URBAN ITS EXPERT GROUP

POTENTIAL NEEDS FOR STANDARDISATION OF URBAN ITS

REPORT

January 2013
Document Information

Version Number: 1.0
Dissemination Level: Public

Members of Urban ITS Expert Group

ALBRECHT Hanfried* Albrecht Consult GmbH / OCA DE
BEASLEY Simon* Reading Borough Council / UDG UK
BLAQUIERE Alexandre Tisseo - Toulouse Public Transport Authority FR
BROWN Tony Hampshire County Council UK
COLDEFY Jean Greater Lyon Region FR
DIEGO BERNARDO Enrique EMT - Madrid Public Transport Authority SP
ELIASSEN Jarl Trafikanten AS NO
FIBY Hans Transport Association East Austria AT
FRANCO Gino Mizar / Swarco IT
HASELBERGER Rainer City of Vienna AT
HEDIN Johan* Hybris Konsult SE
IZDEBSKI Piotr ZTM Warsaw PL
JENSEN Helge City of Oslo NO
KEARNS Steve Transport for London UK
LEFEBVRE Olivier STIF Ile-de-France FR
LEIHS Dietrich Kapsch TrafficCom AT
MEEUWISSEN Marcel City of Enschede NL
PLANATH Susanne Swedish Transport Administration SE
SPELL Sabine Volkswagen AG DE
TØFTING Svend North Denmark Region DK
TOMASSINI Maurizio ISIS - Rome IT
TYRINOPoulos Yannis Hellenic Institute of Transport (HiT) GR
VAN DEN ABBEELE Didier Alstom Transport FR
VLEMMINGS Tiffany National Data Warehouse for Traffic information NL
WINNING Ian City of Cork IE

* Members of the author team

Notices

The Urban ITS Expert Group thanks following external experts for their contributions to this document:

- PEELEN Martin, CEN

Additional authors and editors of document:

- SZELIGOWKSA Dorota, European Commission, DG Mobility and Transport
- EGELEER Christian, Rapp Trans AG

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<th>Description</th>
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<tbody>
<tr>
<td>CEN</td>
<td>European Committee for Standardisation</td>
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<tr>
<td>C-ITS</td>
<td>Cooperative Intelligent Transport Systems</td>
</tr>
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<td>CWA</td>
<td>CEN Workshop Agreement</td>
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<tr>
<td>DAB</td>
<td>Digital Audio Broadcasting</td>
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<tr>
<td>DATEX</td>
<td>Standard for the exchange of traffic related data</td>
</tr>
<tr>
<td>DSRC</td>
<td>Dedicated Short Range Communication</td>
</tr>
<tr>
<td>EC</td>
<td>European Commission</td>
</tr>
<tr>
<td>EFC</td>
<td>Electronic Fee Collection</td>
</tr>
<tr>
<td>EN</td>
<td>European Norm (a standard-document in CEN and ETSI)</td>
</tr>
<tr>
<td>ESO(s)</td>
<td>European Standards Organisation(s) (i.e. CEN, ETSI, CENELEC)</td>
</tr>
<tr>
<td>ETSI</td>
<td>European Telecommunications Standards Institute</td>
</tr>
<tr>
<td>GIS</td>
<td>Geographic Information Systems</td>
</tr>
<tr>
<td>GNSS</td>
<td>Global Navigation Satellite System</td>
</tr>
<tr>
<td>GPS</td>
<td>Global Positioning System</td>
</tr>
<tr>
<td>GSM</td>
<td>Global System for Mobile Communications</td>
</tr>
<tr>
<td>IFMSA</td>
<td>Interoperable fare management system architecture</td>
</tr>
<tr>
<td>IMI</td>
<td>Intermodal Information</td>
</tr>
<tr>
<td>IS</td>
<td>International Standard (a form of standard in ISO, corresponds to the EN-format in CEN)</td>
</tr>
<tr>
<td>ISO</td>
<td>International Standards Organisation</td>
</tr>
<tr>
<td>ITS</td>
<td>Intelligent Transport Systems</td>
</tr>
<tr>
<td>ITS-CG</td>
<td>ITS Coordination Group (CEN TC 278 &amp; ETSI TC ITS)</td>
</tr>
<tr>
<td>MIS</td>
<td>Multimodal Information Service</td>
</tr>
<tr>
<td>MMI</td>
<td>Multimodal Information</td>
</tr>
<tr>
<td>NeTEx</td>
<td>Network Exchange (CEN Standard for exchanging PT schedules)</td>
</tr>
<tr>
<td>NSB</td>
<td>National Standards Body</td>
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<tr>
<td>NTS</td>
<td>National Travel Survey</td>
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<tr>
<td>PAS</td>
<td>Publicly Available Specification</td>
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<tr>
<td>PSI</td>
<td>Public Sector Information</td>
</tr>
<tr>
<td>PT</td>
<td>Public Transport</td>
</tr>
<tr>
<td>RDS</td>
<td>Radio Data System</td>
</tr>
<tr>
<td>RUC</td>
<td>Road Use Charging</td>
</tr>
<tr>
<td>SDO(s)</td>
<td>Standards Developing Organisation(s)</td>
</tr>
<tr>
<td>SG</td>
<td>Sub-Group (working under a working-group in the ESOs).</td>
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<tr>
<td>TC</td>
<td>Technical Committee (in ESOs)</td>
</tr>
<tr>
<td>TMC</td>
<td>Traffic Message Channel</td>
</tr>
<tr>
<td>TMP</td>
<td>Traffic Management Plan</td>
</tr>
<tr>
<td>TPEG</td>
<td>Transport Protocol Experts Group</td>
</tr>
<tr>
<td>TR</td>
<td>Technical Report (a standardisation deliverable type)</td>
</tr>
<tr>
<td>TS</td>
<td>Technical Specification (a standardisation deliverable type)</td>
</tr>
<tr>
<td>TSI</td>
<td>Technical Specifications for Interoperability</td>
</tr>
<tr>
<td>WG</td>
<td>Working-group (working with standards under a TC in the ESOs)</td>
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1 Introduction

