PD CEN/TS 16614-6:2024



BSI Standards Publication

Public transport — Network and timetable exchange (NeTEx)

Part 6: European Passenger Information Accessibility Profile

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National foreword

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

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

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European foreword

This document (CEN/TS 16614-6:2024) has been prepared by Technical Committee CEN/TC 278 “Intelligent transport systems”, the secretariat of which is held by NEN.

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

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

This document presents Part 6 of the European Technical Specification known as “NeTEx”. NeTEx provides a framework for specifying communications and data exchange protocols for organisations wishing to exchange scheduled information relating to public transport operations.

This document is made up of six parts defining a single European Standard series, which provides a complete exchange format for public transport networks, timetable description and fare information:

— Part 1 is the description of the public transport network topology exchange format. It also contains use cases shared with part 2, modelling rules, and the description of a framework shared by all parts.

— Part 2 is the description of the scheduled timetables exchange format.

— Part 3 is the description of the fare information exchange format.

— Part 4 is the description of the European passenger information profile.

— Part 5 is the description of the alternative modes exchange format.

— Part 6 is the description of the European passenger information accessibility profile.

Part 1 is fully standalone, and Parts 2 and 3, 4, 5 and 6 rely on Part 1. Part 6 also relies on Part 4.

The XML schema can be downloaded from https://netex-cen.eu or from GitHub (https://github.com/NeTEx-CEN/NeTEx, either press code and download zip or use a defined tag), along with available guidance on its use, example XML files, and case studies of national and local deployments.

Transmodel terms and NeTEx conceptual model elements are written in capital letters, a journey pattern would be spelled as JOURNEY PATTERN.

The minimally recommended elements are printed in **bold** in the examples.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to announce this Technical Specification: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

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Introduction

Public transport services rely increasingly on information systems to ensure reliable, efficient operation and widely accessible, accurate passenger information. These systems are used for a range of specific purposes: setting schedules and timetables; managing vehicle fleets; issuing tickets and receipts; providing real-time information, and so on.

This document specifies a Profile of Network and Timetable Exchange (NeTEx) for public transport. NeTEx is intended to be used to exchange information between public transport organisation systems containing mostly scheduled public transport data. It can also be seen as a complement to the SIRI (Service Interface for Real-time Information) standard (the EN 15531 series), as SIRI needs reference data exchanged in the scope of NeTEx before any possible real-time exchange.

Well-defined, open interfaces have a crucial role in improving the economic and technical viability of public transport information systems of all kinds. Using standardized interfaces, systems can be implemented as discrete pluggable modules that can be chosen from a wide variety of suppliers in a competitive market, rather than as monolithic proprietary systems from a single supplier. Interfaces also allow the systematic automated testing of each functional module, vital for managing the complexity of increasingly large and dynamic systems. Furthermore, individual functional modules can be replaced or evolved, without unexpected breakages of obscurely dependent functions.

NeTEx improves a number of features of public transport information and service management:

- Interoperability – the standard will facilitate interoperability between information processing systems of the transport operators by:
  - → introducing common architectures for message exchange;
  - → introducing a modular set of compatible information services for real-time vehicle information;
  - → using common data models and schemas for the messages exchanged for each service;
  - → introducing a consistent approach to data management.
- Technical advantages include the following: reusing a common communication layer shared with SIRI for all the various technical services enables cost-effective implementations, and makes the standard readily extensible in the future.

A profile is an ancillary document to the standard which specifies additional rules for implementation in a given context. The profile contains information such as:

- Details of the objects used in an exchange.
- Details on the options proposed by the standard.
- Details on optional elements.
- Precision on the identifier codes to be used.
- Advice on grouping elements.

The reason for having a detailed profile specification is that it facilitates implementation. A developer intending to implement a certain service or type of service in a given environment need only implement the smaller set of options and parameters specified in the profile and is given a number of additional rules that restrict or simplify the required processing of data.

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1 Scope

This document is a profile of the CEN/TS 16614 series. It focuses on information relevant to feed the necessary accessibility passenger information services and excludes operational and fares information. It is based directly on EPIP (CEN/TS 16614-4).

This European Passenger Information Accessibility Profile (EPIAP) for NeTEx is for exchanging passenger information; it describes how to extend EPIP (the European Passenger Information Profile) with additional information (including a minimal set) to feed the necessary accessibility passenger information services in a European wide and multimodal context. EPIAP especially formulates a mandatory minimal implementation that needs to be filled in by everybody to deliver the necessary information for an assessment of the accessibility of site(s), vehicles and on vehicle-site interaction for impaired persons. The minimal level allows an assessment and contains the information to produce PRM TSI if necessary. It will also cover what the current legislation usually warrants. It then describes how additional information must be provided if an organisation decides to provide it (e.g. the information of the full DELFI+ standard in Germany).

EPIP does not reflect part 5 (New Modes) yet. However, EPIAP takes it into account. EPIP will have to be adapted accordingly.

For EPIAP to be of use, the EC needs to declare the minimal level of EPIAP as mandatory.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 12896-1, *Public transport — Reference data model — Part 1: Common concepts*

EN 12896-4, *Public transport — Reference data model — Part 4: Operations monitoring and control*

EN 12896-5, *Public transport — Reference data model — Part 5: Fare management*

EN 12896-6, *Public transport — Reference data model — Part 6: Passenger information*

EN 12896-7, *Public transport — Reference data model — Part 7: Driver management*

EN 12896-8, *Public transport — Reference data model — Part 8: Management information & statistics*

CEN/TS 16614-1, *Public transport — Network and Timetable Exchange (NeTEx) — Part 1: Public transport network topology exchange format*

CEN/TS 16614-2, *Public transport — Network and Timetable Exchange (NeTEx) — Part 2: Public transport scheduled timetables exchange format*

CEN/TS 16614-3, *Public transport — Network and Timetable Exchange (NeTEx) — Part 3: Public transport fares exchange format*

CEN/TS 16614-4, *Public transport — Network and Timetable Exchange (NeTEx) — Part 4: Passenger Information European Profile*

CEN/TS 16614-5, *Public transport — Network and timetable exchange (NeTEx) — Part 5: Alternative modes exchange format*

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3 Terms and definitions

For the purposes of this document, the terms and definitions given in the EN 12896 series (Transmodel V6) and the CEN/TS 16614 series (NeTEx) and the following apply.

3.1
attribute
property of an entity

3.2
conceptual data model
description of a real-world domain in terms of entities, relationships and attributes, in an implementation independent manner

Note 1 to entry: It should provide a structure on which the rest of the development of an application system can be based.

3.3
conformant
satisfying all the rules of a specification, both syntactic and otherwise

3.4
consumer
system that imports profile conformant data

3.5
data model
description of a real-world domain in terms of data and relationships

3.6
data provider
organisation responsible for providing data

Note 1 to entry: This may be distinct from that of the data source or the producer.

3.7
dominant validity condition
validity condition that attaches to a version frame and applies to all its contents

3.8
entity
object (data) that has its own existence (as opposed to an attribute)

3.9
external reference
reference to another object in a document other than the document holding the reference

3.10
fare management
all activities related to the travel products and their tariffication

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3.11
functional area
arbitrarily defined set of activities, used, in this document, to define the objectives and limits of the data model and exchange profile

3.12
internal reference
reference to another object in the same document as that holding the reference

3.13
interoperability
ability of (sub)systems to interact with other (sub)systems according to a set of predefined rules (interface)

3.14
object-oriented data model
data structure expressed according to principles that allow for a direct implementation as an object-oriented database, where information is represented in the form of objects, i.e., respecting the principle of encapsulation, meaning in particular that each data is accessed or modified through operations (methods) belonging to it

3.15
passenger information
all activities related to informing the users either about the planned or about the actual transportation services

3.16
producer
system that outputs data intended to be conformant to a profile

3.17
profile
subset of a standard selecting the needed concepts (entities and associated attributes) for a specific use case or set of use cases, and complemented by rules defined to restrict possibilities of divergent interpretations of open parts of the standard

3.18
profile code value
metadata used to describe a profile, a standardised code value, unique with the namespace of the profile, that helps define the profile

3.19
profile metadata
data describing the properties of a profile, such as the permitted frame types and restricted code values

3.20
specific frame
version frame that may only contain certain types entities concerned with a particular functional area, e.g. to describe a timetable

3.21
strict conformance
conformance to a profile such that a document contains only the specified elements (i.e. that is not augmented or extended)

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3.22
XML document
file containing data marked up with XML tags conforming exactly to an XML schema that specifies precise syntactic rules for the names, nesting and cardinalities of the tags and for the formats of the data values

4 Abbreviations

CCAM	Cooperative, Connected and Automated Mobility
CEN	Comité Européen de Normalisation (European Committee for Standardization)
CEN/TC	CEN Technical Committee
CEN/TS	CEN Technical Specification
CENELEC	European Committee for Electrotechnical Standardization
DELFI	Durchgängige ELektronische FahrgastInformation
EN	European Norm
EPIAP	European Passenger Information Accessibility Profile for NeTEx
EPIP	European Passenger Information Profile for NeTEx
ERA	EU Agency for Railways
EU	European Union
HRDF	Hafas Raw Data Format
IFOPT	Identification of Fixed Objects in Public Transport – DEPRECATED AND REPLACED BY TRANSMODEL FROM VERSION 6
ISO	International Organization for Standardization
ITS	Intelligent Transport Systems
MaaS	Mobility as a Service
NEN	NEderlandse Norm (Dutch Norm)
NeTEx	Network and Timetable Exchange
OJP	Open Journey Planner
OSM	Open Street Map
PRM	Persons with Reduced Mobility
PT	Public Transport
PTO	Public Transport Operator
PT1711	(a CEN Technical Specification for alternative modes of PT)
SIRI	Service Interface for Real-time Information
Transmodel	Public Transport Reference Data Model (EN 12896)
TSI	Technical Specification(s) for Interoperability
TSI TAP	TSI - Telematics applications for passenger services
PRM TSI	TSI - Persons with Reduced Mobility
PRM TSI IoA	PRM TSI Inventory of Assets
UML	Unified Modelling Language
XML	Extensible Markup Language
XSD	XML Schema Definition

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5 Use cases for accessibility

5.1 General

Finding out the level of accessibility during the entire passenger journey/ trip (i.e., along the trip chain) is a high priority. The presence of an “inaccessible" transfer within the travel chain can significantly reduce the accessibility of the entire journey. Planning and selection of individual stages within the journey need to be based on knowledge about the accessibility of individual transport services, as well as the physical transfer to subsequent transport services, from the departure of the passenger at the origin (i.e., residential area) to the destination (i.e., work/school or tourist destination).

At the pre-trip planning stage, the passenger will use a journey planner (also called trip planner) which will provide sufficient information for all the stages in the trip.

1. Procedures to access transport services
    a. Procedures to book and purchase transport services
    b. Procedures to book accessibility assistance services
    c. Information on passenger rights
    d. Information on services for persons with disabilities and reduced mobility
2. Information on transport stations/stops:
    a. Locations of destinations and transport stations/stops
    b. Accessibility of destinations and transport stations/stops
    c. Layout and location of facilities in transport stations (including emergency services)
    d. Accessibility of services within transport stations
3. Information on transport services:
    a. Travel and route options
    b. Accessibility of travel and route options (for each segment)
    c. Real-time transport schedules and disruptions
    d. Location and accessibility of platforms (also for specific locations on the platform)
    e. Ticket conditions and prices
    f. Integration with booking and purchasing of travel tickets or assistance services

5.2 During trip and on-trip usage

The existence of smartphone devices has made on-trip information services and planning based on them very common. Making and adjusting trip plans “on-the-go" no longer requires past experience or requests for information from attendants. Since smartphones are often equipped with location services, the trip can be planned from the current position of the passenger to the destination of choice. Travel Information systems can also provide information on real-time disruptions:

- Information on transport services:
    - Real-time provision of transport schedules and disruptions
    - Support route planning in case of disruptions (similar to information and booking/purchase in the pre-trip stage)
- Personal navigation
    - Real-time navigation instructions, including current location (towards destinations, next platform or accessibility services)

Data supplied in the NeTEx EPIP format forms the basis for enabling both the pre-trip and on-trip functionalities. This profile describes an unambiguous interpretation of accessibility based on EPIP.

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Collecting detailed data from stations and stops to meet the information needs of travellers with disabilities requires a substantial effort. The starting point with regard to available data differs greatly between the different Member States. NeTEx offers a framework to collect data at different levels of detail. This concept is also used in EPIAP, which gives an entry-level for all Member States to include accessibility in travel information.

Until both infrastructure and vehicles are accessible without restrictions, appropriate information services can and must make an important contribution to enable or facilitate the use of public transport for people with reduced mobility and the elderly. This will be more successful as all information relevant to the passenger can be made generally accessible in high quality.

Passengers with reduced mobility is a collective name for different user groups. Each of these user groups has different needs for a journey to be accessible. to describe inputs for a journey planner that may to be taken in to account when seeking journeys. For example, an assisted wheelchair could use a route that involved a single step and the use of doors. An unassisted wheelchair would not. A path between an entrance and a stop that is accessible for a person in a wheelchair might not be suitable for a visually impaired person.

5.3 User groups

The following assumptions apply to the user groups.

