

# Research on Legal Liability of Unmanned Driving

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**Abstract:** *The arrival of the era of driverless driving has impacted the relationship between people and vehicles with drivers as the core in the traditional sense, which makes the driver's obligations gradually shift to the new product of driverless cars, and makes it difficult for driverless cars to be applied to the traditional motor vehicle imputation system regulated by the "motor vehicle side", which makes the traffic charges fail under the current criminal system. The existing legal system is aimed at the gaps in the application of some laws inevitably brought about by the development of traditional motor vehicles. It is necessary to standardize and allocate relevant specific responsibilities from the perspectives of civil, administrative and criminal law, and analyze the development direction of relevant supporting systems of driverless technology from the perspective of responsibility allocation and commitment from different legal angles.*

**Keywords:** *unmanned driving system, impacts the principle of imputation and responsibility, distribution of responsible subjects*

## 1. Introduction

On the one hand, the development of driverless technology impacts the traditional relationship between people and vehicles, and on the other hand, it also has a certain impact on the existing road safety imputation system, such as tort law. Countries all over the world are waiting for a new technological change, and will have a new legal standard for future science and technology, and build the superstructure of driverless car technology. Starting from the core mechanism of unmanned driving, this paper will discuss the impact of its development on the existing legal system of traffic roads in China, analyze and discuss the main difficulties in theory, and seek better solutions.

## 2. Development status and future trend of driverless cars

### 2.1 The core mechanism of driverless cars

At present, the understanding and positioning of self-driving cars in the academic circles means that self-driving cars, also known as driverless cars or intelligent driving cars, are based on many functions of modern cars and combined with various artificial intelligence technologies such as visual computing, architecture and computers. A motor vehicle that can drive autonomously without manual operation. It uses on-board sensors to sense the environment around the vehicle, and controls the steering and speed of the vehicle according to the road, vehicle position and obstacle information obtained by sensing, so that the vehicle can travel safely and reliably on the road. In short, the core of its technical principle is to liberate the driver from the leading role in driving in order to reduce the risk of human factors such as drivers, so as to effectively reduce the damage caused by drivers' subjective mistakes in traffic accidents, and to control vehicles through the artificial intelligence technology of calm and rational chips, instead of the natural rationality of human beings, so as to achieve the maximum benefit of road safety to a great extent. In the case of unmanned driving, the automatic driving system determines the next driving scheme by quantifying and calculating the influencing factors, so that the driver's instinctive reaction will be replaced by extremely fast and precise program analysis.

### 2.2 Unmanned driving technology development and future planning

Compared with traditional cars, self-driving cars have advantages in preventing traffic accidents, saving energy and increasing road capacity. He makes it possible to become a breakthrough change in the future automobile industry. Due to its great economic value, the domestic and foreign countries are keen on the technical exploration of unmanned driving technology. According to the current situation in

the industry, automatic driving is divided into five levels: L1 to L5. At present, Baidu's Robotaxi is considered as L4 level automatic driving with limited functions and limited areas, which is also the first echelon status in the global automatic driving field.

However, compared with the development of technology, the relevant legislation has not made great progress in the world. At present, there are only a few trial regulations in China. In the future, in the field of unmanned driving, there are still many legal gaps to be filled, and this article will also discuss its future discovery direction from different legal regulations.

### **3. The impact of the era of driverless driving on existing traditional rules**

#### ***3.1 Its impact on the qualifications and duty of care of future drivers***

Generally speaking, in the traditional driving field, the relationship between people and vehicles is a specific and absolute relationship between people's control of vehicles and driving. Based on this consideration, the current Road Traffic Safety Law of China stipulates that driving a motor vehicle should obtain a motor vehicle driver's license according to law, and applying for a motor vehicle driver's license must go through theoretical and practical tests. However, with the continuous evolution of unmanned driving technology, which can be put into traffic operation, the driver's conditional qualification is not a necessary condition for driving at this time, and the duty of care in driving is also transferred to artificial intelligence by people, so how to determine whether the driver still has the duty of care and whether this driving duty can be completely cancelled in the era of fully automatic driving remains to be discussed and studied.

At present, the developed technology is still based on the theory of responsibility. According to Cao Xianfeng and Zhang Long's "Dualism" thought of operation control and operation benefit put forward in the article "Interpretation of Article 49 of Tort Liability Law—Outline of Tort Liability for Road Traffic Accidents under Separation of Subjects", users enjoy the benefits brought by motor vehicle operation. Although they do not directly control motor vehicle operation, the operation of this motor vehicle comes from its demand and can also be regarded as operation control. However, the author believes that since the technical root of driverless driving itself is to form the self-perception and cognitive ability of automobiles, and our trust interest in its advanced technology is worth protecting, drivers should only have some responsibilities in the field of product safety such as correct operation and equipment inspection, and other responsibilities, if still imposed, are extremely unfair and will greatly hurt people's confidence in purchasing.

