

# **SLOVENSKI STANDARD**

## **SIST-TS CEN/TS 16614-3:2020**

**01-junij-2020**

**Nadomešča:**

**SIST-TS CEN/TS 16614-3:2016**

---

**Javni prevoz - Izmenjava omrežnih in voznorednih podatkov (NeTEx) - 3. del:  
Format za izmenjavo informacij o vozovnicah**

Public transport - Network and Timetable Exchange (NeTEx) - Part 3: Public transport fares exchange format

Öffentlicher Verkehr - Netzwerk- und Fahrplan Austausch (NeTEx) - Teil 3:  
Austauschformat für das Fahrgeld im öffentlichen Verkehr

Transport public - Echange des données de réseau et d'horaires (NeTEx) - Partie 3 :  
Format d'échange d'informations voyageurs concernant le réseau de transport public

**Ta slovenski standard je istoveten z: CEN/TS 16614-3:2020**

---

**ICS:**

|           |                                  |                              |
|-----------|----------------------------------|------------------------------|
| 35.240.60 | Uporabniške rešitve IT v prometu | IT applications in transport |
|-----------|----------------------------------|------------------------------|

**SIST-TS CEN/TS 16614-3:2020**

**en,fr,de**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

Full standard:  
<https://standards.iteh.ai/catalog/standards/sist/0a7bc67d-29ba-40c9-a303-58987b7de382/sist-ts-cen-ts-16614-3-2020>

TECHNICAL SPECIFICATION  
SPÉCIFICATION TECHNIQUE  
TECHNISCHE SPEZIFIKATION

**CEN/TS 16614-3**

April 2020

ICS 35.240.60

Supersedes CEN/TS 16614-3:2016

English Version

**Public transport - Network and Timetable Exchange  
(NeTEx) - Part 3: Public transport fares exchange format**

Transport Public - Echanges des informations  
planifiées (NeTEx) - Partie 3: Echange des informations  
tarifaires pour le transport public

Öffentlicher Verkehr - Netzwerk- und Fahrplan  
Austausch (NeTEx) - Teil 3: Austauschformat für das  
Fahrgeld im öffentlichen Verkehr

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.

CEN members are the national standards bodies of 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 United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

TECHNICAL SPECIFICATION  
SPÉCIFICATION TECHNIQUE  
TECHNISCHE SPEZIFIKATION

**CEN/TS 16614-3**

April 2020

ICS 35.240.60

Supersedes CEN/TS 16614-3:2016

English Version

**Public transport - Network and Timetable Exchange  
(NeTEx) - Part 3: Public transport fares exchange format**

Transport Public - Echanges des informations  
planifiées (NeTEx) - Partie 3: Echange des informations  
tarifaires pour le transport public

Öffentlicher Verkehr - Netzwerk- und Fahrplan  
Austausch (NeTEx) - Teil 3: Austauschformat für das  
Fahrgeld im öffentlichen Verkehr

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.

CEN members are the national standards bodies of 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 United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

## Contents

Page

|                                                                     |     |
|---------------------------------------------------------------------|-----|
| European foreword .....                                             | 4   |
| Introduction .....                                                  | 5   |
| 1 Scope .....                                                       | 6   |
| 1.1 General .....                                                   | 6   |
| 1.2 Fares scope .....                                               | 6   |
| 1.3 Transport modes .....                                           | 7   |
| 1.4 Compatibility with existing standards and recommendations ..... | 7   |
| 2 Normative references .....                                        | 7   |
| 3 Terms and definitions .....                                       | 8   |
| 4 Symbols and abbreviations .....                                   | 27  |
| 5 Use Cases for Fare Exchange .....                                 | 28  |
| 5.1 Purpose .....                                                   | 28  |
| 5.2 Business context .....                                          | 28  |
| 5.2.1 Fare planning process .....                                   | 28  |
| 5.3 Actors and use case types .....                                 | 33  |
| 5.3.1 Use Cases for Fare Policy .....                               | 36  |
| 5.3.2 Use Cases for Organisation of Fare Policy Usage .....         | 36  |
| 5.4 Excluded Use Cases .....                                        | 37  |
| 5.5 Use Cases .....                                                 | 37  |
| 5.5.1 Collection of Use Cases .....                                 | 37  |
| 6 Generic Physical Model and XSD mapping rules .....                | 64  |
| 7 Public Transport Fares – Conceptual and physical data model ..... | 64  |
| 7.1 Introduction .....                                              | 64  |
| 7.2 Conceptual Model overview .....                                 | 64  |
| 7.2.1 Functional Domains .....                                      | 64  |
| 7.2.2 Data Model Overview .....                                     | 66  |
| 7.2.3 Main Concepts .....                                           | 68  |
| 7.3 Fare Model dependencies .....                                   | 72  |
| 7.3.1 NeTEx Part3 Use of Version Frames .....                       | 74  |
| 7.3.2 Fare Frame .....                                              | 75  |
| 7.4 Reusable Fare Components .....                                  | 92  |
| 7.4.1 Fare Zone .....                                               | 92  |
| 7.4.2 Fare Facility .....                                           | 111 |
| 7.4.3 Vehicle Seating .....                                         | 114 |
| 7.5 Fare Structure .....                                            | 115 |
| 7.5.1 Fare Structure – Model dependencies .....                     | 115 |
| 7.5.2 Common Fare Structure .....                                   | 116 |
| 7.5.3 Geographical Fare Structure .....                             | 123 |
| 7.5.4 Time Fare Structure .....                                     | 132 |
| 7.5.5 Quality Fare Structure .....                                  | 140 |
| 7.5.6 Fare Structure Element .....                                  | 150 |
| 7.5.7 Distance Matrix Element .....                                 | 178 |
| 7.5.8 Validable & Controllable Elements .....                       | 189 |
| 7.6 Access Rights Description .....                                 | 200 |

