Cross-ministerial Strategic Innovation Promotion Program(SIP) Automated Driving for Universal Services (expansion of system and service)

Study on Assessment and Strategy of Promotion for Social and User Acceptance

(FY2019-FY2022) FY2021 Annual Report (the third periodic report)





Positioning of the survey

[Collection of quantitative data]

Individual research by Dai-Ichi Life Research Institute Inc.

3,000 samples collected nationwide

METI & MLIT commissioned project

The 1st Questionnaire Survey on Automobiles and automated Driving 12,400 samples collected nationwide

METI & MLIT commissioned project

The 2nd Questionnaire Survey on Automobiles and automated Driving
12,400 samples collected nationwide

METI, MLIT and SIP commissioned project The 3rd Questionnaire Survey on Automobiles and automated Driving

[Collection of qualitative data]

- · Eiheiji Town: World Cafe
- · SIP Citizen Dialogue
- Himakajima, Aichi Prefecture: World Cafe
- Hitachi City, Ibaraki Prefecture: World Cafe
- Chatan Town, Okinawa Prefecture: Test-ride
- & group discussion
- Australia: Test-ride & interview
- SIP Citizen Dialogue
- Collecting follow-up information on past World Cafe locations
- Gathering information through lectures on automated driving throughout Japan

2018 survey

2019 survey

2020 survey

2021 survey

2022

METI, MLIT and SIP commissioned project The 4th Questionnaire Survey on Automobiles and automated Driving

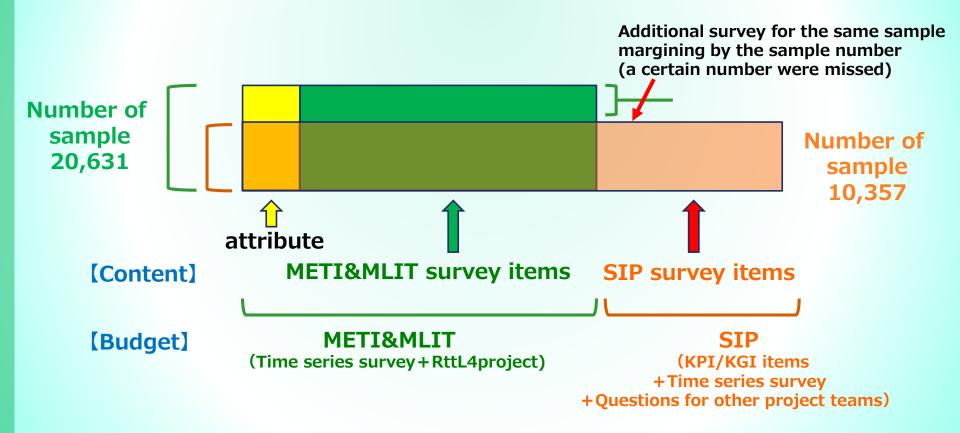
- · Interview at Kozo-ji New Town
- Gathering information through lectures on automated driving throughout Japan

Cooperation with SIP

(Joint collection of quantitative data, dispatching information of SIP cafe, etc.)



Outline of the Third Questionnaire Survey on Automobiles and Automated Driving



- Target: People aged 18-69 in Japan, 20,631 (METI&MLIT)·10,357 (SIP)
- Period: January & February 2022
- Method : Online survey (by Cross Marketing)



The Contents of Surveys (Item Lists)

[METI and MLIT Survey]

- **◆FACE** (including life satisfaction)
- ◆Q1 Driver's license, purpose of driving, type of driving
- ◆Q2 Number of cars owned
- ◆Q3 Public transportation (distance to station and burden/issue)
- **♦Q4 Transportation use (past month)**
- ◆Q5 Regional characteristics, mobility awareness, mobility in old age
- ◆Q6 Driving assistance functions (recognition, use, awareness, understanding, intention to use)
- **♦Q7** Car lease awareness
- ♦Q8 Intention to use car lease
- ◆Q9 Automatic driving awareness/actual condition
- ◆Q10 Receptivity to automatic driving (A-B preference)
- ◆Q11 Receptivity to automatic driving (4-way)
- **♦Q12 Cost burden awareness**
- **♦Q13 Cost Consciousness**
- **♦Q14** Speed x Cost Preference
- **♦Q15 Long-distance truck lanes**
- ◆Q16 Signaling during automated driving
- **♦Q17** Expectations of Problem Solving by Automated Service Cars
- **♦Q18 Police Agency Items**

[Cabinet Office SIP Survey]

- **♦Q1** Attitudes toward place of residence (community commitment/civic pride)
- ◆Q2 Satisfaction with mobility in daily life
- **♦Q3** Accidents and near-misses
- ◆Q4 Overall acceptance Score of automated driving by type
- ◆Q5 Subjective understanding of automated driving
- ◆Q6 Acceptance of automated driving by item (for scale)
- **♦ Q7 Consumer Commitment**
- ♦ Q8 What you should do as a user for diffusion
- ◆Q9 Expectations for specific uses of automated driving
- **♦Q10** Evaluation of being connected (V2X)
- **♦Q11** Awareness of consumer information provision
- **♦Q12 University of Tsukuba Item** (Lv Comprehension)

Survey form creation cooperation:

- Cabinet Office (SIP-adus)
- National Police Agency
- Ministry of Economy, Trade and Industry
- Ministry of Land, Infrastructure, Transport and Tourism







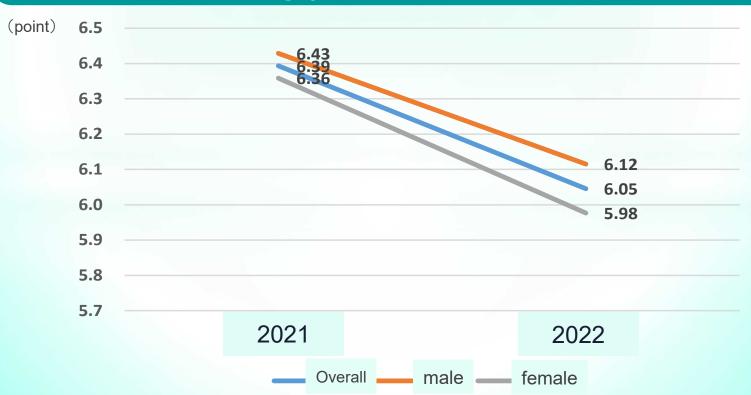
5

Mobility satisfaction in daily life (time series by gender)

Travel satisfaction declined.

