15 years ESJ
Special edition

Sustainable Mobility and Accessibility for People with Disabilities: Emerging Trends, Policy Challenges, and Evolution in Motor Insurance

Sara Landini, Full Professor in Economic Law
Simona Viciani, Associate Professor in Private Law
University of Florence, Italy

Doi:10.19044/esj.2025.v21n42p76

Submitted: 20 March 2025
Accepted: 15 May 2025
Published: 17 October 2025

Cite As:
Landini, S. & Viciani, S. (2025). *Sustainable Mobility and Accessibility for People with Disabilities: Emerging Trends, Policy Challenges, and Evolution in Motor Insurance*. European Scientific Journal, ESJ, 21 (42), 76. https://doi.org/10.19044/esj.2025.v21n42p76

Abstract

Smart mobility, understood as automation-assisted driving, has found new solutions for individuals with chronic progressive diseases (e.g., multiple sclerosis), who require driving support that meets their evolving needs. Furthermore, specific issues, such as gender smart mobility (which particularly regards the needs of the female population), have recently been highlighted. The challenge is to combine these new methods with essential insurance coverage which is sustainable in terms of pricing and limitations (deductibles, reimbursement policies, etc.). It is also necessary to rethink non-mandatory policies that provide fundamental support, such as roadside assistance and vehicle repair coverage. This paper, through legal analysis, focuses on analysing smart mobility techniques, addressing critical issues in emerging insurance coverage, and providing constructive legal proposals for policymakers, as well as for insurance production and distribution. The issues addressed are based on data collected and analyzed by others, to whom this essay refers.

Keywords: Automation, Ethical Issues, Insurance

Introduction

1. Vulnerability Due to Physical, Mental, and Social Disabilities

Traditional forms of vulnerability tend to revolve around 'vulnerable people' or 'vulnerable populations'(Hall, 2012, pp. 61-94) and presuppose a checklist centred on inequalities within social groups based, for example, on gender, age, disability, and socio-economic status (Fineman, 2008, pp. 1-2). In other words, 'to be "vulnerable" in this sense means to be perceived as inferior' (Hall, cit.).

The concept of vulnerability as a human condition has been a central theme in many judgments of the European Court of Human Rights in recent decades. In interpreting the articles of the European Convention for the Protection of Human Rights and Fundamental Freedoms, the ECtHR has construed vulnerability either narrowly or broadly, depending on the likelihood of an individual suffering harm or being unable to achieve certain goals (Diciottti, 2018, pp. 13-34).

Consequently, a vulnerable individual may be someone whose status or claimed rights remain unrecognised, whose dignity and status as a human being with physical individuality and personal, spiritual identity requires formal acknowledgment (Garcia, 2017).

In this context, due sensitivity has not always been shown in dealing with the problems connected to reduced subjective capacity and, accordingly, in assessing the right to self-determination of individuals with disabilities. Even in cases where an attempt has been made to manage the problem, the issue has remained within the exclusive preserve of public power.

The evolution of legal thought on the protection of psycho-physical disability is marked by the need for complete liberation from the 19th-century vision - based on the antithesis between mental illness and normality - which sets individuals who are 'different' against the rest of society, isolating them from human relations on the ground that they are considered dangerous to themselves and others.

The rationale behind codified legislation was undermined by innovations that, from the 1960s onwards, influenced psychiatric science. As a result, the theory based on a univocal paradigm of mental illness was rejected in favour of an attitude that considered individuals with disabilities as "persons" and embraced a renewed conception of illness that had already established itself in the clinical sphere. Psychiatry thus ceased to play a role in the exclusion of the mentally ill, having previously been tied to an ideological system that sought to deny and annul its own contradictions by pushing them away and marginalising them.

These developments have taken place in a context where the increase in mental health disorders appears to be attributable to the cultural and identity decline affecting society. This decline may lead to the emergence of illnesses

such as anorexia, gambling, alcoholism, depression, and drug addiction, all of which are worryingly on the rise. In 2014, it was estimated that at least 3 million Italians suffered from mental health-related disorders. This number has certainly increased. According to ISS (National Institute of Health), estimates from 2022, approximately 1,100,000 people in Italy suffer from dementia, 50-60% of whom (about 600,000 people) are Alzheimer's patients. Additionally, there are approximately 1 million individuals struggling with alcoholism and about 800,000 people affected by ludopathy (gambling addiction).

Such degenerations have occurred in every historical era, and responses to them have varied widely. However, the challenge facing society, and with it, the legal world, is unprecedented, as it requires going beyond the Rawlsian theory of justice to apply constitutional and supranational principles and promote the concrete implementation of human rights (Rawls, 1982).

These theories are based on the well-known thought of Rousseau: when man decides to aggregate at a social level and thus cede part of his personal power, he does so to gain advantages, for example in terms of security. Rawls then questions whether such advantages remain even when subjects with weaknesses participate in the pact, gaining more from the agreement than they contribute. As Rawls explains, the role of such institutions is to distribute 'the fundamental duties and rights and determine the distribution of the benefits of social cooperation.'

Moreover, the gradual normalization of difference, the growing emphasis on inclusivity, and significant awareness initiatives on the importance of mental health have led a considerable number of people to take these issues more seriously. This growing attention confirms that mental health is not only a subject of great interest but also fosters greater social awareness. In 2017, the WHO defined mental health as a 'state of emotional and psychological well-being in which the individual can utilize his or her cognitive or emotional capacities, exercise his or her function within society, respond to the demands of everyday life, establish satisfying and mature relationships with others, participate constructively in changes in the environment, and adapt to external conditions and internal conflicts.' This approach led to the development of the Mental Health Gap Action Programme (Mhgap), aimed at scaling up care for mental, neurological, and substance use disorders while bridging the gaps between mental health care, physical integrity, and functionality.

However, it is essential to avoid the deception that, in the age of vulnerability, individuals ultimately identify with their disorder, relegating themselves to a life of perpetual insecurity. This perspective has indiscriminately broadened the concept of pathology - today, everyone is seen as weak, fragile, and unwell. Only those who accept this condition and make

it public, exposing it everywhere without considering the consequences of their testimony, seem to remain afloat. In the western world, the web and social media platforms have become therapeutic outlets that absorb information without providing anything in return (Cima, 2024).

On the other hand, when the flexibility of subjective and intersubjective experience, depersonalization, and detachment from the self and the world become unmanageable, and a return to everyday praxis is no longer possible, it is necessary to speak of illness. According to one author, the hypermodern subject appears as a lost individual, lacking a center, dominated by a compulsive drive for solitary (narcissistic and cynical) enjoyment that excludes symbolic exchange with the other (Stanghellini, 1997).

Furthermore, it is a fact that mental and physical health problems can affect anyone, especially in today's world, where individuals face immense pressure and the weight of imposed societal models. As a logical consequence, the need to identify new instruments of protection (Recalcati, 2010) has become an increasingly pressing issue.

