SLOVENSKI STANDARD
SIST-TS CEN/TS 16614-2:2020

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SIST-TS CEN/TS 16614-2:2014

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

Ta slovenski standard je istoveten z:　　　**CEN/TS 16614-2:2020**

ICS:

03.220.01	Transport na splošno	Transport in general
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SIST-TS CEN/TS 16614-2:2020　　　　**en,fr,de**

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TECHNICAL SPECIFICATION

SPÉCIFICATION TECHNIQUE

TECHNISCHE SPEZIFIKATION

CEN/TS 16614-2

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ICS 35.240.60

Supersedes CEN/TS 16614-2:2014

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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This Technical Specification (CEN/TS) was approved by CEN on 2 March 2020 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.

CEN members are required to announce the existence of this CEN/TS in the same way as for an EN and to make the CEN/TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the CEN/TS) until the final decision about the possible conversion of the CEN/TS into an EN is reached.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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CEN/TS 16614-2:2020 (E)

European foreword

This document (CEN/TS 16614-2:2020) 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 supersedes CEN/TS 16614-2:2014.

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.

NeTEx is made up of three 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 1 is fully standalone, and Parts 2 and 3 rely on Part 1.

The XML schema can be downloaded from http://netex-cen.eu, 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 on keeping the text readable. This has been done through a set of editorial rules enhancing usual CEN writing rules:

- To avoid confusion with usual wording, Transmodel terms are in capital letters (JOURNEY PATTERN for example).
- To avoid confusion with usual wording, attributes names are in bold/italic style and use camelcase style with no spaces (JourneyPattern for example).
- To avoid confusion with usual wording, attributes types are in italic style and use camelcase style with no spaces (TypeOfEntity for example).

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to announce this document: 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, Turkey and the United Kingdom.

Introduction

Public transport services rely increasingly on information systems to ensure reliable, efficient operation and widely accessible, accurate passenger information. 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 European Technical Specification specifies a Network and Timetable Exchange (NeTEx) about public transport. It is intended to be used to exchange data relating to scheduled 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.

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1 Scope

1.1 General

NeTEx is dedicated to the exchange of scheduled data (network, timetable and fare information) based on Transmodel V5.1 (EN 12986), IFOPT (CEN/TS 28701) and SIRI (CEN/TS 15531-4/5 and EN 15531-1/2/3[1]) and supports information exchange of relevance to public transport services for passenger information and AVMS systems.

NOTE   Many NeTEx concepts are taken directly from Transmodel and IFOPT; 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 transit scheduling systems and AVMS (Automated Vehicle Monitoring Systems). However it is not restricted to these purposes, and NeTEx can provide an effective solution to many other use cases for transport exchange.

1.2 Transport modes

Most 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 provisions that apply especially to air transport.

1.3 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 organizations; 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.

2 Normative references

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

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.

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[1] Under preparation.

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
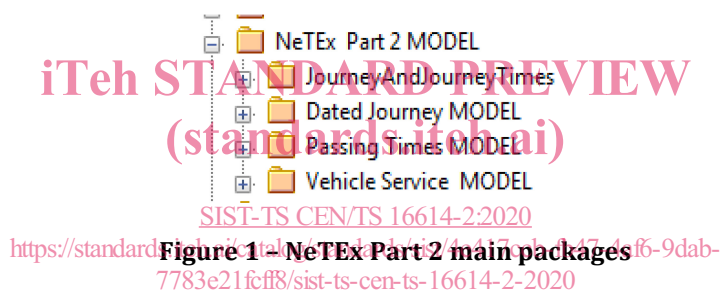
The Journey and Journey Times model: describes the model planned services and dead runs and their timings
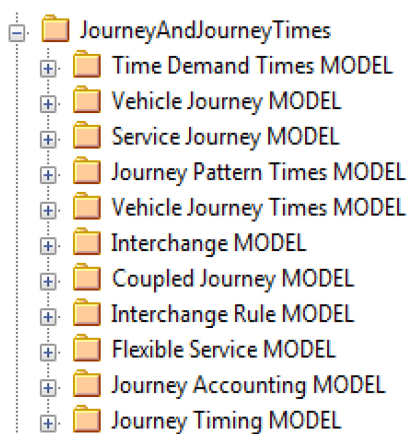