|              |                                                                           |     |
|--------------|---------------------------------------------------------------------------|-----|
| 7.6.1        | Access Right Parameters.....                                              | 200 |
| 7.6.2        | Fare Product.....                                                         | 338 |
| 7.7          | Pricing.....                                                              | 383 |
| 7.7.1        | Fare Calculation Parameters.....                                          | 383 |
| 7.7.2        | Fare Price.....                                                           | 398 |
| 7.7.3        | Fare Table.....                                                           | 411 |
| 7.8          | Sales Description.....                                                    | 436 |
| 7.8.1        | Fare Sales Distribution.....                                              | 436 |
| 7.8.2        | Type of Travel Document.....                                              | 447 |
| 7.8.3        | Sales Offer Package.....                                                  | 451 |
| 8            | Sales Transactions.....                                                   | 477 |
| 8.1          | Sales Transaction – Model dependencies.....                               | 477 |
| 8.1.1        | Sales Transaction Frame.....                                              | 478 |
| 8.1.2        | Fare Contract.....                                                        | 482 |
| 8.1.3        | Customer Eligibility.....                                                 | 498 |
| 8.1.4        | Retail.....                                                               | 502 |
| 8.1.5        | Sales Transaction.....                                                    | 508 |
| 8.1.6        | Travel Specification.....                                                 | 519 |
| 8.1.7        | Customer Purchase Package.....                                            | 533 |
| Annex A      | (normative) Extensions to NeTEx Part1 & 2.....                            | 551 |
| Annex B      | (informative) ERA – TAP TSI annexes B1, B2 and B3 mapping.....            | 552 |
| B.1          | Summary of mapping of B1 (NRT) fares.....                                 | 552 |
| B.2          | Summary of mapping of B2 (IRT) fares.....                                 | 552 |
| B.3          | Summary of mapping of B3 (Special) fares.....                             | 553 |
| Annex C      | (informative) NeTEx Passenger Information Query model.....                | 554 |
| C.1          | PiRequest.....                                                            | 554 |
| C.1.1        | PI Request dependencies.....                                              | 554 |
| C.1.2        | Pi Request.....                                                           | 556 |
| Annex D      | (informative) How to go from a trip (from NeTEx Part1&2) to a fare ?..... | 594 |
| D.1          | Passenger Trip.....                                                       | 594 |
| D.1.1        | Passenger Trip Model.....                                                 | 594 |
| D.1.2        | Passenger Fare Offer Model.....                                           | 603 |
| Annex E      | (informative) Proposed model for Parking Tariff.....                      | 608 |
| E.1          | Parking Tariff.....                                                       | 608 |
| E.1.1        | Parking Tariff – Conceptual MODEL.....                                    | 608 |
| Annex F      | (informative) Changes in Version 1.1.....                                 | 615 |
| F.1          | Introduction.....                                                         | 615 |
| F.2          | General Changes.....                                                      | 615 |
| F.3          | List of Changes.....                                                      | 615 |
| Bibliography | .....                                                                     | 621 |

## European foreword

This document (CEN/TS 16614-3:2020) 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 16614-3:2016.