Another aspect that can no longer be overlooked is the advent of the so-called era of *silverization*, the sharp increase in the number of persons of advanced age. To put this into perspective, at least 7 million Italians are currently over the age of 75, 30% of them live alone and have at least three illnesses, while 22% have difficulties in managing their daily lives. Furthermore, according to the ISS (National Institute of Health), 19% of elderly people in Italy are at risk of frailty, and the risk is highest among people with low levels of education and those living in the south and on the islands. Future estimate indicates that this number will continue to rise every year.

While Italy has seen a desirable increase in life expectancy and improvements in the condition of elderly persons, the phenomenon of an ageing population also necessarily entails at least two related problems. Firstly, there is a significant rise in the number of individuals who will require both material assistance and moral support, with a forecast increase in degenerative conditions such as Alzheimer's disease and senile dementia. Currently, 1,480,000 people in Italy suffer from dementia and this number is expected to rise to 2,300,000 by 2050, an increase of 55%. Globally, 75% of those living with some form of dementia do not receive a diagnosis, and 85% of those diagnosed do not have access to the necessary post-diagnostic support. Federazione Alzheimer Italia and Alzheimer's Disease International (ADI) have appealed to governments, communities, and individuals to take action in raising awareness about dementia and combating the stigma that continues to hinder diagnosis, treatment, care, and necessary support. These individuals will have to be supported by other persons and institutions.

ISSN: 1857-7881 (Print) e - ISSN 1857-7431

Secondly, as the quality of life and the possibilities open to each person increase, it is fair to assume that the person's needs may change. Today, even the elderly have various personal as well as property interests, and it is the duty of the welfare state to maintain and protect them.

Ultimately, finding responses that are both balanced and timely is not always straightforward, especially for those who, despite their mental and physical frailty, are still able to retain clarity and a sense of orientation.

In the international framework, the UN Convention on the Rights of Persons with Disabilities (CRPD) consolidated the use of the term "persons with disabilities" and emphasized that disability is linked to the relationship between individuals and their environment.

Its preamble states that 'disability results from the interaction between persons with impairments and attitudinal and environmental barriers that hinders their full and effective participation in society on an equal basis with others.'

The issue, therefore, does not lie in the subjective condition of the individual but in the social and cultural contexts in which disability manifests. As a result, institutions and civil society are called upon to remove or reduce disability-related barriers. The convention specifically highlights education and employment as key areas requiring targeted commitment. There are many cultural, social, political, and technical transformations that this text introduces. It marks a shift from the traditional reading of disability as an individual problem to the realization that persons with disabilities face discrimination and equal opportunities due to the responsibility of society. It moves from viewing them as invisible citizens to acknowledging them as individuals with human rights; from an approach centered on assistance and healthcare policies to one advocating for inclusive and mainstreaming policies; and from treating them as passive subjects of decisions made by others to recognizing them as autonomous individuals who seek to make decisions about their own lives Griffo, 2012, pp. 39-45).

Article 1 of the UN Convention states that its primary purpose is "to promote, protect, and ensure the full and equal enjoyment of all human rights and fundamental freedoms by all persons with disabilities, and to promote respect for their inherent dignity," thereby advancing beyond a purely health-welfare perspective.

With regard to the implementation of the Convention, Italy was brought before the Committee on the Rights of Persons with Disabilities (CRPD) because Article 12 emphasizes supporting persons with disabilities according to their preferences - however expressed - rather than acting in their best interests. This shift underscores that protecting individuals with disabilities should be centered on respecting their wishes.

Recently, under Enabling Act 227/2021, Italy approved Legislative Decree 2024/62, titled 'Definition of the condition of disability, basic assessment, reasonable accommodation, multidimensional assessment for the elaboration and implementation of a personalised and participatory individual life project'.

The decree, which is structured in four chapters and 40 articles, not only simplifies the procedures for ascertaining disability (the so-called basic assessment) and the subsequent multidimensional assessment but also introduces significant changes to the regulatory disability language. Specifically, it formally incorporates the definition of *persons with disabilities* into the Italian legal system (Legislative Decree 2024/62) and amends the wording of Law 104/92 accordingly.

A special aspect of this reform is the replacement of the term "handicapped or disabled person" with the more inclusive term "person with disabilities". A person with a disability is defined as someone with lasting physical, mental, intellectual, or sensory impairments who, in interaction with barriers, may experience difficulties in achieving full and effective participation in different aspects of life on an equal basis with others.

Another important aspect of the reform is the introduction of multidimensional assessment, which is made at the disabled person's request and is focused on ensuring support for that person's participation in decision-making processes. It is entrusted to teams of both permanent and variable staff and relies on a multidisciplinary method based on a biopsychosocial approach. At the end of the assessment, a personalized participatory individual life project is drawn up by the individuals who took part in the assessment. This is an innovative tool that identifies services and reasonable accommodation aimed at eliminating and preventing barriers while providing the necessary support to enable the inclusion and participation of the person concerned in various spheres of life. Persons with disabilities are the true owners of their individual life project. They must request its implementation, help to determine its contents, and exercise their right to make changes and additions according to their own wishes, expectations, and choices. The innovative character of the life project lies primarily in its ability to overcome the fragmentation of services, support plans, interventions, and services, bringing them together into a unified existential perspective.

Thus, the objective is to shift the perspective on disability - moving beyond a purely welfare-based approach to one that values individuals as people. This involves simplifying procedures, actively listening to each person's desires and choices, and ultimately enabling them to achieve a dignified and fulfilling life path.

2. Sustainable Mobility for People with Disabilities

Within the *Internet of Things* (IoT), one of the sectors undergoing the greatest development is undoubtedly the automotive sector. The expression Internet of Things (IoT) was coined in 1999 by the British engineer Kevin Ashton, co-founder of the *Auto-ID Center* in Massachusetts. It refers to technological development through which - via the Internet - potentially every object of everyday experience acquires its own identity in the digital world (Ashton, 2009, pp. 97-114, Peppet, 2014, pp. 84 ff.).

It is indeed expected that a level of automation will be reached in a fairly short time that can revolutionise driving habits. In this scenario, while performing autonomous driving functions, the driver will no longer need to constantly monitor the vehicle.

These advancement have given rise to Smart Cars and Connected Cars, which are driving the market growth, including the Italian one.

These vehicles connect to communicate real-time information to users, enable vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communication to prevent and detect accidents, and support the development of new insurance models and geo-referenced traffic data services.

Due to advancements in technology, vehicles are now interconnected with each other and their surroundings. This connectivity not only simplifies driving but also enhances road safety and reduces fuel consumption.

In the field of autonomous vehicles, connectivity plays a crucial role in facilitating communication between vehicles and their environment. Three primary types of communication can be identified:

1. Vehicle-to-Device (V2D) Communication – The most common form, enabling automated vehicles to interact with various external devices.
2. Vehicle-to-Infrastructure (V2I) Communication – A more specific type of interaction between vehicles and infrastructure, such as traffic lights and speed monitoring systems (e.g., Italy's Tutor system and speed cameras).
3. Vehicle-to-Vehicle (V2V) Communication – The most advanced form, relying on fully autonomous or highly automated vehicles to exchange information directly with one another.

