7th International Workshop on Vehicle Communications for Safety and Sustainability

Minutes of the Meeting

The 7th International Workshop on Vehicle Communications for Safety and Sustainability, organised by COMeSafety2 Project, took place in Orlando, Florida on October 21st 2011, one day after the ITS World Congress. The event was opened by Søren Hess (C2C-CC), who welcomed all participants. Afterwards he handed over to the morning session moderator Peter Sweatman (UMTRI) for chairing the VCSS Workshop. Juhani Jääskeläinen provided the welcome address from the European Commission, Directorate General for Information Society and Media (EC DG INFSO) and highlighted the long tradition of this workshop in exchanging information and learning from each other, and in stimulating the discussion between the regions for achieving a reasonable harmonised approach. Yasuhiro Okumura from the Japanese MLIT and Shelley Row from US DoT ITS Joint Program Office also welcomed the Workshop participants and expressed their expectations on the meeting.

More than 120 experts and high level people contributed to the discussion and the way forward for ITS development and deployment. The workshop was organised by the COMeSafety2 project and strongly supported by the European Commission, the US Department of Transportation and the Japanese Ministry for Land, Infrastructure and Transport (MLIT) and sponsored by the CAR 2 CAR Communication Consortium (C2C-CC).

The full-day workshop was divided into five sessions, each with panellists from all three regions: Europe, Japan and the USA. At the beginning of each session a voting on topic related questions was held. After that the panellists started with brief statements followed by interactive discussions between the panellists and with the audience. Moreover three keynote presentations enriched the workshop. The final summary was given by the two moderators Søren Hess and Peter Sweatman and included their cordial thanks to all panellists, participants and sponsors of the workshop.
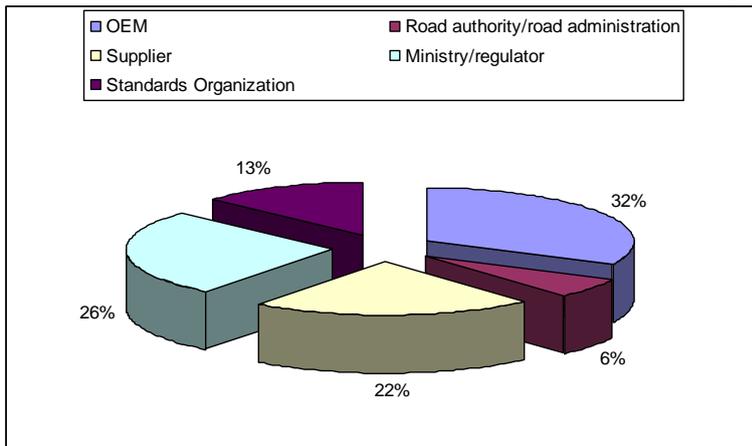
Voting results on workshop participants:

1) Which region are you from?
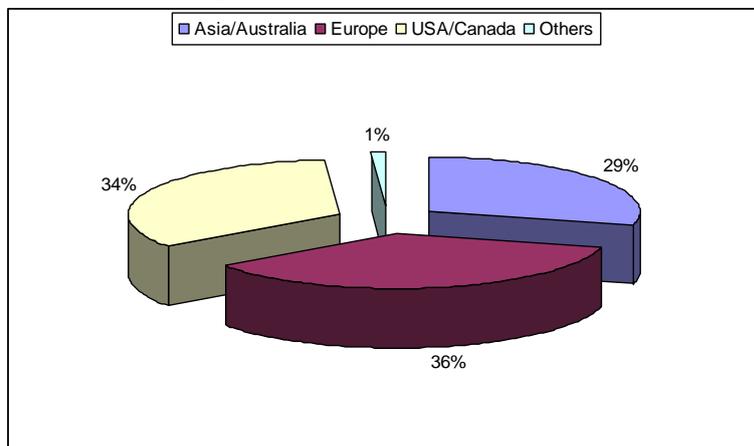
The workshop participants came from:

36% from Europe
34% from USA / Canada
29% from Asia / Australia
01% other regions

2) Which type of company / organization are you representing?

