

ICS 35.240.60

English Version

## Intelligent transport systems - Standards and actions necessary to enable urban infrastructure coordination to support Urban-ITS

Systèmes de transport intelligents - Normes et actions  
nécessaires pour permettre la coordination des  
infrastructures urbaines en faveur des STI urbains

Intelligente Verkehrssysteme - Notwendige Normen  
und Aktivitäten um die Koordination der urbanen  
Infrastruktur zur Unterstützung urbaner ITS zu  
ermöglichen

This Technical Report was approved by CEN on 18 September 2017. It has been drawn up by the Technical Committee CEN/TC 278.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, 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: Avenue Marnix 17, B-1000 Brussels**

## Contents

Page

European foreword.....	10
Introduction.....	11
1 Scope .....	13
2 Terms and definitions.....	15
3 Symbols and abbreviations.....	28
4 Summary of Remit to PT1701 .....	33
5 Summary of situational factors affecting the study.....	34
5.1 The Commission Implementing decision on ITS in urban areas.....	34
5.2 Autonomous vehicles .....	34
6 Summary of Standards framework .....	36
7 Summary of Stakeholders and structuring .....	37
7.1 Stakeholders.....	37
7.2 Actors.....	38
8 Summary of panoptic ‘across the board’ Requirements .....	38
8.1 The panoptic context.....	38
8.2 EU-ICIP .....	38
8.3 Concept of Operations.....	40
8.4 Common meta-data registry .....	40
8.5 Vendor lock-in .....	42
8.6 Testing and Conformance.....	42
8.7 Standards procedures.....	42
8.8 Other panoptic recommendations .....	43
9 Summary of communications and security requirements .....	43
9.1 Communications and Security context .....	43
9.2 C-ITS Communications and Urban-ITS.....	44
10 Summary of MIS requirements.....	45
10.1 The MIS context.....	45
10.2 MIS and Urban-ITS.....	47
10.3 Approach taken .....	48
11 Summary of Traffic Management (TM) requirements.....	48
11.1 The TM context.....	48
11.2 TM and Urban-ITS.....	49
11.3 Traffic management Standards issues.....	50
11.4 Exchange of data and information with third parties .....	50
11.5 Procurement and maintenance of the Urban-ITS solution for TM .....	50
12 Summary of Urban Logistics (UL) requirements .....	51
12.1 UL context.....	51
12.2 Urban Freight.....	52
12.3 Standardised data formats and standardised transaction profiles .....	52
12.4 Emissions monitoring and geofencing.....	52
12.5 Recommendations for Urban Logistics.....	53
13 Summary of architecture requirements.....	53
13.1 FRAME Architecture context.....	53

13.2	Coherence.....	53
13.3	Standards required in order to ensure homogeneity and support for Urban-ITS.....	53
13.4	Update and extension of the FRAME ITS architecture.....	54
<b>Annex A (informative) Detailed Recommendations of CEN/TC 278/PT 1701 .....</b>		<b>55</b>
A.1	Background and Structure of this Annex.....	55
A.1.1	Background.....	55
A.1.2	Use Cases.....	55
A.1.3	Objectives for Phase 2 outreach.....	57
A.2	Key issues and summarised recommendations .....	59
A.2.1	Summarised recommendations .....	59
A.2.2	Phase 2 outreach.....	60
A.3	Revised High Level Priority Recommendations for CID Support.....	64
A.4	Revised Recommendations for other ESOs/Committees.....	68
A.5	Revised priority Recommendations for other support measures.....	70
A.6	Other supported Recommendations for CID support .....	72
A.7	Other Recommendations for CID support (unsupported by outreach feedback) .....	72
A.8	Recommendations withdrawn as a result of outreach feedback.....	73
<b>Annex B (informative) Objectives, strategy, philosophy and process of the study.....</b>		<b>76</b>
B.1	Foreword .....	76
B.2	Overview .....	76
B.3	Commission Implementing Decision.....	76
B.3.1	Overview .....	76
B.3.2	General requirements for the requested deliverables .....	78
B.3.3	Requirements to strengthen compatibility and coherence with existing standards and technical specifications.....	78
B.3.4	Specific requirements for the requested deliverables.....	79
B.3.5	Multimodal information systems.....	79
B.3.6	Traffic management, including access regulation .....	80
B.3.7	Urban logistics, including parking management .....	80
B.4	Remit to PT1701 .....	81
<b>Annex C (informative) Situational Factors affecting the study .....</b>		<b>83</b>
C.1	Overview .....	83
C.2	Characterising Urban-ITS .....	87
C.3	Stakeholders and actors.....	92
C.3.1	Stakeholders.....	92
C.3.2	Actors .....	94
C.4	Mixed vendor environment .....	96
C.4.1	Introduction.....	96
C.4.2	Obligations and expectations of urban public bodies .....	98
C.5	Standards combinations .....	101
C.6	Cooperation .....	103
C.7	Barriers and constraints to the operation of the open single European market (OSEM) .....	103
C.7.1	Common issues .....	103
C.7.2	Political obstacles to OSEM .....	105
C.7.3	Commercial obstacles to OSEM.....	105
C.7.4	Technical obstacles to OSEM .....	106
C.7.5	Contending aspirations of Urban administrations and commercial freight operators .....	107
C.7.6	Vendor lock-in .....	107

