

The Experimentation Act and its Practice of Autonomous Vehicles in Taiwan

Li-Ching Chang*

Ph. D., München University (Germany), Ph. D., National Taiwan University (Taiwan); Chair Professor, Shih Chien University, Taiwan, CEO, International AI and Law Research Foundation; Address: No.70, Dazhi St., Zhongshan Dist., Taipei City 104, Taiwan; E-mail: liching0903@yahoo.com.tw

Abstracts: Taiwan has invested considerable sums of human capital and material resources in the practical application of autonomous vehicles for more market opportunity. As on-road testing and technological development for autonomous vehicles continue to develop in different countries, the controversial issues of safety, ethics, liability, and the invasion of privacy continue to emerge. In order to resolve these issues, the government of Taiwan seeks to provide a good environment for AI innovation and applications. This article summarizes and highlights relevant content and key points of Unmanned Vehicles Technology Innovative Experimentation Act, which was legislated in Taiwan in 2018. In addition, with introduction to the progress and achievement after the implementation of the Act, the article also explains the development and prospection of autonomous vehicles in Taiwan.

Keywords: Artificial Intelligence, Unmanned Vehicles Technology Innovative Experimentation Act, Autonomous Vehicles; Ethics Guideline, Regulatory Sandbox.

1. PREFACE

In recent years, with the rapid development of Artificial Intelligence (AI) and the increasing maturity of remote-control technology, unmanned vehicles have become a development priority of countries around the globe. Countries have invested considerable sums of human capital and material resources in the practical application of unmanned vehicles, also known as autonomous vehicles. Famous carmakers are all proactively researching and developing in the areas as well, demonstrating the impressive market opportunity. In light of this trend, Taiwan does not want to fall behind either. However, the regulations of autonomous vehicles in Taiwan are insufficient. The regulations currently only cover pilot programs, so in order to explore the legal issues of autonomous vehicles, the ethics of them cannot be ignored either.

Along with on-road testing and technological development for autonomous vehicles in different countries arises the controversial issues of safety, ethics, liability, and the invasion of privacy. In order to resolve these issues, countries such as the United States, Germany, and Japan have drafted relevant regulations to serve as references.

For example, in 2017, the Ethics Commission of German Federal Ministry of Transport and Digital Infrastructure released a report, *Automated and Connected Driving (Automatisiertes und Vernetztes Fahren)*. Twenty ethical guidelines called “The German Ethics Code for Automated and Connected Driving” (Ethics Regeln für den automatisierten und vernetzten Fahrzeugverkehr)¹ listed in this report makes it the world-first ethical rules regarding how the autonomous vehicles should be programmed. These ethics guidelines fully comprehends the influence and the impacts among people’s rights and the society based on the thought of the protection for human’s traffic safety under the current development trend of autonomous vehicles.

Following the passage of the Level 3 Autonomous Vehicles Act in 2017, the Level 4 Autonomous Vehicles Act will also come into effect in July 2021. Since then, Germany will be the first country in the world to send autonomous vehicles from research laboratories to the road. Autonomous vehicles have not yet been allowed to hit on the road in Taiwan, but there are still needs for the industry to test whether the function or their technology has met the standards.

This article will introduce current laws and regulations of autonomous vehicles in Taiwan, starting by the content of Unmanned Vehicles Technology Innovative Experiment Act (hereinafter referred to as Unmanned Vehicles Act). In addition, with introduction to the progress and achievement after the implementation of the Act, the article also explains the development and prospection of autonomous vehicles in Taiwan.

2. LAWS ON AUTONOMOUS VEHICLES IN TAIWAN - UNMANNED VEHICLES TECHNOLOGY INNOVATIVE EXPERIMENTATION ACT

2.1 Purpose of Legislation

Unlike other countries around the world, autonomous vehicles has not been allowed to use on the road in Taiwan. However, in order to meet the technological development and testing needs of unmanned vehicles, Unmanned Vehicles Act was published in December 2018. The Act creates a reasonable and safe testing environment for innovation, and encourages different sectors to invest in the research, development, innovation, and application of unmanned vehicles. Furthermore, the Act allows unmanned vehicles to step into the field of life. Unmanned Vehicles Act is the first legal regulation in Taiwan on subjects related to artificial intelligence as well as autonomous vehicles.

Article 3, Subsection 1, of the Act defines an unmanned vehicle as a “driverless transport vehicle”, including an automobile, aircraft, ship, or any combinations of the above and of the land, sea, that “operates through remote control or autonomous operation.” In other words, unmanned vehicles may have an operator, or conversely, none. Unmanned vehicles that have operators rely on remote driving technology, providing the ability to operate vehicles from afar via remote control technology; unmanned vehicles without operators on the other hand use autonomous operation technology for movement. Multinational corporations are primarily focused on developing unmanned vehicles without operators, specifically “automated-operating and driving” vehicles, which is also the focus of this article.