In the coming years, the automotive market is destined to take off again because of new social demands to which automobiles, more than any other means of transport, can respond. Acceleration is further reinforced by legal mandates, particularly following the enforcement of the EU legislation in 2018.

Under this regulation, all new models of cars and light vans must be capable of automatically alerting emergency services in the event of an

accident. As a result, the number of natively connected vehicles has already increased significantly.

More specifically, according to the regulations, vehicles must be equipped with an automatic system that, as soon as the vehicle's sensors detect a serious collision, dials the European emergency number 112. The system then establishes a telephone connection with the emergency call centre and sends data relating to the accident, including the time, location of the vehicle involved, and direction of travel (particularly relevant if the incident occurred on a motorway or in a tunnel). Additionally, the eCall system can also be activated manually via a special button in the vehicle, which is particularly useful if a passenger witnesses an accident and needs to report it.

At present, when discussing autonomous driving, it is essential to consider the different levels, ranging from zero to five, which classify driver assistance systems based on their ability to intervene in case of driver input failure. Specifically, the levels are defined as follows:

- Level 0: The driver must maintain constant attention and perform all driving tasks. The system only provides warnings about malfunctions or dangerous situations.
- Level 1: The vehicle can take limited actions, such as steering (lateral movement) or braking/accelerating (longitudinal movement), but the driver must remain fully alert.
- Level 2: The vehicle can control steering, acceleration, and braking in certain situations (e.g., accident prevention), but the driver must be ready to intervene at any moment.
- Level 3: The vehicle autonomously manages steering, acceleration, braking, and environmental monitoring, though the driver must remain prepared to take over if necessary.
- Level 4: The vehicle can handle all driving functions in specific conditions (e.g., designated areas or traffic scenarios), though the driver is still required for monitoring purposes.
- Level 5: Full autonomy is achieved, allowing the vehicle to operate independently in all environments, eliminating the need for a driver altogether.

In the future, Level 4 and Level 5 autonomous vehicles will not only enhance mobility and accessibility, particularly for individuals with disabilities and the elderly, but also significantly improve road safety, minimizing human error.

Additionally, the implementation of European legislation mandating Advanced Driver Assistance Systems (ADAS), such as automatic braking and lane-keeping assistance, further supports this transition. ADAS minimizes the

need for driver intervention, reducing difficulties for elderly and disabled individuals when performing driving maneuvers.

Thus, recent *IoT* technologies applied in this field are paving the way for the mobility of the future, where connected cars will play an even more prominent role, and mobility will continue to evolve rapidly, bringing considerable benefits.

There will be an improvement in road traffic conditions, a reduction in environmental pollution and, above all, the extension of mobility to people who are often excluded from driving, such as the elderly and people with disabilities. As a result, mobility will increasingly be transformed into a comprehensive service (Scagliarini, 2019; Schreurs & Steuwer, 2015). The concept of 'mobility-as-a-service' expresses an interesting change of perspective, which increasingly places the role of the user at the centre by stimulating his or her potential ability to adopt more sustainable behaviour. This is leading not only to the emergence of new mobility systems and new delivery mechanisms and actors in the various modes of transport, but also to a new interpretation of the notion of infrastructure (Heikkilä, 2014; Finger, Bert & Kupfer, 2015).

The preamble of the UN Convention on the Rights of Persons with Disabilities emphasizes 'the importance of mainstreaming disability issues in relevant strategies for sustainable development'. Under Article 4, States Parties pledge, among other things, to 'undertake or promote research and development... of mobility aids'. Article 9 also highlights measures to ensure access to roads and transport, while Article 20, which focuses on personal mobility, calls on states to 'facilitate the mobility of persons with disabilities in the manner and at the time of their choice and at an affordable cost' and to facilitate access to assistive devices and technologies.

The 2030 Agenda, adopted by the United Nations in September 2015, emphasizes the need for innovation and advancements in production processes, training, and education to address the challenges of sustainability through a 'cross-cutting approach' and 'horizontal coherence' between social, environmental, and economic policies. In particular, Goal 11 - Sustainable Cities and Communities - sets a specific target: "By 2030, provide access to safe, affordable, accessible, and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities, and older persons."

In Europe, it is important for the new European Disability Strategy to adopt an approach and vision that will provide guidance in the future. However, it is not easy to find the expression 'sustainable mobility' linked to the topic of mobility for people with disabilities. A change in perspective is

ISSN: 1857-7881 (Print) e - ISSN 1857-7431

therefore necessary - not only to better understand this issue, but also to ensure that it becomes part of the sustainable mobility framework of communities.

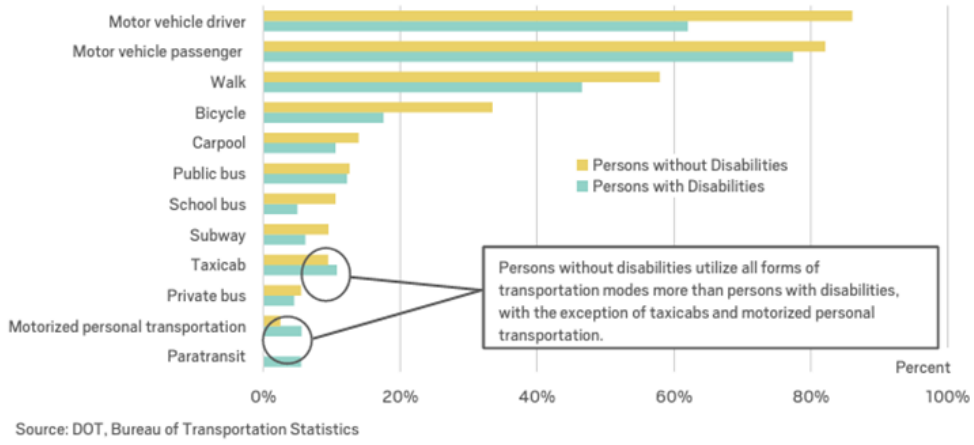
In Italy, the Second Biennial Action Programme for the Promotion of the Rights and Integration of Persons with Disabilities, launched in 2017, underlines 'the timely commitment to suggesting concrete opportunities for innovation' and seeks to respond to the 'demand for full and integral citizenship of the most vulnerable, offering indications for rethinking, as a whole, a society that is more just, cohesive, and respectful of the many diversities that make up the national community'.

Moreover, the fragilities that emerge for persons with disabilities may be likened to those of the elderly who have the same motor, sensory, and cognitive difficulties and need the same aids to achieve equal access to mobility. In many cases, these two conditions coincide, creating even greater obstacles to mobility. Statistics indicate that half of all persons with disabilities drive a car, and among them, half are over 64 years of age and continue to do so. Additionally, 1/3 of individuals over 75 years of age have a severe limitation of autonomy, and for 1 in 10 elderly people, these limitations affect both the daily activities of personal care and those of domestic life (Annese, 2023).

