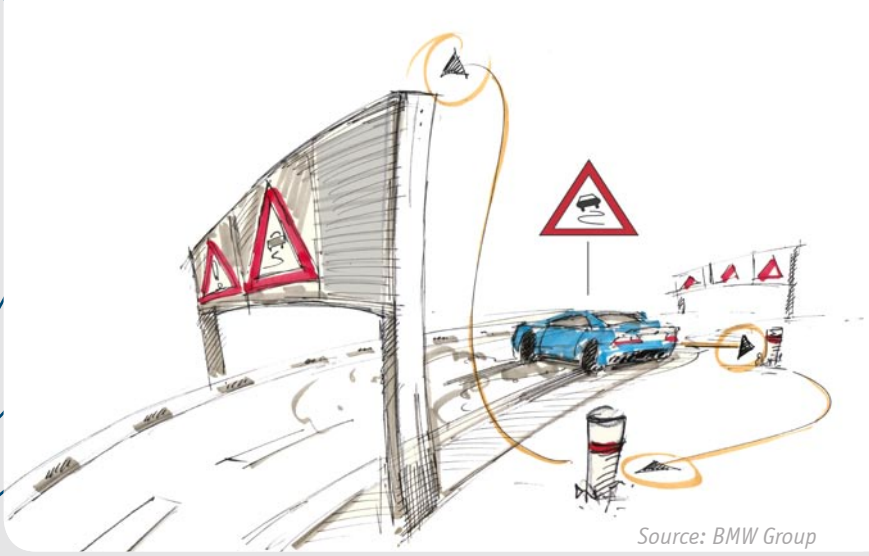
CAR 2 CAR -Newsletter-

Issue 3 / June 2008



Source: BMW Group

In the third issue:

CAR 2 CAR COMMUNICATION CONSORTIUM

At a glance

Dear partners and members

In today's fast-paced world mobility is a key function we don't want to miss. It raises our quality of life and symbolises an essential condition for wealth and increase. Experts evaluate a raise of individual traffic of 30 % till the year 2020. Heavy duty traffic will increase even more. This rising volume of traffic can't be accomplished efficiently by roadworks and political regulations alone.

Only with a proper organisation, intelligent guidance and a combination of already existing and new communication- and traffic capacity technologies, the future flow of traffic will get out of its chaotic shadow existence and make another quality of mobility possible.

The CAR 2 CAR Communication Consortium takes part at the creation of this approaching future and actively designs it with the help of the members in various national and European projects.

We already reported about a few of these projects in previous newsletters. In this one we would like to give you an overview of the project Safespot.

A big milestone within the annual CAR 2 CAR Communication Consortium Forum will be the Demonstrator. On the basis of the 802.11p preliminary standard and the frequency in 5.8/5.9 GHz band concerning the subject Car 2 Car and Car 2 Infrastructure communication, the latest technologies will be presented there for the first time. As far as we know, there has never been a comparable event before, showing these technologies in function and in this complexity.

With this years CAR 2 CAR Forum and Demonstrator the CAR 2 CAR Communication Consortium is showing its ability and how efficiently we are pushing our common intentions. We are delighted to have reached a good and positive noticeability on the European level in political- as well as in standardisation committees. The amount of requests of the media and invitations to special events demonstrate that we are appreciated as reliable and competent contact.

The ETSI applied to become co-sponsor of our CAR 2CAR Forum and Demonstrator 2008. We, as CAR 2 CAR Communication Consortium, appreciate this emphatically and are looking forward to the closer collaboration with the ETSI also in the new created Technical Committee Intelligent Transport Systems (ITS) in which we actively collaborate with our CAR 2 CAR Communication Consortium.

As always, if you have any comments or feedback concerning the newsletter, don't hesitate to contact me via mail: mietzner@car-2-car.org. Or, if you want to see your name in lights, or at least on our website you should post your thoughts to us.

Yours faithfully,
Rudolf Mietzner
General Manager

Membership News: CAR 2 CAR Communication Consortium Web Presence

by Gunnar Heyms (GZVB)

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Collaboration Area

The collaboration area for the active members of the CAR 2 CAR Communication Consortium was successfully activated at the beginning of this year. In this regard the new document management has replaced the previous one, placed in the right hand side area of the website. For this reason the previous document management will disappear from this area within the next weeks.

If you have any comments or problems with your account concerning the new collaboration area please don't hesitate to contact me. We are in the start-up phase and reporting is important for bug fixing.

Website

In the course of the improvement of the web presence, there will be carried out a revision of the navigation structure and content of the website within the next months. As an active member you will find a mind map with a structure proposal in the folder "Public_Relation_Material" on the collaboration area.

This is attended by the revision of the design and functionality. You can see a first proposition for the functionality as well as the design of the menu in the screenshot below (figure 1). A first mock-up for testing look and feel is also available with limited functionality on the following link within the CAR 2 CAR website: www.car-2-car.org/fileadmin/gfx/revision/Prototype08.html

I am pleased about any feedback and proposals!

