PTOLEMUS
Consulting Group

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THE AUTONOMOUS VEHICLE GLOBAL STUDY

Interview with:

François Guichard

UN Secretary Vehicle Active Safety - Focal Point ITS

United Nations Economic Commission for Europe (UNECE)

The most thorough report on driverless vehicles

A perfect storm ready to wipe out risk

ABOUT PTOLEMUS CONSULTING GROUP

from Ptolemy, the Egyptian savant who built the 1st map of the world

PTOLEMUS is the first international strategy consulting & research firm specialised in the connected vehicle and the Internet of Things (IoT).

We help our clients apply strategic analysis to this fast-moving ecosystem, across all its industries (automotive, insurance, assistance, fleet management, road charging, mobile telecoms, etc.) and on an international basis.

PTOLEMUS, founded by Frederic Bruneteau, operates worldwide and is present in 9 countries: Belgium, Canada, France, Germany, Italy, Russia, South Africa, the UK and the US.

PTOLEMUS has performed nearly 100 consulting assignments related to connected and autonomous vehicles.

For any enquiry, please send a message to contact@ptolemus.com

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INTERVIEWS

François Guichard

UN Secretary Vehicle Active Safety - Focal Point ITS
United Nations Economic Commission for Europe (UNECE)

The UNECE defines the safety requirements for type approval in new vehicles. Can you please tell us how the update of the UN Regulation No. 79 is progressing?

Experts on active safety and advanced driver assistance systems under the World Forum for harmonisation of vehicle regulations have just adopted technical provisions as a first step towards the introduction of self-steering systems.

The group defined 5 categories of automation corresponding to the functionalities that the vehicle will be able to perform and adopted performance requirements for the first 2 levels of automation defined by SAE International.

These **relate to systems that, under specific driving circumstances, will take over the control of the vehicle under the permanent supervision of the driver**, such as self-parking functions and Lane Keeping Assist Systems (e.g. when the car will take corrective measures if it detects that it is about to cross a lane accidentally).

They also entail removing the current limitation of automatic steering functions to driving conditions below 10 km/h contained in UN Regulation No. 79. Once adopted by the World Forum at one of its forthcoming meetings, these provisions will be integrated into UN vehicle Regulation No. 79

Many vehicles on the road are already capable of much more automation. How did a car like the Tesla S receive approval?

Tesla was type approved by one of the EU member States, and from there it got *de facto* an approval valid for the rest of Europe. This was done on the basis of requirements that are now updated and clarified.

How does the regulation regulate Lane Keeping Systems?

With these new provisions, lane keeping on highway is not only defined as the capability to stay between two markings on the lane, it also defines what happen if the car does not manage to do that anymore.

Two situations then: transition demand, i.e. asking the driver to take control followed by a **minimum risk manoeuvre** if needed.

In some cases, this could be as simple as stopping on

your own lane for systems with lower capacity.

Some experts on the subject said they would prefer to have the car stop on the lane safely than try to change lane in an unsafe manner.

This is a definition of the technical requirements for a more advanced ACC system that includes ACC and lane keeping (so both directions are controlled).

Administratively, this first set of requirements will be submitted to the world forum for endorsement later this year. The entry into force will be a few months later.

Will this address automated driving globally?

More than 50 countries follow the world forum decisions and use them to define the rules on homologation. They are bound by the requirements, other countries are referring to it, meaning they incorporate them into their own national regulations.

Are the USA going to apply these requirements?

The USA rely solely on national regulations and standards applied to the automotive sector but also collaborate at WP.29: the World Forum has a second regulatory framework applied by the USA, China, India, EU, Korea Japan and other countries.

The Forum develops within this framework some kind of meta-regulations whereby the country agrees on requirements that they have to transpose into their national laws. This differs from the framework for UN Regulation. Once R79 is ratified, it will be transposed into law automatically.

Global technical regulation (GTR), within the second framework, are not directly applicable, a second step is needed.

The US government did not influence the working group on R79. It was mostly pushed by Japan, Germany and Korea which where backed by the UK, France and Spain.

The US industry however was very active.

All the work is done under the R79 umbrella, which is dealing with steering and we are adding elements related to braking.

Therefore, we might work on a new regulation in the near future.

Why introducing braking elements?

The systems have to be good enough to detect moving "targets" but also standing objects on the highway.

One of the collisions we saw in the recent past was the result of the sensor not recognising whether the standing object in front was on the road or part of the infrastructure.

This is a conversation we have had with AEB for trucks and buses. One of the challenges was to avoid false alarms because of standing objects. There is a need to regulate this because it is a real problem that could discredit the technology in the eyes of consumers.

We will regulate AEB for passenger cars and light vehicles within the next 2 years. That doesn't mean we will mandate it but member States such as the US, Japan etc. will be able to mandate AEB on the basis of our regulation.

In addition, the braking requirements will be there to make sure that in case of an emergency, the vehicle is able to cope with it and

address it safely. This might also be addressed by requirements for functions working similarly to AEB.

As part of the technical and safety requirement, are you going to include a reliability requirement? We know from testing agencies such as Thatcham that AEBS can avoid 20% of the front-facing collisions. That suggests it misses 80%.

Not to my knowledge because we cannot quantify that.

There are reasonable practical limitations into what can be done by authorities before a product can be put on the market.

The industry does test and verify reliability through a very wide range of tests, winter / summer, multiple locations, something that most of OEMs are doing over a few years per model. This is not what authorities are responsible for doing.