The legislative purpose of the Unmanned Vehicles Act ‘is formulated to encourage the research and development and the application of unmanned vehicle technology, and to create a sound and safe environment for innovative experimentation, so as to advance the development of industry technology and innovative services.’ In short, despite the lack of maturity of unmanned vehicle industry and applicability of its technology, the industry is expected to continue to develop and change human lives in the foreseeable future. Countries should provide testing environments to enable industry growth, facilitating growth potential of the unmanned vehicle industry¹.

2.2 Main content of the Act

Unmanned Vehicles Act could be organized into two parts: administrative control of experiments and regulatory exemptions.

Administrative control of experiments include the application and review procedures, the management and safety of the field involved in experiments, and the management of innovative experimentation. In other words, applicants need to submit proposals and receive approvals before they conduct on-road testing. In addition, testing environments need to uphold safety standards, and the testing environments are subjected to various inspections from governing bodies.

This Act includes 24 articles. The first to fourth articles are general principles, which indicate the purpose of legislation, the authority in charge, the definitions of terms, and the establishment of a unit dedicated to innovative tests. Articles 5 to 12 specify application and review procedures. Articles 13 to 18 stipulate safety and management of testing areas. These five articles state that applicants need to abide by the Act, and report on the tests based on the requirements set forth by governing authority. In addition, applicants cannot evade, hinder, or refuse onsite visits of governing authorities. Articles 19 to 21 stipulates the methods of the processing, revoking, and reporting of innovative experimentation. These articles also state that, if the testing

programs lead to bodily harm and monetary losses of testing subjects or stakeholders, governing bodies have the authority to request the testing programs and projects to make improvements within a limited time period. If the improvements do not occur before the deadline, then the approval to experiment would be revoked. The Act is summarized as follows¹:

Test duration is limited to one year, and if necessary, the applicant can request for a one year extension. If the need to study and amend the Act arises, the testing period can receive additional extension up to four years. In regards to the application of unmanned vehicle testing, there is a need for a singular contact window to facilitate in the creation of more convenient administrative processes.

Review procedures are carried out by the Ministry of Economic Affairs (MEA). MEA is tasked with the work to hold review meetings and invite representatives from the central government and local government, experts of law and relevant industries, and academics in the field in question. The items reviewed include the innovativeness, conditions, and the qualification of the unmanned vehicle testing program as well as the safety and risk management of the program.

Safety Control: Applicants for unmanned vehicle experiments are required to provide an insurance plan. Furthermore, the applicant needs to provide notifications in the vehicle or around the testing location. In the event of an accident, the applicant should promptly notify authority and provide the cause of the accident and follow-up actions. Moreover, the applicant is obligated to equip the unmanned vehicles with dash cameras to reduce the possible complexity of accountability due to the lack of a driver in the event of an accident. Evidence collected by dash cameras is conducive to transparency and impartiality for the subsequent investigations.

During the testing period for unmanned vehicles, the legislators are required to loosen regulations and simplify administrative procedures by removing certain laws, regulatory orders and penalties established in administrative law to create a friendlier legal environment.

2.3 Characteristics of the Regulation

As mentioned previously, the Act is designed to create a friendly legal environment. Hence, other than introducing **the spirit of Regulatory Sandbox**, under specific scopes and conditions, the Act exempts testing programs from relevant laws². This spirit is embodied by Article 22, where the Exemption rule is exerted. Upon approval of the experiments and during the time of experiments, authority may grant “exemptions to the acts, codes, regulations, orders, and administrative rules related to the experiment.” For instance, the testing program may be exempt from the Road Traffic Management and Penalty Act, Highway Act, Civil Aviation Act, Law of Ships, Seafarer Act, Telecommunications Act and other relevant regulations. However, tort and criminal liabilities created during testing may not be removed, nor the regulations of the Money Laundering Control Act, Counter-Terrorism Financing Act, and other relevant laws.

In accordance with the above, Article 23 states exemptions from existing law are only applicable to the testing experiments that have been approved. Further, the exemptions from acts, codes, regulations and directions are only applicable to testing periods. Of the legal exemptions, Road Traffic Management and Penalty Act involve the broadest areas of regulations, including regulations on drivers, vehicles, and autonomous vehicles.

For instance, article 25 of Road Traffic Management and Penalty Act states all drivers of vehicles shall carry driver licenses during driving period. However, article 25 will not be applicable for the experiments of unmanned vehicles (i.e. autonomous vehicles), namely that the vehicles without drivers are not comply with existing laws. Therefore, in Unmanned Vehicles Act article 22, paragraph 1 and 2, subparagraph 1 stipulates: Within experiment environments and time period, authority may exempt article 25 of Road Traffic Management and Penalty Act. In other words, for unmanned vehicle experimenting within its reported testing range and time period, despite without a driver and a driver’s license, the experiment is not fined and may

continue the testing of artificial intelligence in driving. Above applications of the exemption rule are reflections of the Regulatory Sandbox. The experiments may be conflicting with existing laws and legislators need to take in consideration of such; furthermore, legislators need to provide legal and suitable experimental environments.