The ITS Directive (2010/40/EU) establishes the legal and policy framework in order to accelerate the coordinated deployment of Intelligent Transport Systems across Europe. It aims to establish interoperable and seamless ITS services while leaving Member States the freedom to decide which specific systems to invest in.

Two recent European Action Plans include complementary actions on the issue of ITS for urban areas:

- The ITS Action Plan (2008) foresees the set-up of a specific ITS collaboration platform to promote ITS initiatives in the area of urban mobility.
- The Action Plan on Urban Mobility (2009) foresees that the Commission will offer assistance on ITS applications for urban mobility, possibly in form of a guidance document, to complement the ITS Action Plan.

Resulting from these provisions, the European Commission established the Expert Group "ITS for Urban areas" (Urban ITS Expert Group) in December 2010 for 24 months in order to support the European Commission in its work concerning the aforementioned Action Plans. The Urban ITS Expert Group was multi-modal in its focus, broad in nature and covered the urban region taking into account the interfaces between the urban and inter-urban mobility. Both passenger and freight issues were considered and a dialogue between public and private stakeholders encouraged.

The tasks of the Urban ITS Expert Group have been three-fold: to provide guidance on ITS deployment in urban areas, collect Best Practices on successful deployment and identify a possible need of Standardisation. The guidelines had the aim to promote and show the benefits of the use of ITS in urban areas along the individual travellers' mobility chain. The guidelines, despite the fact that they do not have mandatory character aim at fostering interoperability and continuity of services within Europe.

The Urban ITS Expert Groups third task, to assess the need of further standardisation of urban ITS applications, is the object of the present report. The work on this report has been based on discussions in the Urban ITS Expert Groups, a questionnaire distributed within the Urban ITS Expert Group and of direct contributions from some of its members. The proposed conclusions were endorsed by the Urban ITS Expert Group members.

The report describes the European standardisation landscape and the place that urban standardisation occupies within it. Finally, there is a set of conclusions and recommendations of the Urban ITS Expert Group concerning the future standardisation of urban ITS.
2 Standardisation in ITS

2.1 What is a Standard?

A standard is a specification approved by a body recognised on the regional, national, or international level and made available to the public. A standard is a technical document designed to be used as a rule, guideline or definition.

Standards are created by bringing together all interested parties such as manufacturers, consumers and regulators of a particular material, product, process or service.

All standards have a process of consensus forming and voting that recognises the rights of its members. Standards are produced by and adopted through one of the numerous Standard Developing Organisations (SDOs): European Standardisation Organisations (ESO; i.e. CEN, CENELEC, ETSI), National Standards Bodies (NSB), and international organisations (ISO, ITU, etc). Standards have strong rules for production and management, and automatically have a special status in European procurement law.