- There are different types of disability: physical, sensory and cognitive:
    - Physically impaired people mainly have special requirements regarding obstacles and hindrances on their way (e.g., wheelchair accessibility).
    - Sensory impaired people mainly have special requirements to be able to find their way, in particular by relying on additional sensory information (e.g., tactile guidance, colored steps, audible signals).
    - Cognitively impaired people mainly have special requirements for easy access to information and easy to understand information and guidance (e.g., how to change trains).
- Within the disability types there are different user groups with different needs.
- There are overlaps between the needs of user groups.
- Improved accessibility services in transportation in most cases benefit everyone.

User needs and user stories can always be assigned to a user group. The following table shows the user groups within their type of disability and a selection of relevant needs for this particular user group.

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Table 1 – User groups with special needs in public transport

Type	User group	Relevant needs (selection)
physical		
	Person in a wheelchair	Wheelchair accessible routes (paths, ramp, elevator, automatic doors), accessible stops, accessible vehicles
	Person in a wheelchair (motorised)	Wheelchair accessible routes (paths, ramp, elevator, automatic doors), accessible stops, accessible vehicles, entrance restrictions
	Person in a wheelchair with assistance	Stair-free routes (paths with or without single steps, ramp, elevator), accessible stops, low floor vehicles
	Person with walking disability (with aids like rollator)	Step free routes (paths, ramp, elevator), accessible stops, low floor vehicles, seating
	Person with walking disability, elderly, illness	Step free routes (paths, ramp, elevator), low floor vehicles, seating
	Temporary impaired Person (stroller, baggage)	Step free routes (paths, ramp, elevator), low floor vehicles, storage
sensory		
	Visually impaired person	Surfaces, Braille, audio announcements, lighting
	Hearing impaired person	Visual information
	Balance impaired person	Handrails and grabrails
cognitive		
	Mentally impaired person	Special drivers' trainings
	Intellectually impaired person	Special drivers' trainings, easy understandable information, easy ticketing

5.4 Use cases

5.4.1 General

For the profile no additional use cases have been created. Instead, existing use cases have been complemented to include accessibility aspect. Two sources were considered: NeTEx part 1 and the EU regulation (see Annex B).

5.4.2 Use cases from NeTEx part 1

The following relevant use cases have been taken from NeTEx part 1 and complemented with accessibility aspects in this profile.

Use Case: NETWORK-001-002(#1)	
Name	Planning and understanding the coverage of an area or region by public transport
Source	Transmodel
Description	In order to plan the adequate accessibility on the PT service within a region, a detailed model of actual coverage is needed.
NeTEx contribution	NeTEx allows for describing the availability and accessibility of stop places and stop points as well as the PT service offer within a region.

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Use Case: NETWORK-001-002(#1)	
Main actors	Urban development departments, authorities.
Main objects	Stop places, stop points, accessibility attributes.

Use Case: PASSENGER-001-014 (#2)	
Name	Planning trips through the network, including detailed transfer times and detailed guidance for making an interchange between two services over a connection/interchange.
Source	Transmodel
Description	In planning a multi-leg trip plan through a network, a trip planning system will take into account the transfer time needed to interchange between services at an interchange point. Depending on the sophistication of the journey planning system and the availability of data, the individual timings required for transfers between different stop areas or stop points within an interchange may be taken into account or just an average time for any transfer at the station may be used. In particular, in the case of frequency based services enough information about the service frequency shall be provided to the journey planning system in order to allow for sufficient waiting time. Trips may be made by passengers on foot, on a bicycle, in a car or using a combination, for example park and ride or kiss and ride. The stop model should support journey planning of intermodal journeys. Journey planners providing trip plans for trips involving the traversal of large interchanges will be concerned to provide detailed guidance on the navigation of the interchanges, typically as step by step instructions that can be related to the signage found within the interchange building. Depending on the sophistication of the journey planning system and the availability of data, the individual paths required for transfers between different stop areas or stop points within an interchange using specifically identified navigation paths and accessibility needs may be given.
NeTEx contribution	Journeys for NeTEx part 2 Connection and interchange times are part of NeTEx part 1. NeTEx only supports guidance information if it is inside a Stop place (not on the road network, etc.) The link of Stop Places (or components) to the road has to be taken into account Guidance information may be attached to the access path links.
Main actors	Authorities, operators, passenger information systems.
Main objects	Connection links, interchanges, stop places, accessibility attributes.

Use Case: PASSENGER-001-015 (#3)	
Name	Planning journeys through the network, including detailed connection/interchange times, under different constraints for mobility restricted users.
Source	Transmodel
Description	As a refinement to previous use case, in planning a multi-leg trip through a network, a journey planner may additionally take into account the accessibility requirements and different transfer times needed for different types of users, with different walk speeds or other needs, in particular for impaired mobility accessibility. Depending on the sophistication of the journey planning system and the availability of data, the individual timings required for transfers between different stop areas or stop points within an interchange using specifically identified navigation paths and accessibility needs may be taken into account or just an average time for any transfer at the station may be used, scaled to a particular walk speed.

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NeTEx contribution	Providing enough information to support the needs of mobility restricted users is of importance for NeTEx. Stops places, Equipment, accessibility on path links. Journey accessibility has to be taken into account in part 3. This comprises the assignment of timetabled trips to vehicle attributes (e.g., low-floor, lift-equipped vehicles).
Main actors	Authorities, operators, passenger information systems.
Main objects	Connection links, interchanges, stop places, accessibility attributes.

Use Case: PASSENGER-001-019 (#4)	
Name	Distributed assignment of responsibility for data management.
Source	Transmodel
Description	The data sets covered by NeTEx are large and belong to many different stakeholders. The task of gathering, collating and aggregating the data necessarily shall be distributed among many different organisations. Some degree of central coordination is needed to agree who is responsible for which type of data, to agree common interfaces, and to agree the partition of code namespaces so that data coded to a common standard can be aggregated without clashes as to the unique identifiers. Each data object should have: - Operational responsibility. - Owner (legal owner of the data who holds the copyright). - Data Provider (Organization which runs the producer of the data). - Administrator (Organization which is responsible for the content of the data). - "Data System": Name Space in which identifiers are unique.
NeTEx contribution	NeTEx provides means to define ownership of data objects so that it becomes clear who is responsible to maintain the data. It also provides unique object identifiers that allow mapping of object references across system boundaries.
Main actors	Data aggregating systems, authorities.
Main objects	Ownership attributes for stop places, stop points, lines, equipment, connections links, interchanges. Object reference mechanisms.

The two following diagrams (Figure 1 and Figure 2) describe an example of an organisational context that requires a distributed role ("Planning") and a corresponding responsibility assignment. In this example it is illustrated that several organisations do maintain the data that describe the informational results of the processes that are executed by them. The following roles are shown:

- Schedule planning role as executed by PTOs. A PTO may be responsible to plan its operations and provide the service view on the operational schedule plans for external usage.
- Stop place accessibility planning as executed by infrastructure managers. Municipal infrastructure management organisations may be responsible to provide the service view on build and maintenance plans of stop places for external usage.
- Matching of schedule and stop place information as well is maintaining general integrity. A separate role, the information manager, is shown that maintains the matching of the different information sets. Matching of schedules and stop information is realised through the NeTEx concept of "passenger stop assignments" that match logical stops (schedule) to physical stops (stop place information).[1]

[1] Parts of this role could be carried out by the PTO's. For the sake of clarity of the example, these considerations are not taken into account, apart from the fact that NeTEx should not limit the implementation of different organizational structures that are different from this example.

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- Collating and aggregating of sets of information.
  The integrator is responsible for collection and aggregation of the various datasets that collectively describe the entire operation within an area (e.g., region or country). The result is the provision of information to users that completely and consistently describe the journeys carried out, regardless of service provider origin.
- End-usage of information.
  Information can be used by various types of users, e.g. providers of a journey planning service. The PTO's and infrastructure managers are users as well.

One major justification for the existence of an integrator is the requirement that (sub) regional information can be used consistently, regardless the partitioned structure of the original information sets that are provided by the service providers that implement their part of the services. This is illustrated by Figure 2, where an end-user requests data through a NeTEx filtered request, that describes the operation in, e.g., a single city. This filtered sub-set is represented by the *User view* rectangle.

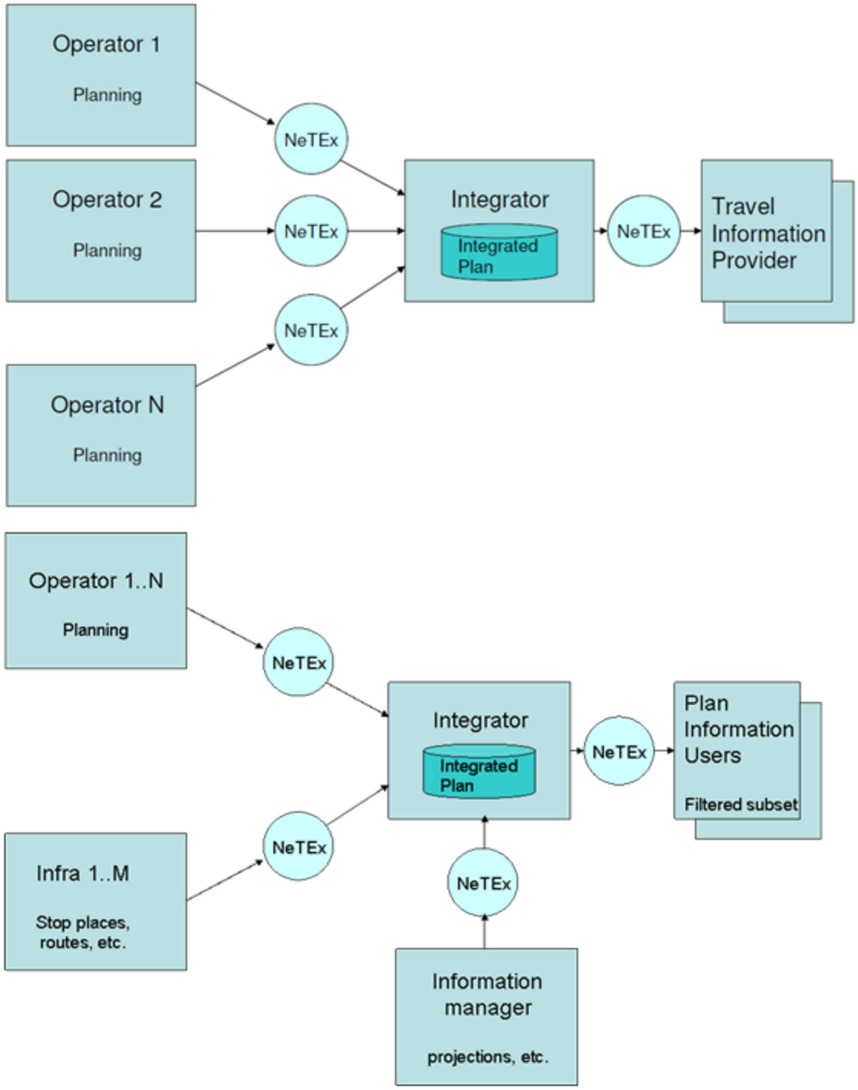
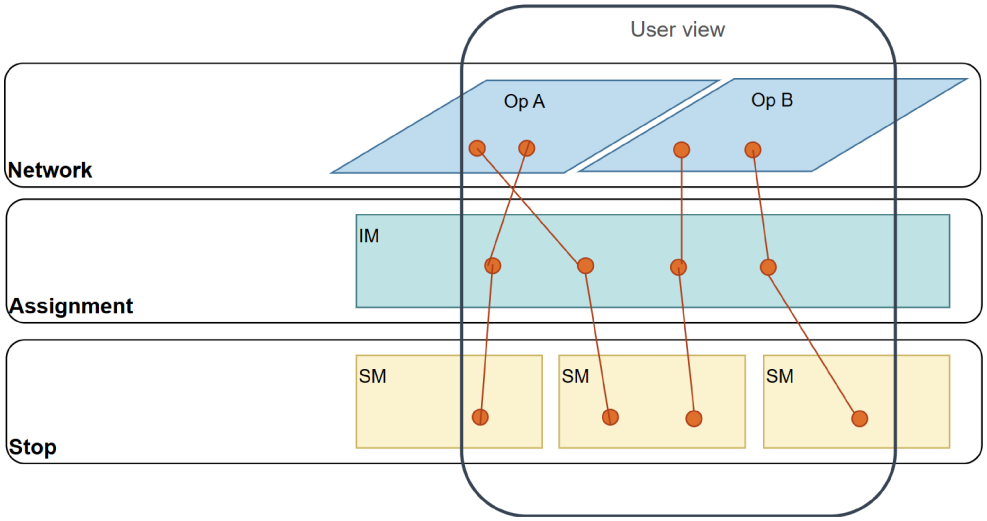


Figure 1 — Illustration for use case "*Distributed assignment of responsibility*".

