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Javni prevoz - Izmenjava omrežnih in voznorednih podatkov (NeTEx) - 2. del: Izmenjavni format za vozne rede rednega javnega prevoza

Public transport - Network and Timetable Exchange (NeTEx) - Part 2: Public transport scheduled timetables exchange format

Öffentlicher Verkehr - Netzwerk- und Fahrplan-Austausch (NeTEx) - Teil 2: Austauschformat für Fahrpläne im öffentlichen Verkehr

Transport Public - Échanges des informations planifiées (NeTEx) - Partie 2: Description de l'offre de transport

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ICS:

03.220.01	Transport na splošno	Transport in general
35.240.60	Uporabniške rešitve IT v prometu	IT applications in transport

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TECHNICAL SPECIFICATION

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English Version

Public transport - Network and Timetable Exchange (NeTEx) - Part 2: Public transport scheduled timetables exchange format

Transport Public - Échanges des informations planifiées (NeTEx) - Partie 2: Description de l'offre de transport

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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European foreword

This document (CEN/TS 16614-2:2026) has been prepared by Technical Committee CEN/TC 278 “Intelligent transport systems”, the secretariat of which is held by NEN.

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This document will supersede CEN/TS 16614-2:2019.

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.

0 Introduction

0.1 General

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 on service running, and so on.

This document specifies a Network and Timetable Exchange (NeTEx) about public transport. It is intended to be used to exchange static data relating to public transport between the systems of PT organisations. It can also be seen as a complement to the SIRI (Service Interface for Real-time Information) standard, as SIRI needs a prior exchange of reference data from NeTEx's scope to provide the necessary context for the subsequent exchange of a real-time data.

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

This standard will improve 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: (i) introducing common architectures for message exchange; (ii) introducing a modular set of compatible information services for real-time vehicle information; (ii) using common data models and schemas for the messages exchanged for each service; and (iv) 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 future.

NeTEx is dedicated to the exchange of scheduled data (network, timetable and fare information) based on Transmodel V6.2 (EN 12986), and SIRI (CEN/TS 15531-4/5 and EN 15531-1/2/3) and supports information exchange of relevance to public transport services for passenger information and Automated Vehicle Monitoring Systems (AVMS).

NOTE Many NeTEx concepts are taken directly from Transmodel. The definitions and explanation of these concepts are extracted directly from the respective standards and reused in NeTEx, sometimes with further adaptions in order to fit the NETEx context.

The data exchanges targeted by NeTEx are predominantly oriented towards passenger information and also for data exchange between public transport scheduling systems and AVMS. However it is not restricted to these purposes, and NeTEx can provide an effective solution to many other use cases for transport data exchange.

0.2 Transport modes

All mass public transport modes are taken into account by NeTEx, including train, bus, coach, metro, tramway, ferry, and their submodes. It is possible to describe airports and air journeys, but there has not been any specific consideration of any additional requirements that apply specifically to air transport.

Such modes may be operated, conventionally according to a fixed timetable, or flexibly as demand responsive services.

Additionally, NeTEx v2.0 takes into account the alternative modes of operation such as cycle hire, taxis, car-pooling, ride sharing. They have both network (i.e., places where services may be accessed), service (i.e., the available services and how to book them), and fare aspects (i.e., the costs of different services).

NeTEx v2.0 distinguishes the following types of 'mode of operation':

— conventional mode of operation: the legacy method of operation which is provided as a scheduled and/or flexible publicly advertised flexible transport offer. This method of operation is either following a fixed schedule and fixed routes or linked to a fixed network/schedule but offering flexibility, in order for instance, to optimise the service or to satisfy passenger demand;

— alternative mode of operation: any publicly advertised mode of operation different from the conventional mode of operation, in particular vehicle sharing, vehicle rental and vehicle pooling; and

— personal mode of operation: a private mode of transport excluding any publicly advertised use.

0.3 Compatibility with existing standards and recommendations

The concepts covered in NeTEx that relate in particular to long-distance train travel include; rail operators and related organisations; stations and related equipment; journey coupling and journey parts; train composition and facilities; planned passing times; timetable versions and validity conditions.

