CAR 2 CAR -Newsletter-

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CAR 2 CAR
COMMUNICATION CONSORTIUM

In the ninth issue:

CAR 2 CAR Communication Consortium
by Søren Hess (General Manager, C2C-CC)

The C2C-CC is still growing as important stakeholders from both automotive manufacturers and global suppliers as well as development members are joining us to take part in our activities to develop and deploy cooperative ITS.

Since the consortium was established 10 years ago we took a leading role in research on Car2Car Communication systems. We have overcome the technical challenges and cooperative ITS is now validated at large scale field operational tests such as Drive C2X, SCORE@F, sim-TD and others.

We took a strong lead in the standardisation within in particular ETSI TC ITS

The CAR 2 CAR Communication Consortium's General Manager Søren Hess.

but also contributing strongly to the work in CEN TC 278 in order to meet the standards requirements for day one in the cooperative ITS.

The C2C-CC task forces to solve technical open issues such as event detection and data quality, wireless performance, multi channel operation and security/privacy is now being finalised and with finalisation of the standardisation within ETSI and CEN we are soon ready for the initial deployment.

In this process we have also had close cooperation with the OEMs within US notably the CAMP and the VIIC people. Coordination of the deployment activities solving technical and operational issues is useful for both parties even if we have somewhat different deployment plans. Also the MoU between SAE and ETSI has resulted in constructive cooperation and coordination of our standardisation activities.

The OEMs within the Steering Committee of the C2C-CC have agreed on a Memorandum of Understanding for initial deployment within the next few years and we have agreed on the day one applications and the C2C system profile of the standards is being developed based on ETIS G5 standards.

In the Amsterdam Group, the C2C-CC is working with the European Road Authorities within CEDR, the Motorway operators within ASECAP and the city and regions authorities within POLIS. A joint roadmap for deployment is being developed and agreements are being signed. The demonstration of

the C2C-CC and the Testfeld Telematik consortium at the ITS World Congress in Vienna where we jointly are showing cooperative ITS on public roads is a major step towards the joint deployment which will be initiated soon.

The European Commission supports our activities as a key element in fulfilling the requirements within the ITS Action Plan and the ITS Directive. I would like to thank all of you for your excellent contributions within the CAR 2 CAR Communication Consortium and the standards

organisations as well as the field operational tests to achieve our common goals.
I look forward to your continued cooperation for the last steps toward deployment of cooperative ITS in Europe and globally.

Summary of OEM/GOV Meeting in Wolfsburg
by Karl-Oskar Proskawetz (Administrator, C2C-CC)

The standardisation of cooperative Intelligent Transport Systems enters its terminal phase in the oncoming months. Within the Mandate M/453, the minimum set of standards aiming at ensuring the interoperability of Cooperative Systems all over Europe will be finalised in near future. While the CAR 2 CAR Communication Consortium has heavily contributed to the activities of the European standardisation organisations and in so doing prepares the deployment of C-ITS, it keeps in a further step in sight the international harmonisation of standards and requirements. As a result, the CAR 2 CAR Communication Consortium proceeded its harmonisation approach with an OEM/Government-Workshop, held from 12 to 15 March in Wolfsburg, Germany. Over 50 participants, among them representatives of OEMs and authorities from Europe, USA and Japan, US-Dot and EC, participated in this event hosted by Volkswagen in the Volkswagen Arena, the home stadium of the German Soccer League's Club VfL Wolfsburg.

The quartan meeting aimed at continuing the discussion of standards for day-one Car2X technology which had already constituted the main focus of last year's meetings in Böblingen and Orlando. The working groups reported their efforts in counselling and acquiring harmonisation approaches on message sets, position and performance requirements, crash-avoidance applications, liability issues, certification and qualification, and security, data ownership and liability. The last-named topic was addressed intensively in a separate workshop on the fourth

meeting day. In presentations and discussions, the working groups declared the progress of harmonisation since the meetings in Böblingen and Orlando and gave an insight to the next tasks to be fulfilled to foster the harmonisation of C-ITS standards as a basis of aimed interoperable Intelligent Transport Systems between the regions.

