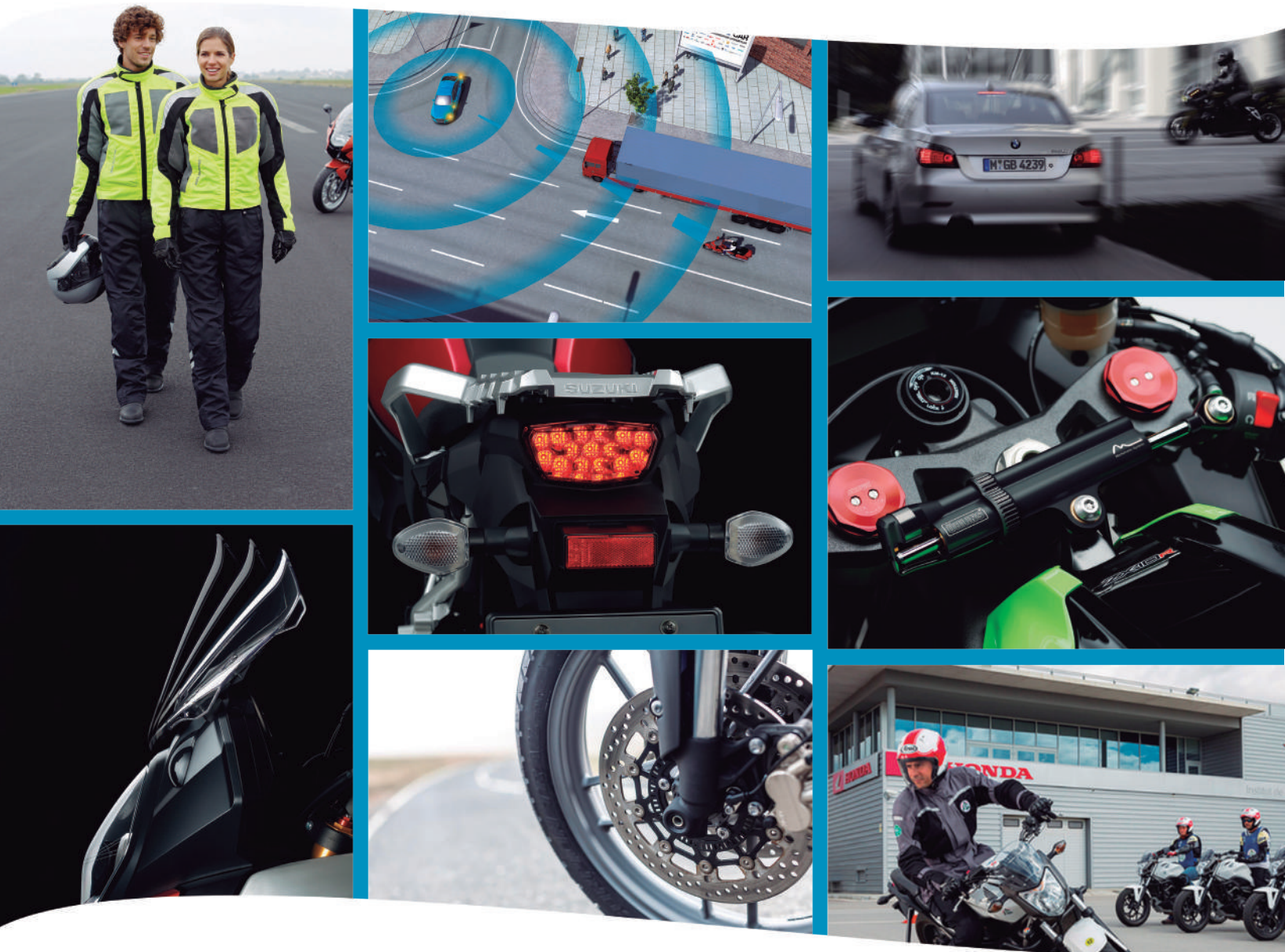


The safe ride to the future

The motorcycle industry's commitment to road safety



September 2014

Looking into the future: Intelligent transport systems

In the years ahead, further technological breakthroughs will come through innovative intelligent transport systems (ITS), which will allow vehicles to interact with each other and with surrounding infrastructure.

Some ITS devices have already been successfully introduced on the market by ACEM members. Moreover, the motorcycle industry is engaged in in-house R&D activities and actively participates in EU research projects on cooperative ITS.

ACEM manufacturers have also adopted a Memorandum of Understanding on ITS, committing themselves to install safety-relevant cooperative ITS onto at least one of their models by 2020.