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Key

User view	view presented to user
Op	Operator
IM	Information Manager
SM	Stop Management
Network	Network / plan information (NeTEx/Transmodel)
Assignment	assignment of physical stops to network (NeTEx)
Stop	physical stop information (NeTEx / IFOPT)
red dots and lines	actual assignment stop to network element

Figure 2 — Illustration for use case *Distributed assignment of responsibility*, showing the referencing of layers and the use of filtering

Use Case: VALIDITY-001-001 (#5)	
Name	Temporary change in stop availability
Source	TRANSMODEL : GEN#02
Description	Systems shall allow for the temporary change of stop availability or accessibility, through the addition or closing of stops or the reassigning of scheduled stop points from one physical location to another, the moving of stops, or by alterations to accessibility. Typically such changes are planned in advance and can be distributed with a validity condition along with other updates to the stop data.
NeTEx contribution	NeTEx provides enough support for temporary changes to stops such that current and up-to-date timetables can be exchanged to reflect the correct situation. Support for advising passengers about what the impact to public transport will be and how they could avoid potential disruptions is likely to be applied in the following two typical situations: • During preparation of a trip, e.g. by using a trip planner: NeTEx objects can optionally refer to a SIRI-SX structure as part of the NeTEx data delivery to provide situation related cause / effect information. • During travelling, however, the provision of this cause / effect information is the task of the operational SIRI interfaces.
Main actors	Authorities, operators, passenger information systems
Main objects	Validity information on stop places and stop point attributes

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5.4.3 Use cases from the EU regulation

5.4.3.1 General

The following use cases are directly extracted from the COMMISSION DELEGATED REGULATION (EU) 2017/1926 of 31 May 2017 (https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32017R1926).

5.4.3.2 Trip planning

Table 2 – EU use cases for trip planning

Level	Category	Description	Minimal concept	Other concepts
1	Trip plan computation — scheduled modes transport	Stop facilities access nodes (including platform information, help desks/information points, ticket booths, lifts/stairs, entrances and exit locations)	FACILITIES STOP PLACE PASSENGER STOP ASSIGNMENT	EQUIPMENT
1	Trip plan computation — scheduled modes transport	Accessibility of access nodes, and paths within an interchange (such as existence of lifts, escalators)	FACILITIES STOP PLACE	EQUIPMENT NAVIGATION PATH
1	Trip plan computation — scheduled modes transport	Existence of assistance services (such as existence of on-site assistance)	FACILITIES STOP PLACE	LOCAL SERVICE
1	Trip plan computation — scheduled modes transport	Vehicles (low floor; wheelchair accessible.)	FACILITIES VEHICLE TYPE	EQUIPMENT
1	Trip plan computation — road transport (for personal modes)	Pedestrian network and accessibility facilities Note: Detailed topology is usually taken from a source like OSM.	n/a	NAVIGATION PATH
1	Passing times, trip plans and auxiliary information	Status of access node features (including dynamic platform information, operational lifts/escalators, closed entrances and exit locations — all scheduled modes)	(SIRI) Situation Exchange Facility Monitoring	
3	Detailed common standard and special fare query (all scheduled modes)	Passenger classes (classes of user such as adult, child, student, veteran, impaired access and qualifying conditions and classes of travel such as 1st, 2nd.)	ACCESS RIGHT PARAMETER ASSIGNMENT	
Special case	Parking REGULATION (EU) 2015/962 et REGULATION (EU) 2017/1926	Information on parking facilities (all modes) Note: EU regulation doesn't explicitly warrant accessibility information for parking facilities.	PARKING PARKING AREA PARKING BAY	EQUIPMENT NAVIGATION PATH

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5.4.3.3 Place information

Table 3 – EU use cases for place information

Level	Category	Description	Minimal concept	Other concepts
1	Location search (origin/destination)	Address identifiers (building number, street name, postcode)	Everything that inherits from ADRESSABLE PLACE	ENTRANCE QUAI POI PARKING
1	Location search (origin/destination)	Topographic places (city, town, village, suburb, administrative unit)	TOPOGRAPHIC PLACE	
1	Location search (access nodes)	Identified access nodes (all scheduled modes)	STOP PLACE	QUAY SCHEDULED STOP POINT PASSENGER STOP ASSIGNMENT
1	Location search (access nodes)	Geometry/map layout structure of access nodes (all scheduled modes)	STOP PLACE	QUAY
1	Trip plan computation — scheduled modes transport	Stop facilities access nodes (including platform information, help desks/information points, ticket booths, lifts/stairs, entrances and exit locations)	STOP PLACE FACILITIES	EQUIPMENT
1	Trip plan computation — scheduled modes transport	Existence of assistance services (such as existence of on-site assistance)	STOP PLACE FACILITIES	LOCAL SERVICE

5.4.4 Use cases from the EU regulations (EU) 2019/772 (PRM TSI) and (EU) 454/2011

The use cases are extracted from the Commission Implementing Regulation (EU) 2019/772 of 16 May 2019 (PRM TSI)[2] and from the Commission Regulation (EU) 454/2011 (TAP TSI)[3].

Table 4 – Use cases for the PRM TSI and TAP TSI

#	Description	Regulation
1	The entity in charge of collecting accessibility data or the station manager publishes information on the accessibility of rail services	Recommendation concerning a revision of (EU) 454/2011[4] (TAP TSI)
2	the public shall be able to access information from a public website hosted by the European Union Agency for Railways	(EU) 2019/772

[2] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1566397460027&uri=CELEX%3A32019R0772
[3] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3AOJ.L_.2013.328.01.0072.01.ENG
[4] https://www.era.europa.eu/content/recommendation-era-rec-122-european-union-agency-railways-technical-specification_en

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#	Description	Regulation
3	registered national authorities shall be able to retrieve all accessibility data that are relevant to the Member State	(EU) 2019/772
4	the Commission and the Agency shall be able to retrieve all accessibility data	(EU) 2019/772

5.5 User group needs

Table 5 describes the passenger information need related to different user groups. It is also indicated to which area of application the information requirement belongs. The information need is based on research in The Netherlands (Reis Gerust), Germany (Delfi plus) and the European Railway Agency (Guide for the application of the PRM TSI).

The modelling approach described in the subsequent chapters allows for satisfying all passenger information needs listed here.

Table 5 – Passenger information needs and user groups

PassengerInformationNeed	Priority	Wheelchair user	Rollator user	assisted- Wheelchair	disabled people (walking elderly)	temp. restriction (stroller, baggage)	Hard of hearing and deaf people	Visually impaired and blind	cognitive limitations	Calculation	For Routing	Information
Spatial Information about stop(s) or platform(s) / Quay												
is the stop or platform (wheelchair) accessible?	M	●	●	●	●	●	●	●	●	●		●
map of the stop, bus station or platform	S	●	●	●	●	●	●					●
photo of the stop, bus station or platform	W											●
does the platform or stop have a lift?	S	●	●	●	●	●				●	●	●
Is the platform or stop barrier-free/Stepfree accessible?	M		●	●	●	●	●	●	●	●		●
Are there escalators to the platform or stop?	W				●	●		●				●
which tracks are on one platform?	S	●	●	●	●	●	●	●	●	●		●
location of entrances and exits	S	●	●	●	●	●	●	●	●	●	●	●
exit types (door/stairs/elevator/escalator)	S	●	●	●	●	●		●			●	●
width and depth of the lift	W	●		●						●		
photo of the elevator	W											●
Does a bus stop have a raised kerb?	C	●	●	●	●					●	●	●
platform height	C	●	●	●	●					●	●	
horizontal distance from platform to rails (due to gap width)	W	●	●	●	●	●					●	●
Is there enough space for turning with wheelchair at the exit door?	S	●	●		●					●	●	
Spatial Information about stations												
map of the station	S	●	●	●	●	●	●					●
how big and busy is the station?	C											●

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PassengerInformationNeed	Priority	Wheelchair user	Rollator user	assisted- Wheelchair	disabled people (walking elderly)	temp. restriction (stroller, baggage)	Hard of hearing and deaf people	Visually impaired and blind	cognitive limitations	Calculation	For Routing	Information
location check in check out gates/poles	C	●	●	●	●	●		●			●	
location service desk/public transport shop	S	●	●	●	●	●	●	●	●			●
location barrier-free entrance(s)	S	●	●	●	●	○	○	●	○		●	●
Is the journey barrier-free (up to the vehicle)?	M	●	●	●	●	○	○	○	○	●		
type of transfer between platforms (tunnel or bridge or railway crossing)	C	●	○	○		●				●		●
warning of renovations in station	W	●	●	●	●	●	●	●	●		●	●
is there a (wheelchair accessible) toilet at the station	S	●	●	●	●	●						●
is the toilet out of service?	W	●	●	●	●	●						●
location toilet in the Station	C	●	●	●	●	●					●	●
photo of toilet	W											●
wheelchair parking spaces at the station (p+r)	C	●	●	●	●	●	●	●	●			●
Boarding assistance												
When is (boarding)assistance available on a particular station?	M	●		●						●		
Is (boarding)assistance provided by station personnel or by a taxi driver	W	●	●	●								●
I want the direct phone number of the person providing assistance	W											●
A clear meeting place at a particular station.	W											●
Walking route/Network information												
what is the real (not as the crow flies) walking distance	S	●	●	●	●	○	○	○	○	●	●	●
walking route distances in meters (not just minutes).	S	●	●	●	●	○	○	○	○	●	●	●
how steep is a ramp?	S	●	●	●	●	●				●		●
Length of ramp	C	●	●	●	●	●				●		●
I want the walking routes to be shown on a map, also within stations	C	●	●	●	●	●	●					●
I want to be able to practice the walking route in the station	C	●	●	●	●	●	●					●
Vehicle Information												
Is the vehicle a low floor vehicle?	M	●	●	●	●	●	●		●	●		●
Does the bus have a manual or electric ramp, or a lift?	M	●		●	●	●	●			●		●
Does the train have a slidingStep, levelFloorAccess, lift? Is boardingAssistance needed for access with a wheelchair?	M	●	●	●	●	●	●			●		●
What is the length of the train in meters? At which doors are the wheelchair spaces?	C	●	●	●								●
Does the vehicle have a (wheelchair accessible) toilet?	C	●	●	●	●	●		●				●
Notifications during travelling												
Accurate and actual disruption info	C	●	●	●	●	●	●	●	●		●	●
notifications about changes in the current journey	C	●	●	●	●	●	●	●	●		●	●
mobile notification when an (auditory) announcement is made	C						●					●

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PassengerInformationNeed	Priority	Wheelchair user	Rollator user	assisted- Wheelchair	disabled people (walking elderly)	temp. restriction (stroller, baggage)	Hard of hearing and deaf people	Visually impaired and blind	cognitive limitations	Calculation	For Routing	Information
Is the disembarking left or right?	S	●	●					●				●
Notification about a faulty elevator in the current journey	S	●	●	●								●
Notification about toilet out of order in ongoing journey	W								●			●
Notification if wheelchair space in bus is occupied	W	●		●								●

Key:
● is relevant for ...
● characteristic is not needed to inform individual user groups, but required for the calculation of the routing
M: must haves, these requirements must be reflected in the end result
S: should haves, these requirements are highly desirable
C: could haves, these requirements will only be addressed if there is enough time
W: these requirements will probably not be addressed but could be interesting in the future

The practical needs of travellers with an impairment can be grouped under four headings:

- information. Relevant information at this point consists, for example, of links to maps or telephone numbers of contact persons, under which the passenger can request detailed information on the equipment of vehicles and stops.
- tailoring travel advice to the disability. The functionality of the travel planners is often limited to taking wheelchair accessibility into account. Travellers want to know how the accessible journey is made possible, whether they can travel independently, whether boarding assistance is needed, etc. Disabled travellers also want information about low-floor vehicles, adapted stops with raised curbs, etc.
- Routing information, for finding an accessible way, also within station buildings (indoor routing).
- notifications about unexpected changes, such as data on the operating status of escalators and elevators, as well as current information on construction sites within a station or stop, real-time information about the actual vehicle use. Added value arises when this data is processed in real-time travel advice.

The harmonisation of the concept of accessibility is an indispensable prerequisite for the comprehensive provision of consistent passenger information: users with specific mobility requirements are dependent on cross-system information that includes the same interpretation of accessibility in all parts of the connection/interchange/transfer. In the interests of the cross-border harmonisation of information on accessibility, the same search profiles with a consistently equivalent definition should be used, despite the individual look-and-feel of the individual information systems. The potential passenger must always be able to rely on the same parameters when determining an individual travel chain.

A central goal of EPIAP is to define a uniform language on the basis of which all future information on accessibility in public transport can be collected, recorded and integrated. Harmonising data relevant for

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journey planning and routing information has priority. Sensory and cognitive impaired people require no extra restrictions for journey planning. For the different user groups with a physical impairment, the characteristics of stops, routes and vehicle access determine whether independent travel can be made.

6 Functional description of accessibility

6.1 Introduction

All data models are maps of the physical reality. The more precise they are, the more complex they will get. A map which allows for turn-by-turn navigation will always need to contain much more detail than a map which will only allow for generally heading into the correct direction. The same effect applies to the NeTEx accessibility model:

- At the lowest level it is possible to just inform about the accessibility of stops, stations and vehicles and leave it up to the users whether a given journey is feasible for them.
- It is possible to indicate that a given journey is feasible with a wheelchair and let the user work out the details of getting from the underground platform to the railway platform
- At the highest level we can inform users exactly how to navigate through the station depending on their needs and on the actual state of elevators, vehicles etc.