C.8	Autonomous /automated vehicles .....	109
C.8.1	Context.....	109
C.8.2	Autonomous driving and mobility.....	109
C.8.3	Autonomous driving and connectivity.....	109
C.8.4	Autonomous driving and maps.....	110
C.8.5	Autonomous vehicles and safety issues .....	112
C.8.6	Autonomous vehicles and security .....	113
C.8.7	Take up of autonomous vehicles.....	113
C.8.8	Autonomous vehicles and associated standardizations.....	114
C.9	Issues associated with the introduction of Urban-ITS .....	118
<b>Annex D (informative) Standards Framework.....</b>		<b>119</b>
D.1	Extant Standards.....	119
D.2	Legacy systems and Standards.....	120
D.2.1	Context.....	120
D.2.2	Legacy system and standards benefits.....	121
D.2.3	Legacy Standards for general use .....	121
D.2.4	Legacy system and standards issues .....	147
D.2.5	Vendor lock-in .....	151
D.2.6	Transition and migration issues .....	151
D.2.7	Availability of data concepts.....	153
D.3	C-ITS as a tool to overcome silos .....	154
D.4	Organisation and interdependencies.....	157
<b>Annex E (informative) Stakeholders and structuring .....</b>		<b>160</b>
E.1	Key stakeholders .....	160
E.2	E.2 High level mapping for key identified stakeholders.....	160
E.3	Overall framework required for interoperability and interchangeability .....	161
E.3.1	Interoperability.....	161
E.3.2	Interchangeability .....	161
E.3.3	Intermodality .....	161
E.3.4	Multimodality.....	162
E.3.5	Sustainability .....	162
E.4	Systems and devices that could take advantage of common structuring and implementation guidelines.....	168
E.4.1	Benefits of a common reference data model/ Meta-data registry .....	168
E.4.2	Benefits of data exchange profiles.....	169
E.4.3	Location determination and location referencing.....	170
E.4.4	Open urban data access portal.....	179
E.4.5	Structure of Public Transport Service related data .....	181
E.5	High level generic 'Concept of Operations' for city/administration support for Urban-ITS.....	187
E.5.1	General .....	187
E.5.2	Statement of the goals and objectives of the Urban-ITS .....	187
E.5.3	Strategies, tactics, policies, and constraints affecting the Urban-ITS.....	188
E.5.4	Organisations, activities, and interactions among participants and stakeholders for Urban-ITS.....	191
E.5.5	Clear statement of responsibilities and authorities delegated for Urban-ITS .....	192
E.5.6	Equipment required for Urban-ITS.....	192
E.5.7	Operational processes for the Urban-ITS .....	193
E.5.8	Role of the jurisdiction in Urban-ITS.....	195
E.5.9	Role of the Urban-ITS prime service provider .....	196
E.5.10	Role of the Urban-ITS application service provider .....	197
E.5.11	Role of the Urban-ITS user .....	197

