



BSI Standards Publication

**Intelligent transport systems — Urban ITS — Mixed
vendor environments, methodologies & translators**

National foreword

This Published Document is the UK implementation of CEN/TS 17400:2020.

The UK participation in its preparation was entrusted to Technical Committee EPL/278, Intelligent transport systems.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2020
Published by BSI Standards Limited 2020

ISBN 978 0 539 04752 3

ICS 35.240.60

Compliance with a British Standard cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 30 April 2020.

Amendments/corrigenda issued since publication

Date	Text affected
------	---------------

TECHNICAL SPECIFICATION
SPÉCIFICATION TECHNIQUE
TECHNISCHE SPEZIFIKATION

CEN/TS 17400

April 2020

ICS 35.240.60

English Version

Intelligent transport systems - Urban ITS - Mixed vendor environments, methodologies & translators

Systèmes de transport intelligents - ITS urbain -
Environnements de fournisseurs mixtes méthodologies
et traduction

Intelligente Verkehrssysteme - Städtische IVS -
Gemischte Anbieterumgebungen Methodologien &
Übersetzer

This Technical Specification (CEN/TS) was approved by CEN on 29 December 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	4
Introduction	5
1 Scope.....	6
2 Normative references.....	6
3 Terms and definitions.....	6
4 Abbreviations.....	8
5 Mixed vendor environments in urban ITS.....	10
5.1 General.....	10
5.2 Interfaces between systems.....	11
5.3 Legacy and migration issues.....	13
6 MVE methodologies.....	14
6.1 Design methodologies.....	14
6.2 Public procurement constraints.....	16
6.3 Communications	17
7 Translators.....	19
7.1 Introduction.....	19
7.2 Specifications	21
7.3 Location of functional processing.....	21
7.4 Data storage and caching	22
7.5 Data models: concepts, definitions and terms.....	23
7.6 Upper layer protocol adaptors.....	24
7.7 Communications network translation.....	24
7.8 Information security.....	25
Annex A (informative) Approach of DVM Exchange/IVERA to interoperability.....	26
A.1 Introduction.....	26
A.2 General architectural approach of DVM-Exchange	26
A.3 General architectural approach of IVERA.....	28
A.4 Procurement issues and impact.....	29
A.5 Management and governance	29
A.6 Example DVM Exchange/IVERA implementation: Deventer.....	30
Annex B (informative) Approach of OCIT to interoperability	32
B.1 Introduction.....	32
B.2 General architectural approach	33
B.3 Procurement issues and impact.....	33
B.4 Management	34
B.5 Example OCIT implementation.....	34

Annex C (informative) Approach of UTMC to interoperability	37
C.1 Introduction	37
C.2 General architectural approach	38
C.3 Procurement issues and impact.....	40
C.4 Management.....	41
C.5 Example UTMC implementation: Reading.....	41
Annex D (informative) Approach of RSMP to interoperability	43
D.1 Introduction	43
D.2 General architectural approach of RSMP.....	44
D.3 Procurement issues and impact.....	46
D.4 Management and governance	47
Bibliography	48

Currently in preview, click buy full version

European foreword

This document (CEN/TS 17400:2020) 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 Commission Implementing Decision (M/546) given to CEN by the European Commission and the European Free Trade Association [1], and supports essential requirements of the EU ITS Directive [2]. It fulfils part of the workplan identified in CEN/TR 17143:2017, Intelligent transport systems - Standards and actions necessary to enable urban infrastructure coordination to support urban-ITS [3].

According to the CEN/CENELEC Internal Regulations, the national standards organizations 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

This suite of standards ([4], [5] and the present document) assist stakeholders to implement urban-ITS systems in a mixed vendor environment.

This suite of standards deliverables will support the family of existent standards, and others under development, referencing both common communications protocols and data definitions, that, in combinations, enable Urban-ITS (and ITS in general) to function and be managed, and will reference application standards, and their interdependencies and relationships.

Urban authorities use an increasing array of intelligent transport systems (ITS) to deliver their services. Historically, urban ITS have tended to be single solutions provided to a clear requirements specification by a single supplier. Increasingly, as ITS opportunities become more complex and varied. They involve the integration of multiple products from different vendors, procured at different times and integrated by the urban authority.

The need for a mixture of systems provided by different manufacturers to so-called Mixed Vendor Environments (MVEs) is a growing paradigm, which results primarily from the demand for the introduction of competition in the context of public tenders, and the increasing networking of existing stand-alone solutions to address complex traffic management systems.

The mix of systems of different manufacturers is also, in part, a result from technological change. Established companies are suddenly in competition with new companies that exploit technological changes and offer exclusively, or at a reasonable price, new or improved functionality for sub systems.

However, ITS design is often proprietary and, as a consequence integration and interoperability can be difficult, time-consuming, and expensive, limiting the ability of urban authorities to deploy innovative solutions to transport problems. In some Member States, national/regional solutions to this problem have been created, and there are also some solutions in specific domains, which have been very beneficial. However, these are not uniform across Europe, compromising the efficiency of the single market.

This document provides the methodologies and translators to avoid vendor lock-in, introducing suitable methodologies for system architecture design, making appropriate use of standards, and specifications to be used when translator systems are adopted.

This specification is designed to enable ITS architects to develop concrete architectural concepts for mixed-manufacturer systems in order to achieve the migration of existing monolithic single-manufacturer systems, by creating and delivering EU-wide MVE communication specifications designed to actively support the implementation of distributed and open system structures for regionally and nationally networked systems in the transport sector throughout the EU.

This document should be read together with [4], which provides a 'Guide' giving a high level introduction into the concept of operations (CONOPS) for a mixed vendor environment (MVE); provides a high-level architectural context explanation of an MVE and its operational requirements, and describes the problems and effects are associated with vendor lock-in. It also provides a systematic approach for many aspects of Urban-ITS implementation, and indeed almost all ITS MVE implementation; and provides a methodical guideline with a procedural model, in order to provide assistance to implementers and managers involved with the structure of an MVE and/or with the removal of vendor lock-in.

This document should also be considered together with [5], which focuses specifically on the area of traffic management systems in an MVE, identifies appropriate standards to use to enable an MVE, and addresses aspects associated with the accommodation of regional traffic standards (RTS) in such mixed vendor environments (RTS-MVE), with particular emphasis on the centre/field systems context. The document also provides information regarding MVE provisions in the public transport domain.

1 Scope

This document focuses on the principal aspects of urban ITS where vendor lock-in is recognized as a technical and financial problem: primarily centre-to-field communications and traffic management systems. It will cover the following scope:

- approaches to the management of MVEs by urban authorities, including mitigation and migration options;
- procedural and operational protocols to achieve interworking, using product/interface adaptation, translation products, replacement/reengineering, and other migration strategies;
- technical options for interworking multiple vendors' products;
- mechanisms to enable interoperability through automated translation between specifications, frameworks and product interfaces;
- review of principal approaches taken to date to implement these options in community frameworks and specifications.

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 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 <http://www.iso.org/obp>

3.1

central system

collection of ITS products and services maintained and managed at one or more control centres, in a sheltered environment

3.2

field device

ITS device that is intended for location within the public realm, whose primary mode of operation does not involve control by a human operator

Note 1 to entry Field devices may operate in a standalone mode; these are not subject to significant MVE issues. Generally in this document, therefore, the term will refer to field devices which are connected to a central system by an operational communications link, over which the communication (in real time) is essential to their designed operation.