Note: There are also many specifications, systems and common agreements among stakeholders and industry that are commonly referred to as being "standards" although they are not in the real sense of the term. They may be produced by any industry body, and rarely have a special legal status. In this report we refer to these as "common specifications" and note that they should not be mixed up with real standards. Therefore this document uses the expression “standard” primarily for documents from the ESOs. If standards from ISO or NSB are meant, this will be indicated clearly.

Success of ITS standards is not generally guaranteed or pre-determined. It depends on the ability of market players to build consensus. This depends on the standards body being able to represent accurately, fairly and flexibly the requirements of the ITS stakeholders (public and private sectors).

The standards development work conducted in the European standardisation organisations adheres to the following principles:1:

- It is based on voluntary work
- It is based on a formal (development, review and ratification) process
- It is based on consensus
- Standards remain voluntary (unless referred to as part of national / international legislation)
- Standards are sometimes a market requirement. The Public Procurement Directive (93/36/EEC, Art 8, see also excerpt in Annex D) e.g. states that "the technical specifications shall be defined by the contracting authority by reference to national standards implementing

1 See CEN (www.cenorm.be/boss/), ISO (http://isotc.iso.org/isotcportal/index.html ) and ETSI’s (www.etsi.org) standardisation process and procedures for the technical work.
European standards, or by reference to European technical approvals or by reference to common technical specifications....”

- Standards may be referred to as part of national / international legislation.

2.2 General Need of Standards, namely in ITS

2.2.1 Benefits of Standards in General

The application of standards has benefits for all participants. Standardisation contributes significantly to following issues:

- Standards enable the interoperability of products and services
- Standards encourage innovation and open up new markets for suppliers
- Standards expand the markets, enable economies of scale and encourage greater competition
- Standards facilitate trade by diminishing trade barriers
- Standards supports greater confidence in procurement
- Standards help to prevent duplication in effort
- Standards reduces dependencies on manufacturers for installed systems and increases the interchangeability of system component suppliers

Although the application of standards is voluntary\(^2\), the legal status of standards is rather strong if used in tendering processes.

Another advantage of standards is that there is a commonly accepted structure in the decision making and voting process. This applies to handling revisions and corrections too.

The development of standards relies on voluntary work from stakeholders and experts. A consensus process is needed. Therefore the development takes some time.

\(^2\) unless referred to as part of national / international legislation
2.2.2 Benefits of Applying Standards in ITS

"Intelligent Transport Systems" (ITS) consist of applying Information and Communication Technologies (ICT) to the transport sector. ITS can greatly benefit transport efficiency, sustainability, safety and security, whilst also contributing to the EU internal market and competitiveness objectives. In order to reap full advantage of the benefits that ICT based systems and applications can bring to the transport sector, it is necessary to ensure interoperability among the different systems across borders, in this case, throughout Europe.

International standards are becoming more important due to the globalisation of product markets. Therefore the focus of standardisation has shifted from a national to an international level. Particularly compatibility standards are becoming more important because the number of networks where systems and processes need to be compatible with each other is growing.

Intelligent Transport Systems are such a network. ITS are playing an ever greater role in increasing the efficiency of public and private transport, improving the driving experience and, most importantly, making a major contribution to road safety and reduction of costs, energy consumption and pollution.

ITS standards are fundamental to the establishment of an open ITS environment. Standards facilitate deployment of interoperable systems at local, regional and national levels without impeding innovation as technology advances and new approaches evolve.

A European- and world-wide standardisation process requires a harmonised approach to ITS application requirements, system architecture, networks and transport protocols, media related and security issues for the implementation and deployment of ITS services within the European Community.

2.3 The International and European ITS Standardisation Landscape

For ITS Standardisation, the following organisations are recognised in Europe³:

- Comité Européen de Normalisation (European Committee for Standardisation)
- European Telecommunications Standards Institute
- Comité Européen de Normalisation Électrotechnique (European Committee for Electrotechnical Standardisation)

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³ Directive 98/34EC
On the global scale another organisation is involved in standardisation:

International Standards Organisation

The following table gives a short overview on these four organisations:

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Founded</th>
<th>Member countries</th>
<th>No. of standards$^4$</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEN</td>
<td>1975</td>
<td>33</td>
<td>14498</td>
</tr>
<tr>
<td>ETSI</td>
<td>1988</td>
<td>62</td>
<td>29854</td>
</tr>
<tr>
<td>CENELEC</td>
<td>1973</td>
<td>33</td>
<td>6004</td>
</tr>
<tr>
<td>ISO</td>
<td>1947</td>
<td>111 (164)$^5$</td>
<td>19023</td>
</tr>
</tbody>
</table>

In the following sections the organisations are shortly introduced as well as the technical committee which plays an important role in ITS standardisation in CEN, the CEN/TC278 on “Road Transport and Traffic Telematics”.