E.5.12	EGeneric characteristics for all instantiations of the Urban-ITS application service domain .....	198
E.6	Standards requirements .....	198
E.7	Identifying standardisation gaps.....	198
E.8	The process of consensus .....	199
Annex F	(informative) Panoptic (Multi-category) requirements.....	201
F.1	Panoptic (Multi-category) requirements — Objectives, summary and scope addressed .....	201
F.1.1	Objectives .....	201
F.1.2	Summary .....	201
F.1.3	Scope .....	201
F.1.4	Stakeholder engagement .....	201
F.1.5	Common/Interoperable data .....	201
F.1.6	Multimodality.....	202
F.1.7	Creation of (multimodal) transport datasets .....	202
F.1.8	Multiple means of communication.....	202
F.1.9	Creation of urban-interurban interfaces .....	203
F.1.10	Use of open standards, architectures and specifications.....	204
F.1.11	Enable rather than prescribe or proscribe .....	204
F.1.12	Obtaining consistency across the European Community, and across wider domains.....	204
F.1.13	Objectives of EU-ICIP .....	207
F.1.14	Organization of an EU-ICIP Guide .....	209
F.2	Panoptic (Multi-category) requirements — Relevant business/service areas and applications identified with key stakeholders.....	210
F.3	Panoptic (Multi-category) requirements — Gap and overlap analysis involving European and international SDOs and their relevant deliverables .....	210
F.3.1	Panoptic (Multi-category) requirements — Standards to achieve objectives .....	210
F.4	Panoptic (Multi-category) requirements — Potential revision of existing standards, new standards development and international harmonisation tasks based on gap/overlap results .....	214
F.5	Panoptic (Multi-category) requirements — Roadmap with targeted deliverables and concrete actions to speed up deployment of Urban-ITS .....	214
F.6	Funding issues .....	214
Annex G	(informative) Multimodal Information Services (MIS).....	215
G.1	MIS Objectives, summary and scope addressed .....	215
G.1.1	General .....	215
G.1.2	Stakeholder engagement .....	217
G.1.3	Common/Interoperable data .....	217
G.1.4	Multimodality.....	218
G.1.5	Flexible Transport Services .....	220
G.1.6	Creation of (multimodal) transport datasets .....	220
G.1.7	Multiple means of communication.....	221
G.1.8	Creation of urban-interurban interfaces .....	221
G.1.9	Use of open standards, architectures and specifications.....	222
G.1.10	Enable rather than prescribe or proscribe .....	225
G.2	MIS Relevant business/service areas and applications identified with key stakeholders .....	225
G.2.1	MIS Business service area.....	225
G.2.2	MIS Applications (Use Cases) information layers and data types.....	226
G.2.3	MIS Use Cases context .....	226
G.2.4	MIS Use Cases .....	228