This may be due to the impact of Covid-19, which lasted more than two years.

Female respondents are less satisfied with their mobility, and the gap widened further.

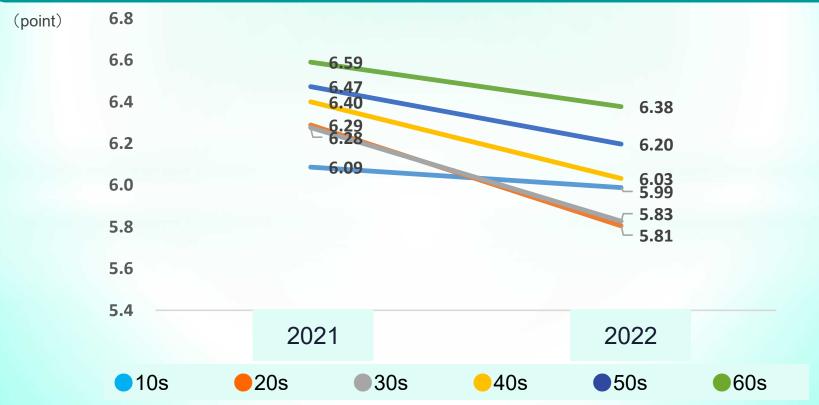




Mobility satisfaction in daily life (time series by age group)

Looking at changes by age group, there is a large decline in travel satisfaction among those in their 20s and 30s.

Travel satisfaction among teens is relatively lower, but the decline over the past year has been small than other age groups.

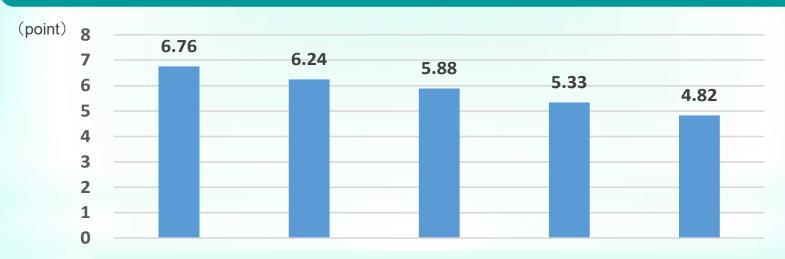




Mobility satisfaction in daily life (by city size)

Travel satisfaction tends to be lower for smaller cities.

The average score differs by 1.94 points between the largest and smallest in city size.



Tokyo wards, governmentdesignated cities

Cities with a population of 300,000 or more

Cities with a population of 100,000 or more and less than 300,000

Cities with a population of less than 100,000

Towns and villages



Satisfaction with mobility in daily life (by degree of dependence on privately-owned car)

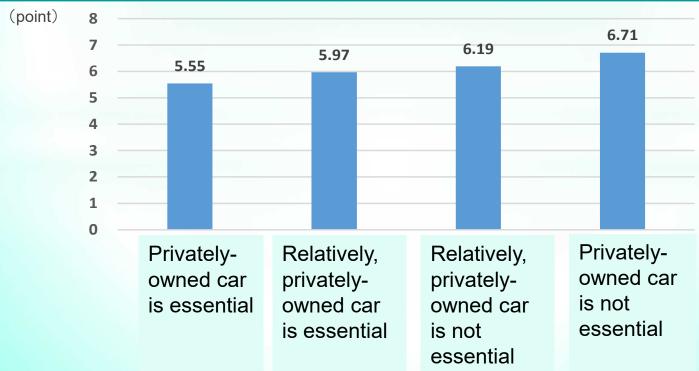
Dependence on the privately-owned car

= "Whether the privately-owned car is essential for daily life or not".

The higher the level of dependence on privately-owned cars,
the lower the level of travel satisfaction. It may show the dissatisfaction to
the limitation of mobility mode available in their residential area.

This may also affect mobility satisfaction by city size.

<Hypothesis> Does the diversity and variety of mobility options increase
mobility satisfaction?



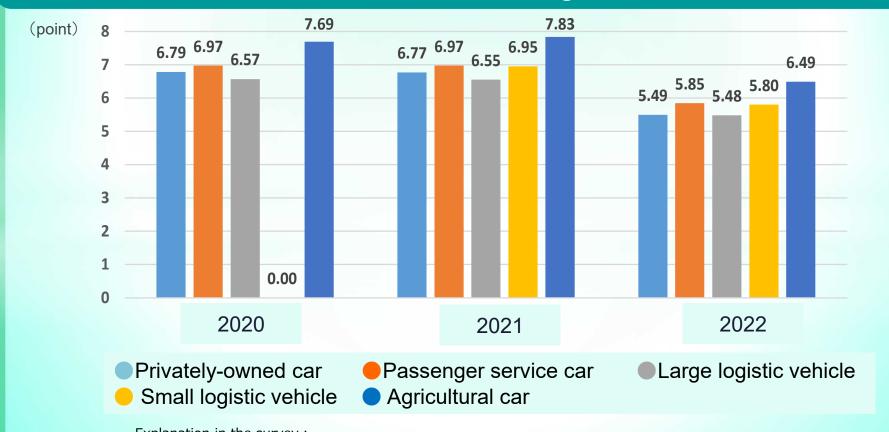


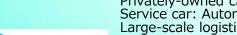
Q4 ACCEPTANCE OF AUTOMATED DRIVING BY MOBILITY TYPE



Overall Acceptance Score for Automated Driving by Type (Overall Value Trends)

Agricultural cars continue to have the highest relative acceptance of automation. This is followed by passenger service cars and small logistic vehicles at about the same level. Privately-owned cars and large logistic vehicles have relatively low acceptance of automated driving.