Figure 2 – JourneyAndJourneyTimes packages

- 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

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7.2 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:
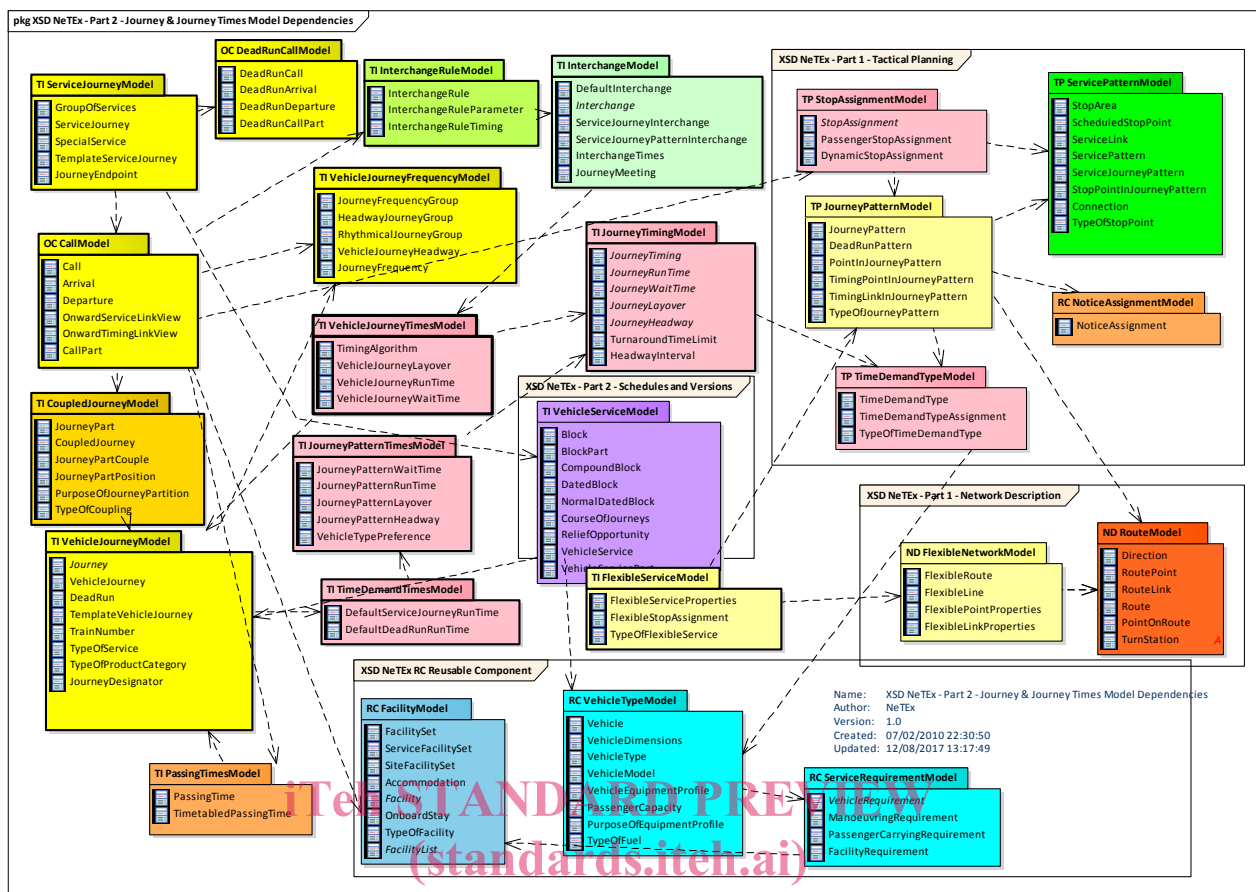
TIMETABLE FRAME

- 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**

7.3 Explicit Frames

7.3.1 Timetable Frame

7.3.1.1 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.