By way of example, the working group on message set coordination and harmonisation has stated different approaches for data accuracy in the USA and Europe and that some data elements of the BSM message are missing in the CAM message. For example the data element for acceleration has to be further discussed, and as question raises whether the data element steering wheel angle is suitable to communicate the intention of the driver to change direction. Additionally the SAE 2735 is evaluated as a message dictionary with many options and a comparison if all data elements of CAM and DEMN are covered by SAE is planned.

An intensive discussion surrounded the position requirements, whether the relative or absolute position is the sufficient information to communicate the adequate vehicle position and has to be put into standards, above all important for crash avoidance applications.

The working group on performance requirements presented the results of the comparison of EU and US approaches. While Waking up/Ignition Concepts and post-crash availability display no need of harmonisation and the 4 way acceleration has not to be harmonised regarding CAM

and BSM, lively discussions surround the antenna performance, congestion control and timing issues as well as the already mentioned steering wheel angle. The WG plans therefore to exchange data and to bring experts together. The same procedure is undertaken for the question which types of performance requirements have to be taken into account for harmonisation of crash avoidance applications. An intensive exchange of information between Europe and the US is envisaged. Representatives of the Working Group on certification and qualification pointed out the differences between qualification as a non-mandatory system and certification as compulsory and mandated procedure. The scope of qualification encompasses technical components like data quality, protocol and interoperability, the overall wireless performance as well as policy components like the use of common sense procedures. Questions raised in this field are how to enforce compliance, fair participation and how to handle new market entrance. The scope of harmonisation is named in identifying and establishing identical test procedures. The workshop with status presentations and internal working group discussions was accompanied by a programme which led the participants through the appealing backdrop of the Volkswagen Arena where they could take a look behind the scenes of managing and hosting a German Soccer League's club. As another social event, the Autostadt was visited.

Over 50 attendees, among them representatives from the OEMs and authorities from Europe, the USA and Japan, participated in the harmonsiation workshop. The quartan meeting took place in the Volkswagen Arena in Wolfsburg.

New CAR 2 CAR members

by Sonja Eickmann (C2C-CC)

ifak - Institut f. Automation und Kommunikation e.V. Magdeburg
Type of member: Development Member
Type of business: Institute of applied research (Industry automation, industrial data communication, industrial metrology, intelligent transport systems)

ARADA Systems
Type of member: Associate Member
Type of business: services for companies engaged in Wi-Fi product development and operations

Autotalks Ltd.
Type of member: Associate Member
Type of business: semiconductor company developing novel solutions for V2X Communication.

Announcement: CAR 2 CAR Forum 2012 in Göteborg, Sweden

by Sonja Eickmann (C2C-CC)

Having passed a very successful annual meeting in the Honda Academy in Erlensee last year, the CAR 2 CAR Communication Consortium currently prepares the next CAR 2 CAR Forum. It will take place on 13 and 14 November 2012 in Göteborg, Sweden, in the Volvo Hall. The yearly event has proven itself as an ideal occasion to exchange and discuss the latest news on developments in the field of cooperative Intelligent Transport Systems. Above all, the activities the CAR 2 CAR Communication Consortium has undertaken to support the deployment of C-ITS, like contributing to the near term standardisation of the technology in the context of the mandate M/453, will be presented to the Consortium's active and basic members. They are invited to take part in the two-days meeting after online-registration which will be arranged on the CAR 2 CAR Communication Consortium's homepage in due time. The first meeting day is intended for plenary presentations and panel discussion sessions, while the second day will be organised by the CAR 2 CAR Communication Consortium's Working Groups and therefore has workshop character. The detailed programme for the CAR 2 CAR Forum will soon be published online under www.car-to-car.org.

