# ITS - standardisering

Statusrapport på engelsk 2012

## Forord

Denne rapporten om ITS standardisering er utført av Q-Free i Trondheim på oppdrag fra Statens vegvesen i løpet av høsten 2012. Rapporten er en oppdatert versjon av fjorårets rapport, VD rapport nr 54, med samme navn.

Rapporten er skrevet på engelsk dels fordi den skal være lesbar for flere og dels fordi den henter tekst og formuleringer fra engelskspråklige dokumenter. Dessuten ville oversetting av titler, formuleringer og status medføre risiko for feil og mye ekstra arbeid som vi ikke fant god nok grunn til å gjøre.

Det er viktig å være klar over at spesifikasjoner fra standardisering oppdateres jevnlig. For siste status i de ulike standardiseringsorganisasjonene henviser vi til web-linkene som følger under hver gruppe. Ved å følge dem vil man kunne finne de siste oppdateringene.

Rapporten gir et innblikk i hva hver av gruppene i ISO, ETSI og CEN jobber med. I tillegg er det beskrevet en del andre fora og organisasjoner som påvirker standardiseringen eller er sterkt knyttet opp mot ITS standardisering. En del internasjonale prosjekter er og nevnt som bruker ny ITS teknologi, og som gjennom sitt arbeid indirekte gir input til og påvirker standardisering av ITS teknologi. Nye fokusområder innen standardisering er trukket fram, for eksempel «cooperative systems» (samhandlende systemer).

En viktig del av hensikten med rapporten er å belyse sider ved ITS standardisering som kan påvirke Statens Vegvesens valg av teknologiske løsninger på kort og langs sikt. Slike aspekter er bakt inn i teksten under grupper som man anser er viktige for Statens vegvesen. I tillegg er det påpekt direktiver og mandater som påvirker Statens vegvesen sin oppfølging av ITS tjenester og som er rådgivende og styrende for implementering av ITS i vegsektoren.

Målet med rapporten er også å gi et overblikk av status og perspektiver framover innen ITS standardisering, og dermed skape større interesse og kunnskap om standardiseringens hensikt og viktighet. Det er et håp at rapporten kan være med å stimulere til økt medvirkning på feltet. Det er viktig med norsk deltagelse i internasjonal standardisering, både for å sikre næringsinteresser og for utvikling av kompetanse og nettverk.

Rapporten er tenkt å være et levende dokument. Det vil si at dokumentet vil oppdateres jevnlig slik at det er relativt up-to-date med hensyn til hva som skjer innen ITS standardisering.

Kontaktpersoner for rapporten og standardisering av ITS er listet under preface kapittelet.

Oslo/Trondheim november 2012
Vegdirektoratet
Seksjon for trafikkforvaltning (VT)
Seksjon for ITS (TMT)

# 1    Sammendrag av ITS standardisering

Intelligente transportsystemer (ITS) innen vegtrafikk er systemer som bruker informasjons- og kommunikasjonsteknologi for sikrere transport og mer effektiv bruk av veginfrastrukturen. Intelligente transportsystemer har et bredt nedslagsfelt fra grunnleggende styringssystemer til avanserte systemer som benytter avanserte modeller til å beregne trafikkutviklingen frem i tid. Om noen år kommuniserer kanskje kjøretøyene med hverandre og øvrig veginfrastruktur slik at de blir en integrert del av trafikkstyringssystemene.

Standardisering er et viktig element for å utvikle gode ITS løsninger. Standardisering bidrar til at ITS systemer virker sammen uavhengig av hvilke leverandører som benyttes. Det åpner et større marked for leverandørene og er bra for vegoperatørene som får flere tilbydere av samme utstyr. Et velfungerende marked fører til økt innovasjon og lavere priser.

Innen ITS standardisering er det de tre standardiseringsorganene CEN, ETSI og ISO som er spesielt relevant. Hvert standardiseringsorgan består av en rekke tekniske komiteer som utvikler standarder innen sine spesielle felt. Innen de tre nevnte organisasjoner er det de tekniske komiteene CEN TC 278, ETSI TC ITS og ISO TC 204 som er spesielt relevant for ITS

CEN og ETSI er europeiske standardiseringsorganisasjoner og som sådan spesielt interessante siden EU har spesiell fokus på europeisk lovgiving og regulering. Det er blitt etablert en europeisk koordineringsgruppe (ITS Coordination Group, ITS-CG) mellom CEN og ETSI for å koordinere standardiseringen innen CEN og ETSI.

ISO er den internasjonale standardiseringsorganisasjonen. Den bidrar til global standardisering slik at produkter og tjenester kan brukes over hele verden. For å få til mest mulig homogene løsninger med USA har det i tillegg blitt etablert en EU-U.S. koordineringsgruppe.

Det som standardiseres dekker så å si hele ITS feltet. Dette inkluderer arkitekturer for ITS tjenester, trådløs kommunikasjon, meldingsformater, sikkerhet, personvern, databaser m.m.

Bruksområdene til standardene kan grupperes in i områder for reiseinformasjon, kontrollsystemer for transport, kommunikasjon til og fra kjøretøy, godstransport, offentlig transport m.m.

EUs ITS-direktiv legger visse føringer for å sikre en raskere innføring av ITS i Europa. Målet er å fremme sikre, effektive og miljøvennlige mobilitetsløsninger. Direktivet peker på behovet for interoperabilitet og homogene løsninger på tvers av landegrensene. Distribusjon av grenseoverskridende tjenester for reiseinformasjon og trafikkstyring kan ikke oppnås av medlemsstatene alene.

For å oppnå den ønskede internasjonale interoperabiliteten som ITS direktivet etterspør, er det viktig at Statens vegvesen holder seg oppdatert på det som skjer innen ITS standardisering. ITS tjenester er og vil bli en stadig viktigere del av eksiterende og ny infrastruktur. Kunnskap om ITS tjenester og utviklingen innen ITS standardisering er derfor viktig for flere fagmiljøer, slik at ITS blir en integrert del av fremtidens transportsystemer.

Informasjonen som er gitt i denne rapporten er korrekt pr. oktober 2012. Men standarder utvikler seg hurtig, så leseren oppfordres til å bruke lenkene som er oppgitt i denne rapporten hvis man ønsker å sjekke de siste oppdateringer innen den enkelte standard.

En oversikt over hvor de ulike gruppene i standardiseringsorganene CEN, ISO og ETSI har hovedfokus kan finnes i figur 1.

# ITS-standardisation
Overview and Status Report 2012
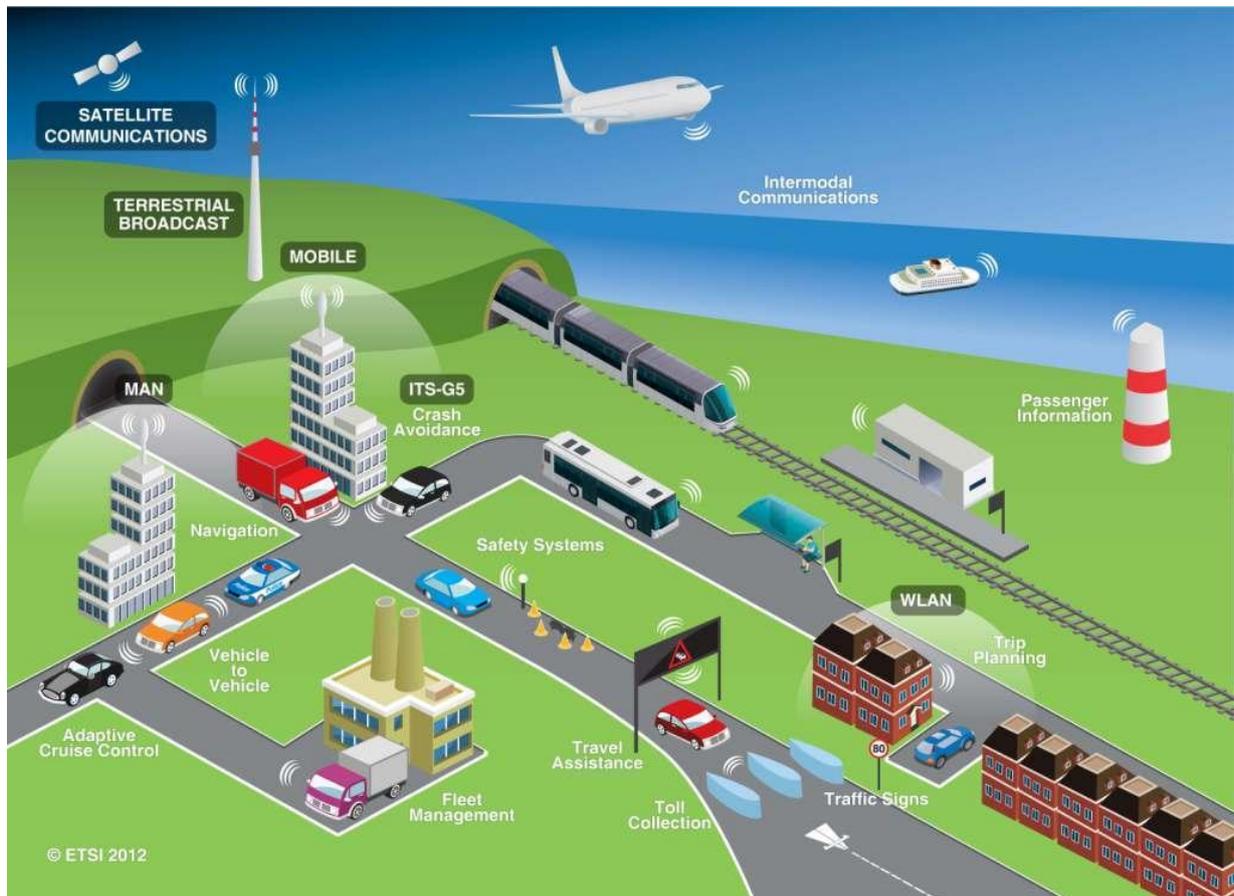


Norwegian Public Roads
Administration
Traffic Management Section
ITS Section
2012

# Executive Summary

Standardisation has been important since the start of ITS, and it is now even more essential.

Up until now, most of the ITS standards have been stand-alone standard such as Electronic Fee Collection and traffic information (RDS-TMC). There is no doubt that EFC and RDS-TMC standards have been essential in bringing ITS technology to the mass market, have driven down product prices, and allowed these services to become interoperable. This report gives a good overview of current standards, but much of the effort has gone into explaining the next stage of ITS standards.

ITS is seen as a tool to: reduce accidents; increase transport efficiency; reduce environmental impact and improve sustainability.  At the same time as providing an improved user experience.
Policies are being set both on the national level, on the regional level such as EU Directives, and lately also between the regions such as between US and Europe. It is clear that some targets are conflicting, and that systems trying to incorporate them will need to handle many parameters and be flexible for the future. Taken together, there is no doubt that the next stage of ITS will see increased complexity. The task for standardisation is to hide this complexity from the users.

The good news is that the standardisation domain, together with the R&D projects, has focus on this task. There are many organisations at work now, and good standards are being produced.
The not-so-good news is that there is duplication of work between these organisations, and the standards being produced are not necessarily interoperable with each other. This problem has been recognized, and both the EC and US DoT are actively trying to bridge the gaps.

The perceived situation at the present time is that the balance between Safety requirements and Efficiency requirements has been tilted in favour of anti-collision vehicle Safety. This is a result of the car makers being a strong group politically and financially, and there is no comparable group from the efficiency side to counter this strength.

From a policy perspective, there is significant on-going work to support the policy documents from the EC:  ITS Action Plan and ITS Directive. Areas that are of special interest linked to the ITS action plan include:

- Real time traffic and traveller data sharing to support a safer and more relaxed driving situation

- International road signing and information layout and formats to support common understanding across borders

- International Automatic Vehicle Identification/Electronic Fee Collection systems to support common paying service and a greener transport sector due to diverse emission fees.

- Emergency call and safety warnings to drive down the number of traffic fatalities and accidents

These aspects are also common with the overall road transport development strategy from the Ministry for transport and communication in Norway. Following up and impacting the SDOs and forums working on these aspects will lead to specifications in line with Norway's special interests.

## Table of Content

## 2    Preface

This report is an overview of ITS Standardisation as part of a project financed by the Norwegian Public Roads Administration (NPRA). The work has been done by Q-Free in Trondheim during August to October 2012.

### 2.1    Disclaimer
All facts and figures are believed to be correct by October 2012 unless otherwise noted.
Attention has been made to produce a report that can be maintained in a reasonable way. Relevance of subjects and contents has been decided together with NPRA to fit within the given time and resources. Some minor additions and editing has been carried out by NPRA as a final wrapping of the document to embrace some certain issues which were of special interest.

Note that the standardisation scene changes rapidly, and that information from some of the groups is limited. Some information in this report may thus be out dated when reading. Please refer to the embedded links to check the most recent status.

### 2.2    IPR on Standards
All standards in this document are referenced back to the source where they can be acquired in a legal way respecting the intellectual property rights for the different sources and types of standards. Weblinks are provided throughout the document for open sources where available. Please refer to these links for more in-depth information. Resources protected by copyright cannot be accessed without the corresponding access rights, and these are usually noted by a reference. Unfortunately most working documents from the SDOs are restricted until they are finished. This makes it difficult to give detailed information and open references to the technical work progress within each WI.

### 2.3    How to get hold of standards
There are several possible ways to get hold of copyrighted material, depending on the source of the material, the user of the material and the purpose the material will be used for. In general all standards are free for standards development but protected by copyright while in the process of development. Finished standards are often sold on a commercial basis by ISO, CEN and the national standardisation organisations (NSOs).  In general the best way to get hold of finished or draft standards is to contact Standards Norway (SN).

### 2.4    Contact persons
The person in charge of ITS standards in Norway is Bjørnhild Sæterøy who will be able to answer all questions related to ISO and CEN committees, and procuring standards from these committees.

The person within NPRA with the best knowledge of ITS standardisation and ITS policies/directives, currently serving as the leader of our national ITS reference group, is Ivar Christiansen.

For other organisations such as ETSI and IEEE, and for general questions related to the contents of this document, please contact the author of this report: Knut Evensen.

Contact person for this report at NPRA is Thor Gunnar Eskedal. (TRAFF)

# 3    Introduction

## 3.1    The aim of ITS standardization

The term Intelligent Transport Systems (ITS) refers to efforts to collect, store and provide real-time traffic information to maximize the utilisation efficiency, provide convenient safe transport, and reduce energy by applying advanced electronics, information and telecommunication technologies into roads, automobiles and goods. Whatever transport system that former was controlled, managed and operated predominantly by human intervention should now make more use of technology to automate diverse functions and information gathering. The air transport has already made extensive use of ITS for all kinds of control of the aircraft and airspace for decades. This has not, in the same extent, been the case for the road transportation system. Lights signals, automatic speed control systems, camera surveillance, tunnel safety systems and some other services have been operative for many years. These are however only a fragment of possible traffic control, information and surveillance systems that may be implemented to alleviate the increasing traffic problems especially in urban areas. In particular the interconnection of systems and sharing of data is still in its infancy for the road transportation segment.

Intelligent Transport Systems (ITS) can significantly contribute to a cleaner, safer and more efficient transport system. Consequently, ITS have become the focus of a number of policy and legislative initiatives in Europe. The European Commission has laid down the legal framework in order to accelerate the deployment of these innovative transport technologies across Europe. Furthermore, the European Commission has requested the European Standards Organizations to develop and adopt European standards in support of this legal framework. Not surprisingly there is considerable activity in this area by the European standards organizations CEN, CENELEC and ETSI.

Standardization of technological solutions for road transport is one important aspect to increase the uptake of ITS to reap the estimated benefits. In addition ITS standardization has the following benefits:

- Enable interoperability of systems/services and between different implementations that will give users seamless plug-and-play functionality.

- Encourage innovation, foster enterprise and open up new markets for suppliers

- Create trust and confidence in products and services. This include test and quality that will assure that products/solutions are safe, healthy, secure, flexible and of correct quality.

- Expand the market, bring down costs and increase competition

- Help to prevent duplication of effort and improve communication

- Assisting Governments, Administrations and Regulators to support
    - legislation,
    - regulation and
    - policy initiatives

- For the industry, manufacturers and suppliers of systems, Standardization brings important benefits including a solid foundation upon which to develop new technologies and an opportunity to share and enhance existing practices. This involves a.o.:
    - Provides technology stability
    - enable multi-market access
    - create active markets
    - encourage innovation

Knowledge of emerging ITS services through standardisation is important for NPRA to make optimal use of them in all areas and phases of the road transportation system. This is in line with NPRAs and the national governments overall strategy and requirements regarding the Norwegian road transportation system.

### 3.2    ITS standardization organizations

Within ITS standardisation there are three Standardisation bodies which are of special interest for the European domain. These are CEN TC 278, ETSI TC ITS and ISO 204. Of these the European SDOs CEN TC 278 and ETSI TC ITS are particular of interest since the European community has special focus on European legislation and regulations which Norway is a natural part of. The ITS Coordination Group (ITS-CG) between CEN and ETSI has been established to ensure ongoing coordination of the standardization activities within these two SDOs.

ISO, IEC and ITU are global SDOs who standardise ITS on a global level. Many of the WGs with CEN are overlapping with ISO. To harmonise and obtain a good and fruitful cooperation CEN 278 and ISO 204 has joint meetings twice a year.

ITS standardisation is also going on in USA.
An EU-U.S. joint declaration of Intent on Research Cooperation in Cooperative systems has been established, and is coordinating standardisation to some extent.

In addition to the mentioned SDOs there are lots of organisations working with ITS standardisation. Please refer chapter 10 to and onward for some other relevant SDOs.

Note that the number of standards from various SDOs at any stage (published or under active work) changes quite rapidly for a number of reasons:

- New standards are started that covers aspects of existing standards. In the case of full overlap, existing standards are usually withdrawn.

- Paradigm shifts like Cooperative Systems will generate a lot of new standards in a comparatively short time.

- Shifting user requirements will lead to new standards being developed.

- Depending on the type of standard, it has a limited lifetime of three to five years after which it needs to be reconsidered and either re-adopted, modified and re-voted, or withdrawn if there is not enough interest

Cooperation between global ITS standards organisations is important in order to achieve harmonised standards providing global interoperability. Detailed cooperation between the standards organisations has been initiated in addition to the already existing cross participation by membership in the relevant organisations.

To ensure work progress and cooperation in standard development the EC has created so called mandates. These shall ensure that standards are developed within certain high focused areas, ref section 15.1. The ITS directive is supported by mandate M/453, and this mandate is ending December 2012.

Getting a good understanding of what is being standardised, who is working with what and the importance and impact of the standardisation for NPRA is thus important.

The facts listed for each SDO in this report is believed to be correct at October 2012, but note that this changes so the reader is advised to use the links given in the text to check the most recent updates.

### 3.3    What is being standardized

The scope of what is being standardized is very broad and covers more or less the complete ITS field in various ITS domains. This includes amongst other:

- standardisation of architectures for ITS services,

- various radio communications systems,

- formats and structure of message systems and transport,

- security and privacy technologies and system aspects

- interfaces and reference points

- Database technologies and data file structures


The usage areas of the standards can be grouped into categories such as:

- Traveller information systems

- Transport control systems

- Vehicle-centric communication

- Goods and vehicle information

- Public transport aspect including emergency systems


The work in the standards organisations partly follow this pattern of separating technologies from application areas, but please note that this split is not absolute. Instead there are significant overlaps and combinations of services and technologies in one working group ("silo standards").


## 4    The status and outlook of ITS Standardisation

This conclusion will necessarily be somewhat subjective. The perceived situation at this time, is that the needed balance between Safety requirements and Efficiency/sustainability requirements has been tilted in favour of Active Safety. This is a result of the car makers being a strong group politically and financially, and there is no comparable group from the efficiency/sustainability side to balance this strength. Therefore many of the standards coming from ETSI are only relevant for anti-collision in a very restricted understanding of Cooperative Systems.

ISO and CEN are struggling to keep up their part, but this work has less funding, less coordination and is per definition more complex to achieve. Therefore the work is progressing at a much slower pace. The author of this report is still convinced that Cooperative ITS will succeed, but there is a lot of ground to be covered in order to satisfy the needs of authorities and road operators. Even if the car makers will claim that the goal has been achieved, they are only referring to their part of the equation.

Another challenge we are facing is the overlap of standardisation. Even though the EU-US TF has issued policies to the contrary, there is an absolute trend that ETSI is completing a fully overlapping and competing standard with the already existing CALM set. The same is happening with IEEE and SAE. There are therefore at least three competing full sets of standards that needs to be taken into account, and this is an added challenge when designing for a global marketplace

To improve this situation, the EC DG CONNECT(INFSO) and US DOT has jointly run a series of Harmonization Task Groups in 2012, and these groups have suggested a number of fixes to bring the diverging elements back together. Please see the last section "Standardisation interests in line with ITS action plan and ITS directive"

### 4.1    Standardisation impact on NPRAs work with ITS action plan and ITS directive
The ITS directive, led by mandate 453, puts forward certain requirements and guidelines for the implementation of ITS to ensure a more rapid implementation of ITS services in Europe. The aim of the European Union's land transport policy is to promote a mobility that is efficient, safe, secure and environmentally friendly. The directive points out the need for interoperability and homogeneous solutions across borders. It also promotes a layered architecture to ensure better compatibility between communication solutions and services. Trans-national deployment of continuous cross-border services for travel information and traffic management cannot be achieved by Member States alone.

The work on cooperative systems is one major step in this direction. The new standards stemming from this work will directly impact the way NPRA should develop its infrastructure and system architecture to cope with the upcoming ITS services to ensure compatibility. Usage of Datex2 as a common traveller information system is one such step to harmonise transport information across borders. A common system for Electronic Registration Identification and AVI/AFC are other initiatives.

The global nature of road communication will demand interoperability. Following and impacting the standardisation groups working with international systems that will affect the Norwegian transport system is important and must be followed up. Good cooperation with the countries with common boarders with Norway are thus of special interest.

Areas that are of special interest linked to the ITS action plan include:

- Real time traffic and traveller data sharing to support a safer and more relaxed driving situation

- International road signing and information layout and formats to support common understand ability across boarders

- International Automatic vehicle identification/Automatic fee collection systems to support common paying service and a greener transport sector due to diverse emission fees.

- Emergency call and safety warnings to drive down the number of traffic fatalities and accidents

These aspects are also common with the overall road transport development strategy from the Norwegian national department of communication. Following up and impacting the SDOs and forums working on these aspects will lead to specifications in line with Norway's special interests.


## 5    How do the work groups fit together


The picture below illustrated the main focus area of working groups from several standardisation bodies Not all groups are included and some groups may span more than one focus area.

However, the intent of the picture is to give a quick overall glance at the different areas of a road management system and where the work groups have their main focus.
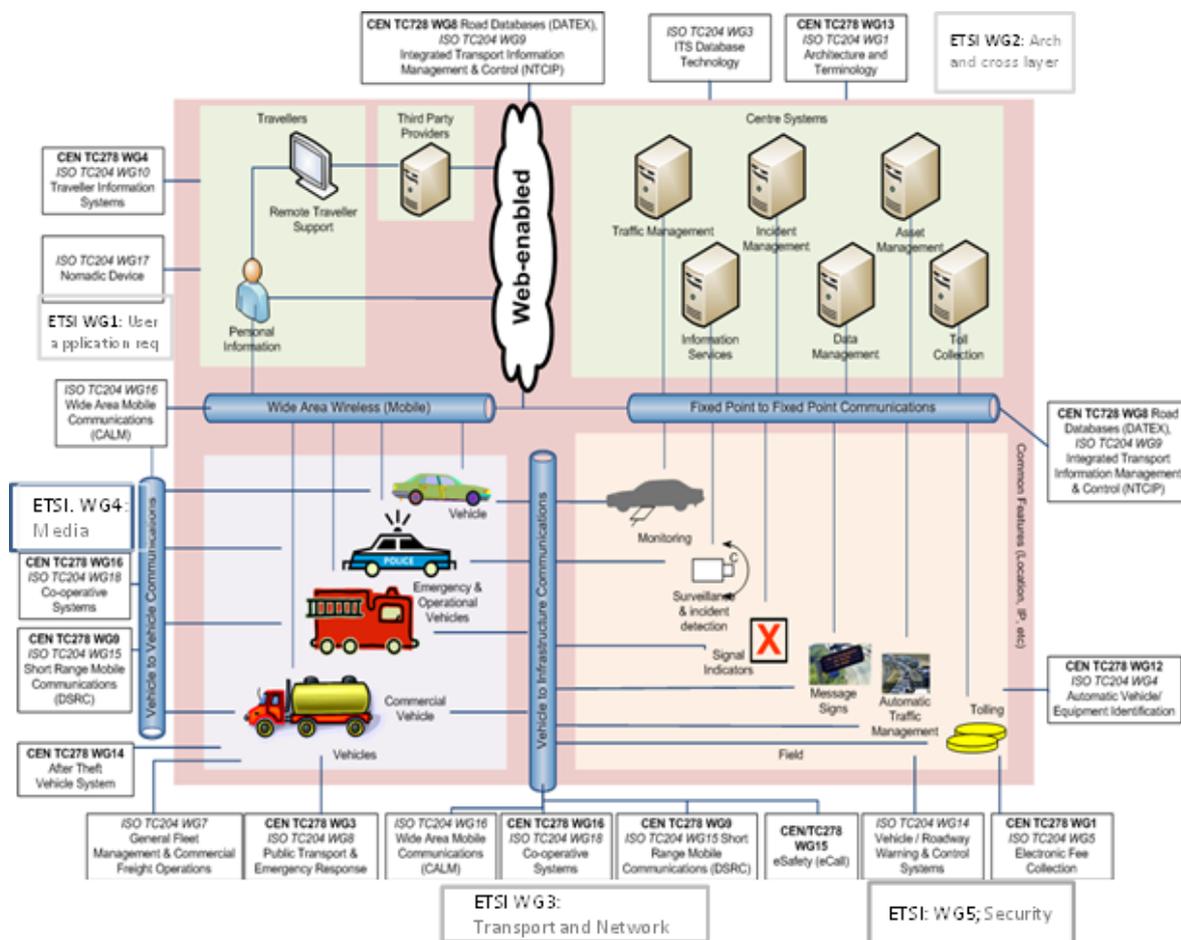


**Figure 1: Overview of the focus areas of the various working groups in ISO, CEN and ETSI**

## 6   Terminology and abbreviations

The Standardisation field has its own "tribal language" with many abbreviations. The following list of terms and abbreviations can be of help to read and understand some of the documents in this field.

| Term | Explanation and link |
| --- | --- |
|  |  |
| API | Application Programmers Interface, in the case of C-ITS this is the definition for applications residing on top of the Facilities layer |
| C2C-CC | Car-to-car communications consortium, a group started by OEMs |
| CAM | Cooperative Awareness Message defined by ETSI. This is the basic data set that is broadcast from vehicles and roadsides 2-10 times per second |
| CAMP | Crash Avoidance Metrics Partnership is a US project of mainly US car makers supported by the US DoT. GM and Ford were the founders of this cooperation, and there are many similarities to the European C2C-CC. |
| CEN | The European Standardisation Committee, with 27 European Nation States as members. |
| C-ITS | Cooperative Intelligent Transport Systems. Used as synonym for CS when ITS is needed as a qualifier. |
| CS | Cooperative Systems, the new paradigm of ITS involving communications and sharing of information. See later chapters. |
| CVIS | Cooperative Vehicle-Infrastructure System. This is the largest European Integrated Project in the field of Cooperative ITS, and has significant involvement with standardisation |
| DENM/DNM | Decentralized Environmental Notification Message. Defined by ETSI. This is an message that is broadcast from a vehicle or a roadside to notify an event, e.g. ice spot, panic braking in my vehicle, crash happened,… |
| DSRC | Dedicated Short Range Communication. ***Note that this is an ambiguous term.*** CEN DSRC is the 5.8 GHz system developed by CEN TC278/WG9 and used for tolling systems around the world, e.g. the AutoPASS system in Norway. This is the original meaning from 1992 DSRC is now also used in America as a synonym for WAVE (5.9 GHz IEEE 802.11p) systems since 2005. This understanding is sometimes used by European car makers as well. |
| EC DG INFSO | European Commission – Directorate General – Information Society |
| EFC | Electronic Fee Collection, payment systems such as AutoPASS |
| EN | European Norm; the full European standard that has been voted through the CEN, CENELEC or ETSI national members |
| ERI | Electronic Registration Identifier, identification system for vehicles including electronic license plates and electronic registration papers. |
| G5A | ETSI terminology for European 5.9 GHz operation based on IEEE 802.11p protocols. G5A spectrum is 5.875-5.905 GHz, where the Control Channel (CCH) is defined as 5.895-5.905 GHz. |
| IP Project | Integrated Project. This is the larger size EC R&D projects consisting of multiple sub-projects. Typical size is 10-40 million Euro over 3-4 years. Examples are SAFESPOT, CVIS, SmartFreight |
| IPR | Intellectual Property Rights, this covers patents and other ownership claims. Usually the standards shall be either free of IPR, or where this cannot be |

| Term | Explanation and link |
|------|----------------------|
| | avoided, the IPR holder has to sign a declaration of FRAND (Free, Reasonable and Non-Discriminatory) |
| ISO | International Standards Organisation, the global SDO with almost all Nation States as members. |
| ITS Station | defined in ETSI EN 302 665 / ISO 21217, e. g.  units installed in vehicles, at the road side, in traffic control/management centres, in service centres, or hand-held units. |
| LDM | Local Dynamic Map. One of the main concepts coming out to the CVIS and SAFESPOT projects, where all information is referenced by time and position, and then stored in a relational database. Accepted to be one of the core blocks of C-ITS. |
| NSO | National Standards Organisation, the body responsible for voting and selling standards in each country. An NSO can also provide national Standards, and will then be a national SDO. |
| OEM | Original Equipment Manufacturers; in the case of ITS this is a synonym for car makers, e.g. Daimler, Ford, GM, Toyota. |
| PT | Project Team, a small group of experts financed by European Commission to draft a standard for CEN in a short time. |
| SA Project | Support Action projects are small, special European Framework R&D projects that will facilitate and support coordination of other projects. Are usually funded 100%. Examples are COMeSafety and iCar Support who have standardisation support as part of their task. |
| SAE | Society of Automotive Engineers |
| SDO | Standards Developing Organisation, the generic term for CEN, ETSI, ISO, IEEE and so on. |
| STF | Specialist Task Force, a small group of experts financed by European Commission to draft a standard for ETSI in a short time. |
| STREP | Specific Targeted Research Projects. A "regular" European Framework R&D project, which can get up to 67% EC funding support. Examples are GeoNet, EVI and RCI |
| US DoT RITA/JPO | United States Department of Transportation - Research and Innovative Technology Administration – Joint Programs Office. See this link for an overview. This is the federal administration responsible for ITS research and standardisation |
| VA | Vienna Agreement, the cooperation agreement between CEN and ISO. It basically regulates that CEN shall not start work where ISO is already working on a subject, and vice versa. The end result is no duplication or overlapping standards. |
| WAVE | Wireless Access in the Vehicular Environment. The name of an IEEE project (set of standards) called P1609. |

## 7    CEN TC278

**CEN TC278** is the European ITS committee with the name of Road Transport and Traffic Telematics (RTTT). This was the first ITS standardisation body, and TC278 has laid the ground works for global ITS standards. The initial ideas came from the European framework programme called DRIVE, where it became clear that standardisation had to be started.

In general, CEN has a good representation and participation from industry, service providers, public bodies and road operators/authorities, but less from car makers.

CEN TC278 recently opened a new home page with a good overview of ITS standardisation and search facilities for TC278 items. The site will be kept updated close to the official CEN/ISO database.

The following link directs you to the active WGs and list over reports from the groups:

**http://www.compumax.nl/tc278/index.php?option=com_content&view=article&id=83&Itemid=92**

Looking into the *application areas* drop down menu information about the various active working groups can be found.

### 7.1    WG responsible:
The following working group information is intended to give a rapid overview of the status. Note however that Work Items and published standards change quickly over time, as do the other facts. Therefore please use the web links to get the exact status of any fact below. Note also that CEN work groups does not have formal websites, but the intention is to develop more information on the TC278 website. Please look under the tab "**Application Areas**

The following WG are active (October 2012):
- WG 1 Electronic Fee Collection (Sweden) – Jesper Engdahl
- WG 2 Freight, Logistics and Commercial Vehicle Operations (UK) - Jonathan Harrod Booth
- WG 3 Public Transport (France) – Dominique Descolas
- WG 4 Traffic and Travel Information (UK) – Paul Burton (Passive, see description below)
- WG 8 Road Traffic Data (Netherlands) – Dick de Winter
- WG 10 Human-Machine Interfacing (Germany) – C. Heinrich
- WG 12 AVI/AEI (Norway) – Knut Evensen
- WG 13 Architecture and Terminology (UK) – Richard Bossom
- WG 14 Recovery of stolen vehicles (UK) – Alan McInnes
- WG 15 e-safety (UK) – Bob Williams
- WG 16 Cooperative systems (Germany) – H.J. Schade

## 7.2    WG1: Electronic fee collection

Road User Charging (RUC) in transport is used all over Europe for raising revenue, dealing with congestion and internalizing transport costs. Concerns over escalating congestion, pollution and carbon dioxide issues, i.e. the sustainability of road transport, put even more emphasis on fair pricing schemes in European traffic.

Electronic Fee Collection (EFC) is a collective name for IT technologies that allow for electronic charging of road users (as opposed to manual systems, such as paying at a toll booth). EFC systems offer the possibility of charging road vehicles in a flexible way, and allow for targeted infrastructure charging policies. There are three basic technologies in use in EFC today:

- EFC based on dedicated short range communication (DSRC) at a toll station.
- Autonomous EFC systems, which use in-vehicle devices for positioning (e.g. GNSS-based EFC).
- Video-based charging (i.e. registering the number plate automatically by video recognition).