A complete journey involving public transport can consist of several legs of service:

- From origin address to first public transport stop
- From first stop to an interchange stop
- Possibly from interchange stop to another interchange stop
- From last interchange stop to final stop
- From final stop to address of destination

For intermodal journeys, the first and last legs can also be replaced by private or rented vehicles. For each public transport leg of the journey, the vehicle must suit the needs of the user. It must also be possible to manage the transition between subsequent legs of the journey with the given disabilities. Using the data model, a journey planning solution should be able to answer questions like

- Is it possible for me to reach the platform of the first stop at ground level, or do I need to use stairs or cross tracks?
- Which is the best entrance to use?
- How can I find the correct vehicle for my journey if I cannot see the vehicle destination display?
- Is there a ramp or other low floor access for boarding the vehicle? If so, is it big enough?
- Is it possible to interchange from underground platform to the rail station using an elevator?
- If yes, will the elevator really be working?
- Where on the platform do I find the wagon with the wheelchair spaces?
- Is assistance available in case something goes wrong?
- Can I leave the final stop without using the stairs?

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6.2 Detail levels for Accessibility

NeTEx uses a uniform set of components to describe the accessibility of sites and services, based on an ACCESSIBILITY ASSESSMENT. The use of the system of assessment defines the minimal data needed for computing an accessible journey.
In addition to the AccessibilityAssessment, the following objects are relevant:

- The ASSISTANCE BOOKING SERVICE provides information about how to book assistance for wheelchair and disabled users.
- VehicleType (type of access, lowfloor, hoist/lift) including VehicleAccessEnumeration gives information how the vehicle can be accessed. This information, in addition to the Vehicle StepFreeAccessLimitation, is relevant for users with a motor disability. Technical automatic aids for boarding result in independent access but may malfunction. Then it is desirable to be informed in good time about defects or breakdowns. For a manual ramp, help is needed to fold/unfold the ramp.
- In a Site Frame, the complete topology of an interchange can be described, consisting of Entrances, AccessSpaces, Quays, PathLinks (which may use Equipments like lifts, ramps, stairs, escalators), other Equipment (like toilets), as well as the AccessibilityLimitations of each or selected components. This detailed information of a station allows for the calculation of individual timings required for transfers within an interchange, taking into account the accessibility needs, and for providing (realtime) navigation instructions.

6.3 NeTEx mechanisms for Accessibility

NeTEx provides various elements relevant for accessibility. The following table names some of them. The next chapters will define their usage and their relation to the proposed quality levels.

Table 6 – Accessibility elements in NeTEx

NeTEx model	Area of concern	Information to be stored there
AccessibilityAssessment AccessibilityLimitation VehicleType	Site Line Journey	Is a Site/Line/Journey wheelchair accessible or does it pose other limitations for the mobility/visually impaired? How is vehicle access possible? Relevant for passengers with a walking disability (i.e., lowfloor, lift, level access, manual ramp, sliding step).
Equipment/LocalService Facility	Site Vehicle Journey	Does a Site or Vehicle provide (or lack) certain accessibility relevant services (i.e., boarding assistance) and equipment with location (i.e., lift, accessible toilet)?
Level Entrance PathLink NavigationPath	Site	Mapping of the 'walking' network (paths, including lifts, ramps) for the purpose of routing and navigating
Connection Transfer	Network	Do certain paths (for instance from Quay to Quay) take longer for a mobility restricted passenger? However, doing things with PathLinks is the better and more accurate method.

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NeTEx model	Area of concern	Information to be stored there
Level Entrance AccessSpace	Site	Basically a mapping of floor plans of a station to NeTEx (topology of a station)
CheckConstraint	Site Journey	Do journeys (or paths through a station) pose certain kinds of obstacles (ticket barrier etc.)

6.4 EPIP (NeTEx part 4 as starting point)

The starting point of EPIAP is the EPIP. It has a chapter on accessibility, but we start from the assumption that no information concerning accessibility is provided in standard EPIP files. One could also say that chapter 7.6.13 of NeTEx part 4 is interpreted and detailed here in part 6.

6.5 EPIAP mandatory minimal accessibility profile

The profile defines the minimal level that must be met to fulfill the obligations under Regulation (EU) 2017/1926 and also fulfills the duties under PRM TSI. The minimal level contains definitions and interpretations about accessibility, both for the AccessibilityAssessment of Sites (stations and stops) as well as for Vehicles.

The minimal level includes the following:

- AccessibilityAssessment with AccessibilityLimitations has to be used for Stops and Vehicles. The values used indicate whether the user with a motor disability needs technical aids for the access to the vehicle, and which, in the case of automatic aids, can malfunction AND of which it is desirable to be informed in good time about defects or breakdowns.
- All existing ACCESSIBILITY LIMITATION must be mentioned on stop level[5]. If nothing is mentioned no assumption on accessibility can be made. However, always expand this to an AccessibilityAssessment in the export (mandatory).
- If “partial“ value is used for Accessibility Assessment then on lower level (Quay / AccessSpace) a definitive “yes" or “no" must be provided.
- Other elements must be filled in as well, so that PRM TSI could be generated from a minimal EPIAP. These elements are:
    - AccessVehicleEquipment: to indicate low floor access to vehicle (see sections 9.3,12.3)
    - AssistanceService: if assistance is offered on the floor, presence of an information desk (see section 11.1)
    - PassengerInformationEquipment: to indicate that visual information is present (see section 10.13)
    - MobilityFacilityList: if some things can be accessed by wheelchair, details about tactile and contrasting walking surface indicators, control barriers, level access for wheelchairs (see section 9.3)
    - AccessibilityInfoFacilityList: to tell if a counter has induction loops and other audio features in Equipment (see section 9.3)
    - TicketingEquipment/TicketingService: To tell if there is staffed ticket vending present
    - SanitaryEquipment: to inform in more detail about toilets (see sections 9.3, 9.3.2)
    - AssistanceFacilityList: Details about PRM assistance from and to platform see sections 9.3, 9.3.3)

[5] The usage of USER NEED and SUITABILITY is explicitly NOT RECOMMENDED to formulate accessibility.

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  - CheckConstraints: if there are special information about ticketCollection, ticketPurchase, tickedValidation (see sections 9.3.2, 9.2.6)
- Wheelchair access (cross border journey): For calculation of a journey with access option “wheelchairfriendly" only accessible stops (wheelchairAccess) and accessible Vehicles are included. For this purpose at least the AccessibilityAssessment must be available at Station/StopPlace level and at Journey/VehicleType level in order to enable filtering on this feature. If it is not possible for a wheelchair user to board a train independently, the existence of boarding assistance is needed. (PassengerStopAssignment is necessary to relate the timetable data to the StopPlace data.)
- VehicleTypes[6] (type of access, lowfloor, hoist/lift) and VehicleAccess(Facility) enumeration. With these extra data in combination with an extra LevelAccessIntoVehicle Limitation in the Site frame is it possible:

  - To inform the passenger how access is given (independently, with staff aid, on site boarding assistance)
  - To distinguish different physically impaired user groups in travel advice

The mandatory parts will be marked in the following chapters.

6.6 EPIAP optional parts

Above the minimal (mandatory) level there are additional types of accessibility information that shall and can be transferred. EPIAP describes how the information – if it is available – must be integrated.
It is important to mention that if additional accessibility information is available, it should be published in NeTEx and always following the guidelines outlined in this document.

EPIAP defines the following additional elements, that need to be taken into account to reach maximal impact:
- Stops must be modelled with AccessSpace, Entrance, Quays and the necessary Equipment binding them together.
- A full path model with SitePathLinks must be provided.
- Tactile strips and the like must be modelled as separate SitePathLinks.
- Networks of SitePathLinks for guidance and navigation within a StopPlaces. Major hubs must also be integrated into their environment.
- Accessibility is recorded for the separate components within a StopPlace/Station (Quays, SitePathLinks including the presence of elevators, ramps etc.).
- All other Equipment that is important for accessibility must be modelled.
- VehicleTypes must be provided.
- VehicleAccessFacilities must be provided.
- VehicleAccess(Facility)Enumeration,
- Descriptions must be added to all elements, where necessary.
- Many elements must contain additional information.

[6] Doesn’t need to be real physical types, but it may be a typing only for the purposes of accessibility (e.g. low floor bus with ramp).

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7 Modelling principles and guidelines, general information

7.1 General

After defining the content, the How is discussed in this chapter. The following general modelling principles and guidelines have to be followed:

- AccessibilityAssessments (see chapter 8) must be provided so that they cover stations and vehicles completely (meaning, that if the StopPlace(see section 9.3.1) is completely accessible no additional information for Quays (see section 9.3.3) is needed).
- The id values of all physical objects should be persistent across subsequently generated files and should follow the naming pattern described in EPIP.
- AccessibilityAssessment must be defined for all locations and vehicles that should be reachable.
- All equipment and services available at a certain StopPlace must be defined within the StopPlace.
- An EquipmentPlace (see section 9.5) should contain a reference to the Equipments (see chapter10) instead of an explicit definition.
- An Equipment should always be positioned by use of EquipmentPlace, this means that the geographical coordinates and the embedding into the site structure is done via EquipmentPlace.
- All the objects related to a StopPlace should be connected either directly (as nested objects) or via reference:
    - Each object enumerates nested elements only on the first level immediately below.
    - Objects referring to parent elements – only the first level above.
- If different stops are naturally reachable directly by walking, the necessary SitePathLinks (see section 9.6) should be modelled (meta-station and environment).
- Vehicles are mostly modelled in an abstract form as VehicleTypes (see section 12.1).
- In some countries a lot of the trip planning is done in the GIS (also indoor routing). Some other countries assume that the full routing (as far as it goes) is done solely on the topology provided by NeTEx. Therefore, some countries use the polygon (area) for stations, quays, entrances and access spaces. Others only have centroids. The systems must be able to deal with it. Having references to GIS objects in OSM or national geo frameworks can be helpful but are not mandatory. The routing necessary for trip planners should be possible with NeTEx alone.

7.2 Marking the accessibility level of a NeTEx file

A data set that conforms to EPIAP should be marked as such with the version epiap:1.0. At least the minimal data according to section 6.5 must be provided.

```
<CompositeFrame    id="epip:EU_PI_METADATA"    version="epiap:1.0"    responsibilitySetRef="epip:epip_metadata"
  dataSourceRef="epip:common">
    <ValidBetween>
      <FromDate>2018-02-01T00:00:00</FromDate>
      <ToDate>2020-12-31T12:00:00</ToDate>
    </ValidBetween>
```

Figure 3 — Marking the version of a conform EPIAP minimal level file for stops and vehicles

Additional information can't be codified formally. However, it is **strongly suggested** to use the Description in PublicationDelivery to show what data is really in the file and which part is complete.

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```
<PublicationDelivery version="1.1" xsi:schemaLocation="http://www.netex.org.uk/netex
  ../../../xsd/NeTEx_publication.xsd" xmlns="http://www.netex.org.uk/netex"
  xmlns:siri="http://www.siri.org.uk/siri" xmlns:gml="http://www.opengis.net/gml/3.2"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <PublicationTimestamp>2017-12-17T09:30:47.0Z</PublicationTimestamp>
  <ParticipantRef>SYS001</ParticipantRef>

  <PublicationRequest version= "1.0 ">
    <RequestTimestamp>2017-12-17T09:30:46.0Z</RequestTimestamp>
    <ParticipantRef>SYS002</ParticipantRef>
  </PublicationRequest>
  <Description>
    EPIAP minimal level conform delivery of the station of Chur. PathLinks available,
    all relevant equipment modeled.
  </Description>
```

Figure 4 — Using the element Description to indicate what the NeTEx publication delivery contains

7.3 Id and references

The ids of persistent elements are always managed by the owner of such objects or a provider of shared ids. Some elements are only transitory in nature (meaning they will change for each export). Others must be aligned and globally represented by the same id (or at least the same PrivateCode).

For such elements the owner of the data object defines the id which is to be used by everybody else (e.g. Transmodel for stops).

The owner can also be a responsible ORGANISATION. Bigger stops almost always have divided responsibility.

The following elements **must** be managed in that way by the owners:

- Organisation/OrganisationPart
- StopPlace
- Quay
- BoardingPosition
- Line/FlexibleLine
- ServiceJourney/FlexibleServiceJourney
- Equipment
- Situation
- ProductCategory
- Direction
- TopographicPlace

The persistent id must be used directly in id-attribute.

The profile encourages adding foreign keys into the relevant elements (e.g., PublicCode) as well as using KeyList in full. Multiple ALTERNATE IDENTIFIER help to reference data.

Additionally, KeyList **must not** be used as a replacement for information that can be stored without problems in other elements (PublicCode / PrivateCode). KeyList is an extension mechanism.

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```
    <KeyList>
        <KeyValue>
            <Key>CodeCRCICH</Key>
            <Value>008772174600</Value>
        </KeyValue>
        <KeyValue>
            <Key>uicCode</Key>
            <Value>87721746</Value>
        </KeyValue>
        <KeyValue>
            <Key>CodeRESARAIL</Key>
            <Value>FRHDF</Value>
        </KeyValue>
    </KeyList>
```

Figure 5 — Using KeyList with ALTERNATE IDENTIFIER to increase interoperability (here is an example of a StopPlace by SNCF)

A different example is a LiftEquipment, where the internal key of the manufacturer is added. However, the elevator may also have a key in the station's infrastructure management system.

```
<LiftEquipment id="ch:1:LiftEquipment:sfaid:012301230123" version="any">
  <keyList>
    <KeyValue>
      <Key>OTIS</Key>
      <Value>chur-23-232312</Value>
    </KeyValue>
  </keyList>
  <Description>Lift 0;-1;-2</Description>
  <TypeOfEquipmentRef ref="EFA_AUF" version="any"/>
</LiftEquipment>
```

Figure 6 — Example of a LiftEquipment with an id from the "owner" and a reference to the manufacturer

In this case, the key would probably even be only unique for the station where the elevator is located. The "Key" element should indicate the name of the key originating system. The value element contains the key in that system.

