

**SMART CARS AND SMART ROADS:
THE ITALIAN WAY FOR THE NEW MOBILITY TEST PHASE**

*Stefano Pellegatta**

SUMMARY: 1. The Italian regulatory framework: the Smart Roads Decree – 2. The requirements for the authorization to test “automatic driving” on public roads – 3. The new figure of the “supervisor” of the self-driving vehicle: duties and civil liability – 4. Opportunities and limits of a conservative choice, justified in the testing phase – 5. From “supervisor” to “driver:” the delicate transition from automatic to manual driving mode (so-called “switch”) – 6. The safety of the experimental vehicles from cyber risks – 7. The provision of an enhanced mandatory insurance for the experimental phase of automatic guided vehicles – 8. Civil liability and insurance: the challenges of the new mobility.

1. – In Italy, the so-called Smart Roads Decree (m.d. 28 February 2018) (the “Decree”)¹ introduced a framework of legal rules related to new technologies that are destined to revolutionize the world of transport and human mobility².

This recent Decree defines Smart Roads as road infrastructures where, in accordance with the functional specifications introduced by the Decree itself, a digital transformation process occurs aimed at introducing platforms that enable the managers of such infrastructures, the public administration and the users themselves to view and monitor traffic, data and information processing models, as well as advanced management services, in order to

* Dottore di ricerca in Diritto Privato e Storia della Scienza Giuridica Civilistica, Professore a contratto di Diritto Privato nell'Università degli Studi di Milano.

¹ The Decree, implementing the 2018 budget law, also regulated the possibility of conducting experiments with self-driving vehicles on Italian public roads.

² On the subject, see AA.VV., *Smart mobility, smart cars e intelligenza artificiale: responsabilità e prospettive*, curated by D. Cerini – A. Pisani Tedesco, Milano, 2019; D. Cerini, *Dal Decreto Smart Roads in avanti ridisegnare responsabilità e soluzioni assicurative*, in *Danno e resp.*, 2018, 4, 401 f.; S. Scagliarini, “Smart Roads” e “Driverless Cars” nella legge di bilancio, in *Quad. cost.*, 2018, 2, 497 f.



create a technological ecosystem that facilitates the interoperability between infrastructures and new-generation vehicles. The Decree promotes the valorization of existing infrastructures, the creation of useful infrastructures, the technological upgrading of the national road network in line with European and international frameworks on the digitalization of road infrastructures, supports – in connection with the use of Smart Roads – vehicles with advanced driver assistance systems, and additionally reduces road accidents and ensures the continuous provision of European cooperative, connected and automated mobility (C-ITS)³ services.

The implementation of this new technology is aimed at facilitating the development of self-driving vehicles and to render practicable – in a broad sense – the advancement to higher levels on the scale of autonomy⁴. It has been correctly pointed out that there is a very close connection between “vehicle” and “infrastructure”: the digital evolution of these two supporting protagonists is, indeed, necessary to pursue the goal of creating completely self-driving transportation⁵.

To this end, the Decree is careful to introduce an accurate definition of the concept of “self-driving” car, qualifying it as a vehicle equipped with technologies capable of adopting and performing driving behavior without the active intervention of the driver, in certain road situations and external conditions. The new legislation specifies that vehicles approved for circulation on public Italian roads in accordance with the law in force, and equipped with one or more driver assistance systems that are activated by drivers for the sole purpose of activating driving functions that they themselves decide to activate and that anyhow require the continuous attention

³ This acronym refers to the system of cooperative, connected and automated mobility, as defined under the European C-ITS platform. See the Decree at Article 1.

⁴ The reference is made to the most widely used and authoritative technical classification, proposed by the *Society of Automotive Engineers* (SAE). SAE J3016 TABLE on autonomous driving, available at: <https://www.sae.org>.

⁵ Smart roads are developed in order to accompany the development of smart cars. See Dekra, *Road Safety Report*, 2018, p. 52 f., available at: www.dekra.it. Connected infrastructures (such as roads, traffic lights, signals) capable of dialoguing with intelligent vehicles will therefore be implemented. In this regard, additional legal needs will concern the phenomenon of information exchanges between vehicles and between vehicles and infrastructures. See also Cerini, *Dal Decreto Smart Roads*, cit., 407 and U. Ruffolo, *Self driving cars, Auto driverless e responsabilità*, in AA.VV., *Intelligenza artificiale e responsabilità*, curated by U. Ruffolo, Milan, 2017, 49-51.

of the drivers, are not considered “self-driving.” Assisted driving, currently permitted and marketed, therefore does not fall under the category of fully-fledged autonomous driving vehicles referred to in the above-mentioned Decree ⁶.

Using these basic notions, which are fundamental to classify individual cases, the new law additionally provides essential rules for the authorization of experiments using self-driving vehicles.