The difficulties faced by elderly people and people with disabilities have to be addressed through suitable tools designed to solve or at least mitigate the problems faced by these users. If these innovations become a shared practice among policymakers and practitioners, sustainable mobility for people with disabilities could become one of the models through which the development of future communities will be based.

Here is some data on the use of transportation means for people with or without disabilities. This data shows the impact of disabilities on the use of transportation means.

Self-Driving Cars: The Impact on People with Disabilities



Source: DOT, Bureau of Transportation Statistics

Transport Modes Used in the Past Month for Local Travel

ISSN: 1857-7881 (Print) e - ISSN 1857-7431

3. Automated Vehicles

The concept of automation in vehicles is generally associated with the use of algorithms for decision making. It refers to systems that display intelligent behaviour by analyzing their environment and taking actions - with some degree of autonomy - to achieve specific goals (Nof, 2009, pp. 13-52). In 1979, the Stanford Cart was able to move without human intervention using an image processing algorithm called The Cart's Vision Algorithm, which was inspired by the Blocks World planning method. This algorithm functioned by reducing images to a set of edges (Simon, 1979, p. 10).

The SAE (Society of Automobile Engineers) International's On-Road Automated Vehicle Standards Committee, along with experts from industry and government, issued an information report defining key concepts related to the increasing automation of on-road vehicles. Central to this report are six levels of driving automation: 0 (no automation), 1 (driver assistance), 2 (partial automation), 3 (conditional automation), 4 (high automation), and 5 (full automation) (Parasuraman, Sheridam Wickens, 2000, p. 286).

Furthermore, the levels of automation can be distinguished by considering the interaction between humans and computers (Landini, 2021, pp. 100-101):

- At level 1, the human operator acts and turns to the computer to implement his/her actions;
- At level 2, the computer helps the human operator by determining the options;
- At level 3, the computer suggests options and the human operator can choose to follow the recommendation;
- At level 4, the computer selects the action and the human operator decides whether it should be done or not;
- At level 5, the computer selects the action and implements it if the human operator approves the selected action;
- At level 6, the computer selects the action and informs the human operator who can cancel the action;
- At level 7, the computer carries out the action and informs the human operator;
- At level 8, the computer carries out the action and informs the human only if the human operator asks;
- At level 9, the computer carries out the action and informs the human operator only if the computer decides that the operator should be told;
- At level 10, the computer carries out the action if it decides it should be done. The computer informs the human operator only if it decides the operator should be told.

Governments around the world are actively discussing the regulations to be implemented to allow driverless vehicles to be present in cities. As discussed in the following paragraphs, it is essential to determine whether new regulations need to be established or if adapting existing legislation is sufficient. Globally, the number of connected devices is expected to rise significantly, with the Internet of Things (IoT) playing a major role in transforming road transport networks. Vehicle-to-vehicle and vehicle-to-infrastructure communication will allow driverless cars to leverage data in real time, making mobility for city residents much more enjoyable and easier. Furthermore, it seems likely that the majority of future driverless cars will be fully electric vehicles (FEVs). Cities will therefore need to increase investment in charging infrastructure to support the growing share of automated and non-automated electric vehicles.

A revolution in road traffic is underway, necessitating a reconsideration of civil liability and insurance.

4. Liability Issues

Most of the literature dealing with compensation for damage caused in the event of automation has raised the question of the possible responsibility or co-responsibility of the manufacturer and/or programmer. The attention of European institutions has also focused on this aspect. Efforts have mostly been directed towards the reform of the directive on manufacturer liability and cyber security. Scholars have also reviewed the concept of guilt of the owner and/or user of an automated product and suggested measures that might be taken, for example, raising the required level of diligence (Hubbard, 2014, 1803; Chopra & White, 2011, pp. 128-130).

However, this discussion specifically aims to highlight human-machine interaction and self-learning AI as potential causes of damage. It also raises the question of whether civil liability alone is sufficient - not only to compensate for losses but, more importantly, to prevent harm from occurring in the first place.

The recommendations to the EU Commission on Civil Law Rules on Robotics (2015/2103(INL) stressed this point.

The interactions between machines and humans (the owner, user, manufacturer, programmer, and machine manager) are so many and complex that it becomes difficult to identify the person(s) responsible.

Even where the parties may be assumed to share liability, this fails to resolve the victim's difficulties in identifying the person actually responsible. In fact, each potentially responsible person will try to prove that the action of the others has excluded his or her own liability.

Thus, there could be a real risk of extending the time needed to receive compensation for losses or damage. Moreover, the damage is usually so huge

and with domino effects that prevention, rather than compensation, becomes fundamental.

One possible solution lies in a special legal provision on joint liability. The question of whether wrongdoing can be attributed to multiple actors does not emerge if all parties involved are automatically considered joint tortfeasors. In this case, they are jointly liable, and it is therefore their task to determine responsibility internally. In any case, this solution requires the introduction of legislation, whereby liability is attributed to all actors independently of proof of their culpability and the causal chain in the determination of wrongdoing.

One author's proposal is "to construct a system of strict liability, completely uncoupled from notions of fault for this select group of cases. A strict liability regime cannot be justified on the basis that autonomous vehicles are 'ultra-hazardous' or 'unreasonably risky' as they are likely to be far less hazardous than the conventional vehicles they replace. Indeed, it is precisely their advanced technology that creates the expectation of reliability and minimal failure. Given this, the author argues for a true strict liability regime, one that does not rely on risk-utility tests or a negligence standard, as those tests would be too difficult - if not impossible - for injured parties to meet." The author also states, "[l]est there be any doubt, my argument is not based on notions of a 'no-fault' liability system, that is, a system that substitutes mandatory insurance and eliminates access to the judicial system. My proposal is a strict liability regime implemented by the courts. Although the idea of 'no fault' systems took hold in the 1970s and 1980s and was expected to drive down insurance costs by limiting the transaction costs related to litigation, the introduction of driverless cars is likely to shift liability from the 'driver' to the manufacturer, which may, in turn, renew interest in 'no-fault' insurance regimes." (Vladeck, 2014, p. 146; Anderson et al. 2010, p. 10).

A transfer of risk to an insurer of the owner or of the user can represent a solution.

5. Insurance and Risk in the Case of Automated Cars

5.1. More Automation, Less Risk

According to a survey conducted in the USA, "despite claims to the contrary, self-driving cars currently have a higher rate of accidents than human-driven cars, although the injuries are less severe. On average, there are 9.1 self-driving car accidents per million miles driven, compare to 4.1 crashes per million miles for regular vehicles" (Clifford Law Offices, 2021).

Among the dangers inherent with driverless cars:

1. False Sense of Security
2. Danger of Fire
3. Imperfect Technology

4. Cyber Attacks
5. Complex, Real-Life Driving Conditions
6. Lack of Self-Driving Regulations (Nikitas, 2015, pp. 26-27)

Is it possible to reduce risk through so-called highly automated driving (HAD)?