The workshop participants represented:

32% - OEMs
26% - Ministries / Regulators
22% - Suppliers
13% - Road Authorities /
        Road Administration
06% - Standards Organisations

09:00 – 09:15   Welcome

The need for continued global cooperation and harmonization.
- Juhani Jääskeläinen, EU Commission
- Yasuhiro Okumura, MLIT
- Shelley Row, US DOT

09:15 – 09:30   Böblingen meeting

Objective:
Overview and action item from the July meeting in Böblingen.
Panel participants:
- Richard Bishop, Bishop Consulting
- Søren Hess, CAR 2 CAR Communication Consortium

Richard Bishop started the reporting of the OEM and Government workshop held at Böblingen. He pointed out the common sense of expectation that not everything needs to be harmonised, but all aim on taking advantage of current opportunities on harmonising the right elements as much as possible and on saving further harmonisation for future revisions as needed. Søren Hess highlighted that the OEMs request to achieve common hardware with same chip sets and security foundation. The software needs to take into account the specific characteristics of the regions, but the data elements of the message sets shall be aligned as much as necessary. The US approach of using also aftermarket devices for safety applications is being further developed and analysed. The vehicle data access will be probably not necessary. The OEMs explore opportunities for keeping the certification process as simple as possible. Security (and Privacy) is a precondition for achieving user acceptance based on protection and integrity of the communication. Security will rely on common security hardware and security chips based on common standards. The common architecture for key management is aimed to be adoptable to the needs of the regions. The OEMs raised strong concerns regarding to an open vehicle platform and the need for a global registration authority. With respect to the physical layer the different EU – US spectrum channel approach and usage as well as the EU restrictions on out of band emissions were highlighted. Last but not

least the joint Demonstration during the next ITS World Congress 2012 at Vienna was announced.

The main results are documented in a PowerPoint presentation attached to this document.

09:30 – 10:30 Session 1: Global vehicle safety

Moderation: Peter Sweatman, US

Panel participants:

- Markus Bauer, BMW
- Roger Berg, DENSO
- Robert Denaro, NAVTEQ
- Masao Fukushima, Nissan
- Tom Schaffnit, VII
- Mike Shulman, Ford

Voting results:

1) Will aftermarket crash avoidance equipment without vehicle data access support existing sophisticated safety systems? [48% yes / 52% no]
2) Will it be possible to apply performance standards for aftermarket equipment? [66% yes / 34% no]
3) Will crash avoidance be linked to automated intervention? [79% yes / 21% no]
4) Will global implementation of aftermarket equipment for critical safety devices be possible? [41% yes / 59% no]

The discussion started with Masao Fukushima (Nissan) who noted the strong voting result concerning crash avoidance being linked to automated intervention . However, in his opinion warning is very useful and cost effective. Robert Denaro (NAVTEQ) added that the concepts of hard safety and soft safety are complementary. Tom Schaffnit (VII) pointed out the importance of warning the driver before an accident occurs as an intermediate step regarding crash avoidance. Furthermore he stressed that the possibility of implementation of aftermarket equipment will depend on the question if it will accelerate the success of critical safety devices. Roger Berg (DENSO) added that there will be two scenarios for the aftermarket. The first scenario will be a dealer installation and the second will be retail availability like existing entertainment systems.

Markus Bauer (BMW) believed that the process from an informing system to a full vehicle control system will take up to a decade. OEMs and suppliers need time to optimise their systems. Moreover he warned not to start with the most difficult applications but rather rely on the learning curve effect. Mike Shulman (Ford) stressed the importance of a quick success. He saw the biggest challenges in data transmission and consideration of requirements. To solve those challenges it would be a good idea for the OEMs to work cooperatively in the field of demonstration and testing. He expected that after this process a regulation will follow. After these statements the moderator opened the discussion to the audience. Gérard Ségarra (Renault) highlighted that the aftermarket is very important for Renault to equip as many cars as possible.