2. – Article 9 of the Decree clearly states that experimenting on public roads with self-driving vehicles is authorized by the Ministry of Infrastructure and Transport – Department for Transport, Navigation, General Affairs and Personnel – Directorate General for Motor Vehicles. This regulation, therefore, makes it possible to conduct tests on Italian public roads ⁷. Authorization may be requested, whether individually or jointly, by the producer of the vehicle equipped with automated driving technologies, as well as by universities, public and private research entities that conduct experiments on vehicles equipped with autonomous driving technology. Authorization may only be granted for vehicles that lack self-driving technologies that have already been approved and certified according to applicable law ⁸.

⁶ On this topic, for further profiles, see also S. Pellegatta, *Autonomous Driving and Civil Liability: the Italian Perspective*, in *this Journal*, XVII, 2019, 135 f.

⁷ The Italian system has therefore followed the example set by other European countries, and especially Germany, which has a rigorous law on self driving vehicles and related tests. For more on this subject, see “8th Amendment of the German Road Traffic Act”, which entered into force on 21 June 2017, available at: www.bgbl.de/xaver/bgbl/start.xav#__bgbl__%2F%2F*%5B%40attr_id%3D%27bgbl117s1648.pdf%27%5D__1517589427052. On the subject, see M. Losano, *Il Progetto di legge Tedesco sull'auto a guida automatizzata. Appendice: Il Progetto di legge e le relazioni illustrative*, in *Dir. informaz. e informatica*, XXXIII, 2017, 1-25; M.T. Franzé, *La proposta normativa tedesca sulla guida autonoma, il via ai test sulle strade*, in *Cyberlaws*, 18 September 2018, available at: <https://www.cyberlaws.it/2018/la-proposta-normativa-tedesca-sulla-guida-autonoma-il-via-ai-test-sulle-strade/>. For more information related to the procedure introduced by this amendment, on the related debate and on the previous situation, see F. Henkel – J. Nowak – N. Smirra, *Autonomous vehicles: the legal landscape in Germany*, in *Norton Rose Fulbright*, 11 August 2016, available at: <https://www.nortonrosefulbright.com/en/knowledge/publications/0e91a75d/autonomous-vehicles-the-legal-landscape-in-germany>.

⁸ However, the same article – in the second part of paragraph 3 – clarifies that the power of manufacturers of motor vehicles and their trailers, their representatives, agents and dealers, as well as the producers of autonomous driving technologies, universities and research entities (whether

The law states that, if a person other than the producer requests authorization, the applicant must provide proof that the producer of the vehicle has given permission to experiment. This provision has been nonetheless challenged by the Italian Antitrust Authority and could cause future amendments to the applicable law ⁹.

The authorization may be granted for one or more vehicles, with indication of each vehicle's owner ¹⁰. Following the authorization, the vehicles are annotated in a special register held by an authorized person, and a special label – which must be placed on both the front and back of the vehicle during experiments – indicating the vehicle has been authorized for experimentation is issued. During experiments, the authorized vehicles circulate with test plates issued pursuant to the Decree of the President of the Republic No. 474 of 2001.

The authorization refers to the execution of experiments on one or more road areas and, for each of these, for the specific road infrastructures indicated by the applicant after having obtained permission from the road's owner. Authorization therefore requires the involvement of the road manager and reinforces the vehicle-infrastructure pair referred to above.

Pursuant to Article 11 of the Decree, the application for authorization must include, among other things: a) the name of the owner of the automated vehicle (who is liable under Article 196 of the road-safety rules and Article 2054, paragraph 3, of the Italian civil code), or another person who is jointly liable pursuant to Article 196 of the road-safety rules; b) indication

public or private) that conduct experiments on vehicles, to perform validation road tests on a new model before mass production, pursuant to presidential decree No. 474 of 24 November 2001, remains unaffected.

⁹ This provision is contained in the Decree at Article. 14. The position adopted by the Antitrust authority is found in the report dated 8 January 2019, published in bulletin No. 2, Year XXIX of the Antitrust Authority, pursuant to Article 26, law No. 287/1990, and available at: www.agcm.it. For further discussion on the subject, reference may be made to S. Pellegatta, *Profili anticoncorrenziali del procedimento di autorizzazione alla sperimentazione della guida automatica*, in *Diritto di Internet*, 17 April 2019, available at: <https://dirittodiinternet.it/profili-anticoncorrenziali-del-procedimento-autorizzazione-alla-sperimentazione-della-guida-automatica/>.

¹⁰ Paragraph 4 states that said vehicles “fall under the same class and category laid down in Article 47 of the rules of the road, equipped with autonomous driving technologies belonging to a homogeneous family with functional characteristics similar to and capable of ensuring the same amount of road security, even in different versions”.

of the road areas for which authorization to conduct testing is requested and, for each area, the specific stretches of road where experiments are expected to be conducted, and other related information ¹¹.

