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### Javni prevoz - Referenčni podatkovni model - 1. del: Splošni pojmi

Public transport - Reference data model - Part 1: Common concepts

Öffentlicher Verkehr - Datenreferenzmodell - Teil 1: Gemeinsame Konzepte

Transports publics - Modèle de données de référence - Partie 1: Concepts communs

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 12896-1**

July 2026

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**Public transport - Reference data model - Part 1: Common  
concepts**

Transports publics - Modèle de données de référence -  
Partie 1: Concepts communs

Öffentlicher Verkehr - Datenreferenzmodell - Teil 1:  
Gemeinsame Konzepte

This European Standard was approved by CEN on 15 April 2026.

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## European foreword

This document (EN 12896-1:2026) has been prepared by Technical Committee CEN/TC 278 “Intelligent transport system”, the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2027, and conflicting national standards shall be withdrawn at the latest by January 2027.

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 EN 12896-1:2015.

This document is part of the European standard EN 12896, known as “Transmodel”. This European standard is a series of documents that comprises of the following ones:

- EN 12896-1, Public transport - Reference data model - Part 1: Common concepts,
- EN 12896-2, Public transport - Reference data model - Part 2: Public transport network,
- EN 12896-3, Public transport - Reference data model - Part 3: Timing information and vehicle scheduling,
- 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 and statistics,
- EN 12896-10, Public transport – Reference data model – Part 10: Alternative modes.

Together these documents create Transmodel version 6.2 and thus replace Transmodel V6.0.

In addition to the nine normative Parts of this European Standard, a Technical Report (Public Transport – Reference Data Model – Informative Documentation) was published in 2016 under the reference CEN/TR 12896-9. It provides additional information to help those implementing projects involving the use of Transmodel. It is intended that this Technical Report will be extended and republished as soon as all the normative parts are revised.

The split into several documents is intended to ease the task of users interested in particular functional domains. It corresponds to the modularisation of Transmodel into functionally related parts, each made up of distinct UML packages and subpackages that describe a particular aspect of public transport. The NeTEx UML model follows the same modularisation, allowing a direct mapping from the conceptual model to the implementation.

Annex C provides details of the significant technical changes between this document and EN 12896-1:2015

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Annex D describes all conventions, methodology and notations for conceptual modelling, applicable to the EN 12896 series.

Annex E provides a clear overview to help readers understand the core principles, structure, and purpose of Transmodel.

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 implement this European Standard: 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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## 1 Scope

This document incorporates data structures used by all other data domains of Transmodel. It is composed of the following data packages:

- versions and validity;
- responsibility;
- generic framework;
- reusable components;
- explicit frames referring to generic data.

The data structures represented in this part are either generic patterns that can be explicitly reused in other domains (e.g., a generic model for version frames, a generic grouping mechanism, etc.) or are referenced by different other parts (e.g., service calendar model).

This document itself is composed of the following parts:

- main document representing the data model for the concepts shared by the different domains covered by Transmodel (normative);
- Annex A containing the data dictionary and attribute tables, i.e., the list of all the concepts present in the main document, together with their definitions (normative);
- Annex B, indicating the data model evolutions (informative),
- Annex C, presenting the Transmodel development history (informative),
- Annex D, describing all conventions, methodology and notations for conceptual modelling (informative),
- Annex E, providing a clear overview to help readers understand the core principles, structure, and purpose of Transmodel (informative),
- Annex F, providing information on the Functional domains and Modes of operation (informative).
- Annex G, providing details of the significant technical changes between this document and EN 12896-1:2015 (informative).

## 2 Normative references

There are no normative references in this document.

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions.

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

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

### 3.1 General information technology terms

#### 3.1.1.

#### **attribute**

property of an entity

**EN 12896-1:2026 (E)****3.1.2.****conceptual data model**

admitted term

description of a real world domain in terms of entities, relationships and attributes, in an implementation independent manner, which should provide a structure on which the rest of the development of an application system can be based

**3.1.3.****conceptual level**

conceptual data model in the context of data modelling

**3.1.4.****database**

collection of data; often used in the sense of the physical implementation of a data model

**3.1.5.****data domain**

data structure (in this document, a part of the Reference data model for public transport) made up of data related to each other, through the fact that there is a functional area or group of functions using this data set as a whole

**3.1.6.****data model**

description of a real world domain in terms of data and relationships

**3.1.7.****entity**

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

**3.1.8.****function**

activity, or in this document, sub-activity of a functional area

**3.1.9.****functional area**

arbitrarily defined set of activities, used, in this European Standard, to define the objectives and limits of the data model

**3.1.10.****GDF database**

database containing geographical information on the road network in a particular application area, possibly including information on the location of public transport points, links and services (routes)

**3.1.11.****interoperability**

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

**3.1.12.****logical data model**

data design, that takes into account the type of database to be used, but does not consider means of utilization of space or access

**3.1.13.****logical denormalized model**

relational data model that is not fully normalized, i.e., does not completely follow the normalization rules and thus can be redundant

**3.1.14.****logical level**

logical data model in the context of data modelling

**3.1.15.****relational data model**

type of logical data model giving the information as series of tables (relations) and attributes

Note to entry: It will have the following characteristics: 1. all attribute values are atomic; 2. all “tuples” (rows/occurrences) are distinct; 3. no part of the primary key may be null; 4. foreign key values will correspond to an existing primary key in another relation or be null.