<b>G.3</b>	<b>MIS Gap and overlap analysis involving European and international SDOs and their relevant deliverables.....</b>	<b>254</b>
<b>G.3.1</b>	<b>MIS-0001 Gaps- MIS planned data retrieval .....</b>	<b>254</b>
<b>G.3.2</b>	<b>MIS-0002 Gaps - MIS real-time data capture .....</b>	<b>255</b>
<b>G.3.3</b>	<b>MIS-0003 Gaps - MIS planned data processing .....</b>	<b>255</b>
<b>G.3.4</b>	<b>MIS-0004 - Gaps - MIS real-time data processing.....</b>	<b>256</b>
<b>G.3.5</b>	<b>MIS-0005 Gaps - MIS actual trip plan provision .....</b>	<b>256</b>
<b>G.3.6</b>	<b>MIS-0006 Gaps - MIS information structuring .....</b>	<b>258</b>
<b>G.3.7</b>	<b>MIS-0007 Gaps - MIS information dissemination.....</b>	<b>258</b>
<b>G.3.8</b>	<b>MIS-0008 Gaps - MIS query structuring.....</b>	<b>258</b>
<b>G.3.9</b>	<b>MIS-0000 Gaps - user support.....</b>	<b>258</b>
<b>G.4</b>	<b>MIS Potential revision of existing standards, new standards development and international harmonisation tasks based on gap/overlap results.....</b>	<b>258</b>
<b>G.4.1</b>	<b>MIS planned data retrieval UC-MIS- 0001.....</b>	<b>258</b>
<b>G.4.2</b>	<b>MIS real-time data capture UC-MIS- 0002.....</b>	<b>259</b>
<b>G.4.3</b>	<b>MIS operational raw data provision UC- MIS-0002-1 .....</b>	<b>259</b>
<b>G.4.4</b>	<b>MIS planned data processing UC-MIS-0003.....</b>	<b>259</b>
<b>G.4.5</b>	<b>MIS scheduled trip plan provision UC-MIS-0003-1 .....</b>	<b>260</b>
<b>G.4.6</b>	<b>MIS planned data updating UC-MIS-0003-2 .....</b>	<b>260</b>
<b>G.4.7</b>	<b>MIS real-time data processing UC-MIS-0004 .....</b>	<b>260</b>
<b>G.4.8</b>	<b>MIS real-time data updating UC-MIS-0004-1 .....</b>	<b>261</b>
<b>G.4.9</b>	<b>MIS Actual Trip Plan Provision UC-MIS-0005.....</b>	<b>261</b>
<b>G.4.10</b>	<b>MIS Dynamic Car-pooling UC- MIS-0005-1 .....</b>	<b>261</b>
<b>G.4.11</b>	<b>MIS Driver Guidance UC-MIS-0005-2.....</b>	<b>261</b>
<b>G.4.12</b>	<b>MIS Information Structuring UC-MIS-0006 .....</b>	<b>262</b>
<b>G.4.13</b>	<b>MIS Information Dissemination UC-MIS-0007 .....</b>	<b>262</b>
<b>G.4.14</b>	<b>MIS Query Structuring UC-MIS-0008 .....</b>	<b>262</b>
<b>G.4.15</b>	<b>to topology-related concepts i.e. ‘origin/destination’, a specific location (e.g. stop point), line, etc.; .....</b>	<b>262</b>
<b>G.4.16</b>	<b>User Support.....</b>	<b>263</b>
<b>G.5</b>	<b>MIS Roadmap with targeted deliverables and concrete actions to speed up deployment of Urban-ITS.....</b>	<b>263</b>
<b>G.6</b>	<b>Funding issues .....</b>	<b>263</b>
<b>Annex H</b>	<b>(informative) Traffic Management (TM).....</b>	<b>264</b>
<b>H.1</b>	<b>TM Objectives, summary and scope addressed .....</b>	<b>264</b>
<b>H.1.1</b>	<b>Traffic management: principles and historical evolvement.....</b>	<b>264</b>
<b>H.1.2</b>	<b>Spheres of activities and problem scenarios .....</b>	<b>265</b>
<b>H.1.3</b>	<b>Solution strategies and processes .....</b>	<b>267</b>
<b>H.2</b>	<b>TM Relevant business/service areas and applications identified with key stakeholders .....</b>	<b>267</b>
<b>H.2.1</b>	<b>Impact facilities of Traffic Management.....</b>	<b>267</b>
<b>H.2.2</b>	<b>TM infrastructure as a toolbox .....</b>	<b>268</b>
<b>H.2.3</b>	<b>Use Cases as a tool to describe the business in the TM-domain .....</b>	<b>271</b>
<b>H.2.4</b>	<b>TM process model as a reference model for TM Use Cases .....</b>	<b>272</b>
<b>H.2.5</b>	<b>TM Use Cases .....</b>	<b>274</b>
<b>H.3</b>	<b>TM Gap and overlap analysis involving European and international SDOs and their relevant deliverables.....</b>	<b>287</b>
<b>H.3.1</b>	<b>Problems in the TM domain related to the lack of standards .....</b>	<b>287</b>
<b>H.3.2</b>	<b>Interoperability requirements in the TM-domain .....</b>	<b>288</b>
<b>H.3.3</b>	<b>Use Case based gap and overlap analysis.....</b>	<b>290</b>
<b>H.4</b>	<b>TM Potential revision of existing standards, new standards development and international harmonisation tasks based on gap/overlap results.....</b>	<b>291</b>