Securing your Secrets: Hardware Security Module for C2X security

by Marko Wolf and André Weimerskirch (escrypt)

Hardware Security Modules (HSMs) play a substantial role for the trustworthiness for C2X communication systems. To the expense of some extra complexity, a meaningful HSM integration provides several advantages, which can quickly reward their extra costs. Thus, (1) HSMs enable physical shielding of central C2X security assets (e.g., identities, signing/encryption keys), which, for instance, prevents their extraction in case of a security vulnerability within the upper software layers. By applying adequate tamper-protection measures, (2) HSMs can help to detect and hinder particularly powerful embedded systems attackers, which are capable to execute also physical, offline, or insider attacks. Thirdly, (3) HSMs can accelerate computing-intense security operations by applying dedicated cryptographic accelerators. Last but not least, (4) HSMs might reduce security costs by (i) adding some high-performance special circuitry, instead a costly overall system upgrade, and by (ii) avoiding a costly tamper-protection of the complete ECU.

Figure 1: HSM-enabled C2X system architecture
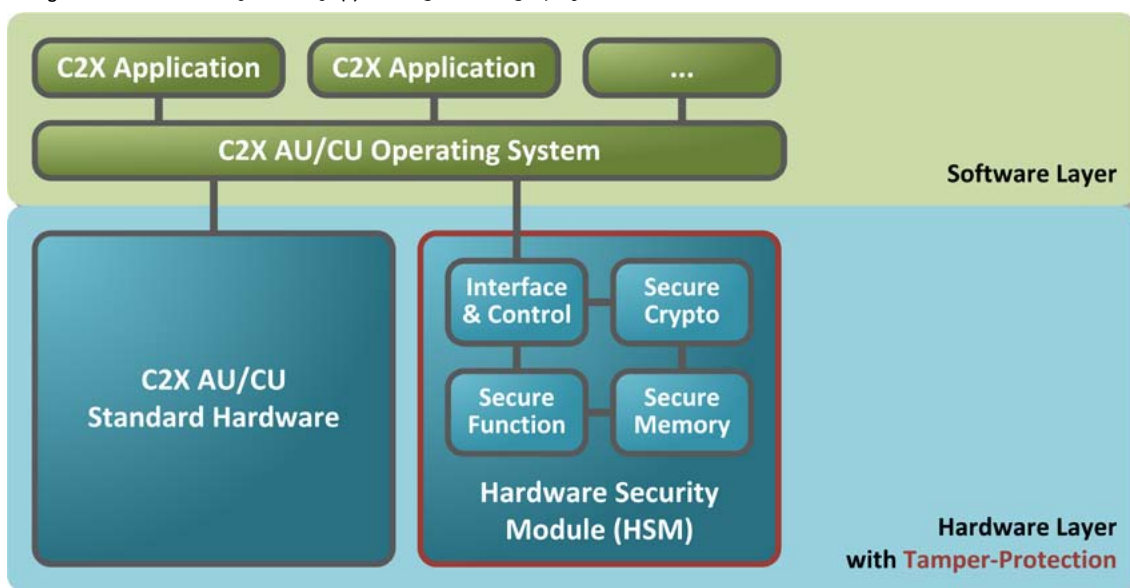
However, the market for HSMs is manifold and not every HSM is meaningful in a C2X context. To enable an adequate protection of the vehicular components involved in a C2X system, a "HSM taskforce", founded as part of the C2C-CC WG Security, develops HSM requirements regarding functionality, protection level, modularity, and sustainability. As shown in the diagram below, the HSM taskforce developed five increasing HSM trust assurances levels (TAL), which classify HSMs regarding their necessary hardware security functionality & performance and their physical tamper-protection level. The classification includes also increasing security evaluation requirements to ensure against any overseen security vulnerabilities in order to increase trust into the resistance and dependability of the respective HSM class. In the last step, all C2C (safety) use cases are grouped to minimum TAL required, which represent an overall attack resistance against security attacks.
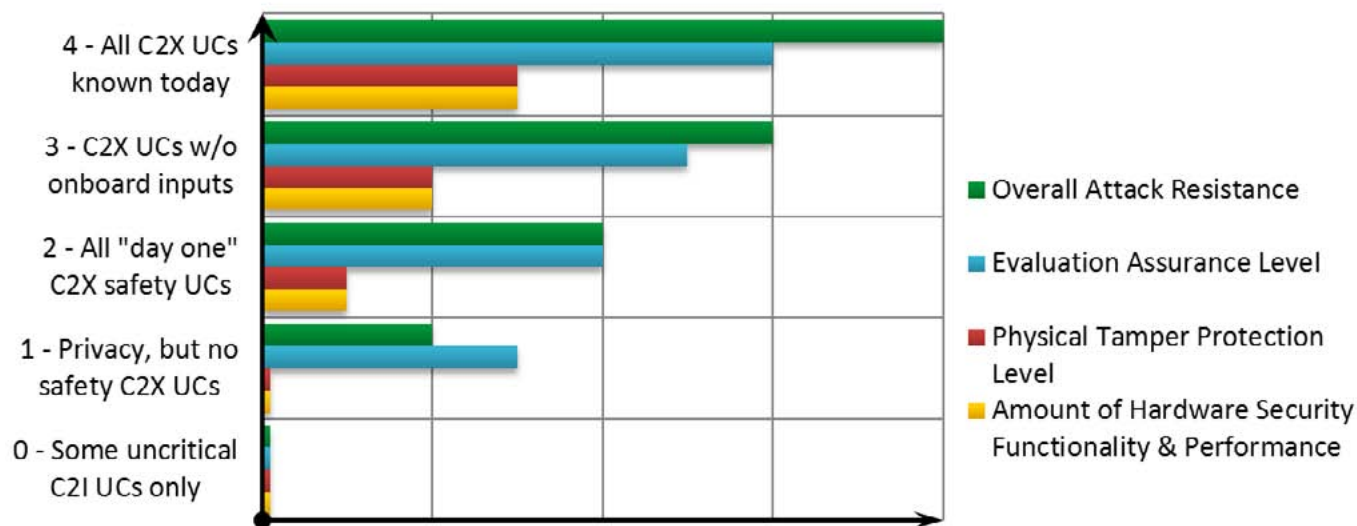