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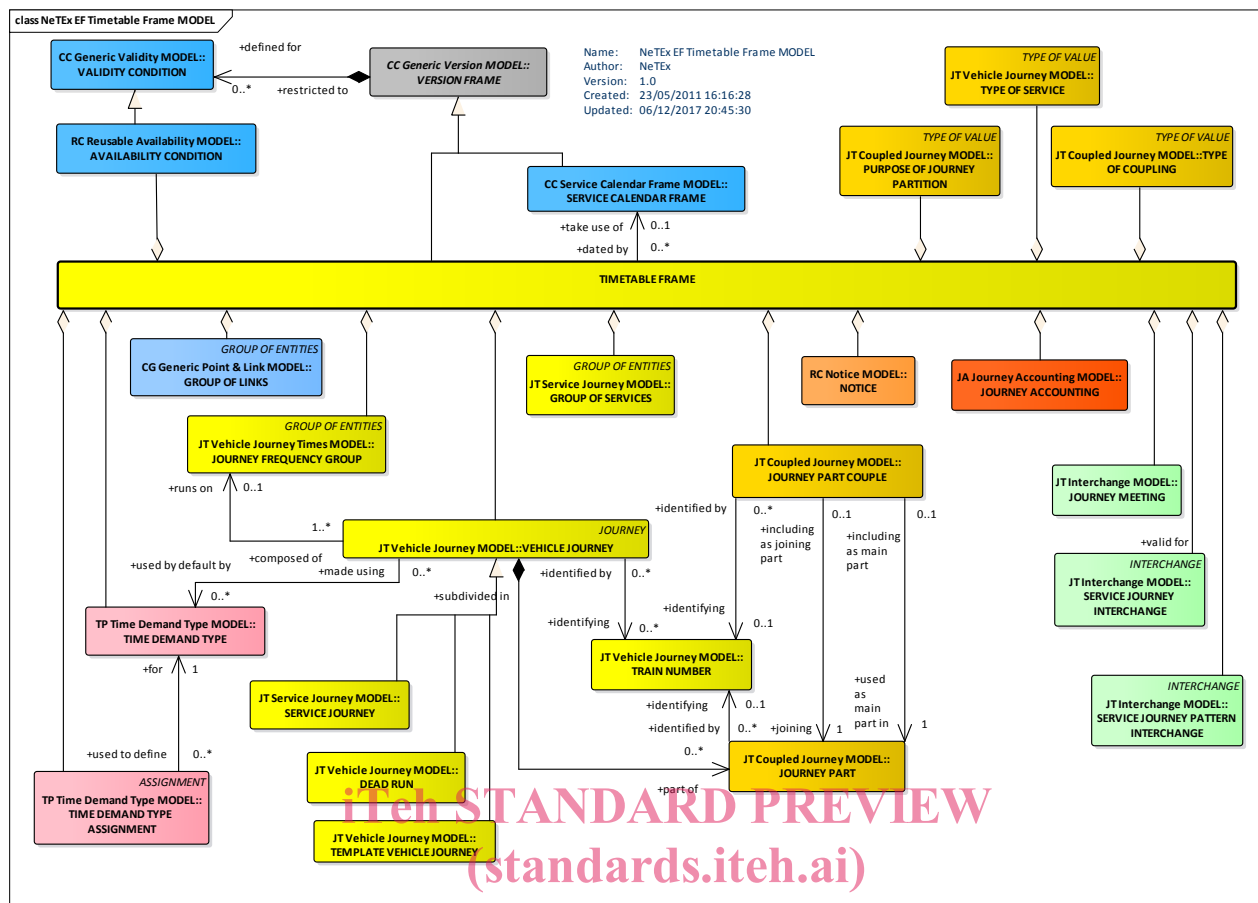
Figure 4 — Timetable Frame – Conceptual MODEL (UML)