#### ***3.2 The impact on the determination of the responsibility of the future responsible subject***

The uncertainty of the future responsible subject is also caused by the complexity of the composition and structure of unmanned driving itself. Different from traditional cars, it is because of the lack of drivers with the most subjective judgment, so a series of functional driving devices including big data and navigation system all operate according to people's thinking. In this complex cooperation chain, all hardware and software are indispensable, and any small details may lead to tragedy. While we have higher and higher requirements for the quality of these equipments, their responsibilities should naturally be heavier. The distribution and commitment of the responsibilities involved will also change from the traditional "motor vehicle side". China's current tort liability law stipulates that "the motor vehicle side" itself is a rather vague provision. In the era of driverless driving, the motor vehicle side is not only the owner and user of today's automobile, but also the manufacturer, material supplier and technology provider of the whole driverless field. Therefore, the responsibility should not only be established between the motor vehicle and the counterpart, but also be more finely divided.

#### ***3.3 Difficulties in identifying and imputing responsibilities due to hidden dangers of future road driving***

Nowadays, according to the imputation principle stipulated in the Road Traffic Safety Law, the principle of fault presumption is the main one, supplemented by fault liability, which constitutes the dual system of the imputation principle of traffic accident liability in China. However, the complexity of road traffic means that there are great risks and uncertainties in every step of unmanned vehicles from design, production, transportation and driving, and even become the direct cause of traffic accidents. However, in the future administrative law and criminal law rules, there is a greater acceptance problem for the new

driving mode to break the traditional responsibility determination than the civil responsibility.

### ***3.3.1 Changes in the subject of administrative regulations***

In the process of identification and liability regulation of traditional motor vehicle traffic accidents, the responsible subject is regarded as having higher driving obligations Driver; However, as unmanned driving technology can gradually replace human drivers, the driving role of human drivers gradually fades and turns to the basic safety confirmation obligations and reasonable operation obligations for driving vehicles. At this time, the traditional restrictions that drivers are not allowed to drink alcohol and need to reach the legal driving age no longer exist. Based on this situation, it is quite contrary to common sense whether the Road Traffic Safety Law can be applied to give relevant administrative penalties to self-recognized and self-judged unmanned vehicles. Moreover, under the existing administrative law system, the recognition of motor vehicles is still based on traditional driving vehicles, and it is obviously illegal to regulate unmanned vehicles with this standard.

### ***3.3.2 Changes in subjective determination of intent and negligence in criminal law***

The subjective judgment and determination in criminal law is an extremely important link in the criminal field. Due to the development of driverless technology, we will find significant changes in the judgment of intention, negligence or accident. First of all, based on the substitution effect of driverless technology for drivers, traditionally, the direct intention of wanting events to happen and the indirect intention of letting events happen are difficult to form when the driver's role declines. At this time, the driver is just a passenger sitting in the driver's seat, and even if his criminal intention is generated, it is difficult to implement, and the subjective and objective are not unified, so the crime will not be constituted. As for the judgment of negligence, it is a technical determination, because we have every reason to believe that the driverless technology is advanced enough. Under this reasonable trust, our problems in driving will be weakened. The law should give ordinary people who do not know this technology the possibility of criminal prediction, that is, our negligence must be a problem that ordinary people should not commit without reasonable operation, and the definition of this problem depends not only on criminal standards, but also on certain related technical standards.

## **4. Specifically on the delineation of responsibilities**

### ***4.1 The analysis of the liability under the civil system***

In the face of the impact of the development of driverless cars on traditional laws and regulations, we need to make a clear division between the main responsibility and the specific responsibility, so that when faced with specific events, we can have a better response to ensure the fair implementation of the law. First of all, in essence, the unmanned vehicle itself is a special kind of high-tech vehicle, that is, a special product produced by automobile enterprises. In the field of civil infringement, if there is a defect in the product itself, it should bear the product liability for the infringed person. However, at the same time, as another level of civil affairs, the regulation of its operational risk on the road needs to apply the traffic accident liability of motor vehicles to bear corresponding responsibilities.

#### ***4.1.1 Handling of product liability and traffic liability under infringement system***

Take the provisions on motor vehicle accidents under the current tort liability system as an example; Problems arising from the design process of vehicles are applicable to product liability. Traffic accident liability of self-driving vehicles mainly involves two liability forms: motor vehicle traffic accident liability and product liability. Based on the particularity of this tort liability, these two liability forms are not competing relations, but different legal rules are applied based on the different legal relations between the driver and the victim automobile manufacturer in the traffic accident of self-driving automobile. Between the driver and the victim, the liability rules of motor vehicle traffic accidents should be used to determine the share of liability that the driver should bear. Between the driver and the automobile producer, based on the share of responsibility that the driver should bear, the ultimate bearer of responsibility or the proportion of responsibility should be determined according to the product liability rules. After the accident, the victim can take the automobile user as the defendant or the user and the producer as the co-defendants, and the user and the producer distribute their respective compensation responsibilities according to the product liability rules on the basis of joint and several liability.

