La Prévention Routière Internationale

PRP Prevenção Rodoviária Portuguesa

International Conference on

Autonomous Driving and the Impact on Traffic Safety

October, 13th& 14th2016 in Lisbon–Portugal

Final Report and Recommendations

The International Conference on Autonomous Driving and the Impact on Traffic Safety has been held in Lisbon-Portugal in the 13th and 14th of October 2016 under the theme ”With autonomous driving, will Roads be more safe?..I hope so! “. This event of international scale has been organized by La Prévention Routière Internationale (PRI) in collaboration with Portuguese Road Safety Association PRP-Portugal.

It has to be noted that the choice of this theme stemmed from recent technological development in the field of industrial vehicles that start marketing fully autonomous vehicles. Subsequently, it is expected that the impact on road safety will be of great value.

Quiet conceivably, this technological development shall impose to all industrial and professional actors enormous challenges in infrastructure, regulation, enforcement, training and road users behaviour. By organising such an event, PRI seeks to be among pioneer organisations that show interest in this field and then propose some guidelines for the future.

From this perspective, this international conference has been an opportunity for:

- Bringing together leading professionals, experts, academia and stakeholders from different areas to examine the theme of autonomous driving and all related issues.
- Exchanging the knowledge and the experiences in this field;
- Deepening the reflection on the balance of mobility-safety duality;
- Finding ways of improvement to satisfy needs in automated mobility without compromising the safety road users.

As such, the overall aim of this international conference has been to engage a real debate on this issue and give an overview of autonomous driving, identify the main safety benefits and offer some key recommendations for all stakeholders.

For that, More than 100 participants: academic, professional, institutional researchers, components with several of international experts belonging to almost 30 countries have participated in the works of the various sessions of this international scientific event.

Four themes have been handled in this conference namely:

- State of art by defining the concept and the issue and the presenting an overview of the recent development and last experiences for smart devices and technology used to improve the quality and safety of driving;
- Regulation and case study by showing the appropriate legal framework for vehicle testing and operation;
- Safety challenges by presenting the outcome of autonomous driving in terms of reduction of risks related to crashes and fatalities;
- ITS and driving assistance systems by focusing on individual benefits and societal benefits in terms of decreased traffic congestion; improved road safety.

Two days of dialogue, brainstorming and discussion around a single question: "With autonomous driving, will Roads be more safe? These two days have given their fruits and several conclusions have been drawn. All grouped in the following reflections, suggestions and recommendations:

❖ **As for STATE OF ART: we can deduce that we have More questions than answers**

- The global policy priority now should be to mandate theAdvanced Driver Assistance Systems (ADAS) already in use and which are building blocks towards more autonomous vehicles.
- There is a real risk that 'hype' about the safety impact of self driving cars will divert attention from the L1 & 2 technologies that are already delivering road injury reduction and will continue to do so to 2030 and beyond. These are:

  -Electronic Stability Control (ESC)
  -Autonomous Emergency Braking (AEB)
  -Intelligent Speed Assistance (ISA)
- Self driving vehicles will not AUTOMATICALLY improve road safety.
- Although they can potentially overcome human error, they will also introduce new (machine) errors.
- In addition we have to deal with a transition period where:
  - systems won't work fully autonomous and the driver has to act as fall back;
  - not all vehicles are self-driving; which creates uncertainty for other road users.
- There are two main issues: how the new technologies can contribute for the road safety and how the increase of the use of new technologies in the automobile industry will affect the performance, the satisfaction and the user's experience?
- Potential risks of field trials with (partially) self-driving vehicles are categorized by level of automation and the role the driver (still) plays, related to mental workload and transition of control.
- Good practices and demonstration of the safe and efficient integration of sophisticated automated transport systems into real world smart city environments should be witnessed.