Figure 2: Five different HSM security levels for C2X use cases (UC) with individual security requirements

The different HSM classes enable a modular and cost-efficient approach based on the individual security requirements for each group of C2X use cases. Protecting the in-car C2X components according to the protection needs of the corresponding C2X use case enables a sound balance between risks for the use case and appropriate in-car protection measures. Having this (at least) five individual HSM security levels, we can always ensure adequate security at minimum costs. In particular, the assurance levels pave the way for a moderate in-car security for initial deployment, while also allowing later extensions for use-cases with elevated in-car security needs.

Common driving demonstration at ITS World Congress 2012 in Vienna

by Sonja Eickmann (C2C-CC)

The label 'Smarter on the way' guides the conference programme and exhibition of this year's ITS World Congress, taking place from 22 to 26 October 2012 in Vienna, Austria. The state-of-the-art of cooperative Intelligent Transport Systems (C-ITS) and the progress of bringing them onto the roads will lay in the focus of the 19th World Congress, being the most important yearly event to meet stakeholders of ITS from different business departures. The organisers expect about 7.000 visitors and 300 exhibitors from industry, science and politics in Vienna. The industry and project exhibition as well as the technical lectures serve as platform also to discuss the advantages of ITS for private and commercial use and to network relevant stakeholders in charge for the deployment of Cooperative Systems. In addition, the ITS World Congress hosts a demonstration programme visualising how C-ITS will support the safer and more efficient mobility of the future. The CAR 2 CAR Communication Consortium and the Austrian Testfeld Telematic

Consortium are situated among the organisers of demonstration showcases within this framework. They are currently occupied with preparing a common driving demonstration which enables interested attendees of the ITS World Congress to experience the benefits of Cooperative Systems in informing and supporting the driver, making his traffic participation safer, more efficient and more comfortable. His support in deciding how to react, for example if road works obstruct his route and a lane change is needed, if he risks a red light violation, under bad weather conditions or to choose the optimal speed to approach traffic lights in green phase will be displayed in several use cases of Vehicle2Vehicle as well as Vehicle2Infrastructure Communication. The driving demonstration therefore visualises the interoperability of cooperative Intelligent Transport Systems at this stage, the advantage of common standards set for the interconnectivity of vehicles and infrastructure and that all stakeholders are heavily investing in the near-

