

ICS 35.240.60

English Version

Intelligent transport systems - Urban ITS - Models and definitions for new modes

Systèmes de transport intelligents - ITS urbains -
Modèles et définitions des nouveaux modes de
transport

Intelligente Verkehrssysteme - Städtische IVS - Modelle
und Festlegungen für neue Modi

This Technical Specification (CEN/TS) was approved by CEN on 27 October 2019 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	3
Introduction	4
1 Scope	5
2 Normative references	5
3 Terms and definitions	5
4 Symbols and abbreviations	9
5 Functional description of the alternative modes	9
5.1 Introduction	9
5.2 Categorization of modes of transport	9
5.3 Links to Mobility as a service	13
5.4 Functions and aspects related to the alternative modes	14
5.5 Cycling	19
5.6 Car sharing	20
5.7 Carpooling	23
6 Data requirements	30
6.1 General	30
6.2 Data model	30
Annex A (normative) Data dictionary	80
Annex B (informative) Use cases	96
Annex C (normative) Additional Common Concepts — Extension to EN 12896-1:2016, Public Transport Reference Data Model — Part 1: Common Concepts — Methodologies and Conventions	101
Annex D (informative) Additional Information on Carpooling	121
Bibliography	123

European foreword

This document (CEN/TS 17413:2020) 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 has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

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, Turkey and the United Kingdom.

Introduction

Services already present in the urban environment such as multimodal information and traffic management and control are already well understood. Standard reference data models and data exchange formats for the use of these services, in particular data sets describing the public transport offer, are already standardized and available. However, a previous study has identified that there is a need for reference data models to accommodate emerging modes of transport to allow seamless transitions for the traveller between all available modes. Examples of these new modes are car and cycle sharing, car-pooling, and intelligent parking (Park & Ride).

The Commission Delegated Regulation (EU) 2017/1926 requires that Member States facilitate the easy exchange and reuse of data for the provision of comprehensive travel information services. Transport authorities, transport operators, infrastructure managers or transport on demand service providers as appropriate should make the static data, corresponding metadata and information on the quality of the data accessible to users through a national or common access point.

This document defines a reference data model, in order to allow integration of these modes into urban multimodal services (e.g. trip planning systems).

This document considers in first place static data, but some aspects of real-time (dynamic) information are taken into account in order to enable efficient traveller information and includes: cycle sharing; car sharing; carpooling and cars with a driver (taxi).

To form this document, information has been gathered from outreach to stakeholders, Transmodel (EN 12896 series), and documents in the Bibliography.

CEN/TS 17413 is a project under the European Standardization body CEN/TC 278 - Intelligent Transport Systems Working Group 17 (Urban ITS). Its title is Models and definitions for new modes. The project team members have worked within Intelligent Transport Systems for many years as developers, implementers and standardizers.

1 Scope

This document defines new modes in a reference data model, in order to allow integration of these modes into urban multimodal travel services (e.g. trip planning systems).

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 12896-1:2016, *Public transport – Reference data model – Part 1: Common concepts*

3 Terms and definitions

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

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

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

3.1 General terms and definitions:

3.1.1

attribute

property of an entity

3.1.2

conceptual data model

description of a real-world domain in terms of entities, relationships and attributes in an implementation independent manner in order to 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

Note 1 to entry: Often used in the sense of the physical implementation of a data model.

3.1.5

data domain

data structure 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

fare management

activities related to the collection of money from passengers

3.1.9

function

activity

3.1.10

functional area

arbitrarily defined set of activities used to define the objectives and limits of the data model

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 which does not consider means of utilization of space or access

3.1.13

logical level

logical data model, in the context of data modelling

3.1.14

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 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 and definitions:

3.2.1

access mode

characterization of the traveller movement (e.g. walking, cycling, etc.) enabling the traveller to reach public transport or to carry out a whole trip

3.2.2

alternative mode

publicly advertised mode of operation different from the conventional mode of operation, in particular vehicle sharing, vehicle rental and vehicle pooling

3.2.3

car pooling

vehicle pooling applied to cars, consisting in sharing a privately owned car for a trip between a defined driver who is already engaged in the trip and at least another traveller

3.2.4**car rental**

vehicle rental applied to cars, consisting in making car(s) available at specified agencies with the constraint to bring them back at specified agencies

3.2.5**car sharing**

vehicle sharing applied to cars, consisting of the short-term use of a vehicle for a specific journey or time where the car might be taken from and parked at different places in an urban area

3.2.6**conventional mode**

legacy mode of operation which is provided as a scheduled and/or flexible publicly advertised transport offer relying on a set of features:

- drivers are employees;
- the fleet is owned by an operator or an authority;
- the network topology is defined well in advance and is based on lines and journey patterns

Note 1 to entry: The distinction between alternative and conventional mode of operation relies on the fact that one or more of the conditions as above may not be fulfilled. Moreover, the difference is in the mode of operation rather than the way the traveller is served.

3.2.7**cycle rental**

vehicle rental applied to cycles, consisting in making cycle(s) available at specified agencies with the constraint to bring them back at specified agencies

3.2.8**cycle sharing**

vehicle sharing applied to cycles consisting of short-term cycle rental where the cycle can be taken from and parked at different places in the urban area

3.2.9**flexible transport mode**

passenger transport operation linked to a fixed network/schedule but offering flexibility, in order for instance, to optimize the service or to satisfy passenger demand

3.2.10**operational service**

activities performed by actors in charge of operation of a service

3.2.11**park and ride**

activity allowing travellers to transfer between personal/alternative mode and conventional mode

3.2.12**park and ride facility**

location dedicated to travellers allowing them a modal transfer, in particular to leave/pick up their personal vehicles before/after a trip on public transport