**3.1.16.****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 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

**3.2 Domain-specific terms**

NOTE Terms which are also used as the names of Transmodel ENTITIES are not included here.

**3.2.1.****fare management**

all activities related to the collection of money from passengers

**3.2.2.****management information**

all activities allowing the company management to collect the information necessary to meet problem-solving needs

Note to entry: Data of operational systems are filtered and aggregated for this purpose, and made available to the user interactively, or in the form of pre-defined reports and summaries. Such functions are in principle related to all functional areas of a company, with particular reference to the management of statistical results.

**3.2.3.****operations monitoring and control / real-time control**

all activities related to the transportation process, i.e., real-time functions related to the driving and transportation of passengers according to given instructions, including the monitoring of the driving process and its control in case of deviations, as well as all activities that support the driving process (traffic light priority, track switching, bay selection, advance/delay advice etc.)

Note to entry: Such functions are often assisted by computer-aided tools, known as Automated Vehicle Monitoring (AVM)

**EN 12896-1:2026 (E)****3.2.4.****passenger information**

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

**3.2.5.****personnel disposition**

all activities related to the mid-term and short-term management of drivers

**3.2.6.****tactical planning / scheduling**

all activities related to the tactical planning of transportation, split into vehicle scheduling, driver scheduling, rostering

**4 Abbreviations**

|       |                                                     |
|-------|-----------------------------------------------------|
| API   | Application Programming Interface                   |
| AVM   | Automatic Vehicle Monitoring                        |
| CC    | Common Concepts                                     |
| GIS   | Geographical Information System                     |
| GPS   | Global Positioning System                           |
| HTTP  | Hypertext Transfer Protocol                         |
| IFOPT | Identification of Fixed Objects in Public Transport |
| ISO   | International Standards Organisation                |
| IT    | Information Technology                              |
| NeTEx | Network and Timetable Exchange                      |
| PT    | Public Transport                                    |
| PTO   | Public Transport Operator                           |
| OJP   | Open Journey Planner                                |
| OpRa  | Operating Raw Data and statistics exchange          |
| RC    | Reusable Component                                  |
| SIRI  | Service Interface for Real-time Information         |
| TM    | Transmodel                                          |
| UML   | Unified Modelling Language                          |
| URI   | Uniform Resource Identifier                         |
| URL   | Universal Resource Locator                          |
| VDV   | Verband Deutscher Verkehrsunternehmen (Germany)     |
| WGS   | World Geodetic Standard                             |

## 5 Common concepts domains

### 5.1 Introduction to the common concepts

#### 5.1.1 General

This section describes the common concepts and components (CC) of Transmodel that are shared by all Transmodel functional parts. This data domain has three main aspects: a core framework, a set of generic framework elements, and a set of reusable components.

#### 5.1.2 Core framework mechanisms

The Core **framework** provides mechanisms for common aspects of all Transmodel objects that are needed for effective data management and exchange, such as versioning, validity, grouping, and responsibility tracking. The mechanisms, implemented through common super types and containers, and specialised in the various Transmodel functional modules, can be understood and implemented uniformly for all Transmodel components, rather than on an ad hoc basis. The framework splits into:

**Versions and Validity model:** describes the successive versions of data elements and the conditions to be attached to elements to precisely know when they should be used:

- generic entity model;
- generic version model;
- generic version frame model;
- generic validity model;
- generic type of value model;
- generic delta model.

**Responsibility model:** describes the type of responsibility or role the different organisations may have over the data:

- generic responsibility model;
- generic responsibility role model;
- generic organisation model.

#### 5.1.3 Generic framework elements

**Generic framework:** describes a number of generic objects and representational mechanisms that are not specific to transport but which are specialised or used by Transmodel transport related objects. This part splits into:

- generic location model;
- generic grouping model;
- generic point and link model;
- generic point and link sequence model;

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- generic section model;
- generic zone model;
- generic feature model;
- generic layer model;
- generic projection model;
- generic place model;
- generic path & navigation model;
- generic assignment model;
- generic loggable object model;
- generic event model.
- generic security list model;
- alternative text model;

### 5.1.4 Reusable framework components

**Reusable components:** Certain common low-level components, for example TRANSPORT MODE, SERVICE CALENDAR, DAY TYPE, etc. are not specific to any particular functional part of Transmodel but are widely used in several different functional areas. Such components are defined centrally as part of the common concepts.

**The Reusable components models** describe generic and reusable objects specific to public transport. These are organised into a number of functional areas:

- **Reusable mode models** characterising the different transport modes;
- transport mode model;
- transport submode model;
- travel means model;
- transport mode of operation model;
- Reusable place & organisation models characterising the places and organisations related to in public transport;
- topographic place model;
- topographic projection model;
- transport organisations model;
- additional organisations model;
- employee model;

- Reusable role models characterising the roles acted by organisations and individuals in public transport;
- common role model;
- service organisation role model;
- administrative organisation role model;
- technology organisation role model;
- messaging role model;
- transport user role model;
- employee role model;
- **Reusable time element models** characterising commonly used temporal concepts;
- service calendar model;
- availability condition model;
- transfer timing model;
- **Reusable vehicle type models** characterising vehicle types;
- deck plan model;
- deck path model;
- seating plan model;
- seating affinity model;
- vehicle type model;
- fleet equipment profile model;
- train type model;
- train element type model;
- **Reusable vehicle models** characterising vehicles;
- vehicle model;
- fleet model;
- train composition model;
- **Reusable equipment models** characterising commonly used equipment concepts;
- facility model;