The second paragraph of the above mentioned provision additionally provides that the application for authorization must include a statement, accompanied by any necessary or useful information, in which the applicant attests under his own responsibility to: a) the maturity of the technologies that will be tested on the road areas for which authorization has been requested; b) the description of the know-how deriving from the providers of each component; the testing procedure to be implemented; the tests performed during simulation; the tests performed on the road, with specific mention of the deviations from the real application scenarios; c) that the applicant has already conducted experiments with self-driving vehicles – even if different from those for which authorization is requested – through laboratory simulation, and whether such experiments were conducted with driving simulators or in protected areas, over a distance of at least three thousand kilometers, as well as laboratory experiments in protected areas or on public roads, whether national or foreign ¹²; d) the capacity of the vehicle, in self-driving mode, to manage situations that are foreseeable with regard to the typical driving and external conditions on the road areas for which permission is requested ¹³; e) the suitability of the vehicle, in self-driv-

¹¹ Some of the references include: d) the proof that the Entity that owns the road has given, for each stretch of road for which authorization is requested, permission to conduct experimental tests, including in cases where an extension is being requested; e) the indication, for each road area indicated in the application, of the external, weather and visibility conditions, as well as the road and traffic conditions, for which the capacity of the self-driving to manage will be tested.

¹² Provided that a State regulates experiments with self-driving vehicles, for a homogeneous class of vehicles for which authorization is requested for at least three thousand additional kilometers. The experiments that have already been conducted and the minimum kilometer thresholds indicated refer to each road area for which authorization is requested, in realistic traffic conditions, including the interaction with other vehicles or other objects present on the road area. Any accidents or anomalies that occurred during experiments, whether in a laboratory or protected area, are reported and described.

¹³ Specifically, the documentation must indicate management systems for specific road conditions and scenarios, such as: roundabouts, traffic signals, road signs (e.g., “pedestrian crossing”, “work in progress”); pedestrians and objects, including bicycles, animals, obstacles, cones; if provided for by the external conditions for which authorization is requested, environment conditions such as rain, snow, ice, dust, night; interactions with emergency vehicles, such as fire engines, am-

ing mode, for each of the road areas and external conditions for which authorization is requested, to act appropriately with reference to the typical driving conditions in each road area and, alternatively, the possibility of the supervisor of the self-driving vehicle to intervene promptly to keep the vehicle operating in safe conditions at every moment of and for the full duration of the experiment¹⁴; f) the description of the technology used for the self-driving vehicle; g) the description of the safeguards in place to prevent unauthorized access to the automated driving systems; h) the risk analysis on the circulation of vehicles in self-driving mode, the description of the safeguards in place to avoid or reduce risk, and the safety plans for the tests; i) the list of driver of self-driving vehicles¹⁵ and of the vehicles themselves¹⁶.

3. – Aside from these predominately technical details, the interesting aspect about the Decree is that it expressly introduces the figure of the “supervisor” of the self-driving vehicle during experimentation. This section of the law appears to be particularly focused on identifying who is responsible for controlling the vehicle, notwithstanding the existence of a – predominately active – system of complete automated guidance. This legislative choice seems to be aimed at maintaining full civil responsibility of the physical person seated behind the wheel, whether or not this person has physical control over the vehicle in that specific point in time when an accident occurs.

The *factio iuris* (legal fiction) appears to associate the “in charge” presence of the physical person with his power to intervene¹⁷. Specifically, the super-

balances, police cars.

¹⁴ On this point, the law clarifies that particular attention must be paid to any functions that allow the vehicle to operate in a synchronized convoy, maintaining reduced distances between vehicles, to demonstrate their safety. This is called “platooning” (or convoying) of vehicles, essentially tested for long-distance transport of goods and creates benefits such as reduction of pollutants.

¹⁵ List that, according to the above mentioned law, must include proof of completed training, in order to ensure that the drivers are knowledgeable about the way the vehicle might behave and are able to manage any dangerous situations caused by external factors, functional limitations or malfunctioning of the technologies being tested.

¹⁶ The reference is to the list of self-driving vehicles subject to experimentation, with indication of each single vehicle and the different version of the technology applied to each.

¹⁷ It is appropriate to refer once again to Pellegatta, *Autonomous Driving and Civil Liability: the Italian Perspective*, cit. 135 f. This type of solution appears to echo other noteworthy fictions in the

visor is called to regain control of the vehicle as soon as required by the system, or in emergency situations. Despite the intent of the law, it must be noted that this might not be possible in all situations, and the mere existence of a “panic/stop” button might not automatically attribute control of the vehicle to whoever is in the driver’s seat.