In the case of long distance train the NeTEx takes into account the requirements formulated by the ERA (European Rail Agency) – TAP/TSI (Telematics Applications for Passenger/ Technical Specification for Interoperability, entered into force on 13 May 2011 as the Commission Regulation (EU) No 454/2011), based on UIC directives.

As regards the other exchange protocols, a formal compatibility is ensured with TransXChange (UK), VDV 452 (Germany), NEPTUNE (France), UIC Leaflet, BISON (Netherland) and NOPTIS (Nordic Public Transport Interface Standard).

The data exchange is possible either through dedicated web services, through data file exchanges, or using the SIRI exchange protocol as described in part 2 of the SIRI documentation.

1 Scope

This document presents Part 2 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. As defined by Transmodel, 'Public transport' has to be understood as services advertised and available for use by the general public carried out by any means of transport.

This Technical Specification is made up of six parts defining a single European Standard, 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 case shared with part 2, and 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, 3, 4, 5 and 6 rely on Part 1 and possibly any previous part..

The XML schema can be downloaded from http://netex-cen.eu (or directly from https://github.com/NeTEx-CEN/NeTEx), along with available guidance on its use, example XML files, and case studies of national and local deployments.

This document is highly technical, and a special care has been taken to keep the text readable. In particular a set of formatting conventions is followed that enhances the usual CEN writing rules in order to distinguish references to elements of the formal models within text:

Transmodel terms and NeTEx conceptual model elements are in capital letters (JOURNEY PATTERN for example).

NeTEx physical model names are in bold italic font and use CamelCase style with no spaces (JourneyPattern, for example).

NeTEx physical model attribute types are in italic font and use CamelCase style with no spaces (TypeOfEntity, for example).

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.

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in CEN/TS 16614-1 apply.

4 Symbols and abbreviations

For the purposes of this document, the symbols and abbreviations given in CEN/TS 16614-1 apply.

5 Use Cases for Journey & Journey Time Exchange

NeTEx Part 2 shares its use cases with NeTEx Part 1 since many use cases involve both Part 1 and Part 2 entities. Please refer to NeTEx Part 1 for a detailed use case description.

6 Generic Physical Model and XSD mapping rules

For consistency, the mapping rules for transforming a Conceptual Model to Physical Model and then to XSD are shared between all parts of NeTEx.

Please refer to NeTEx Part 1 for a detailed description of the Physical Model and XSD mapping rules.

7 Timing Information – Conceptual and physical data model

7.1 Introduction

The NeTEx Part 2 timing information model is split into four main submodels defined as UML packages.

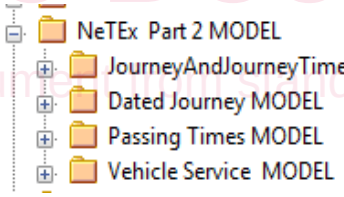

Figure 1 – NeTEx Part 2 main packages

8 The Journey and Journey Times model

8.1 General

Describes the model planned services and dead runs and their timings

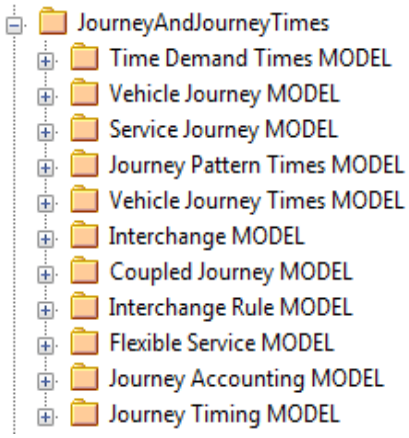

Figure 2 – JourneyAndJourneyTimes packages

The dated journey model: describes the services for a single operating day

The passing times model: describes all the different types of passing times

The vehicle service model: describes the information related to vehicles and their services

8.2 Journey and Journey Times – Model dependencies

The JOURNEY AND JOURNEY TIMES Model describes the VEHICLE JOURNEYs and other components making up a timetable and is itself divided into a number of separate submodels covering different aspects of VEHICLE JOURNEYs. For ease of understanding, the submodels are presented one at a time, each describing only a small set of related concepts.

