

# **Advisory Opinion**

## **Ethical, Legal and Social Issues in Automated Driving**



**May 26, 2023**

**Science Council of Japan**

**Committee on Designing Society by Implementation of  
Automated Driving for Future Generation Mobility**

This Advisory Opinion is largely the outcome of the deliberations of the Committee on Designing Society by Implementation of Automated Driving for Future Generation Mobility, the Subcommittee on Automated Driving Planning and the Working Group for the Investigation of Automated Driving and Co-creation for Future Society, Science Council of Japan.

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Mobility

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This English version is a translation of the original written in Japanese.

## Executive Summary

### I Background

Science Council of Japan (SCJ) issued the Recommendation "The Social Issues of Automated Driving - Designing a New Mobility Society," in the 24<sup>th</sup> term in the year of 2020. In order to implement the new automated driving technology in society, it is also stated that further deeper discussions should be continuously conducted, while taking into the account four pillars of viewpoint which consists of (1) the role of automated driving and mobility in the grand design of future society, (2) human-centered design and social implementation that takes into consideration the values and ethics of the humanities and social sciences, (3) the sustainable development based on verified data preparation and evidence, and (4) human resource development and research and development through a national project of industry-government-academia collaboration.

The issue-oriented committee of the 25th term of SCJ, the Committee on Designing Society by Implementation of Automated Driving for Future Generation Mobility (hereinafter referred to as 'the Committee'), together with the subcommittee on Automated Driving Planning and the Working Group for the Investigation of Automated Driving and Co-creation for Future Society which were established under the umbrella of the Committee are working to further specify the recommendation submitted in the previous year. In this activity, it is strongly recognized that ELSI which refers to non-technical issues is very important and it is supposed to construct this advisory opinion before announcement of these actions in general as recommendation. Here, ELSI refers to Ethical, Legal, and Social Issues which are non-technical issues that must be resolved before a new technology will be implemented in society. Although this consideration was originally proposed in the life science field, such as Genome analysis, it is currently developed to other technological disciplines such as brain sciences, data science which have a great impact on society. Here, as automated driving technology is not a technology that can be simply introduced and deployed once the technology level is reached and regulations are established. however, it is a new technology that will give an impact on society. Therefore, it is essential to accelerate examination on ELSI as a novel technology that has a significant impact on society.

### II Current Status and Issues

As for the legal system related to automated driving, a permit system for specified automated driving has been established in the revision of the Road Traffic Law in 2022, which allows for Level 4 automated driving as unmanned mobility services, although the presence of a specified automated driving supervisor is mandatory for unmanned services. The government aims to realize Level 4 automated driving services in more than 40 locations by 2025, and in more than 100



locations nationwide by 2030. This advisory opinion focuses on Level 4 self-driving mobility services that will be put into practical use in the relatively near future. Although it is expected that automated mobility services in level 4 will become available in a relatively simple driving environment with a large legal framework in place, there are many issues that need to be resolved before actual implementation in society: the ethical guidelines for system design in the event of system failure, etc.; the social acceptance regarding the fact that there is no way to completely eliminate the risk of accidents, despite effective reduction of the number of accidents; the issues of liability and compensation in the event of an accident in the case that driver is not present in the vehicle; and the data security and privacy issues.

Globally, in Germany, Ethical Guidelines were developed and 20 rules were indicated in 2017, gathering representatives and experts from the field of philosophy, law, social science, technology evaluation, consumer protection, and automotive industry, religion, software development, and etc. Similar ethical guidelines for automated driving were also compiled by the European Commission in September 2020. Ethics is a code of human behavior, and ethical considerations need to be made in line with legal considerations and system design. It is noteworthy that Europe was the first to establish ethical guidelines. On the other hand, in Japan, ethical considerations regarding automated driving have just begun, and the current status is that several organizations have proposed draft ethical guidelines. As ethical views differ depending on the form and culture of the local community, it is desirable to consider ethics while taking into account Japan's culture, regional characteristics, and natural environment. The major challenge is how to incorporate the circumstances of individual regions while building fundamental framework of ethics with universality, rather than setting up ethics completely different for each country or region individually.

Although the legal framework for implementing Level 4 automated driving services has been established, the detailed system design and operation methods for actually introducing such services to society still have a long way to go for development and there are also many unclarified points remaining in regard to how the events likely to occur subsequently will be judged in a court of law. With the establishment of the aforementioned ethical guidelines, there are not a few issues to be pointed out by legal experts; whether automated driving systems are required to avoid risks even in cases where human-driven vehicles are driving in violation of road traffic laws; how the systems should take responsibility when unavoidable situations occur. As technological limitations and technological evolution could be expected, it is highly desirable to accelerate the resolution of issues through collaboration between law and other fields of sciences. In addition, investigation of social acceptability is important, and it is strongly anticipated that the social implementation of Level 4 automated mobility services will eliminate people's concerns and enable them to use these services with a sense of security. The collaboration between various fields of engineering for system design and the humanities and social sciences has already begun, and it is necessary to make such mechanism permanent. To achieve this goal, the government should take the lead in creating a framework to promote industry-government-academia collaboration as well as international

cooperation, and to establish a framework for sustainable human resource development together with collaboration with related automobile industries and venture companies.

### III Main Points of the Advisory Opinion

#### (1) Ethical and Legal Considerations for Automated Driving

It is important to sort out the ethical issues that arises from the implementation of automated driving in society, in order to develop laws and social design. Furthermore, it is desirable for the national government, to promote ethical consideration of automated driving in cooperation with industry, local governments, and citizens,, and to develop ethical guidelines most suitable for global comparison, while taking into consideration Japanese culture and regional characteristics. In addition, it is necessary to resolve issues to be reviewed in details, such as how human intervention should be in Level 4 automated driving services and how to respond to abnormal cases in system design. Moreover, it is necessary to consider how to handle data, privacy protection, information security etc., and it is required to continue review for legal.

#### (2) Creation of a system that benefits society as a whole and human resource development

Regarding automated driving, it is necessary to consider risks and benefits from the viewpoints of various stakeholders, including government, research and development (R&D) organizations, business operators, and citizens. It is also required to create a mechanism that appropriately reflects the opinions of stakeholders and benefits the whole society. So far, the development of automated driving technology has been promoted through national projects including SIP in collaboration with government, industry, and technical experts. In the future, however, it is necessary to further involve experts in the humanities and social sciences, as well as local governments and citizens, in comprehensive discussions. In order to realize a grand design for a future society with automated driving, it is desirable to establish the system that continuously make human resource development feasible in interdisciplinary field and industry-government-academia collaboration.