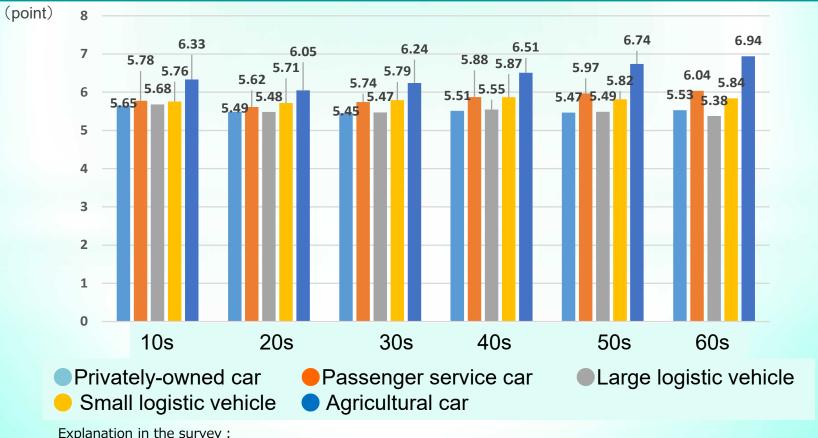




Explanation in the survey: Privately-owned car: A private car owned by an individual and driven automatically on the road. Service car: Automated public transportation vehicles, such as buses and cabs, that travel on the road. Large-scale logistics: Trucks and other large logistics vehicles are automated to pass through on the road. Small logistics: Small-sized self-driving robots carrying daily necessities, food, etc., driving on sidewalks Agricultural car: In agriculture, tractors, rice planters, combine harvesters, and other work vehicles will be automated.

Overall Acceptance Score for Automated Driving by Type (Gender)

There are no significant differences by age group, but the average scores for passenger service and agricultural cars tend to be higher for older age groups.





Dai-ichi Life Group

Privately-owned car: A private car owned by an individual and driven automatically on the road.

Service car: Automated public transportation vehicles, such as buses and cabs, that travel on the road.

Large-scale logistics: Trucks and other large logistics vehicles are automated to pass through on the road.

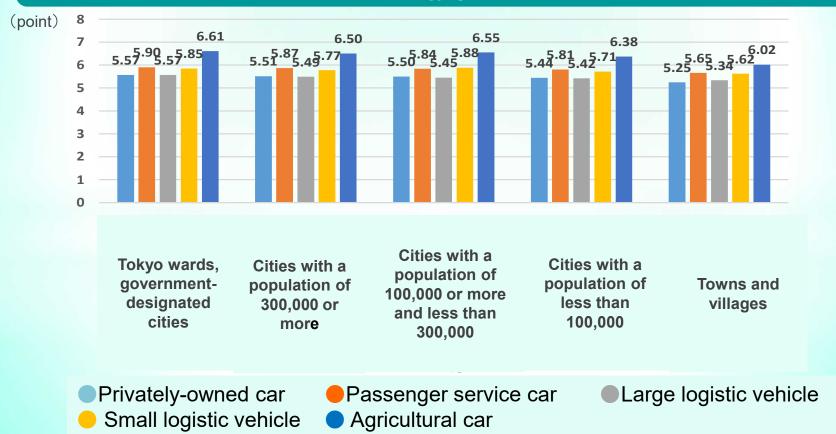
Small logistics: Small-sized self-driving robots carrying daily necessities, food, etc., driving on sidewalks

Agricultural car: In agriculture, tractors, rice planters, combine harvesters, and other work vehicles will be automated.

Overall Acceptance Scores for Automated Driving by Type (by City Size)

Acceptance scores for agricultural cars are higher in areas with larger cities.

Smaller city size does not necessarily mean higher acceptance of passenger service cars.



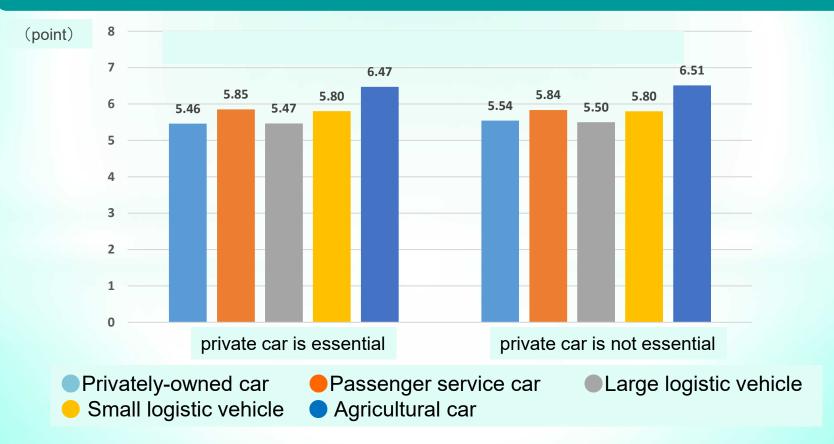


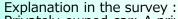
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Small logistics: Small-sized self-driving robots carrying daily necessities, food, etc., driving on sidewalks
Agricultural car: In agriculture, tractors, rice planters, combine harvesters, and other work vehicles will be automated.

Overall Acceptance Score for Automated Driving by Type (By dependence to privately-owned car)

Whether or not a private car is essential in daily life has little effect on the level of acceptance.





Privately-owned car: A private car owned by an individual and driven automatically on the road.

Service car: Automated public transportation vehicles, such as buses and cabs, that travel on the road.

Large-scale logistics: Trucks and other large logistics vehicles are automated to pass through on the road.

Small logistics: Small-sized self-driving robots carrying daily necessities, food, etc., driving on sidewalks

Agricultural car: In agriculture, tractors, rice planters, combine harvesters, and other work vehicles will be automated.





