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NEW INFRASTRUCTURES

AUTOMATED AND CONNECTED VEHICLES, SMART ROADS AND SMART INFRASTRUCTURE

New Infrastructures – Automated and connected vehicles, smart roads and smart infrastructure

Autonomous mobility is a prominent feature of an increasingly interconnected world where the Internet of Things impacts not only vehicles, trains, aircraft, drones or other movable assets, but it also plays a significant role in our cities, our buildings, roads, and supporting infrastructure like airports and ports. It reflects on the way we work and live, with a massive amount of data and information flowing among machines and requiring all players and stakeholders to be cognizant of its potential.

The pace of 'smart' industry

According to high-profile analysts, volume commercial deployment of fully Automated Vehicles (AVs) worldwide is predicted to be 10 years away. However, key industry players aim to have vehicles equipped with Level 4 Automated Driving Systems, which allow vehicles to perform all driving functions in as soon as 2 years in certain markets. Several manufacturers are already testing this technology worldwide, with both real on-road trials and simulation miles run in the cloud.

EU Member States are boosting support for AV industry and related testing. Notable examples, among others, are:

- the United Kingdom where, in March 2019, the Centre for Connected and Autonomous Vehicles published the Future of Mobility: Urban Strategy paper, setting out the governmental approach on automated and connected mobility innovation and related regulatory review; and
- Italy, where the Roads Monitoring Center issued, in Spring 2019, its unanimous official affirmative opinion on the first application to test AVs on public roads.

In the United States, the Department of Transportation published its latest policy update in the fall of 2018. Preparing for the Future of Transportation: Automated Vehicles 3.0 (AV 3.0) provides further guidance on DOT's existing policies, including the use of voluntary safety standards and the proper roles for the Federal and State governments, and also expands DOT's guidance beyond passenger vehicles to other modes of transportation.

AV 3.0 sets forth DOT's six "automation principles" — (1) prioritizing safety; (2) remaining technology neutral; (3) modernizing regulations; (4) encouraging a consistent regulatory and operational environment; (5) preparing proactively for automation; and (6) protecting and enhancing the freedoms enjoyed by Americans. These principles are reflected throughout AV 3.0 and DOT intends to translate these principles into action

through stakeholder engagement, best practices, voluntary standards, targeted research, and regulatory modernization.

- More than 80 companies across the U.S. are already testing self-driving cars, trucks and other vehicles – an estimated 1400 vehicles are currently in testing.
- Over 1.59M drones are currently registered in the U.S. – nearly five times the number of registered manned aircraft.

The technical knowledge and scientific know-how related to the integration of automation technologies into vehicles is already accessible. However, AVs' actual deployment has to endure other technical challenges, such as the complex interplay among the broad range of Machine to Machine communications which include V2V (Vehicle to Vehicle), V2I (Vehicle to Infrastructure), V2G (Vehicle to Grid) and V2X (Vehicle to Everything) interconnections. These technologies require a highly reliable and low latent connectivity in order to be able to convey communications continuously and seamlessly. The choice of a common connectivity standard, such as 5G or WiFi, is therefore a core decision for the flourishing of these new infrastructures.

Main regulatory trends

The starting point for this development was the adoption of EU Reg 2015/758, by means of which the European legislator introduced the interoperable EU-wide eCall, a mandatory requirement applying to all new vehicles from 31 March 2018. Thanks to this IoT mandatory tool, in the event of a severe accident, vehicles must be able to automatically contact the EU emergency number (112) and transmit location and other data to emergency services. For its part, the United States currently favors an industry-driven, technology neutral approach, and some U.S. manufacturers offer similar services on their vehicles.

Following this initial regulatory milestone, the implementation of IoT in movable and non-movable assets has evolved towards enhancing human driving capabilities, improving road safety and achieving a higher social inclusion. However, for cities to be smart and connected with other machines, it is necessary to develop a legal framework that sets out the boundaries for their lawful operation.

