REGULATORY REQUIREMENTS AND LIABILITY FRAMEWORK OF SELF-DRIVING AND DRIVING-ASSISTED CARS

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ASSISTED VEHICLES AND REMOTED-CONTROLLED VEHICLES

TECHNOLOGICAL EVOLUTION IN THE FIELD OF VEHICLES – DRIVERLESS CARS

- Cyber-Assisted Vehicles
- Remoted-Controlled Vehicles

ONTOLOGICAL DIFFERENCE

- Cyber-Assisted and Driver-less Vehicles

- Remoted-Controlled Vehicles

- *Even if their implementation raises many similar moral and legal issues*
- *We do not consider other than just vehicles (no automatic weapons, nor remoted-controlled weapons)*

CYBER-ASSISTED VEHICLES AND REMOTED-CONTROLLED VEHICLES

- Unmanned Aerial Vehicles [Flight-Programmed drones and Remotely Piloted Aircraft System – RPAS]
- Unmanned Ships [Autonomous ships sailing on the basys of pre-programmed software and Remotely Operated Ships]
- «Autonomous» Cars

LEGAL OBSTACLES

- Cyber-Assisted Vehicles and Remoted-Controlled Vehicles

UNMANNED AIRCRAFTS AND CHICAGO CONVENTION

- Article 8 of Chicago Convention of 1944: «*No aircraft capable of being flown* ***without a pilot*** *shall be flown* ***without a pilot*** *over the territory of a contracting State without special authorization by that State and in accordance with the terms of such authorization. Each contracting State undertakes to insure that the flight of such aircraft without a pilot in regions open to civil aircraft shall be so controlled as to obviate danger to civil aircraft*»

- [Reminiscence of World War II flying bombs V-1 and V-2]

ITALIAN CODE OF NAVIGATION, ARTICLE 743, § 2, AS AMENDED

- «Remoted controlled aircrafts, defined as such by special laws, ENAC regulations and, for military ones, by decrees of the Ministry of Defense are also considered *aircrafts*»

UNMANNED SHIPS

- Legal problems of unmanned ships were considered since the first half of last century
- Military use of surface unmanned vessel was tested during World War First)
- UNLOS, Article 94, § 3, lett. *b* and c [duties of flag States to ensure safety at sea]

DUTIES OF FLAG STATES TO ENSURE SAFETY AT SEA, ACCORDING UNCLOS, ARTICLE 94, § 3, LETT. *B* AND C

- b) *each ship [shall be]* ***in the charge of a master and officers*** *who possess appropriate qualifications, in particular in seamanship, navigation, communications and marine engineering, and that the crew is appropriate in qualification and numbers for the type, size, machinery and equipment of the ship*

- c) *the* ***master, officers and, to the extent appropriate, the crew*** *[shall be] fully conversant with and required to observe the applicable international regulations concerning the safety of life at sea, the prevention of collisions, the prevention, reduction and control of marine pollution, and the maintenance of communications by radio*

REDUCED CREWS

- The greater the automation of installed equipment on vessels, the lower the crew complements are for operation of those vessels …
- Reduced Crews as a factor of Risk [see NTSB Report on Exxon Valdes case in Alaska Gulf Waters, 1989]

CARS

SAE - SOCIETY OF AUTOMOTIVE ENGINEERS

- SAE *Recommended Practice, Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles,*

June 2018

THE 6 SAE LEVELS

- 0 - *No Driving Automation*
- 1 - *Driver Assistance*
- *2 - Partial Driving Automation*
- *3 – Conditional Driving Automation*
- *4 - High Driving Automation*
- *5. - Full Driving Automation*

BASIC PROBLEMS

- Rules of the Road
- Liability
- Insurance

RULES OF THE ROAD

CONVENTION ON ROAD TRAFFIC – CRT – VIENNA NOVEMBER 8, 1968 – ARTICLE 8

- Article 8, § 1: «Every moving vehicle or combination of vehicles **shall have a driver**»

- Article 8, § 5: «Every driver **shall at all times be able to control his vehicle** (or to guide his animals)»