2.3.1 European Committee for Standardisation (CEN)$^6$

CEN was created as an international non-profit association based in Brussels. It is a major provider of European Standards and technical specifications. The aim is to diminish trade barriers, promote safety, allow interoperability of products, systems and services, and to promote common technical understanding.

In Europe, CEN works in partnership with CENELEC and ETSI. CEN covers a wide area and its functions overlap in several fields with those of CENELEC and ETSI. The co-ordination between the three bodies is achieved through a Joint Presidents Group and, for IT, by the ICT Standards Board.

In the ITS-area co-ordination is delegated to the ITS-CG, consisting of the chairmen of CEN/TC278 and ETSI TC ITS as well as representatives of the European Comission. Further stakeholders are specially invited for particular agenda items.

CEN/TC 278 "Road transport and traffic telematics"

In CEN, the Technical Committee (TC) 278 is responsible for the development of European standards and technical specifications in the domain of Intelligent Transport Systems (ITS). The standardisation areas include Cooperative

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$^4$ Status End of December 2011

$^5$ in brackets including correspondent and subscriber members

$^6$ Comité Européen de Normalisation, www.cen.eu

Some facts about CEN/TC 278:

- It was established in 1992
- It has 33 national members
- 61 active work items, 114 published standards (up to date)
- 11 active working groups with over 300 nominated experts
- Co-operation between market players: industries, service providers, governments
- It is well connected to European R&D

CEN/TC 278 has a number of Working Groups (WG) in which the actual work is carried out. Each of these groups is dedicated to a more specific aspect of the overall subject (noting that some of these groups are currently dormant):

- WG1 Electronic Fee Collection
- WG2 Freight, Logistics and Commercial Vehicle Operations
- WG3 Public Transport
- WG4 Traffic and Travel Information
- WG5 Traffic Control Systems
- WG6 Parking Management
- WG7 Geographic Data Files
- WG8 Road Traffic Data
- WG9 Dedicated Short Range Communications
- WG10 Human-Machine Interfacing
- WG11 Inter-system Interfaces
- WG12 Automatic Vehicle and Equipment Id.
- WG13 Architecture and Terminology
- WG14 Recovery of Stolen Vehicles
- WG15 eSafety / eCall
- WG16 Cooperative Systems

Urban issues related to key applications that are in focus of the Urban ITS Expert Group are handled in the following working groups:
Main focus, at present, in CEN/TC278 is put on Co-operative systems (WG16).

2.3.2 European Committee for Electrotechnical Standardisation (CENELEC)

CENELEC was set up as a non-profit-making organisation in Belgium. The main focus of CENELEC is electro technical standardisation.

CENELEC and the International Electrotechnical Commission (IEC) operate at two different levels but it is self-evident that their actions have a strong mutual impact since they are the most important standardisation bodies in the electrotechnical field.

CENELEC is currently not active in ITS-standardisation.

2.3.3 European Telecommunications Standards Institute (ETSI)

ETSI was set up as a non-profit organisation in Belgium. The main focus of ETSI is developing a wide range of standards and other technical documentation as Europe's contribution to world-wide standardisation in telecommunications, broadcasting and information technology.

ETSI TC ITS

ETSI has a Technical Committee on Intelligent Transport Systems (ETSI TC ITS). Its mission is to create and maintain standards and specifications for the use of information and communications technologies in future transport systems. The

<table>
<thead>
<tr>
<th><strong>Urban ITS Expert Group work item</strong></th>
<th><strong>CEN/TC278</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic and Travel Information</td>
<td>WG4 - Traffic and Traveller Information</td>
</tr>
<tr>
<td></td>
<td>WG8 - Road Traffic Data</td>
</tr>
<tr>
<td>Smart Ticketing Systems</td>
<td>WG3 - Public Transport</td>
</tr>
<tr>
<td></td>
<td>WG3/SG5 – IFMS standards</td>
</tr>
<tr>
<td>Traffic Management</td>
<td>WG5&amp;6 are dormant</td>
</tr>
<tr>
<td></td>
<td>WG8 - Road Traffic Data</td>
</tr>
<tr>
<td>Urban Logistics</td>
<td>WG2 - Freight, Logistics and Commercial Vehicle Operations (this WG was recently restarted)</td>
</tr>
</tbody>
</table>

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7 Comité Européen de Normalisation Électrotechnique, www.cenelec.org
8 Institut européen des normes de telecommunication, www.etsi.org
focus is on wireless communications for Cooperative ITS and consists of 5 working groups:

- WG1 Application Requirements and Services
- WG2 Architecture and Cross Layer
- WG3 Transport and Network
- WG4 Media and Medium Related
- WG5 Security

The coordination with CEN TC 278 is carried out by the common coordination group (ITS-CG)\(^9\).