This rigor is likely due to the experimental nature of the authorization. In the current context, it is preferable to require that the physical persons, who finds themselves behind the wheel, be fully alert and attentive, even though they do not perform any commands, or at least not under normal circumstances. This solution is understandable: the supervisor is the technical professional called to study and perform tests, and not merely a passenger. Indeed, the new law provides requires the supervisor to have matured a specific amount of experience and hold certain professional qualifications¹⁸. This choice, therefore, does not prevent the legislator from opting – in the future, when self-driving cars become the norm and no longer the exception – a different solution, for example by excluding the liability of the “supervisor” for damages caused by self-driving vehicles, or at least limiting liability to that of the physical person in cases of negligence or other particular circumstances.

Indeed, it is commonly observed that automated guided vehicles were created so that drivers can perform activities other than driving while the vehicle is being operated and, therefore, by requiring him to maintain the same level of attention as a so-called “manual” driver would strip the tech-

field of damages that, however, seem to be in the process of being superseded: the author refers to the now outdated interpretation of Article 2049 of the Italian civil code, aimed at recognizing a continuous liability of the driver for *culpa in eligendo*, if not *in vigilando*: see G. Giorgi, *Teoria delle obbligazioni nel diritto moderno italiano*, V, Florence, 1926, 524; L. Corsaro, *Responsabilità per fatto altrui*, in *Dig. disc. priv., sez. civ.*, XVII, Turin, 1998, 386.

¹⁸ In this regard, Article 10 of the Decree establishes that the self-driving vehicles must be driven during experimentation by a supervisor who has held a driver’s license for at least five years for the relevant class of vehicle being tested, has passed a safe driving course or a course specifically for experimenting with autonomous driving vehicles at an accredited entity in a European Union country, has performed tests on self-driving vehicles in protected areas or on public roads, and even abroad provided that the State in which the experiments were conducted regulates such experiments, for a distance of at least a thousand kilometers and possesses necessary and sufficiently documented knowledge to be able to take part in tests as supervisor.

nological development of its significance ¹⁹.

4. – Accordingly, the Decree focuses exclusively on the objectives of the legislative intervention itself: to authorize a limited number of experiments that use new and disruptive innovation ²⁰. In this framework, it is useful to reduce the risk that the proposed solution might influence the complex future regulation of the phenomenon, once the test phase has been concluded and mass implementation has occurred.

In this respect, the Decree appears “conservative” in that it, at least at this phase, merely “adapts” to the legal solutions currently in force on automobile civil liability, as the “supervisor” – and no longer the “driver” – is civilly responsible for the vehicle. As such, the Decree maintains the liability of the persons physically positioned in the driver’s seat ²¹, even though it is obvious that they cannot be considered full-fledged drivers ²².

¹⁹ Self-driving vehicles were created precisely to reduce the need for constant human intervention in the driving process, so that drivers may use the time they would normally spend at the wheel doing other activities. It would therefore not make sense, in this prospective, to impose a requirement of constant intervention. On this, see M.C. Gaeta, *Automazione e responsabilità civile automobilistica*, in *Resp. civ. e prev.*, 2016, 5, 1729-1730 and 1743-1744.

²⁰ See M.E. McGrath, *Autonomous Vehicles, Opportunities, Strategies and Disruptions*, Poland, 2018, 141. The author’s opinion that “autonomous vehicles will create an extreme degree of disruptions” must be shared because this evolution “will displace a huge existing industry, transportation, along with all its supporting industries”. See also M. Cameron, *Realising the potential of Driverless Vehicles*, Wellington, 2018, 1 f. and A. Herrmann – W. Brenner – R. Stadler, *Autonomous Driving, How the Driverless Revolution Will Change the World*, Bingley, 2018, 31 f.

²¹ The choice appears to be justified in this experimental test phase, as it is presumed that self-driving vehicles are still not sufficiently safe. Also, in consideration of the very limited diffusion – and conditional upon the respect of a detailed authorization regime – of this category of vehicles, it has been held that it is reasonable to maintain the liability of the person sitting in the driver’s seat.

²² Driver means the subject that has control over the vehicle: see, among others, Gaeta, *Automazione e responsabilità civile automobilistica*, cit., 1725; L. De Stefano, *Altri danni derivanti da cose: la rovina degli edifici e la circolazione dei veicoli*, in AA.VV., *Valutazione del danno e strumenti risarcitori*, curated by B. Inzitari, Turin, 2016, 446. See also R. Scognamiglio, *Responsabilità civile e danno*, Bologna, 2010, 72 f. and M. Franzoni, *Fatti illeciti*, in *Comm. Scialoja-Branca-Galgano*, sub art. 2054, II ediz., Bologna-Roma, 2020, 474, who highlights that this person is anyone who drives a vehicle. Therefore, the quality of driver is attributed to the person who has control over the vehicle: see C.G. Terranova, *Responsabilità da circolazione di veicoli*, in *Dig. disc. priv., sez. civ.*, XVII, Turin, 1998, 95. When the “automated driving” system is active, the physical person does not have control over the vehicle and therefore is not the driver. In this regard, Article 1, lett. j), of the Decree (already analyzed) is significant as it establishes that supervisors assume the role of driver when

Currently, even if a vehicle is guided by an automated system, the human driver is liable for any damages produced. This solution thus expressly associates the law with the possibility for vehicle to pass from automated to manual driving almost instantly. It is significant that Article 10, paragraph 2, of the Decree provides that the supervisor must be able to switch rapidly between automated guided and manual driving mode. The law then expressly adds “the supervisor remains responsible for the vehicle in both operative modes”.