H.4.1	Preliminary observation.....	291
H.4.2	TM Architecture recommendations.....	292
H.4.3	H.4.3 Traffic management domain specific recommendations .....	292
H.5	TM Roadmap with targeted deliverables and concrete actions to speed up deployment of Urban-ITS.....	293
H.6	TM Funding issues.....	293
<b>Annex I (informative) Urban Logistics (UL) .....</b>		<b>294</b>
I.1.1	General .....	294
I.1.2	Stakeholder engagement .....	294
I.1.3	Common/Interoperable data .....	295
I.1.4	Multimodality.....	295
I.1.5	Creation of (multimodal) transport datasets .....	295
I.1.6	Multiple means of communication.....	295
I.1.7	Creation of urban-interurban interfaces .....	295
I.1.8	Use of open standards, architectures and specifications.....	296
I.1.9	Enable rather than prescribe or proscribe .....	296
I.2	UL Relevant business/service areas and applications identified with key stakeholders.....	296
I.2.1	Urban freight consolidation centres.....	296
I.2.2	UL Business service area.....	310
I.2.3	UL Applications (Use Cases).....	311
I.3	UL Existing CEN/TC 278 working groups involved and co/cross working arrangements.....	379
I.4	UL International/European harmonisation requirements.....	380
I.5	UL Gap and overlap analysis involving European and international SDOs and their relevant deliverables.....	380
I.5.1	UL--0110v1 Provision of relevant traffic information- congestion; green wave; etc. data.....	380
I.5.2	Delivery vehicle realtime mapping/route optimisation .....	380
I.5.3	Vehicle access management and monitoring .....	381
I.5.4	Vehicle Speed Monitoring.....	381
I.5.5	Urban Consolidation Centres (UCC).....	381
I.5.6	Oversize Management.....	381
I.5.7	Emissions monitoring .....	382
I.5.8	Low Emission Zones- Data Formats .....	382
I.5.9	Cross Border Enforcement.....	382
I.5.10	Charging alternatively fuelled vehicles on streets .....	382
I.6	UL Potential revision of existing standards, .....	382
I.6.1	Weigh in motion .....	382
I.6.2	Vehicle parking facilities .....	382
I.7	UL Roadmap with targeted deliverables and concrete actions to speed up deployment of Urban-ITS.....	383
I.8	UL Funding issues .....	384
<b>Annex J (informative) Communications and Security (CS) issues for Urban-ITS .....</b>		<b>385</b>
J.1	Communications objectives, summary and scope addressed .....	385
J.1.1	Stakeholder engagement .....	385
J.1.2	Cooperative-ITS and Urban-ITS.....	385
J.1.3	Common/Interoperable data .....	387
J.1.4	Multimodality.....	390
J.1.5	Creation of (multimodal) transport datasets .....	390
J.1.6	Multiple means of communication.....	390
J.1.7	Creation of urban-interurban interfaces .....	390

J.1.8	Use of open standards, architectures and specifications.....	391
J.2	Hybrid C-ITS communications .....	398
J.2.1	General .....	399
J.2.2	Hybrid communications Types.....	400
J.2.3	IP for end-to-end communications.....	400
J.2.4	Non-silo approach of hybrid communications.....	401
J.2.5	Hybrid communications : example.....	402
J.2.6	Hybrid Communications – multiple paths.....	403
J.2.7	Hybrid Communications – Path selection.....	404
J.2.8	Hybrid Communications – Collect ITS-station capabilities .....	405
J.2.9	Hybrid Communications – Collect layer information .....	406
J.2.10	Hybrid Communications – Communication profile selection.....	407
J.2.11	Hybrid Communications – Flow Transmission.....	408
J.2.12	Hybrid Communications – Path and Flow management.....	409
J.2.13	Hybrid Communications – Application layer.....	410
J.2.14	Hybrid Communications – Standards.....	410
J.3	Security objectives, summary and scope addressed.....	410
J.3.1	Introduction.....	410
J.3.2	C-ITS security .....	411
J.3.3	EU-US Task Force HTG6.....	412
J.4	Enable rather than prescribe or proscribe .....	414
J.5	Relevant business/service areas and applications identified with key stakeholders.....	414
J.6	Other gap and overlap analysis involving European and international SDOs and their relevant deliverables.....	414
J.6.1	Business service area(s) (Use Cases).....	414
J.6.2	Other applications.....	414
J.6.3	Working groups involved and co/cross working arrangements .....	414
J.6.4	International/European harmonisation requirements .....	415
J.7	Other gap and overlap analysis involving European and international SDOs and their relevant deliverables .....	415
J.7.1	Other standards requirements to achieve objectives .....	415
J.7.2	Other existing Standards .....	415
J.7.3	Other Gap Analysis.....	415
J.7.4	Other requirement for new Standard(s).....	416
J.8	Funding issues .....	416
Annex K	(informative) Urban-ITS Architecture aspects (UA) .....	417
K.1	UA Coherence of Use Cases with FRAME Architecture .....	417
K.2	UA Gap analysis between Use Cases and FRAME Architecture.....	417
K.3	UA Standardisation needs and international harmonisation issues .....	418
K.3.1	UA Background.....	418
K.3.2	UA Standardisation .....	419
K.3.3	UA Harmonisation .....	420
K.4	UA Actions required to speed up deployment of Urban-ITS .....	421
K.4.1	Enhancing tools to assist ITS deployments .....	421
K.4.2	Stakeholder engagement .....	423
K.4.3	Common/Interoperable data .....	423
K.4.4	Multimodality.....	423
K.4.5	Creation of (multimodal) transport datasets .....	423
K.4.6	Multiple means of communication.....	423
K.4.7	Creation of urban-interurban interfaces .....	423
K.4.8	Use of open standards, architectures and specifications.....	423