2.3.4 International Standards Organisation (ISO)\(^{10}\)

Founded and based in Switzerland, ISO is the world's largest developer of standards. ISO is a world-wide network of national standards institutes working in partnership with international organisations, governments, industries, business and consumer representatives. It constitutes a bridge between public and private sectors.

ISO/TC204 is responsible for ISO standardisation in the field of ITS. ISO/TC204 works in close co-operation with CEN/TC278. Most working-groups in ISO/TC204 are jointly run with CEN/TC278. ISO/TC204 also co-operates with ETSI TC ITS on communication standards being used in ITS (WG16) and on standards developments for applications and message sets (WG14, WG3).

ISO/TC204 operates following working groups (noting that dormant WGs are not listed):

- WG1 Architecture
- WG3 ITS database technology
- WG4 Automatic vehicle and equipment identification
- WG5 Fee and toll collection
- WG7 General fleet management and commercial/freight
- WG8 Public transport/emergency
- WG9 Integrated transport information, management and control
- WG10 Traveller information systems
- WG11 Route guidance and navigation systems

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\(^9\) See section 2.3.1 on CEN

\(^{10}\) Organisation internationale de normalisation, www.iso.org
• WG14  Vehicle/roadway warning and control systems
• WG15  Dedicated short range communications for TICS applications
• WG16  Wide area communications/protocols and interfaces
• WG17  Nomadic devices in ITS systems
• WG18  Cooperative systems

2.4 EU-Mandates

Standardisation is perceived by the European Commission as a priority in order to achieve European and global ITS co-operation and coordination.

In order to ask the European Standardisation Organisations to draw up or adopt technical specifications of a normative nature for certain aspects, the European Commission can release mandates. Before formal submission to the ESOs, EU Member States are asked for their opinions. The ESOs can refuse mandates if they think they cannot be fulfilled.

All issued mandates accepted by the ESOs are listed in the database of mandates11.

The European Standardisation Organisations, ETSI, CEN, CENELEC, have been invited in several mandates to prepare a coherent set of standards, specifications and guidelines to support European Community wide implementation and deployment of ITS systems:

- **M/453** Co-operative systems
  Mandate in support of the development of technical standards and specifications in order to ensure the EU-wide deployment and interoperability of cooperative systems (2009)
- **M/338** EETS
  Mandate in support of the widespread introduction and interoperability of electronic road toll systems in the EU (2003)
- **M/270** Standards for Road Transport Telematics (1998)
- **M/211** Use of IC cards in automatic road toll collection systems (1995)
- **M/210** Harmonised standards for automatic toll collection systems (1995)
- **M/018** Pan-European interoperability of Road Transport and Traffic Telematics (1993)

2.5 European Standardisation Products

The CEN standards products, their properties and approximate development times are described below. The products of the other standards organisations, such as ETSI and ISO are similar to CEN’s and are therefore not described below

in order provide a concise overview of the “standards products”. The following descriptions are quoted from www.cen.eu/cen/products.

2.5.1 *European Standard (EN)*

A European Standard (EN) is a standard that has been adopted by one of the three recognised European Standardisation Organisations (ESOs): CEN, CENELEC or ETSI. It is produced by all interested parties through a transparent, open and consensus based process.

A standard represents a model specification, a technical solution against which a market can trade. It codifies best practice and is usually state of the art. ENs are reviewed within five years of their publication.

2.5.2 *Technical Specification (TS)*\(^{12}\)

A Technical Specification (TS) is a normative document, the development of which can be envisaged when various alternatives that would not gather enough data so as to allow agreement on a European Standard (EN), need to coexist in anticipation of future harmonisation, or for providing specifications in experimental circumstances and/or evolving technologies. The TS shall be announced at national level. It may be adopted as a national standard, but conflicting national standards may continue to exist. A Technical Specification may however not conflict with a European Standard. If a conflicting EN is subsequently published, the TS is withdrawn.

No time limit is specified for the lifetime of TSs, but the responsible Technical Body shall ensure that they are reviewed at intervals of not more than 3 years, starting from their date of publication by CCMC.