Q5 UNDERSTANDING OF AUTOMATED DRIVING (AWARENESS)

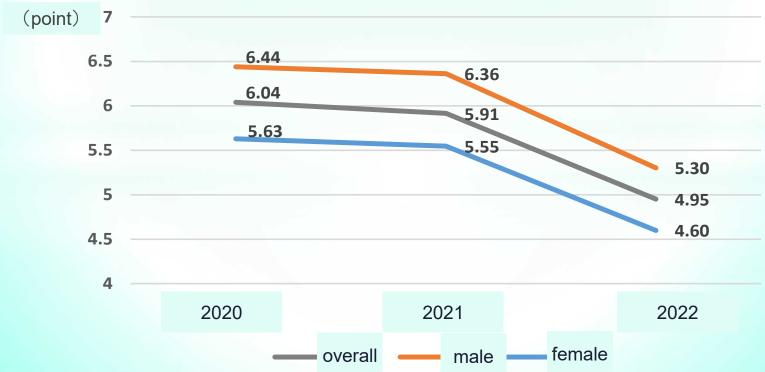


Perceived understanding of automated driving (Time series, overall and by gender)

The perceived level of understanding of automated driving has declined significantly over the past year.

The trend of female respondents awareness of their level of

The trend of female respondents awareness of their level of understanding being lower than male respondents has continued. This may be due to the fact that the general public had less opportunities to come into contact with information and actual products of automated driving in 2021 because of Covid -19.



Subjective Comprehension Rating: Answer on a scale of 0 to 10 to the question of "How well do you think you understand the advantages/disadvantages of automated driving and what automated driving technology can and cannot do (limitations)?"



Perceived understanding of automated driving (Time series, by male age group)

Perceived level of understanding to the technology declined in all age groups. Male respondents in their 30s and 40s tend to regard their level of understanding limited.



Subjective Comprehension Rating: Answer on a scale of 0 to 10 to the question of "How well do you think you understand the advantages/disadvantages of automated driving and what automated driving technology can and cannot do (limitations)?"

N-ICHI LIFE

Perceived understanding of automated driving (Time series, by female age group)

Perceived level of understanding declined in all age groups. Female respondents in their 30s and 40s also tend to regards their level of understanding lower compared to other age groups.



Subjective Comprehension Rating: Answer on a scale of 0 to 10 to the question of "How well do you think you understand the advantages/disadvantages of automated driving and what automated driving technology can and cannot do (limitations)?"

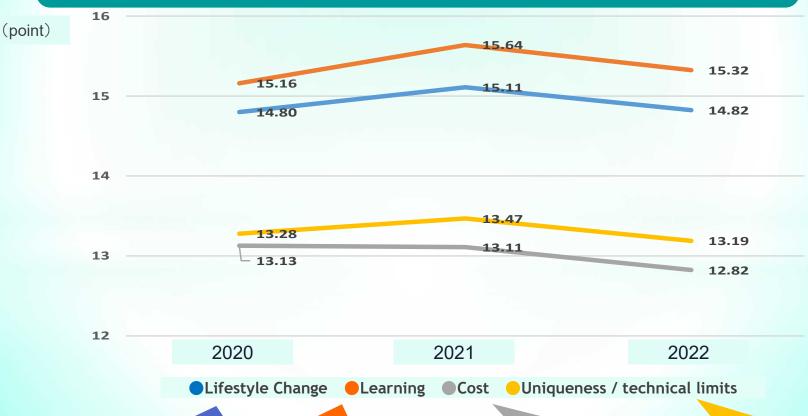






Distribution of Acceptance Scores by Factors (Overall and Gender)

All acceptance factors decreased from the previous year. The "Cost" and "Uniqueness/Technical Limits" factors are lower than in 2020.



Accepting various changes in life due to the spread of automated driving.

Accepting various learning loads for the spread of automated driving.

Accepting various cost burdens in the spread of automated driving.

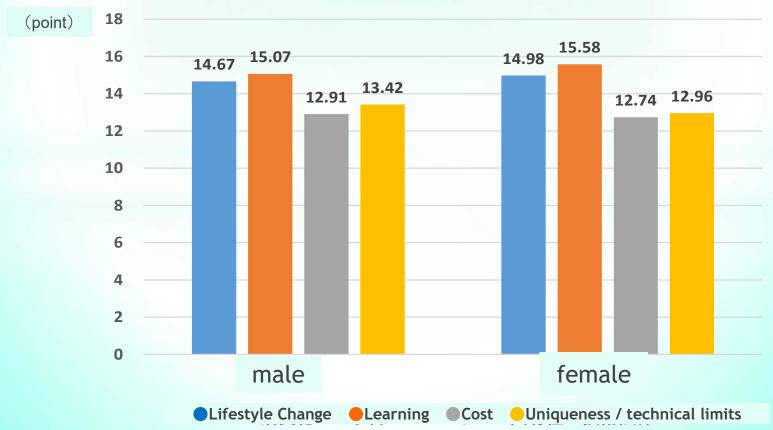
Accepting the unique properties of automated driving and limits and risks of technology.



Distribution of Acceptance Scores by Factor (Gender)

Relatively higher for men than for women are "cost" and "endogeneity/technology limitations".
The relatively higher scores for women than for men are "life change" and "learning.

