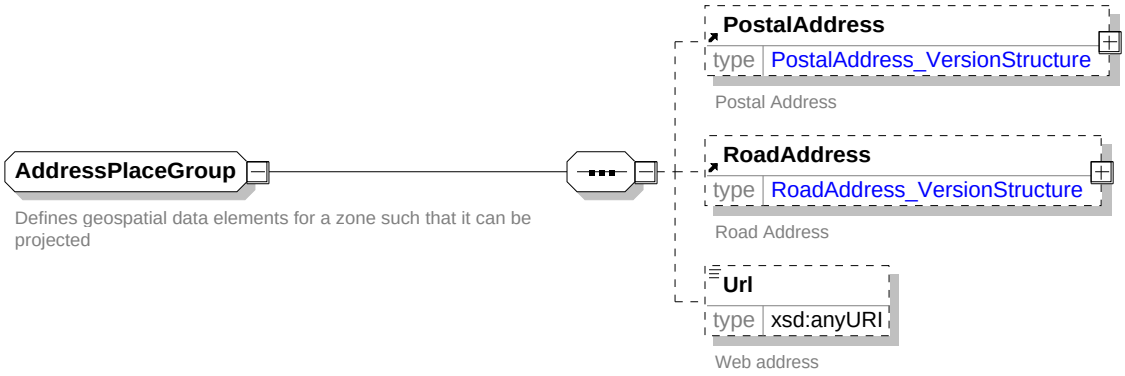


Figure 93 — AddressGroup XSD

9.5.2 PostalAddress – element

PostalAddress specifies a postal address that can be associated with an Entity.

Element Name	Element Type	Cardinality	Comment
Id	*PostalAddressIdType*	0:1	Unique Identifier of ***PostalAddress***.
		::>	***PostalAddress*** is a subtype of ***Address.***
CountryRef	*CountryRef*	0:1	Reference to GIS feature id for road.
HouseNumber	*MultilingualString*	0:1	House Number.
BuildingName	*MultilingualString*	0:1	Building Name.
AddressLine1	*MultilingualString*	0:1	Address line 1.
AddressLine1	*CompassBearing*	0:1	Address line 2.
Street	*MultilingualString*	0:1	Street Name.
Town	*MultilingualString*	0:1	Town Name.
Suburb	*MultilingualString*	0:1	Suburb name.
Postcode	*xsd:normalizedString*		Postcode of ***PostalAddress***.
Postcode extension	*xsd:normalizedString*		Postcode Extension of ***PostalAddress***.
PostalRegion	*xsd:normalizedString*		Postcode Region of ***PostalAddress***.

