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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 24th 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.

Recommendation

Designing Society by Implementation of Automated Driving for Future Generation Mobility



September 15, 2023

Science Council of Japan

This Recommendation 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, and is issued under the auspices of the Science Council of Japan.

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

Executive Summary

I Background

It is stated that automated driving of automobiles has been shifting from the research and development and demonstration phase to the social implementation phase, due to the 2022 amendment to the Road Traffic Law allowing level 4 as specified automated driving. However, it can be also said that there are many issues that need to be resolved before full-scale deployment. Based on this background, the Science Council of Japan (SCJ) issued the Recommendation "On the Social Issues of Automated Driving - Designing Society through New Mobility" in the year 2020 of its 24th term. Upon implementing the new technology of automated driving in society, the recommendations include the role of automated driving and mobility in the grand design of future society, human-centered design and social implementation with consideration for humanistic and social scientific values and ethics, preparation of verification data and sustainable development based on evidence, and national collaboration between industry, government and academia, human resource development and research and development through national projects in collaboration with industry, government and academia.

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 Committee, worked to further concretize the recommendations of the previous term and issued the Advisory Opinion 'Ethical, Legal and Social Issues in Automated Driving' in May 2023. Based on this, further discussions have been held to expand the scope of consideration to include the desirable status of mobility in social design, and to examine the creation of mechanisms and human resource development that will benefit society as a whole. We have decided to issue this recommendation as a summary of these activities, describing items that will lead to future action plans and aiming to serve as a reference for the efforts of all stakeholders concerned.

II Current Situation and Issues

The implementation of automated driving in society is making steady progress; yet with Level 2, vehicles started full-scale operation in Sakai town, Ibaraki Prefecture, in November 2020, and with Level 3 vehicles started to drive on public roads by the end of FY2020. On the other hand, since the investigation of ELSI (Ethical, Legal and Social Issues) is still far from satisfactory, it is

desirable that the legal system be investigated paying attention to detail by deciding ethical guidelines which are preceding in other countries and the technical guidelines be revised by clarifying safety goals, including dilemma issues (ethical and moral conflicts).

In addition, consideration for the social design is also insufficient on what kind of mobility society will be realized by using automated driving and mobility services. Particularly in Japan, it is essential to envision a society with a drastically shrinking population due to the declining birthrate and aging population, and to create a roadmap for the realization of the goals to be attained. While technological sophistication is also expected, it is necessary to accelerate discussions toward setting appropriate targets that do not obstruct the spread of the technology, as setting excessively high targets will rebound on the cost.

III Recommendations

Focusing on ELSI, social design in the era of declining population, and sustainable next-generation mobility, this recommendation lays out the fundamental issues that should be addressed by the cooperative efforts of industry, academia, government, and the private sector, and proposes a roadmap for solving these issues. Regarding ELSI, this summary includes the same content as the "Ethical, Legal, and Social Issues in Automated Driving", the Advisory Opinion issued by the Committee in May 2023.

(1) Ethical Considerations and Legal Issues Study on Automated Driving

It is important to organize ethical issues on fully automated driving for the development of legal systems and social design. It is desirable for the national government, in cooperation with industry, local governments, and citizens, to promote ethical considerations regarding fully automated driving, and to develop optimal "ethical guidelines" at the national level in global contrast, while taking into consideration Japanese culture and regional characteristics.

As the social implementation of fully automated driving without human intervention may be accompanied with various risks and benefits in the long process of deployment, ELSI should be continuously examined by industry, academia, government, and the private sector in response to the needs of the times, along with technical issues such as how human intervention should be and how to design systems to respond to emergency situations.

(2) Grand Design for Society in a Society with a Shrinking Population

Japan's population is declining at a significant rate, and the government should fully discuss and set a direction for sustainable mobility in a society with a shrinking population. The issue of declining population is a major challenge remaining for a certain period of time, and system design requirements compatible with the target regions should be organized and considered for the implementation of next-generation mobility that takes advantage of the demographics and

characteristics of each region.

In such cases, guaranteeing minimum mobility for local residents should be considered, the value and rights of mobility, and the costs and benefits for mobility should also be investigated, and from the perspective of community development, the following benefits should be quantified: health maintenance for the elderly, relief for vulnerable transportation users including those with driving difficulties due to brain diseases, etc., reduction of medical costs, maintenance of social life quality, revitalization of local economy through mobility. The project should visualize the value-enhancing effects on other sectors and indicate a grand design for the entire target area, including the quantification of benefits.

Additionally, from the perspective of the SDGs which aim for a society where no one is left behind, local governments and local residents should work together to develop a cooperative system to introduce, maintain, and manage mobility toward a sustainable society. It is essential to structure an organization that the local governments lead the actions regarding the improvement of mobility and the local residents consider the relevant issues on mobility as their own personal affairs for daily lives.

(3) Clarification of goal setting and collaboration among industry, academia, government, and the private sector for social implementation

It is especially required toward social implementation that fully automated driving systems without human intervention and advanced driver assistance systems incorporating automated driving technology with some human intervention should be positioned as next-generation mobility to solve various social issues, with clear safety goals and specific design targets that are acceptable in terms of cost-benefit effect. For this, it is necessary to make investigation in cooperation with the public and private sectors.

It will take time for fully automated driving to become widespread, and even if it does not reach that point, the benefits of advancing current driver assistance system technologies up to Automated Driving in Level 2 and their social implementation will have a significant benefit, and scenarios for their widespread use also need to be developed under the framework of public-private partnerships. Furthermore, the widespread deployment of this technology should be accelerated by clarifying the specification settings for vehicle manufacturing, with an awareness of business models for mobility and logistics services aiming at fully automated driving. In conjunction with the development of private vehicles, Japan automobile industry should contribute to international cooperation and establishment of international standards and regulations so that it can continue to be a driving force for the Japanese economy.

