

Implementation report (overview version) of
analysis and research of future needs and issues related to
Automated Driving for Universal Service
of FY2018 "Strategic Innovation Promotion Program (SIP)
Automated Driving for Universal Service /
Large-scale Demonstration Experiment,"

February 28, 2019

SC-ABeam Automotive Consulting



Table of contents

1. Background and objectives of the citizens' dialogue project
2. Composition of the research
3. Event track record
4. Characteristics of the citizens' dialogue of this fiscal year
5. Takeaways/ opinions obtained from the citizens' comments
 1. Analysis of the content of the citizens' dialogue in Shodoshima Island
 2. Visualization of dialogue content by graphic recording
6. Effect of Fostering Social Acceptance
 1. Quantitative aspect: outcomes suggested by survey results
 2. Qualitative aspect: Information distribution via media
7. Summary

1. Background and objectives of the citizens' dialogue project

Background

- Fostering social acceptance in anticipation of social implementation of Automated Driving for Universal Service

Fostering social acceptance is indispensable for diffusing Automated Driving for Universal Service to the general public. Thus, it is helpful to hold regional events, etc. regarding Automated Driving for Universal Service with participation of citizens in order to enhance their understanding of the technology and effectiveness of autonomous and cooperative driving support systems that have already been realized so far.

Based on the feedback in these events, it is also important to evaluate and quantitatively verify effectiveness of these activities for fostering acceptance in order to cultivate social acceptance furthermore.

- Responses to issues identified in the citizens' dialogues in the past

As a result of discussions and exchange of opinions in the citizens' dialogues so far, it became clear that further analysis and research are necessary regarding future needs and issues related to Automated Driving for Universal Service.

<Issue (1) Extraction of issues in rural areas>

In the metropolitan area, especially in the downtown area, the public transportation network is well developed even though there are issues involving transportation, including commuting. But, it became clear that in rural areas where public transportation networks are not well developed, many people have deeper concerns.

<Issue (2) Necessity of disseminating accurate information on automated driving>

Also, since people still have anxiety about mixed transportation, it is necessary to be careful not to allow overconfidence or fallacy of automated driving, and to eliminate such overconfidence or distrust of automated driving by facilitating accurate understanding in order to promote widespread use of Automated Driving for Universal Service.

Objective

- Further fostering of social acceptance to automated driving by:
 - a. By providing public citizens with materials for open discussions on the benefits and potential risks of practical implementation of automated driving, and
 - b. foster social acceptance through participatory-type discussions in order to achieve further fostering of social acceptance.

2. Composition of the research

- Forum for bidirectional communication called “citizens’ dialogue” was held. Based on the discussions with the citizens, some future needs, etc. were identified and analyzed and some new takeaways were examined.
- The details and results of the events were disseminated through the media, SIP-adus website, etc. to provide accurate and effective information.

Research Goal

- To create opportunities for eliminating anxieties that various citizens have about automated driving and facilitate correct understanding, for the purpose of implementing "safe" and "secure" automated driving by preventing overconfidence or fallacy in automated driving.
- To organize and analyze new takeaways and visions, etc. based on the feedback obtained in the dialogues, and summarize suggestions regarding how to incorporate them in research and development activities in the future.

Content of the research

- **Research on the benefits and potential risks of practical application of autonomous cruising**
 - Clarify the following points through discussions with the general public, business operators, experts, etc.
 - ✓ Advantages to the general public when self-driving cars are put into practical use
 - ✓ Potential risks posed to the general public and various restrictive conditions (technical limit, legal aspects etc) etc.
- **Formulate and operate forums for two-way communication**
 - Planning, preparing and holding dialogue-style meetings and symposiums on security and safety of self-driving car
 - Summarize specific discussions and organize salient points

Method of the research

- **Implementation of citizens’ dialogue in regions facing problems**
 - Dialogue-style meeting to discuss utilization of automated driving
 - Focus is placed on hilly and mountainous regions and areas where public transportation networks are not well developed
- **Symposium on safety and security**
 - Symposium on safety and security of autonomous car was held in order to eliminate anxiety concerning automated driving and facilitate correct understanding

Transmission of information

- **Facilitate dissemination of accurate information to the general public and further propagation of information**
 - After the citizens’ dialogue, prepare summary of main points and post on the website
 - Shoot videos of the day of the event, edit digest version and post it on the website
 - Provide information on the result of the event to the media etc.
 - Provide/ disseminate information through the panelists and the audience who participated in the citizens’ dialogue