19th **ITS World Congress Vienna,** Austria
22 to 26 October **2012**
smarter on the way

termed market introduction: Vehicle manufacturers and suppliers – as partners and members of the CAR 2 CAR Communication Consortium – as well as infrastructure manufacturers and road operators – merged as partners of the research project Testfeld Telematic – are ready for deployment of Cooperative Systems. The wider focus of showcasing Car2X Technology – relying on the research and field operational test project Drive C2X in a great manner – is one of the unique characteristics of the common demonstration in Vienna compared to previous events like the driving Demonstration in Dudenhofen which solely visualised Car2Car Communication. The driving demonstration in Vienna will additionally occur on public roads in real life traffic. The demo tour starts outside the exhibition hall A

and leads through the road network around the exhibition area in Vienna which is located near the motorway junction A2/A23- A4-S1 and encompasses motorways as well as urban streets. As the Testfeld Telematic project originally uses this area for testing telematic services, a large number of equipped cooperative traffic lights and gantries is present. Several use cases for Car2X technology, like traffic jam ahead warning, road works warning, green light optimum speed advisory and many others are going to be shown in the demo route. Only for safety related use cases like motor cycle approaching indication or red light violation, a parking area is set aside for safety reasons. Interested visitors of the ITS World Congress can accompany the demo tour as passengers.

Registration for the Demo tour will be possible beforehand and on site. The registration and briefing for the driving demonstration is located at the booth of the common demo in Hall A. Beside the introduction, the cooperating consortia present there important topics in the field of cooperative Intelligent Transports Systems and invite all visitors of the ITS World Congress to discuss the impressions they have from the potential of C-ITS.

Further, regularly updated information will soon be announced on the homepage www.car-to-car.org.

Announcement: VCSS Workshop subsequent to ITS World Congress
by Sonja Eickmann (C2C-CC)

8th International Workshop on Vehicle Communications
Vienna - 27th October 2012

In addition to the ITS World Congress, an important save the date in October is the 8th International Workshop on Vehicle Communications for Safety and Sustainability. Like last year, the event organised by the members of the supportive action COMeSafety2 will take place subsequently to the ITS World Congress, therefore it is scheduled for 27 October 2012 in Vienna.

This year's workshop is hosted by Kapsch allocating the venue. Details about the programme and registration will soon be available on the website www.comesafety2.org. Please note that participation is restricted to 100 attendees, hence you should assure your registration early.

Webinar Programme initiatied by COMeSafety2
by Sonja Eickmann (C2C-CC)

With the before long finalised nomination of the minimum set of standards for day-one co-operative ITS, an important milestone to support the deployment of Cooperative Systems will be reached. Within the framework of M/453, the standardisation committees of CEN TC 278 WG 16 and ETSI TC ITS have intensively worked on the list of standards to make cooperative ITS interoperable. The results of this mandated work have been the topic of the webinar 'Standardisation for European Cooperative ITS for Mandate M/453' organised by the project members of COMeSafety2 and held on Tuesday, 24 July 2012.

The webinar was introduced by a short overview on the supportive action COMeSafety2, its objectives, working groups and project members given by Dieter Seeberger who moderated the webinar. He as well explained the background of the Mandate M/453 issued in October 2009 and accepted by ETSI and CEN. Afterwards the focus was on the standardisation activities of both organisations, represented by their chairmen Soeren Hess (ETSI TC ITS) and Hans-Joachim Schade (CEN TC 278). To step in they gave a brief presentation of both organisations, their working groups and the chaired responsibilies of ETSI and CEN TC 278 in the M/453. Hans-Joachim Schade also declared how cooperative Intelligent Transport Systems are defined to lead to a common understanding between the standardisation organisations ISO, CEN and ETSI. Afterwards a detailed presentation of the identified requirements followed.