K.4.9	Enable rather than prescribe or proscribe .....	423
K.5	UA Identified resources of expertise (individuals, organisations) to participate in this work.....	423
K.6	UA Consideration of optimum internal organisation to most effectively address these issues .....	424
K.7	UA Funding issues.....	424
K.8	Requests for support actions.....	424
<b>Annex L (informative) Other identified issues for Urban-ITS (beyond span of CID) .....</b>		<b>425</b>
L.1	Background.....	425
L.2	The population is trending to cities.....	425
L.3	Autonomous/Automated vehicles.....	426
L.4	Transmodel, DATEX II and associated standards .....	426
<b>Annex M (informative) Use Cases Collated.....</b>		<b>428</b>
<b>Annex N (informative) References .....</b>		<b>527</b>
N.1	Standards.....	527
N.2	Legislation and Regulations.....	537
<b>Annex O (informative) Principal existing ITS Standards .....</b>		<b>539</b>
<b>Annex P (informative) Outreach Responses; Outreach contacts, contributors, and effects on Recommendations .....</b>		<b>569</b>
P.1	Organisations and individuals consulted during the preparation of the interim and final reports .....	569
P.2	Organisations and individuals circulated with the Interim Report for comments and prioritisation.....	571
P.3	Feedback from outreach following circulation of interim report.....	572
P.3.1	Overview .....	572
P.3.2	Outreach feedback in relation to the priority areas identified at the Outreach meeting.....	575
P.3.3	Projects recommended, but under the lead of existing initiatives of CEN/TC 278 or other ESOCs.....	587
P.3.4	Outreach feedback to PT1701 recommendations .....	587
P.4	Collated outreach responses to individual recommendations .....	594
P.4.1	Standards Policies - Urban-ITS (and general) .....	594
P.4.2	Panoptic-Across the Board.....	599
P.4.3	Multimodal Information.....	601
P.4.4	Traffic Management.....	605
P.4.5	Urban Logistics .....	608
P.4.6	Architecture.....	609
P.4.7	Recommendations for standards deliverables from other CEN Committees/ other ESO's / recognised standards Issuers.....	610
P.4.8	Recommendations for other associated support measures and policies .....	613
P.5	Other Feedback received .....	616
P.6	Revised High Level Priority Recommendations for CID Support.....	622
P.7	Revised Recommendations for other ESOs/Committees .....	626
P.8	Revised priority Recommendations for other support measures.....	629
P.9	Other supported Recommendations for CID support .....	630
P.10	Other Recommendations for CID support (unsupported by outreach feedback).....	630
P.11	Recommendations withdrawn as a result of outreach feedback.....	631
<b>Bibliography .....</b>		<b>634</b>

## European foreword

This document (CEN/TR 17143:2017) 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.

## Introduction

Cities are home to over 70 % of the EU population and account for some 85 % of the Union's GDP. Most journeys begin and end in cities. In many urban areas, however, increasing demand for urban mobility has created a situation that is not sustainable: severe congestion, poor air quality, noise emissions and high levels of CO<sub>2</sub> emissions. Urban congestion jeopardises EU goals for a competitive and resource-efficient transport system.

With its declared 'Urban Mobility Package', the Commission reinforces its supporting measures in the area of urban transport by:

- sharing experiences, show-casing best practices, and fostering cooperation,
- providing targeted financial support,
- focusing research and innovation on delivering solutions for urban mobility challenges.

In accordance with Article 8 of Directive 2010/40/EU of the European Parliament and of the Council of 7 July 2010 on the framework for the deployment of 'Intelligent Transport Systems' in the field of road transport and for interfaces with other modes of transport, the Commission may request the European standardisation organisations (ESOs) to develop necessary standards to provide interoperability, compatibility and continuity for the deployment and operational use of ITS. Such standards are scoped by Articles 2, 3, 4 (1), and Annex J of Directive 2010/40/EU [2] to specific priority areas and priority actions in the field of ITS. (Annex J also stresses the need for urban and interurban interfaces for data exchange, and the interoperability and compatibility between the urban and European ITS architectures.)