Some studies have demonstrated that in the case of full automation, the risk can decrease. However, the final result of such studies is that drivers' situational awareness decreases when using HAD. In this HAD context, drivers may engage in non-driving tasks such as reading or sleeping. These non-driving tasks lead to an increased reaction time in the case of hazardous situations or risky events (hardware, sensor, or actuator failures, front obstacles or crashes, dense traffic congestion, or adverse conditions). The survey proposes a global risk indicator using local information from surrounding vehicles or infrastructure (V2X communication). Finally, the survey shows the gain resulting from the global risk indicator comparatively to the local one, as well as its impact on the behaviour of both the autonomous car and the driver (Demmel& Gruyer, Burkhardt & Glaser, Larue & Orfilia, Rakotonirainy, 2019, pp. 390-395).

How is it possible to address the abovementioned risks and transfer them to a party (an insurer) who can manage them?

In the situation described, it is important that victims be compensated. So far, the European Commission has focused particularly on the driving of automated vehicles and underlined the importance of assigning responsibilities. It might be possible to impose strict liability on the user, the owner, or the manufacturer. However, would that be enough? Could strict liability represent a disincentive to automation?

As earlier mentioned, EU law considers automation from different perspectives. Firstly, in May 2018, the European Commission presented a proposal to amend the Motor Insurance Directive. The proposal stressed the importance of victims' compensation, but did not contain any specific provisions regarding automated vehicles. Secondly, some gaps in EU Law were underlined in the evaluation of the Product Liability Directive. It considers the approximation of laws, regulations, and administrative provisions of the Member States concerning liability for defective products. The evaluation report also considers typical technological damage that needs to be compensated. For instance, service failures such as downtimes or loss of data. Thirdly, on May 17, 2018, the European Commission published a communication underlining the connections between product liability and cyber liability. Fourthly, the European Parliament's Resolution on February 16, 2017, proposes a form of strict liability of users or owners of robots. Thre different objectives can be highlighted in the abovementioned interventions:

i) the protection of road victims in general, ii) the protection of consumers in the case of defective products, and iii) cyber security.

The solutions proposed so far primarily focus on liability. While civil liability plays a crucial role in compensating for and preventing losses. However, can it truly deter accidents caused by fully automated machines?"
In addition to covering the liability of the owner or manufacturer, or acting as delegate of a public fund for paying out damages to victims of AI, insurers play a proactive role in damage prevention. They can establish and update standards and guidelines to 'educate' machines, leveraging tools such as 'reinforcement learning.' This approach enables an AI agent to learn an optimal policy that maximizes the “reward function” (Kaelbling, Littman, Moore 1996, pp. 237–285; Pandian, Noel 2018, pp. 16–29; Van Otterlo, Wiering, 2012, pp. 3–42). It could be compared with the process that occurs in animal psychology.

In this case, insurance contracts can play a relevant social function. Moreover, due to data sharing, insurers could help in the management of new risks emerging in the AI dimension.

5.2. Automation and Insurance for the Vulnerable and Elderly Population

Autonomous driverless vehicles also offer advantages to people with disabilities.

Disability and the right to mobility: Individuals with disabilities face multiple problems when using public transport. They often need to rely on friends and relatives.

People with certain disabilities - for example, major visual disorders - and much of the elderly population are not permitted to drive at all, even in adapted vehicles. Automation may represent a solution (Leys, 2023, p. 1), but there could be constraints.

Some constraints emerged in a survey among disabled people regarding driverless cars. They are afraid of not being able to understand the technicalities of a driverless car and not being able to board and exit a vehicle - including not being able to escape from a damaged car. They also reported a fear of being stranded, alone and helpless after a collision, and not being able to return home following a breakdown or accident (Scharfsinn & Shutterstock, 2023).
Four key issues can be identified regarding the impact on insurance:

- AUTONOMOUS VEHICLE IMPACT No 1: Fewer claims, less fraud and lower premiums.
- AUTONOMOUS VEHICLE IMPACT No 2: Shift of liability from the driver to the vehicle and to the manufacturer; the claims history and driving behaviour of drivers will become irrelevant.

- AUTONOMOUS VEHICLE IMPACT No 3: less coverage and more service geared towards the safety and comfort of drivers will remove fear and suspicion.
- AUTONOMOUS VEHICLE IMPACT No 4: the insurance ecosystem is becoming increasingly technology-driven. It is important to render such an environment friendly with respect to the elderly population in terms of product design and highlight the resulting improvement in usability and the accessibility of technology to older age groups (Wilkinson, Cornish, 2018, p. 79; Ahmed, Haq, Rahman, Tonner, Abbass, Sharif, Asinger, Sbai, 2021, pp. 166-169).

6. New Distribution Dynamics of Auto Insurance Products and Embedded Insurance

The increasing automation of vehicles and the anticipated introduction of fully self-driving cars - enhanced by systems enabling connectivity with other vehicles and infrastructure - will bring significant benefits in terms of road safety. A major advantage will be a substantial reduction in accidents (Pongelli, 2020, p. 83; Albanese, 2019, p. 995; Nazzaro, 2018, p. 77; Muñoz Paredes, 2024, p. 51). The increasing automation of vehicles and the anticipated introduction of fully self-driving cars - enhanced by systems enabling connectivity with other vehicles and infrastructure - will bring significant benefits in terms of road safety. A major advantage will be a substantial reduction in accidents (Nazzaro, 2018, p. 83).

The transformation on the horizon is far more profound and involves not merely a subjective change in the policyholder - as coverage shifts from the driver-owner to the automaker - but also an evolution of the liability system. Responsibilities will no longer center on the driver but rather on the vehicle itself as the primary source of road accidents. Consequently, there will be a significant increase in the demand for insurance cover linked to hypothetical malfunctions of self-driving vehicles. In particular - with the regulatory framework unchanged - vehicle manufacturers and producers and/or managers of their IT systems, as well as the entities that own or manage the infrastructure, will have to seek suitable solutions to protect themselves from possible claims tied to injury or damage occurring during road circulation due to electrical or IT system failures. The degree to which all these risks associated with the operation of self-driving vehicles and related infrastructure are likely to affect the number of claims in quantitative terms is hard to say. What is certain is that for insurance companies - also in the road traffic sector - large segments of the market will open up for the distribution of non-life products, other than those of traditional third-party motor liability.

Therefore, it seems plausible to assume that insurance companies will be called upon to implement distribution strategies where the core business will no longer consist in placing a policy with the individual consumer-owner of one or two vehicles. Instead they will interface with professional customers, including car manufacturers, producers of computerised automation systems, and operators of related infrastructure. This is without considering the possibility that lawmakers may introduce compulsory insurance to cover damage caused by products in road traffic. In the near future (Sooner than one might expect), a whole series of new risks related to vehicular traffic will emerge, with the aim of ensuring adequate protection and addressing the actual needs of road users. One key example is cyber risk, which is understood as the risk associated with the processing of information in the self-driving vehicle's computer system and can be a decisive factor in determining whether or not an accident will occur in the event that the stored data are violated, tampered, or deleted. Furthermore, as certain risks become a 'normal' part of road traffic, this will influence the product oversight governance (POG) models used by insurers. Since demand for coverage will shift, insurers and distributors will need to periodically reassess and update their target market strategies to ensure they align with evolving risk landscapes and regulatory expectations (Cerini, 2018, p. 401).

