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Public transport - Network and timetable exchange (NeTEx) - Part 6: European Passenger Information Accessibility Profile

Öffentlicher Verkehr - Netzwerk- und Fahrplan-Austausch (NeTEx) - Teil 6:
Europäisches Profil für barrierefreie Fahrgastinformation

Transport public - Echanges des informations planifiées (NeTEx) - Partie 6: Profil Européen d'Information Voyageur pour l'Accessibilité

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**Public transport - Network and timetable exchange
(NeTEx) - Part 6: European Passenger Information
Accessibility Profile**

Transport public - Echanges des informations
planifiées (NeTEx) - Partie 6: Profil Européen
d'Information Voyageur pour l'Accessibilité

Öffentlicher Verkehr - Netzwerk- und Fahrplan-
Austausch (NeTEx) - Teil 6: Europäisches Profil für
Fahrgastinformation zu Barrierefreiheit

This Technical Specification (CEN/TS) was approved by CEN on 15 April 2024 for provisional application.

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

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European foreword

This document (CEN/TS 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.

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

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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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

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:
 - o Real-time provision of transport schedules and disruptions
 - o Support route planning in case of disruptions (similar to information and booking/purchase in the pre-trip stage)
- Personal navigation
 - o 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 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.

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
Hearing impaired person		Visual information
Balance impaired person		Handrails and grabrails
cognitive		Mentally impaired person
	Intellectually impaired person	Special drivers' trainings, easy understandable information, easy ticketing

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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	<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>
NeTex contribution	<p>Journeys for NeTex part 2</p> <p>Connection and interchange times are part of NeTex part 1.</p> <p>NeTex only supports guidance information if it is inside a Stop place (not on the road network, etc.)</p> <p>The link of Stop Places (or components) to the road has to be taken into account</p> <p>Guidance information may be attached to the access path links.</p>
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.