This document presents Part 3 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 Technical Specification is made up of three 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, 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 part 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 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 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; publicising fares, issuing tickets and receipts; providing real-time information on service running, and so on.

The first two parts of the European Technical Specification NeTEx specify a Network and Timetable Exchange for 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 complementary 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.

This document (NeTEx – Part 3) specifies exchanges of Public Transport fares between systems and organisations. It is a complement to Part 1 and Part 2 in the sense that it uses a subset of concepts defined there.

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, (iii) 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: a modular reusing of 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.



# 1 Scope

## 1.1 General

NeTEx is dedicated to the exchange of scheduled data (network, timetable and fare information). It is based on Transmodel V5.1 (EN 12986), IFOPT (EN 28701) and SIRI (CEN/TS 15531-4/5 and EN 15531-1/2/3<sup>1</sup>) and supports the exchange of information of relevance for passenger information about public transport services and also for running Automated Vehicle Monitoring Systems (AVMS).

NOTE NeTEx is a refinement and an implementation of Transmodel and IFOPT; the definitions and explanations of these concepts are extracted directly from the respective standard and reused in NeTEx, sometimes with adaptations in order to fit the NeTEx context. Although the data exchanges targeted by NeTEx are predominantly oriented towards provisioning passenger information systems and AVMS with data from transit scheduling systems, it is not restricted to this purpose and NeTEx can also provide an effective solution to many other use cases for transport data exchange.

## 1.2 Fares scope

This Part 3 of NeTEx, is specifically concerned with the exchange of fare structures and fare data, using data models that relate to the underlying network and timetable models defined in Part 1 and Part 2 and the Fare Collection data model defined in Transmodel V5.1. See the use cases below for the overall scope of Part 3. In summary, it is concerned with data for the following purposes:

- (i) To describe the many various possible fare structures that arise in public transport (for example, flat fares, zonal fares, time dependent fares, distance-based fares, stage fares, pay as you go fares, season passes, etc., etc.).
- (ii) To describe the fare products that may be purchased having these fare structures and to describe the conditions that may attach to particular fares, for example if restricted to specific groups of users, or subject to temporal restrictions. These conditions may be complex.
- (i) To allow actual price data to be exchanged. Note however that NeTEx does not itself specify pricing algorithms or how fares should be calculated. This is the concern of Fare Management Systems. It may be used may be used to exchange various parameters required for pricing calculations that are needed to explain or justify a fare.
- (iii) To include the attributes and the text descriptions necessary to present fares and their conditions of sale and use to the public.

NeTEx should be regarded as being 'upstream' of retail systems and allows fare data to be managed and integrated with journey planning and network data in public facing information systems. It is complementary to and distinct from the 'downstream' ticketing and retail systems that sell fares and of the control systems that validate their use. See 'Excluded Use Cases' below for further information on the boundaries of NeTEx with Fare Management Systems.

---

<sup>1</sup> Under preparation.

### 1.3 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, air journeys, and air fares, but there has not been any specific consideration of any additional requirements that apply specifically to air transport.

### 1.4 Compatibility with existing standards and recommendations

The overall approach for the definition of fares within NeTEx Part 3 follows the approach used by Transmodel V5.1, namely the definition of access rights rather than of just products.

This approach, used in Transmodel V5.1 (Fare Collection data model) to specify the access rights related to the urban public transport (for all urban modes) has been extended to cover access rights for long-distance rail.

**NOTE** The concepts from Transmodel V5.1 and IFOPT used and/or modified by NeTEx are incorporated into Transmodel V6 to guarantee compatibility and coherence of standards.

Concepts covered in NeTEx Part 1 and 2 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 and train routing restrictions.

In the case of long distance train access rights, 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. These relate in particular to the B1 (Non Reservation Tickets), B2 (Integrated Reservation Tickets) and B3 (Special Fares) along with various UIC Leaflets.

As regards the other exchange protocols for network and timetable exchanges, a formal compatibility is ensured with TransXChange (UK), VDV 452 (Germany), NEPTUNE (France), BISON (The Netherlands) and NOPTIS (Nordic Public Transport Interface Standard).

The exchange of data in NeTEx format can be undertaken using a variety of protocols. For example: through dedicated web services, through data file exchanges, or by using the SIRI exchange protocol as described in part 2 of the SIRI documentation. NeTEx adds additional services using the common SIRI transport mechanism.