7.3.1.2   Timetable Frame – Physical Model

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

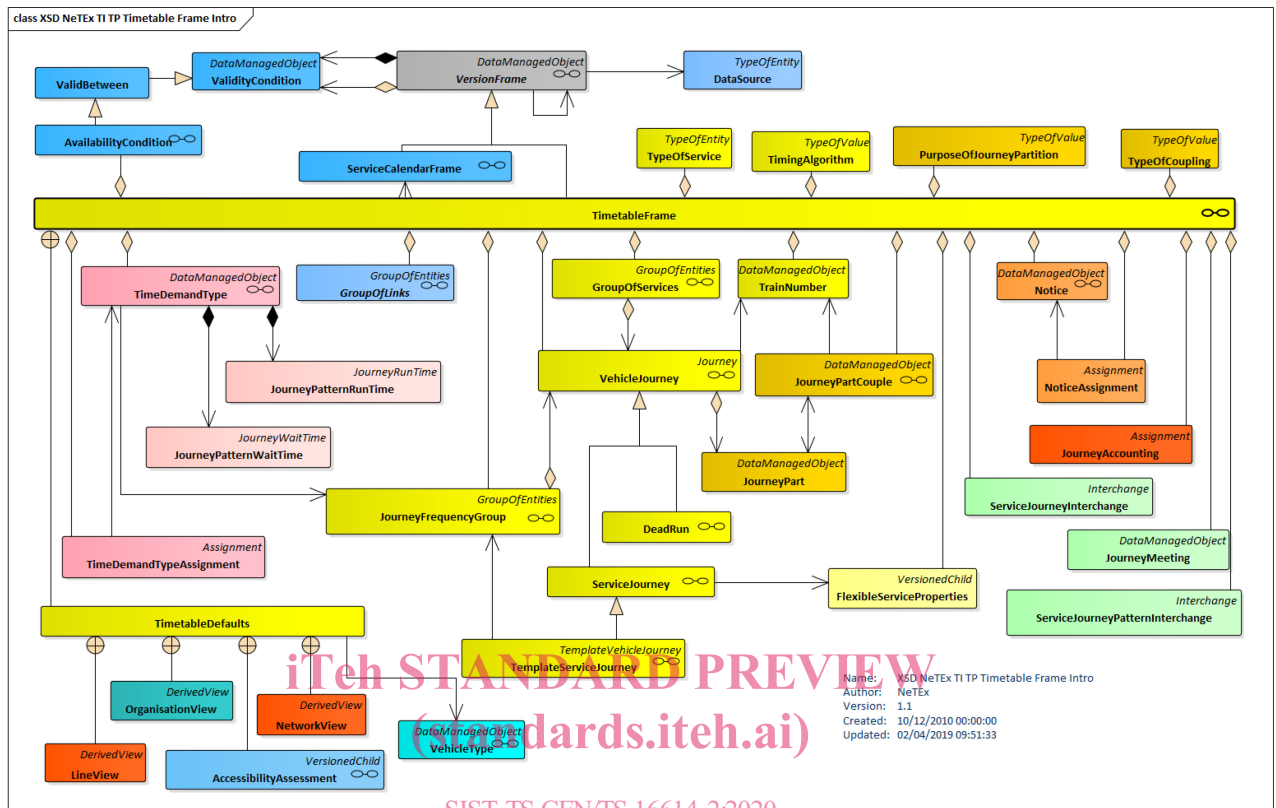**Figure 5 — Timetable Frame Contents – Physical Model (UML)**

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7.3.1.3   Timetable Frame Details – Physical Model