Contact

Gunnar Heyms
contact@car-2-car.org

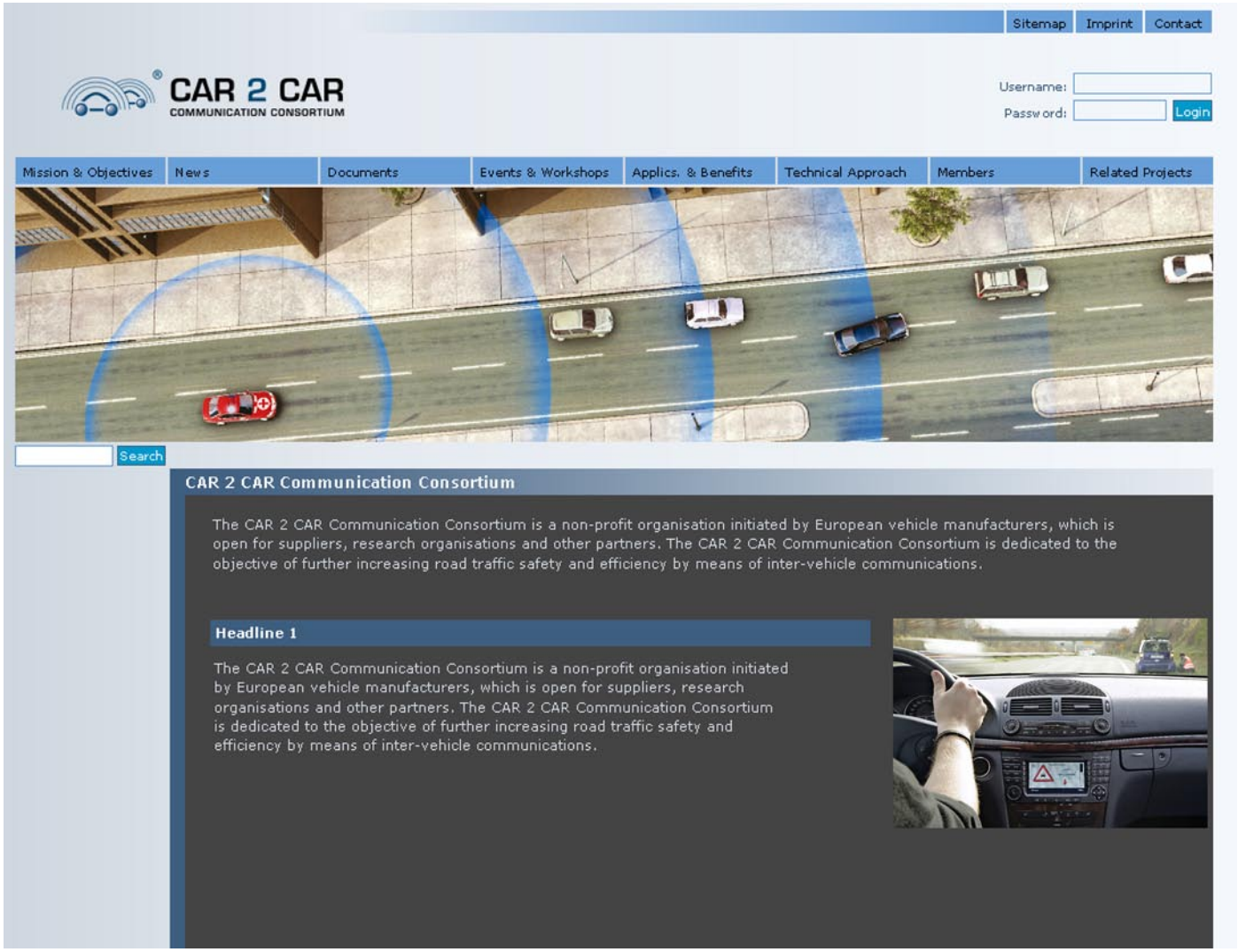

Figure 1: 1st Draft of the website revision

Workgroup Application: Decentralised Environmental Notification

by Lin Lan (Hitachi)

Decentralised Environmental Notification use cases provide information to vehicles or traffic operation centre for a specific situation at a specific location which has potential safety and traffic efficiency impact e.g. black ice. The situation might be detected by one or several passing vehicles or by the road infrastructures, but not necessarily dependent to the detecting node. When a situation is detected, Decentralised Environmental Notification Message is generated, repeated and updated accordingly, and distributed during the duration of the event. This duration may vary from several minutes (broken down vehicle) to several hours (black ice) or even several days (lane closed because of road works). The evolvement as well as the end of the detected situation is reflected in the Decentralised Environmental Notification Message with different versions.

All necessary information specific to the situation shall be included in this message, such as location, situation type, severity etc. Certain level of reliability of the detected situation is assumed by the detect node, based on its detecting capability. Nevertheless, reliability and accuracy check can be also implemented by the receiver vehicle. For example, if a vehicle receives message concerning the same situation from multiple sources, higher reliability and accuracy can be achieved by information correlation.

Furthermore, a destination area is specified, where the information is assumed to be of interest. All vehicles located or entering to the destination area will receive this message. The communication mechanism shall ensure not only that the messages are sent to the required destination area within required latency, but also the messages are kept updated and alive in this destination area during the whole valid time. However, it shall be up to the receiver vehicle to check whether the message is relevant to itself. For this purpose, a common location referencing method is of high importance to explicitly locate the situation and receiver with respect to road network and road traffic. Based on this relevance check, appropriate warning or information shall be given to drivers via HMI (human machine interface) means. This information can be also used for traffic management if the message is sent to traffic operation centers.

Decentralised Environmental Notification can be used for use cases such as hazardous location Car 2 Car warning, road work zone warning, black ice, traffic jam warning etc.

Workgroup Architecture: Report on COMeSafety

by Markus Straßberger (BMW)

On 3rd - 4th of April a Joint Meeting on Architecture (COMeSafety Architecture Task Force Workshop) with participation of COMeSafety, COOPERS, CVIS, SAFESPOT and the European Commission – organised and moderated by COMeSafety (Timo Kosch) – took place in Brussels. One main issue was the creation of a common architecture document. Other topics in the agenda were the discussion of a common demonstration, the status of standardisation and the discussion of technical issues like channel management or congestion control.

A first common demonstration of involved projects is now in preparation. Some use cases are identified, but have to be refined. This first common demonstration shall be shown at the ITS World Congress in Stockholm, 2009. Further demonstrations with full interoperability shall follow according to an overall timeline for cooperative development, which was adopted at the meeting.

COMeSafety will nominate so called liaison managers to build the connection to the standardisation boards of ETSI, IEEE and ISO. Especially for ETSI liaison managers for each work group are planned. This should improve the standardisation efforts of COMeSafety.

Mid of 2008 a common architecture document shall be published by COMeSafety. The document is divided into 3 parts: "Overall Architectural Framework", "Specifications and Standards" and "Proof of Concept". In addition it will have introduction and executive summary as well as a policies chapter, which will be written by the European Commission.
For each chapter of each part chapter editors have been named who are responsible for the edition of the particular chapter.

The Overall Architectural Framework chapter comprises the following topics:

- *Scenarios, Applications, Use Cases: description of scenarios, use cases and applications of the main fields of application as traffic safety, traffic efficiency and value-added services.*
- *Stakeholder Aspirations, User Needs, Requirements: structured list and description of all sorts of requirements to a common architecture.*

Overall Framework: Domains, Actors, Terminators, Entities: list and description of the elements of the overall framework

- *Architectural Views: the different views are a physical viewpoint, a communication viewpoint and a functional viewpoint.*
- *Information Flow: describes the interchanged information.*
- *Organisational Topics: describes the maintenance process for the baseline architecture in case of subsequent events.*

The Specifications and Standards chapter comprises the following topics:

- *Radio Systems: describes radio systems in use.*
- *Communication Protocols: describes application and network layer protocols in use.*
- *Security: considers relevant security aspects.*
- *Message Catalogue: structured list of messages.*
- *System Management: describes communication and data management.*

The Proof of Concept chapter comprises the following topics:

- *Implemented Software Frameworks and Components: describes systems in use.*
- *Common Demonstration: describes the common demonstrations.*

The document is still under construction as a common document of the involved projects COMeSafety, COOPERS, CVIS, SAFESPOT and the European Commission. A first draft will be available in early summer 2008 and a first final version mid of 2008.