It is said that our society is in the midst of a once-in-a-century revolution in mobility, and that collaboration between industry, academia, government, and the private sector is extremely important for the social implementation and widespread deployment of new technologies, including response

to carbon neutrality. The government should take the leading role in the activities, the industry should advance technology, and the people should respond to changes according to the requirements of the times, aiming to build a society where the diverse happiness of each individual can be enjoyed.

Advisory Opinion

Rebuilding the Employment and Livelihood Security Safety Net



27 September 2023

Science Council of Japan

**Subcommittee on
Safety Net and Law
Committee on Law**

This advisory opinion is the result of the deliberations of the Subcommittee on Safety Net and Law of the Law Committee of the Science Council of Japan.

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The original text of this advisory opinion was written and published in Japanese. The SCJ provides an English version of the Executive Summary for non-Japanese readers.

Executive Summary

1. Background

The COVID-19 pandemic that swept the world in early 2020 lingered longer than expected, and has had significant repercussions on employment, work, and livelihoods for people. Such repercussions are more pronounced among 'vulnerable' people, such as those with disabilities, single-parent families, or irregular employees in which the percentage of female is likely to be higher. Such repercussions further extends to 'employment-like working style', such as freelance employment. In response to this situation, the subcommittee has re-examined the basic principles of employment and social security policies and, focusing on the gap between the current legal framework/policies and the actual situations, has analyzed the nature of the 'safety net' as a livelihood security mechanism from various perspectives.

2. Current Situation and Problems

As was the case in previous crises such as the Lehman Shock and Great East Japan Earthquake, COVID-19 increased the number of businesses adjusting employment; however, the impact on workers has not been uniform. During this period, non-regular employment decreased significantly, whilst increase could be actually observed in regular employment. In the industrial sectors most affected by the pandemic, a high proportion of employers use irregular workers, in which women make up a very high proportion. In this respect, COVID-19 revealed the issue on the function of non-regular employment as a buffer, and also highlighted the issue of gender. (Furthermore, the problem of physical and mental strain also arose in sectors strongly affected by the pandemic, such as health care, nursing care, and childcare.) After the financial crisis of 2008, efforts were made to correct disparities in non-regular employment through the introduction of a system for transition of fix-term employment to indefinite-term employment and the reinforcement of balanced and equal treatment, but it is difficult to consider these efforts as adequate.

As in the past, the employment adjustment subsidy system was actively used during the pandemic as a measure to maintain employment, and this contributed significantly to preventing job losses. However, owing to the provision that coverage is limited to those

insured by employment insurance, and because numerous cases surfaced where employers did not pay leave allowance (a premise upon which the system is based), a special benefit system was established. These problems are inherent in the system. Expanding eligibility for employment insurance coverage should also be considered as an important measure for irregular employment.

A distinctive ramification of COVID-19 was the emergence of a crisis in freelance employment. Freelance workers have traditionally been deemed as self-employed and excluded from labor laws (including insurance) that cover workers. The increase in 'employment-like work' in recent decades has emerged as a policy issue in labor and social security law, but measures to address such issue have only just begun.

COVID-19 has exacerbated livelihood problems (in terms of income, health, and social connections) of single-parent families, especially single-mother families. The main reason are that the majority of them working as irregular workers and a lack of ability to deal with the closure of schools and kindergartens, etc., during the pandemic. Although NPOs and other civic organizations have carried out support activities, the challenge lies in enhancement of a comprehensive public support, including both financial support and a consultation system.

Contrary to expectations, the number of applications for livelihood protection and benefits received has decreased during the pandemic. However, issues identified in the past including strict checks on asset holdings (means test), the broad scope of relatives, etc. having an obligation to financially support, the fact that the response of local government offices is not always in line with the law (frontline operations), and the stigma associated with welfare applications; whilst some of such issues have been improved, , they still remain.

3. Opinion Statement

The subcommittee has a multi-layered understanding of safety nets and considers them as "systems that prevent loss of employment or work, provide temporary livelihood security in the event of such loss, support a return to employment or work, and guarantee the minimum standard of a healthy and cultured life in the event that these support measures are not possible." Safety nets, in this sense, should be constructed with due consideration for the fundamental values of the Constitution, namely respect for the individual, the right to the pursuit of happiness, equality in employment, the guarantee of

a healthy and cultured life, and the realization of rewarding employment (decent work) that reflects these values.

The results of the study can be summarized as follows:

(1) The following issues require consideration when recasting the safety net to prevent future employment crises:

- (i) The regulation of fixed-term employment as one of safeguards for irregular employment.
- (ii) The regulatory framework for equal treatment of irregular employees.
- (iii) The scope of employment insurance coverage.
- (iv) The system of leave allowance in shift-work system.

(2) The following issues require consideration when providing a safety net for freelance workers:

- (i) The regulatory framework of workers' accident compensation insurance and the employment insurance system with a view to including 'employment-like work'.
- (ii) The special voluntary enrollment system for workers' accident compensation insurance currently in force.

(3) The support system for single-parent families, including financial support for single-parent families and a consultation system, needs to be enhanced.

(4) Measures to improve the system for livelihood protection should include easing the strict checks on asset holdings (means test), limiting the range of relatives having an obligation to financially support, improving the frontline operations of local authorities, and eliminating the stigma associated with welfare.