Based on this perspective, the distribution of insurance products in the road traffic sector will presumably be aimed at placing them in the market inseparably linked to the sale of the vehicle. Consumers will purchase vehicles with non-life insurance designed to provide coverage against the risks of malfunction, similar to the insurance commonly obtained for household appliances. These 'embedded' insurance products would be integrated into the vehicle itself, addressing the traditional reluctance of end customers to purchase additional insurance, which is often perceived as unnecessary. As previously mentioned, distribution channels will need to pivot toward professional customers, who will act as intermediaries for placing insurance solutions.

Alternatively, or at least as a supplement, distributors - especially small and medium-sized agents and brokers - will be called upon to make a significant digitalization effort, aimed at exploiting the full potential of IT systems. If direct access to major car manufacturers is not feasible, the widespread use of online platforms will be crucial. These platforms can reach individual consumers and drivers, offering insurance contracts that align with specific needs and vehicle characteristics, reinforcing the concept of embedded insurance.

Additionally, technological progress is already driving profound changes in the road traffic insurance system (Marano, 2021, p. 143 ff.; Stoeckli, Dremel, Uebernickel, 2018, p. 287 ff.). What will change is the very

notion of liability, with the centre of gravity shifting from the "human driver" to the "driverless vehicle". This transformation will reshape market dynamics, favoring large industry players while challenging small and medium-sized distributors, who may struggle to compete in this evolving landscape. However, at the same time, technology may be the only tool that can ensure the survival of small agents and brokers, as it will enable them to better reach the vast retail market.

Regarding the need for services linked to insurance products to remove fears and suspicions regarding smart driving, it is important to adopt embedded insurance models. Embedded insurance refers to the offering of insurance services combined with non-insurance products or services.

Concerning this aspect, new models of embedded insurance are going to be put in place.

It is important to consider what the IDD (Directive (EU) 97/2016) lays down in terms of obligations regarding cross-selling where the insurance product is ancillary to another product (and vice versa). In this case, irrespective of the distribution model, certain provisions must be observed.

Article 24 of the IDD provides for specific transparency obligations in the case of cross-selling, ensuring clarity and freedom of choice for consumers. In particular, distributors have to inform customers about the possibility of purchasing different components of a package separately or provide a detailed description of the individual components and their costs.

The new digital technologies create a new insurance ecosystem that includes platforms, clouds, algorithms, and big data. These innovations are enabling the development of new models of embedded insurance that unify customer interactions into a single structured flow. Additionally, data analytics and algorithms allow insurers to offer highly customized solutions tailored to each customer's specific needs, creating new opportunities for operators of all sizes.

New insurance models need to be reflected in the contracts between the parties involved (insurers, intermediaries, ICT Companies, Platform Owners…). They have to negotiate and design the terms of IT integration based on their respective systems, addressing key aspects such as data access and control, obligations and responsibilities of the parties according to their role in data protection, project governance and accountability, liability, and KPIs to monitor the success of the project. Additionally, contracts should outline conditions for early termination, as well as any applicable penalties or other consequences..

However, the regulatory and market framework is not yet complete, particularly with regard to open insurance and data sharing. The industry is awaiting the new European FIDA (Financial Information Data Access)

regulation, proposed by the European Commission, which is expected to become applicable from 2027.

Conclusion

The inclusion of artificial intelligence systems in decision making for driving a vehicle highlights three key aspects: 1- the importance of the prevention of, rather than compensation for, harmful events, 2- the importance of allowing the implementation of algorithms to reduce risks rather than sanction harmful conduct, 3- the possibility of finding new answers to ensure the right of movement of older persons.

Motor insurance can represent a solution for addressing social issues and a strategic opportunity for insurer.

By investing in projects aimed at supporting vulnerable populations, insurers can align their strategies with ESG (Environmental, Social, and Governance) criteria.

Sustainability is increasingly shaping the regulatory framework of the insurance market, positioning insurance companies as key drivers of sustainability - both as institutional investors and as entities that must actively manage sustainability risks within their business operations.

Article 2 of Regulation (EU) 2019/2088 of the European Parliament and Council of 27 November 2019, on "Sustainability-related disclosures in the financial services sector" defines sustainability risk as an environmental, social, or governance event or condition that, if it occurs, could cause an actual or potential significant negative impact on the value of the investment. This includes risks such as climate change, loss of biodiversity, inequality, and lack of inclusiveness, all of which can negatively impact investment in human capital and accident prevention.

The topic investigated here can be part of a broader discussion on sustainability issues and can be integrated into insurance production and distribution.

The concept of sustainability has long influenced the insurance sector, alongside the broader financial and economic community. Insurers evaluate how environmental, social, and governance (ESG) issues influence insurance and investments, as well as how insurance and investment portfolios impact the environment and society (Giusti, 2024, p. 197; Landini (2022), p. 221; Berti De Marinis, 2020, p. 143; Sholtens, 2011, p. 143; Candian, 2017, p. 1456).

According to the Danish report titled "Integrated Review and Reporting on SDGs and Human Rights," the 17 Sustainable Development Goals (SDGs) "seek to realize the human rights of all," with "more than 90% of the targets directly reflecting elements of international human rights and labour standards" (Thornberry, Hassler, 2019, p. 1).

When considering the integration of human rights and SDGs, the focus should not be limited to the fundamental goal of ensuring a clean, healthy, and sustainable environment. It is also important to support the participation of marginalized people in society and their ability to lead an active life.

Acknowledgments: This paper is an outcome of the following projects: Age-it spoke 1, funded under PNRR PE08, and Most – spoke 5, under PNRR CN4. However, the views and opinions expressed are those of the author(s). In particular, paragraphs 1-2 are attributed to Simona Viciani, while paragraphs 3-7 are attributed to Sara Landini.

Conflict of Interest: The authors reported no conflict of interest.

Data Availability: All data are included in the content of the paper.

Funding Statement: The authors did not obtain any funding for this research.