If, in this experimental phase, the solution appears appropriate and reasonable, from the moment that qualified professionals perform the tests and the technology still shows room for improvement and is not without margin of error, it is doubtful that the current solutions will continue to be appropriate and reasonable in the future. Assigning liability to a person just because he is seated behind the wheel (and thus being transported) seems radical and completely without regard for the degree of his fault for any harm caused²³. As such, although liability for motor vehicles is aggravated and strict, it remains anchored to the power of control²⁴.

Instead, the new law appears to associate the person in the driver's seat with a sort of warranty, irrespective of his concrete ability to control the vehicle. The continuous possibility to intervene seems more like a declaration of principle. This solution might be admissible in situations where the person in the driver's seat is a “professional” supervisor, but is probably less convincing when somebody is being “transported” (even if she is seated in the front seat of the vehicle).

At the same time, in the current legal framework and in consideration of the phenomenon's innovative charge, the chosen solution appears suitable, especially considering the transitory nature of the regime in the experimental phase. Indeed, this does not undermine the current system (which

they effectively drive the vehicle, in manual mode.

²³ For a comparison of arguments in favor and against maintaining the current scheme that assigns liability to the owner or driver, see E.F.D. Engelhard – R.W. De Bruin, *Liability for damage caused by autonomous vehicles*, The Hague, 2019, 84 f.

²⁴ Gradually, as automated driving systems assume control over the guidance of the vehicle, it appears that the cause of accidents will be increasingly attributed to a failure of the system itself. At the same time, the role of the driver – tends to – be in increasing decline, which contributes to the need to reduce, at least internally, his degree of accountability for the cause of the damage.

would be excessive at this phase and not even possible by way of ministerial decree), but it is primarily concerned with identifying a plurality of subjects responsible for harm, for the purpose of providing enhanced protection for third parties that could suffer damages as a result of the performance of tests.

5. – As concerns the automated driving systems authorized by the new legislation, Article 12 of the Decree – which governs the characteristics of self-driving systems for the purpose of obtaining authorization to conduct experiments on public roads – appears particularly interesting. The new rules provide that, in order to obtain authorization to conduct tests on public roads, the self-driving system being tested must: a) comply with, under all circumstances, the rules of the road and, in general, operate without posing danger or impeding the movement of traffic; b) be able to interact safely with any and all users of the road, in the authorized area, including the most weak and vulnerable people, such as those affected by reduced mobility or disabilities, children, pedestrians, cyclists and motorcyclists; c) allow the supervisor of the automated vehicle to, at all times, immediately and easily switch from automated to manual driving mode. In this context, this article expressly clarifies that “the transition must occur in a manner and in a period of time such as to permit the successful outcome of the intervention by the supervisor. Such suitability must be documented and included in the application for authorization”.

The transition (or “switch”) phase is thus one of the most delicate. It is significant that the Decree establishes that the manufacturer of the system has a sort of “obligation to achieve a specific result” from the moment that it must “ensure” the positive outcome of the intervention of the supervisor. The same authorization effectively depends on the possibility to pass “simply and immediately” between driving modes. The burden of proof of manufacturer liability therefore appears relaxed in cases where this transition fails.

6. – Article 12, lett. d) of the Decree, establishes additional obligations by clarifying that the vehicle must be equipped with intrinsic safeguards that ensure the integrity of data and security of communications will not be

compromised, and that, in any case, no damage or danger will result from unauthorized access to the systems. As such, the law addresses the cyber risk that appears inevitable and destined to increase at the same speed as the development of intelligent and connected vehicles²⁵.

Additionally, the system installed on the vehicle must be capable, for the entire duration of the tests, to record detailed information. Essentially, the Decree imposes the use of a black box²⁶.

This risk is not limited to the single vehicles, but has to do with the same “smart” infrastructure, due to the profound interconnection between the vehicle and the infrastructure²⁷.

7. – As regards insurance coverage, Article 19 of the Decree establishes that, pursuant to Law No. 990 of 24 December 1969, the applicant must demonstrate – by submitting a copy to the authorizing authority – to have specific liability insurance for the self-driving vehicle, with a minimum ceiling equal to four times that required by current legislation for the same vehicle without automated driving technology. The insurance policy must

²⁵ For particular reference to the risk of hacker attacks, see A. Pisani Tedesco, *Rischi satellitari e informatici*, AA.VV., *Smart mobility, smart cars e intelligenza artificiale: responsabilità e prospettive*, curated by D. Cerini – A. Pisani Tedesco, Torino, 2019, 79 f.; F. Costantini, *Il problema della sicurezza tra informatica e diritto: una prospettiva emergente dalle “smart cars”*, in *Inf. e dir.*, 2016, 1, 95 f.; Gaeta, *Automazione e responsabilità civile automobilistica*, cit., 1744; Ruffolo, *op. cit.*, 48 f.