There are many EFC systems in Europe today, however, most of them have been developed and expanded on a regional basis creating different variants between different nations. In order to reap the full benefits of EFC systems they need to be interoperable, allowing a vehicle to pay charges in different countries using a single on-board unit (OBU) and a single contract. For this reason the European Commission is setting up a common EFC service for Europe called the EETS (European Electronic Toll Service). Directive 2004/52/EC lays down the conditions for this service and the emergence of cross border interoperability of electronic road toll systems in the European Union.

This demand for interoperability calls for strong measures in standardization. Open and common standards are necessary for creating interoperable systems and services. This will also create better opportunities for market development in Road user charging and Electronic fee collection. EFC-standards provide the building blocks for the EETS as well as other tolling schemes in Europe and strengthen the competitiveness of European industry in the global EFC technology market.

This is one of the most productive WGs in ITS. The work is divided in three sub groups currently, and the WG usually have 4-5 meetings per year with 2-4 days per meeting. Most of the meetings are held in Europe, but some of the meetings are held in conjunction the ISO TC204 meeting week which happens twice per year around the world.

The main field from the start was CEN DSRC based tag-and-reader systems, and this was done in a loose cooperation with WG9 and WG12. The EC supported the original set of standards through a mandate and a number of PTs. The basic standards from WG1 have been incorporated in the EFC Directive, and are also referenced by all national EFC specifications, such as the AutoPASS specification.  The new wave of standards has been designed to support the EFC directive even more, and a new mandate (M/338) has been active for a while. This leads up to GNSS/CN based system specifications (called Autonomous in WG1) with related conformance testing standards developed by SG5, and further work on conformance testing also for DSRC-based systems. Architecture, back-office operations and value-added services are other areas of work recently. The following picture shows some of the activities in this highly active WG.

Below is the latest list (May 2012) of reports under various stages of development. FV = Formal Vote.

| WI | Reference | Title | Status |
|---|---|---|---|
| 278338 | CEN TS | Electronic fee collection - Secure monitoring for autonomous toll systems - Trusted recorder | Under development |
| 278328 | CEN TS 17444-2 | Electronic fee collection - Charging performance - Part 2: Examination framework | Under development |
| 278327 | EN 15509 | Electronic fee collection - Interoperability application profile for DSRC | Under development |
| 278325 | EN 15876-1+A1:2012 | Electronic fee collection - Evaluation of on-board and roadside equipment for conformity to EN 15509 - Part 1: Test suite structure and test purposes | Published |

| 278315 | CEN TR | Electronic fee collection - Guidelines for EFC-applications based on in-vehicle ITS Stations | Under development |
|---|---|---|---|
| 278283 | CEN ISO/TS 14907-2 | Electronic fee collection - Test procedures for user and fixed equipment - Part 2: Conformance test for the onboard unit application interface (Review) | Published |
| 278282 | CEN TS | Electronic fee collection- Secure monitoring for autonomous toll systems - Compliance checking | Under development |
| 278281 | CEN TS | Electronic fee collection- Secure monitoring for autonomous toll systems - Trusted recorder | Preliminary |
| 278279 | CEN ISO/TS 16403-2 | Electronic fee collection - Evaluation of equipment for conformity to CEN ISO/TS 17575-4 - Part 2: Abstract test suites | Published |
| 278278 | CEN ISO/TS 16410-2 | Electronic fee collection - Evaluation of equipment for conformity to CEN ISO/TS 17575-3 - Part 2: Abstract test suites | Published |
| 278277 | CEN ISO/TS 16401-2 | Electronic fee collection - Evaluation of equipment for conformity to CEN ISO/TS 17575-2 - Part 2: Abstract test suites | Published |
| 278276 | CEN ISO/TS 16407-2 | Electronic fee collection - Evaluation of equipment for conformity to CEN ISO/TS 17575-1 - Part 2: Abstract test suite | Published |
| 278275 | CEN ISO/TS 16403-1 | Electronic fee collection - Evaluation of equipment for conformity to CEN ISO/TS 17575-4 - Part 1: Test suite structure and test purposes | Published |
| 278274 | CEN ISO/TS 16410-1 | Electronic fee collection - Evaluation of equipment for conformity to CEN ISO/TS 17575-3 - Part 1: Test suite structure and test purposes | Published |
| 278273 | CEN ISO/TS 17444-1 | Electronic fee collection - Charging performance - Part 1: Metrics | Preparing for FV |
| 278272 | CEN TS 16331 | Electronic fee collection - Interoperable application profiles for autonomous systems | Published |
| 278270 | CEN TS 16439 | Electronic fee collection - Security framework | Under Formal Vote |
| 278259 | CEN TR 16219 | Electronic fee collection - Value added services based on EFC on-board equipment | Published |
| 278258 | CEN ISO/TS 16401-1 | Electronic fee collection - Evaluation of equipment for conformity to CEN ISO/TS 17575-2 - Part 1: Test suite structure and test purpose | Published |
| 278257 | CEN ISO/TS 16407-1 | Electronic fee collection - Evaluation of equipment for conformity to CEN ISO/TS 17575-1 - Part 1: Test suite structure and test purposes | Published |
| 278255 | CEN ISO/TS 13140-2 | Electronic fee collection - Evaluation of on-board and roadside equipment for conformity to CEN ISO/TS 13141 - Part 2: Abstract test suite | Published |
| 278254 | CEN ISO/TS 13143-2 | Electronic fee collection - Evaluation of on-board and roadside equipment for conformity to CEN ISO/TS 12813 - Part 2: Abstract test suite | Published |
| 278253 | CEN ISO/TS 12813 | Electronic fee collection - Compliance check communication for autonomous systems | Published |
| 278252 | CEN TR 16092 | Electronic fee collection - Requirements for pre-payment systems | Published |
| 278251 | CEN TR 16040 | Electronic fee collection - Requirements for urban dedicated short-range communication | Published |
| 278250 | CEN TR 16152 | Electronic fee collection - Personalisation and mounting of first mount OBE | Published |
| 278249 | CEN ISO/TS 13140-1 | Electronic fee collection - Evaluation of on-board and roadside equipment for conformity to CEN ISO/TS 13141 - Part 1: Test suite structure and test purposes | Published |

| 278248 | CEN ISO/TS 13143-1 | Electronic fee collection - Evaluation of on-board and roadside equipment for conformity to CEN ISO/TS 12813 - Part 1: Test suite structure and test purposes | Published |
|---|---|---|---|
| 278247 | CEN ISO/TS 13141 | Electronic fee collection - Localisation augmentation communication for autonomous systems | Published |
| 278241 | EN 15876-2 | Electronic fee collection - Evaluation of on-board and roadside equipment for conformity to EN 15509 - Part 2: Abstract test suite | Published |
| 278240 | CEN ISO/TS 17575-4 | Electronic fee collection - Application interface definition for autonomous systems - Part 4: Roaming | Published |
| 278239 | CEN ISO/TS 17575-3 | Electronic fee collection - Application interface definition for autonomous systems - Part 3: Context data | Published |
| 278238 | CEN ISO/TS 17575-2 | Electronic fee collection - Application interface definition for autonomous systems - Part 2: Communication and connection to the lower layers | Published |
| 278237 | CEN ISO/TS 17575-1 | Electronic fee collection - Application interface definition for autonomous systems - Part 1: Charging | Published |
| 278236 | CEN ISO/TS 14907-1 | Electronic fee collection - Test procedures for user and fixed equipment - Part 1: Description of test procedures (review) | Published |
| 278235 | CEN ISO/TS 17574 | Electronic fee collection - Guidelines for security protection profiles (Review) | Published |
| 278234 | EN ISO 14906 | Electronic fee collection - Application interface definition for Dedicated Short-Range Communication (review) | Published |
| 278233 | EN ISO 12855 | Electronic fee collection - Information exchange between service provision and toll charging | Published |
| 278221 | CEN ISO/TS 25110 | Electronic fee collection - Interface definition for on-board account using Integrated Circuit Card | Published |
| 278215 | CEN TR 15762 | Road transport and traffic telematics - Electronic fee collection (EFC) - Ensuring the correct function of EFC equipment installed behind metallised windshield | Published |
| 278187 | EN 15509 | Road transport and traffic telematics - Electronic fee collection - Interoperability application profile for DSRC | Published |
| 278 | AC CEN ISO/TS 14907-1:2010/AC:2010 | Road transport and traffic telematics - Electronic fee collection - Test procedures for user and fixed equipment - Part 1: Description of test procedures (ISO/TS 14907-1:2010/Cor 1:2010) | Published |

### 7.3    WG2: Freight and Fleet Management Systems

The work in this WG has concentrated on information gathering and information collection about goods and vehicles/trailers/containers. The following aspects have been studied.

- Data on the performance of both drivers and vehicles;
- Vehicle tracking systems;
- Text messaging communication;
- Trailer tracking;
- Paperless manifest and proof of delivery;
- Traffic information and
- On-board navigation systems.
- Parking and resting locations for truck drivers

This work is important for an efficient transport of goods across longer distances by always obtaining information about the whereabouts of goods and trailers and the travel routes being used. Below is the list of active WIs from the group. As seen two of the reports are connected to truck parking. This is linked with safety and the requirements concerning rest hours for truck drivers on long journeys.

Since the establishment of WG2 in 2011, many stakeholders have shown interest in the work of WG2 but active participation remains low. Most of the current members are direct representatives from standardization bodies. There is a need to promote the work of WG2 in order to involve the right stakeholders. The convener requested support from the national standardization bodies and head of delegations in assessing interest in national developments in respect of (1) Intelligent Truck Parking, (2) data modelling for dangerous goods transport.

| WI | Reference | Title | Status |
|---|---|---|---|
| 00278304 | CEN TS | ITS Standardisation requirements for Freight, Logistics and Commercial Vehicle Operations | Preliminary |
| 00278305 | CEN TS | Framework Architecture, Roles and Responsibilities to support Intelligent Truck Parking Information and Reservations services. | Preliminary |
| 00278306 | CEN TR | ITS Standardisation requirements for Intelligent Truck Parking Information and Reservations services | Preliminary |

### 7.4   WG3: Public Transport

WG3 is producing standards in several areas. The primary ones are:



- Internal data networks in public transport vehicles that will connect sensors, indicators, ticket machines, etc. together (FIP, CAN, IP/Ethernet, Messages and Data contents)
- Man-machine interfaces for drivers, platform validators and on-board validators.
- Information systems  - real-time and multimodal network and time table exchange as an addition on top of Transmodel
- Ticketing systems including the full business chain from electronic tickets to exchange between back-office systems

As seen from the WI list below the main aspects are concerned with real time status information and ticketing. Most of the members are coming from the Public Transport industry, but with some regulators/authorities sitting in. There is a good cooperation with other WGs such as WG1 (EFC). The ISO equivalent (WG8) is a more closed group with little information coming out from the work progress. In ISO TC204 the group is also focused on emergency situations linked to public transport which is an important issue to follow.

| WI | Reference | Title | Status |
|---|---|---|---|
| 278332 | CEN TS | Public transport - Road vehicle scheduling and control systems - Part 8: Physical layer for IP communication | Under development |
| 278331 | CEN TS | Public transport - Road vehicle scheduling and control systems - Part 7: Network and system architecture | Under development |
| 278330 | CEN TS | Public transport - Network and timetable exchange (NeTEx) - Part 3 Public transport network fare information exchange format | Under development |
| 278319 | CEN TS 16406 | Intelligent transport systems - Public transport - Indirect fulfilment for rail | Under Formal Vote |
| 278317 | EN 28701 | Intelligent transport systems - Public transport - Identification of Fixed Objects in Public Transport (IFOPT) | Under Formal Vote |
| 278309 | CEN TR 16427 | Intelligent transport systems - Public Transport - Traveller Information for Visually Impaired People (TI-VIP) | Under Formal Vote |
| 278308 | EN | Public transport - Network and Timetable Exchange (NeTEx) - Part 2: Scheduled time table | Under development |
| 278307 | EN | Public transport - Network and Timetable Exchange (NeTEx) - Part 1: Public transport network topology | Under development |
| 278261 | CEN TS | Public transport - European ticketless and ticket on departure for rail distribution | Preliminary |
| 278222 | EN ISO 24014-2 | Public transport - Interoperable fare management system - Part 2: Recommended business practices for set of rules | Preliminary |
| 278219 | CEN TS 15531-5 | Public transport - Service interface for real-time information relating to public transport operations - Part 5: Traffic incident monitoring service | Published |
| 278218 | CEN TS 15531-4 | Public transport - Service interface for real-time information relating to public transport operations - Part 4: Real-time status monitoring information of facilities | Published |
| 278207 | CEN TS 28701 | Public transport - Identification of Fixed Objects in Public Transport (IFOPT) | Published |
| 278204 | CEN TS 15531-3 | Public transport - Service interface for real-time information relating to public transport operations - Part 3: Functional service interfaces | Published |
| 278203 | CEN TS 15531-2 | Public transport - Service interface for real-time information relating to public transport | Published |

| | | operations - Part 2: Communications infrastructure | |
|---|---|---|---|
| 278202 | CEN TS 15531-1 | Public transport - Service interface for real-time information relating to public transport operations - Part 1: Context and framework | Published |
| 278196 | CEN TS 13149-3 | Public transport - Road vehicle scheduling and control systems - Part 3: WORLDFIP message content | Published |
| 278195 | CEN TS 15504 | Public transport - Road vehicles - Visible variable passenger information devices inside the vehicle | Published |
| 278179 | EN ISO 24014-1 | Public transport - Interoperable fare management system - Part 1: Architecture | Published |
| 278176 | EN 13149-5 | Public transport - Road vehicle scheduling and control systems - Part 5: CANopen cabling specifications (review) | Published |
| 278175 | EN 13149-4 | Public transport - Road vehicle scheduling and control systems - Part 4: General application rules for CANopen transmission busses (review) | Published |
| 278170 | EN 13149-2 | Public transport - Road vehicle scheduling and control systems - Part 2: WORLDFIP cabling specifications (review) | Published |
| 278169 | EN 13149-1 | Public transport - Road vehicle scheduling and control systems - Part 1: WORLDFIP definition and application rules for onboard data transmission (review) | Published |
| 278140 | EN 12896 | Public transport - Reference data model (review) | Published |
| 278125 | CEN TS 13149-6 | Public transport - Road vehicle scheduling and control systems - Part 6: CAN message content | Published |
| 278083 | ENV 13998 | Public transport - Non interactive dynamic passenger information on ground | Published |
| 278079 | ENV 12796 | Public transport - Road vehicles - Validators | Published |
| 278078 | ENV 13093 | Public transport - Road vehicles - Driver's console mechanical interface requirements - Minimum display and keypad parameters | Published |
| 278077 | ENV 12694 | Public transport - Road vehicles - Dimensional requirements for variable electronic external signs | Published |

## 7.5    WG4: Traffic and Travel Information

WG4 was recently put in a dormant state in CEN TC278 to avoid the extra work involved in the Vienna agreement application. The following description therefore applies for ISO TC204/WG10, and will be moved there in the next issue of this report.

WG4 has been very active in the past, but the activity is mostly moved to TISA (Traveller Information Services Association) which is a nonprofit organisation for TPEG, RDS-TMC (Alert C) and Graphic Data Dictionary. The main work is related to definition of data sets and transport protocols for sending traffic related information, mostly via public broadcast systems, but also via other media.

This is one of the most productive WGs with around 35 developing + published standards, and considered to be the most successful set of ITS standards globally, perhaps with the exception of CEN DSRC/EFC.

TPEG is a standard that will allow much larger data volumes to be sent to the on boards travel units. It is based on DAB radio communication and some argue that it will eventually take over for RDS-TMC. TPEG is included as a communication and location standard for Datex II. A DATEX II-to-TPEG demonstrator was organized during the ITS European Congress in Lyon for which the technical explanation is available here.

It is recommended to follow this work and uptake of this standard closely in the coming years and evaluate if a transition to TPEG should be carried out in Europe or if TPEG should be seen upon as a compliment to RDS-TMC.

The working group is planning to move the 21219 series work items to ISO as ISO only work item considering the lack of commitment in CEN TC278.

| WI | Reference | Title | Status |
|---|---|---|---|
| 278326 | CEN ISO/TS 18234-2 | Traffic and Travel Information (TTI) -- TTI via Transport Protocol Expert Group (TPEG) data-streams -- Part 2: Syntax, Semantics and Framing Structure (SSF) | Under development |
| 278324 | CEN ISO/TS 18234-10 | Intelligent transport systems - Traffic and travel information via transport protocol expert group (TPEG) data-streams - Part 10: Conditional access information (TPEG-CAI) | TC review closed |
| 278323 | CEN ISO/TS 18234-9 | Intelligent transport systems - Traffic and travel information via transport protocol expert group (TPEG) data-streams - Part 9: Traffic Event Compact (TPEG-TEC) | TC review closed |
| 278322 | CEN ISO/TS 18234-1 | Intelligent transport systems - Traffic and travel information via transport protocol expert group (TPEG) data-streams - Part 1: Introduction, numbering and versions | TC review closed |
| 278321 | CEN ISO/TS 18234-7 | Intelligent transport systems - Traffic and travel information via transport protocol expert group (TPEG) data-streams - Part 7: Parking Information (TPEG-PKI) | TC review closed |
| 278313 | CEN ISO/TS 18234-11 | Intelligent transport systems - Traffic and Travel Information (TTI) via Transport Protocol Expert Group (TPEG) binary data format - Part 11: Location Referencing Container (TPEG-LRC) | Preparing for FV |
| 278312 | CEN ISO/TS 18234-3 | Intelligent transport systems - Traffic and travel information via transport protocol expert group (TPEG) data-streams - Part 3: Service and Network Information (TPEG-SNI) (Review) | Preparing for FV |
| 278301 | EN ISO 14819-3 | Intelligent transport systems - Traffic and travel information messages via traffic message coding - Part 3: Location referencing for Radio Data System - Traffic message Channel (RDS-TMC) using ALERT-C (review) | Enquiry closed |
| 278300 | EN ISO 14819-1 | Intelligent transport systems - Traffic and travel information messages via traffic message coding - Part 1: Coding protocol for Radio Data System -- Traffic Message Channel (RDS-TMC) using ALERT-C (review) | Enquiry closed |
| 278200 | CEN ISO/TS 14823 | Traffic and Travel Information - Messages via media-independent stationary dissemination systems - Graphic data dictionary for pre-trip and in-trip information dissemination system | Published |
| 278197 | EN ISO 14819-2 | Intelligent transport systems - Traffic and travel information messages via | Enquiry closed |

| | | traffic message coding - Part 2: Event and information codes for Radio Data System - Traffic Message Channel (RDS-TMC) using ALERT-C (Review) | |
|---|---|---|---|
| 278164 | CEN ISO/TS 24530-4 | Traffic and Travel Information (TTI) - TTI via Transport Protocol expert Group (TPEG) Extensible Markup Language (XML) - Part 4: tpeg-ptiML | Published |
| 278163 | CEN ISO/TS 24530-3 | Traffic and Travel Information (TTI) - TTI via Transport Protocol expert Group (TPEG) Extensible Markup Language (XML) - Part 3: tpeg-rtmML | Published |
| 278162 | CEN ISO/TS 24530-2 | Traffic and Travel Information (TTI) - TTI via Transport Protocol expert Group (TPEG) Extensible Markup Language (XML) - Part 2: tpeg-locML | Published |
| 278161 | CEN ISO/TS 24530-1 | Traffic and Travel Information (TTI) - TTI via Transport Protocol expert Group (TPEG) Extensible Markup Language (XML) - Part 1: Introduction, common data types and tpegML | Published |
| 278160 | CEN ISO/TS 18234-6 | Traffic and Travel Information (TTI) - TTI via Transport Protocol Expert Group (TPEG) data-streams - Part 6: Location Referencing for applications (TPEG-Loc) | Published |
| 278159 | CEN ISO/TS 18234-5 | Traffic and Travel Information (TTI) - TTI via Transport Protocol Expert Group (TPEG) data-streams - Part 5: Public Transport Information (PTI) Application | Published |
| 278158 | EN ISO 14819-6 | Traffic and Travel Information (TTI) - TTI Messages via traffic message coding - Part 6: Encryption and condition access for the Radio Data System - Traffic Message Channel ALERT C coding | Published |
| 278151 | EN ISO 14819-3 | Traffic and Travel Information (TTI) - TTI Messages via traffic message coding - Part 3: Location referencing for ALERT- C (review) | Published |
| 278150 | CEN ISO/TS 18234-4 | Traffic and Travel Information (TTI) - TTI via Transport Protocol Expert Group (TPEG) data-streams - Part 4: Road Traffic Message (RTM) Application | Published |
| 278149 | CEN ISO/TS 18234-3 | Traffic and Travel Information (TTI) - TTI via Transport Protocol Expert Group (TPEG) data-streams - Part 3: Service and Network Information (SNI) Application | Published |
| 278148 | CEN ISO/TS 18234-2 | Traffic and Travel Information (TTI) - TTI via Transport Protocol Expert Group (TPEG) data-streams - Part 2: Syntax, Semantics and Framing Structure (SSF) | Published |
| 278147 | CEN ISO/TS 18234-1 | Traffic and Travel Information (TTI) - TTI via Transport Protocol Expert Group (TPEG) data-streams - Part 1: Introduction, Numbering and Versions | Published |
| 278136 | CEN TS 14821-8 | Traffic and Travel Information (TTI) - TTI messages via cellular networks - Part 8: GSM-specific parameters | Published |
| 278135 | CEN TS 14821-7 | Traffic and Travel Information (TTI) - TTI messages via cellular networks - Part 7: Performance requirements for onboard positioning | Published |
| 278134 | CEN TS 14821-6 | Traffic and Travel Information (TTI) - TTI messages via cellular networks - Part 6: External services | Published |
| 278133 | CEN TS 14821-5 | Traffic and Travel Information (TTI) - TTI messages via cellular networks - Part 5: Internal services | Published |
| 278132 | CEN TS 14821-4 | Traffic and Travel Information (TTI) - TTI messages via cellular networks - Part 4: Service-independent protocols | Published |
| 278131 | CEN TS 14821-3 | Traffic and Travel Information (TTI) - TTI messages via cellular networks - Part 3: Basic information elements | Published |
| 278130 | CEN TS 14821-2 | Traffic and Travel Information (TTI) - TTI messages via cellular networks - Part 2: Numbering and ADP message header | Published |
| 278129 | CEN TS 14821-1 | Traffic and Travel Information (TTI) - TTI messages via cellular networks - Part 1: General specifications | Published |
| 278116 | ENV 12313-4 | Traffic and Travel Information (TTI) - TTI Messages via traffic message coding - Part 4: Coding protocol for Radio Data System - Traffic Message Channel (RDS-TMC) - RDS-TMC using ALERT-Plus with ALERT-C | Published |
| 278113 | EN ISO 14819-2 | Traffic and Travel Information (TTI) - TTI Messages via traffic message coding - Part 2: Event and information codes for Radio Data System - Traffic Message Channel (RDS-TMC) | Published |
| 278112 | EN ISO 14819-1 | Traffic and Travel Information (TTI) - TTI Messages via traffic message coding - Part 1: Coding protocol for Radio Data System - Traffic Message Channel (RDS-TMC) using ALERT-C | Published |

| 278060 | ENV 12315-1 | Traffic and Travel Information (TTI) - TTI Messages via Dedicated Short-Range Communication - Part 1: Data specification - Downlink (roadside to vehicle) | Published |
| 278026 | ENV 12315-2 | Traffic and Travel Information (TTI) - TTI Messages via Dedicated Short-Range Communication - Part 2: Data specification - Uplink (vehicle to roadside) | Published |
| 278 | AC EN ISO 14819-1:2003/AC:2004 | Traffic and Travel Information (TTI) - TTI Messages via traffic message coding - Part 1: Coding protocol for Radio Data System - Traffic Message Channel (RDS-TMC) using ALERT-C (ISO 14819-1:2003) | |

### 7.6    WG5: Traffic Control
Dormant WG with no active standards or work items. Some of the ideas are taken up by ISO TC204 WG9.

### 7.7    WG6: Parking Management
Dormant WG with no active standards or work items.

### 7.8    WG7: Geographic Road Databases
Currently dormant WG. There is still one active standard in this field called Geographical Data Files (GDF). The current version (GDF 3.0 in Europe) is used in modified versions by map providers, with unfortunately little interoperability as a result. New developments of GDF have been taken over by **ISO TC204 WG3** where there is a lot of activity. GDF has been upgraded to GDF4.0 and recently further to GDF5.0 which is currently under implementation in some regions. More information on the standardisation of GDF5 can be found here

### 7.9   WG8: Road Traffic Data

This is the DATEX II working group. EasyWay now provides the user forum for DATEX II. Some attempts have been made at standardising interfaces for roadside infrastructure and controllers, but the current internal situation in WG8 is unknown.

There have been contact between TISA and DATEX II recently, and also some joint activities with ETSI for Cooperative Awareness Message (CAM) and Decentralised Environmental Notification Message (DENM event messages) broadcast. The main focus is achieving global interoperability with ISO TC204 WG9, which is the "global" Datex II WG.

The Datex II standards are steadily adopting new material as new technologies emerge and as member states apply for new material to be included. A new location technology, OpenLR, is included in the last standard which will be voted on in April. In addition new mechanisms for easier linking of point locations to name lists have been added to identify the location of a traffic situation such as an accident. These are both additions of class A/B.

ISO and CEN both develop DATEX standards which are different. In ISO TC205/WG9, the name is DATEX-ASN, and the contents and structure is quite different from DATEX II.Efforts should be taken to inform users regarding these differences, furthermore efforts are on-going to align the work of ISO and CEN. It should also be mentioned that there is significant overlap with a standard from the US, called NTCIP.

| WI | Reference | Title | Status |
|---|---|---|---|
| 278320 | CEN TS 16157-5 | Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 5: Measured and Elaborated Data Publications | Under development |
| 278318 | CEN TS 16157-4 | Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 4: Variable Message Sign (VMS) Publications | TC review closed |
| 278227 | CEN TS 16157-3 | DATEX II data exchange specifications for traffic management and information - Part 3: Situation publication | Published |
| 278226 | CEN TS 16157-2 | DATEX II data exchange specifications for traffic management and information - Part 2: location referencing | Published |
| 278225 | CEN TS 16157-1 | DATEX II data exchange specifications for traffic management and information - Part 1: Context and framework | Published |

### 7.10  WG9: Dedicated Short-Range Communication (DSRC)

Dormant WG This WG used to be joint with ISO TC204 WG15 which is also dormant. In the end the WG produced 4 basic standards from 1993-2001, and these four still provide the basics of tolling systems around the world. More than 40 million units are in daily use around the world.

The four standards EN12253(L1), EN12795(L2), EN12834(L7) and EN13372(Profile) are now maintained by CEN TC278 itself. Conformance validation standards are managed by ETSI TC ITS WG2.

### 7.11  WG10 Human-Machine Interfacing

This WG was transferred to ISO/TC22/SC13/WG8 since it was mainly related to in-vehicle systems which are in the scope of ISO TC22 (Road Vehicles). The WG has produced five ENs which deals with HMI testability and symbols, and has around five more under way as ISO items. There is no direct ISO TC204 parallel group, but some relations with ISO TC204 WG14 and WG17.

Some key words for what is done in this WG are: Dialogue Management, Auditory Information Presentation, Measurement of Driver Visual Behaviour, Visual Information Presentation, Process requirements for driver system integration such as Warning Systems in Vehicles.

Most of the work in this WG is finished with published reports. The only "working" document is about auditory presentation for in-vehicle systems EN ISO15006.

| WI | Reference | Title | Status |
|---|---|---|---|
| 278280 | EN ISO 15007-1 | Road vehicles - Measurement of driver visual behaviour with respect to transport information and control systems - Part 1: Definitions and parameters | Under development |
| 278271 | EN ISO 15006 | Road vehicles - Ergonomic aspects of transport information and control systems - Specification and compliance procedures for in-vehicle auditory presentations (Review) | Published |
| 278224 | EN ISO 15008 | Road vehicles - Ergonomic aspects of transport information and control systems - Specifications and compliance procedures for in-vehicle visual presentation (ISO/DIS 15008:2007) | Published |
| 278128 | EN ISO 17287 | Road vehicles - Ergonomic aspects of transport information and control systems - Procedure for assessing suitability for use when driving | Published |
| 278101 | EN ISO 15005 | Road vehicles - Ergonomic aspects of transport information and control systems - Dialogue management principles and compliance procedures | Published |
| 278070 | EN ISO 15007-1 | Road vehicles - Measurement of driver visual behaviour with respect to transport information and control systems - Part 1: Definitions and parameters | Published |

**7.12**  WG12. Automatic Vehicle Identification & Automatic Equipment Identification

This WG deals with AVI/AEI, which is one of the earliest and most basic ITS technologies. This WG runs all meetings jointly in CEN and ISO. Identification in its various forms is essential for many applications, requiring a good cooperation with other WGs. The registration regime defined in ISO14816 that was created by WG12 is for example used directly in the core Electronic Fee Collection standards.

There are three main groupings of AVI/AEI: The basic set of AVI/AEI standards for road vehicles (ISO 14814, 14815 and 14816), the intermodal freight standards (17261, 17262, 17263), and finally the Electronic Registration Identifier (ERI) series (17264, 24534-1/-4, 24535). Finally an Interoperability Application Profile determining how to apply AVI and ERI on top of CEN DSRC protocol is being developed.

The Electronic registration Identification work may be of special interest since this work is directly aimed at public authorities. The idea is to combine electronic license plates and electronic registration papers in a way that respect European privacy laws. Several countries around the world are looking at this; Portugal and Brazil are planning the introduction of this technology. This technology is sensitive for privacy issues, so careful attention has been made for cryptographic solutions that will manage privacy according to European legislation.

Below is the list of reports that are under work in this WG. As noted above the ERI documents should be carefully followed in relation to various ITS services where individual vehicles are registered (for short or longer time duration).

| WI | Reference | Title | Status |
|----|-----------|-------|--------|
| 278302 | EN ISO 24534-3 | Automatic vehicle and equipment identification - Electronic registration identification (ERI) for vehicles - Part 3: Vehicle data (review) | Under development |
| 278285 | EN 16312 | Intelligent transport systems - Automatic Vehicle and Equipment Registration(AVI/AEI) - Interoperable application profile for AVI/AEI and Electronic Register Identification using dedicated short range communication | Preparing for FV |
| 278265 | EN ISO 17263 | Intelligent transport systems - Automatic vehicle and equipment identification - System parameters | Under Formal Vote |
| 278264 | EN ISO 17262 | Intelligent transport systems - Automatic vehicle and equipment identification - Numbering and data structures | Preparing for FV |
| 278263 | EN ISO 17261 | Intelligent transport systems - Automatic vehicle and equipment identification - Intermodal goods transport architecture and terminology | Preparing for FV |
| 278232 | EN ISO 24534-4 | Automatic vehicle and equipment identification - Electronic Registration Identification (ERI) for vehicles - Part 4: Complementary element (review) | Published |
| 278231 | EN ISO 24534-3 | Automatic vehicle and equipment identification - Electronic Registration Identification (ERI) for vehicles - Part 3: Vehicle data (review) | Published |
| 278230 | EN ISO 24534-2 | Automatic vehicle and equipment identification - Electronic Registration Identification (ERI) for vehicles - Part 2: Operational requirements (review) | Published |
| 278229 | EN ISO 24534-1 | Automatic vehicle and equipment identification - Electronic Registration Identification (ERI) for vehicles - Part 1: Architecture (review) | Published |
| 278228 | EN ISO 17264 | Automatic vehicle and equipment identification - Interfaces (review) | Published |
| 278173 | EN ISO 14816 | Automatic vehicle and equipment identification - Numbering and data structures (review) | Published |
| 278172 | EN ISO 14815 | Automatic vehicle and equipment identification - System specification (review) | Published |
| 278157 | EN ISO 14814 | Automatic vehicle and equipment identification - Reference architecture and terminology (review) | Published |
| 278090 | CEN ISO/TS 17261 | Intelligent transport systems - Automatic vehicle and equipment identification - Intermodal goods transport architecture and terminology | Published |
| 278089 | CEN ISO/TS 17263 | Automatic vehicle and equipment identification - Intermodal goods transport - System parameters | Published |
| 278088 | CEN ISO/TS 17262 | Automatic vehicle and equipment identification - Intermodal goods transport - Numbering and data structures | Published |

| 278 | AC CEN ISO/TS 17261:2005/AC:2006 | Intelligent transport systems - Automatic vehicle and equipment identification - Intermodal good transport architecture and terminology (ISO/TS 17261:2005/Cor.1:2005) |
|-----|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### 7.13  WG13: Architecture

WG13 is one of the later additions to the committee. Originally TC278 intended to do architecture, terminology and several other such tasks directly at the TC level. After ISO TC204 got started, it set up Architecture as WG1 because of its essential nature.  It then became clear that architecture is so central that a European WG had to be created, and the TC level work transferred to WG13

There is an on-going task to set up a registration scheme for data objects /(data dictionary) This task will require funding for the operation, and this has proven to be a challenge..

According to the Vienna Agreement, most of the work is done in ISO, so there is little direct activity in WG13. Please see ISO TC204/WG1 for more information on technical work. One specific European issue is the Privacy regulations, and this one is not under the joint work with ISO.

| WI | Reference | Title | VA | Status |
|---|---|---|---|---|
| 278314 | CEN TR | Privacy aspects in ITS standards and systems in Europe | No | Under development |

## 7.14  WG14 After Theft Systems for Vehicle Recovery

This group was started as cooperation between police and insurance companies. The idea was originally to use ITS to track and recover stolen vehicles, in particular on border crossings towards east Europe. These standards are mainly finished now, and the need is reduced because of better anti-theft technology in new cars. Only some testing is carried on (ref report list below) that may lead to minor corrections in the specifications.

This working group has developed a suite of Technical Specifications for the location, tracking and recovery of stolen vehicles. The TS are not technology specific as they are designed to allow both short range and long range systems to detect and identify the stolen vehicle. Systems may therefore be GPS, GSM, direct bearing or electronic tagging based, or a combination of these.