References:

1. Acosta Aida, J. (2018). What Governments across the globe are doing to seize the benefits of autonomous vehicles'. Cyber Harvard edu. https://cyber.harvard.edu/.
2. Albanese, A. (2019). "Le responsabilità civile per i danni da circolazione di veicoli ad elevata automazione", Europa e diritto privato. p. 995 et seq.
3. Anderson M. Et Al. (2010). The US Experience with no fault automobile insurance: a retrospective. http://www.rand.org.
4. Annese, L. (2023). www.stradeeautostrade.it,
5. Ashton, K. (2009). *That 'Internet of Things' Thing*, in RFID *Journal,* vol.22, no.7, 2009, 97-114
6. Biard, A., Product Liability 2.0 How to make EU rules fit for consumers in the digital age, Bruxelles.
7. Boehmer-Christiansen, S. (1994).The precautionary principle in Germany–enabling government. Interpreting the Precautionary Principle 31 (1994): 38-39.
8. Bonab, A.B., Rudko, I., Bellini, F. (2021). A Review and a Proposal About Socio-economic Impacts of Artificial Intelligence. In: Dima A.M., D'Ascenzo F. (eds) Business Revolution in a Digital Era. Springer Proceedings in Business and Economics, Springer.
9. Borges, G. (2021). "AI Systems and Product Liability", Proceedings of the 18th International Conference on Artificial Intelligence and Law, ICAIL 2021 pp. 32-39;
10. Buckingham, W. (1961). Automation: Its Impact on Business and

People, Harper & Brothers, New York.
11. Cima, G. (2024). *L'epoca della vulnerabilità. Come la psicologia ha invaso le nostre vite*, Piano B,.
12. Commission Staff Working Document Executive Summary of the Evaluation of the White Paper Roadmap to a Single European Transport Area - Towards a competitive and resource efficient transport system {SWD (2020) 410 final}.
13. Cerini, D. (2018). "Dal decreto smart roads in avanti: ridisegnare responsabilità e soluzioni assicurative". Danno e responsabilità, p. 401 et seq.
14. Čerka, P., Grigienė, J., & Sirbikytė, G. (2015). "Liability for damages caused by artificial intelligence", Computer Law & Security Review, 31, 3 pp. 376-389;
15. Chan Ching-Yao (2017). Advancements, prospects, and impacts of automated driving systems, IJTST, 208-216
16. Chen, L., Mislove, A., Wilson, C. (2015). Peeking beneath the hood of Uber. IMC 2015.
17. Chopra, S. & White, L.F. (2011). A Legal Theory for Autonomous Artificial Agents (Ann Arbor: University of Michigan Press.
18. Clifford Law Offices (2021). The Dangers of Driverless Cars, in National Law Review, 5 May 2021.
19. Committee of Ministers of the Council of Europe (CoE) (2020). Recommendation on the human rights impacts of algorithmic systems. Brussels.
20. Dafoe, A., Evans, O., Grace, K., Salvatier, J., & Zhang, B. (2017). When will AI exceed human performance? Evidence from AI experts. J. Artif. Intell. Res. 62, pp. 729–754.
21. Demmel, S., Gruyer, D., Burkhardt, J.-M., Glaser, S., Larue, G., Orfila, O., & Rakotonirainy, A. (2019). Global risk assessment in an autonomous driving context: Impact on both the car and the driver, IFAC-PapersOnLine, Volume 51, Issue 34, pp. 390-395.
22. Decree No. 62 of 3 May 2024 in G.U. (Official Gazette), General Series, 14 May 2024 no. 111
23. Diciotti, E. (2018). *La vulnerabilità nelle sentenze della Corte europea dei diritti dell'uomo*,13-34,.
24. Ethik-Kommission Automatisiertes und Vernetztes Fahren, Bericht (2017) https://www.bmvi.de.
25. Fineman, M. (2004). The autonomy myth. A theory of dependency, in The New Press, New York, ID., The vulnerable subject: Anchoring equality in the human condition, in Yale Journal of Law & Feminism, 20, 1-2, 2008.

26. Finger, M., Bert, N., & Kupfer, D. (2015) .*What role for digitisation to achieve an intermodal level playing field?* in *Regulation Observer*, FSR.
27. Fluet, C. (2002). "Liability Insurance and Moral Hazard under the Strict Liability and Negligence", Revue D'économie Politique, 112, 6, pp. 845-61.
28. Following the entry into force in March 2018 of the European regulatory obligation related to eCall, (Regulation (EU) 2015/ 758 of the European Parliament and of the Council of 29 April 2015, in OJEU, L 123/77)
29. Garcia, C. A., *Il diritto dei deboli* at *www.laleggepertutti.it.*
30. Gallage, A. S. (2020). Updating The EU Product Liability Directive For The Digital Era. Droit & Technology, 24 February 2020.
31. Gless, S., Seelmann, K. (eds.) (2016). Intelligente Agenten und das Recht, Baden-Baden: Nomos.
32. Gnambs, T. & Appel, M. (2019). Are robots becoming unpopular? Changes in attitudes towards autonomous robotic systems in Europe. Computers in Human Behavior, 2019, pp. 53-61.
33. Greger, R. (2018). Haftungsfragen beim automatisierten Fahren. Zum Arbeitskreis II des Verkehrsgerichtstags, 31 Neue Zeitschrift fuer Verkehrsrecht, pp. 1-5.
34. Griffo, G. (2012). *Le ragioni della Convenzione ONU sui diritti delle persone con disabilità delle Nazioni Unite*, in OSIO O., BRAIBANTI P., Il diritto ai diritti. *Riflessioni e approfondimenti a partire dalla Convenzione ONU sui diritti delle persone con disabilità*, Milano, FrancoAngeli, pp.39-45.
35. Hall, M. I. (2012). Mental capacity in the (civil) law: Capacity, autonomy and vulnerability, in McGill Law Journal, 58, 61-94.
36. Heikkilä, S. (2014). *Mobility as a Service - A Proposal for Action for the Public Administration, Case Helsinki, Master's Thesis*, Aalto University,.
37. Heymann, L. A. (2010). Reading the Product: Warnings, Disclaimers, and Literary Theory (June 3, 2010), Yale Journal of Law & the Humanities, Vol. 22, pp. 393-415, 2010, William & Mary Law School Research Paper No. 09-50.
38. Hubbard, (2015). Sophisticated Robots: Balancing Liability, Regulation, and Innovation, 66 Florida Law Review, p, 1803.
39. ISTAT (Italian National Institute of Statistics) Report (2019).
40. Independent High-Level Expert Group on Artificial Intelligence set up by The European Commission (2019). Ethics Guidelines for Trustworthy AI, Brussels.
41. JCER (1955). 'Hearings on automation and technological change', in