The standardisation activities focus on day-one applications and use cases and the minimum set of standards will be finalised soon - for example on behalf of ETSI, 33 standards are already published. Nevertheless there remains much work for both standardisation organisations. Dieter Seeberger led the discussion of the next steps in standardisation of C-ITS and how the organisations' chairmen conceive the future work when the mandate M/453 is finalised.

For interested parties who have not been able to participate in the webinar, the presentations are available on the COMeSafety2 website (www.comesafety.org) in the category Events and Workshops.

The COMeSafety2 webinar programme already started in June and offers all interested stakeholders to learn more about the key steps towards deployment of cooperative ITS in monthly online-seminars lasting between one and one and a half hours. The next webinar is scheduled for September 2012 and will deal with legal aspects of Cooperative ITS. Further topics will be Field Operational Tests (October), C-ITS applications description and requirements (November) and Testing and Certification (this webinar is not yet dated).

With the first webinar held in June, Paul Kompfner and Teresina Herb broke the first ground

Webinars on key steps towards deployment of cooperative ITS

11 June 2012, 10.30 to 12.00 a.m.
Cooperative ITS Architecture: A blueprint for deployment?
Organiser: P. Kompfner (ERTICO - ITS Europe), T. Herb (bast)

24 July 2012, 3.30 to 5.30 p.m.
Standardisation for European Cooperative ITS for Mandate M453
Organiser: D. Seeberger (Daimler AG) , H.-J. Schade (TSE-Consulting), S. Hess (hess-consult)

September 2012
Legal aspects of Cooperative ITS
Organiser: D. Westhoff (bast)

October 2012
Field Operational Tests
Organiser: M. Strassberger (BMW Group)

November 2012
Cooperative ITS Applications description and requirements
Organiser: G. Ségarra (Renault), H. Zakizadeh (Volvo)

Tbd.
Cooperative ITS System Testing and Certification
Organiser: F. Fischer (ERTICO - ITS Europe)

with the topic ‚Cooperative ITS archtiecture: A blueprint for deployment?' Together with experts from the infrastructure industry and from traffic authorities, they presented and discussed the ongoing identification of a multimodal architecture as a guideline for the deployment of C-ITS, covering different perspectives on the system from an organisational, functional and technical approach.

Paul Kompfner introduced how COMeSafety2 continues the work of the previous project status COMeSafety. It aims at expanding the already established communication architecture to and overall cooperative ITS architecture. C-ITS can't enter European roads without coor-dination between the different actors – vehicle manufacturers, infrastructure producers, suppliers, authorities. They need some kind of guidance, for example the standardisation of technical and legal requirements. Teresina Herb explained subsequently that COMeSafety2 members hold the view of a wide understanding of architecture, not only covering parts of the system, but regarding it from different perspectives. The organisational perspective for example includes the definition of roles and responsibilities, the functional one focuses, among others, on services and applications.

To support the deployment of C-ITS, COMeSafety2 members work intensively on the descrip-tion of an architecture for Cooperative Systems, which is also part of national, European and international projects.

Furthermore COMeSafety2 contacts stakeholders who implement C-ITS to identify problems. For describing an integral C-ITS architecture, the project partners need the feedback of different stakeholders. The overall goal is a multimodal architecture which is open for the further development of C-ITS exceeding day-one use cases, for example the inclusion of new technologies should be possible without the need of changing the architecture.

COMeSafety2 at the Intertraffic 2012 in Amsterdam

by Sonja Eickmann (C2C-CC)

COMeSafety2 project partners Gérard Ségarra, Dr. Markus Straßberger, Teresina Herb, Dr. Karl-Oskar Proskawetz and Hossein Zakizadeh could establish valuable contacts with stakeholders from the traffic and transport industry.

The booth was designed as a real life traffic scenario with a motorcycle and a mobile traffic light.

