

# From ambition to meaning...

Automation took centre stage in Glasgow in June but what did it teach us? **Daive Brizzolara** and **Andrea Toth** on lessons learned from the 11th ITS European Congress

▼ Glasgow, venue of the 11th ITS European Congress



**A**utomated vehicles have plenty of merits, quite a few opponents and engender a long list of open questions. They also rank pretty highly on the excitement scale making it one of the hottest topics in ITS today.

Bringing connected and automated vehicles to the roads has the potential to make road transport safer, more efficient and less harmful for the environment. With so many different aspects to consider, stakeholders to get involved and ideas to be exchanged, conferences workshops and congresses in the automotive world have dedicated more and more time and attention towards automation and connectivity in the past decade.

The 11th ITS European Congress, held in Glasgow in June, also put a strong emphasis on discussing the path “from standalone to

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connected to automated” vehicle. As Angelos Amditis, Research Director at ICCS (partner in the Vehicle and Road Automation (VRA) project) and European Programme Committee Member of the ITS Congress explained<sup>1</sup>: “Automation is expected to be a key development for transport in the next years and transport stakeholders need to

stay informed about all developments in the sector.”

Experts and enthusiasts from across Europe, interested in the vast array of challenges waiting to be tackled, came together to explore the technological, operational and legal requirements to make automated vehicles reality.

Several aspects related to these requirements are still up for discussion before we can reach a consensus. Where else better to have such exchange of opinions than at an event including ITS experts from the most diverse backgrounds including research institutes, industry, public authorities, and policymaking.

Representatives from the European Commission, FIA (Federation Internationale de l’Automobile), ACEA (the European vehicle manufacturers association) and the

City of Copenhagen participated in a panel discussion to find an answer to the question: “Do end users want automaton and will they pay for it?” The panellists agreed that to ensure adoption, users need to see a clear benefit and be assured that an automated vehicle is as safe or safer than a human-driven one. It was also discussed that citizens do not necessarily want/or not want automation: they are looking for a more convenient traveling experience, a more liveable city and a safer and less congested environment. Automation can be seen as a means to achieving these goals and if deployed successfully, citizens would be more likely to accept and embrace it.

## TECHNOLOGICAL ADVANCEMENTS

Vehicles of today are not technologically fit to run completely on their own yet, especially in cities. They need to sense their surroundings perfectly – no blind spots – analyse and perceive every change that impacts the vehicle. What makes it even more challenging, is that the environment is highly dynamic, full of unexpected changes (surprise events) rather than following easily comprehensible patterns. The sensors also need to work in tough or harsh conditions such as fog or heavy rain and continue operating at their best. Once all the sensors are in place and functioning, the next hurdle is fusing multi-sensor data in an efficient and reliable way in real-time.

The ITS Europe congress session titled “Vehicular Connectivity and Challenges in the Era of Automation” focused on the ways vehicles can be enhanced by exploiting telecommunication technologies enabling connectivity. The importance of connectivity is multi-fold, ranging from decrease in sensor costs (by enabling the vehicle to obtain information from outside sources rather than in-built sensors) through benefits in object identification to a rise in accuracy. A key factor in achieving a connected system is interoperability: all elements of the transport system need to be able to talk to each other. These ‘conversations’ between vehicles and others – referred to as V2V (vehicle-to-vehicle), V2I (vehicle-to-infrastructure) and ultimately V2X (vehicle-to-everything) communication – are crucial

points in the road towards automation. The more the car knows about its environment, the safer it can drive on the roads. Sensors or cameras fitted on the vehicles are just as important but are often prone to blind spots. V2X technology can provide a 360° view of the environment beyond what would humanly be possible (such as what is happening on the other side of a bend in the road or in dense fog).

As more of the driving experience shifts towards a digital world, the static, physical infrastructure is in need of an upgrade as well. The automated vehicle needs to interact with and operate in a digital infrastructure: the static and dynamic digital representation of the physical world.

As Dr Maxime Flament (pictured), project coordinator of VRA explained: “Sometimes we get too caught up in the details to see the bigger picture. Self-driving, connectivity, digitalisation, big data, IoT, deep learning: the true potential of automated driving technologies can only be reached if we connect the parts together and form a digital ecosystem. In fact, the future of transport will necessarily require long-term investments in a collaborative digital infrastructure.”

A dedicated session discussed how to create such a digital infrastructure with the support of public authorities and map providers. This included discussions on governance, role and responsibilities, regulatory needs and the elaboration of a common roadmap.

## WE NEED TO TALK ABOUT THE LEGAL SIDE

“It is well known that in several cases (but not always and not for all conditions) the technology is already available (though expensive) but the application of automation is hindered due

to currently unsolved legal and liability issues,” Dr Amditis explained.

In addition, solving the challenges of policy, regulation, privacy and liability were high on the agenda in Glasgow, where representatives from European public authorities gathered together to discuss the legal conditions of implementing autonomous vehicles.