A BMW Motorrad-run project, ConnectedRide, has developed specialised warning systems for bad weather conditions, obstacles and approaching emergency vehicles, among others.

The motorcycle industry's vision on ITS

ITS devices can further enhance road safety

Research shows that one of the most frequent human errors in accidents is the failure of other road users to see PTWs within the traffic environment, due to lack of driver attention, temporary view obstructions or the low conspicuity of the PTW¹⁹. This problem could be addressed by enabling non-PTW drivers to receive a 'motorcycle approaching indication' (MAI) or in case of an emergency situation, a 'collision warning' message. This form of 'digital' conspicuity of PTWs would result in a higher level of safety for riders. For this reason, the industry sees vehicle to vehicle (V2V) communication as a technology which has a high potential to improve road safety across the EU and may lead to better integration of motorcycles in the transport system.



The HMI developed by Honda provides a visual and an audible warning in safety critical situations. The visual element is located close to the rider's line-of-sight and uses changes in color and intensity to communicate the nature of the threat.

¹⁹. The final report of the SIM project is available at http://cordis.europa.eu/publication/rcn/11467_en.html

Some ITS applications have also the potential to improve the environmental performance of vehicles and to help meet the growing demand for mobility by optimizing the use of existing road infrastructure (e.g. by providing information on the shortest routes).

Examples of ITS applications include: collision prevention devices, emergency notification systems and road traffic management systems.

Specific vehicle usages must be taken into account

It is important to bear in mind that powered-two and three-wheelers encompass a wide-range of vehicles that have very different uses. Although the PTW market is often perceived as a whole, in reality, it is characterized by a great diversity of vehicles. Whilst the largest market segment (60%) is represented by urban oriented vehicles with a cylinder capacity below 125cc, PTWs above 500cc represent 25% of the market.

Certain ITS solutions would be better suited to a particular category of PTW because they would provide the most benefit with a cost level coherent to the market segment. Small urban PTWs, for example, could be equipped with ITS devices improving their electronic conspicuity, whilst high-end vehicles could benefit of more advanced optional features.

A mandatory approach, without distinguishing PTW categories, would be counterproductive. As long as core functions and interoperability are preserved, each ACEM manufacturing member should have the freedom to implement the most appropriate technical solutions and optional features, within a competitive business environment.



A Honda Goldwing with simple, logical and intuitive HMI for faster and easier recognition of potential risks, compensating for errors of perception or momentary lacks of concentration by the rider.

Technical considerations of relevance to PTWs

Notwithstanding the above mentioned benefits of ITS, important technical issues must be addressed in order to ensure market uptake. Further ITS deployment will require investments in research technology and infrastructure, as well as a clear and sound legal framework.

The driving dynamics of powered-two and three-wheelers are much more complex than those of automobiles. ITS applications, which may remove or interfere with the rider's control of the vehicle, cannot be utilised in the way they are for automobiles. Autonomous active interventions in the control or dynamics of the vehicle may be dangerous to a PTW rider, as this could destabilize the rider and the vehicle, potentially causing, instead of preventing, an accident. For this reason, ACEM members strongly support the use of warning systems.

Advanced Driver Assistance Systems (ADAS), Adaptive Cruise Control (ACCA) or Autonomous Emergency Braking Systems (AEBS), which have been primarily engineered for use in cars, have the potential to be dangerous if applied to a PTW without the necessary adaptation to

PTW dynamics. Powered-two and three-wheelers require a dedicated approach and specific engineering solutions to optimize the potential of ITS for road safety.

It is also important to stress that these systems will require the development of appropriate human-machine interfaces (HMI). HMI must minimise rider distraction and should be specifically designed with PTW riding in mind. For example, messages should be prioritised so that safety warnings override more general notifications.

ACEM members are committed to ensuring that any safety related co-operative ITS applications are interoperable between both PTW manufacturers, and more importantly, with other road users.

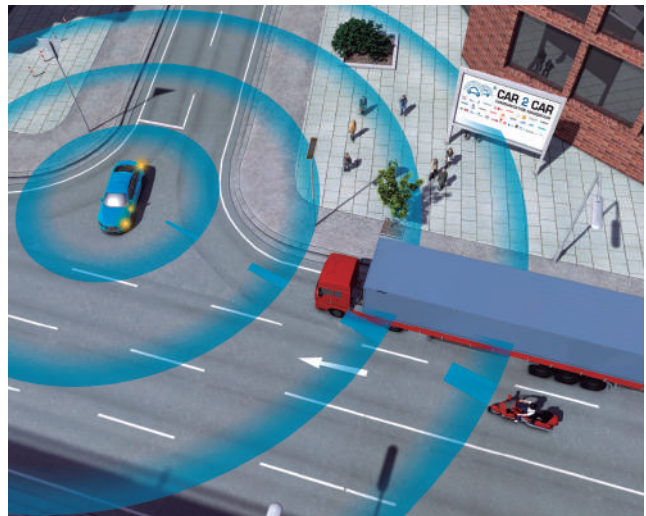
The motorcycle industry will contribute to European and global ITS forums to ensure that cars, trucks and PTWs are all able to communicate using their various ITS applications. It is critical that all PTWs must be able to recognise messages from any other vehicle on the road, regardless of brand, vehicle type, etc. This can be ensured by adhering to established harmonised standards.