The submodels depend on a number of general NeTEx framework models and reusable components described elsewhere (for example, the GENERIC POINT AND LINK model, NOTICE model, etc.,) – See NeTEx Part 1 for further details.

The following figure shows the dependencies between the JOURNEY AND JOURNEY TIMES physical submodels. The terminal packages contain the SERVICE FRAME and the TIMETABLE FRAME. These two VERSION FRAMEs are containers that organise the other payload elements into a coherent set of elements suitable for exchange as a serialised file. The payload elements are contained in the following packages:

TIMETABLE FRAME

VEHICLE JOURNEY Models journeys that vehicles make.

SERVICE JOURNEY Additionally models the properties of journeys that carry passengers.

TIME DEMAND TIMEs Models the times of the different demand levels found during a day.

PASSING TIMEs Describes the times of vehicles at points in their journey.

JOURNEY TIMINGs Describes the common timing properties for journeys.

JOURNEY PATTERN TIMEs Describes the timings of JOURNEY PATTERNs.

VEHICLE JOURNEY TIMEs Describes the timings of VEHICLE JOURNEYs.

INTERCHANGE Describes interchanges between journeys.

COUPLED JOURNEY Describes multipart journeys which join and split.

FLEXIBLE SERVICE: additional describes demand responsive transport services.

JOURNEY ACCOUNTING Assigns a cost basis for journeys.