Addressing new challenges: ethics and liability

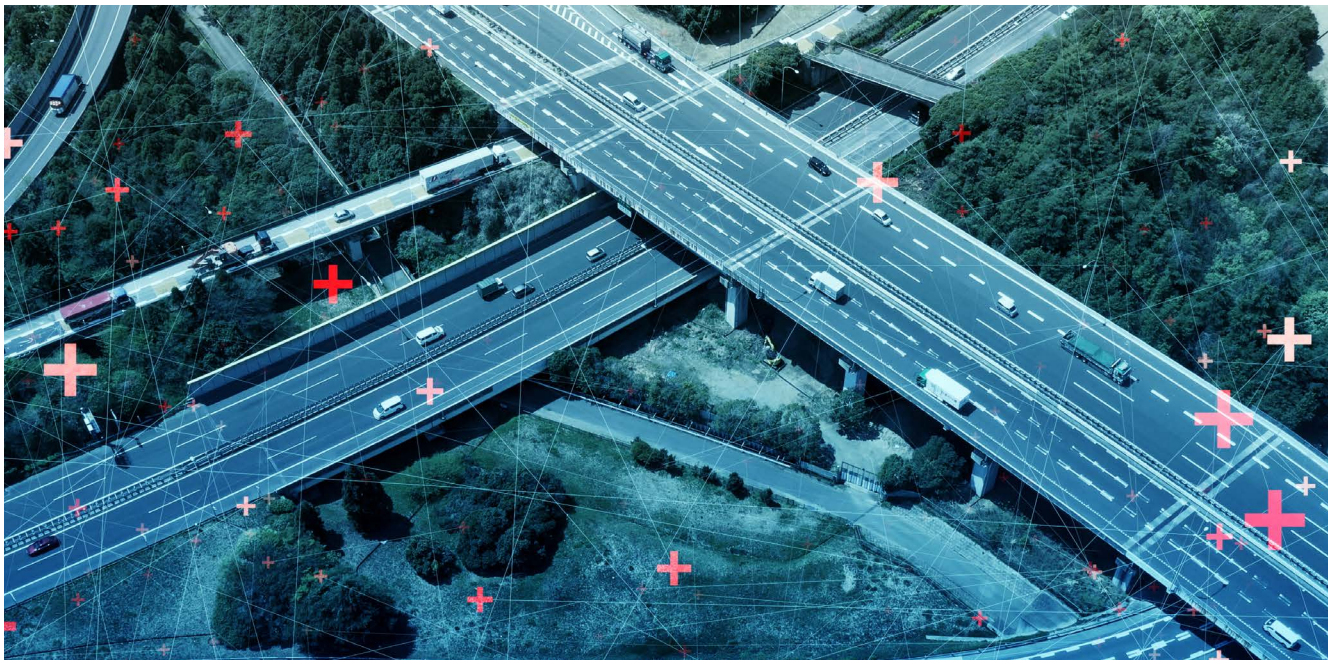
As the application of IoT technologies in this field often entails machines engaging in decision-making activities, regulators have to take into account ethics-related aspects (e.g., by mapping ethical frameworks to guide AVs' algorithmic/software design decisions). Although there are only few examples (see the German Report on Automated and Connected Driving), the debate has been the subject of many experiments. The Massachusetts Institute of Technology developed the so-called Moral Machine, a global survey in the form of an online game that gathered human judgements on acceptability of ethical decisions made by automated driving systems in various accident scenarios – needless to say, the outcomes were far from conforming.

Alongside the challenging debate around ethics and algorithms, one of the other aspects curbing the widespread dissemination of these new infrastructures relates to the liability regime surrounding AV's circulation. Most jurisdictions are currently consulting to identify appropriate solutions to regulate various aspects such as:

- the applicability of civil negligence and what exclusions may be granted, e.g., duty of care, breach of duty and accountability for the resulting damages;
- the criminal liability regime, e.g., corporate manslaughter for defective AVs, liability for compliance with motor vehicle code;
- insurance coverage requirements and liability for OEM and drivers, e.g. whether the OEM will be required to carry insurance;
- the contractual liability between OEMs and the supply chain, e.g. contract caps, indemnities for faulty software.

Conclusions

As the trends are converging to a common and standardized environment, the deployment of next-gen, interconnected infrastructures and vehicles will be shaped by forward-looking guidance. The combination between top-down regulation and industry-led collaboration with regulators is key to the achievement of an optimal balance. AVs and smart cities will characterize the future look of our urban surroundings. New rules will be needed in order to efficiently integrate the existing environment with these new infrastructures.



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