#### ***4.2 The specific responsibility of administrative law***

##### ***4.2.1 The road traffic law on the responsibility to confirm***

At present, the responsibility regulation of unmanned vehicles under the system of Road Traffic Law is not clear, which makes it difficult to directly apply to the current law to regulate. Administrative law has strict requirements for drivers' obligations, such as driving with a license, not being drunk and so on. However, the emergence of driverless technology breaks through the traditional definition of "motor vehicle" under this legal system, and makes the responsibility of administrative law shift from the responsibility of correcting and regulating people to the supervision of driving unmanned vehicles. The loss of traffic accidents is caused by the intentional collision of non-motor vehicle drivers and pedestrians with motor vehicles, and the motor vehicle side is not liable for compensation.) The liability system built is centered on the driver's control fault of vehicles, but based on the "autonomy" and "weak control" of self-driving vehicles, its liability system is somewhat different from that of traditional vehicles.

##### ***4.2.2 The need to confirm the responsibility of administrative supervision from the perspective of comparative law***

In European and American countries with relatively developed driverless technology, more attention is paid to giving the government the power to exercise the inspection and supervision of unmanned vehicles administratively, so as to ensure the normal operation of social public interests. From the perspective of comparative law, there are relatively few civil and criminal legislations related to this new technology in developed countries in Europe and America, while they focus more on increasing the restrictions on the future development and application of this technology in government administrative supervision, that is, to confirm and supervise the development status of unmanned technology and vehicles at the source, to screen in the audit process of road operation, and to strengthen the technical requirements for unmanned driving, so as to control the risks caused by the development of unmanned technology from the root.

#### ***4.3 Specific confirmation of criminal responsibility***

##### ***4.3.1 Traffic accident crime and dangerous driving crime law failure***

Due to the punishment of criminals, the status of drivers is gradually reduced in the increasingly mature state of driverless technology, and the related subjects behind driving become the key of criminal law regulation. The change of this technical fact makes the imputation of criminal law more unpredictable, and more subjects may become the objects of criminal law regulation, which is not commensurate with the principle of a legally prescribed punishment for a specified crime. Because the original criminal subject is the driver, and when the driver is developing, it is also the process that the driver gradually becomes a passenger, and he is only responsible for the correct application of unmanned vehicles, so his original driving obligation is eliminated and the unmanned vehicles are replaced. But for a lifeless technology product, obviously it can't be the object of behavior, which means that the manufacturer, seller and even the third person who maliciously infringes on the driverless technology may become the subject of criminal responsibility. However, the composition of criminal behavior needs the unity of subjectivity and objectivity, which objectively causes traffic accidents. However, the subjective and well-intentioned sales producers have no intention of committing crimes, and even if there are faults in the driverless cars manufactured by them, they are based on the faults in the products themselves, and the civil product liability is regulated, which cannot rise to the level of criminal law regulation. Drivers, however, are based on reasonable trust that the unmanned driving technology is sufficiently developed, and do not have the expectation of preventing accidents. And it is generally based on the deeper value judgment of criminal law as an administrative regulation system. Nowadays, the identification of motor vehicles and the requirements for drivers in the Road Traffic Safety Law cannot be applied to unmanned vehicles, based on the ranking of legal rank problems of "breaking the law first, then committing crimes", that is, only the administrative punishment of the transportation department first can constitute related crimes, but the unmanned vehicles that cannot be applied to the current Road Traffic Safety Law will not be inferred to constitute related traffic criminal crimes in jurisprudence.

##### ***4.3.2 The possibility of applying the crime of endangering public safety by dangerous methods***

Just as it is difficult to apply the original crimes of causing traffic accidents and dangerous driving that endanger public safety in the above article, the criminal law still has severe disciplinary provisions that endanger public safety by dangerous means, and the situation that driverless cars are used as criminal tools. The state that may exist in future practice is the easiest to identify and solve the liability regulation.

It is the criminal's knowing intention to control the unmanned vehicle or cause its judgment to get out of control through technical means. The resulting harm to the personal safety of the unspecified majority can be attributed by the perpetrators who endanger public safety. However, there is still a certain legal gap here, that is, if it is the fault of the operator or the driver, it is difficult to identify the harm to the public as a crime endangering public safety under intentional crime. Even today's motor vehicles driven by human beings have uncontrolled accidental factors such as lever failure, tire explosion, brake runaway, etc. Therefore, even though the runaway of unmanned vehicles objectively causes the loss of unspecified majority, there is no criminal intention in jurisprudence, but it is only treated as an accident. Moreover, the steering system of driverless cars is nonlinear to a certain extent, which is easy to be interfered by the outside world. When the interference makes the car uncontrollable, it is difficult to determine the interference source.

## 5. Conclusion

Analysis of legislative technical problems should be addressed, that is, in the future forecast of 35 years, smart cars will really mature, and can our policy and system guarantee it? If the development of any technology is not bound by the norms of relevant systems, it will be abused to form a disaster. If unmanned driving is really applied to practice, the supporting measures of national related risk protection are the key to its protection. The qualitative process of modern science and technology in the past productivity and the impact on legal system and ethical thinking are accompanied. The study of relevant system design and jurisprudence in these aspects in China should use the application of comparative law and learn from the grasp of the golden mean in the conflict between science and technology, law and ethics. The future science and technology is only a tool to promote human productivity, and it cannot be replaced by people, which is the eternal purpose.

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