## 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*

## CEN/TS 16614-3:2020 (E)

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in CEN/TS 16614-1:2019 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

**NOTE** A lot of definitions are shared with Transmodel (EN 12896): special attention was paid to the consistency of definitions, keeping exactly the same wording. The italic bracket name at the beginning of the definition is a package name that will help the reader to find the related concept in the UML data model.

#### 3.1

##### **access right in product**

*(Fare Product MODEL)*

VALIDABLE ELEMENT as a part of a PRE-ASSIGNED FARE PRODUCT, including its possible order in the set of all VALIDABLE ELEMENTs grouped together to define the access right assigned to that PRE-ASSIGNED FARE PRODUCT

#### 3.2

##### **access right parameter assignment**

*(Validity Parameters MODEL)*

assignment of a fare collection parameter (referring to geography, time, quality or usage) to an element of a fare system (access right, validated access, control mean, etc.)

#### 3.3

##### **amount of price unit**

*(Fare Product MODEL)*

FARE PRODUCT consisting in a stored value of PRICE UNITS: an amount of money on an electronic purse, amount of units on a value card etc.

#### 3.4

##### **blacklist**

*(Fare Contract MODEL)*

list of identified TRAVEL DOCUMENTs or CONTRACTs the validity of which has been cancelled temporarily or permanently, for a specific reason like loss of the document, technical malfunction, no credit on bank account, offences committed by the customer, etc.

#### 3.5

##### **border point**

*(Fare Zone MODEL)*

POINT on the Network marking a boundary for the fare calculation

Note 1 to entry: May or may not be a SCHEDULED STOP POINT

**3.6****cancelling***(Cancelling Usage Parameters MODEL)*

Parameter giving conditions for cancelling of a purchased access right

**3.7****capped discount right***(Fare Product MODEL)*

specialisation of SALE DISCOUNT RIGHT where the discount is expressed as a rule specifying a ceiling for a given time interval

Note 1 to entry: For example, the London Oyster card fare, which charges for each journey until travel equivalent to a day pass has been consumed after which further travel is free at that day

**3.8****capping rule***(Fare Product MODEL)*

capping limit for a given time interval, where the capping is expressed by another product

Note 1 to entry: For example, the London Oyster card fare, which charges for each journey until travel equivalent to a day pass for the mode of travel has been consumed

**3.9****capping rule price***(Fare Product MODEL)*

set of all possible price features of a CAPPING RULE: default total price, discount in value or percentage etc.

**3.10****cell***(Fare Table MODEL)*

unique individual combination of features within a FARE TABLE, used to associate a FARE PRICE with a fare element

**3.11****charging moment***(Fare Product MODEL)*

classification of FARE PRODUCTS according to the payment method and the account location: pre-payment with cancellation (throw-away), pre-payment with debit on a value card, pre-payment without consumption registration (pass), post-payment etc.

**3.12****charging policy***(Charging Usage Parameters MODEL)*

Parameter governing minimum amount and credit allowed when consuming a FARE PRODUCT

## CEN/TS 16614-3:2020 (E)

## 3.13

**commercial profile***(Eligibility Usage Parameters MODEL)*

category of users depending on their commercial relations with the operator (frequency of use, amount of purchase etc.), often used for allowing discounts

## 3.14

**companion profile***(Eligibility Usage Parameters MODEL)*

number and characteristics of the persons entitled to travel in a group or as companions to another USER PROFILE

## 3.15

**controllable element***(Validable Element MODEL)*

smallest controllable element of public transport consumption, all along which any VALIDITY PARAMETER ASSIGNMENT remains valid

## 3.16

**controllable element in sequence***(Validable Element MODEL)*

CONTROLLABLE ELEMENT as a part of a FARE STRUCTURE ELEMENT, including its possible order in the sequence of CONTROLLABLE ELEMENTs grouped together to form that FARE STRUCTURE ELEMENT, and its possible quantitative limitation

## 3.17

**controllable element price***(Validable Element MODEL)*

set of all possible price features of a CONTROLLABLE ELEMENT: default total price, discount in value or percentage etc.

## 3.18

**customer***(Fare Contract MODEL)*

identified person or organisation involved in a fare process

Note 1 to entry: There may be a CONTRACT between the CUSTOMER and the OPERATOR or the AUTHORITY ruling the consumption of services

## 3.19

**discounting rule***(Fare Calculation Parameters MODEL)*

price calculation rule determined by a set of discounts, depending upon a USAGE PARAMETER, to be applied to a FARE PRICE