The critical features are the testing of systems, accuracy of identification and location, the confirmation of report of crime and the timely and accurate passing of data between the stolen vehicle, infrastructure, monitoring agencies and law enforcement agencies at national or international level. All of which should lead to the lawful recovery of the vehicle and arrest of offenders.

The next phase of work is investigating the viability of systems to remotely slow down and/or stop the engine of a known stolen vehicle or a vehicle that poses a significant risk to people. If the investigation is successful this will be developed to TS. In the first instance this is only relevant for heavy vehicles/special vehicles that can be used for terrorism and serious crime.

| WI | Reference | Title | Status |
|---|---|---|---|
| 278289 | CEN ISO/TS 17426 | Intelligent transport systems - Co operative systems - Contextual speeds | Preliminary |
| 278288 | CEN TS | Intelligent transport systems - Co operative systems - Profiles for processing and transfer of information between ITS stations for applications related to transport infrastructure management, control and guidance | Preliminary |
| 278287 | CEN ISO/TS 17425 | Intelligent transport systems - Co operative systems - Data exchange specification for in-vehicle presentation of external road and traffic related data | Preliminary |
| 278286 | CEN ISO/TS 17427 | Intelligent transport systems - Co operative systems - Roles and responsibilities in the context of co-operative ITS based on architecture(s) for co-operative systems | Preliminary |
| 278269 | EN ISO 17424 | Intelligent transport systems ? Co-operative systems ? State of the art of Local Dynamic Maps concepts | Preliminary |

### 7.15  WG15 eSafety

For the benefit of road users and society in general, eSafety is working for a quicker development and increased use of smart road safety (and eco-driving) technologies. They are called 'smart' because they are based on the powers of computers and telecoms.

In 2009, road accidents killed 35.100 people in the EU and injured 1.5 million. Human error is involved in 95% of all traffic accidents!
http://212.68.215.195/esafety/esafety_2010.wmv

'eSafety technologies' help reduce these negative effects of road transport. They bring down the death toll and cut road traffic's energy consumption and $CO_2$ exhausts. This WG was created specifically to produce system level standards for the eCall directive which is the main eSafety system being standardised. Radio standards for eCall have been produced by ETSI 3GPP.

There are two different "types" of eCall:
- Pan-European eCall is the "normal" standard way to achieve this task, and is covered by the European Mandate. The intention is to install this in all new vehciles from 2015 onwards.
- Third-party eCall is based on already installed equipment in cars (e.g Volvo on-call, BMW Assist Advanced eCall, Renault Odysline, Ford/Opel OnStar, Daimler TeleAid, etc)

The majority of work is in the final stages of development, but there have been some controversy that may delay final approval and deployment of eCall. The challenge is around how to apply the third-party eCall, and make it interoperable with Pan-European eCall.
The reports under work from the group are listed below. The scope of the WG is wider than only eCall providing a standard for eCall end-to-end testing and a new preliminary work item for heavy goods vehicles related optional data.

- EN 16072 Pan-European eCall – Operating requirements. Passed Enquiry ballot. Comment Resolution successfully completed. Draft revised and submitted for affirmation vote.
- EN 15722 ESafety - ECall minimum set of data. Passed Enquiry ballot. Comment Resolution successfully completed. Draft revised and submitted for affirmation vote.
- EN 16062 eCall - High level application protocols. Passed Enquiry ballot. Comment Resolution successfully completed. Draft revised and submitted for affirmation vote.
- EN 16102 eCall - Operating requirements for third party support. On 2010-02-10, Passed Enquiry ballot. Comment Resolution successfully completed. Draft revised and submitted for affirmation vote.
- EN/ISO 24978 ITS Safety and emergency messages using any available wireless media — Data registry procedures. Approved ISO/EN 2009

| WI | Reference | Title | Status |
|---|---|---|---|
| 278316 | CEN TS 16454 | Intelligent transport systems - eSafety - eCall end to end conformance testing | Preparing for FV |
| 278284 | CEN TR 16405 | Intelligent transport systems - eSafety - eCall additional optional data set for heavy goods vehicles eCall | Under Formal Vote |
| 278244 | EN 16102 | Intelligent transport systems - eCall - Operating requirements for third party support | Published |
| 278243 | EN 16062 | Intelligent transport systems - eCall - High level application protocols | Published |
| 278242 | EN 15722 | Intelligent transport systems - eSafety - eCall minimum set of data (MSD) (review) | Published |
| 278220 | EN 16072 | Intelligent transport systems - eSafety - Pan-European eCall Operating requirements | Published |
| 278206 | EN ISO 24978 | Intelligent transport systems - ITS Safety and emergency messages using any available wireless media - Data registry procedures (ISO/FDIS 24978:2009) | Published |

### 7.16 WG16 Co-operative systems

Co-operative systems are ITS systems based on vehicle-to-vehicle (V2V), vehicle-to-infrastructure (V2I, I2V) and infrastructure-to-infrastructure (I2I) communications for the exchange of information. As the name indicates the goal is to construct systems that can communicate efficiently and in a safe and secure manner. Co-operative systems have the potential to increase the benefits of ITS services and applications.

This is the latest addition to CEN TC278, and is an initiative coming out of Europe to answer the European ITS Roadmap and ITS Directive, see chapter on Cooperative Systems. This WG is fully joint with ISO WG18, and has two main roles:  Firstly to develop new standards in the field of CS, and secondly to help coordinate and foster new CS thinking in the existing WGs of CEN TC278 and ISO TC204.

It is safe to say this is the new super-WG in CEN/ISO. There are more than 80 experts registered from 17 countries around the world; more than half of the experts coming from Europe. Since WG16 is still under creation, there are minimal results available. The seven Work Items are likely going to be supported by Project Teams, but as noted later the CEN role in M/453 is lagging a bit. The current proposals inside WG16 is a mix of applications/services related to speed and information display in cars, and more Facilities layer functions related to LDM and APIs.

Documents from the WG is still under development. The overall goal is to achieve interoperability in data formats and transfer capabilities so the systems can "talk together" and exchange understandable and sufficient information. This work is of great importance to achieve the goals of data sharing, not only local within vehicles systems and between the vehicle and the national traffic data bases, but also across borders and international systems.

| WI | Reference | Title | Status |
|---|---|---|---|
| 278266 | CEN ISO/TS 17419 | Intelligent transport systems - Co-operative systems - Classification and management of ITS applications in a global context | Under development |
| 278286 | CEN ISO/TS 17427 | Intelligent transport systems - Co operative systems - Roles and responsibilities in the context of co-operative ITS based on architecture(s) for co-operative systems | Preliminary |
| 278269 | EN ISO 17424 | Intelligent transport systems - Co-operative systems - State of the art of Local Dynamic Maps concepts | Preliminary |
| 278268 | CEN ISO/TS 17423 | Intelligent transport systems - Co-operative systems - ITS application requirements for automatic selection of communication interfaces | Under development |
| 278287 | CEN ISO/TS 17425 | Intelligent transport systems - Co operative systems - Data exchange specification for in-vehicle presentation of external road and traffic related data | Preliminary |
| 278288 | CEN TS | Intelligent transport systems - Co operative systems - Profiles for processing and transfer of information between ITS stations for applications related to transport infrastructure management, control and guidance | Preliminary |
| 278289 | CEN ISO/TS 17426 | Intelligent transport systems - Co operative systems - Contextual speeds | Preliminary |

## 8   ETSI TC ITS

**ETSI** is the European Telecom Standardisation Institute, and is a major contributor to global telecom standards such as GSM and DVB. ETSI does also have a formal and legal role in Europe since it produces Harmonised European Norms, which is an operative part of the R&TTE directive that allows sale and operation of radio equipment without type approval. ETSI is different from ISO and CEN since it is a private institution with paying members, and where voting is done according to weighted votes according to membership size.

Since the members pay for the secretariat, the resulting standards and finished documents can be downloaded for free. The main link to ETSI gives a good overview has further links to search for freely downloadable standards.

Under study at ISO/TC 204 are standardization proposals for (1) system architecture, (2) interface (message set, etc.), (3) framework (data dictionary and message template), (4) performance requirements of a system and (5) test methods.

ETSI TC ITS has made very good use of EC financial support to pay for standardisation developments. The process is called Specialist Task Force (STF) and consists of groups of 3-5 experts that are paid to draft a standard over a limited period of time, typically 6-12 months. This is the same as CEN Project Teams (PTs). The financing formally comes from DG Enterprise, but is advised by DG INFSO and DG MOVE.

ETSI TC ITS has a separate home page. This home page is relatively complete with news updates and links to much other work, but unfortunately not very easy to get an overview of.
The formal work is performed under the ETSI Portal. Much of the overview and status information is available, but drafts and internal documents require password access.
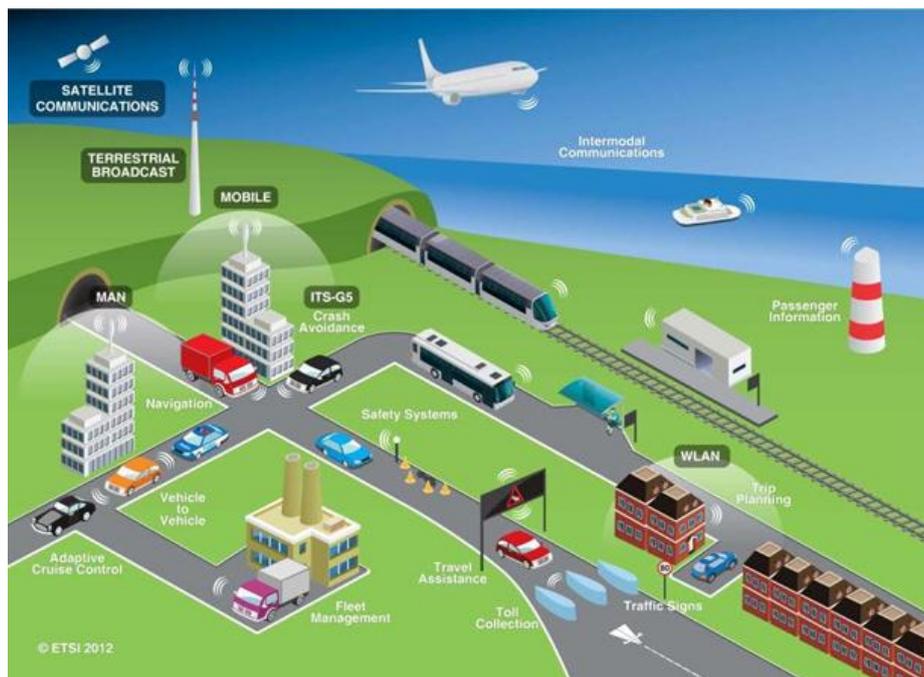


**Figure 2: Overview picture illustrating the scope of ETSI standardisation of ITS.**

This picture gives an overview of the total scope of ETSI, and it is also a good overview of elements for multimodal cooperative systems.
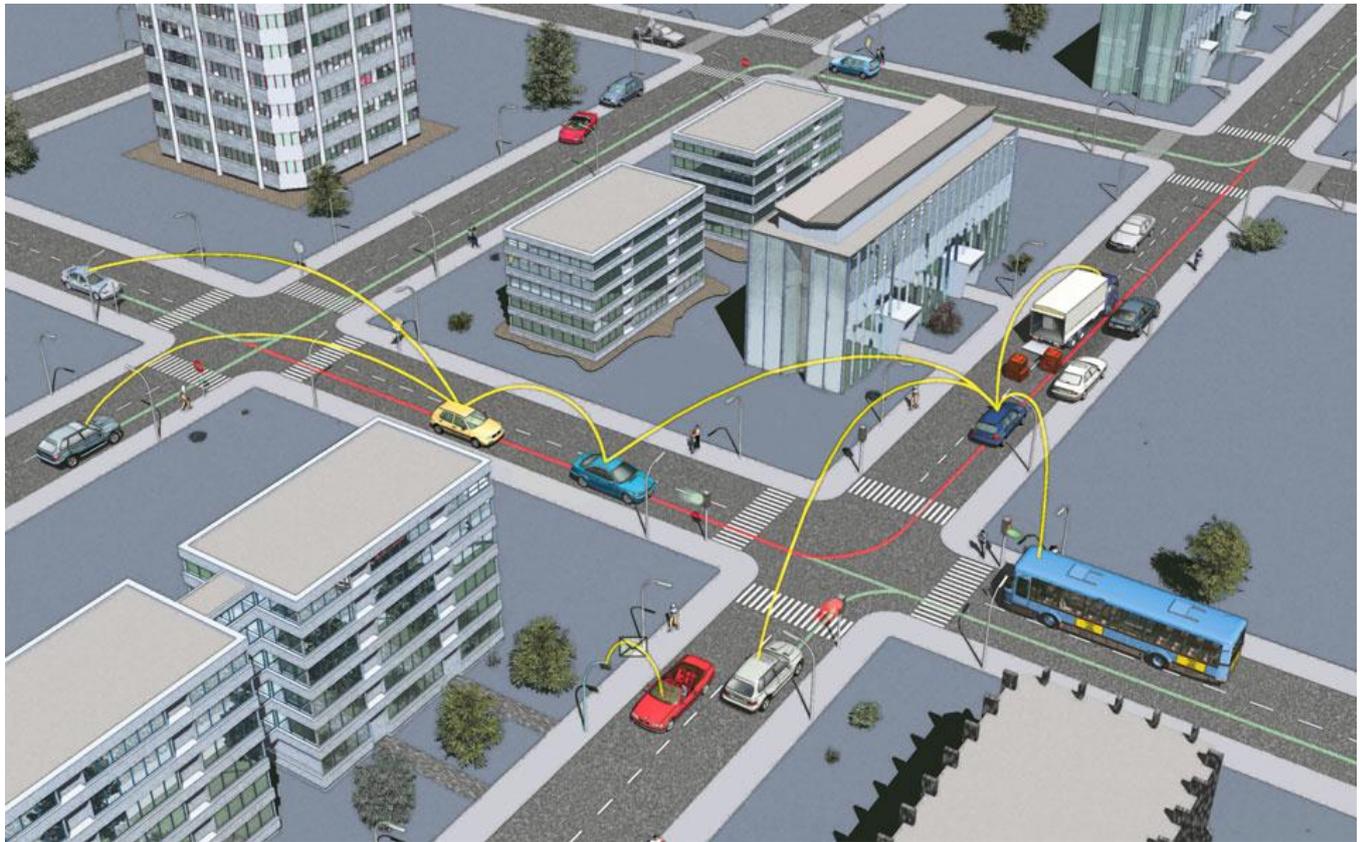
**Figure 3: Overview of the communication scenarios**

Note that ETSI TC ITS is currently limited to a small subset of this scope. The current focus is exclusively on 5.9GHz communications called G5A in ETSI terminology, connected via a special multi-hopping network function called GeoNet, and served by a small number of mainly safety applications for vehicle-to-vehicle and vehicle-to-roadside scenarios (see Figure 3). This vehicle-safety-centric scenario is supported by strong security provisions.

The strong focus on vehicle safety is promoted by the Car-to-Car Communications Consortium (C2C-CC) which is led by European car industry.

## 8.1    ETSI TC ITS Working Groups

There are five working groups in this committee. The structure of the committee is as follows:
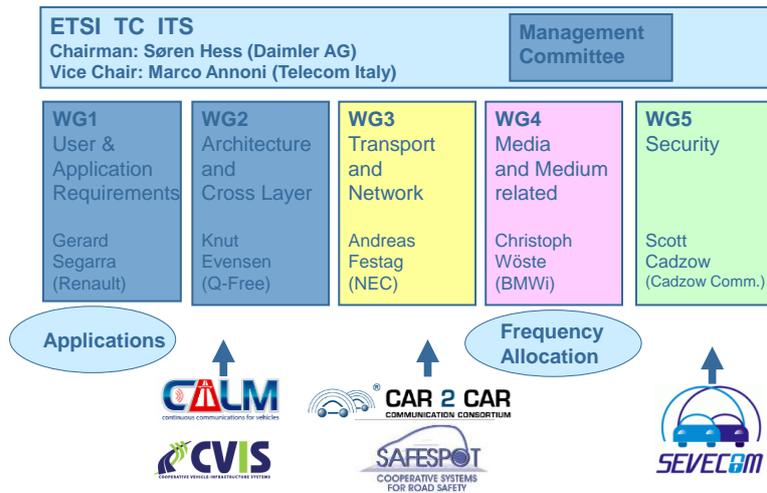


**Figure 4: Overview of ETSI WGs and the conveners of each group**

### 8.1.1    WG1: User and Application Requirements

WG1 is developing standards in three different areas:

1.  **Facilities** are the upper layer or technical core standards that form the basis for applications. WG1 has several of these under development at the moment, but none have been published yet

2.  **Basic set of Applications** is a list of around 50 core applications and services for cooperative systems. This list contains an overall description of each plus some parameters that are useful for sorting and characterizing the different applications. This document can be quite useful to understand the scope of Cooperative Systems as seen from ETSI, please see this link to BSA.

3.  **Data sets** are defining CAM and DENM. These messages are broadcast from a vehicle and/or a roadside, and are used in a number of different applications. This work is partly based on data sets from TC278/WG4, TC278/WG8, TC204/WG3, TC204/WG14, TC204/WG16 and SAE J2735, and the results are also partly overlapping.

It should also be mentioned that WG1 has taken an active role in standards for Tyre Pressure and EV, Electric Vehicles, in particular for the use case of communicating charge status and opportunities, and guiding vehicles to charge points.

By clicking on the specifications below short information is given about the scope of the WI and status.

| | Work Item | Title (Formal only) | Current Status | Planned Next Status |
|---|---|---|---|---|
| **ITS WG1** | | | | |
| 1. | EN 302 895 DEN/ITS-0010005 | Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications; Local Dynamic Map (LDM) Specification | 2009-10-15 Start of work | 2012-06-01 Early draft |
| 2. | EN 302 637-2 REN/ITS-0010019 | Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications; Part 2: Specification of Cooperative Awareness Basic Service | 2012-04-23 Early draft | 2011-09-15 Stable draft |
| 3. | EN 302 637-3 REN/ITS-0010020 | Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications; Part 3: Specifications of Decentralized Environmental Notification Basic Service | 2012-04-12 Stable draft | 2012-11-02 Final draft for approval |
| 4. | TR 103 061-1 DTR/ITS-0010011 | Intelligent Transport Systems (ITS); Testing; Cooperative Awareness Messages (CAM) validation report | 2011-10-27 WG approval | 2012-11-01 TB approval |
| 5. | TR 103 061-2 DTR/ITS-0010012 | Intelligent Transport Systems (ITS) Testing Decentralized Environmental Notification Messages (DENM) validation report | 2010-08-31 Start of work | 2012-03-31 Early draft |
| 6. | TS 102 894-1 DTS/ITS-0010004 | Intelligent Transport System (ITS); Users and Applications requirements; Facility layer structure, functional requirements and specifications; | 2012-02-01 Early draft | 2012-02-01 Stable draft |
| 7. | TS 102 894-2 DTS/ITS-0010022 | Intelligent Transport Systems (ITS); Users and applications requirements; Applications and facilities layer common data dictionary | 2012-01-13 Early draft | 2012-02-25 Stable draft |
| 8. | TS 102 890-3 DTS/ITS-0010013 | Intelligent Transport System (ITS); Facilities layer function; Position and time facility specification | 2011-05-03 Early draft | 2011-10-01 Stable draft |
| 9. | TS 102 869-1 DTS/ITS-0010008-1 | Intelligent Transport Systems (ITS); Testing; Conformance test specification for Decentralized Environmental Notification Messages (DENM); Part 1: Test requirements and Protocol Implementation Conformance Statement (PICS) proforma | 2011-03-31 Publication | |
| 10. | TS 102 869-2 DTS/ITS-0010008-2 | Intelligent Transport Systems (ITS); Testing; Conformance test specification for Decentralized Environmental Notification Messages (DENM); Part 2: Test Suite Structure and Test Purposes (TSS&TP) | 2011-03-31 Publication | |
| 11. | TS 102 869-3 DTS/ITS-0010008-3 | Intelligent Transport Systems (ITS); Testing; Conformance test specification for Decentralized Environmental Notification Messages (DENM); Part 3: Abstract Test Suite (ATS) and Protocol Implementation eXtra Information for Testing (PIXIT) | 2011-03-31 Publication | |
| 12. | TS 102 868-1 DTS/ITS-0010007-1 | Intelligent Transport Systems (ITS); Testing; Conformance test specification for Co-operative Awareness Messages (CAM); Part 1: Test requirements and Protocol Implementation Conformance Statement (PICS) proforma | 2011-03-30 Publication | |
| 13. | TS 102 868-2 DTS/ITS-0010007-2 | Intelligent Transport Systems (ITS); Testing; Conformance test specification for Co-operative Awareness Messages (CAM); Part 2: Test Suite Structure and Test Purposes (TSS&TP) | 2011-03-30 Publication | |
| 14. | TS 102 868-3 DTS/ITS-0010007-3 | Intelligent Transport Systems (ITS); Testing; Conformance test specification for Co-operative Awareness Messages (CAM); Part 3: Abstract Test Suite (ATS) and Protocol Implementation eXtra Information for Testing (PIXIT) | 2011-03-30 Publication | |

| 15. | TR 102 863<br>DTR/ITS-0010006 | Intelligent Transport Systems (ITS);<br>Vehicular Communications; Basic Set of Applications; Local Dynamic Map (LDM);<br>Rationale for and guidance on standardization | 2011-06-07<br>Publication | |
| 16. | TR 102 698<br>RTR/ITS-00100011 | Intelligent Transport Systems (ITS);<br>Vehicular Communications;<br>C2C-CC Demonstrator 2008; Use Cases and Technical Specifications | 2010-07-05<br>Publication | |
| 17. | TR 102 698<br>DTR/ITS-0010003 | Intelligent Transport Systems (ITS);<br>Vehicular Communications;<br>C2C-CC Demonstrator 2008; Use Cases and Technical Specifications | 2009-06-18<br>Publication | |
| 18. | TR 102 638<br>DTR/ITS-0010001 | Intelligent Transport Systems (ITS);<br>Vehicular Communications; Basic Set of Applications;<br>Definitions | 2009-06-29<br>Publication | |
| 19. | TS 102 637-1<br>DTS/ITS-0010002-1 | Intelligent Transport Systems (ITS);<br>Vehicular Communications; Basic Set of Applications;<br>Part 1: Functional Requirements | 2010-09-08<br>Publication | |
| 20. | TS 102 637-2<br>DTS/ITS-0010002-2 | Intelligent Transport Systems (ITS);<br>Vehicular Communications; Basic Set of Applications;<br>Part 2: Specification of Cooperative Awareness Basic Service | 2010-04-30<br>Publication | |
| 21. | TS 102 637-3<br>DTS/ITS-0010002-3 | Intelligent Transport Systems (ITS);<br>Vehicular Communications; Basic Set of Applications;<br>Part 3: Specifications of Decentralized Environmental Notification Basic Service | 2010-09-08<br>Publication | |
| 22. | TS 102 637-4<br>DTS/ITS-0010002-4 | Intelligent Transport Systems (ITS);<br>Vehicular Communications; Basic set of applications;<br>Part 4: Operational Requirements. | 2008-04-10<br>Start of work | 2011-11-01<br>WG approval |
| 23. | TS 101 556-1<br>DTS/ITS-0010014 | Intelligent Transport Systems (ITS);<br>I2V Applications;<br>Electric Vehicle Charging Spot Notification Specification | 2012-05-15<br>WG approval | 2012-12-02<br>TB approval |
| 24. | TS 101 556-2<br>DTS/ITS-0010030 | Intelligent Transport Systems (ITS);<br>Vehicular Communications;<br>Messages specification for Tyre Pressure Management System (TPMS) | 2012-02-15<br>TB adoption of WI | 2012-02-15<br>Start of work |
| 25. | TS 101 539-1<br>DTS/ITS-0010017 | Intelligent Transport Systems (ITS);<br>V2V Application;<br>Part 1: Road Hazard Signalling (RHS) application requirements specification | 2012-05-21<br>Final draft for approval | 2012-05-02<br>WG approval |
| 26. | TS 101 539-2<br>DTS/ITS-0010015 | Intelligent Transport System (ITS);<br>V2V Application;<br>Intersection Collision Risk Warning Specification | 2011-10-15<br>Stable draft | 2012-10-01<br>Final draft for approval |
| 27. | TS 101 539-3<br>DTS/ITS-0010016 | Intelligent Transport Systems (ITS);<br>V2V Application;<br>Longitudinal Collision Risk Warning Specification. | 2012-06-04<br>Stable draft | 2012-05-02<br>Final draft for approval |
| 28. | TR 102 638<br>RTR/ITS-0010023 | Intelligent Transport Systems (ITS);<br>Vehicular Communications; Basic Set of Applications;<br>Definitions | 2011-10-28<br>TB adoption of WI | 2011-10-28<br>Start of work |
| 29. | TS 102 637-2<br>RTS/ITS-0010018 | Intelligent Transport Systems (ITS);<br>Vehicular Communications; Basic Set of Applications;<br>Part 2: Specification of Cooperative Awareness Basic Service | 2011-03-24<br>Publication | |
| 30. | TS 103 084<br>DTS/ITS-0010025 | Intelligent Transport Systems (ITS);<br>Vehicular Communications;<br>GeoMessaging Enabler | 2012-04-11<br>Early draft | 2012-09-30<br>Stable draft |
| 31. | DTS/ITS-0010021 | Intelligent Transport Systems (ITS);<br>Facilities layer;<br>Communication congestion control | 2011-05-05<br>TB adoption of WI | 2011-05-05<br>Start of work |
| 32. | TS 102 637-1<br>RTS/ITS-0010024 | Intelligent Transport Systems (ITS);<br>Vehicular Communications; Basic Set of Applications;<br>Part 1: Functional Requirements | 2011-10-28<br>TB adoption of WI | 2011-10-28<br>Start of work |
| 33. | TS 102 868-2<br>RTS/ITS-0010026 | Intelligent Transport Systems (ITS);<br>Testing; Conformance test specification for Co-operative Awareness Messages (CAM);<br>Part 2: Test Suite Structure and Test Purposes (TSS&TP) | 2011-10-28<br>TB adoption of WI | 2011-10-28<br>Start of work |
| 34. | TS 102 868-3<br>RTS/ITS-0010027 | Intelligent Transport Systems (ITS);<br>Testing; Conformance test specification for Co-operative Awareness Messages (CAM);<br>Part 3: Abstract Test Suite (ATS) and Protocol Implementation eXtra Information for Testing (PIXIT) | 2011-10-28<br>TB adoption of WI | 2011-10-28<br>Start of work |
| 35. | TS 102 869-2<br>RTS/ITS-0010028 | Intelligent Transport Systems (ITS);<br>Testing; Conformance test specification for Decentralized Environmental Notification Messages (DENM);<br>Part 2: Test Suite Structure and Test Purposes (TSS&TP) | 2011-10-28<br>TB adoption of WI | 2011-10-28<br>Start of work |
| 36. | TS 102 869-3<br>RTS/ITS-0010029 | Intelligent Transport Systems (ITS);<br>Testing; Conformance test specification for Decentralized Environmental Notification Messages (DENM);<br>Part 3: Abstract Test Suite (ATS) and Protocol Implementation eXtra Information for Testing (PIXIT) | 2011-10-28<br>TB adoption of WI | 2011-10-28<br>Start of work |

### 8.1.2    WG2: Architecture and Cross Layer

Specification of ITS architecture is going on in several SDOs.  In April 2010, ISO published the ITS communications architecture standard ISO 21217, which is part of the published basic set of communication standards for cooperative systems in ITS. In September 2010, the ETSI version of the ITS communications architecture standard EN 302 665 was published, which is almost identical to ISO 21217. IEEE 1609 is developing an ITS communications architecture standard (IEEE 1609.0) for short-range 5.9GHz (IEEE 802.11/1609 (WAVE)) communications only (V2V / V2I). CEN/ISO are working together to create necessary standards for an Architecture of Cooperative ITS.

WG2 has three main responsibilities:
1. Communications Reference Architecture was the first full standard to be completed in TC ITS. This is coordination and extension of what has been produced in TC204/WG16 as the CALM standards, and is now fully harmonized with ISO and CEN. It embodies the ITS Station concept that is included in the definition of Cooperative ITS. At the moment there is also hope that IEEE P1609 will adopt or adapt to this reference architecture.
2. Cross-layer coordination and management plane standards. This is mainly the technical kernel of the ITS Station and defines how the different components work together to form a system. This part of the standard set has met heavy opposition and is currently dormant.
3. Legacy DSRC standards. The EC has funded several STFs in this domain, and the basic set of DSRC test suites in the EN 300 674 series are developed here.

By following the links below further information on each WI can be found.

| | Work Item | Title (Formal only) | Current Status | Planned Next Status |
|---|---|---|---|---|
| **ITS WG2** | | | | |
| 1. | EN 302 665 DEN/ITS-0020012 | **Intelligent Transport Systems (ITS); Communications Architecture** | 2010-09-24 **Publication** | |
| 2. | EG 202 798 DEG/ITS-0020022 | **Intelligent Transport Systems (ITS); Testing; Framework for conformance and interoperability testing** | 2011-01-13 **Publication** | |
| 3. | ES 200 674-1 RES/ITS-0020034 | **Intelligent Transport Systems (ITS); Road Transport and Traffic Telematics (RTTT); Dedicated Short Range Communications (DSRC); Part 1: Technical characteristics and test methods for High Data Rate (HDR) data transmission equipment operating in the 5,8 GHz Industrial, Scientific and Medical (ISM) band** | 2011-02-17 **Publication** | |
| 4. | TS 103 175 DTS/ITS-0020046 | **Intelligent Transport Systems (ITS); Decentralized Congestion Control (DCC); Cross Layer DCC control entity** | 2012-04-26 **TB adoption of WI** | 2012-04-26 **Start of work** |
| 5. | TR 103 068 DTR/ITS-0020045 | **Intelligent Transport Systems (ITS); ITS-S Management Procedures; Study of requirements** | 2011-07-20 **TB adoption of WI** | 2011-07-20 **Start of work** |
| 6. | TS 102 985-1 DTS/ITS-0020028-1 | **Intelligent Transport Systems (ITS); Communications Access for Land Mobiles (CALM); Test specifications for non-IP networking (ISO 29281); Part 1: Protocol Implementation Conformance Statement (PICS) proforma** | 2012-05-24 **Waiting - see "Remarks"** | 2012-06-13 **Draft receipt by ETSI Secretariat** |
| 7. | TS 102 985-2 DTS/ITS-0020028-2 | **Intelligent Transport Systems (ITS); Communications Access for Land Mobiles (CALM); Test specifications for non-IP networking (ISO 29281); Part 2: Test Suite Structure and Test Purposes (TSS&TP)** | 2012-05-24 **Waiting - see "Remarks"** | 2012-06-13 **Draft receipt by ETSI Secretariat** |
| 8. | TS 102 985-3 DTS/ITS-0020028-3 | **Intelligent Transport Systems (ITS); Communications Access for Land Mobiles (CALM); Test specifications for non-IP networking (ISO 29281); Part 3: Abstract Test Suite (ATS) and partial PIXIT proforma** | 2012-05-24 **Waiting - see "Remarks"** | 2012-06-13 **Draft receipt by ETSI Secretariat** |
| 9. | TS 102 984-1 DTS/ITS-0020027-1 | **Intelligent Transport Systems; Test specifications for Intelligent Transport Systems; Communications Access for Land Mobiles (CALM); Architecture (ISO 21217); Part 1: Implementation Conformance Statement (ICS) proforma** | 2010-01-28 **Start of work** | 2013-05-02 **Early draft** |
| 10. | TS 102 984-2 DTS/ITS-0020027-2 | **Intelligent Transport Systems; Test specifications for Intelligent Transport Systems; Communications Access for Land Mobiles (CALM); Architecture (ISO 21217); Part 2: Test Suite Structure and Test Purposes (TSS&TP)** | 2010-01-28 **Start of work** | 2013-05-02 **Early draft** |
| 11. | TS 102 983-1 DTS/ITS-0020026-1 | **Intelligent Transport Systems; Test specifications for Intelligent Transport Systems; Communications Access for Land Mobiles (CALM); M5 (ISO 21215); Part 1: Protocol Implementation Conformance Statement (PICS) proforma** | 2010-01-28 **Start of work** | 2013-05-02 **Early draft** |
| 12. | TS 102 983-2 DTS/ITS-0020026-2 | **Intelligent Transport Systems; Test specifications for Intelligent Transport Systems; Communications Access for Land Mobiles (CALM); M5 (ISO 21215); Part 2: Test Suite Structure and Test Purposes (TSS&TP)** | 2010-01-28 **Start of work** | 2013-05-02 **Early draft** |
| 13. | TS 102 983-3 DTS/ITS-0020026-3 | **Intelligent Transport Systems; Test specifications for Intelligent Transport Systems; Communications Access for Land Mobiles (CALM); M5 (ISO 21215); Part 3: Abstract Test Suite (ATS) and partial PIXIT proforma** | 2010-01-28 **Start of work** | 2013-05-02 **Early draft** |
| 14. | TS 102 982-1 | **Intelligent Transport Systems;** | 2010-01-28 | 2013-05-02 |