Frank Kargl (Preserve) directed the discussion to the question of involving other road users like pedestrians. Masao Fukushima (Nissan) answered that other road users are often involved in accidents. Therefore they should have small communication tools to communicate with each other and the cars to avoid accidents. This is also a chance for such aftermarket devices. Markus Bauer (BMW) underlined the importance of systems addressing all road users and

pointed to two projects of BMW which focused on pedestrians and motor cycles, because all road users are at risk.

Søren Hess underlined the differences between US partners who focus on vehicle to vehicle (V2V) communication and the EU partners who focus on vehicle to vehicle communication and vehicle to infrastructure (V2I) communication when talking about aftermarket. Mike Shulman (Ford) returned that V2V needs V2I and Shelley Row (US DOT) added made it clear the major US connected vehicle programs are working in both V2V and V2I as well.

The next discussed topic was the relative roles of vehicle-based sensors and communication between vehicles. Robert Denaro (NAVTEQ) and Tom Schaffnit (VII) saw a complementary function of sensors and communication. Communication will not replace sensors and vice versa. Markus Bauer (BMW) also identified advantages and disadvantages on both systems and he stressed that there is still a lot of research and development to do in the future.

The audience raised the question of aftermarket devices which interact with drivers and other devices which don't interact with drivers. Mike Shulman (Ford) answered that it is open which kind of application will succeed, but warning devices should have a very good chance in the aftermarket.

Then the discussion changed over to the question which actors will enter the community. Robert Denaro (NAVTEQ) and Tom Schaffnit (VII) said that big innovations will come from the smart phone sector, so that these companies could play a bigger role in the future. The major challenge therefore could be the integration of complementing communication media on different systems in a single architecture.

Afterwards Markus Bauer (BMW) emphasised in respect to voting question 3 that usage of hard intervention is a global challenge and needs global cooperation. Roger Berg (DENSO) pointed out that the architecture system must be able to support all kind of devices. This is the key factor for a global supplier who deals with hard safety applications. Mike Shulman (Ford) added the major problem of correctness of data regarding a hard intervention.

10:50 – 12:00 Session 2: Sustainable driving

Moderation: Peter Sweatman, US
Panel participants:

* Hironao Kawashima, Keio University
* Jean-Charles Pandazis, ERTICO
* Marcia Pincus, US DOT
* Hans-Joachim Schade, CEN/ISO
* Gérard Ségarra, Renault
* Steve Shladover, PATH, University of California

Voting results:
1) Are applications for sustainable driving well defined?   [17% yes / 83% no]
2) Is research and standardization finalized for sustainable driving applications?
                                                                        [04% yes / 96% no]
3) Is global harmonization of sustainable driving applications needed?
                                                                        [49% yes / 51% no]
4) Will implementation and deployment be aligned within the regions?
                                                                        [52% yes / 48% no]
5) Will the concept be proved globally within the FOTs?   [39% yes / 61% no]

Before the session started Shelley Row (US DOT) explained that US DOT will have a partnership role in the Vienna show case at the ITS World Congress 2012. This show case will contain exhibits, joint sessions and further elements under discussion. Included in the showcase will be a demo which is sponsored by the CAR 2 CAR Communication Consortium and the TT Consortium from Austria.

After the voting Jean-Charles Pandazis (ERTICO) commented on the very major differences between the safety and sustainability elements of the connected vehicle enterprise. Sustainability applications are at the very beginning. Steve Shladover (PATH) and Hironao Kawashima (Keio University) emphasised the importance of definition of a common terminology. The different parts of sustainable driving are not well defined. Hans-Joachim Schade (CEN/ISO) supported this view and considered that OEMs were well placed to propose some definitions. Gérard Ségarra (Renault) answered that the definitions have to be developed in cooperation between OEMs and road managers. Steve Shladover (PATH) added that the different applications regarding the safety aspects are diverging defined by the stakeholders involved.