Currently COMeSafety is updating its website www.comesafety.org. All new information on and ongoing activities of the project can be consulted there.

Workgroup Net: Channel Usage, Policies

by Achim Brakemeier (Daimler), Andreas Festag (NEC)

Based on the ECC Decision of frequency designation of 30 MHz for road safety applications in the band 5875-5905 MHz the discussion about an efficient channel usage has lead to a preliminary proposal as shown in the following figure:

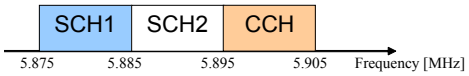

Figure 1: preliminary channel usage

The frequency band is divided into 10 MHz channels, whereas the upper channel is used as a control channel (CCH). The lower channel is used as the first service channel (SCH1) and the inner channel is used as a secondary service channel (SCH2). Control channel and the first service channel are equivalent to the previously defined channels of the dual receiver concept. In addition the secondary service channel could be used for low power, short distance communication.

This channel usage scheme has been adopted by the European projects COMeSafety, SAFESPOT, COOPERS and CVIS where it forms the base for project interoperability. Furthermore this proposal will be fed into the standardisation at ETSI TC ITS where the discussion about the harmonised use of a control channel has already started.

It must be noted that the frequency band 5875-5905 MHz for ITS road safety applications will not suffer from excessive interference resulting from other services / systems, but the system must cope with adjacent channel interference inside this band. Therefore the communications on the channels have to follow special policies such that the negative impact on the other channels is minimised. These policies are discussed e.g. in conjunction with congestion control functions and taking into account the special needs of safety applications.

Georouting

Triggered by the definition of application protocols in WG APP, the WG NET has started to specify the corresponding network headers. Clearly, the simplest case is the „Single-Hop Broadcast" network header that is typically used by „Cooperative Awareness" messages on application layer. Once all partners have agreed on the initial network layer specification, the defined format will be the basis for the CAR 2 CAR CC demonstration in October 2008.

ETSI TC ITS WG3 (Transport and Network)

The working groups in ETSI TC ITS are "ready to work": They have defined their scope and working methods – Terms of Reference (ToR) and created a number of work items. Specifically TC ITS WG3 agreed on the development of a multipart standard for Geonetworking and a tentative roadmap (fir gure 2):

The time schedule is challenging and requires a smooth interaction between CAR 2 CAR CC and ETSI TC ITS and optimal support from ongoing R&D projects. For WG3, the FP7 project GeoNet[1], started in February 2008, is strongly supporting the efforts.

[1] www.geonet-project.eu

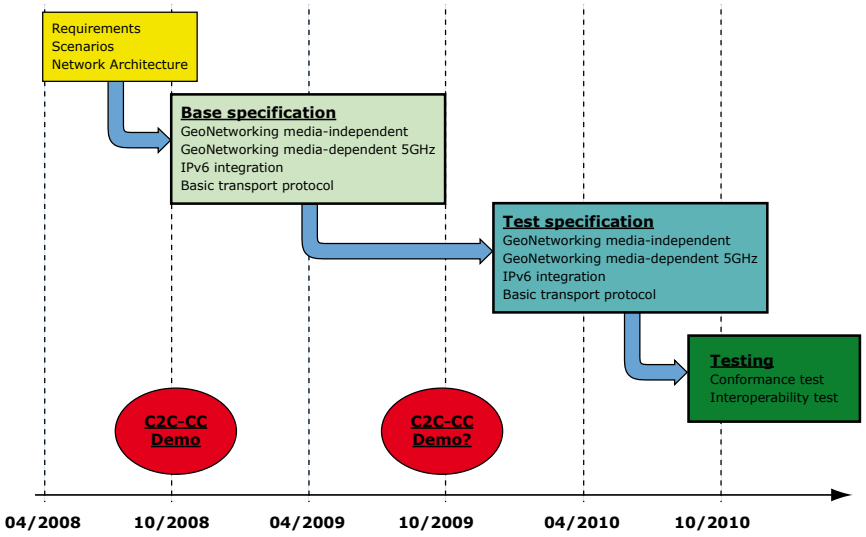

Figure 2: tentative roadmap

Workgroup Phy / Mac: Prototype platforms

by Dr. A. Lübke (Volkswagen), R. Brandes (Delphi), Dr. B. Böddeker (Denso), Dr. A. Festag (NEC) and T. Tsuboi (Renesas)

As a result of the frequency allocation process in Europe, 30 MHz of bandwidth from 5.875 to 5.905 GHz are expected to be available for safety related Car 2 X applications. Additional 20 MHz above this range are considered for future extensions. This spectrum is slightly different from the spectrum available in the US and therefore, CAR 2 CAR Communication Consortium proposes different techniques for channel usage and media access.

In US, the channel selection is based on a time synchronous system using GPS as clock master. The switching interval will be 100 ms and is subdivided as follows: During the first 50 ms, all units must listen and may send on the control channel. For the next 50 ms, one of the service channels can be used. The proposed scheme can be implemented with single or multiple receivers.

In contrast to US solution, CAR 2 CAR CC proposes a multiple receiver system for Europe, with one receiver permanently listening to the control channel and one or more additional receivers for operating the other channels. The advantages of CAR 2 CAR CC´s approach are a more efficient use of the spectrum and shorter latencies for time critical messages on the control channel.

The consortium now is very proud to announce that four members – Delphi, Denso, NEC and Renesas – are ready to support the vehicle manufactures with prototype communication units. All units coming with an application programming interface, which makes it easy for the vehicle manufactures access the communication functionalities. First compatibility tests among the suppliers have already taken place and they delivered promising results.

In the following you can find a more detailed description of the four units.