²⁶ According to the law, the instrument must be suitable for the recording of data with a frequency of at least ten hertz and such to include at least 1) time lapsed from the beginning of the recording, coinciding with the beginning of the experiment; 2) current mode of operation (manual or automated); 3) date, hour, position in WGS84 coordinates and instantaneous vehicle speed; 4) instantaneous acceleration speed; 5) distance travelled from the beginning of the experiment; 6) activation of the vehicle’s controls for side movements; 7) activation controls for the vehicle’s longitudinal movements; 8) the motor’s rpm speed, or another equivalent indicator; 9) transmission-gear ratio, or other equivalent indicator; 10) current value of the yaw, roll and pitch angles; 11) use of lights, and visual and acoustic signals; 12) sensor-acquired data from sensors belonging to the system subject to testing; 13) any V2V and V2I messages received and transmitted. This last hypothesis refers to the following notions established by Article 1 of the Decree: o) “cooperative V2I systems”, systems that integrate vehicles and infrastructure capable of transmitting information and services related to safety and efficacy of driving and traffic; p) “cooperative V2V systems”, systems for the interaction and collaboration between vehicles; q) “connected driving”, driving conditions of the vehicle equipped with cooperative V2I or V2V systems.

²⁷ See also D. Cerini, *Tra c.d. “smart roads” e “smart vehicles”: prospettive e problematiche in tema di responsabilità ed assicurazioni*, in AA.VV., *Smart Roads*, cit., 3 f.

expressly indicate that the insurance company is aware of the manner in which the vehicle will be used and that the vehicle circulates in self-driving mode on public roads.

The new legislation therefore imposes drivers to obtain more insurance coverage for damage caused by the circulation of self-driving vehicles to offer greater protection for third parties who are damaged by the experiments²⁸. This type of insurance only covers part of the risks associated with the development of “intelligent” automobiles. For the moment, aspects such as cyber risks and the risk of invasion of privacy that the new technology brings are set aside²⁹. We are dealing with aspects that are destined to be subject to deeper consideration, as a result of the diffusion of these new instruments and the consequent increase of related risk. On this point, it must be observed that, aside from the foreseen legal obligations, driverless car policies that offer a complete package of services and coverage, going in the direction of covering the typical risks associated with this new sector, are beginning to become more diffused on the market³⁰. Additionally, the new regulation, although ignoring the need for mandatory insurance even against these risks, nonetheless emphasizes the full liability and warranty of

²⁸ See G. Iorio, *Corso di Diritto Privato*, Turin, 2018, 819.

²⁹ As regards the privacy profiles, see M.C. Gaeta, *La protezione dei dati personali nell'IoT, l'esempio dei veicoli autonomi*, in *Diritto informaz. e informatica*, 1, 2018, 147 f. On spatial risks, see the detailed observations of Cerini, *Dal Decreto Smart Roads*, cit. 405-407, which points out how the skeleton of the new mode of circulation and organization of transportation connected to self-driving cars derives from the question of satellites, and also Pisani Tedesco, *op. cit.*, 79 f.

³⁰ It is noteworthy that we are currently taking the first steps toward driverless insurance policies: they are essentially “tailor-made” in Italy, for the purpose of managing experimentation with driverless cars; the United Kingdom, on the other hand, has already started commercializing such policies and proposes an array of added coverage (e.g., coverage against hacker attacks and software update failures). See, for an example on insurance coverage offered by Trinity Lane for self-driving vehicles, which general conditions establish that with “driverless mode” activated, the policy covers: “loss or damage caused if a security patch, firewall or operating system update has not been successfully installed in the vehicle within 24 hours of the owner being notified by the manufacturer or software provider; loss or damage caused if updates to electronic mapping and journey planning software have not been successfully installed within 24 hours of the owner being notified by the manufacturer or software provider; loss or damage caused by satellite failure/outages that affect navigation systems; loss or damage caused by manufacturer’s operating system failure or authorized software failure; loss or damage caused by failing when able to use manual override to avoid a collision or accident in the event of operating system, navigation system or mechanical failure”.

the manufacturer: the need for a safe vehicle, even in the face of external risks, is indeed envisioned in the technical specifications, which bias the same possibility to apply for authorization to experiment ³¹.