Peter Sweatman asked the panel about the advantages of sustainability data based on broadcasting existing measurements in vehicles. Marcia Pincus (US DOT) confirmed the usefulness of such data and proposed the need for a basic (safety and sustainability) message defined with respect to the minimum data needed. Gérard Ségarra (Renault) proposed a cooperative effort between the US and EU to develop such a basic message set with the support of the international standardisation organisations.

Hans-Joachim Schade (CEN/ISO) identified the multiplicity of infrastructure behind the V2I Communication as the most important problem in advancing sustainability applications. The infrastructure part of V2I is quite unclear and not well defined. Jean-Charles Pandazis (ERTICO) strengthened this argument and said that also the legal issues and access aspects are a problem because of the differentiation between the countries. Hironao Kawashima (Keio Univ.) added as another crucial point the different management philosophies of the road operators. The differentiation of message sets of vehicles and message sets of other media is a technical problem that is not well understood yet, but the CEN TC 278 working group 8 tries to solve these questions.

The moderator switched the topic from standardisation to research aspects.

Jean-Charles Pandazis (ERTICO) and Steve Shladover (PATH) pointed out that sustainability research is very complex because it is difficult to directly measure environmental effects, and there is a strong influence of the driver. The EU driven EcoDrive project is one example of research activities in this field. Marcia Pincus (US DOT) and Jean-Charles Pandazis (ERTICO) highlighted that tests have to show the benefit of sustainability applications. These tests have to be carried out across different FOTs. Gérard Ségarra (Renault) took on this argument and suggested a combination of different FOTs (e.g. electro mobility and ITS) to do more and better research, to optimise the FOTs and to show pilots for deployment.

The next discussed topic was the usage of probe data, and was raised by the audience. Steve Shladover (PATH) reported about a project dealing with probe data and traffic signal systems. The process for integration of trucks seems to be a big challenge. Jean-Charles Pandazis (ERTICO) referred to an EU project that has the aim to allow trucks to drive through a city at as much as possible continuous speed with the help of probe data and communication. This reduces significantly the waste of energy by acceleration and braking. In this context Hans-Joachim Schade (CEN/ISO) and Hironao Kawashima (Keio Univ.) pointed out that the ownership of such probe data is still an open question as well as the data management. Gérard Ségarra (Renault) suggested that such data are very helpful for overall traffic management. Traffic management centres in France can collect these data and use it.

The last point of session 2 discussion was the privacy issue. Could the collected probe data be used to make private profiles of drivers? To avoid this, data should be aggregated within in the vehicles. Steve Shladover (PATH) and Gérard Ségarra (Renault) affirmed this audience point of view.

After closing the discussion a revote took place.
Voting results:
1) Are applications for sustainable driving well defined?   [11% yes / 89% no]
2) Is research and standardization finalized for sustainable driving applications?
                                                                                  [04% yes / 96% no]
3) Is global harmonization of sustainable driving applications needed?
                                                                                  [42% yes / 58% no]
4) Will implementation and deployment be aligned within the regions?
                                                                                  [48% yes / 52% no]
5) Will the concept be proved globally within the FOTs?   [32% yes / 68% no]

Ad-hoc Keynote:
After the revote Hironao Kawashima gave a presentation on "**ITS for Evacuation Guidance**". The presentation dealt with the tsunami catastrophe in Japan. It showed that a working communication infrastructure could help warning people and saving lives, but today's communication means failed in operation for several days caused by the disaster. Therefore the cooperative ITS community should consider to use the technology not only for traffic safety and sustainability but also as a viable means to provide disaster communication. The disaster situation in Japan in March 2011 had proved that decentralised cooperative ITS communication systems were more reliable than cellular technologies in this situation.
The presentation is attached to this document.

12:45 – 14:00 Session 3: Security and privacy including certification issues

Keynote:
Andre Weimerskirch (ESCRYPT) gave a presentation on "**Security and Privacy Issues for Connected Vehicle Safety Applications**". The presentation is attached to this document.