Delphi

Delphi's Car 2 Car On Board Unit (OBU) is developed to be a suitable solution to communicate between vehicles and to infrastructure. The preinstalled Linux operating system offers an open platform for user applications. The system is open to support all commonly used programming languages like Java, C/C++, etc.

Based on the standard x86 architecture offered by the Intel® Celeron® M 400MHz/1GHz processor and Intel® 815E chipset with 256/512MB SDRAM, the system offers a high calculating ca-

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pability with fast software development. The mass storage is made by a 2/4GB solid-state disk to reduce the risk of damage and loss of data. It can be employed in harsh environmental conditions.

The OBU (figure 1) provides a wide set of standard interfaces, like IEEE 802.11p in the 5.9 GHz frequency range (Atheros chipset), 10/100Mbps Ethernet, USB 1.1 or USB2.0 ports, VGA, Mouse/ Keyboard, RS232, RS422 and RS485. Two CAN ports are also accessible. Microphone and audio input and audio output interfaces are integrated within the system. A build in GPS module permits a precise localisation, real time vehicle tracking and enhanced communication applications.

Figure 1: Delphi's OBU

Delphi also developed a Multistandard Telematics Antenna Module prototype especially for the usage in Car 2 Car and Car 2 Infrastructure communications. The antenna combines two receiver modules for MIMO-/ diversity operation in the designated frequency range. The universal antenna module also contains an active GPS patch and a wide-range cellular phone antenna.

Denso

DENSO's Wireless Safety Unit (WSU) is the follow up development to DENSO's first generation 802.11p communication module, the Wave Radio Module (WRM). The WSU is a feasibility test platform for communication protocol evaluation and application prototyping. It is specifically designed for automotive environments (temperatures, shock, vibration,…) and has its primary focus on safety related applications.

The unit was designed to be as close to an automotive product as possible. This design choice is reflected in several ways, e.g. in the choice of the 400MHz SPC5200B PowerPC processor or the availability of CAN2.0 interfaces.

On the wireless communication side, the WSU can be equipped with one or two custom miniPCI radio modules. The configuration with one module reflects the demands of the US market, the configuration with two modules the EU demands. The custom modules operate in the 5.9 GHz 802.11p frequency band and are able to provide ~20dBm Pout (rate-independent).

In conjunction with the WSU, DENSO provides a communication software stack that implements 802.11p, P1609.3 and P1609.4. This stack can be accessed from applications via a well documented API. Furthermore, the provided software contains a set of dedicated test tools.

In addition, the WSU can be used in combination with ACUp (AKTIV Communication Unit), a CAR 2 CAR CC conformant communication solution for active safety. The development was initiated by BMW and implemented by the partners Cirquent and Philosys in the context of the German AKTIV project. The goal of ACUp is to provide an open and flexible communication solution, which is based on the current state of the CAR 2 CAR CC. The ACUp framework is especially designed to meet the need of evaluation and fast prototyping activities within the Car 2 Car community. The architecture follows an exchangeable approach by enabling the replacement of algorithms and whole communication layers.

The ongoing further development (called OpenWAVE Engine) aims at speeding up the European standardisation activities. It is therefore intended to be provided to interested projects and partners as a highly efficient and easily extendable communication platform.

Figure 2 shows a picture of the WSU in the dual radio configuration.

Figure 2:

Dual Radio Wireless Safety Unit by DENSO

NEC

NEC's platform comprises LinkBird MX as a hardware prototype and the CAR-2-X Communication SDK as software protocol stack. LinkBird MX is based on a 64bits MIPS microprocessor It has 512MB NAND flash memory, 16MB NOR flash and 128MB SDRAM. It supports Linux OS, currently with kernel 2.6, and provides test programme modes and hardware diagnosis functions. With physical dimensions of 153.5mm (W) x 118mm (D) x 43mm (H), LinkBird MX is ideal for usage as a vehicle OBU. Industrial operation temperature in the range between -20 and +65 °C is met. Hibernation technology reduces start-up time and features low power consumption of maximum 5W. Interfaces include RJ-45, USB, VICS[1] , Integrated UART, GPS, CAN and MOST. An IEEE 802.11 card is plugged in as miniPCI, supporting multiple standards, particularly IEEE 802.11p draft 3.0. Two SMA connectors are mounted for antennae and two PCMCIA card slots are for further extensions.

LinkBird MX executes NEC's Car 2 X communication SDK (http://c2x-sdk.neclab.eu), a software toolkit, which provides the most recent CAR 2 CAR Communication Consortium's compliant protocol stack. Additionally, it offers various advanced features, such as wireless ad hoc and multi-hop communication based on Geocast, mechanisms for efficient and reliable data communication, security and privacy, and support safety and infotainment applications based on IP version 4 and 6. The SDK enables co-located, stand-alone and hybrid configurations. LinkBird MX either executes the communication protocol stack and applications (collocated), or runs the protocol stack only and connects to one or more application units, such as safety-enhanced navigation devices, telematics units, or mobile phones (stand-alone).

LinkBird MX is designed for maximum flexibility and programmability. Combined with the CAR-2-X Communication SDK, LinkBird MX ideally meets the requirements for field trials, greatly supports implementers in rapid application development, and represents a future-proof platform.

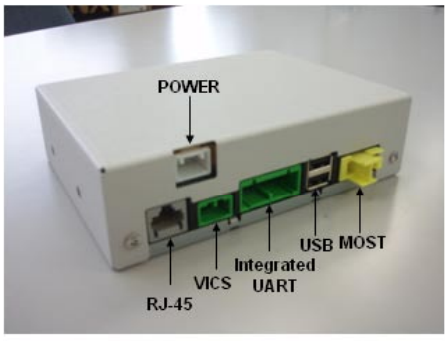

Figure 3:
LinkBird-MX rear view by NEC

[1]Vehicle Information and Communication System

Workgroup Phy / Mac: Prototype platforms

by Dr. A. Luebke (Volkswagen), R. Brandes (Delphi), Dr. B. Boeddeker (Denso), Dr. A. Festag (NEC) and T. Tsuboi (Renesas)

Renesas

Renesas's WAVE system platform supports IEEE802.11p, IEEE1609 and CAR 2 CAR CC target specification. There are two types for WAVE system platform.