8. – In light of the above observations, it is understandable that the Smart Roads Decree has created a complete normative context for the conduction and development of the test phase of this new technology. Autonomous driving, as defined by the same Decree, is therefore permitted on an experimental basis by the Italian system, under the conditions described above. The structure of the Decree additionally makes clear that there is an intimate connection between infrastructure and vehicle, which the regulatory body seems to have in mind, and which constitutes the backbone of future development: indeed, this is a sector where it is essential to create symbiosis between smart “roads” and smart “vehicles” through an ecosystem of rules. Moreover, the goal is to achieve the highest level of supranational and European coordination possible in order to ensure full harmonization and free movement ³².

The Decree may take a more traditional approach to the laws on liability and (consequently) mandatory insurance coverage. Continuing to hold the supervisor liable in all circumstances and increasing insurance ceilings appears to be a first response that is entirely focused on the current regime of civil motor liability where the driver is central. Some aspects will certainly have to be remedied. For instance, manufacturer liability may be promoted by excluding the supervisor’s power of control. For the rest, the same Decree, seems to implicitly support a framework where the producer is called to create “infallible” systems that allow a switch from automated to manual driving ³³.

³¹ Reference is made to the already analyzed Articles 11 and 12 of the Decree.

³² At the EU level, the Resolution of the European Parliament of 15 January 2019 on “autonomous driving in European transport” is noteworthy. Incidentally, this is a subject of EU importance from the moment that it impacts safety and product liability, as well as the freedom of movement.

³³ On the relationship between automated driving systems and product liability, see G. Calabresi – E. Al Mureden, *Driveless cars, Intelligenza artificiale e futuro della mobilità*, Bologna, 2021, p. 156 f.; Gaeta, *Automazione e responsabilità civile automobilistica*, cit., 1730 f.; A. Bertolini, *Robots as Products: The Case for a Realistic Analysis of Robotic Application and Liability Rules*, in *Law, Innovation and Technology*, 2013, V, II, 227 f.; E. Al Mureden, *Sicurezza “ragionevole” degli autoveicoli e*

The generalized affirmation of manufacturer liability is destined to introduce significant elements to applicable insurance models, as it may prove advantageous to move to a system where manufacturers are directly responsible for the protection of third parties. The cost of such insurance coverage (which would be hypothetically managed in house by the same automobile manufacturers or self-insurance instruments)³⁴ would be passed on to the consumer and built into the cost of the product, even if doing so might impede the development of this new market³⁵. On the other hand, this option seems suitable to put additional pressure on manufacturers to pursue higher levels of safety standards: in turn, this would increase collective trust for the product's quality and thereby stimulate a sort of vicious cycle for the growth of a new market. Some more advanced producers on the market already appear to have considered this option, and have already implemented it to

responsabilità del produttore nell'ordinamento giuridico italiano e negli Stati Uniti, in *Contr. e Imp.*, 2012, 1506 f.; K. Van Wees - K. Brookhuis, *Product Liability for ADAS: legal and human factors perspectives*, in *EJTIR*, 2005, 357; Engelhard - De Bruin, *op. cit.*, 2019, 11 f.

³⁴ See AA.VV., *What's the horizon for the insurance industry in 2019*, in *Norton Rose Fulbright*, Marzo 2019, available at: <https://www.nortonrosefulbright.com/en/knowledge/publications/d8017fe6/whats-on-the-horizon-for-the-insurance-industry-in-2019> evidencing how "several insurers have already thought about these developments and see new opportunities. While less individual drivers might need insurance in the future, large insurance policies could be offered to manufacturers, fleet owners and operators. They are currently investigating different insurance schemes for autonomous vehicles, like "direct insurance", where the insurer immediately deals with the damage for the insured, without having to determine his liability". See also D. Muoio, *Tesla is already showing how the insurance industry will be disrupted by self-driving cars*, in *Business Insider*, 27 February 2017, available at: <https://it.businessinsider.com/driverless-cars-could-negatively-affect-insurance-industry-2017-2/?r=US&IR=T>. On this point, the author shares the observations of CERINI, *Dal Decreto Smart Roads*, cit., 404 that "it will be necessary to bear in mind the entrance in the market of new competitors that are interested in risk management and that do not necessarily belong to the scheme of traditional insurance companies". On this topic also see Calabresi - Al Mureden, *op. cit.*, 144 f.

³⁵ This is the so-called "technology-chilling effect": see A. Bertolini - E. Palmerini, *Regulating robotics: A challenge for Europe*, in *EU Parliament, Workshop on Upcoming issues of EU law for the IURI Committee, Publications Office of the EU Parliament*, Bruxelles, 2014, 110 f. The option that will have to be assessed in the future, even from a normative and regulatory standpoint, will be between keeping the owner of the vehicle at the "center of assignment of risk", or identifying other responsible persons, and eventually require them to adopt new forms of mandatory insurance, thereby "yielding a owner-driver margin that at best will support the increased product-vehicle cost such that manufacturers will bear the cost of insurance coverage". See Cerini, *Dal Decreto Smart Roads*, cit., 409.

some degree as a (voluntary) alternative to traditional insurance systems³⁶.