Moderation: Søren Hess, EU
Panel Participants:
- Tom Schaffnit, VII
- Frank Kargl, Preserve
- Takaaki Sugiura, Mitsubishi
- Tim Leinmüller, DENSO
- Andre Weimerskirch, ESCRYPT
- Mary Wroten, Ford

Voting results:
1) Is a high level of security protection needed? [78% yes / 22% no]
2) Is global harmonization of security issues useful and demanded? [67% yes / 33% no]
3) Is global harmonization of Public Key Infrastructure sufficiently needed and useful?
[48% yes / 52% no]
4) Are regulatory issues regarding data protection hindering cooperative ITS developments? [64% yes / 36% no]
5) Should a certificate authority be managed by the users (OEMs)? [39% yes / 61% no]
6) Are certification issues in general sufficiently harmonized within the regions?
[46% yes / 54% no]

Frank Kargl (Preserve) and Tim Leinmüller (DENSO) opened the panel with statements that level of privacy depends on the actor. Moreover the level of privacy for the whole system is a question of who could be the attacker and with which resources and who is willing to spend which amount of money for the protection. So, the consequence is that future system has to be upgradeable, because these are open questions. Takaaki Sugiura (Mitsubishi) emphasised the importance of security for a market success. The EU and US experts from the audience added that privacy by design could be a way for the future. The regulation authorities are involved in an opinion process on this issue. Andre Weimerskirch (ESCRYPT) referred to the EU privacy directive which regulates certain aspects. In the future the market will show if this is suitable or if other regulations will follow. Emilio Davila-Gonzales (EC) answered that it is a task of government to regulate those things and it is not a good idea to address it only to the market. Frank Kargl (Preserve) highlighted that it is still unclear what should be protected by any regulation (e.g. full driver anonymity). Having this question answered the technical solutions will follow.

T. Russell Shields (ygomi) from the audience saw a big danger in sophisticated terrorists who could manipulate vehicles to crash into each other. Andre Weimerskirch (ESCRYPT) didn't share this point of view because it is not possible to intervene actively into the vehicle. He thought that false alarms might be a more realistic scenario of terrorism. Frank Kargl (Preserve) supported this opinion and made clear that a danger from terrorists could be acute when talking about autonomous driving.

After that Søren Hess brought the aspect of harmonisation as a new topic to the discussion. Andre Weimerskirch (ESCRYPT) talked about different levels of harmonisation and pointed out that the middle ware is widely harmonised and also implemented in the working groups. Tim Leinmüller (DENSO) made clear that there is no difference between the US and EU standards concerning the requirements. Tom Schaffnit (VII) believed that the security system has to be developed step by step. The driver must be the final decision maker in the case of real dangerous situation or in the case of false alarms.

Takaaki Sugiura (Mitsubishi) emphasised the importance of design of the security system with an encryption key. The question is not only the in-vehicle system but rather aspects of storage and operational concept. Frank Kargl (Preserve) and Tom Schaffnit (VII) noted that different parties are involved in the process of harmonisation and therefore it is not only a technical problem in the first instance but also a political problem, which could take a longer time.

Mary Wroten (Ford) closed the discussion with a comment on harmonisation of standardisation. She noted that components are different in the regions but that standardisation is an accelerator for market entry. Common test procedures should be globally the same to ensure that one test verification and validation works even though the approaches are different in the regions.

14:00 – 15:20 Session 4: Global standards harmonization

Moderation: Søren Hess, EU
Panel Participants:
- Yosuke Akatsu, Nissan
- Sue Bai, Honda
- Bernd Datler, ASFINAG
- Emilio Davila-Gonzalez, EU Commission
- William Whythe, IEEE
- Hans-Joachim Schade, CEN/ISO
- Mike Shulman, Ford
- Dieter Seeberger, Daimler
- Gérard Ségarra, Renault

Voting results:
1) Are the current global harmonization activities sufficient to achieve common hardware and full interoperability?   [41% yes / 59% no]
2) Would harmonization of message elements (BSM and CAM/DENM) support interoperability and deployment?   [80% yes / 20% no]
3) Will global harmonization of all messages set support deployment within the regions?   [82% yes / 18% no]
4) Would a Registration Authority to globally manage applications and message sets be necessary?   [33% yes / 67% no]

Yosuke Akatsu (Nissan) stressed that common hardware is the key factor of security applications that have to be best practice examples. Dieter Seeberger (Daimler) didn't see the need for combining hardware and interoperability issues. The hardware is on a good way and the interoperability is only needed inside the regions but not between regions. Sue Bai (Honda) pointed out the importance of similar data availability. This is a key factor for harmonisation.