CRT AS AMENDED, ARTICLE 8, § *5 BIS*

- Art. 8, § *5 bis*: «1. *Vehicle systems which influence the way vehicles are driven shall be deemed to be in conformity with paragraph 5 of this Article and with paragraph 1 of Article 13, when they are in conformity with the conditions of construction, fitting and utilization according to international legal instruments concerning wheeled vehicles, equipment and parts which can be fitted and/or be used on wheeled vehicles.*
- *2. Vehicle systems which influence the way vehicles are driven and are not in conformity with the aforementioned conditions of construction, fitting and utilization, shall be deemed to be in conformity with paragraph 5 of this Article and with paragraph 1 of Article 13, when such systems can be overridden or switched off by the driver*»
- [in force since March 23, 2016]

CRT, ARTICLE 13, § 1 - SPEED AND DISTANCE BETWEEN VEHICLES

[

- «1. ***Every driver of a vehicle shall in all circumstances have his vehicle under control*** *so as to be able to exercise due and proper care and to be at all times* ***in a position to perform all manoeuvres required of him.*** *He shall, when adjusting the speed of his vehicle, pay constant regard to the circumstances, in particular the lie of the land, the state of the road, the condition and load of his vehicle, the weather conditions and the density of traffic, so as to be able to stop his vehicle within his range of forward vision and short of any foreseeable obstruction. He shall slow down and if necessary stop whenever circumstances so require, and particularly when visibility is not good*».

ITALIAN CODE OF THE ROAD, ARTICLE 46

- Vehicles **driven by a man** are considerend as vehicles falling under the scope of the code
- To be admitted to road circulation vehicles must be driven by a [human] driver on-board

BARRIERS LIMITING THE IMPLEMENTATION OF DRIVERLESS CARS

BASIC LEGAL CONSTRAINTS (*DE LEGE LATA*)

- As we have seen above, admission to the road circulation of a car requires a driver on-board, who has the actual control of the vehicle
- Similar problem for RPAS in air-space.
- For a long time, RPAS have been relegated to use in segregated airspace
- Target for RPAS is operations in non segregated airspace (i.e. together with traditional aircrafts, with a crew on-board). See EU Regg. 2018/1139 of July 4, 2018 and 2019/947 of May 24, 2019.

TECHNICAL CONSTRAINTS

- To operate driverless cars you need reliable operating conditions, i.e. a customized operating environment [=smart roads]
- It means that you need infrastructures and data interconnection at least between cars operating in the same area

- Technical and Economical Problem: how extensive the network can be?
- «Last mile» problem: may we expect a «door-to-door» service? Customized operating environment limited to the main roads?

FURTHER TECNICAL CONSEQUENCES

- Interconnection between vehicles requires a standard
- It implies the problem of intellectual property licensing
- Intellectual property rights become a competitive advantage
- Intellectual property as «*essential utility*»

[We have already many examples of the extension of the problem in the field of civil aviation: GPS, ACAS, etc.]

POSSIBLE CONSEQUENCES *DE LEGE FERENDA*

- Restricting the use of conventional cars [ban on smart roads?]
- Model in aviation: imposition of ACAS devices to fly in certain airspace

OTHER IMPLICATIONS

- Interconnection means control
- Privacy
- Possibility to access data for public authorities
- Data and Big Data Access and Usage for subjects other than public authorities …
- Is present legal framework sufficient to fight and deter abuses?
- Security … Unlawful Interferences and Cyber-Attacks
- Last but not Least: LIABILITY …

TEST ON PUBLIC ROAD

LEGAL ADMITTANCE OF TESTS ON PUBLIC ROAD FOR AUTOMATIC CARS

- In Italy, Decree so called «Smart Road» - decree of February 28, 2018 nr. 70 of Secretary of State for Infrastructures and Transports to admit tests on the Road and to Establish Regulatory Framework
- It does not touch Liability Regime (and Liability Compulsary Insurance Regime, except for minimum insurance ceiling which is doubled)
- So, generally speaking, tests fall under the scope of application of laws for liability and compulsory insurance in the field of circulation of motor vehicles

«SUPERVISOR»

- Italian decree requires a supervisor on-board who could be able to promptly take the manual control of the car (i.e. to convert himself in just a driver)

OTHER COUNTRIES

- Most developed Countries enacted laws for testing phase of automatic driving

FRANCE

- Ordonnance n° 2016-1057 of August 3, 2016 «*relative à l'expérimentation de véhicules à délégation de conduite sur les voies publiques*»
- Loi n° 2019-486 of May 22, 2019 relative à la croissance et la transformation des entreprise [so called «loi Pacte»] amending Ordonnance n° 2016-1057
- After loi-Pacte amendments to Ordonnance n° 2016-1057 tests on public road may be possible, also with a « «*conducteur à l'extérieur du véhicule*» [driver outside the car, i.e. a remote driver]