The new risks tied to the technological development of both smart infrastructures and smart vehicles require new insurance coverage options: in this respect, the market already appears to be ahead of the regulatory body. Indeed, we are faced with a new opportunity for sector players who will likely be called to adopt new business and distribution models³⁷, while continuing to offer essential services that are both in the public interest and economically sustainable. The desire to reduce the number of road accidents through the advent of self-driving vehicles³⁸ will inevitably cause insurance companies to rethink risk models. From a normative and regulatory perspective, we cannot exclude the future introduction of types of mandatory insurance policies for product liability and other correlated risks. In conclusion, it is essential to support the insurance sector in adapting to new risks if the goal is to promote the development and social acceptance of this new technology³⁹.

³⁶ Reference is made to the manufacturer, Tesla, which in some Asian markets commercializes vehicles together with an ad hoc insurance product. This market player has recently declared that it will provide a wider range of insurance products in the future, managed directly by the company for damages caused or suffered by vehicles. We must also consider that, at least when it comes to declarations of principle, already in 2015, Volvo had declared to accept “full liability” in cases where a self-driving car was involved in an accident.

³⁷ This brings a necessary change of distributive insurance strategy, with a foreseeable impact on businesses and intermediaries.

³⁸ See Ruffolo, *op. cit.*, 39. The drastic reduction in the number of accidents will likely force insurance companies to rethink their products and prices. According to information from the *National Highway Traffic Safety Administration* (NHTSA), the goal is to reduce road accidents by at least 80% by 2035, in consideration of the fact that at present nine out of ten accidents are caused by human error. We can identify two complications: on the one side, more information is necessary (regarding accidents and therefore risks) on self-driving vehicles in order to accurately quantify the cost of the policy. To measure risk, a mountain of information is necessary that, currently, has yet to be collected: driverless vehicles must still travel thousands of kilometers.

³⁹ We can expect to see new developments in the area of product liability (and the connected increase in coverage – eventually even mandatory – for that sector) and an increase of spatial and cyber risks. As indicated by Cerini, *Dal Decreto Smart Roads*, cit., 404-406, “these sectors are currently characterized by an absence of regulation and a situation of underinsurance, especially in the Italian market”.

Abstract

Il saggio analizza la regolamentazione relativa alla sperimentazione su strada pubblica dei veicoli a guida autonoma nel contesto italiano, alla luce del c.d. Decreto Smart Roads. L'analisi si sofferma in particolare sulla figura del "supervisore", chiamato a vigilare sul funzionamento del sistema automatico nella fase di test. La presenza di questa figura professionale, dotata di specifici compiti, avvalorata la scelta di conservare un regime giuridico tutto sommato "tradizionale", relativamente al profilo della allocazione delle responsabilità, che tende a equiparare il "supervisore" al "conducente". Particolare attenzione viene dedicata al delicato fenomeno del c.d. "switch" che determina il passaggio del controllo del veicolo dal sistema automatico alla persona fisica. La nuova normativa introduce poi previsioni relative alla sicurezza dei veicoli, anche con riferimento ai "cyber risk", e rafforza altresì la copertura assicurativa obbligatoria allo scopo di assicurare la massima tutela dei potenziali danneggiati. Se le regole proposte appaiono un primo tentativo di disciplinare il fenomeno "disruptive" della guida automatizzata, ad un più attento esame, molte delle scelte normative del Decreto sembrano però da rimeditare ove la fase della sperimentazione lasci spazio a quella della autorizzazione, in via generale, di tali nuovi veicoli alla circolazione su strada, che porrà nuove sfide anche per il settore assicurativo.

The paper examines the Italian rules relating to the experimentation on public roads of *self-driving* vehicles, in the light of the so-called Smart Roads Decree. The analysis focuses in particular on the figure of the "supervisor", called to monitor the operation of the automatic system in the test phase. The presence of this professional figure, entrusted with specific tasks and duties, supports the choice of maintaining a "traditional" and conservative legal regime, in relation to the profile of the allocation of responsibilities for damages deriving from the circulation of vehicles, which tends to equate the "supervisor" to the "driver". Particular attention is paid to the delicate phenomenon of the so-called "switch" which determines the transition of control of the vehicle from the automatic system to the natural person. The new legislation then introduces provisions relating to vehicle safety, also with reference to "cyber risks", and also strengthens the compulsory insurance coverage in order to ensure maximum protection of potential injured persons. The proposed rules appear to be an effective

first attempt to regulate the “disruptive” phenomenon of automated driving. However, upon closer examination, many of the legislative choices of the Decree seem to be reconsidered once the test phase is completed and the circulation of these new vehicles on the road is generally permitted, which will also pose new challenges for the insurance sector.