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| | DTS/ITS-0020025-1 | Test specifications for Intelligent Transport Systems; Communications Access for Land Mobiles (CALM); IR (ISO 21214);<br>Part 1: Protocol Implementation Conformance Statement (PICS) proforma | **Start of work** | **Early draft** |
| 15. | TS 102 982-2<br>DTS/ITS-0020025-2 | **Intelligent Transport Systems;**<br>**Test specifications for Intelligent Transport Systems; Communications Access for Land Mobiles (CALM); IR (ISO 21214);**<br>**Part 2: Test Suite Structure and Test Purposes (TSS&TP)** | 2010-01-28<br>**Start of work** | 2013-05-02<br>**Early draft** |
| 16. | TS 102 982-3<br>DTS/ITS-0020025-3 | **Intelligent Transport Systems;**<br>**Test specifications for Intelligent Transport Systems; Communications Access for Land Mobiles (CALM); IR (ISO 21214);**<br>**Part 3: Abstract Test Suite (ATS) and partial PIXIT proforma** | 2010-01-28<br>**Start of work** | 2013-05-02<br>**Early draft** |
| 17. | TS 102 981-1<br>DTS/ITS-0020024-1 | **Intelligent Transport Systems;**<br>**Test specifications for Intelligent Transport Systems; Communications Access for Land Mobiles (CALM); IP networking (ISO 21210);**<br>**Part 1: Protocol Implementation Conformance Statement (PICS) proforma** | 2010-01-28<br>**Start of work** | 2013-05-01<br>**Early draft** |
| 18. | TS 102 981-2<br>DTS/ITS-0020024-2 | **Intelligent Transport Systems;**<br>**Test specifications for Intelligent Transport Systems; Communications Access for Land Mobiles (CALM); IP networking (ISO 21210);**<br>**Part 2: Test Suite Structure and Test Purposes (TSS&TP)** | 2010-01-28<br>**Start of work** | 2013-05-02<br>**Early draft** |
| 19. | TS 102 981-3<br>DTS/ITS-0020024-3 | **Intelligent Transport Systems;**<br>**Test specifications for Intelligent Transport Systems; Communications Access for Land Mobiles (CALM); IP networking (ISO 21210);**<br>**Part 3: Abstract Test Suite (ATS) and partial PIXIT proforma** | 2010-01-28<br>**Start of work** | 2013-05-02<br>**Early draft** |
| 20. | TS 102 965<br>DTS/ITS-0020042 | **Intelligent Transport Systems (ITS);**<br>**Application Object Identifier (ITS-AID);**<br>**Registration list** | 2011-05-05<br>**TB adoption of WI** | 2011-05-05<br>**Start of work** |
| 21. | TS 102 964-1<br>DTS/ITS-0020039 | **Intelligent Transport Systems (ITS);**<br>**Communications Access for Land Mobiles (CALM);**<br>**IPv6 networking security (ISO 16789); Part 1: Protocol Implementation Conformance Statement (PICS) proforma** | 2011-05-05<br>**TB adoption of WI** | 2011-05-05<br>**Start of work** |
| 22. | TS 102 964-2<br>DTS/ITS-0020040 | **Intelligent Transport Systems (ITS);**<br>**Communications Access for Land Mobiles (CALM);**<br>**IPv6 networking security (ISO 16789); Part 2: Test Suite Structure & Test Purposes (TSS&TP)** | 2011-05-05<br>**TB adoption of WI** | 2011-05-05<br>**Start of work** |
| 23. | TS 102 964-3<br>DTS/ITS-0020041 | **Intelligent Transport Systems (ITS);**<br>**Communications Access for Land Mobiles (CALM);**<br>**IPv6 networking security (ISO 16789); Part 3: Abstract Test Suite and Partial PIXIT information (ATS)** | 2011-05-05<br>**TB adoption of WI** | 2011-05-05<br>**Start of work** |
| 24. | TS 102 963-1<br>DTS/ITS-0020036 | **Intelligent Transport Systems (ITS);**<br>**Communications Access for Land Mobiles (CALM);**<br>**IPv6 networking optimization (ISO 16788); Part 1: Protocol Implementation Conformance Statement (PICS) proforma** | 2011-05-05<br>**TB adoption of WI** | 2011-05-05<br>**Start of work** |
| 25. | TS 102 963-2<br>DTS/ITS-0020037 | **Intelligent Transport Systems (ITS);**<br>**Communications Access for Land Mobiles (CALM);**<br>**IPv6 networking optimization (ISO 16788); Part 2: Test Suite Structure & Test Purposes (TSS&TP)** | 2011-05-05<br>**TB adoption of WI** | 2011-05-05<br>**Start of work** |
| 26. | TS 102 963-3<br>DTS/ITS-0020038 | **Intelligent Transport Systems (ITS);**<br>**Communications Access for Land Mobiles (CALM);**<br>**IPv6 networking optimization (ISO 16788); Part 3: Abstract Test Suite and Partial PIXIT Information (ATS)** | 2011-05-05<br>**TB adoption of WI** | 2011-05-05<br>**Start of work** |
| 27. | TR 102 962<br>DTR/ITS-0020035 | **Intelligent Transport Systems (ITS);**<br>**Framework for Public Mobile Networks in Cooperative ITS (C-ITS)** | 2012-02-24<br>**Publication** | |
| 28. | TS 102 890-1<br>DTS/ITS-0020043 | **Intelligent Transport Systems (ITS);**<br>**Facilities layer function;**<br>**Communication Management specification** | 2011-05-09<br>**Early draft** | 2010-11-01<br>**Stable draft** |
| 29. | TS 102 890-2<br>DTS/ITS-0020044 | **Intelligent Transport Systems (ITS);**<br>**Facilities layer function;**<br>**Services announcement specification** | 2012-01-18<br>**WG approval** | 2012-11-02<br>**TB approval** |
| 30. | TS 102 860<br>DTS/ITS-0020023 | **Intelligent Transport Systems (ITS);**<br>**Classification and management of ITS application objects** | 2011-05-12<br>**Publication** | |
| 31. | TS 102 797-1<br>DTS/ITS-0020010 | **Intelligent Transport Systems (ITS);**<br>**Communications Access for Land Mobiles (CALM); Test specifications for ITS station management (ISO 24102);**<br>**Part 1: Protocol Implementation Conformance Statement (PICS) specification** | 2012-06-06<br>**Waiting - see "Remarks"** | 2012-06-20<br>**Draft receipt by ETSI Secretariat** |
| 32. | TS 102 797-2<br>DTS/ITS-0020011 | **Intelligent Transport Systems (ITS);**<br>**Communications Access for Land Mobiles (CALM); Test specifications for ITS station management (ISO 24102);**<br>**Part 2: Test Suite Structure and Test Purposes (TSS&TP)** | 2012-06-06<br>**Waiting - see "Remarks"** | 2012-06-20<br>**Draft receipt by ETSI Secretariat** |
| 33. | TS 102 797-3<br>DTS/ITS-0020030 | **Intelligent Transport Systems (ITS);**<br>**Communications Access for Land Mobiles (CALM); Test specifications for ITS station management (ISO 24102);**<br>**Part 3: Abstract Test Suite (ATS) and partial PIXIT proforma** | 2012-06-06<br>**Waiting - see "Remarks"** | 2012-06-20<br>**Draft receipt by ETSI Secretariat** |
| 34. | TS 102 760-1<br>DTS/ITS-0020008 | **Intelligent Transport Systems (ITS);**<br>**Test specifications for Intelligent Transport Systems; Communications Access for Land Mobiles (CALM); Medium Service Access Points (ISO 21218);**<br>**Part 1: Implementation Conformance Statement (ICS) proforma** | 2009-11-27<br>**Publication** | |
| 35. | TS 102 760-2<br>DTS/ITS-0020009 | **Intelligent Transport Systems (ITS);**<br>**Test specifications for Intelligent Transport Systems; Communications Access for Land Mobiles (CALM); Medium Service Access Points (ISO 21218);**<br>**Part 2: Test Suite Structure and Test Purposes (TSS&TP)** | 2009-11-27<br>**Publication** | |
| 36. | TS 102 760-3<br>DTS/ITS-0020021 | **ITS (Intelligent Transport Services);**<br>**Test specifications for Intelligent Transport Systems, Communications Access for Land Mobiles (CALM), Medium Service Access Points (IS 21218);**<br>**Part 3: Abstract Test Suite (ATS) and partial PIXIT proforma** | 2009-04-24<br>**Start of work** | 2009-12-01<br>**Early draft** |
| 37. | TS 102 723-1<br>DTS/ITS-0020015 | **Intelligent Transport Systems (ITS);**<br>**OSI cross-layer topics;**<br>**Part 1: Architecture and addressing schemes** | 2011-07-20<br>**Final draft for** | 2011-07-20<br>**Stable draft** |

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|---|---|---|---|---|
| 38. | TS 102 723-2<br>DTS/ITS-0020016 | **Intelligent Transport Systems (ITS);**<br>**OSI cross-layer topics;**<br>**Part 2: Management information base** | 2011-09-09<br>**Waiting - see**<br>**"Remarks"** | 2011-09-06<br>**Publication** |
| 39. | TS 102 723-3<br>DTS/ITS-0020017 | **Intelligent Transport Systems;**<br>**OSI cross-layer topics;**<br>**Part 3: Interface between management entity and access layer** | 2012-04-25<br>**Early draft** | 2013-11-02<br>**TB approval** |
| 40. | TS 102 723-4<br>DTS/ITS-0020018 | **Intelligent Transport Systems;**<br>**OSI cross-layer topics;**<br>**Part 4: Interface between management entity and network and transport layers** | 2012-01-18<br>**WG approval** | 2013-11-02<br>**TB approval** |
| 41. | TS 102 723-5<br>DTS/ITS-0020019 | **Intelligent Transport Systems;**<br>**OSI cross-layer topics;**<br>**Part 5: Interface between management entity and facilities layer** | 2012-01-18<br>**WG approval** | 2013-11-02<br>**TB approval** |
| 42. | TS 102 723-6<br>DTS/ITS-0020020 | **Intelligent Transport Systems;**<br>**OSI cross-layer topics;**<br>**Part 6: Interface between management entity and security entity** | 2009-04-24<br>**Start of work** | 2013-11-01<br>**WG approval** |
| 43. | TS 102 708-1-1<br>DTS/ITS-0020002 | **Intelligent Transport Systems (ITS);**<br>**RTTT; Test specifications for High Data Rate (HDR) data transmission equipment operating in the 5,8 GHz ISM band;**<br>**Part 1: Data Link Layer; Sub-Part 1: Protocol Implementation Conformance Statement (PICS) proforma specification** | 2010-03-23<br>**Publication** | |
| 44. | TS 102 708-1-2<br>DTS/ITS-0020003 | **Intelligent Transport Systems (ITS);**<br>**RTTT; Test specifications for High Data Rate (HDR) data transmission equipment operating in the 5,8 GHz ISM band;**<br>**Part 1: Data Link Layer; Sub-Part 2: Test Suite Structure and Test Purposes (TSS&TP)** | 2010-03-23<br>**Publication** | |
| 45. | TS 102 708-1-3<br>DTS/ITS-0020004 | **Intelligent Transport Systems (ITS);**<br>**RTTT; Test specifications for High Data Rate (HDR) data transmission equipment operating in the 5,8 GHz ISM band;**<br>**Part 1: Data Link Layer; Sub-Part 3: Abstract Test Suite (ATS) and partial PIXIT proforma** | 2010-03-23<br>**Publication** | |
| 46. | TS 102 708-2-2<br>RTS/ITS-0020032 | **Intelligent Transport Systems (ITS);**<br>**RTTT; Test specifications for High Data Rate (HDR) data transmission equipment operating in the 5,8 GHz ISM band;**<br>**Part 2: Application Layer; Sub-Part 2: Test Suite Structure and Test Purposes (TSS&TP)** | 2012-02-29<br>**Publication** | |
| 47. | TS 102 708-2-1<br>DTS/ITS-0020005 | **Intelligent Transport Systems (ITS);**<br>**RTTT; Test specifications for High Data Rate (HDR) data transmission equipment operating in the 5,8 GHz ISM band;**<br>**Part 2: Application Layer Common Application Service Elements; Sub-Part 1: Protocol Implementation Conformance Statement (PICS) proforma specification** | 2010-03-30<br>**Publication** | |
| 48. | TS 102 708-2-2<br>DTS/ITS-0020006 | **Intelligent Transport Systems (ITS);**<br>**RTTT; Test specifications for High Data Rate (HDR) data transmission equipment operating in the 5,8 GHz ISM band;**<br>**Part 2: Application Layer Common Application Service Elements; Sub-Part 2: Test Suite Structure and Test Purposes (TSS&TP)** | 2010-03-30<br>**Publication** | |
| 49. | TS 102 708-2-3<br>DTS/ITS-0020007 | **Intelligent Transport Systems (ITS);**<br>**RTTT; Test specifications for High Data Rate (HDR) data transmission equipment operating in the 5,8 GHz ISM band;**<br>**Part 2: Application Layer Common Application Service Elements; Sub-Part 3: Abstract Test Suite (ATS) and partial PIXIT proforma** | 2010-03-30<br>**Publication** | |
| 50. | TS 102 708-2-2<br>RTS/ITS-0020053 | **Intelligent Transport Systems (ITS);**<br>**RTTT; Test specifications for High Data Rate (HDR) data transmission equipment operating in the 5,8 GHz ISM band;**<br>**Part 2: Application Layer; Sub-Part 2: Test Suite Structure and Test Purposes (TSS&TP)** | 2012-06-04<br>**Draft receipt by**<br>**ETSI Secretariat** | 2012-07-02<br>**Publication** |
| 51. | TR 102 707<br>DTR/ITS-0020013 | **Intelligent Transport Systems (ITS);**<br>**ETSI object identifier tree;**<br>**ITS domain** | 2009-05-25<br>**Publication** | |
| 52. | EN 302 665<br>REN/ITS-0020047 | **Intelligent Transport Systems (ITS);**<br>**Communications Architecture** | 2011-10-28<br>**TB adoption of WI** | 2011-10-28<br>**Start of work** |
| 53. | ES 200 674-1<br>RES/ITS-0020052 | **Intelligent Transport Systems (ITS);**<br>**Road Transport and Traffic Telematics (RTTT); Dedicated Short Range Communications (DSRC);**<br>**Part 1: Technical characteristics and test methods for High Data Rate (HDR) data transmission equipment operating in the 5,8 GHz Industrial, Scientific and Medical (ISM) band** | 2012-06-05<br>**Draft receipt by**<br>**ETSI Secretariat** | 2012-06-19<br>**Start of Membership Vote** |
| 54. | DTR/ITS-0020048 | **Intelligent Transport Systems (ITS);**<br>**Test suite validation**<br>**CALM Fast services** | 2012-02-08<br>**TB adoption of WI** | 2012-02-08<br>**Start of work** |
| 55. | DTR/ITS-0020050 | **Intelligent Transport Systems (ITS);**<br>**Test suite validation;**<br>**Access technology support ISO 21218** | 2012-02-08<br>**TB adoption of WI** | 2012-02-08<br>**Start of work** |
| 56. | TS 102 708-2-1<br>RTS/ITS-0020031 | **Intelligent Transport Systems (ITS);**<br>**RTTT; Test specifications for High Data Rate (HDR) data transmission equipment operating in the 5,8 GHz ISM band;**<br>**Part 2: Application Layer; Sub-Part 1: Protocol Implementation Conformance Statement (PICS) proforma specification** | 2012-02-29<br>**Publication** | |
| 57. | TS 102 708-2-3<br>RTS/ITS-0020033 | **Intelligent Transport Systems (ITS);**<br>**RTTT; Test specifications for High Data Rate (HDR) data transmission equipment operating in the 5,8 GHz ISM band;**<br>**Part 2: Application Layer; Sub-Part 3: Abstract Test Suite (ATS) and partial PIXIT proforma** | 2012-03-20<br>**Publication** | |
| 58. | TS 102 708-2-3<br>RTS/ITS-0020054 | **Intelligent Transport Systems (ITS);**<br>**RTTT; Test specifications for High Data Rate (HDR) data transmission equipment operating in the 5,8 GHz ISM band;**<br>**Part 2: Application Layer; Sub-Part 3: Abstract Test Suite (ATS) and partial PIXIT proforma** | 2012-06-04<br>**Draft receipt by**<br>**ETSI Secretariat** | 2012-07-02<br>**Publication** |

### 8.1.3    WG3: Transport and Network

WG3 is focused on the middle communications layers for network and data transport functions. All efforts are concentrated on GeoNetworking/GeoRouting which is a concept that uses GPS positions as an address, and where intermediate stations can be used as relay stations in case there is no direct connection. This work has been described as experimental, unproven and containing IPR from the main promoters, but there is significant pressure from C2C-CC so it is possible that this protocol will be deployed in Europe.

By following the links below further information on each WI can be found.

| | Work Item | Title (Formal only) | Current Status | Planned Next Status |
|---|---|---|---|---|
| **ITS WG3** | | | | |
| 1. | EN 302 931 DEN/ITS-0030021 | **Intelligent Transport Systems (ITS); Vehicular Communications; Geographical Area Definition** | **2011-07-20 Publication** | |
| 2. | EN 302 636-1 REN/ITS-0030032 | **Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 1: Requirements** | **2012-06-05 Final draft for approval** | **2012-11-02 WG approval** |
| 3. | EN 302 636-2 REN/ITS-0030033 | **Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 2: Scenarios** | **2012-06-01 Final draft for approval** | **2012-11-02 WG approval** |
| 4. | EN 302 636-3 REN/ITS-0030034 | **Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 3: Network Architecture** | **2012-06-05 Final draft for approval** | **2012-11-02 WG approval** |
| 5. | EN 302 636-4-1 REN/ITS-0030035 | **Intelligent Transport System (ITS); Vehicular communications; GeoNetworking; Part 4: Geographical addressing and forwarding for point-to-point and point-to-multipoint communications; Sub-part 1: Media-Independent Functionality** | **2011-10-28 TB adoption of WI** | **2011-10-28 Start of work** |
| 6. | EN 302 636-5-1 REN/ITS-0030036 | **Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 5: Transport Protocols; Sub-part 1: Basic Transport Protocol** | **2011-10-28 TB adoption of WI** | **2011-10-28 Start of work** |
| 7. | EN 302 636-6-1 REN/ITS-0030037 | **Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 6: Internet Integration; Sub-part 1: Transmission of IPv6 Packets over GeoNetworking Protocols** | **2011-10-28 TB adoption of WI** | **2011-10-28 Start of work** |
| 8. | TR 103 099 DTR/ITS-0030038 | **Intelligent Transport Systems (ITS); Architecture of conformance validation framework** | **2012-06-06 TB adoption of WI** | **2012-06-06 Start of work** |
| 9. | TR 103 061-3 DTR/ITS-0030020 | **Intelligent Transport Systems (ITS) Testing GeoNetworking validation report** | **2011-10-24 Early draft** | **2012-12-02 Stable draft** |
| 10. | TR 103 061-4 DTR/ITS-0030019 | **Intelligent Transport Systems (ITS) Testing GeoNetworking Basic Transport Protocol validation report** | **2010-07-31 Start of work** | **2012-07-02 Early draft** |
| 11. | TR 103 061-5 DTR/ITS-0030018 | **Intelligent Transport Systems (ITS); Testing; IPv6 over GeoNetworking validation report** | **2010-08-02 TB adoption of WI** | **2010-08-02 Start of work** |
| 12. | TS 102 871-1 DTS/ITS-0030014 | **Intelligent Transport Systems (ITS); Testing; Conformance test specifications for GeoNetworking ITS-G5; Part 1: Test requirements and Protocol Implementation Conformance Statement (PICS) proforma** | **2011-06-14 Publication** | |
| 13. | TS 102 871-2 DTS/ITS-0030015 | **Intelligent Transport Systems (ITS); Testing; Conformance test specifications for GeoNetworking ITS-G5; Part 2: Test Suite Structure and Test Purposes (TSS&TP)** | **2011-06-14 Publication** | |
| 14. | TS 102 871-3 DTS/ITS-0030013 | **Intelligent Transport Systems (ITS); Testing; Conformance test specifications for GeoNetworking ITS-G5; Part 3: Abstract Test Suite (ATS) and Protocol Implementation eXtra Information for Testing (PIXIT)** | **2011-06-14 Publication** | |
| 15. | TS 102 870-1 DTS/ITS-0030011 | **Intelligent Transport Systems (ITS); Testing; Conformance test specifications for GeoNetworking Basic Transport Protocol (BTP); Part 1: Test requirements and Protocol Implementation Conformance Statement (PICS) proforma** | **2011-03-23 Publication** | |
| 16. | TS 102 870-2 DTS/ITS-0030012 | **Intelligent Transport Systems (ITS); Testing; Conformance test specifications for GeoNetworking Basic Transport Protocol (BTP); Part 2: Test Suite Structure and Test Purposes (TSS&TP)** | **2011-03-23 Publication** | |
| 17. | TS 102 870-3 DTS/ITS-0030010 | **Intelligent Transport Systems (ITS); Testing; Conformance test specifications for Geonetworking Basic Transport Protocol (BTP); Part 3: Abstract Test Suite (ATS) and Protocol Implementation eXtra Information for Testing (PIXIT)** | **2011-03-23 Publication** | |
| 18. | TS 102 859-1 DTS/ITS-0030017 | **Intelligent Transport Systems (ITS); Testing; Conformance test specifications for Transmission of IP packets over GeoNetworking; Part 1: Test requirements and Protocol Implementation Conformance Statement (PICS) proforma** | **2011-03-30 Publication** | |
| 19. | TS 102 859-2 DTS/ITS-0030009 | **Intelligent Transport Systems (ITS); Testing; Conformance test specifications for Transmission of IP packets over GeoNetworking; Part 2: Test Suite Structure and Test Purposes (TSS&TP)** | **2011-03-30 Publication** | |
| 20. | TS 102 859-3 DTS/ITS-0030016 | **Intelligent Transport Systems (ITS); Testing; Conformance test specifications for Transmission of IP packets over GeoNetworking; Part 3: Abstract Test Suite (ATS) and Protocol Implementation eXtra Information for Testing (PIXIT)** | **2011-03-30 Publication** | |
| 21. | TS 102 723-11 DTS/ITS-0030008 | **Intelligent Transport Systems; OSI cross-layer topics; Part 11: Interface between network and transport layers and facilities layer** | **2009-04-24 Start of work** | **2013-11-02 WG approval** |

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| 22. | TS 102 636-1<br>DTS/ITS-0030002 | **Intelligent Transport Systems (ITS);**<br>**Vehicular Communications; GeoNetworking;**<br>**Part 1: Requirements** | 2010-03-23<br>**Publication** | |
| 23. | TS 102 636-2<br>DTS/ITS-0030003 | **Intelligent Transport Systems (ITS);**<br>**Vehicular Communications; GeoNetworking;**<br>**Part 2: Scenarios** | 2010-03-16<br>**Publication** | |
| 24. | TS 102 636-3<br>DTS/ITS-0030004 | **Intelligent Transport Systems (ITS);**<br>**Vehicular Communications; GeoNetworking;**<br>**Part 3: Network architecture** | 2010-03-16<br>**Publication** | |
| 25. | TS 102 636-4-1<br>DTS/ITS-0030001 | **Intelligent Transport System (ITS);**<br>**Vehicular communications; GeoNetworking; Part 4: Geographical addressing and forwarding for**<br>**point-to-point and point-to-multipoint communications;**<br>**Sub-part 1: Media-Independent Functionality** | 2011-06-14<br>**Publication** | |
| 26. | TS 102 636-4-2<br>DTS/ITS-0030007 | **Intelligent Transport Systems (ITS);**<br>**Vehicular Communications; GeoNetworking;**<br>**Part 4: Geographical addressing and forwarding for point-to-point and point-to-multipoint**<br>**communications; Sub-part 2: Media dependent functionalities for ITS-G5A media** | 2012-04-13<br>**Stable draft** | 2012-11-02<br>**WG approval** |
| 27. | TS 102 636-5-1<br>DTS/ITS-0030006 | **Intelligent Transport Systems (ITS);**<br>**Vehicular Communications; GeoNetworking;**<br>**Part 5: Transport Protocols; Sub-part 1: Basic Transport Protocol** | 2011-02-02<br>**Publication** | |
| 28. | TS 102 636-6-1<br>DTS/ITS-0030005 | **Intelligent Transport Systems (ITS);**<br>**Vehicular Communications; GeoNetworking;**<br>**Part 6: Internet Integration; Sub-part 1: Transmission of IPv6 Packets over GeoNetworking**<br>**Protocols** | 2011-03-30<br>**Publication** | |
| 29. | TR 101 555<br>DTR/ITS-0030031 | **Intelligent Transport Systems (ITS);**<br>**Network & Transport Layer;**<br>**Analysis of IPv6 for networking** | 2011-02-21<br>**TB adoption of WI** | 2011-02-21<br>**Start of work** |
| 30. | TS 102 871-1<br>RTS/ITS-0030022 | **Intelligent Transport Systems (ITS);**<br>**Testing;**<br>**Conformance test specifications for Geonetworking ITS-G5; Part 1: Test requirements and Protocol**<br>**Implementation Conformance Statement (PICS) proforma** | 2010-11-03<br>**TB adoption of WI** | 2010-11-03<br>**Start of work** |
| 31. | TS 102 871-2<br>RTS/ITS-0030023 | **Intelligent Transport Systems (ITS);**<br>**Testing;**<br>**Conformance test specifications for Geonetworking ITS-G5; Part 2: Test Suite Structure and Test**<br>**Purposes (TSS&TP)** | 2010-11-03<br>**TB adoption of WI** | 2010-11-03<br>**Start of work** |
| 32. | TS 102 871-3<br>RTS/ITS-0030024 | **Intelligent Transport Systems (ITS);**<br>**Testing;**<br>**Conformance test specifications for Geonetworking ITS-G5; Part 3: Abstract Test Suite (ATS) and**<br>**Protocol Implementation eXtra Information for Testing (PIXIT)** | 2010-11-03<br>**TB adoption of WI** | 2010-11-03<br>**Start of work** |
| 33. | TS 102 870-1<br>RTS/ITS-0030025 | **Intelligent Transport Systems (ITS);**<br>**Testing;**<br>**Conformance test specifications for Geonetworking Basic Transport Protocol (BTP); Part 1: Test**<br>**requirements and Protocol Implementation Conformance Statement (PICS) proforma** | 2010-11-03<br>**TB adoption of WI** | 2010-11-03<br>**Start of work** |
| 34. | TS 102 859-3<br>RTS/ITS-0030026 | **Intelligent Transport Systems (ITS);**<br>**Testing;**<br>**Conformance test specifications for Transmission of IP packets over Geonetworking; Part 3:**<br>**Abstract Test Suite (ATS) and Protocol Implementation eXtra Information for Testing (PIXIT);** | 2010-11-03<br>**TB adoption of WI** | 2010-11-03<br>**Start of work** |
| 35. | TS 102 870-2<br>RTS/ITS-0030027 | **Intelligent Transport Systems (ITS);**<br>**Testing;**<br>**Conformance test specifications for Geonetworking Basic Transport Protocol (BTP); Part 2: Test**<br>**Suite Structure and Test Purposes (TSS&TP)** | 2010-11-03<br>**TB adoption of WI** | 2010-11-03<br>**Start of work** |
| 36. | TS 102 870-3<br>RTS/ITS-0030028 | **Intelligent Transport Systems (ITS);**<br>**Testing;**<br>**Conformance test specifications for Geonetworking Basic Transport Protocol (BTP); Part 3:**<br>**Abstract Test Suite (ATS) and Protocol Implementation eXtra Information for Testing (PIXIT);** | 2010-11-03<br>**TB adoption of WI** | 2010-11-03<br>**Start of work** |
| 37. | TS 102 859-1<br>RTS/ITS-0030029 | **Intelligent Transport Systems (ITS);**<br>**Testing;**<br>**Conformance test specifications for Transmission of IP packets over Geonetworking; Part 1: Test**<br>**requirements and Protocol Implementation Conformance Statement (PICS) proforma** | 2010-11-03<br>**TB adoption of WI** | 2010-11-03<br>**Start of work** |
| 38. | TS 102 859-2<br>RTS/ITS-0030030 | **Intelligent Transport Systems (ITS);**<br>**Testing;**<br>**Conformance test specifications for Transmission of IP packets over Geonetworking; Part 2: Test**<br>**Suite Structure and Test Purposes (TSS&TP)** | 2010-11-03<br>**TB adoption of WI** | 2010-11-03<br>**Start of work** |

### 8.1.4    WG4: Media

WG4 is the media of physical interface group. The work can be split in two parts as follows:

1. The work related to 5.9GHz called G5A. Here we have the basic standards deciding legal operation in Europe called Harmonised ENs followed with the relevant test standards, but also technical regulations how to use the channels effectively. One of the work areas is regarding interference between the CEN DSRC on 5.8GHz, and the G5A on 5.9 GHz which is likely to be of special interest for current operators of DSRC systems. There is a proposal for a test programme that will be run by ETSI during 2011 to validate the level of interference and potential problems for current users of DSRC.

2. All the other media like 700 MHz digital dividend, LTE, new digital broadcast media and so on are included in the WG scope, but have a much lower priority than G5A. There are some voluntary efforts around this but no real work items leading to standards soon.

By following the links below further information on each WI can be found.

| | Work Item | Title (Formal only) | Current Status | Planned Next Status |
|---|---|---|---|---|
| **ITS WG4** | | | | |
| 1. | EN 302 663 REN/ITS-0040028 | **Intelligent Transport Systems (ITS); Access layer specification for Intelligent Transport Systems operating in the 5 GHz frequency band** | **2012-05-23 End of pre-processing** | **2012-11-01 WG approval** |
| 2. | ES 202 663 DES/ITS-0040015 | **Intelligent Transport Systems (ITS); European profile standard for the physical and medium access control layer of Intelligent Transport Systems operating in the 5 GHz frequency band** | **2010-01-14 Publication** | |
| 3. | TR 102 960 DTR/ITS-0040029 | **Intelligent Transport Systems (ITS); Mitigation techniques to avoid interference between European CEN Dedicated Short Range Communication (RTTT DSRC) equipment and Intelligent Transport Systems (ITS) operating in the 5 GHz frequency range Evaluation of mitigation methods and techniques** | **2012-01-19 Stable draft** | **2012-11-01 Final draft for approval** |
| 4. | TS 102 917-1 DTS/ITS-0040025 | **Intelligent Transport Systems (ITS); Test specifications for the channel congestion control algorithms operating in the 5,9 GHz range; Part 1: RF conformance and Protocol Implementation Conformance Statement (PICS) proforma** | **2011-10-14 Early draft** | **2012-07-02 Stable draft** |
| 5. | TS 102 917-2 DTS/ITS-0040026 | **Intelligent Transport Systems (ITS); Test specifications for the channel congestion control algorithms operating in the 5,9 GHz range; Part 2: Test Suite Structure and Test Purposes (TSS & TP)** | **2011-10-14 Early draft** | **2012-07-02 Stable draft** |
| 6. | TS 102 917-3 DTS/ITS-0040027 | **Intelligent Transport Systems (ITS); Test specifications for the channel congestion control algorithms operating in the 5,9 GHz range; Part 3: Abstract Test Suite (ATS) and Protocol Implementation eXtra Information for Testing (PIXIT)** | **2011-10-26 Early draft** | **2012-07-02 Stable draft** |
| 7. | TS 102 916-1 DTS/ITS-0040022 | **Intelligent Transport Systems (ITS); Test specifications for the methods to ensure coexistence of Cooperative ITS G5 with RTTT DSRC; Part 1: Protocol Implementation Conformance Statement (PICS)** | **2012-05-22 Publication** | |
| 8. | TS 102 916-2 DTS/ITS-0040023 | **Intelligent Transport Systems (ITS); Test specifications for the methods to ensure coexistence of Cooperative ITS G5 with RTTT DSRC; Part 2: Test Suite Structure and Test Purposes (TSS&TP)** | **2012-05-22 Publication** | |
| 9. | TS 102 916-3 DTS/ITS-0040024 | **Intelligent Transport Systems (ITS); Test specifications for the methods to ensure coexistence of Cooperative ITS G5 with RTTT DSRC; Part 3: Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT)** | **2012-05-22 Publication** | |
| 10. | TR 102 862 DTR/ITS-0040021 | **Intelligent Transport Systems (ITS); Performance Evaluation of Self-Organizing TDMA as Medium Access Control Method Applied to ITS; Access Layer Part** | **2011-12-05 Publication** | |
| 11. | TR 102 861 DTR/ITS-0040020 | **Intelligent Transport Systems (ITS); STDMA recommended parameters and settings for cooperative ITS; Access Layer Part** | **2012-01-27 Publication** | |
| 12. | TS 102 792 DTS/ITS-0040013 | **Intelligent Transport Systems (ITS); Mitigation techniques to avoid interference between European CEN Dedicated Short Range Communication (RTTT DSRC) equipment and Intelligent Transport Systems (ITS) operating in the 5 GHz frequency range** | **2010-10-01 Stable draft** | **2012-06-30 Stable draft** |
| 13. | TS 102 724 DTS/ITS-0040016 | **Intelligent Transport Systems (ITS); Harmonized Channel Specifications for Intelligent Transport Systems operating in the 5 GHz frequency band** | **2012-04-17 Stable draft** | **2012-11-02 WG approval** |
| 14. | TS 102 723-10 DTS/ITS-0040018 | **Intelligent Transport Systems; OSI cross-layer topics; Part 10: Interface between access layer and network and transport layers** | **2012-04-20 Stable draft** | **2012-11-01 WG approval** |
| 15. | TS 102 687 DTS/ITS-0040014 | **Intelligent Transport Systems (ITS); Decentralized Congestion Control Mechanisms for Intelligent Transport Systems operating in the 5 GHz range; Access layer part** | **2011-07-01 Publication** | |
| 16. | TS 102 486-1-3 RTS/ITS-0040017 | **Intelligent Transport Systems (ITS); Road Transport and Traffic Telematics (RTTT); Test specifications for Dedicated Short Range Communication (DSRC) transmission equipment; Part 1: DSRC data link layer: medium access and logical link control; Sub-Part 3: Abstract Test Suite (ATS) and partial PIXIT proforma** | **2009-05-27 Publication** | |
| 17. | TS 102 486-1-2 RTS/ITS-0040006 | **Intelligent Transport Systems (ITS); Road Transport and Traffic Telematics (RTTT); Test specifications for Dedicated Short Range Communication (DSRC) transmission equipment; Part 1: DSRC data link layer: medium access and logical link control; Sub-Part 2: Test Suite Structure and Test Purposes (TSS&TP)** | **2008-10-06 Publication** | |
| 18. | TS 102 486-1-3 RTS/ITS-0040007 | **Intelligent Transport Systems (ITS); Road Transport and Traffic Telematics (RTTT); Test specifications for Dedicated Short Range Communication (DSRC) transmission equipment;** | **2008-10-06 Publication** | |

| | | Part 1: DSRC data link layer: medium access and logical link control; Sub-Part 3: Abstract Test Suite (ATS) and partial PIXIT proforma | | |
|---|---|---|---|---|
| 19. | TS 102 486-2-1 RTS/ITS-0040008 | **Intelligent Transport Systems (ITS);** **Road Transport and Traffic Telematics (RTTT); Test specifications for Dedicated Short Range Communication (DSRC) transmission equipment;** **Part 2: DSRC application layer; Sub-Part 1: Protocol Implementation Conformance Statement (PICS) proforma specification** | 2008-10-06 **Publication** | |
| 20. | TS 102 486-2-2 RTS/ITS-0040009 | **Intelligent Transport Systems (ITS)** **Road Transport and Traffic Telematics (RTTT); Test specifications for Dedicated Short Range Communication (DSRC) transmission equipment;** **Part 2: DSRC application layer; Sub-Part 2: Test Suite Structure and Test Purposes (TSS&TP)** | 2008-10-06 **Publication** | |
| 21. | TS 102 486-2-3 RTS/ITS-0040010 | **Intelligent Transport Systems (ITS);** **Road Transport and Traffic Telematics (RTTT); Test specifications for Dedicated Short Range Communication (DSRC) transmission equipment;** **Part 2: DSRC application layer; Sub-Part 3: Abstract Test Suite (ATS) and partial PIXIT proforma** | 2008-10-06 **Publication** | |

### 8.1.5   WG5: Security

Security is considered to be one of the most important and most difficult areas in Cooperative ITS. To illustrate the challenge, just imagine a 15 year old Japanese produced car registered in Norway, and a new American car registered in Italy, meeting somewhere in France. These two cars will have to understand and trust the information the other is sending, and prove that the other car is not a fake installation sending spoofed information.