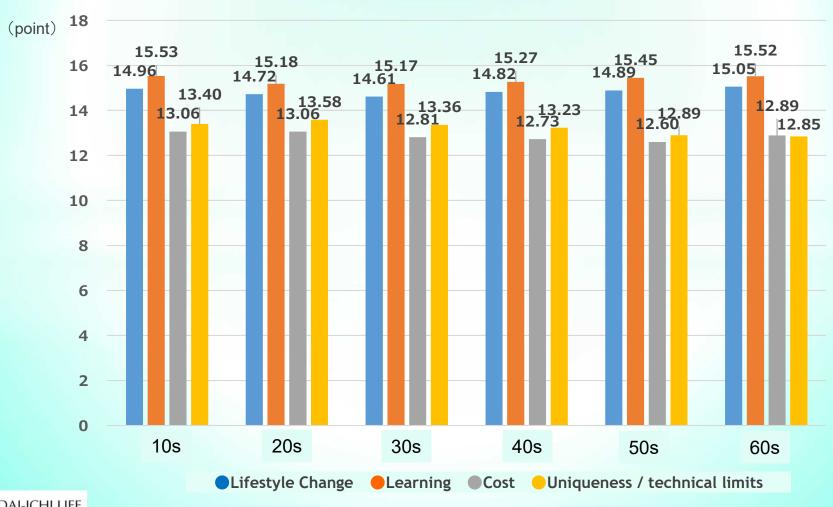
It is possible that the key points in promoting understanding differ by attribute.





Distribution of Acceptance Scores by Factor (Age)

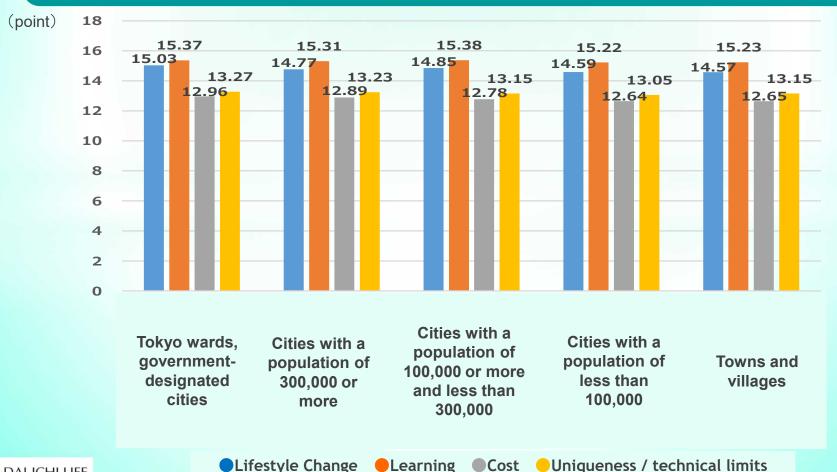
No noteworthy trends were observed by age group.





Distribution of Acceptance Scores by Factor (by city size)

Even small city-sized areas, where mobility is expected to be an issue in the future, do not have a high level of acceptance in each factor. Rather, some factors have higher average values in larger cities.



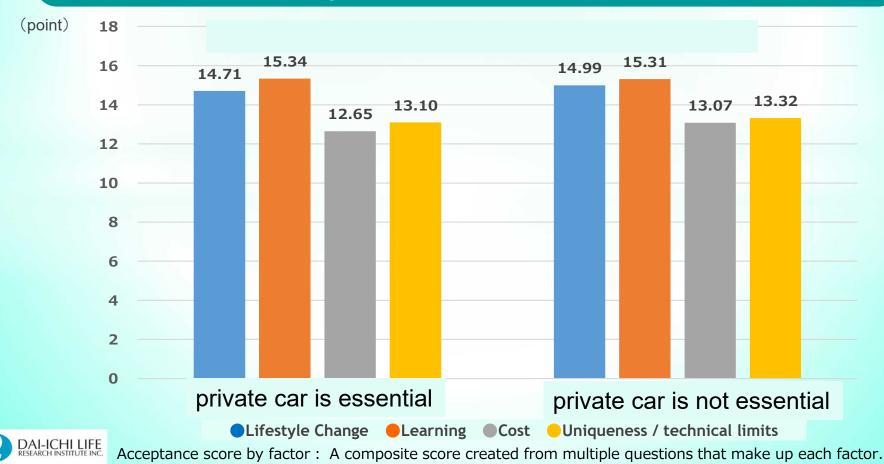


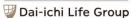
Distribution of Acceptance Scores by Factor (A private car is indispensable for daily life)

Similar to the trend by city size, there is no marked difference by dependence on the private car.

Rather, the averages for "lifestyle change," "cost," and "Uniqueness/

Technical Limits" are higher for those for whom a private car is not essential.





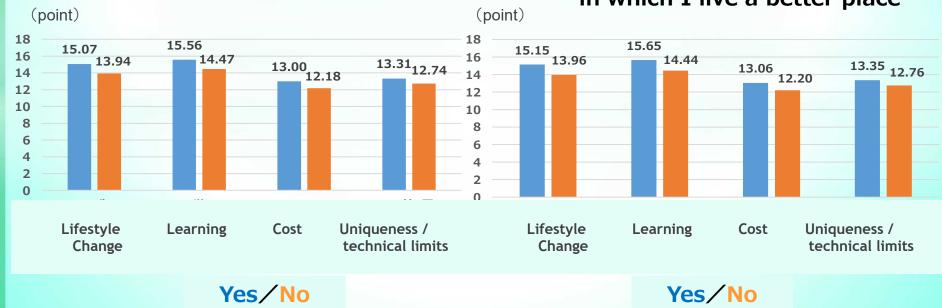
Local Residents' Attitudes and Acceptance of Automated Driving-1

The average value of each acceptance factor is generally higher than those who are not attached to the community or committed to their area of residence.

(Similar trend to previous survey)

I have a love for the community

I want to make the community in which I live a better place





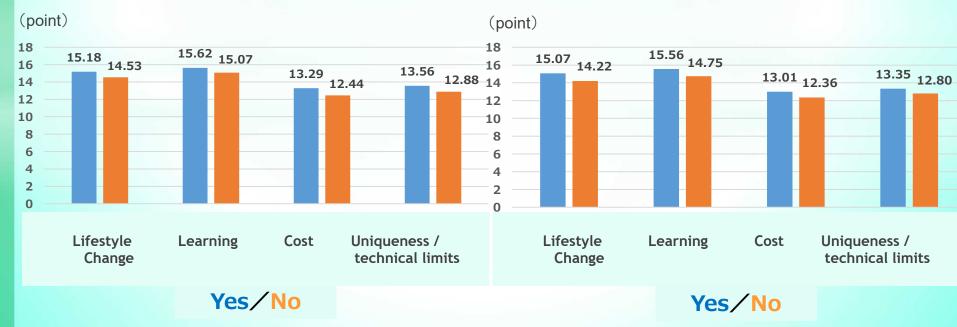
Local Residents' Attitudes and Acceptance of Automated Driving-2

Those who are aware of local issues and want to stay in their current residence longer have generally higher average values for each acceptance factor than those who are not.