Besides the regulation, and perhaps more importantly, are market acceptance and market demand. If the systems are costly and not functional, they will be baldly received and not sold. **Market demand is sometimes a more efficient tool than regulation.**

If a regulation suggests the functions have to be, let's say, 75% reliable (only), that could impact the competition and some companies would stop trying to do better.

We saw that one of the problems that led to incidents is the natural human expectation that if the car rides the same route multiple times, it will learn to drive it better. While technology providers are clearly working on this to be the case one day, do you believe "learning" will become part of the safety requirements?

To learn from each other, cars would need to be connected.

Today the connectivity in vehicles is mainly for entertainment. There is no link between the vehicle motion and its connectivity.

If there were, we would immediately start having serious cyber security risks to manage. Until we have a better understanding of how to manage these risks, I expect we won't have the opportunity to use connectivity to steer a vehicle.

To date, in the development phase, data may be collected for testing purposes but this is only for the technical testing process, not from a regulatory perspective.

If you have big data used in and coming from the vehicle, it will be very difficult to secure it. Cyber security and software safety are important considerations.

Do we have a cybersecurity problem today?

I don't see a crisis to date. We do have example of what can be done for hacking but they come mostly from universities and researchers alerting about potential crisis.

The point is that, as long as there is no connection between the brain of the car and the web (or whatever is outside of the car), we don't have too many potential problems. **The bigger problem starts once we**

connect the driving function of the vehicle to the web.

We heard from NHTSA recently. They published a very detailed safety requirement list and defined the Operating Design Domain concept and required OEMs to send them a letter identifying the capabilities of each of their cars from Level 2 onwards.

Is NHTSA going in the type-approval direction?

In the USA, the safety standards designed by NHTSA are in the self-certification framework. This differs from the emissions requirements, with the EPA, being much closer to the European system. The Policy paper issued by NHTSA on AV has a holistic approach.

At UNECE, we focused more specifically on technical requirements in Regulation No. 79, so there are certainly elements of this policy that can inspire our work e.g. on over-the-air update issues.

Also, it is worth noting that depending on manufacturers, a new vehicle type-approval may take around 3 months. Personally, I have never experienced type approval to be a problematic factor delaying market introduction.

NHTSA published guidelines only. How can you work in a self-certification market if you don't have very strict standards defined?

If you look at the standards defined by the Federal Motor Vehicle Safety Standards (FMVSS), they are very stringent, sometimes more than the UN ones. We always work with a third party, so there is a possibility to discuss things and their interpretations.

When OEMs work on the basis of self-certification there is no third party. They need to perform the test according to the regulation.

As of today, nobody really knows holistically how and when AV will work, so it is impossible to define very strict and precise standards for the purpose of self-certification.

What is remarkable is that NHTSA looked at pragmatic options, such as the possibility of a third party testing.

NHTSA is insisting throughout the document on data transfer and transparency. This is a core issue for the insurance sector. Will R79 bring answers regarding what data is shared and how?

What we try to do is to deliver technical tools being useful for further concerns, such as the determination of responsibilities in case of collision involving these technologies.

We are drafting requirements for some of the information to be kept on the system. This suggests a sort of black box where a set of data is securely stored for a certain time.

That dataset is defined to understand what led to the incident and possibly to help reconstruct it, including:

- If the automated system was on or off,
- If the driver was interfering,
- If the driver was attentive, in case an attention detection system was available.

The collection of the data will need to take into consideration cybersecurity risks as well as data

protection (impacting privacy).

Do you expect the black box data to be accessed wirelessly or manually, as Electronic Data Recorders are in the US?

I suspect that in order to follow the data protection regulation and to protect the driver, it will be preferable that the **wireless transmission of the data is forbidden**, which is a point that is advocated by the FIA.

We know OEMs are all looking at being able to upgrade their product over the air during their life on the road. How will this affect the homologation rules?

At this stage we have not got a precise answer yet on this item. However work is in progress since March 2016.

If you look at the US guideline, you will also see some suggestions regarding software upgrades – specifically that they need to be communicated to NHTSA in time.

If you look at what is happening already today, you'll find that some ECUs may encounter problems and that they can be flashed at the dealership. Software updates already exist and are already part of the processes if tackled as "retrofit".

Core activities of the WP9

So what remaining regulation to have a L3 vehicle legally on the market will need to be passed once the national highway code has been changed?

The borderline between level 2 and level 3 is vague. In our technical work at UNECE, we prefer to work on clear technical requirements for categories of systems corresponding to certain use cases.

At level 2, the driver has the obligation to monitor the situation outside and inside the car. At level 3, the driver only has the obligation to monitor the proper working of the system. Not the environment, as long as the system doesn't request to do so. Again, this is quite vague and could be subject to interpretation.

We do work on integrating the SAE levels in our regulatory framework. But when we talk about the requirements, we move away from them for more clarity.

The regulatory process for such technologies is ongoing and we expect that the full specifications will be adopted by the working group by September 17.

In terms of the traffic rules, there are complications that need to be looked at. They include the enforcement by the police related to the secondary task.

If the driver is in a level 3 vehicle and using his smartphone, what would be expected from a policeman? How will they react?

We can guess that the UN body looking at driving rules internationally and the Vienna convention will come up with a standard rule to solve this problem.

Interview conducted by Thomas Hallauer in November 2016