WG5 consist of cryptography experts and has several STFs to help. The individual experts are the same is those in IEEE P1609.2 and ISO TC204/WG16, so the basic concepts are harmonized in this area. Unfortunately the resulting standards are still not fully compatible due to different requirements. The process goes over several steps where the first step is to characterize the entire environment using an ETSI concept called TVRA for Threat, Vulnerability and Risk Analysis. WG5 has performed this analysis, but limited the scope to G5A in a V2V/V2I scenario which is driven by the C2C-CC needs. Note that the EU-US Task Force has suggested several improvements to make the WG5 standards more applicable for ITS in general.

By following the links below further information on each WI can be found.

| | Work Item | Title (Formal only) | Current Status | Planned Next Status |
|---|---|---|---|---|
| **ITS WG5** | | | | |
| 1. | ES 202 910 DES/ITS-0050010 | **Intelligent Transport Systems (ITS); Security; Identity Management and Identity Protection in ITS** | 2011-03-26 Early draft | 2012-11-01 Stable draft |
| 2. | TS 103 097 DTS/ITS-0050023 | **Intelligent Transport Systems (ITS); Security; Security header and certificate formats for ITS G5** | 2012-04-26 TB adoption of WI | 2012-04-26 Start of work |
| 3. | TR 103 096-4 DTR/ITS-0050022 | **Intelligent Transport Systems (ITS); Testing; Conformance test specification for TS 102 867 and TS 102 941; Part 4: Validation report** | 2012-04-26 TB adoption of WI | 2012-04-26 Start of work |
| 4. | TS 103 096-1 DTS/ITS-0050021 | **Intelligent Transport Systems (ITS); Testing; Conformance test specification for TS 102 867 and TS 102 941; Part 1: Test requirements and Protocol Implementation Conformance Statement (PICS) proforma** | 2012-04-26 TB adoption of WI | 2012-04-26 Start of work |
| 5. | TS 103 096-2 DTS/ITS-0050019 | **Intelligent Transport Systems (ITS); Testing; Conformance test specification for TS 102 867 and TS 102 941; Part 2: Test Suite Structure and Test Purposes (TSS & TP)** | 2012-04-26 TB adoption of WI | 2012-04-26 Start of work |
| 6. | TS 103 096-3 DTS/ITS-0050020 | **Intelligent Transport Systems (ITS); Testing; Conformance test specification for TS 102 867 and TS 102 941; Part 3: Abstract Test Suite (ATS) and Protocol Implementation eXtra Information for Testing (PIXIT)** | 2012-04-26 TB adoption of WI | 2012-04-26 Start of work |
| 7. | TS 102 943 DTS/ITS-0050017 | **Intelligent Transport Systems (ITS); Security; Confidentiality services** | 2012-04-11 Waiting - see "Remarks" | 2012-04-11 Draft receipt by ETSI Secretariat |
| 8. | TS 102 942 DTS/ITS-0050016 | **Intelligent Transport Systems (ITS); Security; Access Control** | 2012-04-17 Waiting - see "Remarks" | 2012-06-06 Draft receipt by ETSI Secretariat |
| 9. | TS 102 941 DTS/ITS-0050015 | **Intelligent Transport Systems (ITS); Security; Trust and Privacy Management** | 2012-04-17 Waiting - see "Remarks" | 2012-06-06 Draft receipt by ETSI Secretariat |
| 10. | TS 102 940 DTS/ITS-0050014 | **Intelligent Transport Systems (ITS); Security; ITS communications security architecture and security management** | 2012-04-11 Waiting - see "Remarks" | 2012-04-11 Draft receipt by ETSI Secretariat |
| 11. | TR 102 893 DTR/ITS-0050005 | **Intelligent Transport Systems (ITS); Security; Threat, Vulnerability and Risk Analysis (TVRA)** | 2010-03-11 Publication | |
| 12. | TS 102 867 DTS/ITS-0050013 | **Intelligent Transport Systems (ITS); Security; Stage 3 mapping for IEEE 1609.2** | 2012-06-04 Draft receipt by ETSI Secretariat | 2012-06-18 Publication |
| 13. | TS 102 731 DTS/ITS-0050001 | **Intelligent Transport Systems (ITS); Security; Security Services and Architecture** | 2010-09-21 Publication | |
| 14. | TS 102 723-7 DTS/ITS-0050007 | **Intelligent Transport Systems; OSI cross-layer topics; Part 7: Interface between security entity and access layer** | 2009-04-24 Start of work | 2013-11-02 WG approval |
| 15. | TS 102 723-8 DTS/ITS-0050008 | **Intelligent Transport Systems (ITS); OSI cross-layer topics; Part 8: Interface between security entity and network and transport layer** | 2012-05-31 Stable draft | 2012-06-15 End of pre-processing |
| 16. | TS 102 723-9 DTS/ITS-0050009 | **Intelligent Transport Systems; OSI cross-layer topics; Part 9: Interface between security entity and facilities layer** | 2012-04-19 Early draft | 2013-11-02 WG approval |
| 17. | TR 102 893 RTR/ITS-0050018 | **Intelligent Transport Systems (ITS); Security; Threat, Vulnerability and Risk Analysis (TVRA)** | 2012-01-14 Early draft | 2012-06-30 Stable draft |

## 9   ISO TC204

**ISO TC204** is the International ITS committee. It was originally called Transport Information Control Systems (TICS), but changed its name to Intelligent Transport Systems some years ago. This was the second ITS standardisation body to start after CEN TC278.

TC204 was patterned on TC278, and the cooperation is regulated by the Vienna Agreement (VA) between ISO and CEN, which means that they occasionally have joint meetings to ensure alignment.

All Work Items, both drafts and finished standards, can be searched via this search engine in this ISO search page.

The following table shows the overlap and common working groups between CEN TC278 and ISO TC204.

### Alignment CEN TC278 – ISO TC204 Working Groups



| CEN/TC 278 WGs | ISO/TC 204 WGs |
|---|---|
| – WG13 (Architecture) | – WG1 (Architecture) |
| | – WG3 (Database Technology) |
| – WG12 (Automatic Vehicle & Equipment Identification) | – WG4 (Automatic Vehicle & Equipment Identification) |
| – WG1 (Electronic Fee Collection) | – WG5 (Fee and Toll Collection) |
| | – WG7 (General Fleet Management and Commercial/Freight Operations) |
| – WG3 (Public Transport) | – WG8 (Public Transport) |
| – WG8 (Road Traffic Data) | – WG9 (Integrated Transport Inform., Management and Control) |
| – WG4 (Traffic and Traveller Inform.) | – WG10 (Traveller Inform. Systems) |
| | – WG14 (Vehicle/Roadway Warning and Control Systems) |
| | – WG16 (CALM) |
| | – WG17 (Nomadic Devices) |
| – WG14 (After Theft Systems for the Recovery of Stolen Vehicles) | |
| – WG15 (Safety, eCall) | |
| – WG16 (Cooperative Systems) | – WG18 (Cooperative Systems) |

**Figure 5: Overlapping WGs between CEN/TC278 and ISO TC 204**

### 9.1   ISO TC204 Working Groups
The following drawing gives a quick overview of the full set of working groups:

| WG | ISO TC204 – Intelligent Transport System | Country | Convenor |
|---|---|---|---|
| 1 | Architecture | UK | R. Bossom |
| 2 | Quality and reliability requirements | USA | dormant |
| 3 | TICS Database Technology | JAP | J. Shibata |
| 4 | Automatic Vehicle and Equipment Identification | NO | K. Evensen |
| 5 | Fee and Toll Collection | NL | J. Engdahl |
| 6 | General Fleet Management | USA | dormant |
| 7 | General Fleet Management and Commercial Freight | CAN | L. Sabounghi |
| 8 | Public Transport – Emergency | USA | M. Olayi |
| 9 | Integrated Transport Information, Management, Control | AUS | D. Zabrieszach |
| 10 | Traveler Information Systems | UK | P. Burton |
| 11 | Route Guidance and Navigation Systems | GER | dormant |
| 12 | Parking Management/Off-Road Commercial | | dorman |
| 13 | Man-Machine Interface (Off-vehicle) | USA | dormant |
| 14 | Vehicle-Roadway Warning and Control Systems | JAP | Y. Akatsu |
| 15 | Dedicated Short Range Communications and For TICS Applications | GER | dormant |
| 16 | Wide Area Communications-Protocols and Interfaces | USA | S. Sprouffske |
| 17 | Nomadic & Portable Devices for ITS Services | KOR | Y. Moon |
| 18 | Co-Operative Systems | GER | H-J. Schade |

**Figure 6: Working groups of ISO TC204 and the conveners for each group**

### 9.1.1   WG1 Architecture

WG1 is an active WG producing standards that mainly support ITS specification tasks. The WG is responsible for maintaining terms and dictionaries, and has links to basic ITS architectures such as the European [FRAME](#) work and the [US National ITS Architecture](#) work.

Several of the standards describe how to write other ITS standards, so this can be considered as meta-standards. Examples are how to include machine readable data definitions like XML and ASN.1 in the standards, and how to use UML effectively to describe architectures and processes in ITS standards

This Working Group continues to support and work with CEN TC278 WG16 and other WG's to assist in the creation of some of the standards for cooperative systems that are identified in the CEN/ETSI response to Mandate M/453.

| Reference | Document title | Reg. date | Crnt stage | Stage date | Limit date |
|---|---|---|---|---|---|
| ISO/TR 12859:2009 | Intelligent transport systems -- System architecture -- Privacy aspects in ITS standards and systems | 2008-06-12 | 60.60 | 2009-05-28 | |
| ISO/NP 13189 | Business Case Template for ITS Projects | | 10.00 | 2010-08-31 | |
| ISO 14813-1:2007 | Intelligent transport systems -- Reference model architecture(s) for the ITS sector -- Part 1: ITS service domains, service groups and services | 2004-10-07 | 90.92 | 2010-09-08 | |
| ISO/TR 14813-1:1999 | Transport information and control systems -- Reference model architecture(s) for the TICS sector -- Part 1: TICS fundamental services | 1998-08-26 | 95.99 | 2007-02-02 | |
| ISO/NP 14813-1 | Intelligent transport systems -- Reference model architecture(s) for the ITS sector -- Part 1: ITS service domains, service groups and services | 2010-09-08 | 10.99 | 2010-09-08 | 2012-09-08 (Cancellation date: 2013-03-08) |
| ISO/TR 14813-2:2000 | Transport information and control systems -- Reference model architecture(s) for the TICS sector -- Part 2: Core TICS reference architecture | 1998-09-24 | 60.60 | 2000-12-21 | |
| ISO/TR 14813-3:2000 | Transport information and control systems -- Reference model architecture(s) for the TICS sector -- Part 3: Example elaboration | 1997-08-14 | 90.93 | 2009-01-15 | 2014-01-15 |
| ISO/TR 14813-4:2000 | Transport information and control systems -- Reference model architecture(s) for the TICS sector -- Part 4: Reference model tutorial | 1994-12-09 | 90.93 | 2009-01-15 | 2014-01-15 |
| ISO/TR 14813-5:1999 | Transport information and control systems -- Reference model architecture(s) for the TICS sector -- Part 5: Requirements for architecture description in TICS standards | 1998-08-26 | 95.99 | 2010-06-29 | |
| ISO 14813-5:2010 | Intelligent transport systems -- Reference model architecture(s) for the ITS sector -- Part 5: Requirements for architecture description in ITS standards | 2007-03-19 | 60.60 | 2010-06-29 | |
| ISO 14813-6:2009 | Intelligent transport systems -- Reference model architecture(s) for the ITS sector -- Part 6: Data presentation in ASN.1 | 2006-03-05 | 60.60 | 2009-09-03 | 2014-07-15 |
| ISO/TR 14813-6:2000 | Transport information and control systems -- Reference model architecture(s) for the TICS sector -- Part 6: Data presentation in ASN.1 | 1998-05-07 | 95.99 | 2009-09-03 | |
| ISO 14817:2002 | Transport information and control systems -- Requirements for an ITS/TICS central Data Registry and ITS/TICS Data Dictionaries | 2001-07-10 | 90.93 | 2009-01-15 | 2014-01-15 |
| ISO/TR 17452:2007 | Intelligent transport systems -- Using UML for defining and documenting ITS/TICS interfaces | 2006-01-15 | 60.60 | 2007-04-17 | |
| ISO/DTR 17465 | Intelligent transport systems - Definition of terms for "Cooperative ITS" and guidelines for standards | 2011-08-31 | 30.20 (Start date: 2012-06-01) | 2012-06-01 | 2014-02-28 |
| ISO 24097-1:2009 | Intelligent transport systems -- Using web services (machine-machine delivery) for ITS service delivery -- Part 1: Realization of interoperable web services | 2006-01-05 | 60.60 | 2009-09-01 | 2014-07-15 |
| ISO/TR 24529:2008 | Intelligent transport systems -- Systems architecture -- Use of unified modelling language (UML) in ITS International Standards and deliverables | 2005-10-15 | 60.60 | 2008-04-08 | |
| ISO 24531:2007 | Intelligent transport systems -- System architecture, taxonomy and terminology -- Using XML in ITS standards, data registries and data dictionaries | 2004-10-08 | 90.92 | 2010-09-17 | |

| ISO/DIS 24531 | Intelligent transport systems -- System architecture, taxonomy and terminology -- Using XML in ITS standards, data registries and data dictionaries | 2010-09-08 | 40.20 (Start date: 2012-01-24 End date: 2012-06-25) | 2012-01-24 | 2013-03-08 |
|---|---|---|---|---|---|
| ISO/TR 24532:2006 | Intelligent transport systems -- Systems architecture, taxonomy and terminology -- Using CORBA (Common Object Request Broker Architecture) in ITS standards, data registries and data dictionaries | 2005-01-12 | 60.60 | 2006-06-09 | |
| ISO/TR 25100:2008 | Intelligent transport systems -- Systems architecture -- Harmonization of ITS data concepts | 2005-08-15 | 90.92 | 2011-04-26 | |
| ISO/PRF TR 25100 | Intelligent transport systems -- Systems architecture -- Harmonization of ITS data concepts | 2011-04-26 | 50.00 | 2012-06-01 | |
| ISO/TR 25102:2008 | Intelligent transport systems -- System architecture -- 'Use Case' pro-forma template | 2005-08-15 | 60.60 | 2008-02-07 | |
| ISO/TR 25104:2008 | Intelligent transport systems -- System architecture, taxonomy, terminology and data modelling -- Training requirements for ITS architecture | 2005-08-15 | 60.60 | 2008-01-28 | |
| ISO/TR 24098:2007 | Intelligent transport systems -- System architecture, taxonomy and terminology -- Procedures for developing ITS deployment plans utilizing ITS system architecture | 2006-01-05 | 60.60 | 2007-03-09 | |
| ISO/PRF TR 26999 | Intelligent Transport Systems - Systems Architecture - Use of 'Process Orientated Methodology' in ITS International Standards and Deliverables | 2012-04-01 | 50.00 | 2012-06-01 | |
| ISO/TR 28682:2008 | Intelligent transport systems -- Joint APEC-ISO study of progress to develop and deploy ITS standards | 2005-10-01 | 60.60 | 2008-11-10 | |

### 9.1.2   WG2 Quality and reliability requirements

This was a proposed WG from USA, but it never got the necessary support to start real work. This WG is fully dormant at this time.

### 9.1.3   WG3 Database technology

WG3 maintains the European Geographical Data Files (GDF) and will extend the current GDF 4.0 to a new GDF 5.0. GDF5.0 was approved as Draft International Standard (ISO/DIS14825) in June 2010. GDF is an international standard that is used to model, describe and transfer road networks and other geographic data. Major GDF5.0 enhancements include UML model migration & refinements; harmonization with linear referencing and geo-spatial web standards; support for 3-D content and time coordinates; comprehensive character set and phonetic representations; and new XML and SQL based delivery formats. Apart from that, this WG has mainly concentrated on map databases and common interfaces for navigation systems. WG3 includes several OEMs and will standardise the electronic map layers of LDM.

The following sub working groups are established:

SWG3.1: Geographic Data Files
SWG3.2: Physical Storage Format and Data Delivery
SWG3.3: Location Referencing
SWG3.4: (Passive) Application Programming Interface

This working group is supporting M/453 through WG18 providing map related functional requirements, data model (logical data model/logical data organization), and data elements for Local Dynamic Map for those applications of Cooperative ITS that require information derived from map databases (such as Cooperative Traveller Assistance). The scope will be focused on data elements of a static nature (see below ISO/NP 14296).

SWG3.3 Location Referencing sub-working group has been reactivated as the IS 17572 series standards are being revised. An active participation of WG18 and TISA has been requested by the sub-working group.

| Reference | Document title | Reg. date | Crnt stage | Stage date | Limit date |
|---|---|---|---|---|---|
| ISO/NP 14296 | Intelligent Transport Systems -- Extension of map database specifications for applications of cooperative ITS | 2011-04-26 | 10.99 | 2011-04-26 | 2012-10-26 (Cancellation date: 2013-04-26) |
| ISO/TR 14825:1996 | Geographic Data Files (GDF) | 1994-12-09 | 95.99 | 2004-02-03 | |
| ISO 14825:2004 | Intelligent transport systems -- Geographic Data Files (GDF) -- Overall data specification | 1998-05-20 | 95.99 | 2011-07-08 | |
| ISO 14825:2011 | Intelligent transport systems -- Geographic Data Files (GDF) -- GDF5.0 | 2009-06-11 | 60.60 | 2011-07-08 | |
| ISO/PWI 14826 | Physical storage for TICS database technology | | 00.00 | 2006-07-06 | |
| ISO 17267:2009 | Intelligent transport systems -- Navigation systems -- Application programming interface (API) | 2007-07-19 | 60.60 | 2009-11-04 | 2014-10-15 |
| ISO 17572-1:2008 | Intelligent transport systems (ITS) -- Location referencing for geographic databases -- Part 1: General requirements and conceptual model | 2007-03-09 | 90.60 | 2012-03-17 | |
| ISO 17572-2:2008 | Intelligent transport systems (ITS) -- Location referencing for geographic databases -- Part 2: Pre-coded location references (pre-coded profile) | 2007-03-09 | 90.60 | 2012-03-17 | |
| ISO 17572-3:2008 | Intelligent transport systems (ITS) -- Location referencing for geographic databases -- Part 3: Dynamic location references (dynamic profile) | 2007-03-09 | 90.60 | 2012-03-17 | |
| ISO 17572-3:2008/Cor 1:2009 | Intelligent transport systems (ITS) -- Location referencing for geographic databases -- Part 3: Dynamic location references (dynamic profile) -- Technical Corrigendum 1 | 2009-06-15 | 60.60 | 2009-07-09 | |
| ISO/TS 20452:2007 | Requirements and Logical Data Model for a Physical Storage Format (PSF) and an Application Program Interface (API) and Logical Data Organization for PSF used in Intelligent Transport Systems (ITS) Database Technology | 2005-07-30 | 90.93 | 2010-09-22 | |
| ISO/DTS 17931 | Intelligent transport systems -- Extension of map database specifications for Local Dynamic Map for applications of Cooperative ITS | 2012-01-19 | 30.20 (Start date: 2012-05-12) | 2012-05-12 | |

| ISO/CD 17931 | Intelligent transport systems -- Extension of map database specifications for Local Dynamic Map for applications of Cooperative ITS | 2012-01-19 | 30.20 (Start date: 2012-05-12) | 2012-05-12 | 2013-07-19 |
| ISO 24099:2011 | Navigation data delivery structures and protocols | 2006-04-15 | 60.60 | 2011-01-06 | |

### 9.1.4   WG4 Automatic Vehicle and Equipment Identification (AVI/AEI)
This WG is fully joint with CEN TC278/WG12. Please find further details here

### 9.1.5   WG5: Electronic Fee Collection (EFC)
This is a fully joint WG with CEN WG1. Please find further details here

### 9.1.6   WG7: Commercial Fleet Management
WG7 was passive for a long time, but was restarted based on needs from US Army to manage and control goods transport to their military deployed areas around the world. Japan and Australia has also become quite active here the last year in order to look at combined, end-to-end transports involving everything from Electronic Digital Identification to RFID tagging. As mentioned WG2 in CEN has been restarted as a European companion to extend the work into Cooperative ITS. Much of the work in ISO WG7 is also linked to work that will be carried out in CEN TC278/WG2.

The scope of WG7 is intermodal in its nature, and there is a close relationship with WG4 (AVI/AEI) including some joint meetings. The main adopted standard relates to hazardous materials electronic marking, and this may be relevant for controlling and monitoring access of dangerous goods to sensitive areas (city centres, tunnels etc). Japan and Australia is currently doing significant work to improve multimodal interchanges.

This WG may be important to follow regarding standardised solutions for "green (and safe) transport". Efforts to decrease fuel consumption, better usage of multimodal transport, good overview of trailers to minimize empty carriage transport etc will all be part of a green transport effort, and is linked to the EC directives and actions like iMobility

| Reference | Document title | Reg. date | Crnt stage | Stage date | Limit date |
|---|---|---|---|---|---|
| ISO/PRF 15638-1 | Intelligent transport systems -- Framework for collaborative Telematics Applications for Regulated commercial freight Vehicles (TARV) -- Part 1: Framework and architecture | 2011-04-26 | 50.00 | 2012-05-18 | |
| ISO/PRF TS 15638-2 | Intelligent transport systems -- Framework for collaborative Telematics Applications for Regulated commercial freight Vehicles (TARV) -- Part 2: Common platform parameters using CALM | 2011-04-26 | 50.00 | 2012-05-24 | |
| ISO/DIS 15638-2 | Intelligent transport systems -- Framework for collaborative Telematics Applications for Regulated commercial freight Vehicles (TARV) -- Part 2: Common platform parameters using CALM | 2011-04-26 | 40.20 (Start date: 2012-03-29 End date: 2012-08-30) | 2012-03-29 | 2014-10-26 |
| ISO/DIS 15638-3 | Intelligent transport systems -- Framework for cooperative telematics applications for regulated commercial freight vehicles (TARV) -- Part 3: Requirements, 'Certification authority' approval procedures, and enforcement provisions for the providers of regulated services | 2011-04-26 | 40.20 (Start date: 2012-03-16 End date: 2012-08-17) | 2012-03-16 | 2014-10-26 |
| ISO/PRF TS 15638-3 | Intelligent transport systems -- Framework for cooperative telematics applications for regulated commercial freight vehicles (TARV) -- Part 3: Requirements, 'Certification authority' approval procedures, and enforcement provisions for the providers of regulated services | 2011-04-26 | 50.00 | 2012-05-24 | |
| ISO/NP 15638-4 | Intelligent transport systems -- Framework for collaborative Telematics Applications for Regulated commercial freight Vehicles (TARV) -- Part 4: System security requirements | | 10.60 | 2011-03-19 | |
| ISO/NP TS 15638-4 | Intelligent transport systems -- Framework for collaborative Telematics Applications for Regulated commercial freight Vehicles (TARV) -- Part 4: System security requirements | 2011-04-26 | 10.99 | 2011-04-26 | |
| ISO/DIS 15638-5 | Intelligent transport systems -- Framework for collaborative Telematics Applications for Regulated commercial freight Vehicles (TARV) -- Part 5: Generic vehicle information | 2011-04-26 | 40.20 (Start date: 2012-03-16 End date: 2012-08-17) | 2012-03-16 | 2014-10-26 |
| ISO/PRF TS 15638-5 | Intelligent transport systems -- Framework for collaborative Telematics Applications for Regulated commercial freight Vehicles (TARV) -- Part 5: Generic vehicle information | 2011-04-26 | 50.00 | 2012-05-24 | |
| ISO/NP 15638-6 | Intelligent transport systems -- Framework for collaborative Telematics Applications for Regulated commercial freight Vehicles (TARV) -- Part 6: Regulated applications | 2011-04-26 | 10.99 | 2011-04-26 | 2013-04-26 |
| ISO/NP TS 15638-6 | Intelligent transport systems --- Framework for collaborative Telematics Applications for Regulated commercial freight Vehicles (TARV) -- Part 6: Regulated applications | 2011-04-26 | 10.99 | 2011-04-26 | |
| ISO/DIS 15638-7 | Intelligent transport systems -- Framework for collaborative Telematics Applications for Regulated commercial freight Vehicles (TARV) -- Part 7: Other applications | 2011-04-26 | 40.20 (Start date: 2012-05-15 End date: 2012-10-16) | 2012-05-15 | 2014-10-26 |

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|---|---|---|---|---|---|
| ISO/DTS 15638-7 | Intelligent transport systems -- Framework for collaborative Telematics Applications for Regulated commercial freight Vehicles (TARV) -- Part 7: Other applications | 2011-11-26 | 30.99 | 2012-03-28 | |
| ISO/NP 15638-8 | Intelligent transport systems -- Framework for collaborative Telematics Applications for Regulated commercial freight Vehicles (TARV) -- Part 8: Vehicle access monitoring (VAM) | 2012-05-03 | 10.99 | 2012-05-03 | 2013-11-03 |
| ISO/NP 15638-9 | Intelligent transport systems -- Framework for collaborative Telematics Applications for Regulated commercial freight Vehicles (TARV) -- Part 9: Remote electronic tachograph monitoring (RTM) | 2012-05-03 | 10.99 | 2012-05-03 | 2013-11-03 |
| ISO/NP 15638-10 | Intelligent transport systems -- Framework for collaborative Telematics Applications for Regulated commercial freight Vehicles (TARV) -- Part 10: Emergency messaging system/eCall (EMS) | 2012-05-03 | 10.99 | 2012-05-03 | 2013-11-03 |
| ISO/NP 15638-11 | Intelligent transport systems -- Framework for collaborative Telematics Applications for Regulated commercial freight Vehicles (TARV) -- Part 11: Driver work records (work and rest hours compliance) (DWR) | 2012-05-03 | 10.99 | 2012-05-03 | 2013-11-03 |
| ISO/NP 15638-12 | Intelligent transport systems -- Framework for collaborative Telematics Applications for Regulated commercial freight Vehicles (TARV) -- Part 12: Vehicle mass monitoring (VMM) | 2012-05-03 | 10.99 | 2012-05-03 | 2013-11-03 |
| ISO/NP 15638-13 | Intelligent transport systems -- Framework for collaborative Telematics Applications for Regulated commercial freight Vehicles (TARV) -- Part 13: Mass Penalties and Levies (VMC) | 2012-05-04 | 10.99 | 2012-05-04 | 2013-11-04 |
| ISO/NP 15638-14 | Intelligent transport systems -- Framework for collaborative Telematics Applications for Regulated commercial freight Vehicles (TARV) -- Part 14: Vehicle access control (VAC) | 2012-05-04 | 10.99 | 2012-05-04 | 2013-11-04 |
| ISO/NP 15638-15 | Intelligent transport systems -- Framework for collaborative Telematics Applications for Regulated commercial freight Vehicles (TARV) -- Part 15: Vehicle location monitoring (VLM) | 2012-05-04 | 10.99 | 2012-05-04 | 2013-11-04 |
| ISO/NP 15638-16 | Intelligent transport systems -- Framework for collaborative Telematics Applications for Regulated commercial freight Vehicles (TARV) -- Part 16: Vehicle speed monitoring (VSM) | 2012-05-04 | 10.99 | 2012-05-04 | 2013-11-04 |
| ISO/NP 15638-17 | Intelligent transport systems -- Framework for collaborative Telematics Applications for Regulated commercial freight Vehicles (TARV) -- Part 17: Consignment and location monitoring (CLM) | 2012-05-04 | 10.99 | 2012-05-04 | 2013-11-04 |
| ISO/NP 15638-18 | Intelligent transport systems -- Framework for collaborative Telematics Applications for Regulated commercial freight Vehicles (TARV) -- Part 18: ADR (Dangerous Goods) transport monitoring (ADR) | 2012-05-04 | 10.99 | 2012-05-04 | 2013-11-04 |
| ISO/NP 15638-19 | Intelligent transport systems -- Framework for collaborative Telematics Applications for Regulated commercial freight Vehicles (TARV) -- Part 19: Vehicle parking facilities (VPF) | 2012-05-04 | 10.99 | 2012-05-04 | 2013-11-04 |
| ISO/NP TS 17187 | Intelligent transport systems -- Electronic information exchange to facilitate the movement of freight and its intermodal transfer -- Governance rules to sustain electronic information exchange methods | | 10.00 | 2011-02-03 | |
| ISO 17687:2007 | Transport Information and Control Systems (TICS) -- General fleet management and commercial freight operations -- Data dictionary and message sets for electronic identification and monitoring of hazardous materials/dangerous goods transportation | 2000-06-05 | 90.93 | 2010-07-15 | |
| ISO/PRF TS 24533 | Intelligent transport systems -- Electronic information exchange to facilitate the movement of freight and its intermodal transfer -- Road transport information exchange methodology | 2010-11-04 | 50.00 | 2012-04-30 | |
| ISO/DIS 26683-1 | Intelligent Transport Systems -- Freight land conveyance content identification and communication architecture -- Part 1: Application profile | 2010-09-28 | 40.20 (Start date: 2012-01-25 End date: 2012-06-26) | 2012-01-25 | 2013-03-28 |
| ISO/TS 26683-1:2012 | Intelligent transport systems -- Freight land conveyance content identification and communication (FLC-CIC) -- Part 1: Context, architecture and referenced standards | 2010-10-21 | 60.60 | 2012-05-09 | |
| ISO/TS 26683-2:2012 | Intelligent transport systems -- Freight land conveyance content identification and communication (FLC-CIC) -- Part 2: Application interface profiles | 2010-10-21 | 60.60 | 2012-04-23 | |
| ISO/DIS 26683-2 | Intelligent transport systems -- Freight land conveyance content identification and communication (FLC-CIC) -- Part 2: Application interface profiles | 2010-10-21 | 40.20 (Start date: 2012-01-25 End date: 2012-06-26) | 2012-01-25 | 2013-04-21 |
| ISO/NP 26683-3 | Intelligent transport systems -- Freight and conveyance content identification and communication architecture -- Part 3: Handling of cargo stress information during road transport | | 10.00 | 2010-10-21 | |
| ISO/NP TS 26683-3 | Intelligent transport systems -- Freight and conveyance content identification and communication architecture -- Part 3: Handling of cargo stress information during road transport | | 10.00 | 2010-10-21 | |
| ISO/NP TS 26683-4 | Intelligent transport systems -- Freight and conveyance content identification and communication architecture -- Part 4: Security profile | | 10.60 | 2011-01-27 | |
| ISO/NP 26683-4 | Intelligent transport systems -- Freight and conveyance content identification and communication architecture -- Part 4: Security profile | | 10.60 | 2011-01-27 | |

### 9.1.7    WG8: Public Transport and Emergency services

WG8 has not been very active, and has a split scope since it covers both public transport and emergency services. It seems that WG8 is moving closer to the more active CEN TC278/WG3
as far as public transport is concerned. There is some exchange of documents and experts in the domain for ticketing system standards between the groups.

Very little is known of WG8 since the convenor does not report much to the TC.