Bernd Datler (ASFINAG) added with regard to existing systems that the coexistent of DSRC at 5.8 GHz and ITS G5 at 5.9 GHz needs to be ensured. Hans-Joachim Schade (CEN/ISO) mentioned that the actors have to use the standards and that harmonization and interoperability shall be in the focus at the beginning to avoid later costs. William Whythe (IEEE) strengthened the importance of coordination, but he believed that it is not necessary to harmonise things like message sets. Gérard Ségarra (Renault) raised the opinion that interoperability is not necessary between US, EU or Japan, because there is no big movement of the vehicles between these regions. But it is important to ensure interoperability with other regions like India, China or Africa.

Dieter Seeberger (Daimler) highlighted the issue of registration authorities and said that the authorities have to make a distinction between several kinds of messages like CAM and BSM of ITS G5 or smart phone applications. Sue Bai (Honda) noted that the message sets are different in the regions because of the regional frameworks and the parallel development processes, but the teams work together and understand the differences, which is why the harmonisation is on a good way. William Whyte (IEEE) and Sue Bai (Honda) shared the same opinion about the usage of PSID, which could be different in the regions without causing problems. The same messages could have different but unique numbers in the region.

Emilio Davila-Gonzalez (EU Commission) strengthened the position of the EC to go ahead in terms of global harmonisation. Steve Shladover (PATH) added from the audience that the harmonisation will help everybody because it will reduce the costs for every involved player. Bernd Datler (ASFINAG) and Hans-Joachim Schade (CEN/ISO) saw differences between V2V and V2I development. V2V already achieves a good status but V2I still needs more research and development. Furthermore a registration authority shall steer the standardisation process of V2I with respect to past activities. Dieter Seeberger (Daimler) pointed out with regard to the CAM and DEMN / BSM messages that the framework is ready and CEN has to make the next step.

After that the moderator asked whether everybody agrees on the benefit of harmonisation. Yosuke Akatsu (Nissan) answered that the customer wants to have harmonisation especially in terms of safety applications. Then the audience asked about the harmonisation of human-machine-interface (HMI). Gérard Ségarra (Renault) and Dieter Seeberger (Daimler) replied that there shall be a balance between standardisation of HMI to help customers in using the applications and some freedom for the OEMs to generate characteristic designs and taking into account different vehicle classes. Emilio Davila-Gonzalez (EU Commission) emphasised that branding is important but in the case of safety critical applications there must be harmonisation and standardisation of HMI (e.g. car rental). Yosuke Akatsu (Nissan) added to consider the human factors when talking about HMI.

A Dutchman from the audience made clear that harmonisation is a step by step process which is still underway. This is very crucial for the roadside units and leads to difficult investment decisions. Bernd Datler (ASFINAG) and Hans-Joachim Schade (CEN/ISO) shared this opinion and postulated more standardisation efforts to make investment in roadside units calculable (e.g. regarding driver information and tolling based on cooperative ITS). Moreover there should be only one telematics box per car, but this will be a long way off. Dieter Seeberger (Daimler) highlighted that the OEMs will focus on safety and efficiency issues in the first instance and not on tolling aspects. In this context Emilio Davila-Gonzalez (EU Commission) referred to the pan-European eCall which is also an application to be integrated into the vehicular system. Therefore only one platform per vehicle is sufficient.