It was clear that new means of mobility require new laws. Several countries including Greece, Spain, Finland, Germany and France have started the legal process to allow the deployment of automated vehicles on public roads. Though there has been great interest in legalising systems allowing inattentive driving, there is no universal approach to the regulatory and legal aspects related to deploying self-

driving cars. In addition it is no longer a distinction of commercial and private vehicles: a new emerging trend of decreased car ownership and a rise in car sharing further complicates the matters of liability.

The Netherlands has placed vehicle automation high on the agenda during its Presidency of the European Union in the first half of 2016, highlighted by the success of the European Truck Platooning Challenge<sup>2</sup>, where six brands of automated trucks drove through Europe’s roads to arrive in the Netherlands. In April, 28 European Member States signed the Declaration of Amsterdam<sup>3</sup> laying down agreements on what needs to be done to develop automated driving technology in Europe. This was the first, unified political message on connected and automated driving detailing the challenges that member states, industry and the European Com-



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mission need to address.

However, open questions remain. Would a driver be allowed to read a newspaper, send a text message, turn their seat completely backwards? What about the data? Who owns it, how do we protect it? Who is liable: the manufacturer, the owner, the communication providers or the sensor producers? These are only a few of the most pressing concerns participants discussed and will surely continue to debate for the following years.

### MISSING PIECES FOR DEPLOYMENT

Even if we have the technology ready and have agreed on the legal aspects there are still several operational pieces missing from the puzzle. Dealing with the exceptions: those that aren't connected or not automated will become an increasingly more discussed topic as other forms of barriers to implementation are overcome. Similarly, a common view on safety principles, standardisation and certification needs to be put in place.

A dedicated stakeholder workshop organised by VRA, offered insight into how standardisation towards automation is currently driven and what are the expected needs in the short and long term. It discussed certification procedures considering the European member states which today allow (in specific conditions) driverless vehicles on public roads.

From a holistic point of view, standardisation and certification are tools for both industry and public authorities to foster

### VRA Networking

VRA (Vehicle and Road Automation) Networking is a European support-action (grant agreement: 610737 under the European Commission 7th framework programme) to create a collaboration network of experts and stakeholders working on deployment of automated vehicles and its related infrastructure. The project and its associated partners are active in organising, participating to various events across Europe and beyond to maintain and promote an active discussion on automation.

the development and deployment of technologies creating a common framework for all the stakeholders. But we cannot stop in Europe, common impact methodologies, assessments, standards and certification need to be aligned globally making co-operation with the United States and Japan crucial in the works of global deployment.

“Despite the leading edge of the European automotive industry, development in automated driving needs to rely on close international cooperation. Many of the challenges we face here can be found in the US, Japan or elsewhere. Whether it is establishing best practices for human-machine interactions or contributing to impact assessment studies, it definitely makes sense to work on it together and learn from each other,” Dr Flament added.

### A NEW ERA OF TESTING

Testing of automated vehicles is becoming increasingly more important which requires a new set of testing methodologies to be put in place. The importance of field operational tests (FOTs) and the re-use of the data obtained are highlighted more and more often. The FESTA methodology (created by FOT-Net Data<sup>4</sup>) was created to improve significance, comparability and transferability of FOT results both on national and European level. Ensuring the exchange and comparability of data gathered in real traffic conditions is invaluable, however the current methodology relies heavily on drivers and their behaviour making it necessary to adapt it to automated vehicle FOTs. Ide-

ally automated and non-automated driving data should be comparable. Further, the impact assessment needs to be revisited as automated vehicles will have the potential for far larger impact than standalone or even connected vehicles.

### WHERE NEXT?

The European Commission has been placing road automation in the spotlight of many of its transport-related activities, resulting in a number of funding opportunities across the continent. One of the successful EC-funded projects launched in July 2016, SCOUT (co-ordinated by VDE VDI) aims to identify the pathways for an accelerated proliferation of safe and connected high-degree automated driving.

CARTRE, launched in October 2016 and co-ordinated by ERTICO-ITS Europe, will be working on increasing market and policy certainties in order to accelerate development and deployment of automated road transport.

As for the longer run, according to Dr Amditis, the real paradigm shift will arrive with “a novel Automated Transport System which introduces harmonised and orchestrated collaboration between all types of automated and connected vehicles, the infrastructure, the mobility users, freight, road and fleet operators, and public transport in a holistic, integrated and seamless way.”

An ambitious statement for an ambitious endeavour.

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#### NOTES

1 <http://glasgow2016.itsineurope.com/automation-paradigm-shift-transport/>

2 <https://www.eutruckplatooning.com/default.aspx>

3 <https://english.eu2016.nl/documents/publications/2016/04/14/declaration-of-amsterdam>

4 <http://fot-net.eu/>