2.5.3 *Technical Report (TR)*

A Technical Report (TR) is an informative document that provides information on the technical content of standardisation work. It may be prepared when it is considered urgent or advisable to provide additional information to the CEN national members, the European Commission, the EFTA Secretariat, other governmental agencies or outside bodies. It involves no obligation at national level.

No time limit is specified for the lifetime of TRs, but it is recommended that they are regularly reviewed by the responsible Technical Body to ensure that they remain valid.

2.5.4 *CEN Workshop Agreement (CWA):*

A CEN Workshop agreement (CWA) is a standardisation document, developed in a CEN Workshop. The latter is open to the direct participation of anyone with an interest in the development of the agreement. There is no geographical limit on

\(^{12}\) The TS-format has replaced the former CEN ENV deliverable type (European Pre-Standard)
participation and hence participants may be from outside Europe. The development of a CWA is fast and flexible, on average between 10-12 months.

A CWA does not have the status of a European Standard and there is no obligation for the National Standards Bodies to adopt it as national standards.

2.5.5 Harmonised Standards

The ESOs are involved in a successful partnership with the European Commission and the European Free Trade Association. The ESOs support European legislation in helping the implementation of the European Commission directives, particularly those developed under the New Approach.

The European Commission requests the ESOs to develop and adopt European Standards, by means of 'standardisation mandates'. Those European Standards developed in response to a mandate are called 'Harmonised Standards'. A list of Harmonised Standards supporting EU Directives and Regulations is available in a dedicated area on the European Commission website13.

2.6 Regional and Industrial Common Specifications

In addition to the European and international standards described above, there are a large number of more local common specification activities which have been initiated in the context of particular markets.

As these are developed locally, such common specifications are not targeted for pan-European harmonisation. However, local development can provide a market-focussed framework, greatly reducing the time taken to:

- Develop, agree and revise the common specifications
- Deliver products based on the common specifications
- Implement solutions based on commonly specified products

In ITS and traffic management we have two examples in; the UTMC framework centred on the UK, and the OTS framework centred on German-speaking countries. In both cases, the starting point is the current and near-term requirement of urban roads authorities to acquire and integrate systems.

Both UTMC and OTS have significant and complex links with formal standards (especially DATEX II). In addition, UTMC was created as a UK Government specification and OTS aims to be adopted as a PAS by the German national SDO DIN.

3 Analysis of Specific Urban Needs

In general, the Urban ITS Expert Group thinks that urban needs for most ITS-areas are properly taken into account by the European standardisation bodies. However, the group also believes that European standards might have a bias in favour of inter-urban rather than urban aspects and that the link between the ESOs working groups and the Local Authorities is missing. Local authorities have just started to understand the need of being involved in standardisation activities. But the effort of participating in these processes is considerable and Local Authorities may not have the resources needed.

Increasingly, urban authorities are interworking with inter-urban authorities, third party information services and others. This implies a need to integrate with systems that are subject to European harmonisation. Partly because of this, there is a fear among urban authorities that current standards (developed for inter-urban solutions) could be applied for urban areas without further adaptation. In any case, the absence of a coherent framework to integrate urban and interurban standards is perceived as a barrier to progress.

The Urban ITS Expert Group expects substantial benefits from standards if they are properly adapted for the urban environment, for example in public procurement. The obvious challenge is to find ways to allow urban stakeholders to get involved in the creation of standards and the review processes inside the ESOs, and this is clearly a field where European value could be created by providing guidance and financial support.

In a fast-moving technological environment, formal standardisation frequently moves too slow. It would also be advantageous to look for ways of supporting more flexible and less constrictive documents - for instance open managed specifications which do not have the force or the procedural formality of standards. Nevertheless, it is obvious that, in some cases standards will still be required.

The Urban ITS Expert Group thinks that it is necessary to continue to develop new standards and to supplement existing ones in the field of Urban ITS, and that the "urban view" in many cases is needed to complement the existing standards.

One of the short- and medium-term challenges is ensuring that the standards that already exist have a real impact on the market solutions. This will require a review of current existing standards to make sure that they are coherent with each other and remain fit for their purpose in a fast-moving technology landscape, also for urban ITS.

Each of the four key areas\(^\text{14}\) are discussed briefly concerning their standardisation needs in separate sections below. During the mandate of the Urban ITS Expert Group, its members discussed in a more detailed manner urban-related standardisation needs and possible projects.