The last issue of the discussion addressed again the registration authority. A workshop participant said that the cooperation between working groups from the regions is not sufficient in along term, so that a registration authority should be installed to make the work easier and faster. Furthermore he explained that the function of the registration authority is not managing data sets or messages but application class identifiers. William Whythe (IEEE) agreed and pointed out that the registration authority could work very quickly. An EC representative informed that in Europe the tolling system will be organised on the basis of one operator - one device. Secondly he mentioned the establishment of a dedicated EETS expert group.

15:40 – 17:00 Session 5: Stakeholder requirements and involvement

Keynote:
Paul Kompfner (ERTICO) gave a presentation on **partnership and deployment**.
He explained that there are five criteria for partnership, (1) voluntary, (2) agreement, (3) contract based, (4) mutual commitment, and (5) project oriented. Moreover there are two types of partnership: (A) equal ones like CAR 2 CAR Communication Consortium or the EU and (B) unequal ones like a farmer and his dog. In the field of cooperative systems the partnership is unequal. To bring this partnership to a success some criteria must be fulfilled:

(1) Bringing all players together, (2) common vision, (3) common purpose, (4) common objectives, (5) clear responsibilities, (6) governance, (7) organisation, and (8) investment program.

With these criteria in mind there is less experience regarding partnerships between public and private sector, but in cooperative systems both sectors are needed. To make this constellation of public-private-partnership successful there are several preconditions like political support, multiple actors, a common system concept, coordinated roadmap, investment plan etc. The result should be a common vision. Paul Kompfner (ERTICO) pointed out that the current existing activities in Japan, USA and EU are different with respect to players, approaches and preconditions.

At the end of the keynote he addressed an open platform for cooperative system like mobile internet on smart phones as the best system solution. He raised the question: Who will be the first mover of this step-by-step process? A public-private-partnership (PPP) could be the right way to go ahead but there are many open issues to be discussed.

Moderation: Søren Hess, EU
Panel Participants:
- Marko Jandrisits, ASFINAG
- Hironao Kawashima, Keio University
- Paul Kompfner, ERTICO
- Jim Sayer, UMTRI
- Koichi Sakai, MLIT
- Hossein Zakizadeh, Volvo

Voting results:
1) Are strategic stakeholders committed to deployment by means of joint roadmaps?
   [50% yes / 50% no]
2) Will private public partnership support and solve the huge investment requirement for infrastructure? [56% yes / 44% no]
3) Shall regulation steer the process towards deployment? [65% yes / 35% no]
4) Are the strategic stakeholders OEMs and road operators/authorities owners of ITS systems? [64% yes / 36% no]

Marko Jandrisits (ASFINAG) started the discussion and said that on the one hand the road operators and authorities and on the other hand the automotive industry has to do the first step. Paul Kompfner (ERTICO) mentioned that the design of a PPP is a critical factor for success and that every partner needs an own area of competence. In addition the investment depends on the interests of the actors. Jim Sayer (UMTRI) added that the strength of a PPP is highly influenced by the commitment of the state and where the state is willing to invest. Koichi Sakai (MLIT) saw a similar situation for Japan. The public sector will invest in the roadside units and traffic management and the private sector will take care for the onboard units. Hossein Zakizadeh (Volvo) expressed the opinion on the PPP idea that this is a model to solve problems of cooperative ITS but not to roll out new technologies. Hironao Kawashima (Keio Univ.) noted that Japan has a long tradition in PPP. He commented that the public actor is responsible for messages coming from the roadside infrastructure and that the private sector is responsible for messages from the in-vehicle-system, but this is not finally defined yet. Paul Kompfner (ERTICO) made clear that a PPP will not create a communication infrastructure. The cooperative infrastructure used will be a mobile communications network. Jim Sayer (UMTRI) expressed the importance of a carrot for the success of PPP. Marko

Jandrisits (ASFINAG) pointed out that PPP isn't the right choice for cooperative systems. He pointed out that the business case is much more important and that the public has to be the first investor and the private sector will follow.