7.4 Descriptions and the usage of AlternativeText

Descriptive text intended for passenger information should be provided in several languages where necessary. For instance, for blind people it may be important to have textual descriptions. These need to be provided in all relevant languages. This can be done using the AlternativeText element.

```
<Notice id="ch:1:Notice:A__GN" version="any">
  <alternativeTexts>
    <AlternativeText attributeName="Text">
      <Text lang="en">GROUPS: transport not admitted</Text>
    </AlternativeText>
    <AlternativeText attributeName="Text">
      <Text lang="fr">GROUPES: transport non autorisé</Text>
    </AlternativeText>
```

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```
    <AlternativeText attributeName="Text">
      <Text lang="it">GRUPPI: trasporto non autorizzato</Text>
    </AlternativeText>
  </alternativeTexts>
  <Text lang="de">GRUPPEN: Beförderung nicht möglich</Text>
  <ShortCode>GN</ShortCode>
  <PrivateCode>A__GN</PrivateCode>
  <TypeOfNoticeRef ref="ch:1:TypeOfNotice:10" version="any"/>
  <CanBeAdvertised>true</CanBeAdvertised>
</Notice>
```

Figure 7 — Example of using AlternativeText in Notice

The element can be used for every NeTEx element derived from EntityInVersion. The attributeName attribute contains the name of the child element which is to be translated. The Text element contains the translated text. The language attribute must be set to indicate the target language.

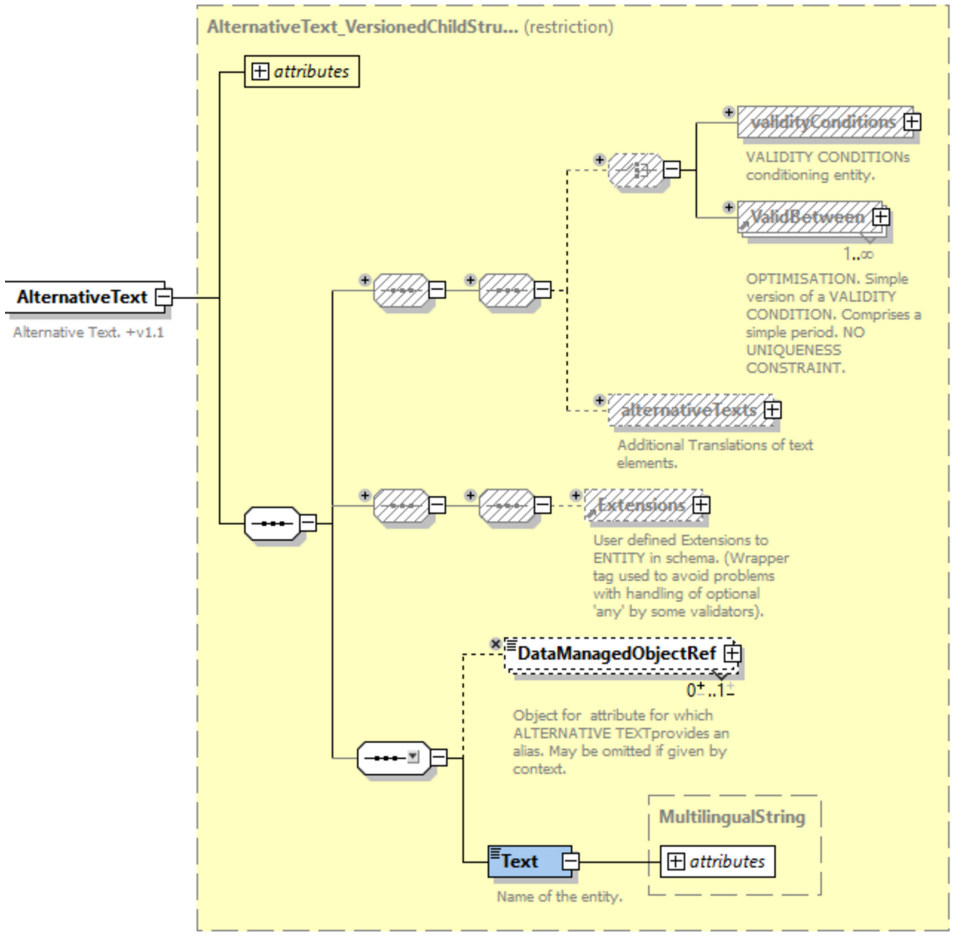


Figure 8 — AlternativeText - XSD

AlternativeText can be used in different places. For better readability, the element should be used as near to the original element as possible.

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NeTEx contains MultiLingualStrings, but those can always only contain one string in one language. To have multiple strings in multiple languages for the same element, AlternativeText has to be used.

7.5 ResponsibilitySet

In the ResourceFrame ResponsibilitySets are defined. The following StakeholderRoleType(s) must be supported:

- EntityLegalOwnership – relevant organisation which was granted the line
- Operation – responsible for the organisation of the operation
- FareManagement – organisation responsible for selling tickets

For Equipment and the like two more roles are added. StakeholderRoleType:

- Maintainer – organisation handling day-to-day operation of Equipment
- Owner – owner of the equipment

DataSource ownership can be set in the DataSource element for the whole delivery and then referenced in each DataManagedObject with the attribute dataSourceRef, if necessary.

7.6 Dimensions

The units can be defined by frame. Normally (metres) are defined by http://www.ordnancesurvey.co.uk/xml/resource/units.xml#metres for the LengthType. This is important as some other standards (e.g. Delfi+) use centimenter. It is suggested to not change the units.

7.7 Additional TypeOfPoint

There are two additional TypeOfPoint that should be present in EPIAP if they are used in the modelling. Most implementations will not use them as the accessibility model does not reach that level of detail. If the Points are modelled on that level, then the TypeOfPoint should be added in that way.