Within the overarching ITS objectives set by Directive 2010/40/EU [2], the urban dimension has its own needs envisioned in the Action Plan on ITS (2008) [33] and the Action Plan on Urban Mobility (2009) [38]. In 2010, the European Commission set up an Expert Group on Urban-ITS, with the participation of representatives of local authorities and their main partners, from the fields of research, industry, transport authorities and operators, standardisation bodies, etc. This 'Expert Group on Urban-ITS' developed guidelines on the deployment of key applications of Urban-ITS (namely: multimodal information, smart ticketing, traffic management and urban logistics), collected a number of best practices and reflected upon the need for further standardisation in the domain of Urban-ITS. The 'Expert Group on Urban-ITS' recommended better integrating the urban dimension within European standardisation activities and focusing standardisation efforts on multimodal information services including new mobility services, traffic management including access management, and urban logistics including reservation of loading bays. The standardisation efforts should cover existing gaps, upgrade and complement existing standards and ensure the establishment of the needed urban-interurban interfaces.

The EC Communication "Against lock-in: building open ICT systems by making better use of standards in public procurement" [41] points to the benefits of using standards and open specifications to avoid vendor lock-in of technological solutions, and promote the deployment of more cost-effective solutions. Its accompanying 'Staff Working Document' "Guide for the procurement of standards-based ICT – Elements of Good Practice" [42], lists a number of examples of open specifications in the transport domain, but also shows a lack of common standards for ITS.

The 'Expert Group on Urban-ITS' recommended involving local authorities and experts with specific urban knowledge in the ITS standardisation process. Therefore, the European standardisation organisations are invited to liaise with relevant bodies representing urban mobility and interested in Urban-ITS, such as standardisation coordination groups and organisations, local standardisation frameworks, experts and stakeholder platforms, cities and regions associations, user associations, transport operators and service provider's representatives. The resultant Project Team (CEN/TC 278/PT 1701) therefore comprises a mix of standardisation experts and experts from within or associated with Urban administrations, and organisations such as POLIS, and, importantly is linked to a wider outer network of experts, largely associated with Urban administrations, with whom it will consult and seek opinion and feedback to its initial proposals. The composition of the project team, in accordance with CEN project team selection procedures, was dependent on, and limited by, those who responded to the call for experts. While it was hoped that many Urban Administrations would be inclined to apply, applications were limited by the fact that public sector applicants could not be recompensed for their time costs. PT1701 have therefore worked to create contacts from other Urban Administrations to review and comment on its work (and acknowledge the help received from the European Commission in this respect), and the Interim Report is being used as a key outreach tool to achieve this participation and feedback.

The European Commission is in the final stages of processing and publishing a "COMMISSION IMPLEMENTING DECISION" (CID) on a standardisation request to the European standardisation organisations as regards Intelligent Transport Systems (ITS) in urban areas in support of Directive 2010/40/EU of the European Parliament and of the Council of 7 July 2010 on the framework for the deployment of Intelligent Transport Systems in the field of road transport and for interfaces with other modes of transport." [1] The measures provided for in this Decision are in accordance with the opinion of the Committee established by Article 22 of Regulation (EU) No 1025/2012 [43].

In this Decision, the European Committee for Standardisation (CEN), the European Committee for Electrotechnical Standardisation (CENELEC) and European Telecommunications Standards Institute (ETSI), hereafter referred as the ESOs (European standardisation organisations), are requested to draft new European standards and European standardisation deliverables in support of the implementation of Article 8 of Directive 2010/40/EU[2] for multimodal information, traffic management and urban logistics in the Urban-ITS domain. The CID[1] is required to be supported by a list of targeted standards to be developed as a priority. And it is within this context that this pre-study has to identify the (high level) requirements, identify available standards, and thereby identify the 'gaps' where the EC should target financial support in order to obtain/accelerate the provision of the Standards necessary to fill these gaps in order to enable efficient Urban-ITS to be instantiated.

The requested European standards and European standardisation deliverables shall be developed to be consistent and compliant with the requirements of the Delegated Acts adopted by the Commission under Directive 2010/40/EU[2], in particular the specifications for the provision of EU-wide real-time traffic information services adopted on 18 December 2014 [44], and the specifications for the provision of EU-wide multimodal travel information service [46].

This pre-study report is therefore designed to assist the European Commission to target where to provide such financial support for standards development in the areas of 'Multimodal Information Systems', 'Traffic Management', and 'Urban Logistics'.