Bringing cooperative Intelligent Transport Systems onto the roads depends on a bundled effort of all relevant stakeholders investing in the deployment of Cooperative Systems. For that reason one of the main concerns of the supportive action COMeSafety2 is to bring important steps towards an expedient progress of Cooperative Systems up for discussion. To network appreciable stakeholders, to see the benefits of C-ITS from their perspective and to receive their feedback also on critical issues was one of the main goals for COMeSafety2 members to exhibit at the Intertraffic 2012 which took place from 27 to 30 March in Amsterdam. The Intertraffic is known as one of the leading fairs to meet stakeholders from the traffic and infrastructure industrials sector as well as projects , road operators and authorities. These contacts should lead to expert talks issuing the benefits of C-ITS not only in enhancing traffic safety and sustainability but also in other business cases like traffic management, road operating and service providing. The expectations of COMeSafety2 members were answered by the impression that stakeholders of C-ITS get more and more persuaded of the advantages of cooperative Systems. Therefore they could win important supporters to the deployment of C-ITS.

At the Intertraffic, COMeSafety2 operated a booth as well as gave presentations and seminars in the so called Smart Mobility Centre, a course of lectures on Smart Mobility. Project partners contributed on the one hand side to the Smart Mobility Knowledge Centre with two seminars, addressing the already fulfilled and still outstanding steps towards deployment of cooperative ITS and the C-ITS Architecture along with roles and responsibilities of involved parties. On the other hand side, two additional lectures where held in the Smart Mobility Theatre, accessible for all interested fair visitors. In this context, project partners presented, beside the framework towards C-ITS in Europe and beyond, field operational tests as one of the current activities to prepare the deployment of Cooperative Systems.
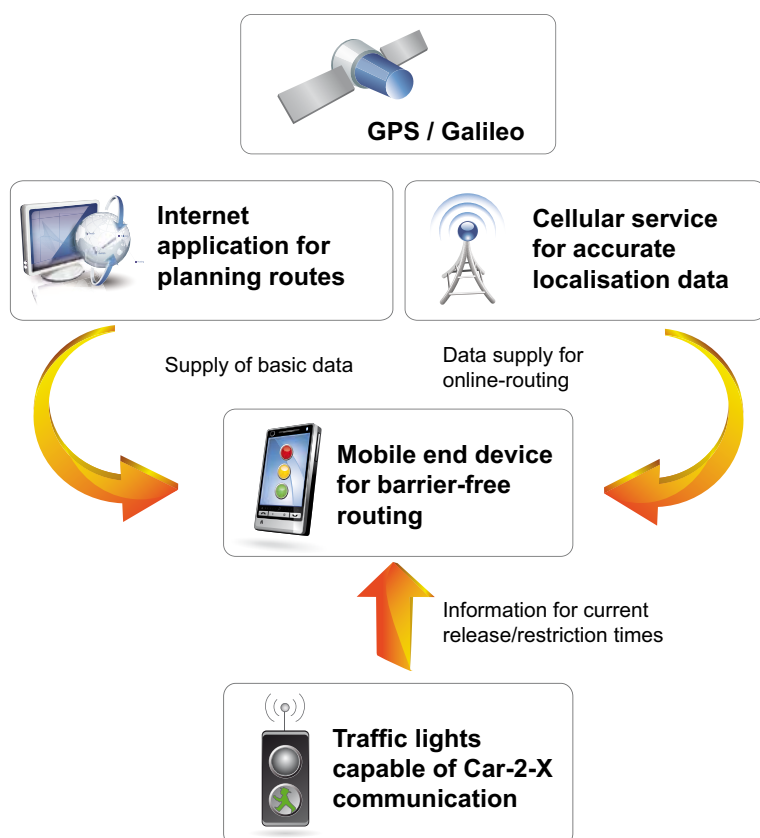
In close proximity to the Smart Mobility Theatre, the COMeSafety2 booth was located. Project partners had decided to design the booth with a printed real life traffic scenario, showing an intersection with different vehicles involved in safety-related use cases, a mobile traffic light and a motorcycle in front to visualise the potential benefits of Cooperative Systems in intra urban traffic. The booth design served at explaining how cooperative Intelligent Transport Systems will enhance traffic safety and efficiency, for example if roadworks obstruct the routes, the driver's view is blocked or lane changes are needed. Another shown use cases was an emergency vehicle approaching the intersection which has to receive a prioritisation fast and therefore can communicate it's intended direction. The COMeSafety2 booth was well frequented by other exhibitors, interested visitor of the professional public and experts from the infrastructure, traffic and transport industry. For example, a delegation of the Dutch National Data Warehouse visited the booth to get familiar with the objectives and main activities of COMeSafety2.