Reaching good cooperation between different transports systems is an important area for effective transport of people and goods, in addition to effective emergency handling.

| Reference | Document title | Reg. date | Crnt stage | Stage date | Limit date |
|---|---|---|---|---|---|
| ISO 22951:2009 | Data dictionary and message sets for preemption and prioritization signal systems for emergency and public transport vehicles (PRESTO) | 2007-03-20 | 60.60 | 2009-01-12 | 2014-01-15 |
| ISO 24014-1:2007 | Public transport -- Interoperable fare management system -- Part 1: Architecture | 2005-04-21 | 90.93 | 2010-09-22 | |
| ISO/NP 24014-1 | Intelligent transport systems -- Interoperable fare management system -- Part 1: Architecture | 2012-02-10 | 10.99 | 2012-02-10 | 2013-08-10 |
| ISO/PWI TR 24014-2 | Intelligent transport systems -- Interoperable fare management system -- Part 2: Supplementary concepts to Part 1 for business practices | | 00.00 | 2007-04-30 | |
| ISO/DTR 14806 | Intelligent transport systems -- Public transport requirements for the use of payment applications for fare media | 2011-11-16 | 30.99 | 2012-01-20 | 2014-05-16 |
| ISO/NP 17185-1 | Public transport user information -- Part 1: Framework | | 10.00 | 2010-12-01 | |
| ISO/NP 17185-2 | Intelligent transport systems -- Part 2: Public transport data and interface standards catalogue and cross reference | | 10.00 | 2012-02-10 | |
| ISO/NP 17185-3 | Intelligent transport systems -- Part 3: Public transport user information use cases for the worldwide traveller | | 10.00 | 2012-02-10 | |
| ISO/NP 17185-4 | Intelligent transport systems -- Part 4: Mobile architecture designs promoting competition and integration across varying mobile platforms | | 10.00 | 2012-02-10 | |
| ISO/NP 17185-5 | Intelligent transport systems -- Part 5: Governance of mandatory public transport standards | | 10.00 | 2012-02-10 | |
| ISO/NP 17185-6 | Intelligent transport systems -- Part 6: Modelling stops and network topology | | 10.00 | 2012-02-10 | |
| ISO/NP 17185-7 | Intelligent transport systems -- Part 7: Conformance test of interoperable fare management system (ISO 24014-1) | | 10.00 | 2012-02-10 | |
| ISO/NP 17185-8 | Intelligent transport systems -- Part 8: Framework message architecture | | 10.00 | 2012-02-10 | |

### 9.1.8    WG9: Integrated Transport Information, Management and Control

This is a very active working group centred round the needs from Road Authorities for information interoperability and sharing. The WG is led by Dean Zabrieszach from Victoria Road Administration in Australia, and the WG consist of a mix of suppliers and authorities. Also refer to CENTC278/WG8.

WG9 spans a relatively wide area of ITS data centres including Centre-to-Centre and Centre-to-Roadside communications. The scope includes relevant interface protocols, data definitions/data dictionary, simulation models and quality of data. Since this is the "road authority" group in TC204, the WG has been assigned tasks related to policy questions and evolution of ITS. WG9 is trying to standardise roadside controller interfaces as well as central to central interfaces, but there seems to be some resistance from the supplier side to this undertaking.

WG9 is also in relatively close contact with CEN TC278/WG8 led by the Dutch road administration, but these WGs are not joint. WG9 is the home of DATEX-ASN in ISO. Also NTCIP which is the US protocol is hosted here.

*It is recommended to follow WG9 closely to be able to early see developments that can influence Road Authorities Datex II work and real time transport information sharing internationally.*

| Reference | Document title | Reg. date | Crnt stage | Stage date | Limit date |
|-----------|----------------|-----------|------------|------------|------------|
| ISO 10711:2012 | Intelligent Transport Systems -- Interface Protocol and Message Set Definition between Traffic Signal Controllers and Detectors | 2007-10-29 | 60.60 | 2012-01-12 | |
| ISO 14827-1:2005 | Transport information and control systems -- Data interfaces between centres for transport information and control systems -- Part 1: Message definition requirements | 2004-10-12 | 90.93 | 2009-05-11 | 2014-04-15 |
| ISO 14827-2:2005 | Transport information and control systems -- Data interfaces between centres for transport information and control systems -- Part 2: DATEX-ASN | 2004-10-12 | 90.93 | 2009-05-11 | 2014-04-15 |
| ISO/NP 14827-3 | Intelligent transport Systems -- Data interfaces between centres for Intelligent transport systems -- Part 3: Data interfaces between centres for Intelligent Transport Systems (ITS) using XML | 2012-04-03 | 10.99 | 2012-04-03 | 2013-10-03 |
| ISO 15784-1:2008 | Intelligent transport systems (ITS) -- Data exchange involving roadside modules communication -- Part 1: General principles and documentation framework of application profiles | 2006-07-06 | 90.60 | 2012-03-17 | |
| ISO/CD 15784-2 | Data Exchange Involving Roadside Modules Communication -- Part 2: Application Profile - SNMP | 2009-12-18 | 30.00 | 2011-04-26 | 2012-12-18 |
| ISO 15784-3:2008 | Intelligent transport systems (ITS) -- Data exchange involving roadside modules communication -- Part 3: Application profile-data exchange (AP-DATEX) | 2006-06-15 | 90.60 | 2012-03-17 | |
| ISO/NP 16786 | Intelligent transport systems -- The use of simulation models for evaluation of traffic management systems: input parameters and reporting template for simulation of traffic signal control systems | 2011-08-08 | 10.99 | 2011-08-08 | 2013-02-08 |
| ISO/TR 21707:2008 | Intelligent transport systems -- Integrated transport information, management and control -- Data quality in ITS systems | 2005-12-15 | 60.60 | 2008-05-19 | |

### 9.1.9   WG10: Traveller Information Systems

This WG is parallel to CEN TC278/WG4. Please refer also to CENTC278/WG4 for additional details. WG 10 has now taken over the main contact to TISA in the development of TPEG standards, and the standards responsibility has been moved from CEN/WG4 to here.

| Reference | Document title | Reg. date | Crnt stage | Stage date | Limit date |
|---|---|---|---|---|---|
| ISO 14819-1:2003 | Traffic and Traveller Information (TTI) -- TTI messages via traffic message coding -- Part 1: Coding protocol for Radio Data System -- Traffic Message Channel (RDS-TMC) using ALERT-C | 2002-02-06 | 90.92 | 2011-01-27 | |
| ISO/DIS 14819-1 | Intelligent transport systems -- Traffic and travel information messages via traffic message coding -- Part 1: Coding protocol for Radio Data System -- Traffic Message Channel (RDS-TMC) using ALERT-C | 2011-02-07 | 40.60 | 2011-12-16 | 2013-08-07 |
| ISO 14819-2:2003 | Traffic and Traveller Information (TTI) -- TTI messages via traffic message coding -- Part 2: Event and information codes for Radio Data System -- Traffic Message Channel (RDS-TMC) | 1997-08-14 | 90.92 | 2011-01-27 | |
| ISO/DIS 14819-2 | Intelligent transport systems -- Traffic and travel information messages via traffic message coding -- Part 2: Event and information codes for Radio Data System -- Traffic Message Channel (RDS-TMC) using ALERT-C | 2011-02-07 | 40.60 | 2011-12-16 | 2013-08-07 |
| ISO 14819-3:2004 | Traffic and Travel Information (TTI) -- TTI messages via traffic message coding -- Part 3: Location referencing for ALERT-C | 2001-06-22 | 90.92 | 2011-01-27 | |
| ISO/TS 14819-3:2000 | Traffic and Travel Information (TTI) -- TTI messages via traffic message coding -- Part 3: Location referencing for ALERT-C | 1998-10-02 | 95.99 | 2005-08-22 | |
| ISO/DIS 14819-3 | Intelligent transport systems -- Traffic and travel information messages via traffic message coding -- Part 3: Location referencing for Radio Data System -- Traffic message Channel (RDS-TMC) using ALERT-C | 2011-02-07 | 40.60 | 2011-12-16 | 2013-08-07 |
| ISO 14819-6:2006 | Traffic and Traveller Information (TTI) -- TTI messages via traffic message coding -- Part 6: Encryption and conditional access for the Radio Data System -- Traffic Message Channel ALERT C coding | 2004-05-07 | 90.93 | 2009-11-23 | 2014-10-15 |
| ISO/TS 14822-1:2006 | Traffic and Travel Information -- General specifications for medium-range pre-information via dedicated short-range communication -- Part 1: Downlink | 2004-04-15 | 95.99 | 2009-10-20 | |
| ISO/TS 18234-1:2006 | Traffic and Travel Information (TTI) -- TTI via Transport Protocol Expert Group (TPEG) data-streams -- Part 1: Introduction, numbering and versions | 2006-02-02 | 90.92 | 2010-10-04 | |
| ISO/DTS 18234-1 | Intelligent transport systems -- Traffic and travel information via transport protocol experts group, generation 1 (TPEG1) binary data format -- Part 1: Introduction, numbering and versions (TPEG1-INV) | 2010-10-04 | 30.60 | 2011-05-06 | |
| ISO/TS 18234-2:2006 | Traffic and Travel Information (TTI) -- TTI via Transport Protocol Expert Group (TPEG) data-streams -- Part 2: Syntax, Semantics and Framing Structure (SSF) | 2006-02-02 | 90.93 | 2009-10-31 | |
| ISO/NP TS 18234-2 | Traffic and Travel Information (TTI) -- TTI via Transport Protocol Expert Group (TPEG) data-streams -- Part 2: Syntax, Semantics and Framing Structure (SSF) | 2012-02-20 | 10.99 | 2012-02-20 | |
| ISO/TS 18234-3:2006 | Traffic and Travel Information (TTI) -- TTI via Transport Protocol Expert Group (TPEG) data-streams -- Part 3: Service and Network Information (SNI) application | 2006-02-02 | 90.93 | 2010-01-06 | |
| ISO/PRF TS 18234-3 | Intelligent transport systems -- Traffic and travel information via transport protocol experts group, generation 1 (TPEG1) binary data format -- Part 3: Service and network information (TPEG1-SNI) | 2011-02-01 | 50.00 | 2012-04-17 | |
| ISO/TS 18234-4:2006 | Traffic and Travel Information (TTI) -- TTI via Transport Protocol Expert Group (TPEG) data-streams -- Part 4: Road Traffic Message (RTM) application | 2006-02-02 | 90.93 | 2009-10-31 | |
| ISO/TS 18234-5:2006 | Traffic and Travel Information (TTI) -- TTI via Transport Protocol Expert Group (TPEG) data-streams -- Part 5: Public Transport Information (PTI) application | 2002-05-19 | 90.93 | 2009-10-30 | |
| ISO/TS 18234-6:2006 | Traffic and Travel Information (TTI) - TTI via Transport Protocol Expert Group (TPEG) data-streams -- Part 6: Location referencing applications | 2003-01-09 | 90.93 | 2009-10-31 | |
| ISO/DTS 18234-7 | Intelligent transport systems -- Traffic and Travel Information via transport protocol experts group, generation 1 (TPEG1) binary data format -- Part 7: Parking Information (TPEG-PKI) | 2011-02-02 | 30.60 | 2011-05-06 | |
| ISO/PRF TS 18234-8 | Intelligent transport systems -- Traffic and travel information via transport protocol experts group, generation 1 (TPEG1) binary data format -- Part 8: Congestion and travel-time application (TPEG1-CTT) | 2007-03-01 | 50.00 | 2012-05-14 | |
| ISO/DTS 18234-9 | Intelligent transport systems -- Traffic and Travel Information via transport protocol experts group, generation 1 (TPEG1) binary data format -- Part 9: Traffic event compact (TPEG1-TEC) | 2011-02-02 | 30.60 | 2011-05-06 | |

| ISO/DTS 18234-10 | Intelligent transport systems -- Traffic and Travel Information via transport protocol experts group, generation 1 (TPEG1) binary data format -- Part 10: Conditional access information (TPEG1-CAI) | 2011-02-02 | 30.60 | 2011-05-06 | |
|---|---|---|---|---|---|
| ISO/PRF TS 18234-11 | Intelligent transport systems -- Traffic and Travel Information (TTI) via transport protocol experts group, generation 1 (TPEG1) binary data format -- Part 11: Location Referencing Container (TPEG1-LRC) | 2011-04-28 | 50.00 | 2012-05-14 | |
| ISO/DTS 21219-2 | Intelligent transport systems - Traffic and travel information via transport protocol expert group, generation 2(TPEG2) -- Part 2: UML modelling rules | 2010-10-04 | 30.60 | 2011-07-06 | |
| ISO/DTS 21219-3 | Intelligent transport systems - Traffic and travel information via transport protocol expert group, generation 2(TPEG2) -- Part 3: UML to binary conversion rules | 2010-10-04 | 30.20 (Start date: 2012-04-10 End date: 2011-05-04) | 2012-04-10 | |
| ISO/DTS 21219-4 | Intelligent transport systems -- Traffic and Travel Information via Transport Protocol Expert Group, Generation 2 (TPEG2) -- Part 4: UML to XML conversion rules | 2011-04-28 | 30.20 (Start date: 2012-04-10) | 2012-04-10 | |
| ISO/DTS 21219-5 | Intelligent transport systems - Traffic and travel information via transport protocol expert group, generation 2(TPEG2) -- Part 5: Service framework (TPEG2-SWF) | 2010-10-04 | 30.20 (Start date: 2012-04-10 End date: 2011-05-04) | 2012-04-10 | |
| ISO/DTS 21219-6 | Intelligent transport systems - Traffic and travel information via transport protocol expert group, generation 2(TPEG2) -- Part 6: Message management container (TPEG2-MMC) | 2010-10-04 | 30.20 (Start date: 2012-04-10 End date: 2011-05-04) | 2012-04-10 | |
| ISO/NP TS 21219-16 | Intelligent transport systems -- Traffic and Travel Information via Transport Protocol Expert Group, Generation 2 (TPEG2) -- Part 16: Fuel Price | 2011-04-28 | 10.99 | 2011-04-28 | |
| ISO/DTS 21219-18 | Intelligent transport systems - Traffic and Travel Information (TTI) via Transport Protocol Expert Group, Generation 2(TPEG2) -- Part 18: Traffic Flow and Prediction application (TPEG2-TFP) | 2010-10-04 | 30.20 (Start date: 2012-04-10 End date: 2012-06-10) | 2012-04-10 | |
| ISO/TS 24530-1:2006 | Traffic and Travel Information (TTI) -- TTI via Transport Protocol Experts Group (TPEG) Extensible Markup Language (XML) -- Part 1: Introduction, common data types and tpegML | 2004-06-01 | 90.93 | 2009-10-31 | |
| ISO/TS 24530-2:2006 | Traffic and Travel Information (TTI) -- TTI via Transport Protocol Experts Group (TPEG) Extensible Markup Language (XML) -- Part 2: tpeg-locML | 2004-06-01 | 90.93 | 2009-10-31 | |
| ISO/TS 24530-3:2006 | Traffic and Travel Information (TTI) -- TTI via Transport Protocol Experts Group (TPEG) Extensible Markup Language (XML) -- Part 3: tpeg-rtmML | 2004-06-01 | 90.93 | 2009-10-31 | |
| ISO/TS 24530-4:2006 | Traffic and Travel Information (TTI) -- TTI via Transport Protocol Experts Group (TPEG) Extensible Markup Language (XML) -- Part 4: tpeg-ptiML | 2004-06-01 | 90.93 | 2009-10-31 | |

### 9.1.10  WG14: Vehicle Control Systems

This WG is standardizing performance requirements and test procedures for many of the new ITS features in cars, such as automatic parking, intelligent cruise control, backing-up aid, lane departure warning, collision warning and so on. Both vehicle manufacturers and authorities are well represented. This is one of the more active and productive WGs; not in the number of produced standards, but in the consistent deployment of these standards into vehicles on the road today.

New work is under way, and the long term trend is moving towards a more and more automated driver support systems based on advanced sensors enhanced by cooperative awareness of the surroundings.

ISO TC 204 WG14 and ETSI TC ITS WG1 is harmonizing the drafting of CIWS (ISO: Cooperative Intersection signal information and violation Warning Systems) & ICRW (ETSI: Intersection Collision Risk Warning) and will develop compatible standards which enables the development of interoperable systems with the aim of achieving globally accepted standards.

WG14 is potentially interesting for the upcoming Automation Working Group of iMobility Forum.

| Reference | Document title | Reg. date | Crnt stage | Stage date | Limit date |
|---|---|---|---|---|---|
| ISO/NP 11067 | Intelligent transport systems -- Curve speed warning systems (CSWS) -- Performance requirements and test procedures | 2012-03-29 | 10.99 | 2012-03-29 | 2014-03-29 |
| ISO 15622:2002 | Transport information and control systems -- Adaptive Cruise Control Systems -- Performance requirements and test procedures | 1996-10-01 | 95.99 | 2010-04-08 | |
| ISO 15622:2010 | Intelligent transport systems -- Adaptive Cruise Control systems -- Performance requirements and test procedures | 2007-07-19 | 60.60 | 2010-04-08 | |
| ISO 15623:2002 | Transport information and control systems -- Forward vehicle collision warning systems -- Performance requirements and test procedures | 1996-10-01 | 90.92 | 2010-05-05 | |
| ISO/DIS 15623 | Intelligent Transport Systems -- Forward vehicle collision warning systems -- Performance requirements and test procedures | 2010-05-05 | 40.20 (Start date: 2012-02-23 End date: 2012-07-24) | 2012-02-23 | 2012-11-05 (Cancellation date: 2013-05-05) |
| ISO/TS 15624:2001 | Transport information and control systems -- Traffic Impediment Warning Systems (TIWS) -- System requirements | 1996-10-01 | 60.60 | 2001-01-18 | |
| ISO/NP 16787 | Intelligent Transport Systems - Assisted Parking System (APS) - Parking with reference to other parked vehicles - Performance and Test Procedures | | 10.20 (Start date: 2011-01-26 End date: 2011-03-26) | 2011-01-26 | |
| ISO 17361:2007 | Intelligent transport systems -- Lane departure warning systems -- Performance requirements and test procedures | 2004-03-17 | 90.93 | 2010-07-21 | |
| ISO 17386:2004 | Transport information and control systems -- Manoeuvring Aids for Low Speed Operation (MALSO) -- Performance requirements and test procedures | 1999-04-28 | 95.99 | 2010-03-10 | |
| ISO 17386:2010 | Transport information and control systems -- Manoeuvring Aids for Low Speed Operation (MALSO) -- Performance requirements and test procedures | 2008-06-10 | 60.60 | 2010-03-10 | |
| ISO 17387:2008 | Intelligent transport systems -- Lane change decision aid systems (LCDAS) -- Performance requirements and test procedures | 2005-04-22 | 90.60 | 2011-09-17 | |
| ISO/DIS 22839 | Intelligent Transport System - Forward Vehicle Collision Mitigation Systems - Operation, Performance, and Verification Requirements | 2010-04-15 | 40.00 | 2012-05-23 | |
| ISO 22840:2010 | Intelligent transport systems -- Devices to aid reverse manoeuvres -- Extended-range backing aid systems (ERBA) | 2006-04-15 | 60.60 | 2010-03-30 | |
| ISO/CD 26684 | Intelligent transport systems -- Cooperative intersection signal information and violation warning systems (CIWS) | 2009-10-09 | 30.99 | 2011-08-08 | 2012-10-09 (Cancellation date: 2013-04-09) |
| ISO/CD 11270 | Intelligent transport systems -- Lane keeping assist systems (LKAS) | 2010-02-04 | 30.99 | 2011-08-08 | 2013-02-04 |
| ISO 22178:2009 | Intelligent transport systems -- Low speed following (LSF) systems -- Performance requirements and test procedures | 2006-03-15 | 60.60 | 2009-03-23 | 2014-01-15 |
| ISO 22179:2009 | Intelligent transport systems -- Full speed range adaptive cruise control (FSRA) systems -- Performance requirements and test procedures | 2006-03-06 | 60.60 | 2009-08-31 | 2014-07-15 |

### 9.1.11  WG16: Wide Area Communications

This is one of the most productive ISO WGs.

The main output is the CALM standard series (Communications Access for Land Mobiles) of communications standards. This WG is also handling vehicle probe data systems (called floating car data in Europe) and security issues, and has taken over maintenance of DSRC in ISO. A cooperation agreement with ETSI means that conformance test standards for CALM are developed by ETSI TC ITS WG2. CALM has been tested and validated in several European projects such as CVIS (Cooperative Vehicle-Infrastructure System) and SAFESPOT (European Integrated Project on cooperative vehicular systems for road safety), and is now used as athe baseline in several new projects.

The convenor is delegated by the US TAG, Mr. Steve Sprouffske from Kapsch.

| Reference | Document title | Reg. date | Crnt stage | Stage date | Limit date |
|---|---|---|---|---|---|
| ISO 13183:2012 | Intelligent transport systems -- Communications access for land mobiles (CALM) -- Using broadcast communications | 2010-04-06 | 60.60 | 2012-04-26 | |
| ISO 15628:2007 | Road transport and traffic telematics -- Dedicated short range communication (DSRC) -- DSRC application layer | 2006-05-17 | 90.93 | 2010-07-15 | |
| ISO/NP 15628 | Intelligent transport systems -- Dedicated short range communication (DSRC) -- DSRC application layer | 2011-02-03 | 10.99 | 2011-02-03 | 2012-08-03 (Cancellation date: 2013-02-03) |
| ISO 15662:2006 | Intelligent transport systems -- Wide area communication -- Protocol management information | 2006-04-26 | 90.93 | 2009-05-15 | 2014-04-15 |
| ISO/NP 15662 | Intelligent transport systems -- Wide area communication -- Protocol management information | 2012-02-13 | 10.99 | 2012-02-13 | 2013-08-13 |
| ISO/PWI 16788 | Intelligent Transport Systems -- Communications access for land mobiles (CALM) -- IPv6 Networking Security | | 00.00 | 2010-11-17 | |
| ISO/PWI 16789 | Intelligent Transport Systems -- Communications access for land mobiles (CALM) -- IPv6 Networking Optimisation | | 00.00 | 2010-11-17 | |
| ISO/PWI 17515 | Intelligent transport systems -- Communications access for land mobiles (CALM) -- LTE cellular systems | | 00.00 | 2011-06-14 | |
| ISO/PWI 18317 | Intelligent transport systems -- Pre-emption of ITS communication networks for disaster relief and emergency communications | | 00.00 | 2012-05-11 | |
| ISO 21210 | Intelligent transport systems -- Communications access for land mobiles (CALM) -- IPv6 Networking | 2007-04-27 | 60.00 | 2012-06-01 | 2011-06-27 |
| ISO 21212:2008 | Intelligent transport systems -- Communications access for land mobiles (CALM) -- 2G Cellular systems | 2006-11-03 | 90.60 | 2012-03-17 | |
| ISO 21213:2008 | Intelligent transport systems -- Communications access for land mobiles (CALM) -- 3G Cellular systems | 2006-11-03 | 90.60 | 2012-03-17 | |
| ISO 21214:2006 | Intelligent transport systems -- Communications access for land mobiles (CALM) -- Infra-red systems | 2003-12-15 | 90.92 | 2008-04-11 | |
| ISO/DIS 21214 | Intelligent transport systems -- Communications access for land mobiles (CALM) -- Infra-red systems | 2010-07-13 | 40.99 | 2011-08-30 | 2013-01-13 |
| ISO 21215:2010 | Intelligent transport systems -- Communications access for land mobiles (CALM) -- M5 | 2008-02-04 | 60.60 | 2010-11-05 | |
| ISO 21218:2008 | Intelligent transport systems -- Communications access for land mobiles (CALM)-- Medium service access points | 2006-04-15 | 90.92 | 2012-02-13 | |
| ISO/DIS 21218 | Intelligent transport systems -- Communications access for land mobiles (CALM) -- Access technology support | 2012-02-13 | 40.00 | 2012-06-04 | |
| ISO 22837:2009 | Vehicle probe data for wide area communications | 2007-02-03 | 90.92 | 2011-04-26 | |
| ISO/NP 22837 | Vehicle probe data for wide area communications | | 10.00 | 2011-04-26 | |
| ISO 24101-1:2008 | Intelligent transport systems -- Communications access for land mobiles (CALM) -- Application management -- Part 1: General requirements | 2007-07-31 | 90.60 | 2011-06-17 | |
| ISO 24101-2:2010 | Intelligent transport systems -- Communications access for land mobiles (CALM) -- Application management -- Part 2: Conformance test | 2008-03-03 | 60.60 | 2010-08-30 | |
| ISO 24102:2010 | Intelligent transport systems -- Communications access for land mobiles (CALM) -- Management | 2006-11-13 | 90.92 | 2012-02-13 | |
| ISO/DIS 24102-1 | Intelligent transport systems -- Communications access for land mobiles (CALM) -- ITS station management -- Part 1: Local management | 2012-02-13 | 40.20 (Start date: 2012-06-01 End date: 2012-11-02) | 2012-06-01 | 2014-08-13 |
| ISO 24103:2009 | Intelligent transport systems -- Communications access for land mobiles (CALM) -- Media adapted interface layer (MAIL) | 2007-02-27 | 60.60 | 2009-05-26 | 2014-04-15 |
| ISO 24978:2009 | Intelligent transport systems -- ITS Safety and emergency messages using any available wireless media -- Data registry procedures | 2005-11-15 | 60.60 | 2009-09-29 | 2014-07-15 |
| ISO 25111:2009 | Intelligent transport systems -- Communications access for land mobiles (CALM) -- General requirements for using public networks | 2005-07-22 | 60.60 | 2009-10-30 | 2014-10-15 |

| | | | | | |
|---|---|---|---|---|---|
| ISO 25112:2010 | Intelligent transport systems -- Communications access for land mobiles (CALM) -- Mobile wireless broadband using IEEE 802.16 | 2006-09-04 | 60.60 | 2010-02-25 | |
| ISO 25113:2010 | Intelligent transport systems -- Communications access for land mobiles (CALM) -- Mobile wireless broadband using HC-SDMA | 2006-09-04 | 60.60 | 2010-02-25 | |
| ISO/TS 25114:2010 | Intelligent transport systems -- Probe data reporting management (PDRM) | 2006-11-13 | 90.92 | 2011-04-26 | |
| ISO/NP TS 25114 | Intelligent transport systems -- Probe data reporting management (PDRM) | | 10.00 | 2011-04-26 | |
| ISO/DTS 29284 | Intelligent transport systems -- Event-based probe vehicle data | 2008-09-12 | 30.99 | 2010-07-19 | |
| ISO/TR 11766:2010 | Intelligent transport systems -- Communications access for land mobiles (CALM) -- Security considerations for lawful interception | 2008-02-10 | 60.60 | 2010-03-29 | |
| ISO/TR 11769:2010 | Intelligent transport systems -- Communications access for land mobiles (CALM) -- Data retention for law enforcement | 2008-02-10 | 60.60 | 2010-09-21 | |
| ISO/PWI 13181-1 | Intelligent Transport Systems - Communications Access for Land Mobiles (CALM) - Security -- Part 1: Framework | | 00.00 | 2008-11-14 | |
| ISO/PWI 13181-2 | Intelligent Transport Systems - Communications Access for Land Mobiles (CALM) - Security -- Part 2: Threat, vulnerability and risk anlaysis | | 00.00 | 2008-11-14 | |
| ISO/PWI 13181-3 | Intelligent Transport Systems - Communications Access for Land Mobiles (CALM) - Security -- Part 3: Objectives and Requirements | | 00.00 | 2008-11-14 | |
| ISO/PWI 13181-4 | Intelligent Transport Systems - Communications Access for Land Mobiles (CALM) - Security -- Part 4: Countermeasures | | 00.00 | 2008-11-14 | |
| ISO/PWI 16444 | Intelligent Transport Systems -- Communications access for land mobiles (CALM) -- Geo-routing | | 00.20 (Start date: 2010-05-27) | 2010-05-27 | |
| ISO/PWI 16445 | Intelligent Transport Systems -- Communications access for land mobiles (CALM) -- Handover mechanisms | | 00.20 (Start date: 2010-05-27) | 2010-05-27 | |
| ISO/PWI 16460 | Intelligent Transport Systems -- Communications access for land mobiles (CALM) -- WAVE | | 00.20 (Start date: 2010-05-27) | 2010-05-27 | |
| ISO/PWI 16461 | Intelligent transport systems -- Criteria for privacy and integrity protection in probe vehicle information systems | | 00.20 (Start date: 2010-05-27) | 2010-05-27 | |
| ISO 21216:2011 | Intelligent transport systems -- Wireless communications -- CALM using millimetre communications -- Air interface | 2010-07-22 | 95.99 | 2012-03-12 | |
| ISO 21216:2012 | Intelligent transport systems -- Communication access for land mobiles (CALM) -- Millimetre wave air interface | 2011-04-26 | 60.60 | 2012-03-12 | |
| ISO 21217:2010 | Intelligent transport systems -- Communications access for land mobiles (CALM) -- Architecture | 2007-09-14 | 90.92 | 2012-02-13 | |
| ISO/NP 21217 | Intelligent transport systems -- Communications access for land mobiles (CALM) -- Architecture | 2012-02-13 | 10.99 | 2012-02-13 | 2013-08-13 |
| ISO 24100:2010 | Intelligent transport systems -- Basic principles for personal data protection in probe vehicle information services | 2006-09-04 | 90.92 | 2011-04-26 | |
| ISO/NP 24100 | Intelligent transport systems -- Basic principles for personal data protection in probe vehicle information services | | 10.00 | 2011-04-26 | |
| ISO/NP 24102-2 | Intelligent transport systems -- Communications access for land mobiles (CALM) -- ITS station management -- Part 2: Remote management | 2012-02-13 | 10.99 | 2012-02-13 | 2013-08-13 |
| ISO/DIS 24102-3 | Intelligent transport systems -- Communications access for land mobiles (CALM) -- ITS station management -- Part 3: Service access points | 2012-02-13 | 40.20 (Start date: 2012-06-01 End date: 2012-11-02) | 2012-06-01 | 2014-08-13 |
| ISO/DIS 24102-4 | Intelligent transport systems -- Communications access for land mobiles (CALM) -- ITS station management -- Part 4: Station-internal management communications | 2012-02-13 | 40.20 (Start date: 2012-06-01 End date: 2012-11-02) | 2012-06-01 | 2014-08-13 |
| ISO/DIS 24102-5 | Intelligent transport systems -- Communications access for land mobiles (CALM) -- ITS station management -- Part 5: Fast service advertisement protocol (FSAP) | 2012-02-13 | 40.20 (Start date: 2012-06-01 End date: 2012-11-02) | 2012-06-01 | 2014-08-13 |
| ISO 29281:2011 | Intelligent transport systems -- Communications access for land mobiles (CALM) -- Non-IP networking | 2007-11-22 | 90.92 | 2012-02-13 | |
| ISO/NP 29281-1 | Intelligent transport systems -- Communications access for land mobiles (CALM) -- Non-IP networking -- Part 1: Fast networking & transport layer protocol (FNTP) | 2012-02-13 | 10.99 | 2012-02-13 | 2013-08-13 |
| ISO/NP 29281-2 | Intelligent transport systems -- Communications access for land mobiles (CALM) -- Non-IP networking -- Part 2: Legacy system support | 2012-02-13 | 10.99 | 2012-02-13 | 2013-08-13 |
| ISO 29282:2011 | Intelligent transport systems -- Communications access for land mobiles (CALM) -- Satellite networks | 2008-12-29 | 60.60 | 2011-07-07 | |
| ISO 29283:2011 | ITS CALM Mobile Wireless Broadband applications using Communications in accordance with IEEE 802.20 | 2008-09-02 | 60.60 | 2011-01-26 | |

### 9.1.12 WG17: Nomadic Devices

This is a relatively new group that started out looking at integration of smart phones in cars. No standards are completed yet, and part of the work has met some opposition from OEMs. Its convenor is Dr. Young-Jun MOON from the republic of Korea.