The version 1 is consist of Intel Celeron M processor 1.3GHz, DDR (SDRAM) 256MB, two Ethernet port, and two USB2.0 port. And this platform supports two channel transceivers concept (CCH and SCH) independently, which is CAR 2 CAR CC concept in CAR 2 CAR CC manifesto. And each CCH and SCH has antenna diversity for good quality of wireless communication. The radio frequency supports not only 5.9GHz but also 2.4Ghz band for ISM band. The operation system is based on Linux 2.6.12 and it supports general PC for users' WAVE application. The basic software supports IEEE1609.3/4, for network layer, it is open for customer requirement. There is recommendable network software from Hitachi Ltd., who is Renesas system platform partner.

The version 1 can work not only OBU but also RSU with proper software.

The version 2 is consist of Renesas fully embedded RISC processor SH4A 600MHz, DDR (SDRAM 128MB), one Ethernet port. And it is 75% smaller size of version 1 platform. The radio characteristic supports same of the version 1 platform such as dual transceivers for CCH and SCH (CAR 2 CAR CC specification) and 5.9/2.4GHz band operation. The operating system is Linux 2.6.22 (latest software).

The version 2 is more suitable for OBU because of small form factor and full embedded system.

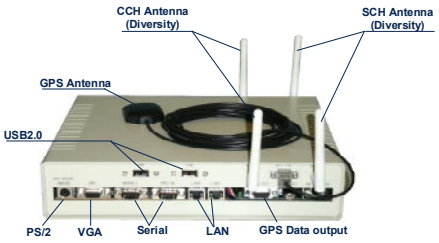

Figure 4.
WAVE system platform version1

Dimension 275mm*240mm*66mm

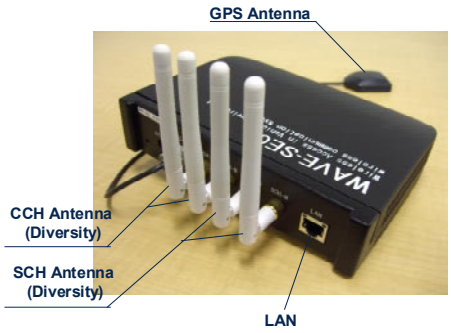

Figure 5:
WAVE System Platform version2
Dimension 150mm*178mm*40mm

Workgroup Security: Status of whitepaper, results from European projects

by Benjamin Weyl (BMW)

Car 2 X communication enables a broad range of safety applications. While this functionality inspires a new era of safety in transportation, new security requirements need to be considered in order to prevent attacks on these systems. Attacks can be manifold: illegally forced malfunctioning of safety critical in-vehicular components as well as the illegal influence of traffic provoked by means of fake messages are just two likely possibilities.

Potential threats and security requirements have been identified and baseline security concepts have been developed by the CAR 2 CAR Communication Consortium Security Working Group. One of the particular interests is trustworthy message exchange to ensure reliable, safe system operation, as well as protection of identity and location against undesired privacy infringement. The Security Working Group has compared different approaches considering efficiency and scalability. More details on the baseline concepts and the activities of the WG can be found in the CAR 2 CAR CC Manifesto [www.car-2-car.org/fileadmin/dokumente/pdf/C2C-CC_manifesto_v1.1.pdf]. Currently, the Working Group discusses efficient pseudonym change methods, appropriate pseudonym change rates and certificate distribution techniques. The Working Group also considers security measures in order to prevent attacks where the in-vehicular system is tampered with, e.g. extracting secret material or manipulating the software.

Within the ETSI TC ITS Working Group 5 on security, a work item has been specified in order to standardise mechanisms and protocols for secure and privacy-preserving communication in vehicular environments, including Car 2 Car as well as Car 2 Infrastructure communication.

Workgroup Simulation: Announcement, mission and scope of work

by Jürgen Rataj (DLR)

The Working group Simulation will be established in the CAR 2 CAR Communication Consortium in the next weeks.

Car 2 X communication raises a bundle of new questions concerning the design of all necessary components, reliability, availability and security aspects as well as the impact of such systems on the entire transportation system. Especially during introduction the market penetration and the possibility of information propagation through the road network are highly important issues.

Existing development methods, like to build-up a few prototypes for function testing are not enough in the case of Car 2 X communication, because of the dependency from penetration rate. Hence, the use of simulation tools is not avoidable. On the other hand, to solve every design and parameter definition problem only by simulation tools will create a huge effort according to the tool development itself.

To tackle these problems the CAR 2 CAR Communication Consortium has now established the new Working Group Simulation. The goal of this Working Group is to support the solution of the described problems by a number of guidelines and standards as well as codes of practice on how to perform simulations and will maintain these guidelines and standards based on ideas and requests from the CAR 2 CAR Communication Consortium Technical Committee.

To start the work in this group a set up committee based on the CAR 2 CAR Communication Consortium Technical Committee will focus and direct the near term goals for the Working Group Simulation. Based on this information all members of the Consortium will be invited to participate in the Working Group Simulation.

Workgroup Standardisation: Latest news on spectrum allocation for ITS in the 5.9 GHz band in Europe

by Dieter Seeberger (Daimler)

The CEPT finalised the frequency allocation in the 5.9 GHz band for Intelligent Transport Systems (ITS). The ECC Recommendation ECC/REC/(08)01 considers 20 MHz of spectrum in the range form 5855 – 5875 MHz for non-safety ITS applications and the ECC Decision ECC/DEC/(08)01 designates 30 MHz of spectrum in the range from 5875-5905 MHz to safety related ITS applications.

It is now in the responsibility of the administrations to implement the CEPT spectrum regulatgions and to make the spectrum available. The German administration decided already to make the spectrum available and started to develop the implementation rules for the national regulation.

All the relevant CEPT documents including the mandate report as basis for a mandatory spectrum decision of the European Commission (EC) are available on the server of the European Radio Office (ERO) www.erodocdb.dk (Figure 1). The development of the EC Decision is still in progress and adoption is expected until end of June 2008.