\(^{14}\) Smart Ticketing, Multimodal information, Traffic Management and Urban Logistics
3.1 Traffic Management & Urban Logistics

Traffic Management applications have often been introduced as separate systems up to now. Nowadays multi-applications are being introduced sharing i.e. sensor data etc. Conurbation management is not possible without strong cooperation on the urban/inter-urban interface. Up until now the interest from stakeholders in traffic management standardisation activities has been low. As a consequence there are not many standards in this field.

Some experts complain that some current standardisation activities are still technology led. The Urban ITS Expert Group underlines the importance to focus on functionalities (and not on technologies) when developing standards. It is worth noting that urban ITS have an increasing need to link up with other systems, e.g. inter-urban ITS, to allow for a seamless management of the network. This imposes significant constraints and obligations for the participants of the standardisation process (with GIS, electronics, sensors, telecoms etc). In the technical domain, these new requirements first of all demand for interoperable systems and open interface standards.

Functional developments tend to happen through projects, either locally (within individual cities or groups of cities) or facilitated through projects such as those initiated under the European Framework Programme. There are, in addition, some common specifications initiatives (such as UTMC and OTS, described in section 2.5 above) that are driven by urban functional needs and act as a bridge into formal standards organisations.

Access Management in traffic management might require further standardisation effort in order to promote interoperable solutions in different cities in terms of (information about) access criteria, payment, reservation etc. This need is valid for urban logistics as well (e.g. access to loading zones, reservations of loading bays, transit rules, etc.), in order to offer a consistent level of information for professional drivers - particularly useful for cross national journeys. Map providers for satellite navigation systems have a role to integrate freight information into their mapping systems.

3.2 Smart Ticketing

In Smart Ticketing, standardisation of solutions and interfaces enabling interoperability and intermodality is one of key success factors. The reduction of costs enabled by seamless or interoperable systems can be considerable for transport operators and their financing authorities. Full compatibility of ticketing systems would enhance the user benefit.

In the domain of Smart Ticketing there are many standardisation activities taking place (e.g. the IFMSA-suite of standards), but it is a field of very fast technological evolution, hence the standards often lag behind the market developments. Additional efforts are needed especially in inter-modal solutions, when applying multi-technology solutions and for the integration in travel information and traffic management applications. Transport operators who have only just invested in new ticketing systems need to be convinced of their own benefit in investing additional effort into interoperable solutions.
3.3 Multimodal Information

There are plenty of standardisation activities in multimodal information and also on-going standardisation that has to be finalised (e.g. SIRI\textsuperscript{15}). In order to allow easy exchange of information and decrease the software costs for Multimodal Information Service, the Urban ITS Expert Group believes that data formats for the new mobility services (car sharing, carpooling, free bike services, etc.) should also be the subject to standardisation efforts. The interfaces for linking together urban and inter-urban information should be developed.

It is important to note that the development of new Multimodal Information Services is possible thanks to and should be based on existing standards.

The Urban ITS Expert Group concludes that it is important to have basic rules and common data format for an effective interoperability of information services. It could be of interest to develop standard integration protocols with back-end systems for each Public Transport mode, regardless of the place, city or the transport mode. The group also proposes efforts to define a multimodal data set for urban areas that would be provided by the urban public authorities. The work on the standardisation of a logical structure and architecture for this multimodal dataset should be launched.

\textsuperscript{15} Service Interface for Real Time Information (CEN/Ts 15531)
4 Conclusion and Recommendations

4.1 Conclusion on the overall Urban ITS Standardisation Needs

Two of the four key applications that are in focus of the Urban ITS Expert Group are already subject to substantial standardisation efforts (Traffic and Traveller Information and Smart Ticketing), but the two other remaining key applications (Traffic Management and Urban Logistics) do not have many specific on-going standardisation activities on a European level. CEN’s and ETSI’s Working Groups dealing with the topics of freight and traffic management are currently either dormant or lack an urban-specific focus. The Urban ITS Expert Group members believe that considerable improvement can be achieved with respect to these two key applications with an increased involvement of urban ITS stakeholders in the ITS-standardisation work. Currently on-going INTERREG IVC project POSSE (Promoting open specifications and standards in Europe) with participation of UDG, OCA and POLIS might be an important step in this direction, especially in the domain of traffic management.

A strategic discussion is needed on how standardisation and specifications should be used in the urban transport context. This should include consideration of how requirements are captured and how specifications/standards are managed. Standards should be driven by the requirements of the user community, but it is difficult to construct a practical format for this and it is not always easy to get direct involvement of urban (i.e. local) experts in a pan-European (and sometimes global) work setting.

It is also of great interest to achieve a better linkage between inter-urban ITS and urban ITS systems and services. ESOs focusing on ITS standardisation can play a role in bringing these sides closer together.