Table 114 — PostalAddress elements

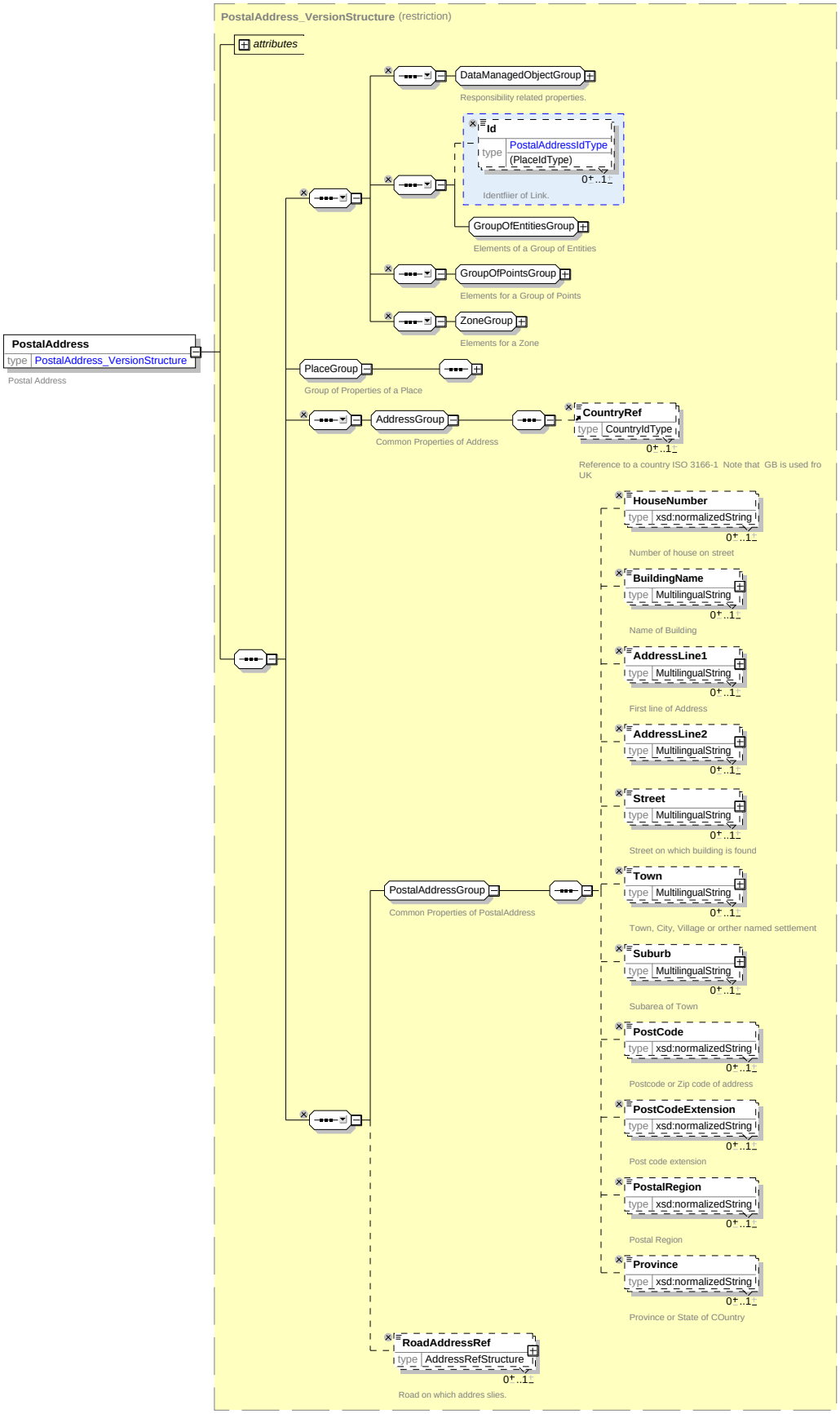


Figure 94 — PostalAddress XSD

9.5.3 RoadAddress – element

RoadAddress specifies the address of an Entity on a road (See above).

Element Name	Element Type	Cardinality	Comment
Id	*RoadAddressIdType*	0:1	Unique Identifier of ***RoadAddress***.
		::>	***RoadAddress*** is a subtype of ***Address.***
CountryRef	*CountryRef*	0:1	Reference to GIS feature id for road.
GISFeatureRef	*CountryRef*	0:1	Name of Department.
RoadNumber	*Location*	0:1	Number of road.
RoadName	*MultilingualString*	0:1	Name of road.
BearingCompass	*CompassBearing*	0:1	Approximate Bearing of road at address as Compass octant
BearingDegrees	*integer*	0:1	Bearing of road at address in degrees.
OddNumberRange	*RoadNumberRange*	0:1	House numbering along road – odd numbers.
EvenNumberRange	*RoadNumberRange*	0:1	House numbering along road – even numbers.

Table 115 — RoadAddress elements

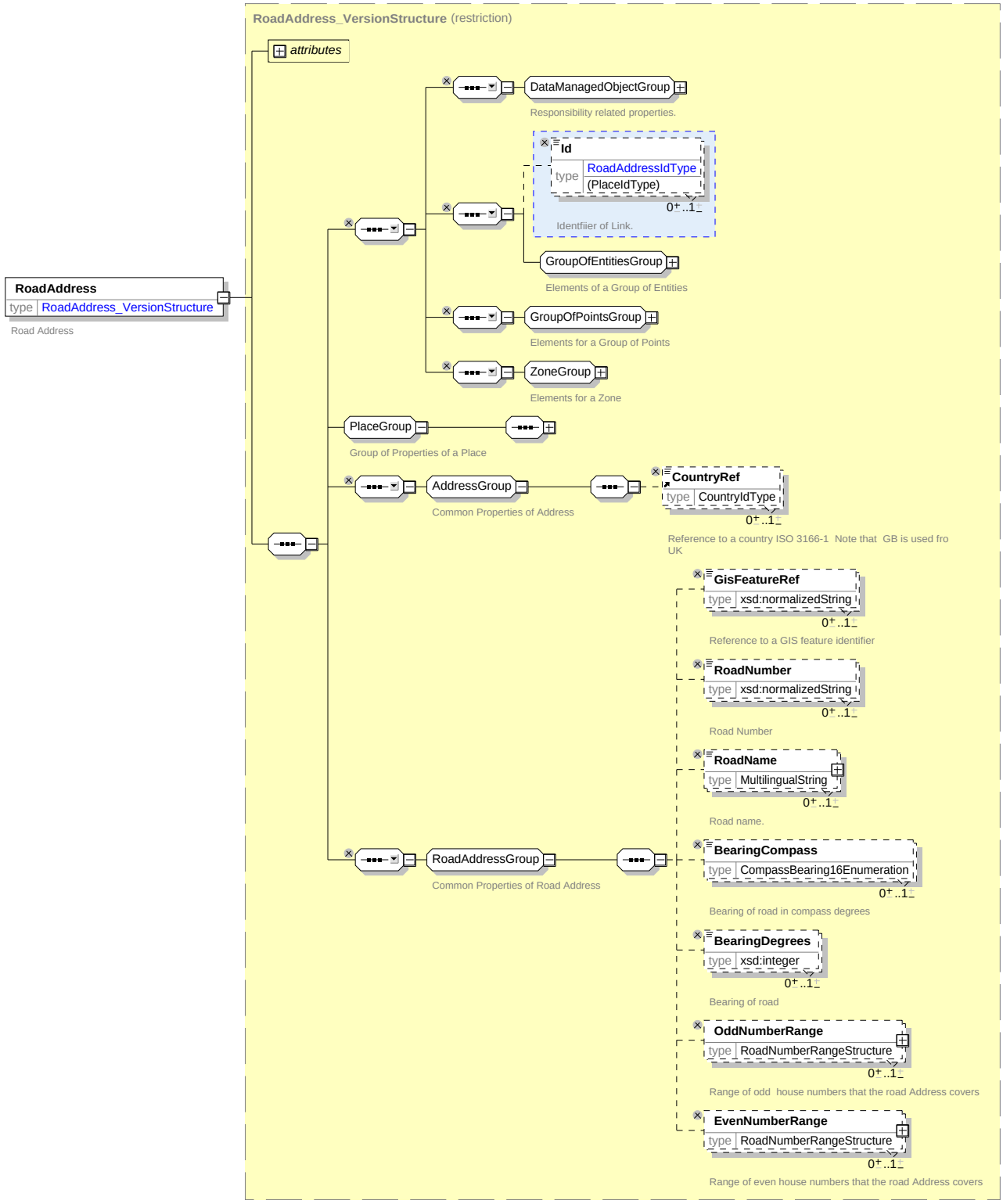


Figure 95 — RoadAddress XSD