Other considerations: liability and training

ACEM members are closely observing the debate surrounding the liability of ITS. The implications of device or system failure; conflict between multiple ITS products; operator information overload; loss of operator attention; incorrect interpretation of information and liability arising as a result of the interaction of both ITS-enabled and conventional vehicles have not yet been clarified in terms of liability.

Last but not least, it is important to remember that ITS solutions should not be considered as a substitute for appropriate training. It should be ensured that the public does not become dismissive of ITS technology in the early phases of adoption where low penetration rates on the roads may prevent the systems from working to their full potential. At a later stage, it is equally critical that drivers and riders do not become over reliant on safety technologies for warnings of potential dangers.

Training and education will remain the most important factors for safer road use. Drivers and riders will remain responsible for awareness of all other road users around them when manoeuvring.



The CAR 2 CAR Communication Consortium is dedicated to the objective of further increasing road traffic safety and efficiency by means of cooperative ITS with vehicle-to-vehicle communication (V2V) supported by vehicle-to-infrastructure communication (V2I).

Towards an eCall system for motorcycles

eCall technology allows for an emergency call to be made, either automatically or manually, from a crashed vehicle immediately after a road collision has occurred. The technology is already available in some cars, and the motorcycle industry has started research into how an embedded eCall system could work on motorcycles. The minimum technical requirements needed for such a system have already been defined and research activities are ongoing in order to address the technical challenges of the system.



One of the objectives of the C2X project is to develop systems that warn drivers about potential collisions with two powered two- or three-wheelers.

The development of crash sensor systems for PTWs is a highly complex task likely to require some years of preparation. Detailed accident analysis assessments, as well as cost-benefit analysis of the systems will be needed in order to develop devices that are reliable, protect consumers and are economically feasible.

Accident-recognition is also an area that will require further efforts. In the case of a severe car accident the driver of a car usually remains inside the vehicle but in the case of a motorcycle accident this situation may be very different. In the majority of cases the rider is usually separated from the vehicle and may come to rest at a distance from the motorcycle. Moreover, there are cases when a motorcycle falls over in a non-accident situation and where clearly there should be no eCall triggered. Also in the case of an accident, the motorcycle and its rider may experience very different events once that accident has started. These and other important challenges have to be properly addressed. In many cases, close cooperation with other stakeholders and organisations will be required.

The industry expects that the ongoing research activities will last for at least the next 18 months. After that, standardisation activities will require about 30 months to be completed. Standardisation will be followed by the development of a technical concept (6 months), the resolution of marketing issues (6 months) and, lastly, the series development phase (24 months). At the end of this process, a reliable and robust eCall system for motorcycles will be available for consumers.

ACEM Memorandum of understanding on ITS

Another important step towards the deployment of ITS was taken in March 2014, when the motorcycle industry adopted a Memorandum of Understanding on cooperative ITS. The objective of this Memorandum is to accelerate and coordinate the deployment of safety-relevant cooperative ITS²⁰ on PTWs in Europe.

20. Cooperative ITS is defined as a network of systems in which communication partners (vehicles, traffic infrastructure and/or service providers) provide and/or exchange information (i.e. 1- or 2- way of communication).

By signing this Memorandum ACEM manufacturing members agreed to initiate the deployment of safety-relevant cooperative ITS and committed to have at least one of their models available for sale with a cooperative ITS application available either as standard equipment or as optional equipment by 2020.

The Memorandum is an expression of the individual and collective commitment of the ACEM manufacturing members to build on the work of the C2C Communication Consortium (C2C-CC) and to realise a shared objective to the benefit of everyone. Specifically but not uniquely, ACEM manufacturing members aim for PTWs, as vulnerable road users, to achieve electronic conspicuity as foreseen in the second phase of the C2C-CC's MoU in collaboration with other vehicle manufacturers.

Initiation of market introduction will require the finalisation of ongoing activities on standardisation, validation and field operational tests, which are expected to be completed by 2015. It will also require the completion of a number of related activities by other players including infrastructure organisations and public authorities.