The work now includes the use of nomadic and mobile devices to support ITS service and multimedia provision in vehicles. The work relates to vehicle interfaces for data access including security, data definitions and protocols. In-door navigation is another new area that is being developed in WG17. Experts from Europe are following the work closely.

| Reference | Document title | Reg. date | Crnt stage | Stage date | Limit date |
|---|---|---|---|---|---|
| ISO/NP 13184-2 | Intelligent transport systems -- Guidance protocol via personal ITS station for advisory safety systems -- Part 2: Protocol requirements and specification | | 10.00 | 2012-02-13 | |
| ISO/NP 13185-2 | Intelligent transport systems  -- Vehicle interface for provisioning and support of ITS Services -- Part 2: Protocol requirements and specification for vehicle ITS station gateway (V-ITS-SG) interface | 2011-11-22 | 10.99 | 2011-11-22 | 2013-05-22 |
| ISO/NP 13185-3 | Intelligent transport systems  -- Vehicle interface for provisioning and support of ITS Services -- Part 3: Configuration process requirements and specification for vehicle ITS station gateway (V-ITS-SG) | | 10.00 | 2012-02-13 | |
| ISO/NP 17438-1 | Intelligent transport systems (ITS) -- Indoor navigation for personal and vehicle ITS stations -- Part 1: General information and use case definition | 2012-05-07 | 10.99 | 2012-05-07 | 2013-11-07 |
| ISO/TR 10992:2011 | Intelligent transport systems -- Use of nomadic and portable devices to support ITS service and multimedia provision in vehicles | 2007-10-08 | 60.60 | 2011-12-16 | |
| ISO/PWI 13111-1 | Intelligent transport systems -- The use of personal ITS station to support ITS service provision for travellers -- Part 1: General information and use cases definition | | 00.00 | 2012-02-13 | |
| ISO/DTR 13184-1 | Intelligent transport systems -- Guidance protocol via personal ITS station for advisory safety systems -- Part 1: General information and use case definitions | 2010-10-20 | 30.99 | 2012-05-03 | 2013-04-20 |
| ISO/TR 13185-1:2012 | Intelligent transport systems -- Vehicle interface for provisioning and support of ITS services -- Part 1: General information and use case definition | 2010-02-23 | 60.60 | 2012-05-11 | |

### 9.1.13  WG18: Cooperative Systems
This is a full parallel group to CEN WG16 please see that entry in the CEN section.
WG18 has similar roles in ISO as in CEN: Firstly to develop new standards in the field of Cooperative Systems, and secondly to help coordinate and foster new Cooperative Systems thinking in the existing WGs.

| Reference | Document title | Reg. date | Crnt stage | Stage date | Limit date |
|---|---|---|---|---|---|
| ISO/NP TS 17274 | Intelligent transport systems -- Co-operative systems -- Classification and management of ITS applications in a global context | | 10.00 | 2011-03-10 | |
| ISO/NP 17275 | Intelligent transport systems -- Co-operative systems -- ITS application requirements for selection of communication profiles | | 10.20 (Start date: 2011-08-11 End date: 2011-10-11) | 2011-08-11 | |
| ISO/NP 17419 | Intelligent transport systems -- Co-operative systems -- Classification and management of ITS applications in a global context | | 10.60 | 2011-10-13 | |
| ISO/NP 17423 | Intelligent transport systems -- Co-operative systems -- ITS application requirements for automatic selection of communication interfaces | | 10.60 | 2011-10-13 | |
| ISO/NP 17424 | Intelligent transport systems -- Cooperative systems -- State of the art of Local Dynamic Maps concepts | | 10.00 | 2011-04-29 | |
| ISO/NP 17425 | Intelligent transport systems -- Co-operative systems -- Data exchange specification for in-vehicle presentation of external road and traffic related data | | 10.20 (Start date: 2012-05-25) | 2012-05-25 | |
| ISO/NP 17426 | Intelligent transport systems -- Co-operative systems -- Contextual speeds | | 10.20 (Start date: 2012-05-25) | 2012-05-25 | |
| ISO/NP 17427 | Intelligent transport systems -- Co-operative systems -- Roles and responsibilities in the context of co-operative ITS based on architecture(s) for co-operative systems | | 10.20 (Start date: 2012-05-25 End date: 2012-07-25) | 2012-05-25 | |
| ISO/NP 17428 | Intelligent transport systems -- Co-operative systems -- Data exchange specification for in-vehicle presentation of external road and traffic related data ("Embedded VMS") [Resolution CEN/TC 278/045/010/2010] | | 10.00 | 2011-04-29 | |
| ISO/NP 17429 | "Intelligent transport systems -- Co-operative systems -- Profiles for processing and transfer of information between ITS stations for applications related to transport infrastructure management, control and guidance." | | 10.60 | 2011-11-22 | |
| ISO/NP 17434 | Intelligent transport systems -- Co-operative systems -- Contextual speeds -- Optimum traffic throughput via speed limits [Resolution CEN/TC 278/045/012/2010] | | 10.00 | 2011-04-29 | |
| ISO/NP 17436 | Intelligent transport systems -- Co-operative systems -- Data exchange specification for in-vehicle presentation of external road and traffic related data | | 10.00 | 2011-04-29 | |

Stage codes for ISO standard development, refrence for tables above.

| STAGE | SUBSTAGE | | | 90 Decision Substages | | | |
|---|---|---|---|---|---|---|---|
| | 00 Registration | 20 Start of main action | 60 Completion of main action | 92 Repeat an earlier phase | 93 Repeat current phase | 98 Abandon | 99 Proceed |
| 00 Preliminary stage | 00.00 Proposal for new project received | 00.20 Proposal for new project under review | 00.60 Close of review | | | 00.98 Proposal for new project abandoned | 00.99 Approval to ballot proposal for new project |
| 10 Proposal stage | 10.00 Proposal for new project registered | 10.20 New project ballot initiated | 10.60 Close of voting | 10.92 Proposal returned to submitter for further definition | | 10.98 New project rejected | 10.99 New project approved |
| 20 Preparatory stage | 20.00 New project registered in TC/SC work programme | 20.20 Working draft (WD) study initiated | 20.60 Close of comment period | | | 20.98 Project deleted | 20.99 WD approved for registration as CD |
| 30 Committee stage | 30.00 Committee draft (CD) registered | 30.20 CD study/ballot initiated | 30.60 Close of voting/ comment period | 30.92 CD referred back to Working Group | | 30.98 Project deleted | 30.99 CD approved for registration as DIS |
| 40 Enquiry stage | 40.00 DIS registered | 40.20 DIS ballot initiated: 5 months | 40.60 Close of voting | 40.92 Full report circulated: DIS referred back to TC or SC | 40.93 Full report circulated: decision for new DIS ballot | 40.98 Project deleted | 40.99 Full report circulated: DIS approved for registration as FDIS |
| 50 Approval stage | 50.00 FDIS registered for formal approval | 50.20 FDIS ballot initiated: 2 months. Proof sent to secretariat | 50.60 Close of voting. Proof returned by secretariat | 50.92 FDIS referred back to TC or SC | | 50.98 Project deleted | 50.99 FDIS approved for publication |
| 60 Publication stage | 60.00 International Standard under publication | | 60.60 International Standard published | | | | |
| 90 Review stage | | 90.20 International Standard under periodical review | 90.60 Close of review | 90.92 International Standard to be revised | 90.93 International Standard confirmed | | 90.99 Withdrawal of International Standard proposed by TC or SC |
| 95 Withdrawal stage | | 95.20 Withdrawal ballot initiated | 95.60 Close of voting | 95.92 Decision not to withdraw International Standard | | | 95.99 Withdrawal of International Standard |

**Figure 7 ISO stage codes**

## 10   IEEE (Institute of Electrical and Electronic Engineers)

IEEE is a mainly USA based organisation, but it has several work relevant for global ITS standardisation. Two groups in IEEE needs to be mentioned is particular:

**IEEE 802.11p** has defined the basic medium-range V2V/V2I (vehicle-to-vehicle and vehicle-to-roadside) communication link dedicated to ITS. This operates on 5.9 GHz and is currently accepted in all of Europe, Northern America, Australia and New Zeeland, some central and South American countries, and some countries in Asia and Africa are considering the use at the moment. 802.11p will be "rolled up" in the main 802.11 wireless standard and become an operational mode of normal 802.11. The 802.11p Task Group has completed their work and the approved 802.11p amendment was published July 15, 2010. This standard is available for free download, but please be warned that it consist of several thousand pages and the ITS/802.11p part is well hidden!

One challenge is the use of DSRC (Dedicated Short-Range Communication) as an acronym for the 5.9GHz technology. Traditionally this acronym has been used for the CEN TC278/WG9 technology, and the use of the same acronym for very different technologies has given raise to significant confusion already.

**Please be aware that DSRC in the US context, is different from the traditional European DSRC used in tolling systems (ISO WG5).**

**IEEE P1609** adds the higher layers including some applications. P1609 has approved four preliminary test standards (P1609.1 – 1609.4), and is in the process of updating and adding two more related to architecture (P1609.0) and EFC application for 5.9GHz (P1609.11). P1609 is the preferred standardisation body for 5.9GHz operation in the US. Standards can also be accessed or bought from this site.

Please note that the dates in the tables below can seem a bit old compared to CEN/ETSI/ISO ITS standards. This is not so. IEEE and SAE have been providing national reference standards for many years, and these standards are used in operational systems for decades. They are still relevant and being maintained, and are often used as a source of inspiration for the newer ITS standards. Many of the standards in the following list are of that nature.

| IEEE 1455-1999 - Standard for Message Sets for Vehicle/Roadside Communications |
| --- |
| **Description:**<br>Standard messages for commercial vehicle, electronic toll, and traffic management applications.<br><br>**SDO(s):** IEEE<br><br>**Version 1 Development Level:** Published<br><br>**Version 1 Publication Date:** Aug 1999<br><br>**Development Level Update:** No update<br><br>**Mapping to National ITS Architecture: IEEE 1455-1999**<br><br>**For more information on how to obtain standard:**<br><br>• http://shop.ieee.org/ieeestore/ Phone: 800-701-IEEE (4333)   HTML |
| **IEEE 1512 -2006 - Standard for Common Incident Management Message Sets for use by Emergency Management Centers** |

**Description:**
Standards describing the form and content of the incident management messages sets for emergency management systems (EMS) to traffic management systems (TMS) and from emergency management systems to the emergency telephone system (ETS) or (E911).

**SDO(s):** IEEE

**Version 1 Development Level:** Published

**Version 1 Publication Date:** Jun 2000

**Development Level Update:** Version 2: Published (Aug 2006)

**Mapping to National ITS Architecture: Incident Management Standards Group**

**For more information on how to obtain standard:**

- http://shop.ieee.org/ieeestore/ Phone: 800-701-IEEE (4333)


HTML

## IEEE 1512.1-2006 - Standard for Traffic Incident Management Message Sets for Use by Emergency Management Centers

**Description:**
Enables consistent standardized communications among Incident Management centers, fleet and freight management centers, information service providers, emergency management centers, planning subsystems, traffic management centers and transit management centers.

**SDO(s):** IEEE

**Version 1 Development Level:** Published

**Version 1 Publication Date:** Mar 2003

**Development Level Update:** Version 2: Published (Nov 2006)

**Mapping to National ITS Architecture: Incident Management Standards Group**

**For more information on how to obtain standard:**

- http://shop.ieee.org/ieeestore/ Phone: 800-701-IEEE (4333)


HTML

## IEEE 1512.2-2004 - Standard for Public Safety Traffic Incident Management Message Sets for Use by Emergency Management Centers

**Description:**
A comprehensive set of messages required for incident management that is unique to public safety communications. These message sets will be generated and transmitted among the emergency management subsystem to all the other subsystems and public safety providers.

**SDO(s):** IEEE

**Version 1 Development Level:** Published

**Version 1 Publication Date:** Nov 2004

**Development Level Update:** No update

**Mapping to National ITS Architecture: Incident Management Standards Group**

**For more information on how to obtain standard:**


HTML

- http://shop.ieee.org/ieeestore/ Phone: 800-701-IEEE (4333)

## IEEE 1512.3-2006 - Standard for Hazardous Material Incident Management Message Sets for Use by Emergency Management Centers

**Description:**
Enables consistent standardized communications among incident management centers, HAZMAT teams, police, local government, fire, special emergency and emergency management centers.

**SDO(s):** IEEE

**Version 1 Development Level:**  Published

**Version 1 Publication Date:** Oct 2002

**Development Level Update:** Version 2: Published (Jul 2006)

**Mapping to National ITS Architecture: Incident Management Standards Group**

**For more information on how to obtain standard:**

- http://shop.ieee.org/ieeestore/ Phone: 800-701-IEEE (4333)

HTML

## IEEE 1570-2002 - Standard for the Interface Between the Rail Subsystem and the Highway Subsystem at a Highway Rail Intersection

**Description:**
This standard defines the logical and physical interfaces, and the performance attributes for the interface between the rail subsystem and the highway subsystem at a highway rail intersection.

**SDO(s):** IEEE

**Version 1 Development Level:**  Published

**Version 1 Publication Date:** Oct 2002

**Development Level Update:** No update

**Mapping to National ITS Architecture: IEEE 1570-2002**

**For more information on how to obtain standard:**

- http://shop.ieee.org/ieeestore/ Phone: 800-701-IEEE (4333)

HTML

## IEEE 1609.1-2006 - Standard for Wireless Access in Vehicular Environments (WAVE) - Resource Manager

**Description:**
This standard describes a resource manager that arbitrates requests for transponder usage.

**SDO(s):** IEEE

**Version 1 Development Level:**  Published

**Version 1 Publication Date:** Oct 2006

**Development Level Update:** Version 2: Under Development

HTML

**Mapping to National ITS Architecture: Dedicated Short Range Communication at 5.9 GHz Standards Group**

**For more information on how to obtain standard:**

- http://shop.ieee.org/ieeestore/ Phone: 800-701-IEEE (4333)

## IEEE 1609.2-2006 - Standard for Wireless Access in Vehicular Environments (WAVE) - Security Services for Applications and Management Messages

**Description:**
Secure message formats, and the processing of those secure messages, within the DSRC/WAVE system are defined. The standard covers methods for securing WAVE management messages and application messages, with the exception of vehicle-originating safety messages. It also describes administrative functions necessary to support the core security functions

**SDO(s):** IEEE

**Version 1 Development Level:** Published

**Version 1 Publication Date:** Jun 2006

**Development Level Update:** Version 2: Under Development

**Mapping to National ITS Architecture: Dedicated Short Range Communication at 5.9 GHz Standards Group**

**For more information on how to obtain standard:**

- http://shop.ieee.org/ieeestore/ Phone: 800-701-IEEE (4333)

HTML

## IEEE 1609.3 - Standard for Wireless Access in Vehicular Environments (WAVE) - Networking Services

**Description:**
Describes standard that supports higher layer communication stacks, including TCP/IP.

**SDO(s):** IEEE

**Version 1 Development Level:** Published

**Version 1 Publication Date:** Apr 2007

**Development Level Update:** Version 2: Published (Aug 2010)

**Mapping to National ITS Architecture: Dedicated Short Range Communication at 5.9 GHz Standards Group**

**For more information on how to obtain standard:**

- http://shop.ieee.org/ieeestore/ Phone: 800-701-IEEE (4333)

HTML

## IEEE 1609.4-2010 - Standard for Wireless Access in Vehicular Environments (WAVE) - Multi-Channel Operation

**Description:**
Describes various standard message formats for DSRC applications at 5.9 GHz.

**SDO(s):** IEEE

**Version 1 Development Level:**  Published

**Version 1 Publication Date:** Nov 2006

**Development Level Update:** Version 2: Published (Aug 2010)

**Mapping to National ITS Architecture: Dedicated Short Range Communication at 5.9 GHz Standards Group**

**For more information on how to obtain standard:**

- http://shop.ieee.org/ieeestore/ Phone: 800-701-IEEE (4333)

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**IEEE 802.11p - Standard for Information Technology - Telecommunications and Information Exchange Between Systems - Local and Metropolitan Area Networks - Specific Requirements - Part II: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specification**

**Description:**
This document supports communication between vehicles and the roadside and between vehicles while operating at speeds up to a minimum of 200 km/h for communication ranges up to 1000 meters. The document will support communications in the 5 GHz bands; specifically 5.850-5.925 GHz band within North America with the aim to enhance the mobility and safety of all forms of surface transportation, including rail and marine.

**SDO(s):** IEEE

**Version 1 Development Level:**  In Ballot

**Version 1 Publication Date:** To be determined

**Development Level Update:** No update

**Mapping to National ITS Architecture: Dedicated Short Range Communication at 5.9 GHz Standards Group**

**For more information on how to obtain standard:**

- http://shop.ieee.org/ieeestore/ Phone: 800-701-IEEE (4333)

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**IEEE P1512.4 - Standard for Common Traffic Incident Management Message Sets for Use in Entities External to Centers**

**Description:**
This standard will address Traffic Incident Management Message Sets which will be exchanged by and between mobile data terminals in response vehicles including mobile command posts and to their respective response and/or dispatch centers such that the exchange of information will be standard and produce the needed response(s). This standard will be limited to common message sets for use by emergency management including transportation, fire/rescue, enforcement, HazMat, etc.

**SDO(s):** IEEE

**Version 1 Development Level:**  In Ballot

**Version 1 Publication Date:** To be determined

**Development Level Update:** No update

[HTML]

**Mapping to National ITS Architecture: Incident Management Standards Group**

**For more information on how to obtain standard:**

- http://shop.ieee.org/ieeestore/ Phone: 800-701-IEEE (4333)

## IEEE P1609.0 - Standard for Wireless Access in Vehicular Environments (WAVE) - Architecture

**Description:**
This standard describes the Wireless Access in Vehicular Environments (WAVE/DSRC) architecture and services necessary for multi-channel DSRC/WAVE devices to communicate in a mobile vehicular environment. The purpose of this standard is to describe the architecture of the DSRC/WAVE operations currently represented by the family of IEEE 1609 standards and IEEE P802.11p.

**SDO(s):** IEEE

**Version 1 Development Level:**  Under Development

**Version 1 Publication Date:** To be determined

**Development Level Update:** No update

**Mapping to National ITS Architecture: Dedicated Short Range Communication at 5.9 GHz Standards Group**

**For more information on how to obtain standard:**

- http://shop.ieee.org/ieeestore/ Phone: 800-701-IEEE (4333)

## IEEE P1609.11 - Standard for Wireless Access in Vehicular Environments (WAVE) - Over- the-Air Data Exchange Protocol for Intelligent Transportation Systems (ITS)

**Description:**
This standard specifies the application service layer and profile for Payment and Identity authentication, and Payment Data transfer for Dedicated Short Range Communication (DSRC) based applications in Wireless Access in Vehicular Environments (WAVE). This standard defines a basic level of technical interoperability for electronic payment equipment, i.e. onboard unit (OBU) and roadside equipment (RSE) using DSRC.

**SDO(s):** IEEE

**Version 1 Development Level:**  Under Development

**Version 1 Publication Date:** To be determined

**Development Level Update:** No update

**For more information on how to obtain standard:**

- http://shop.ieee.org/ieeestore/ Phone: 800-701-IEEE (4333)

## IEEE SH94633-SH94638 - The Survey and Analysis of Existing Standards and those Under Development Applicable to the Needs of the Intelligent Transportation System (ITS) Short Range and Wide Area Wireless and Wireline Technologies

**Description:**
The survey and analysis of existing standards (and those under development) that include requirements for both wireline and wireless transmissions. Full title of this standard is "Survey and Analysis of Existing Standards and Those Under Development Applicable to the Needs of the Intelligent Transportation System (ITS) Short-Range and Wide-Area Wireless Communications

**SDO(s):** IEEE

**Version 1 Development Level:**  Published

**Version 1 Publication Date:** Jan 1998

**Development Level Update:** No update

**For more information on how to obtain standard:**

- http://shop.ieee.org/ieeestore/ Phone: 800-701-IEEE (4333)

## 11   SAE (Society of Automotive Engineers)

**SAE J2735** is the name of both a group and a standard. J2735 is a collection of data types and messages that are primarily intended for 5.9GHz link, i.e. V2V/V2R communications. This is the US data set definition for ITS, and unfortunately the links between the European work and J2735 have so far been minimal. This is now improving with the raised attention on the need to bring data sets together.

There are also a number of other data definitions and ITS-relevant standards in the following list.

### SAE J1663 - Truth-in-Labeling Standard for Navigation Map Databases

**Description:**
This standard defines consistent terminology, metrics, and tests for describing the content and quality of navigable map databases. (This standard does NOT specify the physical format of the database or minimum performance standards.) The focus of this document is to support the navigation applications that automotive manufacturers and suppliers are currently developing for marketplace delivery.

**SDO(s):** SAE

**Version 1 Development Level:**  Published

**Version 1 Publication Date:** Aug 1995

**Development Level Update:** No update

**For more information on how to obtain standard:**

- http://store.sae.org Phone: 877-606-7323

### SAE J1708 - Serial Data Communications Between Microcomputer Systems in Heavy-Duty Vehicle Applications

**Description:**
Defines a recommended practice for implementing a bi-directional, serial communication link among modules containing microcomputers. Defines those parameters of the serial link that relate primarily to hardware and basic software compatibility such as interface requirements, system protocol, and message format.

**SDO(s):** SAE

**Version 1 Development Level:**  Published

**Version 1 Publication Date:** Aug 2004

**Development Level Update:** No update

**For more information on how to obtain standard:**

- http://store.sae.org Phone: 877-606-7323

HTML

### SAE J1746 - ISP-Vehicle Location Referencing Standard

**Description:**
A referencing format for information service provider (ISP)-to-vehicle and vehicle-to-ISP references. This standard will reflect the cross-streets profile of the current location reference message specification (LRMS) document as expressed in the National Location Referencing Information Report (SAE J2374).

**SDO(s):** SAE

**Version 1 Development Level:**  Published

**Version 1 Publication Date:** Dec 1999

**Development Level Update:** No update

**For more information on how to obtain standard:**

- http://store.sae.org Phone: 877-606-7323

## SAE J1757 - Standard Metrology for Vehicular Displays

**Description:**
The scope of this SAE Standard is to provide methods to determine display optical performance in all typical automotive ambient light illumination - with focus on High Ambient Contrast Ratio, which is critical for display legibility in a sunshine environment. It covers indoor measurements and simulated outdoor lighting. It is not the scope of this document to set threshold values for automotive compliance, however some recommended values are presented for reference.

**SDO(s):** SAE

**Version 1 Development Level:** Published

**Version 1 Publication Date:** Jul 2002

**Development Level Update:** No update

**For more information on how to obtain standard:**

- http://store.sae.org Phone: 877-606-7323

## SAE J1760 - ITS Data Bus Data Security Services

**Description:**
Specifies definition of data security requirements between devices on the ITS data bus (IDB) and definitions of device and message level security. Also includes a mechanism to discourage theft of data bus modules.

**SDO(s):** SAE

**Version 1 Development Level:** Published

**Version 1 Publication Date:** Dec 2001

**Development Level Update:** No update

**For more information on how to obtain standard:**

- http://store.sae.org Phone: 877-606-7323

HTML

## SAE J2266 - Location Referencing Message Specification (LRMS)

**Description:**
The Location Referencing Message Specification (LRMS) standardizes location referencing for ITS applications that require the communication of spatial data references between databases. ITS databases may reside in central sites, vehicles, or devices on or off roads or other transportation links. The LRMS is applicable to both homogeneous (same database) and mixed database environments that may be implemented on wireless or landline networks. While developed for ITS applications, the LRMS may be used for non-ITS applications as well within the field of geographic information processing.

**SDO(s):** SAE

HTML

**Version 1 Development Level:** Published

**Version 1 Publication Date:** Nov 2004

**Development Level Update:** No update

**Mapping to National ITS Architecture(s): On-board Vehicle Mayday Standards Group; Advanced Traveler Information Systems (ATIS) Bandwidth Limited Standards Group; Advanced Traveler Information Systems (ATIS) General Use Standards Group**

**For more information on how to obtain standard:**

- http://store.sae.org Phone: 877-606-7323

## SAE J2313 - On-Board Land Vehicle Mayday Reporting Interface

**Description:**
A general specification that prescribes protocol methods which enable vendors with different communication methods to communicate with response agencies in a standard format.

**SDO(s):** SAE

**Version 1 Development Level:** Published

**Version 1 Publication Date:** Sep 1999

**Development Level Update:** No update

**Mapping to National ITS Architecture: On-board Vehicle Mayday Standards Group**

**For more information on how to obtain standard:**

- http://store.sae.org Phone: 877-606-7323

HTML

## SAE J2352 - Mayday Industry Survey Information Report

**Description:**
A summary of information obtained by way of a survey conducted in 1997 of MAYDAY system manufacturers. The information is limited to technical data as it pertains to vehicle and on-board MAYDAY system operations. This survey's purpose was to determine whether the general concept and architecture on which the J2313 MAYDAY Message Set that was consistent with those of current MAYDAY system hardware manufacturers.

**SDO(s):** SAE

**Version 1 Development Level:** Published

**Version 1 Publication Date:** Sep 1998

**Development Level Update:** No update

**For more information on how to obtain standard:**

- http://store.sae.org Phone: 877-606-7323

## SAE J2353 - Data Dictionary for Advanced Traveler Information Systems (ATIS)

This standard has been withdrawn by SAE.

## SAE J2354 - Message Set for Advanced Traveler Information System (ATIS)

**Description:**
A basic message set using the data elements from the ATIS data dictionary needed by potential information service providers to deploy ATIS services and to provide the basis for future interoperability of ATIS devices.

**SDO(s):** SAE

**Version 1 Development Level:** Published

**Version 1 Publication Date:** Nov 1999

**Development Level Update:** Version 2: Published (Feb 2004); Version 3: Under Development

**Mapping to National ITS Architecture(s): On-board Vehicle Mayday Standards Group; Advanced Traveler Information Systems (ATIS) Bandwidth Limited Standards Group; Advanced Traveler Information Systems (ATIS) General Use Standards Group**

**For more information on how to obtain standard:**

- http://store.sae.org Phone: 877-606-7323

HTML

## SAE J2355 - ITS Data Bus Architecture Reference Model Information Report

**Description:**
A reference model for an in-vehicle data bus. The ITS data bus (IDB) will enable manufacturers, dealers, and vehicle owners to install a wide range of electronics equipment reliably and safely in a vehicle at any time during the vehicle lifecycle.

**SDO(s):** SAE

**Version 1 Development Level:** Published

**Version 1 Publication Date:** Oct 1997

**Development Level Update:** No update

**For more information on how to obtain standard:**

- http://store.sae.org Phone: 877-606-7323

## SAE J2365 - Calculation of the Time to Complete In-Vehicle Navigation and Route Guidance Tasks

**Description:**
Guidelines for the implementation of specific man-machine interface transactions and classes of transactions.

**SDO(s):** SAE

**Version 1 Development Level:** Published

**Version 1 Publication Date:** May 2002

**Development Level Update:** No update

**For more information on how to obtain standard:**

- http://store.sae.org Phone: 877-606-7323

## SAE J2366/1 - ITS Data Bus - IDB-C Physical Layer

**Description:**
A physical interface device (connector) that will ensure compatibility between vehicles and aftermarket devices. Physical interface performance requirements, circuit identification and configuration, and electrical requirements for the physical layer of the ITS data bus.

**SDO(s):** SAE

**Version 1 Development Level:** Published

**Version 1 Publication Date:** Nov 2001

**Development Level Update:** No update

**For more information on how to obtain standard:**

- http://store.sae.org Phone: 877-606-7323

[HTML]

## SAE J2366/1L - ITS Data Bus - Low Impedance Stereo Audio

**Description:**
This SAE Recommended Practice describes the Low Impedance Stereo Audio (LISA) bus, which may be used in conjunction with the Physical Layer of the IDB-C, as described in SAE J2366-1. The audio arbitration messages used to control access to the LISA bus are specified in SAE J2366-7. The IDB-C is a non-proprietary virtual token passing bus, designed to allow disparate consumer, vehicle, and commercial electronic components to communicate and share information.

**SDO(s):** SAE

**Version 1 Development Level:** Published

**Version 1 Publication Date:** Nov 2001

**Development Level Update:** No update

**For more information on how to obtain standard:**

- http://store.sae.org Phone: 877-606-7323

[HTML]

## SAE J2366/2 - ITS Data Bus - Link Layer

**Description:**
Requirements for the link layer (layer 7 of the OSI model) for the ITS data bus.

**SDO(s):** SAE

**Version 1 Development Level:** Published

**Version 1 Publication Date:** Nov 2001

**Development Level Update:** No update

**For more information on how to obtain standard:**

- http://store.sae.org Phone: 877-606-7323

[HTML]

## SAE J2366/4 - ITS Data Bus - Thin Transport Layer

**Description:**
Requirements for the thin transport layer (Layer 4 of the OSI model) for the ITS data bus.

**SDO(s):** SAE

**Version 1 Development Level:**  Published

**Version 1 Publication Date:** Mar 2002

**Development Level Update:** No update

**For more information on how to obtain standard:**

- http://store.sae.org Phone: 877-606-7323

[HTML]

## SAE J2366/7 - ITS Data Bus - Application Message Layer

**Description:**
Requirements for the application layer (layer 7 of the OSI model) for the ITS data bus.

**SDO(s):** SAE

**Version 1 Development Level:**  Published

**Version 1 Publication Date:** Apr 2002

**Development Level Update:** No update

**For more information on how to obtain standard:**

- http://store.sae.org Phone: 877-606-7323

[HTML]

## SAE J2369 - Standard for ATIS Message Sets Delivered Over Reduced Bandwidth Media

**Description:**
A general framework allowing transmission of traveler information via bandwidth reduced media such as found in wireless applications. Creates a uniform coding and message structure for link travel times, incident text, weather and transit for broadcast delivery.

**SDO(s):** SAE

**Version 1 Development Level:**  Published

**Version 1 Publication Date:** Mar 2000

**Development Level Update:** No update

**Mapping to National ITS Architecture: Advanced Traveler Information Systems (ATIS) Bandwidth Limited Standards Group**

**For more information on how to obtain standard:**

- http://store.sae.org Phone: 877-606-7323

[HTML]

## SAE J2372 - Field Test Analysis Information Report

**Description:**
This information report presents the results of field tests on location-referencing standards.

**SDO(s):** SAE

**Version 1 Development Level:**  Published

**Version 1 Publication Date:** Dec 1999

**Development Level Update:** No update

**For more information on how to obtain standard:**

- http://store.sae.org Phone: 877-606-7323

## SAE J2373 - Stakeholders Workshop Information Report

**Description:**
Results of workshops to solicit and discuss stakeholder requirements for location referencing standardization.

**SDO(s):** SAE

**Version 1 Development Level:**  Published

**Version 1 Publication Date:** Apr 2000

**Development Level Update:** No update

**For more information on how to obtain standard:**

- http://store.sae.org Phone: 877-606-7323

## SAE J2395 - ITS In-Vehicle Message Priority

**Description:**
Specifies orderly temporal and spatial presentation of ITS information to the driver.

**SDO(s):** SAE

**Version 1 Development Level:**  Published

**Version 1 Publication Date:** Feb 2002

**Development Level Update:** No update

**For more information on how to obtain standard:**

- http://store.sae.org Phone: 877-606-7323

## SAE J2396 - Definitions and Experimental Measures Related to the Specification of Driver Visual Behavior Using Video Based Techniques

**Description:**
Procedures for collecting, reducing, analyzing, and reporting on driver-eye glance data in a manner suitable for evaluating ITS systems and comparing alternative designs for a particular system in terms of visual demand. Helps insure that systems minimize the time a driver's eyes are off the road.

**SDO(s):** SAE

**Version 1 Development Level:**  Published

**Version 1 Publication Date:** Jul 2000

**Development Level Update:** No update

**For more information on how to obtain standard:**

- [http://store.sae.org](http://store.sae.org) Phone: 877-606-7323

## SAE J2399 - Adaptive Cruise Control (ACC) Operating Characteristics and User Interface

**Description:**
This standard presents the minimum requirements for safety-related elements of the operating characteristics and user interface of vehicles equipped with adaptive cruise control (ACC). It also coordinates the operating characteristics and user interface with collision warning and avoidance, along with other driver systems.

**SDO(s):** SAE

**Version 1 Development Level:**  Published

**Version 1 Publication Date:** Dec 2003

**Development Level Update:** No update

**For more information on how to obtain standard:**

- [http://store.sae.org](http://store.sae.org) Phone: 877-606-7323

## SAE J2400 - Human Factors in Forward Collision Warning Systems: Operating Characteristics and User Interface Requirements

**Description:**
Minimum safety and human factor requirements for front collision warning (FCW) operating characteristics and driver interfaces to ensure consistency across vehicles so that drivers can quickly understand and safely use a FCW-equipped vehicle.

**SDO(s):** SAE

**Version 1 Development Level:**  Published

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**Version 1 Publication Date:** Aug 2003

**Development Level Update:** No update

**For more information on how to obtain standard:**

- [http://store.sae.org](http://store.sae.org) Phone: 877-606-7323

## SAE J2539 - Comparison of GATS Messages to SAE ATIS Standards Information Report

**Description:**
An overview and comparison of Global Automotive Telematics Standard (GATS) messages developed for use on global system mobile (GSM) cellular phone systems (European).

**SDO(s):** SAE

**Version 1 Development Level:**  Published

**Version 1 Publication Date:** Feb 2002

**Development Level Update:** No update

**For more information on how to obtain standard:**

- [http://store.sae.org](http://store.sae.org) Phone: 877-606-7323

## SAE J2540 - Messages for Handling Strings and Look-Up Tables in ATIS Standards

**Description:**
Describes the process used in various SAE ATIS message set standards to deliver textual strings and provides national tables used in the delivery of incident description.

**SDO(s):** SAE

**Version 1 Development Level:**  Published

**Version 1 Publication Date:** Jul 2002

**Development Level Update:** No update

**Mapping to National ITS Architecture(s): On-board Vehicle Mayday Standards Group; Advanced Traveler Information Systems (ATIS) Bandwidth Limited Standards Group; Advanced Traveler Information Systems (ATIS) General Use Standards Group**

**For more information on how to obtain standard:**

- http://store.sae.org Phone: 877-606-7323

HTML

## SAE J2540/1 - RDS (Radio Data System) Phrase Lists

**Description:**
This SAE Standard provides a table of textual messages meeting the requirements for expressing "Radio Data Systems" (RDS) phrases commonly used in the ITS industry. They can be used both over the RDS subcarrier transmission media as part of a 37-bit long "Group 8a message" as well as being used to provide a common content list of phrases used in a wide number of other media and applications.

**SDO(s):** SAE

**Version 1 Development Level:**  Published

**Version 1 Publication Date:** Jul 2002

**Development Level Update:** No update

**Mapping to National ITS Architecture(s): On-board Vehicle Mayday Standards Group; Advanced Traveler Information Systems (ATIS) Bandwidth Limited Standards Group; Advanced Traveler Information Systems (ATIS) General Use Standards Group**

**For more information on how to obtain standard:**

- http://store.sae.org Phone: 877-606-7323

HTML

## SAE J2540/2 - ITIS (International Traveler Information Systems) Phrase Lists

**Description:**
This SAE Standard provides a table of textual messages meeting the requirements for expressing "International Traveler Information Systems" (ITIS) phrases commonly used in the ITS industry. The tables provided herein follow the rules of SAE J2540 and therefore allow a local representation in various different languages, media expressions etc., to allow true international use of these phrases. The phrases are predominantly intended for use in the description of traffic related events of interest to travelers and other traffic practitioners.

**SDO(s):** SAE

**Version 1 Development Level:**  Published

HTML

**Version 1 Publication Date:** Feb 2002

**Development Level Update:** Amendment 1 to Version 1: Published (May 2004)

**Mapping to National ITS Architecture(s): On-board Vehicle Mayday Standards Group; Advanced Traveler Information Systems (ATIS) Bandwidth Limited Standards Group; Advanced Traveler Information Systems (ATIS) General Use Standards Group**

**For more information on how to obtain standard:**

- http://store.sae.org Phone: 877-606-7323

## SAE J2540/3 - National Names Phrase List

**Description:**
This SAE Standard provides a table of textual messages meeting the requirements for expressing the names of street and roads and some basic building blocks for phrases commonly used in the ITS industry.

**SDO(s):** SAE

**Version 1 Development Level:** Published

**Version 1 Publication Date:** Jan 2002

**Development Level Update:** No update

**Mapping to National ITS Architecture(s): On-board Vehicle Mayday Standards Group; Advanced Traveler Information Systems (ATIS) Bandwidth Limited Standards Group; Advanced Traveler Information Systems (ATIS) General Use Standards Group**

**For more information on how to obtain standard:**

- http://store.sae.org Phone: 877-606-7323

HTML

## SAE J2630 - Converting ATIS Message Standards from ASN.1 to XML

**Description:**
This SAE Standard presents a set of rules for transforming an Abstract Syntax Notation (ASN.1) message set definition into an eXtensible Markup Language (XML) schema. The result is intended to be a stand-alone XML Schema that is fully consistent with an existing ASN.1 information model.