(similar trend to previous survey)

I am aware of the issues in my community.

I want to live in my current neighborhood for a long time.







Q7-11 HOW TO GET INVOLVED IN AUTOMATED DRIVING AS A CONSUMER



Willingness of participation as a consumer for society with automated driving technology

About 80% of the respondents were willing to "actively understand and cooperate" and "understand and cooperate".

Those who consider a privately-owned car indispensable have a higher level of willingness to be involved.

→The intention and attitude toward commitment may be a good scale as social acceptance.



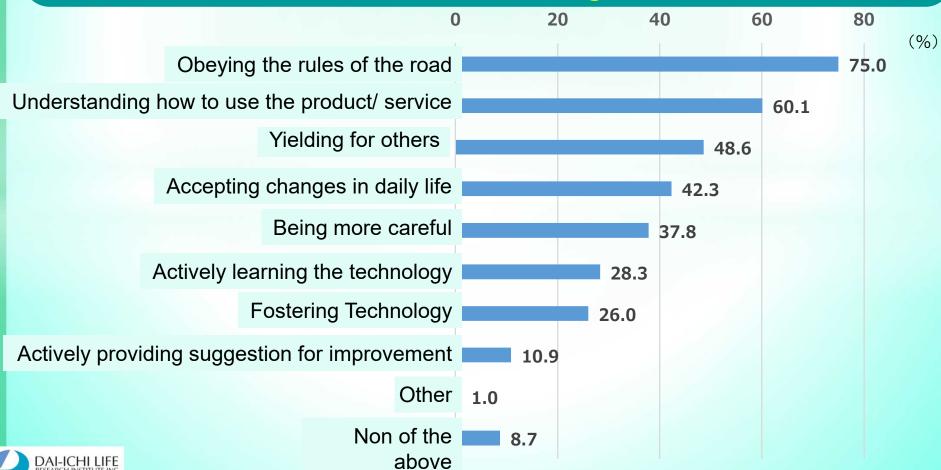


Specific actions people may take as a consumer

Respondents are asked if they are willing to take specific action in order to have automated driving technology spread throughout society.

The top three answers are "obeying the rules of the road" "understanding how to use the product/service" and "yielding for others "

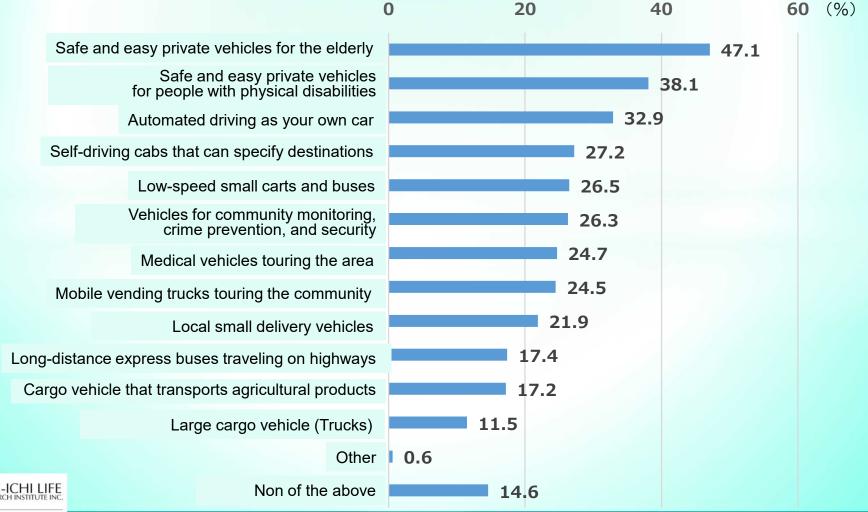
→It is important to promote the merit and technical limitation of automated driving.



Types of mobility People consider useful to have Automated Driving

The top two choices are "a privately-owned car that can be driven safely and easily by the elderly" and "a private car that can be driven safely and easily by the physically disabled."

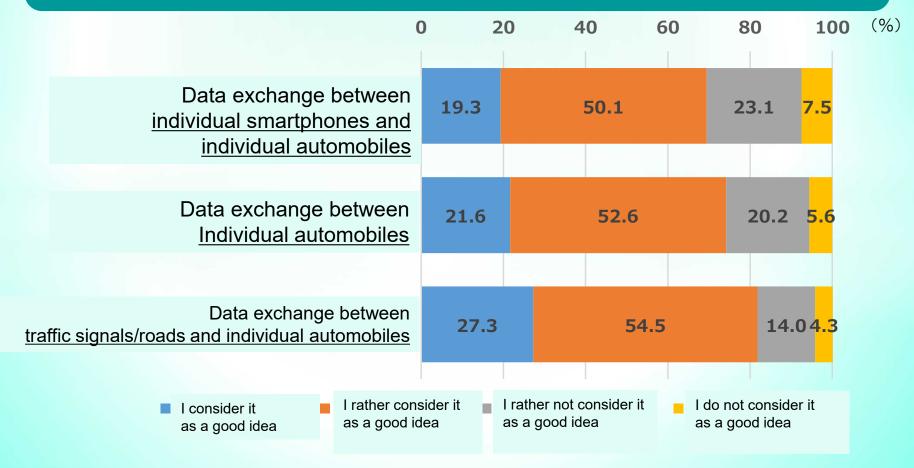
→ High expectations for backup for the vulnerable in transportation



Expectations for "Connected car service (V2X)"

The approval rate slightly decrease for the data exchange between individuals.