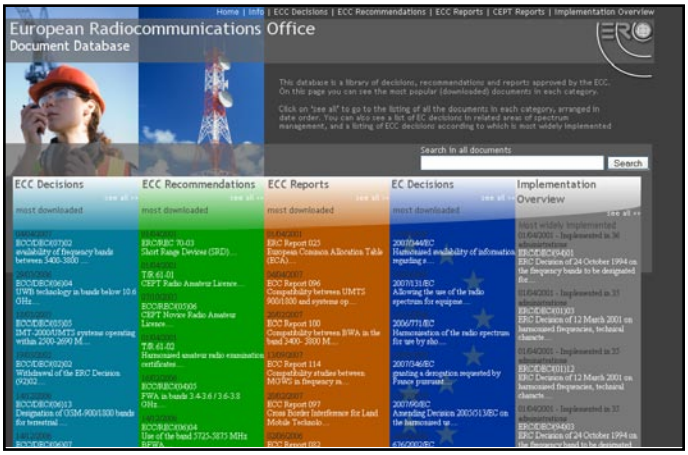

Figure 1: Screenshot of the ERO server on www.erodocdb.dk

ECC Report 101: *Compatibility studies in the band 5855– 5925 MHz between Intelligent Transport Systems (ITS) and other systems*

ECC/DEC/(08)01: *ITS in 5 GHz band ECC Decision of 14 March 2008 on the harmonised use of the 5875-5925 MHz frequency band for Intelligent Transport Systems (ITS)*

ECC/REC/(08)01: *Use of the band 5855-5875 MHz for Intelligent Transport*

CEPT Report 020: *Report from CEPT to EC in response to Mandate on "the harmonised radio spectrum use for safety critical applications of Intelligent Transport Systems (ITS) in the European Union"*

Standardisation of the communication system

CAR 2 CAR Communication Consortium decided to concentrate its standardisation work in the recently founded ETSI Technical Committee ITS. This committee is also seen as the platform for the specification and standardisation of a harmonised system for all over Europe. The TC established liaisons with several projects funded by the European Commission and in its last meeting the TC decided to establish also liaisons with relevant groups at other standardisation bodies like ISO, CEN and IEEE. In particular the IEEE liaison could pave the way towards a European variant of IEEE 802.11p considering the European frequency regulation.

The ETSI TC ITS is chaired by Søren Hess, as Daimler AG representative with support of the CAR 2 CAR CC. The vice chair is Bob Williams from CSI Ltd. Consultancy, who is very much involved in the ISO and CEN standardisation of ITS. The TC ITS is structured into 5 Working Groups as shown in the following table:

WG	Name	Chairman
1	User and Application Requirements	G. Ségarra, Renault
2	Architecture and Cross Layer	Knut Evensen, Q-Free
3	Transport, Network & Web Services	Dr. A. Festag, NEC
4	Media and Medium related	Th. Weber, BNetzA
5	Security	S. Cadzow, Cadzow Com. Consulting Ltd.

The current focus of the activities of the working groups is defined by several work items with regard to Vehicle 2 Vehicle and Vehicle 2 Roadside communications. It is planed to have first draft standards available until June 2009, which will support a basic set of applications. Further information on the work items as well as the schedule of TC and WG meetings is available on the ETSI portal: http://portal.etsi.org.

Honda: Motorcycle 2 Car communication

by Filip Sergeys, Kazumitsu Kushida (Honda)

Since June 2005, Honda has become member to the CAR 2 CAR Communication Consortium with the clear focus to include the motorcycle, and to enrich the scope of the Consortium.

Motorcycles are part of the mobility scenery on our roads since the early days of motorisation in Europe and beyond, providing mobility and leisure to many people. Because of the very concept of the motorcycle – not having any crumble zones like cars – the motorcycle rider is considered a vulnerable road user, alongside pedestrians and cyclists. Its smaller size and limited lighting result in the unfortunate situation where the majority of motorcycle accidents are caused by the other vehicle driver not properly seeing the motorcycle. With increasing traffic and vehicle fleets, motorcycle safety is becoming a growing concern and poses a formidable challenge.

Honda, offering an extensive range of mobility products and the world's market leader of motorcycles - producing around 10 million units annually - recognised this safety challenge since many years and has developed an integrated safety vision build on three pillars: preventive safety, active safety and passive safety. The preventive safety pillar, which aims at avoiding critical situations to occur in the first place, mainly encompasses rider training, but also any ITS based system that is able to provide early warnings which would allow the motorcycle rider to take the appropriate counteraction. A Motorcycle

Figure 1: ASV-3 Scorpion Concept scooter

Honda: Two-wheeler aspects

by Filip Sergeys, Kazumitsu Kushida (Honda)

2 Car communication system, as a variant to the Car 2 Car system, is one such ITS system. Since more than a decade, Honda has been researching and demonstrating Vehicle 2 Vehicle communication systems in Japan (ASV – Advanced Safety vehicle) and the USA (VII – CICAS). This technology shows great potential in several areas, but specifically for the motorcycle rider community for improving motorcycle safety and addressing the motorcycle visibility problem.

Honda is pleased to be member of the CAR 2 CAR Communication Consortium and its contributions focus on motorcycle specific needs and use cases. As one further step forward towards the market introduction of the Car 2 Car system into vehicles – car and motorcycles in Europe - Honda aims to present a Motorcycle 2 Car communication system at the forthcoming CAR 2 CAR demonstration in October 2008. See you there!

Figure 2: ASV-4 Motorcycle-to-Car communication

NoW: Final Workshop on May 8th at Daimler Research Center in Ulm

by Gerhard Nöcker (Daimler)

After 4 years of successful research NoW – Network on Wheels presented it's results on a final workshop in Ulm (Germany). The project NoW was started in May 2004. Supported by the German Ministry of Education and Research (BMBF), project partners are car manufacturers BMW AG, Daimler AG (coordinator of the project), and Volkswagen AG together with Fraunhofer FOKUS, NEC Deutschland GmbH, Siemens AG (until 2006), IMST GmbH (from 2006), and Embedded Wireless GmbH (from 2006). Besides, the Universities Mannheim, Karlsruhe, and München and Carmeq GmbH co-operate within NoW.

Vehicle communication enables a broad variety of safety applications like Hazard Warning, traffic management functions like Decentralised Floating Car Data, and infotainment applications like 'Hot-Spot' information or Media Download. Because inter-vehicle communication is more and more understood as the next big step in vehicle technologies it is essential to lay the foundations for standardisation and commercial exploitation.

NoW has investigated in development and specification of communication protocols, which are based on WLAN technology. An open communication platform for a broad spectrum of applications and for a scalable and reliable communication has been developed. Security concepts and protocols were analysed. Strategies for market introduction were discussed and demonstrator cars for active safety and deployment applications were built up.

The results were continuously submitted to the CAR 2 CAR Communication Consortium in working groups, PHY, MAC, NET, SEC, ARCH, and finally APP. Furthermore the successful process of allocation of a protected spectrum (5.875 - 5.925GHz) for safety and efficiency related

messages was strongly supported by NoW. The communication platform was used in PReVENT WILLWARN and will be applied in other projects like Aktiv, SafeSpot, and CVIS.