Overall COMeSafety2 members left Amsterdam after five days with the rich impression that Cooperative Systems receive more and more support from the infrastructure industry and that all relevant stakeholders are willing to contribute to its deployment.

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Related project InMoBS: Vulnerable road users profit from cooperative traffic lights   *by Sonja Eickmann (C2C-CC)*

GPS / Galileo

Internet application for planning routes

Cellular service for accurate localisation data

Supply of basic data

Data supply for online-routing

Mobile end device for barrier-free routing

Information for current release/restriction times

Traffic lights capable of Car-2-X communication

calise the carrier via GPS and cellular radio. In addition, traffic lights or other road side units (RSUs) capable of Car2X communication accord information about for example the signal phase, intersection topography, obstructions like road works and other, currently updated route conditions. The blind and visually impaired people receive acoustic and haptic information by the mobile device.

To further enhance safety and give visually impaired a feeling of security, the InMoBS project partners are going to create an internet application for route planning. The target group will therefore be able to plan safe routes on their home computers – under familiar and stress free circumstances – and to load the calculated route to their smart phone for on site navigation.

The testing of the technical developments – which basically rely on equipped traffic infrastructure like traffic lights capable of Car2X Communication – will also take place in Braunschweig. With the testfield Application platform for Intelligent Mobility (AIM), inner city roads and intersections of Braunschweig are already provided with communication devices and therefore offer an ideal framework for the validation of the guiding and navigation of visually impaired people. AIM was initiated by the German Aerospace Center (DLR) together with the federal state of Niedersachsen, the city of Braunschweig and others partners and serves as testfield for investigating mobility related research issues.

When it comes to the benefits of cooperative Intelligent Transport Systems in enhancing safety for traffic participants, most people initially think of vehicle drivers being supported in deciding how to react in safety-related situations. Less frequently the target group of pedestrians is considered, even though cooperative ITS features several synergy effects to their endorsement as traffic participant. One example of how Cooperative Systems assist non-motorised road users sets a research and development project started at the beginning of this year in Braunschweig, Germany: The project goal is to guide and navigate blind and visually impaired people in intra-urban areas with assistance of smart phones, receiving messages from cooperative traffic lights about for example signal phases and therefore make traffic participation and crossing intersections for the target group easier and safer. The technical approach relies therefore on Car2X technology in great measure and embodies a specified use case which can lead to a greater public and political acceptance of the benefits of C-ITS and the support of their deployment in cities.

The need of blind and visually impaired people to receive support as traffic participants is obvious regarding the current assistance they

obtain: Merely some intersections are specially equipped with traffic lights sending acoustic signals, but crossing roads and especially much frequented intersections ordinarily remains stressful and dangerous. Those findings originate from a survey among blind and visually impaired persons being an integral part of the research project in Braunschweig. The project InMoBS (intra-urban Mobility-support for the Blind and viSually impaired) aims at finding a solution to support the mobility of the target group, avoiding that they restrict their traffic participation to tested and trained routes. The project was initiated by institutes of the resident Braunschweig University of Technology together with the German Association for Blind People, research institutions (DLR), developers in the field of technical solutions for communication and navigation (Oecon, TransVer) as well as infrastructure manufacturer (Siemens) and a competence network (ITS Niedersachsen).

Together they work on the technical solution to guide and navigate visually impaired people in intra-urban areas – with Car2X technology as basis for the data exchange between road infrastructure and the mobile device. On the one hand side, the mobile device – for example smart phones of commercial practice – shall lo-