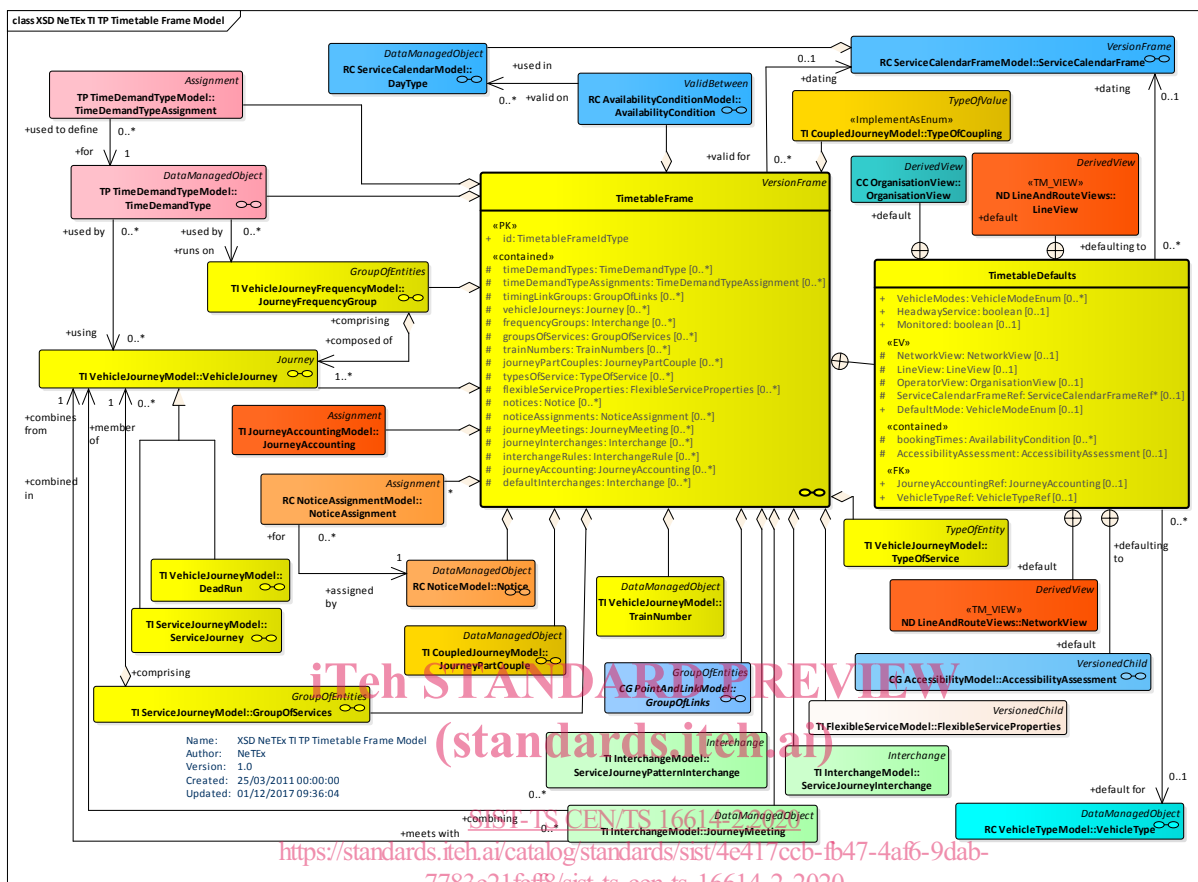The following diagram shows the Physical model for a TIMETABLE FRAME.

Figure 6 — Timetable Frame – Physical Model Detail (UML)

7.3.1.4   Timetable Frame – XSD and attributes

7.3.1.4.1   TimetableFrame – Model Element

A set of timetable data (VEHICLE JOURNEYs, etc.) to which the same VALIDITY CONDITIONs have been assigned.

Table 1 – *TimetableFrame* – Element

Classification	Name	Type	Cardi-nality	Description
::>	*::>*	*VersionFrame*	*::>*	TIMETABLE FRAME inherits from VERSION FRAME.
«PK»	*id*	*TimetableFrameIdType*	1:1	Identifier of TIMETABLE FRAME.
«enum»	*VehicleModes*	*VehicleModeEnum*	0:*	Reference to vehicle transport MODEs for TIMETABLE.
	HeadwayService	*xsd:boolean*	0:1	Whether services of TIMETA-BLE are operated a headway services.
	Monitored	*xsd:boolean*	0:1	Whether services of TIMETA-BLE are monitored in real time.

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Classification	Name	Type	Cardi-nality	Description
XGRP	*TimetableDefaultsGroup*	*xmlGroup*	0:1	Elements specifying shared defaults for timetable.
«cntd»	*timeDemandTypes*	*TimeDemandType*	0:*	TIME DEMAND TYPEs in the frame.
«cntd»	*timeDemandTypeAssignments*	*TimeDemandTypeAssignment*	0:*	TIME DEMAND TYPE ASSIGNMENTS in the frame.
«cntd»	*timingLinkGroups*	*GroupOfLinks*	0:*	TIMING LINK GROUPs in the frame.
XGRP	*TimetableJourneyInFrameGroup*	*xmlGroup*	0:1	Elements describing VEHICLE JOURNEYs in timetable.
«cntd»	*notices*	*Notice*	0:*	NOTICEs in the frame.
«cntd»	*noticeAssignments*	*NoticeAssignment*	0:*	NOTICE ASSIGNMENTs in the frame.
XGRP	*InterchangesInFrameGroup*	*xmlGroup*	0:1	Elements describing INTERCHANGEs in timetable.
«cntd»	*vehicleTypes*	*VehicleType*	0:*	VEHICLE TYPEs in the frame.
«cntd»	*journeyAccountings*	*JourneyAccounting*	0:*	Default JOURNEY ACCOUNTING values for JOURNEYs in frame.