After that statement the discussion switched over to the role of the mobile communications networks as infrastructure for cooperative ITS. Marko Jandrisits (ASFINAG) guessed that the road operators will install some additional infrastructure to collect the information from the vehicles and moreover the mobile communication network will use complementary technologies. Paul Kompfner (ERTICO) saw the danger of fragmentation. Some parts of the cooperative services could be more profitable than others.

Steve Shladover (PATH) added from the audience that other actors should be noticed like suppliers or rescue services. Therefore the goal is to establish a really broad community involving all stakeholders.

Paul Kompfner (ERTICO) suggested the idea to organise a first workshop on partnership for cooperative mobility deployment next year in Vienna.

Juhani Jääskeläinen (EU Commission) gave a brief comment on the PPP model. He mentioned a new model called European innovation partnership that seems to be a good model because it is a user's driven concept and the funding comes from multiple sources.

As a last comment on the session Markus Strassberger (BMW) pointed out that the cooperative ITS industry could learn from the mobile phone industry to manage well a closed system and to handle successfully the different applications. Furthermore he emphasised the chance to make profit with applications of the cooperative system. Therefore he suggested starting with easy systems that could be enhanced later on to realize the first business cases.

17:00 – 17:15   Summary and Closing

After the closing of the last session Søren Hess and Peter Sweatman summarised the core results of the workshop which have been noted by different participants of the audience and thank all participants:

Session 1: Global vehicle safety
- Automated intervention for crash avoidance is strongly supported
- "Soft safety" applications could help avoid many risky situations but clear data is not available to support this
- Clear distinction between different types of aftermarket devices is needed
- Strong support for aftermarket devices
- The differences between hard and soft safety is very important and have to be clearly defined, e.g. hard safety will rely on communication and vehicular sensors
- The collected data in FOTs can be used for hard and soft safety

Session 2: Sustainable driving
- Sustainable driving requires to consider the whole range of transportation
- Sustainable driving needs to involve both the automotive industry and the road operators with their suppliers
- Safety messages are a good starting point for sustainability – needs to be complemented by additional data elements and/or messages
- Harmonization of country specific legal issues, privacy and data usage needed

Session 3: Security and Privacy issues for cooperative ITS
- Common understanding (US/JP/EU) of the baseline for security measures (pseudonyms for privacy and certificates for authorization, based on same cryptographic primitives)
- Agreement that for mandatory systems privacy must be ensured
- Security & Privacy is not only a technological solutions, but also a basic political issue:
  o Intensify policy discussions to tailor the systems to be deployed
  o Intensify operational discussions. Thereby also take into account the valuable experiences from Japan (EasyWay).
- Common test procedures for verification, validation and certification are important

Session 4: Global standards harmonization
- In addition to the harmonization of data elements of the BSM (SAE J2735) and CAM/DENM (ETSI TS 102 637-2 and TS 102 637-3) message sets, existing protocols for I2V like TMC/TPEG and Datex for I2I should be considered.
- Also with respect to cross border issues, harmonized event lists / cause codes are needed to avoid conflicting interpretation.
  Example: end of traffic jam message sent via V2V and via "Traffic Service Providers" shouldn't be conflicting.

Session 5: Stakeholder requirements and involvement
- Reason for existence of PPP: Private solutions can contribute to policy and societal issues
- Define clear PPP vision and governance based on understanding, respect, voluntary, mutual contract, shared investment
- Ensure long term commitment but define backup mechanisms if it fails
- Each party should be aware of what he needs to do/fund before/during and after deployment (shared cost, investment program, resources, interdependence,…) – qui pro quo or carrot idea? Real issue: business cases for each of the actors
- Is the PPP only focusing on deploying IRS/RSU? Should PPP be more ambitious and aim at "*connected mobility*" integrated with the other mobile data networks
- Need of step-by-step approach without excluding further options
- European Innovation Partnerships: combine research with large scale testing and deployment (e.g. smart cities)
- Challenge for next year: first workshop on partnership for cooperative mobility deployment

Announcement of next workshop
The concept of the workshop was in general appreciated. The next similar further improved workshop will be organized related to the next ITS World Congress 2012 at Vienna.