**SDO(s):** SAE

**Version 1 Development Level:** Published

**Version 1 Publication Date:** Dec 2003

**Development Level Update:** No update

**For more information on how to obtain standard:**

- http://store.sae.org Phone: 877-606-7323

HTML

## SAE J2735 - Dedicated Short Range Communications (DSRC) Message Set Dictionary

**Description:**
This standard will assure that DSRC applications will be interoperable. Applications such as collision avoidance, emergency vehicle warnings, and signage require this standard before they can be effective.

**SDO(s):** SAE

**Version 1 Development Level:** Published

**Version 1 Publication Date:** Dec 2006

**Development Level Update:** Version 2: Published (Nov 2009)

**Mapping to National ITS Architecture: SAE J2735**

**For more information on how to obtain standard:**

- http://store.sae.org Phone: 877-606-7323

HTML

## 12  IETF

The Internet Engineering Task Force supplies all the basic Internet standards. "Normal" Internet access is of course already the basis for almost all communications except short range vehicle access. C-ITS is depending on a new level of mobility that current Internet Protocol (IPv4) cannot supply out of the box.  Therefore IETF has had a task force working on a better solution for the new IPv6 that we all are being moved into these days as the addressable range of IPv4 is getting depleted.

The task force relevant for ITS was initially called NEMO for Network Mobility, but is now merged with other (intermodal) use cases to the group MEXT, Mobility EXTensions. The work of MEXT is also mainly completed.

The current implementations from CVIS and the work of CALM is fully based on NEMO/MEXT, and has cooperated to introduce these essential standards for the core Internet operation.

## 13   New paradigm in ITS: Cooperative Systems

CS is the new paradigm in ITS. The most common understanding is that Cooperative Systems is to get away from the multitude of proprietary stand-alone boxes invading the driver environment. The feeling was that it is not sustainable to put a new box with antennas, display, keyboard, etc, etc for each new application that was going into the car. This is too costly, to unsafe, does not give interoperability, and is just not safe or sustainable from a windshield real estate point of view.

The following drawing illustrates the situation in Europe now; based on mandated applications:

| Infotainment/ Sustainability system | EETS system | eCall system | Active Safety system |
|---|---|---|---|
| Radio box (3G/LTE, WiFi, Bluetooth, GPS,…) | Radio box (2G/3G, GPS, 5.8GHz,…) | Radio box (2G/3G, GPS,…) | Radio box (GPS, 5.9GHz,…) |
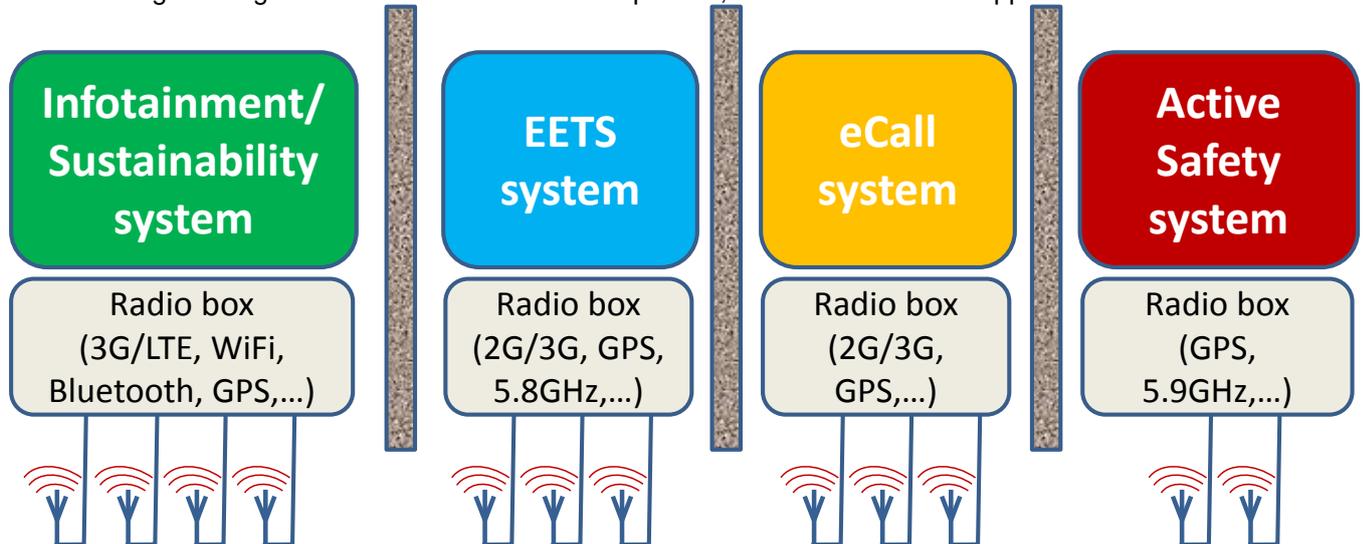
So we had to go from "silos" or vertical integration of all functions for each new application, into a new world of sharing common resources where possible.

### 13.1   What is a "Cooperative System"?

The definition of what a cooperative system is has proven to be difficult. There are obvious reasons for this, mostly to do with turf wars and commercial pressures from actors in existing markets feeling threatened by this new world. This has led to several definitions of CS.

### 13.2   The European Commission basic definition

The most prevalent understanding is the EC definition: " A CS involves V2V and V2I communication". This definition is obviously not a threat since covers all potential CS scenarios. The problem is the same: this definition is so wide that it covers everything from 1990's tolling systems, via regular GSM voice communications to highly advanced ITS services. As standardisers we therefore had to find a more precise definition.

### 13.3   The vehicle active safety viewpoint

A more precise understanding is the use of 5.9GHz 802.11p communications for V2V and V2I links, where the main application is active safety. The idea is that all vehicles broadcast information that will be received by other vehicles or roadsides at a distance of 300-800 meters. The typical applications are warnings or active collision avoidance decided in each vehicle. This is the understanding from OEMs and authorities involved in the active safety world, such as the Car to Car Communications Consortium (C2C-CC, http://www.car-to-car.org/).

### 13.4   The CEN/ETSI/ISO definition

The C2C-CC view is often seen as too restrictive both in terms of technology and services. Therefore CEN/ISO and ETSI has agreed on another definition:

**A co-operative ITS is a subset of the overall ITS that**
- **communicates and**
- **shares information**

**between ITS Stations[*] to**
- **give advice or**
- **facilitate actions**

**with the objective of improving**
- **safety, sustainability, efficiency and comfort**

**beyond the scope of stand-alone systems.**

*) ITS Station defined in ETSI EN 302 665 / ISO 21217, e. g. units installed in vehicles, at the road side, in traffic control/ management centers, in service centers, or hand-held units.

This definition seems to attract the most support at the moment, and it is important to see that it also defines the boundary towards existing, non-cooperative ITS.

CS is still a new paradigm in ITS, and it will influence all existing systems to a certain extent. This is an on-going process in CEN and ISO now, while ETSI TC ITS started directly into this new paradigm and is already organised towards this way of thinking.

## 13.5   Cooperative System Communication

The idea of splitting communications from the applications came from ISO TC204/WG16 about ten years ago. Up to that time all ITS standards and ITS system implementations had been done in a "silo". In 2001/2002 the basic architecture and core standards for CALM where developed, and has remained basically intact until now. The architecture has been extended up to the application level in recent years by the CVIS project and ETSI standardisation.

The concept of CALM is actually very simple: There are a number of medias or physical (radio) interfaces available, and each of these tries to stay continuously connected to the external world. The available connections together with key parameters such as cost, available rate, latency and so on are continuously sent to a Communications Manager. At the same time the applications and services that needs connection, register with the same Communications Manager. They register the preferred parameters in a similar format as above, and also their relative priority class. The communications manager has a simple task in mix-and-match the available interfaces with the applications that need service. It also means that applications might be using different interfaces.

Using the same drawing elements as above, the new architecture would look something like this:
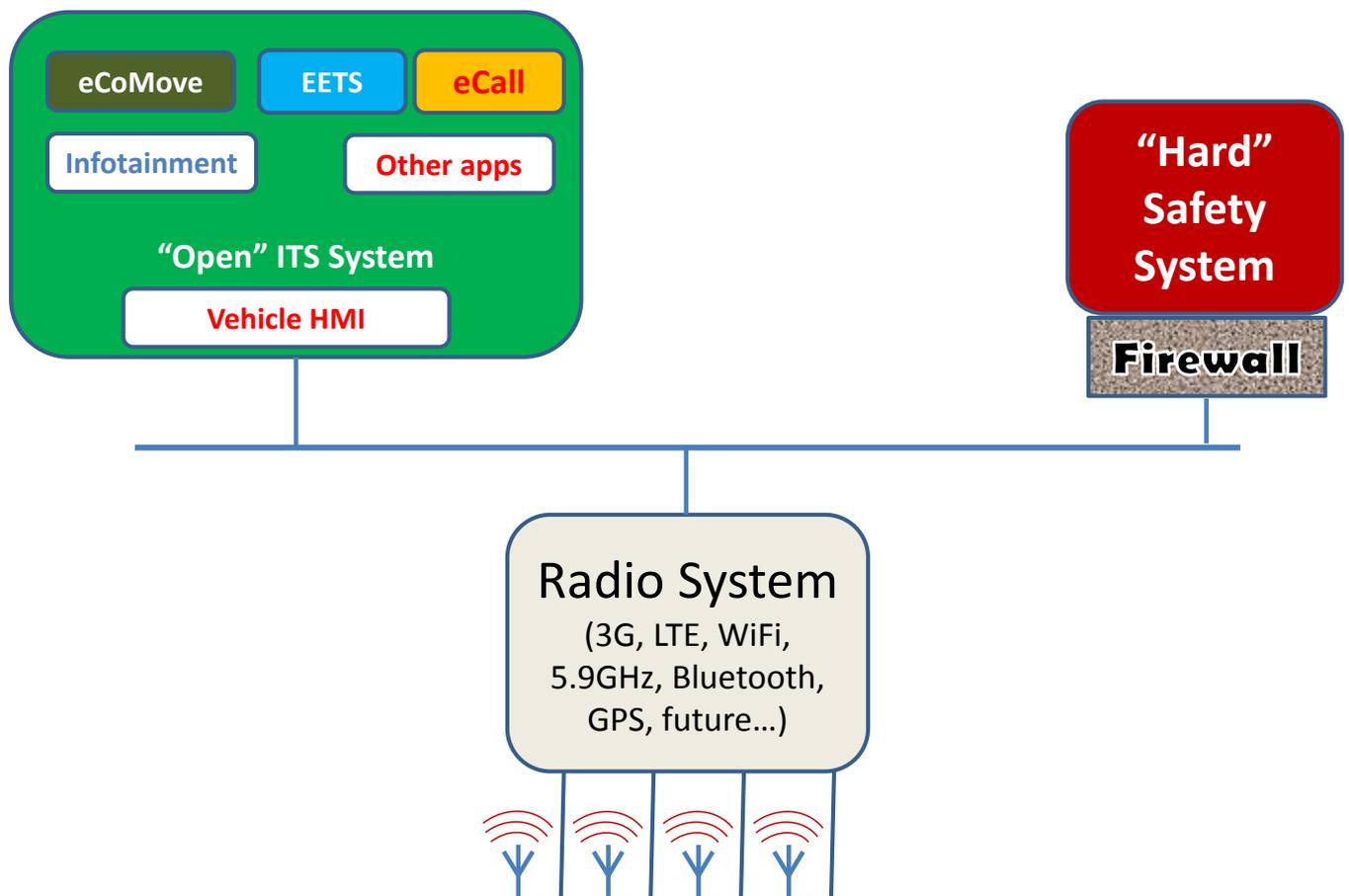
## 13.6   Cooperative System Messages

One basic concept of Cooperative Systems is that vehicles and roadsides will broadcast information to its surroundings, using relatively short range communication means. This can be InfraRed, Millimetre

wave (61 GHz), 700 MHz (in Japan) or the incumbent 5.9GHz link. The typical range is 300-800 meters for most of these media, but 700MHz can achieve much longer range if needed.

The main purpose is to broadcast three different types of messages:
1. The primary "here I am and this is what I am doing" message is sent from all vehicles and equipped roadside infrastructure 2-10 times per second, and received by other vehicles/roadsides within 300-800 meters away. This message is called Cooperative Awareness Message (CAM) in Europe, and Basic Safety Message (BSM) in USA.
2. In addition there are several messages for special events; in particular safety critical events. In Europe these are called Decentralized Environmental Notification Message (DENM/DEM), and in the US they have different names depending on the event type.
3. The third main broadcast group is the Service Announcement, where potential services are offered from a roadside (or vehicle) to any other partners. One special sub-group of this is mandatory services that are made compulsory by (local) authorities. This service announcement message is called a SAM.

## 14   The ITS Station Concept

An ITS Station is the core building block for the new Cooperative Systems. The idea is that any vehicle or roadside system will contain certain functions such as processing, communication, storage like an LDM, interfaces to sensors and actuators, and not the least: Security to protect the ITS-S. The operation and integrity of the ITS Station is controlled via a Management entity.

The basic drawing looks like this:

When several such ITS Stations are connected together, they form an ITS System and belong to an ITS Network. This is well described in ISO 21217 and ETSI EN 302 665.

An ITS Station may be implemented as one box. In fact, the smallest ITS-S may be a software module inside a smartphone or other handheld device.

In larger installations such as in a vehicle, the ITS-S will often consist of a communications device (Mobile Router) and one or more computers (Mobile Hosts and Gateways to ECUs). The example on in section 11.5 therefore constitutes an ITS Station.

For a roadside installation (Roadside ITS Station), there may be several communication devices in an internal network (Access Routers), and several computers running the actual services.

The important aspect is that they form one logical and security entity, a "Bounded Secure Domain".
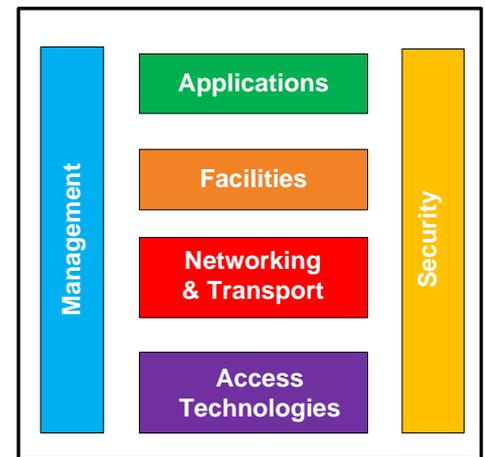
## 15  Projects and Organisations that influence ITS Standards

There are a number of stakeholders in ITS standardisation. In many ways we can say that everyone that are planning, implementing or deploying ITS, needs to either use standards very actively, or need to be involved to influence the core standards.
Note that the scope of this report does not allow any in-depth explanation either of the projects or of the direct influence these projects have had, so the reader is advised to follow the links to get more info where relevant or needed.

### 15.1  Mandates
One of the primary tools for the European Commission is called Mandates.

Areas that are considered important from a policy viewpoint will often need Directives to handle the legal aspects of pan-European introduction and operation. Directives should usually not contain any direct technical requirements, but should primarily point to European Standards (ENs) for the detailed specifications.

Mandates is the tool the EC uses to get such technical standards written. The resulting standards will often be referenced by European legislation (Directives), so there are both time restrictions and the expectation of high technical quality on these standards.

#### 15.1.1  Mandate process
The expectation from the EC will be described in a document together with requirements to develop technical standards, and offered to the three European SDOs (CEN, CENELEC and ETSI). These SDOs will in turn consider the Mandate, and either declare that it is outside their area of interest, or accept responsibility to develop standards in that domain. The SDO will then return a plan for developing relevant standards within the requested time. These plans are often followed by requests for financial support for PTs (CEN name for funded Project Teams), or STFs (ETSI name for funded Specialist Task Force). Mandates can be relatively complex as seen from the EC, since several DGs are involved in setting the requirements. As an example, DG INFSO from a technical/research perspective, DG MOVE responsible for the legal perspective, and DG ENTEPRISE will finance the actual work.

#### 15.1.2  M/338: The EFC mandate
Mandate 338 is dedicated to Electronic Fee Collection, and is the second such mandate. It is held between DG MOVE and DG ENTERPRISE, and is directed to TC278/WG1 only. The mandate goes over several years to support the EFC directive and the EETS operation. M/338 has performed well in the past, and is likely to conclude with success in 2012/2013 time frame. One interesting convergence is the PT looking into how EFC could become a service in a Cooperative ITS Station, similar to the drawing is section 11.5.

#### 15.1.3  M/453: The ITS Mandate
Mandate 453 is considered to be the main ITS mandate. It is intended to support part of the ITS Action Plan and ITS Directive.

M/453 is a cooperation between DG INFSO, DG MOVE and DG ENTERPRISE. It describes 69 areas of work for a complete Cooperative System, and requests a "minimum set of standards" to deploy C-ITS.

This task has been taken up by ETSI and CEN, and there is a split of responsibility between the two bodies where ETSI TC ITS mainly deals with communications and active safety applications, while CEN TC278 takes responsibility for the rest. The work should be completed in 2012, but there are delays that will require certain extension.

The work is not progressing well for CEN, while ETSI TC ITS likely will be able to have a core set of active safety standards finished in time.

The main reasons for CEN falling behind is that the TC and WG structure is adapted for "silo" type of normal ITS standards, so adapting to a new way of thinking will take time. The scope for CEN is also a lot wider, even though the number of bullet items in the Mandate is similar.

Recent discussion points to the possibility of a new Mandate that would focus on the higher levels of Cooperative ITS, but there are no clear decisions yet.

For further information, please contact Knut Evensen who is involved in M/453 both from the CEN and ETSI side.

## 15.2 EU-US Task Force

One central cooperation between ITS authorities is the EU-US Task Force that was set up between US DoT Research and Innovative Technology Administration Joint Programme Office (RITA/JPO) and the European Commission Directorate General Information Society (DG INFSO) in 2009/2010. This cooperation was extended to include Japan early 2011.

The idea is twofold:
- on one hand to coordinate the Cooperative ITS research activities between the regions, to pool resources and get better results by learning from each other's experiences
- and to coordinate standardisation to avoid duplicating and getting conflicting standards that would slow or prevent the uptake of Cooperative ITS.

From a policy perspective, US and Europe agreed on a policy statement called "EU-US Joint Declaration of Intent (13th November 2009)". This policy mainly regulates the R&D activities. The following links gives more details as seen from the European and US viewpoint.

The EU-US TF has had several meetings where the main focus has been to plan for future R&D activities. Two safety applications and one efficiency application is being singled out as examples for further study. The safety side is run by car makers, from the European side C2C-CC with Daimler in lead, and from the US side CAMP (Crash Avoidance Metrics Partnership) with GM in lead.

Since this report is mainly focused on standardisation, it is interesting to see the clear policy wording we can find in clause 10:

### 15.2.1 EU-US Joint Declaration of Intent (13th November 2009) Clause 10:
*Globally harmonized standards are essential to support and accelerate the deployment and adoption of Cooperative Systems. The parties strongly support development of global open standards which ensure interoperability through appropriate actions including, but not limited to, coordinating the activities of the standardization organizations. In particular, the parties intend to make efforts to preclude the development and adoption of redundant standards. The adoption of multiple standards within a given area of interest should be limited to those cases where there are demonstrated technical needs, such as differing frequency spectrum allocations, and legal requirements, such as privacy protection laws. The parties welcome the participation of other countries and regions.*

This cooperation has later been extended to include Japan.

Of more recent interest, there are two Harmonization Task Groups (HTG1+HTG3) that have analysed the available standards from ETSI, CEN/ISO and IEEE. The group was active March-August 2012, and involved 14 experts from US and Europe, with Japanese participation. The main focus has been on communications and security features. There are a set of reports available that includes a gap analysis that describes areas not covered by any standard, and who could usefuly cover these gaps. The other part is an overlap analysis including advice how to update current standard to become interoperable. There is also a good overview of the entire sector in the "background Document. Finally, there is also a set of documents for how to test and validate the C-ITS standards in a way that allows both US and European standards in the same system.

## 16　European Framework Programme activities

The European Commission, in particular through DG INFSO, have been highly active in promoting ITS through the last twenty-odd years. As mentioned earlier, Fotis Karamitsos started this field through the DRIVE programme in the late eighties, and since then the EC has held a continuous focus by providing new research opportunities in every new framework programme call. In the last years, the main driver has been Juhani Jaaskelainen, and he has achieved much in promoting ITS to the level it has now. This Directorate General was started as DG 13, and has recently changed its name to DG CONNECT.The work is carried on in Directorate H: Sustainable & Secure Society, and Unit H.5 Smart Cities and Sustainability.
These R&D projects are of utmost importance for European standardisation work. The policy from the outset has been that the projects should be directly involved in standards, and trherefore part of the funding is earmarked to this end.  Most of the CEN/ISO and ETSI standards are therefore partly funded by EC sponsored projects, and even more the projects often implement and test/validate draft standards as part of the development and quality assurance of the standards .

The EC has several "instruments" or project types to deploy in this area. The main one is called a **STREP or Specific Targeted Research Projects**. This is a "regular" R&D project which can get up to 67% EC funding support.

### 16.1.1　CEN DSRC projects
Examples of completed projects are Delta, EVI and RCI. These example project actually helped the current generation of technology, CEN DSRC, to become proven, stable products that could be trusted in deployment, and they had a pivotal role in ITS standardisation. Partly these early projects did drafting of core specifications and requirements, and partly they implemented and validated the standards to prove the concepts, and finally they fed results back to CEN and ETSI to correct everything for commercial deployment. In a way there was a Ping-Pong match relationship between Cen and these projects that ultimately has meant a significant commercial success, as well as competitive quality systems for users and operators alike.

A more recent "instrument" is the **IP or Integrated Project**. This is the larger size EC R&D projects consisting of multiple sub-projects. Typical size is 10-40 million Euro over 3-4 years.
Examples are SAFESPOT, CVIS, SmartFreight who all belonged to the new generation of Cooperative System technology projects.

### 16.1.2　*SAFESPOT*
SafeSpot was led by FIAT research, and looked into using CS technology for V2V collision avoidance. SafeSpot was based primarily of technology from CVIS, and contributed to CALM and ETSI throughout the project lifetime.

### 16.1.3　*SmartFreight*
Was led by SINTEF and primarily located in Trondheim. The ide was to manage goods transport through a multimodal transport chain. The project used CVIS technology and also CEN DSRC technology in combination, and several interesting findings in the end. The contribution to standards was not so high, but still the validation of the technology in various intermodal situations has proven to be interesting feedback to the SDOs.

### 16.1.4　*CVIS*
CVIS has been the main platform developer of Cooperative Systems. This was the largest ITS project in the world so far, with a budget of around 43 M€. To give full justice to this project in a small space is difficult, so the reader is advised to follow the link and download some of the main documents and project presentations from here.

Q-Free has been central in the technical part of this project, and SINTEF has also been supplying a lot of the results that formed the Open Cooperative System Platform. This platform is a combination of communication subsystems (5.9GHz, IR, 3G, DSRC, GPS and satellite), of sensor integration, vehicle integration, a LDM implementation, a facilities layer based on an extended OSGi standard implementation, hardware developments and several test applications for freight and fleet, urban and interurban, and safety scenarios.

From a standardisation perspective, CVIS supported a large portion of the ISO CALM developments, and sent people to ISO, CEN, ETSI, IETF, IEEE to achieve standardisation harmonisation. While the project was still running, it formed a good counterweight to the OEM active safety dominance in standardisation, but after CVIS ended this balance has largely disappeared.

### 16.1.5  Drive C2X

Successful implementation of vehicular communication requires considerable investments and coordinated efforts of all stakeholders involved. Otherwise the huge benefits that can be expected of this technology cannot be realised. The key to successful implementation is a commonly agreed roadmap, which defines the necessary steps towards market introduction. In order to achieve this agreement each stakeholder needs clarity about what is involved in such an implementation decision. A clear view is required on the costs for system implementation as well as on the benefits and potential revenues generated by vehicular communication. DRIVE C2X provides decision makers from all stakeholders with the information that is needed for an implementation decision. Based on the data generated in field trials with cooperative systems technology on seven European test sites the benefits of cooperative systems with regard to traffic safety and efficiency and drivers' convenience are identified and in a second step quantified in monetary terms. In parallel the costs for system implementation are identified and put into relationship to the identified benefits. This is done from a socio-economic and a business-economic point of view, so that the outcome of the project will be a benefit/cost analysis addressing the societal aspects of vehicular communication and detailed business models addressing the needs of those stakeholders, who have to decide on major investments in this technology.

Having a commonly agreed roadmap for system implementation and insight in the benefits and costs related to the implementation of cooperative systems technology is one important prerequisite for successful implementation of cooperative system. The availability of standards to build the system on is another. Therefore, DRIVE C2X is contributing to the standardisation process ongoing at ETSI TC ITS under the EC standardisation mandate through participation of DRIVE C2X staff to the various standardisation working groups and by making documents available to ETSI TC ITS that are relevant for standardisation. Furthermore DRIVE C2X is participating to various ETSI events such as the annual ETSI TC ITS workshop or ETSI plugtests.

Thus DRIVE C2X is covering all aspects of market implementation. It brings together all stakeholders involved, prepares an implementation roadmap and provides the necessary certainty for a decision for market introduction by investigation of the socio-economic and business-economic aspects of cooperative driving and contributing significantly to the European ITS standardisation.

**Support Action projects** are small, specialised European Framework R&D projects that will facilitate and support coordination of other projects. This means that the project does not perform any research itself, but will help partners and other projects by arranging meetings, funding travels and small studies, prepare position papers for the EC, and so on. These projects are usually funded 100% since there is no long term benefit for the project partners after the project finishes.
Examples are COMeSafety and iCar Support who have standardisation support as part of their task.

### 16.1.6  COMeSafety

This is a Support Action lead by the car industry, more specifically by Timo Kosch at BMW. The SA has recently been extended for a new three-year period. COMeSafety did support the drafting of the new ITS Station Reference Architecture as a combination of ETSI and ISO on one side, and the CVIS and SAFESPOT project on the other side.

### 16.1.7  COMeSafety2

This is a Support Action, the follow-up of the previous COMeSafety as an extension of 3 years.

### 16.1.8  iCar Support

This project is run by ERTICO, and can mainly be seen as an arm of the eSafety Forum, that prepares meetings, documents, studies and so on. One small part of the project is dedicated to give an overview of ITS Standardisation covering both European and overseas SDOs. This project is for instance funding Knut Evensen participation in the EU-US Task Force, as well as meeting contributions to some of the ISO meetings.

iCS also maintains a standardisation web page with many of the same types of information as this report covers

### 16.1.9   Safety Pilot

One US project of particular interest is the Safety Pilot. This programme is run by US Department of Transportation, and the main objective is to evaluate the effectiveness of 5.9 GHz technology in saving lives. The programme is described in great detail in this link. For the purposes of this report, the important information is that there will be a decision late 2013 by NHTSA, on whether this should be mandated on new cars, or if it should be a requirement in the NCAP certification.

## 17  Standardisation interests in line with ITS action plan and ITS directive

The ITS directive, led by mandate 453, puts forward certain requirements and guidelines for the implementation of ITS to ensure a more rapid implementation of ITS services in Europe. The aim of the European Union's land transport policy is to promote a mobility that is efficient, safe, secure and environmentally friendly. The directive points out the need for interoperability and homogeneous solutions across borders. It also promotes a layered architecture to ensure better compatibility between communication solutions and services. Trans-national deployment of continuous cross-border services for travel information and traffic management cannot be achieved by Member States alone.

The work on cooperating systems is one major step in this direction. Usage of Datex2 as a common traveller information system element is one such step to harmonise transport information across borders. A common system for automatic vehicle identification and AVI/AFC are other initiatives.

The global nature of road communication will demand interoperability. Following and impacting the standardisation groups working with international systems that will affect the European transport system is important and must be followed up. Good cooperation between the European countries with common boarders are thus of special interest.

Areas that are of special interest linked to the ITS action plan include:

- Real time traffic and traveller data sharing to support a safer and more relaxed driving situation

- International road signing and information layout and formats to support common understand ability across boarders

- International Automatic vehicle identification/Automatic fee collection systems to support common paying service and a greener transport sector due to diverse emission fees.

- Emergency call and safety warnings to drive down the number of traffic fatalities and accidents

Following up and impacting the SDOs and forums working on these aspects will lead to specifications in line with Europe's special interests.

## 18   Annex B: Standard development and standardisation organisation mapping



**Figure 8: Structure of SDOs on various levels**

In this picture global standardisation resides on top, with regional standardisation in the middle, and with national standardisation efforts on the lower end.

The idea is that higher layers should take precedence, so that if global standardisation is started, then regional and national standardisation should stop and all efforts should be focused to the international domain. There are agreements and conventions between the different SDOs to this effect, such as the stand-still agreement between national SDOs and CEN/ISO, and the Vienna Agreement that regulates the cooperation between CEN and ISO. The situation between the other bodies are usually based on bilateral agreement on a case by case basis, or often lack of any agreements at all.

Unfortunately the world of ITS standardisation has significant overlaps between some SDOs, in particular regarding communication subsystem and some of the new applications such as safety. The main overlaps are currently seen between ETSI TC ITS, ISO TC204/WG16 (CALM), and IEEE P1609 (WAVE/DSRC).
The relevant authorities in Europe (EC DG INFSO) and USA (US DoT RITA/JPO) are following this situation, and has signed a policy statement as a Joint Declaration, see chapter on **EU-US Task Force**.

**Types of standards:**
We broadly distinguish between the following main groups or levels of standards.
1. The top level in Europe is called an EN (European Norm). An EN can only be issues by CEN, CENELEC or ETSI. This is the real, permanent standard voted by 27 European national members according to a key decided by population in each country. ENs have some legal implication for public bodies according to the European Public Procurement Directive, but is mainly voluntary for implementation as long as it is not referenced in national or European law (Directives).
   At the same level we have full International Standards (IS). These are also voted by national members, but with one country-one vote. An IS has less binding force than an EN.
2. The second level is usually called a TS for Technical Specification. A TS is decided by the technical committee itself and is a faster process. TS is often used as an intermediate step towards a full EN/IS. TS can be referenced in public procurement, but it is more common to require a full EN/IS to assure a better consensus. Older document types that are not used any more are ENVs (preliminary EN standards), and these references can still be found in some specifications.
3. The third level can be called a Technical Report (TR), ETSI Specification (ES), Workshop Agreement (WS) and several other names. These are documents that either are intended as supporting material, or if a specification is needed very fast, or where consensus cannot be achieved but the documents still are registered.

There are also other types of documents issued by SDOs, and their status will usually be described in the introduction of the document itself.

**Time to produce standards.**
Standardisation is a very time consuming process. If we go for the full standard EN or ISO above, there are four steps or stages to go through as indicated in the following drawing:
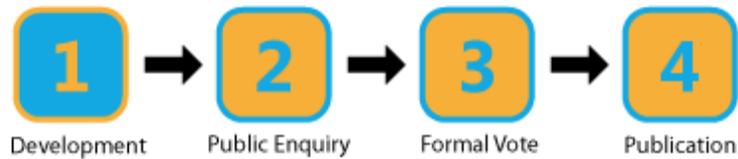


Each of these process steps may take anywhere from 6 to 18 months, and the typical duration is around three years for a full standard. More details can be found in the various bodies development rules, see for example the ETSI Status Codes and the CEN/ISO Stage Codes

| STAGE | SUBSTAGE | | | 90 Decision Substages | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| | 00 Registration | 20 Start of main action | 60 Completion of main action | 92 Repeat an earlier phase | 93 Repeat current phase | 98 Abandon | 99 Proceed |
| 00 Preliminary stage | 00.00 Proposal for new project received | 00.20 Proposal for new project under review | 00.60 Close of review | | | 00.98 Proposal for new project abandoned | 00.99 Approval to ballot proposal for new project |
| 10 Proposal stage | 10.00 Proposal for new project registered | 10.20 New project ballot initiated | 10.60 Close of voting | 10.92 Proposal returned to submitter for further definition | | 10.98 New project rejected | 10.99 New project approved |
| 20 Preparatory stage | 20.00 New project registered in TC/SC work programme | 20.20 Working draft (WD) study initiated | 20.60 Close of comment period | | | 20.98 Project deleted | 20.99 WD approved for registration as CD |
| 30 Committee stage | 30.00 Committee draft (CD) registered | 30.20 CD study/ballot initiated | 30.60 Close of voting/ comment period | 30.92 CD referred back to Working Group | | 30.98 Project deleted | 30.99 CD approved for registration as DIS |
| 40 Enquiry stage | 40.00 DIS registered | 40.20 DIS ballot initiated: 5 months | 40.60 Close of voting | 40.92 Full report circulated: DIS referred back to TC or SC | 40.93 Full report circulated: decision for new DIS ballot | 40.98 Project deleted | 40.99 Full report circulated: DIS approved for registration as FDIS |
| 50 Approval stage | 50.00 FDIS registered for formal approval | 50.20 FDIS ballot initiated: 2 months. Proof sent to secretariat | 50.60 Close of voting. Proof returned by secretariat | 50.92 FDIS referred back to TC or SC | | 50.98 Project deleted | 50.99 FDIS approved for publication |
| 60 Publication stage | 60.00 International Standard under publication | | 60.60 International Standard published | | | | |
| 90 Review stage | | 90.20 International Standard under periodical review | 90.60 Close of review | 90.92 International Standard to be revised | 90.93 International Standard confirmed | | 90.99 Withdrawal of International Standard proposed by TC or SC |
| 95 Withdrawal stage | | 95.20 Withdrawal ballot initiated | 95.60 Close of voting | 95.92 Decision not to withdraw International Standard | | | 95.99 Withdrawal of International Standard |

The focus is on enabling standards. This means that a typical standard will allow several ways to achieve the goal, as long as the function and external behaviour is the same. Exact product

specifications are not the responsibility of SDOs, which often leads to misunderstandings even within the Working Groups.

**Statens vegvesen**

**Statens vegvesen**