Presentations and photos from the final workshop will appear soon on the NoW-website.

For more information:
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Renault: Validation and certification

by Abdel Kader Mokaddem, Gérard Ségarra, (RENAULT SAS)

Product / Service validation is one essential step of the automobile product / service development process (V cycle such as represented in figure 1). Compared to the well known automobile validation procedures, Road Co-operative Systems validation is introducing some new dimensions:

- *Vehicular Communication is by definition supporting Road Co-operative Systems which require the co-operation of several actors to validate its communicating / co-operating applications. It is not anymore the only responsibility of a given OEM to validate elements of Road Co-operating Systems. The responsibility of several actors will be involved in case of malfunction of the system and this especially for road active safety services.*
- *Vehicular Communication is composed of critical radio links and communication protocols which must be working in a complex environment. The complexity is brought by the diversity of road networks and their radio propagation obstacles (urban, rural, motorway with huge buildings, trees, other vehicles…etc.), vehicles being moving at different speeds, variable climatic conditions, changeable traffic patterns… etc.*

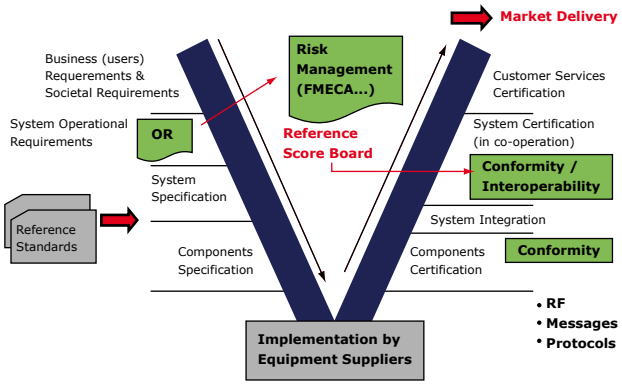

Figure 1: The well known automobile development cycle

Road Co-operative Systems will be supporting various cohabiting customers' services. Societal services will be promoted by public authorities while commercial services shall be developed by the car industry to reach a balanced, viable business model. Some societal services being developed to enhance the road active safety will require some highly availability, dependability, security of the Road Co-operative Systems supporting them. Some communication performances and specific system capabilities requirements will be added. System validation for road safety services can take the form of a self certification which shall be based on common, standard, certification procedures required for cross recognition of the self certification across European Nations (harmonisation role of the European Commission) and World Regions.

Renault: Validation and certification

by Abdel Kader Mokaddem, Gérard Ségarra, (RENAULT SAS)

Facing the complexity of Road Co-operative Systems, their validation / certification and the validation / certification of their components can only be achieved through a combination of validation means such as:

- *Simulation / emulation means using models built from the acquired road experiments.*
- *Tests on circuits equipped in such a way to approach as much as possible the real environments in which vehicles are moving.*
- *Tests on roads in various environmental and traffic conditions.*

Consequently, validation / certification of Road Co-operative Systems involve co-operative activities based on several different standard means which could be shared for the purpose of reducing their investment and operation costs.

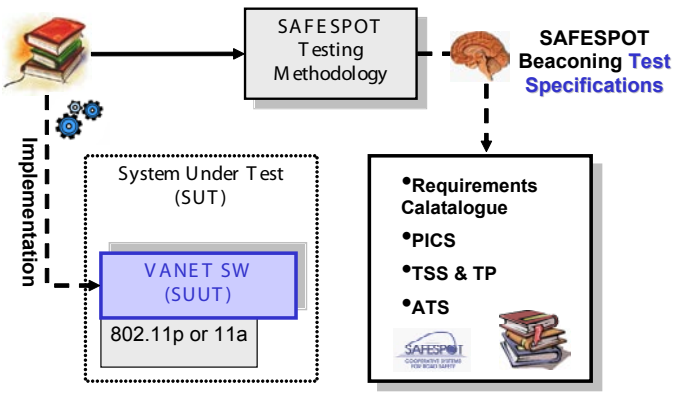

Figure 2: SAFESPOT VANET Specification

Certification in SAFESPOT Project:

Certification is seen as the most effective way to ensure that cooperative systems, based on vehicular communications are compliant to standards or to prove their interoperability.

The European research project SAFESPOT (www.safespot-eu.org) is defining a certification reference framework for cooperative systems starting from relevant existing certification programmes for Bluetooth, WiFi, WiMax, DLNA and EU research project GST-CERTECS. The work currently done is aiming to produce specifications for the tests and the test system following a well defined methodology:

The functionalities to be tested and certified are selected taking as reference points the interfaces defined by the SAFESPOT system architecture. The test specifications are written in TTCN-3 (test and testing control notation) and the test strategy decided according to the objectives of proving conformance between the specification and the real implementation and/or to prove interoperability between different communication systems used by the OEMs.

The test system built from the specifications is validated before starting certification using the SAFESPOT unit under test.

Safespot

by Michele Provera (CRF)

The SAFESPOT integrated project is aimed at improving road safety using Cooperative Applications based on data exchange among vehicles and among vehicles and infrastructure through an ad-hoc network. Its main objectives are:

- *To develop or improve and assess the key enabling technologies:*
  - *Communication through ad-hoc dynamic network whose nodes are vehicles and road side units.*
  - *An accurate relative positioning*
  - *Local dynamic maps.*

  SAFESPOT shall also evaluate how a new generation of wireless network sensors may improve the sensing techniques at infrastructure level.
- *To develop the Safety Margin Assistant, that is an integrated application framework using the safety-related information provided by the network properly fused with the on board sensors and able to advise the driver in order to keep the vehicle as far as possible from emergency situations or to provide a proper warning when they occur. The SAFESPOT applications operates in order to :*
  - *detect in advance potentially dangerous situations,*
  - *extend "in space and time" drivers' awareness of the surrounding environment.*
  - *provide recommendations in order to keep the vehicle as far as possible from emergency situations or providing a proper warning when they occur.*
- *To define in commonality with other EC projects an open, flexible and modular architecture. A joint effort is ongoing in order to define a common European architecture for ITS in the taskforce organised by COMeSAFETY.*

Today SAFESPOT is in its intermediate working period, the core activities are now focused on the development of system components and on the integration of the functions and of the applications on vehicle demonstrators.