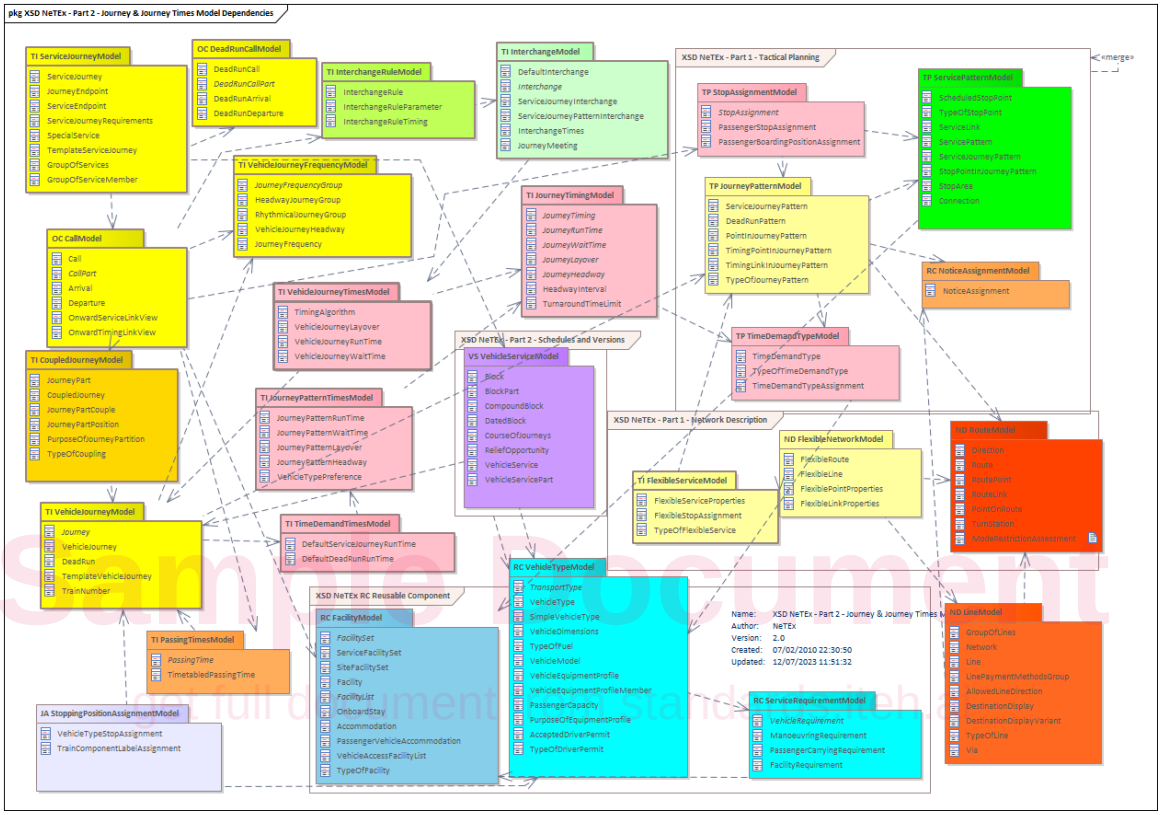

Figure 3 — Journey – Model Dependencies (UML)

8.3 Explicit Frames

8.3.1 Timetable Frame

8.3.1.1 TIMETABLE FRAME – Conceptual MODEL

The elements of the JOURNEY AND JOURNEY TIMES model can be grouped with a TIMETABLE FRAME which holds a coherent set of timetable related elements for data exchange (see VERSION FRAME in the NeTEx Framework section for general concepts relating to version frames).

The primary component exchanged by a TIMETABLE FRAME is a SERVICE JOURNEY, which describes an individual journey. This and other components of a TIMETABLE FRAME are described in detail in the following sections.

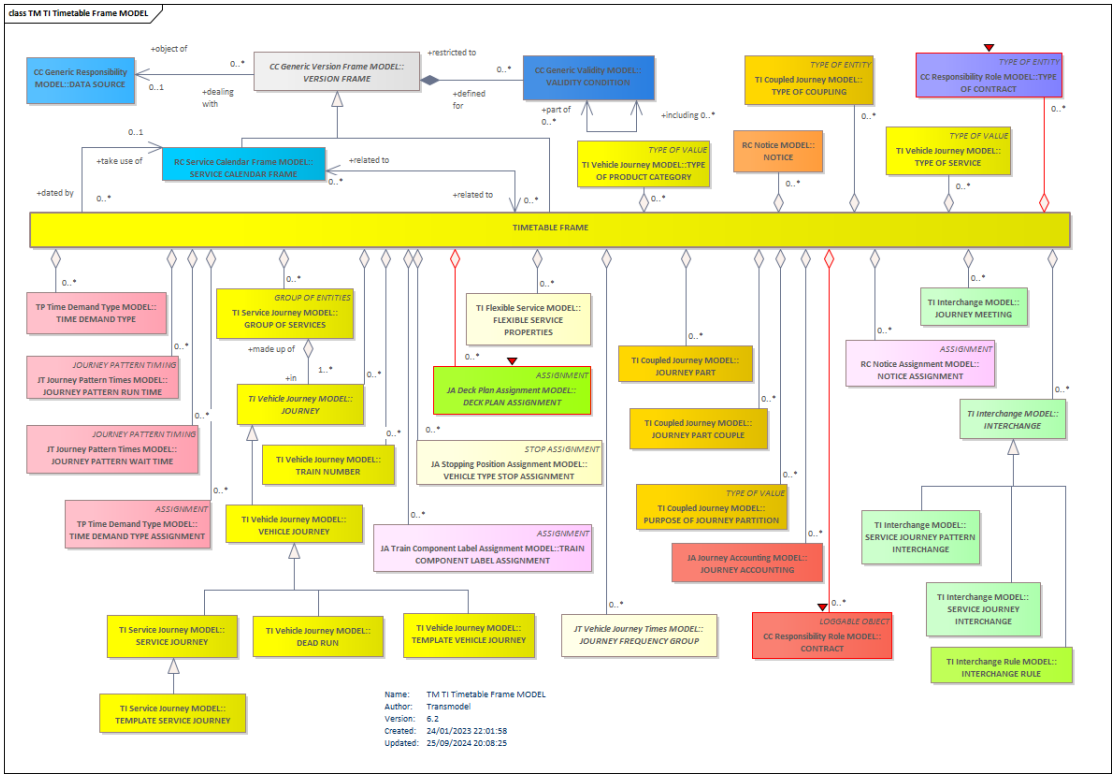

Figure 4 — Timetable Frame – Conceptual MODEL (UML)

8.3.1.2 Timetable Frame – Physical Model

The following diagram gives an overview of the contents of a TIMETABLE FRAME.