```
<ValueSet id="ch:1:ValueSet:TypeOfPoint" version="any" classOfValues="TypeOfPoint">
   <Name>TypeOfPoint</Name>
   <values>
     <TypeOfPoint id="ch:1:TypeOfPoint:dropped_kerb_position" version="any">
       <Name>dropped_kerb_position</Name>
       <Description>dropped kerb or similar spot (usually on a Quay) for wheelchair accessible PathLinks and
       NavigationPaths</Description>
     </TypeOfPoint>
     <TypeOfPoint id="ch:1:TypeOfPoint:tactile_boarding_position" version="any">
       <Name>tactile_boarding_position</Name>
       <Description>tactile boarding position that aligns with the drivers door for fast assistance in tram
       and bus transport</Description>
     </TypeOfPoint>
   </values>
 </ValueSet>
```

Figure 9 — Additional TypeOfPoint - XML

8 Accessibility Assessment

NeTEx uses a uniform set of components to describe the accessibility of sites and services based on an ACCESSIBILITY ASSESSMENT. The use of a system of assessment makes it possible to compute the overall accessibility of a route for a given limitation/need. This framework can be used at different levels. At the

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lowest level, data is recorded from stations and lines/trips/vehicles. Accessibility can be determined at a detailed level for every interaction within a station.

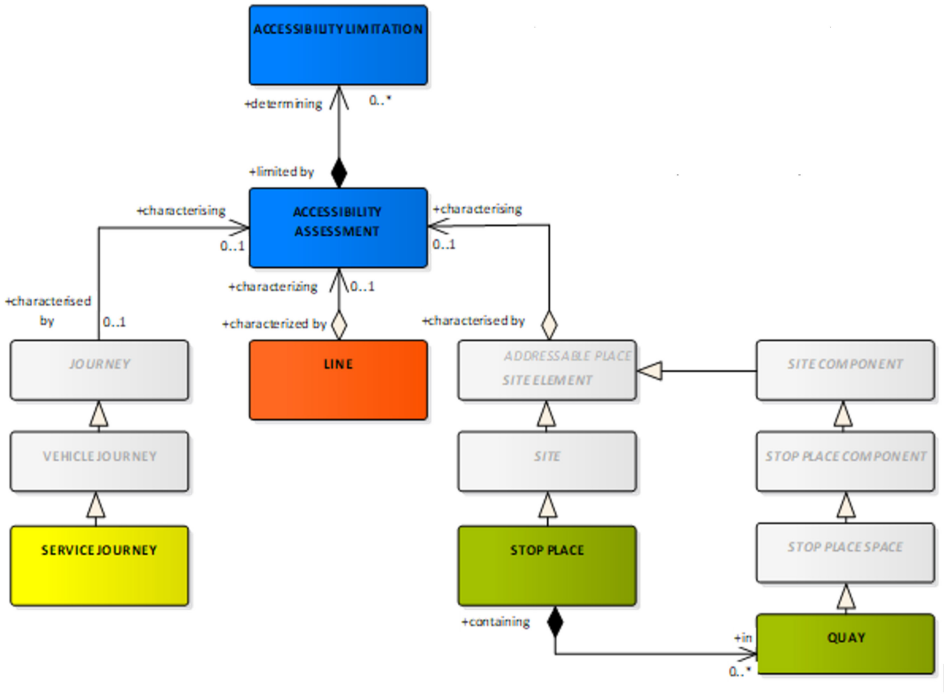


Figure 10 – Accessibility (UML)

An ACCESSIBILITY ASSESSMENT describes the accessibility of a SITE, a LINE or a SERVICE JOURNEY component. An assessment is made up of ACCESSIBILITY LIMITATIONs, each describing the accessibility for a specific need, for example WheelchairAccess, StepFreeAccess, EscalatorFreeAccess, LiftFreeAccess.

8.1 AccessibilityAssessment

Table 7 – AccessibilityAssessment – XML Element

Classification	Name	Type	Cardinality	Description
::>	::>	*DataManagedObject*	::>	ACCESSIBILITY ASSESSMENT inherits from DATA MANAGED OBJECT.
"PK"	***id***	*AssessmentIdType*	0:1	Identifier of ACCESSIBILITY ASSESSMENT.
	MobilityImpairedAccess	*LimitationStatusEnum*	1:1	Whether the overall assessment is that there is access for mobility impaired users. • *true* • *false* • *partial* • *unknown* partial means that there must be Quays or other elements were other AssessibilityAssessment should exist. Some Quays may not be accessible if partial is used on the StoPlace. Ideally, MobilityImpairedAccess is defined from the AccessibilityLimitations (see Table

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Classification	Name	Type	Cardinality	Description
				13. However, in the end it is defined by local law.
"cntd"	***limitations***	*AccessibilityLimitation*	0:1	The LIMITATIONs making up the ACCESSIBILITY ASSESSMENT.

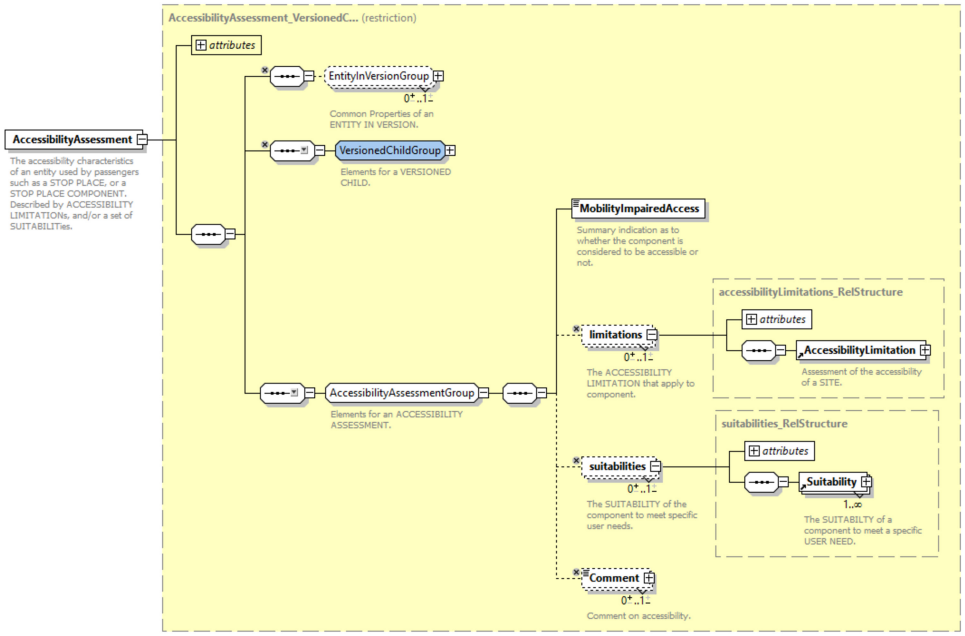


Figure 11 — AccessibilityAssessment – XSD (when used on StopPlace only then valid for all elements of the StopPlace)

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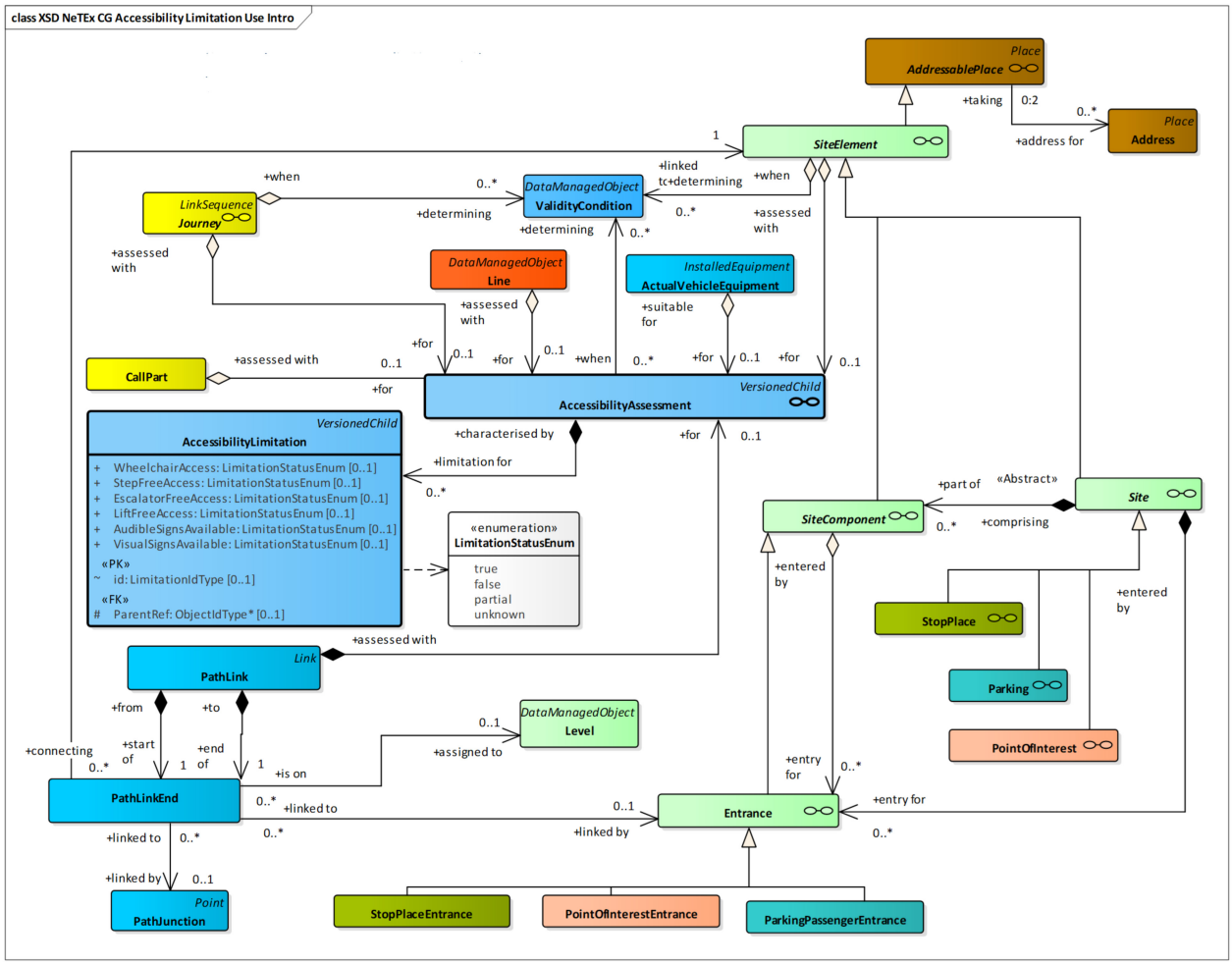


Figure 12 — Accessibility Assessment –Physical Model (UML)

AccessibilityAssessments can be used for the following purposes:

1) Indicate if areas and paths or even journeys or lines are wheelchair friendly (unassisted!).

2) Indicate if areas and paths or even journeys or lines are step free or pose limitations.

3) Indicate if a certain SitePathLink requires a ramp or lift (examples in sections 10.3.6 and 10.4.7).

4) Indicate if audible signals or tactile guiding lines are available on a SitePathLink (various examples in section 10).

5) The online-timetable already offers vehicle access information that could be mapped to AccessibilityAssessments of ServiceJourneys or Lines

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8.2 AccessibilityLimitation

8.2.1 General

A categorisation of the ACCESSIBILITY characteristics to indicate the usability by passengers with specific needs, for example, those needing wheelchair access, step-free access or wanting to avoid confined spaces such as lifts.

A small number of well-defined categories are used that are chosen to allow the consistent capture of data and the efficient computation of routes for different classes of users.

Table 8 – AccessibilityLimitation – XML Element

Classification	Name	Type	Cardinality	Description
::>	::>	*VersionedChild*		ACCESSIBILITY LIMITATION inherits from VERSIONED CHILD.
"PK"	***id***	*LimitationIdType*	0:1	Identifier of ACCESSIBILITY LIMITATION.
"enum"	***WheelchairAccess***	*LimitationStatusEnum*	1:1	Whether there is access for wheelchair users. See values above, section 8.1. If absent assume '*unknown*'.
"enum"	***StepFreeAccess***	*LimitationStatusEnum*	0:1	Whether there is step-free access. See values above. If absent assume '*unknown*'.
"enum"	***StairFreeAccess***	*LimitationStatusEnum*	0:1	Whether there is stair-free access. See values above. If absent assume '*unknown*'.
"enum"	***EscalatorFreeAccess***	*LimitationStatusEnum*	0:1	Whether there is escalator-free access. See values above. If absent assume '*unknown*'.
"enum"	***LiftFreeAccess***	*LimitationStatusEnum*	0:1	Whether there is lift free access. See values above. If absent assume '*unknown*'.
"enum"	***RampFreeAccess***	*LimitationStatusEnum*	0:1	Whether there is ramp free access. See values above. If absent assume '*unknown*'.
"enum"	***AudibleSignalsAvailable***	*LimitationStatusEnum*	0:1	Whether there are audible signals. See values above. If absent assume '*unknown*'.
"enum"	***VisualSignsAvailable***	*LimitationStatusEnum*	0:1	Whether there are visual signs. If absent assume '*unknown*'.
"enum"	***TactileGuidanceAvailable***	*LimitationStatusEnum*	0:1	Whether the object has tactileGuidance (for the visually impaired). If absent assume '*unknown*'.
"enum"	***LevelAccessIntoVehicle***	*LimitationStatusEnum*	0:1	Whether the platform is high enough and gap is small enough for level access into vehicle

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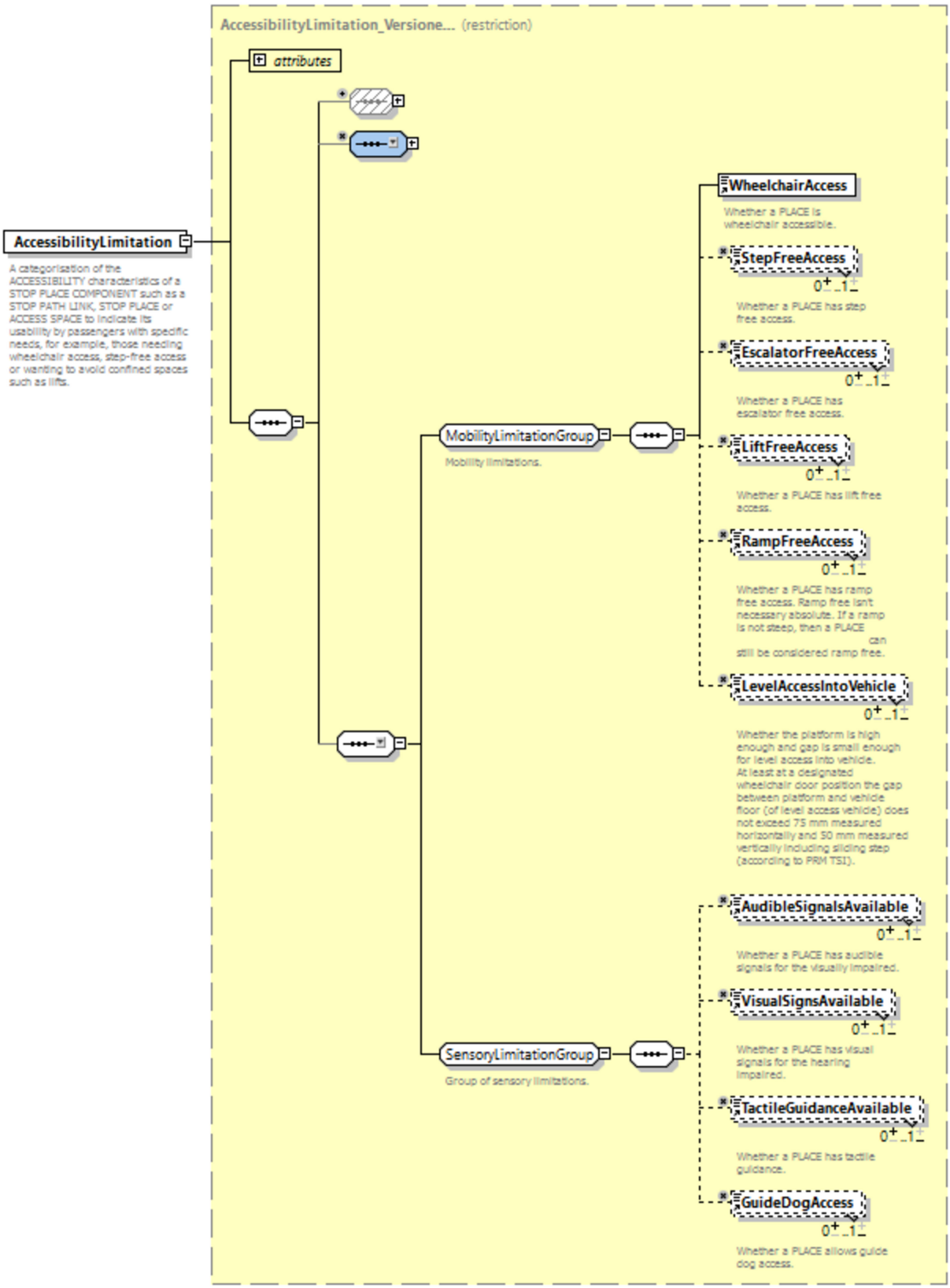


Figure 13 — AccessibilityLimitation – XSD

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In the context of EPIAP, whenever LimitationStatus has value ‘partial’ at StopPlace level, then for each Quay a definitive “yes" or “no" must be provided. A trip planner might interpretate otherwise a ‘partial’ as ‘unknown’.

For a journey to be “wheelchairfriendly", only accessible stops (wheelchairAccess) and accessible Journeys/Lines/VehicleTypes are to be considered. This implies that the AccessibilityAssessment must be available for all stations/StopPlaces and for all Journeys/VehicleTypes. For a wheelchair user it is important to know whether a train can be boarded independently (stepfree/level access) or when boarding assistance is needed.

An unambiguous implementation of the AccessibilityLimitation in all Member States is paramount. The following paragraphs define the criteria for the AccessiblityLimitations for Sites (StopPlaces) and Journeys/Vehicle.

8.2.2 AccessibilityLimitation constraints

Some AccessibilityLimitations are mutually exclusive – see the following figure.

Table 9 – Accessibility Attribute Constraints

	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 access may involve the use of steps	LiftFree access may involve the use of escalators	LiftFree access may involve the use of travelators	To avoid 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

8.2.3 Interpretation Site Accessibility Limitation

Passengers with specific mobility requirements are dependent on cross-system information that includes the same interpretation of accessibility in all parts of the transfer. EPIAP uses the following interpretation of the AccessibilityLimitation of a Site (StopPlace, Quay):

MobilityImpairedAccess for a Site component set to ‘true’ is interpreted as:

- WheelchairAccess ‘true’
- StepFreeAccess ‘true’

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- VisualSignsAvailable ‘true’ (only for railway stations)
- TactileGuidanceAvailable ‘true’

Table 10 – Interpretation Site AccessibilityLimitation

WheelchairAccess	1. StepFreeAccess to all platforms/Quays from an accessible entrance (see next row). 2. The stop/platform is sufficiently wide to make a turn with a wheelchair when entering/leaving the vehicles that usually stops at this stop/platform (depending on the available/needed tools for entering/leaving the vehicle). 3. If boarding trains requires boarding assistance, onsite assistance is available.
StepFreeAccess	1. A step-free route is an obstacle-free/barrier free route that meets the needs of mobility impaired persons. Changes in level are avoided or, when they cannot be avoided, they are bridged via ramps or lifts (compliant with PRM TSI). 2. The platform or Stop is accessible without steps from the surrounding area (footpaths). *A platform which is StepFreeAccessible without WheelchairAccess (= ‘false’) may be not sufficiently wide to make a turn with a wheelchair.*
StairFreeAccess	A stair-free route. More than one step.
LevelAccessIntoVehicle	Whether the platform is high enough and gap is small enough for level access into vehicle. At least at a designated wheelchair door position the gap between platform and vehicle floor (of level access vehicle) does not exceed 75 mm measured horizontally and 50 mm measured vertically including sliding step (according to PRM TSI).
EscalatorFreeAccess	If all Quays can be reached without using an escalator, EscalatorFreeAccess will be true.
LiftFreeAccess	If all Quays can be reached without using an elevator, LiftFreeAccess will be true.
RampFreeAccess	If all Quays can be reached without using a ramp that doesn't fit the UN Design Considerations[1] (for instance, because they are too steep or a landing is missing in case of a ramp of more than 10 m), RampFreeAccess will be true. [1] https://www.un.org/esa/socdev/enable/designm/AD2-01.htm
AudibleSignalsAvailable	Whether a PLACE has audible signals for the visually impaired.
VisualSignsAvailable	PRM TSI: visual information as signposting, pictograms and dynamic information.