People may have found the infrastructure operators more trustworthy.



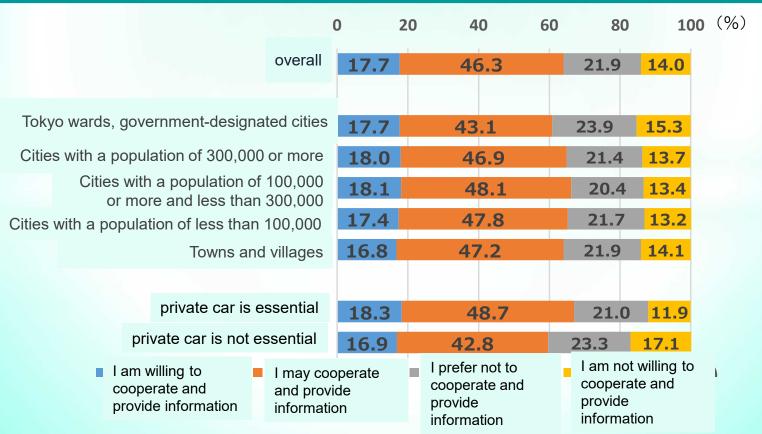


Question: When automobiles are connected to people, other vehicles, and the road via communication (wireless), it is expected to reduce traffic accidents and traffic congestion. What do you think about this?

Attitudes toward providing one's own information in connection with "Connected car service"

Overall, 64% of respondents are positive to the provision of information. It shows that those who drive cars regularly find the merit of cooperation for the safety and accident-prevention as their own.

→ It is possible that those who do not drive cars regularly have relatively low awareness of "safety".





Question: It is expected that automobiles will be connected to people, other vehicles, and the road via communication (wireless) to reduce traffic accidents and lead to more efficient traffic. To do this, you are required to provide information such as your location and speed. You will not be identified by it. Which of the following best describes your view on this?

Further analysis of the January 2022 survey will be continued as a FY2022 project in accordance with the implementation plan, and we will continue to disseminate the results through lectures and writings.







TEP	TEP Region		Items for Actions (Fixed)	r Actions (Fixed) Items that need to be checked (Updated annually)		
1	КРІ	of foun	 Frame & Strategy> 3. Projects work together without waste or duplication. (Comprehensiveness, appropriate target selection, etc.) Collecting and understanding information about the target and soil information about the target and soil 1. Sufficient information was collected and understood in advance about the objects (society, region, people, etc.) that are trying to foster social acceptability.		Overall evaluation by SIP committee members	
2	KPI	P①Examina			Survey Hearing Citizens Dialogue	
3	КРІ		Selection / editing / processing of information for dispatching <adaptation></adaptation>	 For information dispatching, the selection of appropriate information according to the target was examined. Appropriate editing and processing was performed according to the target for information dispatching. 	Video creation and dispatching Citizens Dialogue SIP cafe Creating a booklet Utilization of survey results	
4	КРІ	P @Dispatching	Information dispatching means / media / place <means></means>	Appropriate information dispatching means, media, and venues were used to disseminate information to the subject. The viewpoint of SOCIETY 5.0 (physical / virtual fusion) was conscious.	Video creation and dispatching Sympogium Citizens Dialogue SIP cafe	
5	КРІ		Experience opportunity creation · UX <		· Test-ride event · Exhibition (e.g. TMS)	
6	KPI	and Diffu	Feedback / interactivity <communication></communication>	 The impact of the dispatched information was verified through the reaction from the other party to the dispatched information and the interaction with the target. Through the reaction from the other party to the dispatched information and the interaction with the target, it led to the discovery of improvement points regarding the content and method of the transmitted information and the acquisition of new ideas. 	· Sympogium · Citizens Dialogue · World Café	
7	Id I		Information diffusion / social interest <expansion></expansion>	The content of activities and transmitted information were linked to the spread of related information on mass media, SNS, etc. A derivative effect of information transmission from person to person was created. The traction effect as an "innovator, early adopter" was brought out by improving the satisfaction of existing users.	Number of media publications Number of retweets	
8	KGI		Understanding in consumers <understanding> 1. Improved consumer understanding of autonomous driving and ADAS functions. 2. Intrinsic behavior of consumers trying to understand autonomous driving / ADAS functions was aroused.</understanding>		Questionnaire survey (with related litems) Attribute survey of event participants	
9	KGI	GOAL	Consumption / use behavior <use></use>	 Consumers understand social issues and their own situations and link them to the purchase of related products, services and functions. Started using products, services, and functions that people already own 	Questionnaire survey (with related items) Support car sales status ADAS function usage status	
10	KGI S		Social acceptance in consumers <acceptance></acceptance>	Consumers are willing to accept each of the potential consequences of the introduction of autonomous driving. Lifestyle Change Learning Cost Uniqueness / technical limits	Questionnaire survey (transition of acceptability factor scores)	

1	KPI	tion of foundation	entire frame and individual projects <frame &="" strategy=""/>	2. Each project develops a process with a clear goal.	Overall evaluation by SIP committee members
2	KPI	P①Examina	Collecting and understanding information about the target and soil <target grasp=""> 1. Sufficient information was collected and understood in advance about the objects (society, region, people, etc.) that are trying to foster social acceptability.</target>		SurveyHearingCitizens Dialogue

2. Collection and understanding of information on the subject and conditions

- The Dai-ichi Life Economic Research Institute has conducted four surveys in the past (five if you count the original Dai-ichi Life Economic Research Institute survey, which serves as the basis for this report). The "Questionnaire Survey on Automobiles and Automated Driving" shows that consumers' awareness of automated The presence of a large presence in terms of fostering the social acceptance of driving is not recognized.
- However, the results show that understanding of driver assistance devices is gradually increasing, and (from METI and MLIT survey part), and the extension of mobile life and safe and secure mobility. In presenting automated driving as a solution for building and maintaining The dissemination of information and the promotion of understanding are required.