PRESENT LIABILITY FRAMEWORK

PRESENT FRAMEWORK

- The target of uniformation of law in the field of civil liability for the circulation of motor vehicles has not been achieved till now
- European Convention on Civil Liability for Damage caused by Motor Vehicles of May 14, 1973 (European Council Convention nr. 79) never entered in force
- On the contrary European Convention on Compulsory Insurance against Civil Liability in respect of Motor Vehicles of April 20, 1959 (European Council Convention nr. 29) entered in force on September 22, 1969), not formally ratified that, but enforced *de facto* (even enlarging the scope of application) by Law nr. 990 of 1969 (now recasted in Code of private insurance [Legislative Decree nr. 209 of September 7, 2005).

A COMPARISON

- Even in Europe Legal Framework of for Damage caused by Motor Vehicles is various
- National legislative options range from presumed liability systems like the Italian one, passing through strict liability systems, to social security systems like the French one [*loi «Batinder» no. 85-677 of July 5, 1985, which has many points of contact with the afore-mentioned European Convention on Civil Liability for Damage caused by Motor Vehicles of May 14, 1973*].

ITALIAN CIVIL CODE, ARTICLE 2054

- The driver of a vehicle that is not guided by rails is liable for the damage caused to persons or to property by operation of the vehicle unless he proves that he did all that was possible to avoid the damage.
- In the case of collision of vehicles, it is presumed, until proof to the contrary is offered, that each driver contributed equally toward causing the damage suffered by each vehicle.
- The owner of the vehicle, or in his place the usufructuary or purchaser with reservation of ownership, is liable jointly and severally with the operator of the vehicle, unless he **proves that the vehicle was being operated against his will.**
- In any case, the persons indicated in the preceding paragraphs **are liable for damage arising from defects in the manufacture or maintenance of the vehicle.**

COMPULSORY INSURANCE

- Under the influence of European Council Convention of Strasbourg of April 20, 1959 (never ratified by Italy): Compulsory Liability Insurance
- Direct action by the injured party against the insurers (not generally available under Italian Law)

«FUTURE» UNDER PRESENT LEGAL FRAMEWORK [ITALIAN CIVIL CODE]

- Who is the driver?
- Driver and owner can not exempt themselves giving evidence that damage arose from defects in the manufacture or maintenance of the vehicle
- What is the burden of the proof on the owner that "the vehicle was being operated against his will"? [i.e.: *How to consider hackerage?*]
- What is about precautionary duty of the owner of the car? [e.g.: updating of anti-malware softwares]

FUTURE AND ECONOMICS

- May we expect a push towards disposal of individual ownership of cars?
- Another step towards sharing economy?

RECASTING LIABILITY

LET'S IMAGE A FULLY AUTOMATIC CAR

FUNDAMENTAL QUESTION

- To leave to people on-board the opportunity to intervene, or
- Not to leave

AFFIRMATIVE ANSWER TO PREVIOUS QUESTIONS

- Opens to moral questions [let's mention the «trolley problem»]. Absolute general solution not possible

NEGATIVE ANWER

- Drives to easier solutions in the field of liability
- It has been experienced as the best one in the field of aviation [pilot in command has to follow anyway ACAS Resolution advisories, though inconsistent with ATC Instructions [ICAO Doc. 9863]
- The implementation of this solution in the field of road-circulation may be desirable where and if the vehicle is able to distinguish the situations it faces

NOT ALL OBSTACLES ARE THE SAME

- Baby
- Cat
- Cow
- Wall

PERFECT MURDER/1

- As written by a well-known Italian jurist, also the last solution may pose some problem
- Let's image that you wish to kill the "driver" (better the "user") of a driverless car
- Let's pose that you know that the software driving the car is programmed to turn right in front of a suddenly appeared pedestrian
- How to do?

…

PERFECT MURDER/2

- You wait that your enemy uses his car on a route road bordering a ravine on the right
- You suddenly cross the road in front of your enemy's car …
- The car discards the obstacle turning on the right and falls in the ravine

- *For further information, please refer to:*
- COMENALE PINTO – ROSAFIO, *Responsabilità civile per la circolazione degli autoveicoli e per l'utilizzazione del software per la conduzione autonoma delle automobili. Dal grande fratello al grande conducente*, to be printed in «Diritto dei trasporti» (next issue)

GAME OVER

THANKS FOR YOUR ATTENTION