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TactileGuidanceAvailable	Whether the object has tactile guidance (for the visually impaired). If absent assume 'unknown'. PRM TSI: obstacle-free route to each Quay for the visually impaired passengers equipped with tactile information. For bus- and tram stops: 1. Groundsurfaceindicator (at location first door) and/or full-length guideline (for boarding at all entrances) 2. Tactile guideline or boarding position connected to (natural) guideline in environment

If used, the AccessibilityLimitations overrule a MobilityImpairedAccessLimitation.

8.2.4 Use of AccessibilityLimitations on Site Components

The limitations should be assessed for individual SITE COMPONENTs as shown in the following table.

Table 11 – AccessibilityLimitations for Site Components

LIMITATION	SITE COMPONENT: e.g. ACCESS SPACE, QUAY	NAVIGATION PATH, PATH LINK, SITE: STOP PLACE, POINT OF INTEREST, etc.
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 lift 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.
StairFreeAccess	Does not require the use of stairs (more than one step) to reach it.	Does not require the use of stairs 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.

8.2.5 Interpretation Vehicle AccessibilityLimitation

EPIAP uses the following interpretation of the AccessibilityLimitation for a VehicleType/Journey:

Table 12 – Interpretation of Vehicle AccessibilityLimitation

WheelchairAccess	WheelchairAccess for a Vehicle is interpretated as: **1** One or more wheelchair spaces (at least one) **2** Doors/entrance wide enough for a wheelchair (> 0.90m) to reach the wheelchair space from the wheelchair entrance **3** No steps inside the vehicle to reach the wheelchair space from the wheelchair entrance
StepFreeAccess	Platform and vehicle need to match in the following way (for at least one designated wheelchair door). According to the PRM TSI requirements the gap between the door sill and the platform does not exceed 75 mm measured horizontally and 50 mm vertically.
EscalatorFreeAccess	Not used for vehicle access.
LiftFreeAccess	Only set to false if the vehicle has a lift/hoist for the access for wheelchairs.

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AudibleSignalsAvailable	For example: audio for announcing next stop
VisualSignsAvailable	For example: display in the vehicle with next stop information



Figure 14 — WheelchairAccess 'true' (via manually operated ramp), StepfreeAccess ‘false’

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Figure 15 — WheelchairAccess and StepfreeAccess (platform with LevelAccessIntoVehicle)

In some cases (like the London Underground) there are areas of the platform that are raised to allow for level boarding while other areas do not allow for level boarding. In such a case LevelAccessIntoVehicle means that there is at least one designated wheelchair door (BoardingPosition). A notice stating that level boarding is only possible at the indicated wheelchair areas may be added to inform the passengers about this situation.

8.3 Use of AccessibilityAssessment

Since not all Member States have detailed accessibility information available and the wish to realize cross border PRM journey planning on a short notice, in the profile (EPIAP) a core minimum requirement is AccessibilityAssessment for all StopPlaces and for all Journeys/Vehicles.

NeTEx allows accessibility criteria to be associated with SITE COMPONENTs and PATH LINKs 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.

When the topology of a station with accessibility data is available at the most detailed level, summarization can be derived automatically from the bottom up; the Accessibility Assessment for a Quay[7] is determined by looking for a barrier-free route between an accessible Entrance and the Quay. If the detailed data is not available, the Accessibility Assessment of Quays can be inventoried manually.

[7] This applies to single-sided quays, not to grouped (nested) quays (railIslandPlatform, metroIslandPlatform)

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The AccessibilityAssessment of Quays should be summarized to the StopPlace level according to the following rules:

- if all Quays have an Accessibility Assessment set to true, then the Accessibility Assessment is true for the whole StopPlace.
- if all Quays have an Accessibility Assessment set to false, then the Accessibility Assessment is false for the whole StopPlace.
- If one the Quays (but not all) have an Accessibility Assessment set to true, then the Assessment is 'partial' for the StopPlace.

The AccessibilityLimitations are summarized in MobilityImpairedAccess via the following rules**:**

Table 13 – Ideal generation for MobilityImpairedAccess from AccessibilityLimitations

	Value	**MobilityImpairedAccess**
WheelchairAccess	false	false
	true	true
	unknown	false
StepFreeAccess	false	false
	true	No effect
	unknown	false
StairFreeAccess	false	false
	true	No effect
	unknown	false
EscalatorFreeAccess	false	false
	true	No effect
	unknown	false
TactileGuidanceAvailable	false	false
	true	true
	unknown	false

The values of the limitations for LiftFreeAccess, RampFreeAccess, LevelAccessIntoVehicle, AudibleSignalsAvailable, VisualSignsAvailable and GuideDogAccess have no effect in MobilityImpairedAccess.

If vice versa only MobilityImpairedAccess 'true' is used for a Site without AccessibilityLimitations, this means:

- WheelchairAccess 'true'
- StepFreeAccess 'true'
- TactileGuidanceAvailable 'true'
- Other AccessibilityLimitations 'unknown'

Only MobilityImpairedAccess 'true' for a journey/vehicle (without AccessibilityLimitations) means:

- WheelchairAccess 'true'
- Other AccessibilityLimitations 'unknown'

8.3.1. **Minimum requirement**

For regions without detailed SitePathLink-information on StopPlaces and Quays, MobilityImpairedAccess must be provided at least at StopPlace level.

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The value for a StopPlace automatically applies to the underlying Quays. The value 'partial' may be used. Whenever LimitationStatus has value 'partial' at StopPlace level, then all one-sided Quays have to be modelled with the definitive attribute values. A journeyplanner might interpret otherwise a 'partial' as 'unknown'.

9 Site Model (Stop Place, Quays, Entrances, Access Spaces, etc.)

9.1 General

For most scheduling applications, a public transport stop is just an object with a name, coordinates, fare zones and some other attributes. The site model describes stops from a passenger perspective. A stop may be embedded in a complex station building or other venue with different entrances, levels, platforms and other functional areas such as taxi stands or park and ride places.

Most examples for the Site Model are taken from the mobility hub Chur (Switzerland):

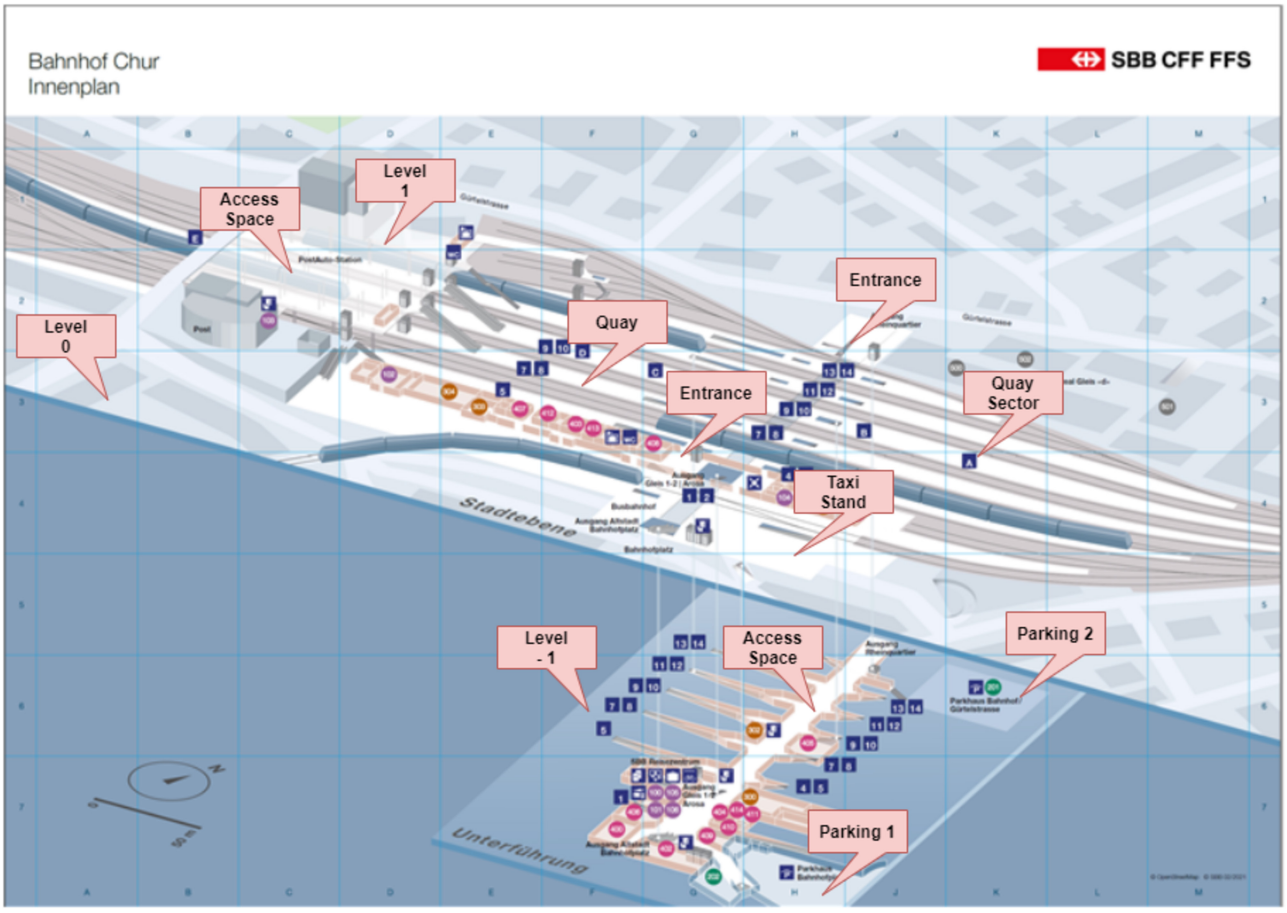


Figure 16 — Chur with annotations of some relevant NeTEx elements (Source trafimage.ch[8], OpenStreetMap contributors © SBB/CFF/FFS 02/2022)

[8] https://plans.trafimage.ch/chur?lang=de&layer=chur_aussenplan&x=759436.06&y=191313.59

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The station contains most features relevant for the site model:

1. There are two main **entrances**
2. The station can also be entered from associated **parking facilities**
3. There are several quays divided into sectors A – F
4. There are two **access spaces** connecting the quays - the underpass and the Postbus station hall.

In the Swiss national stop database Chur consist of three StopPlace records:

- Chur 8509000 (OSM: https://www.openstreetmap.org/node/2522151337)
- Chur, Bahnhofplatz 8581044 (OSM: https://www.openstreetmap.org/relation/9912426)
- Chur, Postautostation 6051245155 (OSM: https://www.openstreetmap.org/relation/6282932)

The stop places are connected by footwalks. Several equipments and services available at those places are modelled according to principles and rules described below.

The usage of GroupOfStopPlaces is not foreseen. The hierarchy of StopPlace is modelled by using ParentRef in the StopPlace.

9.2 Modelling conventions

9.2.1 General

The examples in this chapter show the recommended way to model major elements of a single or a group of StopPlaces in NeTEx.

9.2.2 Hierarchy of the XML file

Table 14: Location of Site XML Elements

NeTEx Element	Location
StopPlace	CompositeFrame/frames/SiteFrame/stopPlaces/StopPlace
Entrance	CompositeFrame/frames/SiteFrame/stopPlaces/StopPlace/entrances/Entrance
Quay	CompositeFrame/frames/SiteFrame/stopPlaces/StopPlace/quays/Quay
AccessSpace	CompositeFrame/frames/SiteFrame/stopPlaces/StopPlace/accessSpaces/AccessSpace
Level	CompositeFrame/frames/SiteFrame/stopPlaces/StopPlace/levels/Level
Parking	CompositeFrame/frames/SiteFrame/parkings/Parking
SiteFacilitySet	CompositeFrame/frames/SiteFrame/stopPlaces/StopPlace/SiteFacilitySet
SitePathLink	CompositeFrame/frames/SiteFrame/stopPlaces/StopPlace/pathLinks/SitePathLink
PathJunction	CompositeFrame/frames/SiteFrame/stopPlaces/StopPlace/pathJunctions/PathJunction
VehicleMeetingPlace	CompositeFrame/frames/MobilityServiceFrame/vehicleMeetingPlaces/VehicleMeetingPlace

9.2.3 Required and optional XML elements

The examples provide explicit XML code, arranged and annotated in tabular form.

Required, non-optional elements are printed in bold, while optional elements are in normal print.

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9.3 Physical elements of a SiteModel

9.3.1 Stop Places

The STOP PLACE model describes different aspects of a physical point of access to transport, such as a stop or a station. For a complex StopPlace, 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.

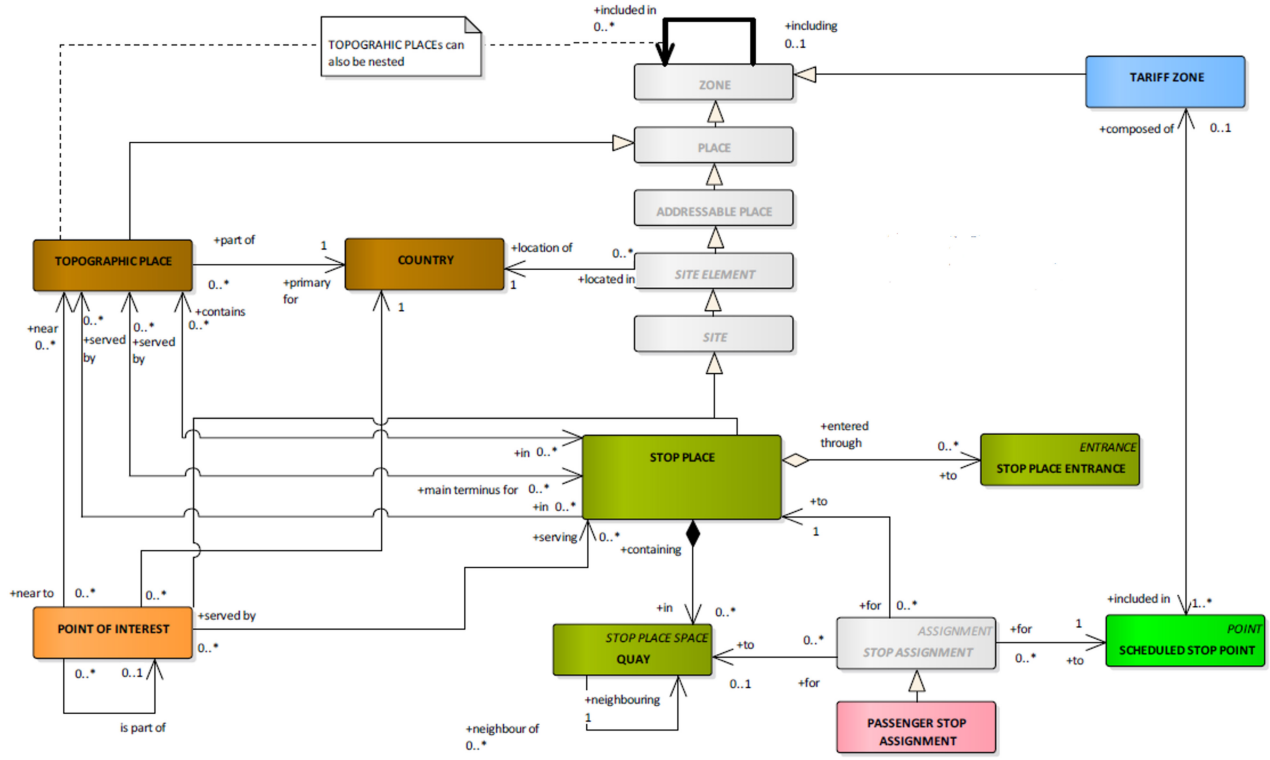


Figure 17 —STOP PLACE Conceptual model (UML)

Each StopPlace must have an AccessibilityAssessment.

The table below is not a complete enumeration of stop related NeTEx elements, it focuses on the elements that are relevant for the accessibility aspects of the use cases.