Subcommittee on Economic Stabilization of the Joint Committee on the Economic Report, US Congress October 1955, pp. 14–28.
42. Kaelbling, L. P., Littman, M. L., & Moore, A. W. (1996). Reinforcement Learning: A Survey, Journal of Artificial Intelligence Research, 4, pp. 237–285.
43. Kim, P. T. (2017). Auditing algorithms for discrimination, University of Pennsylvania Law Review, 166, 189
44. Kroll, J. A., Barocas, S., Felten, E. W., Reidenberg, J. R., Robinson, D. G., Yu, H. (2016). Accountable algorithms. University of Pennsylvania Law Review, p. 633.
45. Landini, S. (2020). Ethical Issues, Cybersecurity and Automated Vehicles, InsurTech: A Legal and Regulatory View, Noussia and Marano (eds), Springer, pp. 291-312.
46. Landini, S. (2020). "The Insurance Perspective on Prevention and Compensation Issues Relating to Damage Caused by Machines", The Italian Law Journal p. 159.
47. Lenze, S. (2005). German product liability law: between European Directives, American Restatements and common sense, in D. Fairgrieve (ed.), Product liability in Comparative Perspective, p. 105.
48. Lütge, C. (2017). The German Ethics Code for Automated and Connected Driving, Philosophy & Technology, p. 9.
49. Law No. 104 of 5 February 1992, in G.U., General Series Ordinary Supplement no. 30, 17 February 1992 no. 39, Framework law for assistance, social integration and the rights of disabled persons.
50. Law No. 227 of 22 December 2021 in G.U., General Series, 30 December 2021 no.309.
51. Regulation (EU) 2019/2144 of the European Parliament and of the Council of 27 November 2019 concerning type-approval requirements for motor vehicles and their trailers, and for systems, components and separate technical units intended for such vehicles, with regard to their general safety and the protection of vehicle occupants and other vulnerable road users, in OJEU, L 325/1.
52. Marano, P. (2021). Management of Distribution Risks and Digital Transformation of Insurance Distribution - A Regulatory Gap in the IDD. Risks 9, p. 143 ff.
53. Miller, T. (2019). Explanation in Artificial Intelligence: Insights from the Social Sciences. Artificial Intelligence, 1-38.
54. Mittelstadt, B., Russell, C., & Wachter, S. (2019). Explaining Explanations in AI. In Proceedings of the Conference on Fairness, Accountability, and Transparency (FAT* '19), 2019, New York, NY: US.

55. Muñoz Paredes, M.L. (2024). Seguros embebidos (embedded insurance), in Digitalización y Seguro, María Luisa Muñoz Paredes (dir.)-Covadonga Díaz Llanova (coord.), Comares Accesso Abierto, pp.51-76.
56. Nazzaro, A.C. (2018). "Macchine intelligenti (smart cars): assicurazione e tutela della privacy", Diritto del mercato assicurativo e finanziario, p. 77 ff.
57. Nikitas, A. (2015). Automated Cars: A Critical Review of the Potential Advantages and Disadvantages of Driverless Technologies. In: First International Workshop on Smart Urban Mobility, 26-27 November 2015.
58. Nof, SY (2009). Automation: what it means to us around the world. In: Nof SY (ed) Springer handbook of automation. Springer, Berlin, pp. 13–52.
59. Peppet, S.R. (2014). *Regulating the Internet of Things: First Steps Toward Managing Discrimination, Privacy, Security, and Consent*, in *Texas Law Review*, vol. 83, 95, 84 ff., esp. 98.
60. Pandian, B. J., Noel, M. M. (2018-09-01). Control of a bioreactor using a new partially supervised reinforcement learning algorithm, Journal of Process Control. 69: 16–29
61. Pape, B. (2012). Warnings and Product Liability – Lessons learned from Cognitive Psychology and Ergonomics. p. 257.
62. Parasuraman, R., Sheridan, T. B., & Wickens, C. D. (2000). A model for types and levels of human interaction with automation, IEEE Transactions on Systems Man and Cybernetics - Part A Systems and Humans 30(3):286-97.
63. Pongelli, G. (2020). "Autonomous vehicles and legal issues on civil liability and motor insurance", Diritto del mercato assicurativo e finanziario, p. 83 ff.
64. Rawls, J. (1982). *A Theory of Justice*, Feltrinelli.
65. Rizzuti, M. (2018). I veicoli automatici, problemi e prospettive. Diritto del mercato assicurativo e finanziario. p. 215
66. Recalcati, M. (2010). *L'uomo senza inconscio. Figure della nuova clinica psicanalitica*, Raffaello Cortina Editore,
67. Santoro, E. (2021). *Persone, ordine, diritti e libertà. L'inadeguatezza delle teorie normative per il dibattito sui diritti delle persone con disabilità. Materiali per una storia della cultura giuridica"* , Il Mulino, fasc. II, 2 dicembre , pp.313-335.
68. Sandvig, C., Hamilton, K., Karahalios, K., & Langbort, C. (2014). Auditing algorithms: research methods for detecting discrimination on Internet platforms, 64th Annual Meeting of the International Communication Association, May 22.

69. Scagliarini, S. (ed.), (2019). *Smart roads' and "driverless cars": tra diritto, tecnologie, etica pubblica*, Giappichelli, Torino.
70. Schreurs, M. A. & Steuwer, S. D. (2015). *Autonomous Driving - Political, Legal, Social, and Sustainability Dimensions*, in Maurer M., Gerdes J., Lenz B., Winner H. (eds.) Autonomes Fahren. Springer Vieweg, Berlin, Heidelberg
71. Stanghellini, G., (1997). *Antropologia della vulnerabilità*, Feltrinelli.
72. Sanità informazione https://www.sanitainformazione.it.
73. Sigma-Swiss re. (2014). Digital distribution in insurance: a quiet revolution. Vol. 2. p. 1-37.
74. Simon, H.A. (1979). Models of thought. Yale University Press, New Haven, p. 10.
75. Spiecker gen & Döhmann, I. (2012). Rechtliche Begleitung der Technikentwicklung im Bereich moderner Infrastrukturen und Informationstechnologien. In: Hill, H., Schliesky, U. (eds.),Die Vermessung des virtuellen Raums.
76. Spindler, G. (2019). User Liability and Strict Liability in the Internet of Things and for Robots. In: Lohsse, S., Schulze, R., Staudenmeyer, D. (eds.), Liability for Artificial Intelligence and the Internet of Things. Nomos, Baden-Baden.
77. Stoeckli, E., Dremel, C., & Uebernickel, F. (2016). Exploring characteristics and transformational capabilities of InsurTech innovations to understand insurance value creation in a digital world, p. 287 ff.
78. Surden, H. & Williams, M. A. (2016). Technological opacity, predictability, and self-driving cars, Cardozo Law Review, 2016, p. 121.
79. Taschner, H. (2005). Product liability: basic problems in a comparative law perspective. in D. Fairgrieve (ed.). Product liability in comparative perspective. p. 159.
80. UN Convention of the Rights of Persons with Disabilities (2006).
81. Van Otterlo, M. & Wiering, M. (2012). Reinforcement learning and Markov decision processes. Reinforcement Learning. Adaptation, Learning, and Optimization, 12, pp. 3–42.
82. Verheyen, T. (2018). Full Harmonization, Consumer Protection and Products Liability: a fresh reading of the case law of the ECJ, European Review of Private Law. pp. 119–140.
83. Verheyen, T. (2019). Modern Theories of Product Warnings and European Product Liability Law. Utrecht Law Review, 15(3), pp. 44–56.
84. Vladeck, D.C (2014). Machines Without Principals: Liability Rules and Artificial Intelligence, 89_Washington Law Review, 117, p. 146.

ISSN: 1857-7881 (Print) e - ISSN 1857-7431

85. Zech, H. (2020). “Liability for AI: public policy considerations”, ERA Forum 22, 147–158 (2021); Wendehorst, C., “Strict Liability for AI and other Emerging Technologies”, Journal of European Tort Law, 11, 2 pp. 150-180;