PRE-DRIVE C2X

by Matthias Schulze (Daimler)

A consortium under the lead of Daimler AG, that consists to the bigger part of CAR 2 CAR CC members had proposed the PRE-DRIVE C2X (PREparation for DRIVing implementation and evaluation of C2X communication technology) project in the 2nd call for proposals by DG INfSo of the European Commission for the 7th Framework Programme. The proposal was accepted and within the next two years the consortium will develop a detailed system specification and a functionally verified prototype of the common European architecture for an Inter-Vehicle and Vehicle 2 Infrastructure communication system defined by COMeSafety. Furthermore, PRE-DRIVE X2X will develop an integrated simulation model for cooperative systems, which, for the first time, enables a holistic approach for estimation of the expected benefits in terms of safety, efficiency and environment. This work will be topped by the development of tools and methods necessary for functional verification and testing of cooperative systems in laboratory environment, on test tracks and on real roads in the framework of a field operational test. Last but not least extensive dissemination activities are planned to communicate the benefits of cooperative systems technology to the public and to address all relevant European stakeholders.

PRE-DRIVE C2X will start on July 01, 2008 and has an overall budget of about 10 MEuro of which 50% will be contributed by the European Commission.

Announcement CAR 2 CAR Forum and Demonstrator *by Gunnar Heyms (GZVB)*

The first CAR 2 CAR Forum in the previous year proved to be a great success. This year's Forum will take place on the 22nd and 23rd of October at the Opel Test Center in Dudenhofen (fig. 1) and will include the CAR 2 CAR Demonstrator for the very first time. For active and basic members of the CAR 2 CAR Communication Consortium, the first day of the Forum offers plenary sessions on the following topics: European Focus, CAR 2 CAR CC progress report, FOT and Testing. On the second day, the Consortium working groups will offer additional workshops focused on application, security, architecture and Phy/MAC & NET. After the final discussion and wrap-up, the active members of the CAR 2 CAR Communication Consortium will gather for a general assembly.

For registered members of the Consortium, the Demonstrator offers the opportunity to experience several use cases of Vehicle 2 Vehicle Communication realised with the 802.11p preliminary standard. Equipped with OBUs (on board units) of Delphi, Denso, NEC and Renesas, several two- and four-wheelers will be provided by Audi, BMW, Daimler, Fiat, Honda, Opel, Renault, Volvo and VW for live testings on a special handling track (fig. 2) .

As a member of the CAR 2 CAR Communication Consortium you will find all relevant information of the Forum as well as the registration facility in the members section of the CAR 2 CAR website (please login first):
www.car-2-car.org/index.php?id=593

Imprint

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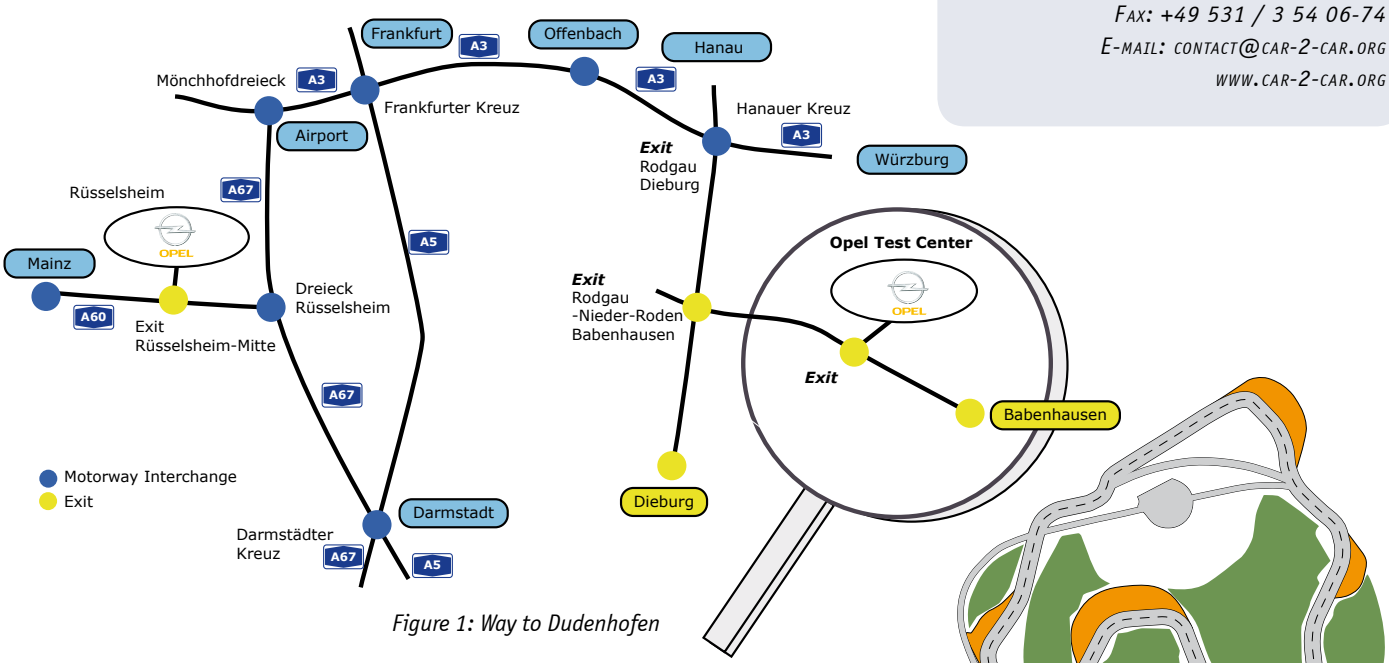

Figure 1: Way to Dudenhofen

Figure 2: Handling track

Interesting Links and Events

IEEE WiVeC'08 — **21–22 September 2008, Calgary, Canda** — **www.ieeevtc.org**
2nd IEEE International Symposium on Wireless Vehicular Communications.

CAR 2 CAR Forum & Demonstrator 2008 — **22-23 October, 2008, Opel Test Track, Dudenhofen, Germany** — **www.car-2-car.org**
the second event of the annually Forum for all active and basic members to provide and discuss the latest consortium news as well as the Demonstrator 2008.

World Congress on ITS — **16-20 November, 2008, New York City, America** — **www.itsworldcongress.org**
The 15th World Congress will be held at the Jacob K. Javits Convention Center.