Any initiative of increased effort in standardisation of Urban ITS should be accompanied by a more strategic and policy oriented discussion about the way that European added value is to be created by cooperation between Local Authorities and the ESOs. Win-win situations have to be sought and a clear and strong basis for cooperation has to be found.

4.2 Need for a New Standardisation Mandate?

The Urban ITS Expert Group does not think that there is a need of a new standardisation mandate for specific urban issues at this point. However, it is recognized that the contribution of Local Authorities to ITS standardisation process would be crucial in order to ensure the development of ITS standards for seamless service. Dedicated urban standards may be required in some cases, but urban contribution to general ITS standards may be equally important. The Urban ITS Expert Group thinks that most work on the urban perspective of ITS-standards can be achieved using the current standardisation set-up and the existing mandates from the EC.

4.3 Active involvement of Local Authorities in ITS Standardisation

The context for urban ITS is changing dramatically, and this first of all needs to be reflected by changing cooperation patterns of the Stakeholders involved.
Local Authorities – that so far were often content to run their own systems and applications for their own purposes – need to become partners in a stakeholder network that operates a vast range of ITS services, public and private. The European Commission could help in setting up an appropriate framework for a good orchestration of ITS services. Even if no legislative instruments are required in this scenario, the European Commission could take a guiding role by establishing the appropriate platform of cooperation and by supporting Local Authorities’ active contribution.

Quick win opportunities lie in establishing standards (and also commonly agreed specifications) that allow Local Authorities to connect their existing systems to those of other stakeholders in the ITS value chain, in order to improve urban ITS applications operated by the Local Authorities as well as to enrich third party services with content from the urban side. More difficult to approach – but maybe also more promising in terms of expected impact – are direct collaboration patterns between urban and inter-urban road operators (i.e. urban/inter-urban TMPs16).

Local Authorities appear to be open minded and willing to actively contribute to such scenarios, but they are suffering from serious budget constraints and – to a lesser extent – from a lack of knowledge on how such cross-operator cooperation and associated processes – like European level standardisation – actually work.

The European Commission is therefore asked to consider this case and try to establish opportunities for Local Authorities to

- Be precisely and concisely informed about current developments in the European ITS framework that are likely to have an impact on Local Authorities and their future work
- Contribute to European level cooperation and harmonisation with other road operators and with public/private ITS service providers
- Actively contribute – where needed – to European level standardisation and considerations regarding system interoperability and continuity of ITS services

4.4 Proposed analysis of Specific Urban Needs in ITS Standardisation

The ESOs are encouraged to make a detailed analysis of the specific urban needs in ITS-standardisation and the coherence of the existing standards. The analysis shall also propose how the specific urban needs could be incorporated into the ITS-standardisation programmes and how existing standards can be adapted. It should also be possible to get a financial EC-backing for such a pre-study under the existing standardisation mandates. It is highly recommended to involve urban experts in this process.

This pre-study should be closely linked to the strategic level of ITS-standardisation but also make concrete proposals for standardisation work to be

16 Traffic Management Plan: pre-defined allocation set of temporary measures to a specific situation

ITS Action Plan – Needs for standardisation of Urban ITS
undertaken. Some suggestions and proposals for such work is given in this report (see section 3). It should also show possible ways how to involve Local Authorities and experts with specific urban knowledge.

In order to foster the use of standards and to increase the number of interoperable systems, the idea of prescribing the use of standards and open (common) specifications in order to receive EC funding should be looked into.

4.5 Recommendations

In light of the Urban ITS Expert Group's discussions, the following recommendations are put forward:

1. Given that there are currently two active standardisation mandates that may also be relevant for Urban ITS applications (M/338 and M/453), a new Urban ITS mandate is not recommended.

2. The Urban ITS Expert Group suggests that a stronger focus on urban issues and urban/inter-urban interfaces should be incorporated into the existing standardisation work.

3. The members of the Urban ITS Expert Group conclude that the ESOs could undertake a pre-study concerning specific Urban ITS standardisation needs. This pre-study would check the coherence of existing standardisation documents; make proposals for further standardisation, if necessary, or coordination of existing work between European and national level. An exercise like this could be proposed under ICT Standardisation Work Programme and it could be co-ordinated by CEN/TC278 and performed in co-operation with ISO/TC204 and ETSI TC ITS.

4. The ESOs should also investigate possible ways in which it would be possible to involve urban authorities, experts and stakeholder more actively in the ITS standardisation process.