❖ **As for REGULATION:**

- The technology in the world of mobility and transport, so disruptive innovating the style of individual and collective life progresses so fast that often the relevant legal framework is not prepared to transpose and adjust the change.
- The autonomous driving is related to the facilities of automatic systems aimed at ensuring more stable and safe performance (ABS, ESP or ESC, and other systems), the simplified guidance systems that limit human intervention.
- While most of scientific discussion deals with development of technologies, the focus is shifting towards topics such as user acceptance and legal issues; policy makers face challenges in designing the appropriate legal and regulatory frameworks so that new technologies are used properly and for the benefit of society;
- Road traffic is a highly regulated area as it bears huge risks for all traffic users in public spaces. The automation of vehicles changes the driving risk in many regards and therefore requires an assessment of all traffic and vehicle related regulation.
- The fundamental principles of Vienna Convention, laid in art 8," that a driver is always fully in control and responsible for the behavior of a vehicle traffic", in its amendment being refined "every vehicle must be a driver" and in the future for highly automated system it will sound like" every vehicle must be a driver who may take the hands off the wheel, but must be ready at all times to take over the driving functions and who can override the system and switch it on and off.
- In the future a further amendment process is therefore necessary to permit driverless vehicles.
- The regulatory environment relating to cyber security, data privacy and liability issues is of particular importance in the development of automated vehicles. Uncontrolled, unrestricted access to vehicle data in the on-board network by third parties directly and indirectly put in danger the safety of the vehicle, occupants and others road users.
- The regulations will have to be revised and corrected , and it might take longer than expected to assist the spread of automated vehicles
- The self-driving car raises more possibilities and more questions than perhaps any other transportation innovation under present discussion. Self-driving cars have become the archetype of our future transportation.
- Still, important concerns emerge. Will they fully replace the human driver? What ethical judgments will they be called upon to make? What socioeconomic impacts flow from such a dramatic change? Will they disrupt the nature of privacy and security? Many of these larger questions will require longer and more thorough dialogue with government, industry, academia and, most importantly, the public.

❖ **CONCERNING SAFETY CHALLENGES:**

- Vehicles can ensure a smoother traffic flow and therefore utilize the available space on the roads much better. Self-driving vehicles also make a positive contribution to road safety and the environment and have economic advantages.
- Learning by doing through an approach in which automatic features are tested step by step is how countries will proceed.
- International cooperation and coordination turns out to be a key word.

❖ **As far as ITS AND DRIVING ASSISTANCE SYSTEMS are concerned:**

- The promotion of driver assistance systems such electronic stability control, auto emergency braking etc. as much more likely to support UN targets for casualty reduction.
- It is sensible to be cautious about how quickly fully autonomous vehicles will make a significant safety impact. However, these systems can be viewed as precursors for progress towards more autonomous driving in the future.
- Traffic management applications should be adopted not only by designers but by other partners and stakeholder of the field.
- Including a global open innovation approach and frugal ingenuity, based on user needs and taking into account the need for sharing of mobility spaces
- The considerable progress that we are entitled to wait for road safety from these driver assistance technologies up to autonomous driving could also benefit from emerging countries
- Innovative approaches, taking into account regional specificities and societal mobilized to design infrastructures integrating immediately next use of autonomous vehicles, should allow deployment of autonomous driving in other regions of the World substantially pace than envisaged in the most technologically advanced countries. Autonomous Driving is a opportunity for evidence based approach of road safety
- Floating Car Data is now available and usable in daily practice
- Police a chance to automation and optimize enforcement
- Start to gain experience by working with Speed Data

As for Human behavior:

- we believe that new situations bring new risks from humans or robots, so we have to try to identify the prevention before they even arise.
- living with robots (which inevitably awaits us) currency risk and its perception, but does not negate the risks.
- If these new risks are only temporary, they gradually lead us to consider our sharing the road and the car with a robot.
- Pedestrian are under high risk despite technological improvements which implies awareness campaigns.
- The safety of the most vulnerable should be yardstick to measure the quality of an ethically acceptable automated transport system.
- Re-engaging the driver Means to engage driver in driving task when system is engaged ; to encourage visual attention to forward roadway ;Active alerts for system failures and limitations ;
- The user interface and the communication of automation limitations are as follow:
  - Clearly indicates the mode of operation;
  - Monitor driver's attention to traffic conditions and vehicle operation
- **Encourage drivers to attend to forward roadway conditions**

Along with all these ideas, the conference has not been without mentioning the importance of scientific research in the implementation of good deeds, solid, for road safety. This will be done in particular through the collection, analysis and exchange of data and indicators and the development of studies and extensive research. Added to this is that not all problems are resolved by autonomous driving.Even, new problems emerge by automation, So, Research definitely needed.

The potential for automation could bring enormous benefits:

- Reduced congestion
- Higher fuel efficiency
- Gain in productivity
- Democratization of mobility
- Improved safety

We understand many of todays safety challenges – but how do these change with greater automation?

Rigorous and robust validation and approval provide the critical path to adoption of automation

- Automation is coming – and it will bring positives
- But the path to get there needs to be carefully managed
- There will be a safety dividend
- But there will also be some hard questions to answer too

Two statements that we should bear in mind:

- From the point of view of sustainable safety and quality of life we are all better off with carless drivers instead of driverless cars.
- Let's learn to walk before we run!