Elektrische Signalverarbeitung Dr. Fischer GmbH

ESF News

Standard releases for C-ITS deployment

As part of the EC's C-ITS mandate M/453 the two European SDOs

- CEN (governmental SDO, cooperating with ISO)

- ETSI (NGO)

produced the requested "C-ITS Release 1" in two documents. Some information on the CEN/ISO part is presented at http://release1.its-standards.eu/. The ETSI TR can be found on the ETSI portal.

As easily to be identified by careful reading of the standards listed in this Release 1, this release is far away from being useful as a release for large-scale deployment. The two major reasons are:

- inconsistency
  (competing standards);

- incompleteness
  (missing standards).

Adding to this the fact that so far it is not visible that the European car industry is providing C-ITS equipment in their vehicles in line with their MoU (start of deployment announced for 2015), those who really need C-ITS and want launching their deployment projects now need to base their policy documents and tender documents either on their own set of specifications, or on a real deployment release.

We have also to be aware of this new movement to wait for 5G, i.e. the next generation of cellular networks (CNs), claiming to be a replacement for ITS-G5 (ETSI) / ITS-M5 (ISO) / US DSRC providing improved technological performance and features. However we rather believe that 5G will constitute a significant change of paradigm towards a more complete control of the society by "the cellular network".

Already in 2016, senior experts on mobile networks presented precisely the challenges with 5G:

- writing requirements and wishes on paper is easy, but there are physical limits;

- agreeing on harmonized specifications is a painful process of consensus finding;

- implementing and testing will not be easier than the paperwork;

- ITS has a low priority in this field, and validation of applicability of the new technology for C-ITS is not at all on top of the to-do list;

- market access for C-ITS can be expected in about 15 years from now only.

Do we want CNs being a communication tool for C-ITS, or C-ITS being a feature of CNs? So far the ITS architecture standards ISO 21217 (and the ETSI copy EN 302 665 of it) identify CNs simply as a communications tool, which is very reasonable, as the ITS station management (ITS-S is a bounded secured managed entity) never can control CN details sufficiently due to the fact that CNs are a kind of "closed systems".

But there are also good news! There is no need to look into the crystal ball, as we have real technical facts available.

A set of standards that can be identified as part of the first deployment release, so to say the C-ITS Release 2, is almost finished by C-ITS experts working mainly at ISO, CEN, and IEEE, and for the still missing part new work items are already approved. Active contributions from ETSI for this release are not expected, as the set of standards created by ETSI TC ITS in the timeframe from end 2007 until now constitutes a silo, i.e. respective implementations are not at all interoperable with IEEE WAVE devices and CEN/ISO ITS station units. Further on, although experts requested specific changes in order to break this silo easily, to save significant protocol overhead, and to align the "ETSI ITS protocol stack" more closely to the OSI model, there was no support so far by ETSI TC ITS.

Choosing a silo-approach for Cooperative ITS, which so far is used only in trial projects, is an oxymoron. Having a sharp tongue it could be concluded that there was an intention to never use this set of silo standards for large scale deployment.

Well, we accept business models and tactics, but for the society this is not helpful right now when the infrastructure stakeholders need "real meat" and not just "funny papers", and when the European Commission is pushing "Urban ITS", which also will use C-ITS technologies.

The world around the "ETSI island" actively works towards real cooperation, i.e. harmonized interoperable protocols and procedures for global

C-ITS without describing a specific "proprietary silo" covered by IPRs, by enabling different implementation contexts, e.g. a WAVE device being highly optimized for road safety applications, and a CEN/ISO ITS station unit operated as a bounded secured managed entity being future-proof and in support of hybrid communications and a wide range of applications — just to illustrate the whole spread of possible approaches. WAVE devices and ITS station units support interoperability modes for road safety using ITS-M5, which is the only proven communication technology we have for localized communications in C-ITS.

For this planned C-ITS release 2, which will be finished in 2018, we consider the good developments from all SDOs, including beneficial usage of cellular networks, i.e. for IPv6-based mobile Internet access.

LTE-V2X specified in the 3GPP Release 14 still seems to be too little mature for large scale deployment. LTE-V2X is a trade name similar to LTE-D2D rather than a precise technical term. The intended technology might probably be sufficiently specified in Release 15 (5G). However band-sharing of LTE-V2X / 5G and ITS-M5 at 5,9 GHz is simply impossible, as the design of ITS-M5 and its related applications was perfectly done to fill the assigned bands to the acceptable level. As there is no more space for another technology at 5,9 GHz, a future LTE-V2X has to use licensed bands, e.g. in the 3,8 GHz range.

There is one world, and one C-ITS / U-ITS!

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Urban ITS

Urban ITS (U-ITS) is the next approach towards global deployment of ITS in Europe pushed by the European Commission with its mandate M/546 on *a standardisation request to the European standardisation organisations as regards Intelligent Transport Systems (ITS) in urban areas in support of Directive 2010/40/EU of the European Parliament and of the Council of 7 July 2010 on the framework for the deployment of Intelligent Transport Systems in the field of road transport and for interfaces with other modes of transport*, dated 12.2.2016. The justification for this mandate is presented in the final report of the CEN TC278 WG17 project team PT1701. This report is based on questionnaires performed in the EU and identifies necessary standardization activities. Subsequently, the EU already granted support for a large sequence of project teams working on the following topics:

- Location Referencing Harmonisation;
- Traffic management systems - Status, fault and quality requirements;
- Emissions management in urban environment;
- Management of electronic traffic regulations (METR);
- Mixed vendor environments;
- Traffic management data models;
- Traffic management interfaces and information;
- Models and definitions for new modes.

Content:

U-ITS, for sure, uses technologies already developed and proven for C-ITS such that U-ITS will not be a new silo, but beneficially uses synergies.

Latest news

ESF GmbH finished the revision of the whole set of C-ITS standards formerly known under the acronym CALM. These standards from ISO TC204 WG16 are architecturally harmonized with the standards from CEN TC278 WG16 / ISO TC204 WG18 (EN ISO 17419, 17423, 18750, CEN ISO TS 21176, etc.). Localized communications at 5,9 GHz (ISO 29281, 21215, 21218) and service advertisement (ISO 22418) has interoperability modes with IEEE WAVE (IEEE 1609.3). Publication of the whole set of standards is expected to be finished in 2018. A common approach towards conformance testing is available in ISO TS 20026. Guidelines on usage of the whole set of standards together with a C-ITS Release 2 description will become available in CEN ISO TR 21186.

The concept of METR, see above, was identified in the context of the U-ITS development, being aware of the progress in the domain of autonomous vehicles, which have to learn about traffic regulations by means of ITS technologies, including communications of such regulations in standardized formats from roadside and central ITS station units into vehicle ITS station units.

Beside the technical challenges to approach METR in a reliable way, considering also mixed mode of traditionally steered and autonomous vehicles, there are mainly legal challenges. These issues are discussed in the U-ITS WG17 of CEN TC278.