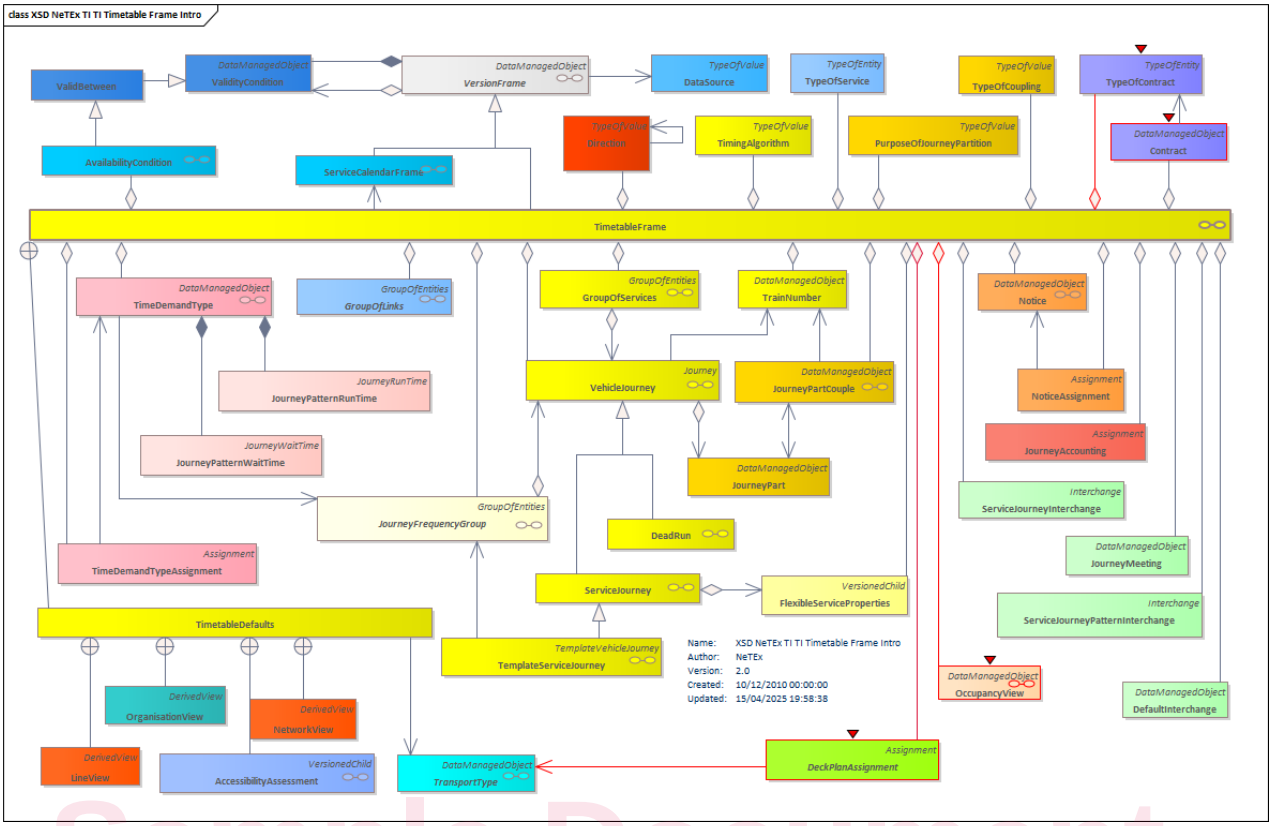

Figure 5 — Timetable Frame Contents – Physical Model (UML)