3	КРІ		Selection / editing / processing of information for dispatching <adaptation></adaptation>	 For information dispatching, the selection of appropriate information according to the target was examined. Appropriate editing and processing was performed according to the target for information dispatching. 	Video creation and dispatching Citizens Dialogue SIP cafe Creating a booklet Utilization of survey results
4 KPI		P @Dispate	Information dispatching means / media / place <means></means>	Appropriate information dispatching means, media, and venues were used to disseminate information to the subject. The viewpoint of SOCIETY 5.0 (physical / virtual fusion) was conscious.	Video creation and dispatching Sympogium Citizens Dialogue SIP cafe
5	KPI		Experience opportunity creation · UX <experience></experience>	Realistic customer experience created opportunities for the subject to personalize the issue.	· Test-ride event · Exhibition (e.g. TMS)

3. Selection, editing, and processing of outgoing information

4. Means, media, and venues for information dissemination

- Despite the coronary disaster, dissemination activities continued using new methods such as webinars. In addition, various events were held to the extent possible while taking measures to prevent the spread of infection. The first of these was the "Mazda Global Forum" held in Tokyo in April.
- However, the survey results do not indicate that information on automated driving has spread sufficiently to the general public, which is not interested in automated driving. Comparing the survey results of similar questions between visitors to automated driving events and the results of this survey, there were some items with large discrepancies, and it is undeniable that there is a discrepancy in awareness of automated driving (including the METI and MLIT survey portion).



8	KGI		Understanding in consumers <understanding></understanding>	2. Intrinsic behavior of consumers trying to understand autonomous driving / ADAS	Questionnaire survey (with related items) Attribute survey of event participants
9	KGI	GOAL	Consumption / use behavior <use></use>	 Consumers understand social issues and their own situations and link them to the purchase of related products, services and functions. Started using products, services, and functions that people already own 	Questionnaire survey (with related items) Support car sales status ADAS function usage status
10	KGI		Social acceptance in consumers <acceptance></acceptance>	(2) earning	· Questionnaire survey (transition of acceptability factor scores)

8. Consumer Understanding

9. Consumption and usage behavior

10. Social acceptance among consumers

• Understanding: Perceived understanding of automated driving has decreased further since last year's survey.

Use: The use of cars with driver assistance functions has been increasing, but the number of cars with these functions has been decreasing.

The use of functions and awareness of the fact that they are installed is still not high. However, there is an upward trend in understanding of the functions, confirming the point that they are gradually becoming more familiar. (METI and MLIT survey portion)

• Acceptance: Acceptance of automated driving by type generally declined. In addition, the level of acceptance The level of acceptance of each of the factors that make up the "change in lifestyle," "learning," "cost," and " uniqueness and technical limits" also declined compared to last year.





FOR FOSTERING SOCIAL ACCEPTANCE OF AUTOMATED DRIVING



39

Process for forming "acceptance" of Automated Driving

PHASE1

Increase the amount of information available to consumers

Increase awareness and understanding

WHAT

What is Automated Car?

WHY

Why is Automated Car required?

PHASE2

Create mechanisms to stimulate consumer action and cooperation

HOW

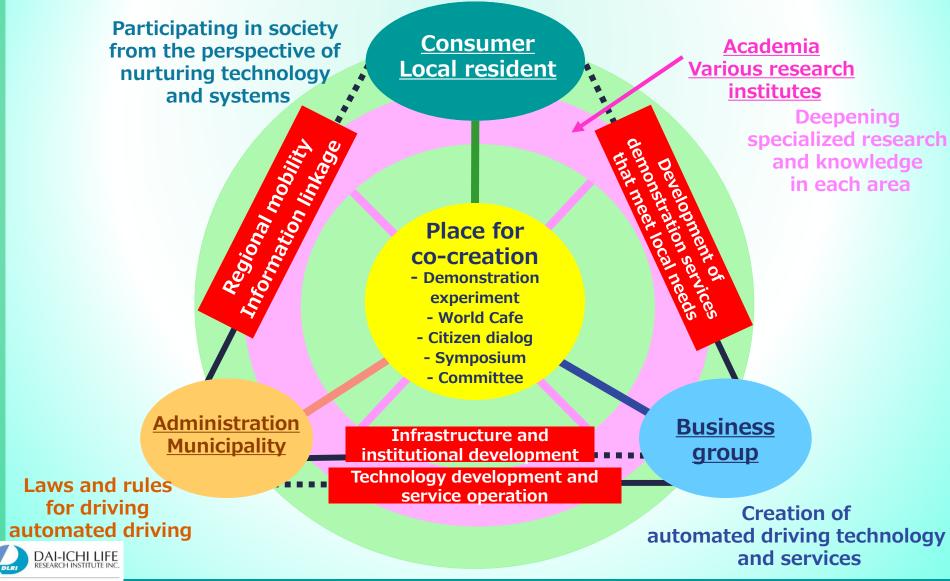
How can we overcome challenges for social implementation?



Break down WHY and consider priorities ⇒ Starting by clarifying and sharing the "WHY" of each region.

	Will of Caciffegioni				
view poin t	Action	Keywords			
Keep it alive	 Create and maintain a means of transportation that fits the local environment and needs Development of mobility infrastructure that enables people to continue mobility even after they have lost their driver's license or their physical functions due to aging, illness, disability, or other causes. Ensure safety in transportation Fostering awareness of the use of diverse mobility by diverse people 	 Sustainability Maintain daily life Safety and security Acceptance of inconvenience 			
Utilization	Impact (financial and non-financial value) of mobility Recognition and visualization 1) Economic benefits (direct and indirect) e.g., fare revenue, improved circulation, regional revitalization, lower social security costs (2) Effects on health Example: Disease prevention, mental health improvement, healthy life extension (iii) Creation of connection and enjoyment Example: Creation of face-to-face contact opportunities, rides as a target of	 Well-being Experience of happiness Happy and joyful Improved quality of life Awareness of inconvenience and benefit 			

Division of roles for acceptance and co-creation of automated driving society







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