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Table 15 – Stop related NeTEx elements with relevance for accessibility

NeTEx	Comment
<StopPlace id="ch:1:StopPlace:8509000" version="any">	Chur railway station.
<ValidBetween> <FromDate>1978-10-01T00:00:00</FromDate> <ToDate>2500-12-31T00:00:00</ToDate> </ValidBetween>	Date interval where the stop is known to be operational.
<keyList> <KeyValue> <Key>DIDOK</Key> <Value>8509000</Value> </KeyValue> </keyList>	Additional keys known in external system.
<Name>Chur</Name>	Official name of the stop.
<PrivateCode>8509000</PrivateCode>	Key of stop in system of data provider.
<Centroid> **<Location>** **<Longitude>9.528933</Longitude>** **<Latitude>46.853087</Latitude>** <Altitude>584</Altitude> **</Location>** **</Centroid>**	Position of stop place on map.
<TypeOfPlaceRef ref="ch:1:TypeOfPlace:general" version="any"/>	Type of stop place. May be “general" or “monomodal".
<AccessibilityAssessment id="ch:1:StopPlace:8509000" version="any"> **<MobilityImpairedAccess>partial</MobilityImpairedAccess>** **<limitations>** **<AccessibilityLimitation>** **<WheelchairAccess>partial</WheelchairAccess>** **<LiftFreeAccess>partial</LiftFreeAccess>** **<AudibleSignalsAvailable>partial</AudibleSignalsAvailable>** **<VisualSignsAvailable>true</VisualSignsAvailable>** **</AccessibilityLimitation>** **</limitations>** **</AccessibilityAssessment>**	Assessment of the stop place as a whole. For a detailed description, see chapter “Accessibility Assessment". Limitations can be omitted, when MobilityImpairedaccess is set to true and no additional information needs to be conveyed.
<AlternativeName id="ch:1:AlternativeName:StopPlace:8509000" version="any"> <NameType>alias</NameType> <TypeOfName>offical</TypeOfName> <Name lang="fr">Coire</Name> </AlternativeName>	Additional names of the stop. These can be abbreviations or actual synonyms.
<Covered>indoors</Covered>	Whether stop is covered by a roof.
<Gated>gatedArea</Gated>	Whether stop is accessible through a gate only, or can be accessed freely from the street.

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NeTEx	Comment
<Lighting>wellLit</Lighting>	Whether a stop is well lit or poorly lit.
<facilities> <SiteFacilitySet id="ch:1:SiteFacilitySet:8509000" version="any"> <AssistanceFacilityList>boardingAssistance</AssistanceFacilityList> </SiteFacilitySet> </facilities>	List of facilities available at the stop. For a detailed description, see chapter “Site Facilities".
<TopographicPlaceRef ref="ch:1:TopographicPlace:8b930b7b-059b-4d0e-8db1-6512f12bc1b9" version="any"/>	Town / municipality where stop is located.
<levels> <Level id="ch:1:Level:8509000-B1" version="any"> <Name lang="de">Untergeschoss 1</Name> <ShortName lang="de">B1</ShortName> <Description lang="de">Unterführung Bahnhofshalle</Description> <PublicCode>U1</PublicCode> <PublicUse>true</PublicUse> <AllAreasWheelchairAccessible>true</AllAreasWheelchairAccessible> </Level> … </levels>	The different levels of the stop place, e.g. ground floor, basement, first floor. Entrances, quays and other components reference the levels defined here. Level is required for StopPlaces with different levels. References to Levels are optional, when there would be only one Level. AllAreasWheelchairAccessible is not required if whole StopPlace has MobilityImpairedAccess or WheelchairAccess.
<entrances> <Entrance id="ch:1:Entrance:8509000:80" version="any"> <Name lang="de">Zugang Gürtel</Name> <ShortName lang="de">ZUG</ShortName> <PrivateCode>80</PrivateCode> <Centroid> <Location> <Longitude>9.528727</Longitude> <Latitude>46.854359</Latitude> <Altitude>584</Altitude> </Location> </Centroid> <LevelRef ref="ch:1:Level:8509000-L0" version="any"/> </Entrance> <!-- --> </entrances>	List of stop or station entrances. For a detailed description, see chapter “Entrances". Simple on-street StopPlaces don't need to have an Entrance.
<placeEquipments> <EscalatorEquipment id="ch:1:Asset:8509000:98" version="any"> <Name lang="de">Rolltreppe von Zwischengeschoss nach Zugang Bahnhofsplatz</Name> <PrivateCode>98</PrivateCode> <TypeOfEquipmentRef ref="EFA_ROL" version="any"/> </EscalatorEquipment> <SanitaryEquipment id="ch:1:SanitaryEquipment:8509000:70" version="any"> <NumberOfToilets>10</NumberOfToilets> <FreeToUse>false</FreeToUse>	List of equipments available at the stop. For a detailed description, see chapter “Equipments". All Equipments are modelled in the StopPlaces.

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NeTEx	Comment
<CallButtonAvailable>true</CallButtonAvailable> <Staffing>unmanned</Staffing> </SanitaryEquipment> </placeEquipments>	
<PublicCode>Chur</PublicCode>	Short name of the station as known to the public.
<Weighting>recommendedInterchange</Weighting>	Whether the stop is generally recommended for an interchange
<quays> <Quay id="ch:1:Quay:8509000:1" version="any"> <Name lang="de">Bahnsteig 1</Name> <ShortName lang="de">1</ShortName> <PrivateCode>1</PrivateCode> </Quay> </quays>	List of quays where passengers can board vehicles. Note that Name is not intended for public use. For a detailed description, see chapter “Quays".
<accessSpaces> <AccessSpace id ="ch:1:AccessSpace:8509000:70" version="any"> <Name lang="de">Unterführung Bahnhof</Name> <ShortName lang="de">ZW</ShortName> <PrivateCode>70</PrivateCode> <!-- --> </AccessSpace> <accessSpaces>	List of access spaces, e.g. entrance hall, overpass or underpass. For a detailed description, see chapter “Access Spaces"
<pathLinks> <!- described in detail in its own section --> </pathLinks>	pathLinks contains the SitePathLinks. As this is an important concept, a separate section 9.6 is dedicated to it.
</StopPlace>	

9.3.2 Entrance

An ENTRANCE is a physical entrance or exit to/from the STOP PLACE. It may be a door, barrier, gate or other recognizable point of access. ENTRANCEs can be external, for example the main ENTRANCE, or internal, for example from an entrance concourse to a platform. Recording entrances is important to calculate walking distances and to be able to navigate from the environment to an accessible entrance at stations.

The receiver of the data should be able to link the entrances to the surrounding street on his GIS network, for this purpose the coordinates must be accurate and the ENTRANCE level must be correct.

Entrances can be omitted for the minimal EPIAP. However, this restricts the possibilities within a journey planner. It is strongly recommended to model Entrances.

In modelling it is important to also make sure that the StopPlace and the environment are connected in the GIS. There "virtual" Entrances like a staircase to a street or an elevator going to a street are modelled.

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These are sometimes not owned or administrated by the StopPlace administrators. It such cases such elements should be added to the inventory and curated nevertheless.



Figure 18 —Example of an Entrance

Table 16 – Relevant elements of Entrance for Accessibility

NeTEx	Comment
`<Entrance id="ch:1:8509000:Entrance:82" version="any">`	We use Entrance opposed to StopPlaceEntrance, because it is more general and the additional elements don't seem to have elements that add value to the model. The use of StopPlaceEntrance is not recommended.
`<Name lang="de">Eingang Bahnhofsplatz</Name>`	Official name of the entrance
`<ShortName lang="de">Eingang Süd</ShortName>`	A short version of the official name.
`<PrivateCode>82</PrivateCode>`	Key of entrance in system of data provider
`<Centroid>` `  <Location>` `  <Longitude>9.530074</Longitude>` `  <Latitude>46.853197</Latitude>` `  <Altitude>584</Altitude>` `  </Location>` `</Centroid>`	Position of entrance on map

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NeTEx	Comment
<AccessibilityAssessment id="ch:1:AccessibilityAssessment:8509000:82" version="any"> **<MobilityImpairedAccess>true</MobilityImpairedAccess>** **<limitations>** **<AccessibilityLimitation>** **<WheelchairAccess>true</WheelchairAccess>** **<StepFreeAccess>true</StepFreeAccess>** <StairFreeAccess>true</StairFreeAccess> <EscalatorFreeAccess>true</EscalatorFreeAccess> <LiftFreeAccess>true</LiftFreeAccess> <RampFreeAccess>true</RampFreeAccess> **<GuideDogAccess>true</GuideDogAccess>** <AudibleSignalsAvailable>false</AudibleSignalsAvailable> **<TactileGuidanceAvailable>** **false** **</TactileGuidanceAvailable>** **<VisualSignsAvailable>true</VisualSignsAvailable>** **</AccessibilityLimitation>** **</limitations>** **</AccessibilityAssessment>**	AccessibilityAssessment of the entrance. For a detailed description, see chapter “Accessibility Assessment" **This Element needs to be provided only if the accessibility of the entrance differs from stop place accessibility.**
<PublicUse>all</PublicUse>	**This element has to be provided if the entrance is not intended for the general public.** If the entrance is not intended for public use, then the value staffOnly has to be used
<Covered>covered</Covered>	Whether the area is covered, i.e., protected from rain and snow.
<Lighting>wellLit</Lighting>	Whether the entrance is well lit or poorly lit.
<AllAreasWheelchairAccessible>true</AllAreasWheelchairAccessible>	Wheelchair access is already covered by the AccessibilityAssessment, see above.
<facilities> <SiteFacilitySet id="ch:1:SiteFacilitySet:8509000:80" version="any"> <MobilityFacilityList>suitableForWheelchairs</MobilityFacilityList> </SiteFacilitySet> </facilities>	List of facilities available at the entrance. For a detailed description, see chapter “Site Facilities".
<LevelRef ref="ch:1:Level:8509000-L0" version="any"/>	Reference to level of entrance.
<checkConstraints> <CheckConstraint id="ch:1:CheckConstraint:8509000:82" version="any"> <CheckProcess>baggageSecurityCheck</CheckProcess> </CheckConstraint>	Processes which may lead to delay and / or encumbrance, e.g., a security or ticket check.

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