Article 22 of Unmanned Vehicles Act also applies on Highway Act for land transportation. Article 63, paragraph 1 of Highway Act provides the inspection instructions for safety qualification of vehicles. It states automobile, electric vehicles, domestic cars & electric cars manufacturers, regular manufacturers, and importers shall comply with MOTC's code (Ministry of Transportation and Communications R.O.C) on safety inspections, registrations, licensing requirements. Furthermore, Article 22 of the Unmanned Vehicles Act also exempts article 77, paragraph 3 of Highway Act. Article 77-3 states utilization of Commercial airport requires approval from authority. Nevertheless, for the purpose of experiment, article 77-3 of Highway Act is exempted.

Lastly, regarding exemption on Telecommunication Act is as below. In testing unmanned vehicles, making or exporting restricted telecom equipment are possible and such may invade personal privacy. Nonetheless, if not obtained with permit, produce or export restricted telecom, Article 65-1 of Telecommunication Act will apply. On the other hand, for the development of unmanned vehicles, such law shall be exempted.

2.4. The Promotion and Achievement

Since the announcement of accepting application for "Unmanned Vehicle Technology Innovative Experimentation Program" in October 2018, 11 cases of the sandbox experiment program, including 9 vehicles and 2 ships, so far in Taiwan has set out on the road. Those have served an amount of 23,000 kilometers of autonomous vehicle mileage and 23,000 passengers for experience and bring along more than 50 domestic industries to participate, including operators, self-driving systems, components manufacturers, research and development institutions and schools.

In 2021, the self-driving logistics and transportation industry is also permitted to build self-produced autonomous trucks in Taiwan for point-to-point transportation. Through the above various approaches can promote industrial benefits such as investment in research and development as we as increase of employment opportunities. Moreover, one of our industry-academia cooperation partners, Turing Drive Inc., has exported their three autonomous driving development platforms to Bangkok in October 2021, and an interactive training session was conducted in Bangkok by the company's engineers in May, 2022¹. After years of challenging, our self-developed autonomous system is capable of sharing the hands-on experience and export the development tools and framework to other countries.

According to the "2020 Autonomous Vehicles Readiness Index" report released by KPMG Internationals, which assesses and ranks the preparedness of 30 countries for autonomous vehicles, Taiwan ranks 13th at its first time participating in the survey. The report uses four measures, including policy and legislation, technology and innovation, infrastructure and consumer acceptance, to analyze the observation on autonomous vehicles of various countries. With the support of the government, Taiwan has spurred the industries, academics, and researchers to invest in the development of autonomous vehicles and obtained good achievement already.

CONCLUSIONS

In regard to the development and application of artificial intelligence, people share a common vision. They hope that artificial intelligence will not harm people, and it would protect people's rights and ensure people's safety. Legal obligation and liability shall be considered alone and integrated with comprehensive evaluations of the autonomous vehicles' characteristics in order to promote societal progress and safety.

This article summarizes and highlights relevant content and key points of Unmanned Vehicles Act, which was

legislated in Taiwan in 2018. In addition, the article points out the fundamental ethics regulation of artificial intelligence that influence Taiwan's legal policy. The research, design, development, and testing of unmanned vehicles shall prioritize human safety and shall provide transparency to gain people's trust.

Moreover, the research and testing shall comply with fundamental ethics of artificial intelligence, yet the regulation shall not be so strict that it hinders the development of unmanned vehicles. Therefore, the laws in Unmanned Vehicles Act regulate that applicant is to be provided with exemptions from other existing law and hence, the research and development for unmanned vehicles is protected. Indeed, regulatory content of the Unmanned Vehicles Act simultaneously provides people protection and guarantees for the participants without hindering the technology enhancement.

In fact, the experimental regulation has already achieved very good results as KPMG Global Headquarters report, the "2020 Autonomous Vehicle Readiness," has showed. The report evaluates and ranks the readiness of autonomous vehicles in 30 countries, and Taiwan is ranked 13th in the survey for the first time.

However, while the laws related to autonomous vehicles have begun to amend in foreign countries, not only have we made no corresponding legal amendments of autonomous vehicles, but even the ethical norms of autonomous vehicles have not yet fully been established in Taiwan. In order to catch up with the rapid development of autonomous vehicles, we should formulate the ethical norms of autonomous vehicles as soon as possible, and besides, the amendment of relevant laws and regulations should not be postponed any longer.

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