3. Event track record

| | The 1st symposium | Citizens' dialogue | The 2nd Symposium |
|-------------------------|---|--|--|
| Date and time | 10: 00-12: 00 Sunday, October 7, 2018 | 12: 00 ~ 15: 00 Tuesday, December 4, 2018 | 17: 30 ~ 19: 30 Wednesday, February 6, 2019 |
| Venue | Tokyo International Exchange Center, Tokyo Academic Park | Kagawa Prefectural Shodoshima Chuo Senior High School | TFT Hall 300, Tokyo/ Ariake |
| Theme | Let's think about security and safety of automated driving | Shodoshima Island - Future vision of Japan ~ Mobility service created in the community ~ | Regarding security and safety of automated driving ~ Let's think together about security & safety of the future society ~ |
| Objective/ aim | Disseminate accurate information and have discussions on the situation of the government's efforts, etc. concerning security and safety of automated driving | Share the issues and needs related to mobility with local citizens, and have discussions on expectations / anxiety, etc. regarding automated driving | Disseminate accurate information and have discussions on the situation of the government's efforts, etc. concerning security and safety of automated driving |
| Moderator/ MC | Mr. Kazuo Shimizu: Promotion Committee member, SIP-adus; international automobile journalist Ms. Rumiko Iwasada: Promotion Committee member, SIP-adus; motor journalist | Ms. Rumiko Iwasada | Mr. Kazuo Shimizu Ms. Rumiko Iwasada |
| Speakers/ Participants | Mr. Seigo Kuzumaki: Program Director, SIP-adus Mr. Tateo Arimoto: Sub-Program Director, SIP-adus Mr. Takahiro Hirasawa: Director for Policy Planning Office for Automated Driving Technology, Engineering Policy Division, Road Transport Bureau, Ministry of Land, Infrastructure and Transport Mr. Toshihiro Sugi, Director, Autonomous Driving Planning Office, Traffic Planning Division, Traffic Bureau, National Police Agency Mr. Toshio Yokoyama: Project manager, Automated Driving Investigative Commission, Japan Automobile Manufacturers Association, Inc. Ms. Yuka Nakagawa: Specialized Professor, Chukyo University Mr. Raksincharoensak Pongsathorn: Associate Professor, Tokyo University of Agriculture and Technology | [SIP participants] Mr. Seigo Kuzumaki/ Mr. Tateo Arimoto Mr. Kazuo Shimizu/ Ms. Rumiko Iwasada [Regional participants] (16 persons in total) The aged club/ Women's Association/ Educator/ Logistics operator/ Welfare service provider/ Tourism operators/ Child-rearing generation (2 persons)/ Transport carriers (5 people)/ local industry operators/ High school student/ migrant/ child-rearing generation/ Automobile service provider/ Youth organization | Mr. Seigo Kuzumaki Mr. Tateo Arimoto Mr. Takahiro Hirasawa Mr. Toshihiro Sugi Ms. Yuka Nakagawa |
| Audience, questionnaire | ■ Pre-registrants: 431 ■ Audience on the day: 194 ■ Questionnaire collected: 158 (recovery rate 81.4%) | Since it was a closed event, there was no audience by advance public invitation | ■ Pre-registrants: 291 ■ Audience on the day: 167 ■ Questionnaire collected: 138 (82.6%) |
| The media coverage | 5 cases (Yomiuri Shimbun, Nikkan Jidosha Shimbun, Kotsu Mainichi Shimbun, Response, ReVision Auto & Mobility) | 4 cases (Yu 6 Kagawa/ NHK Takamatsu Broadcasting Station, Kagawa NEWS WEB, morning edition of Shikoku Shimbun, Business Kagawa web version, ReVision Auto & Mobility) | 1 case (ReVision Auto & Mobility) |

4. Characteristics of the citizens' dialogue in this fiscal year

| | Symposium | Citizens' dialogue |
|----------------------|--|---|
| Main Characteristics | <p>① <u>Symposium held to disseminate information to greater number of citizens</u></p> <ul style="list-style-type: none"> ✓ Symposia were held at related events to facilitate deeper understanding of automated driving by a greater number of citizens of more diverse background. ✓ The first symposium was held at "Tokyo Motor Festival 2018". Of 431 pre-registrants, 194 attended the event on the day ✓ The second symposium was held as part of the information dissemination project of SIP-adus. The venue was originally designed for 100, but due to the large number of applications, the setting of the hall was changed. 167 persons attended | <p>③ <u>The first citizens' dialogue held outside of the metropolis</u></p> <ul style="list-style-type: none"> ✓ Citizens' dialogue so far has been held in Tokyo, but this fiscal year it was held outside of the metropolis for the first time in Shodoshima in Kagawa Prefecture ✓ By holding a dialogue in a rural area facing transportation issues, it was aimed at identifying issues etc. involving implementation of automated driving ✓ The citizens' dialogue was covered by NHK Takamatsu Broadcasting Station in its news program on the day of the event, proving high level of local attention and resulting in highly effective information dissemination |
| | <p>② <u>The theme was "social framework" relating to "security and safety" of automated driving</u></p> <ul style="list-style-type: none"> ✓ In order to foster social acceptance to automated driving, the theme was chosen with the interest in new systems and social frameworks, such as legislation and rules, that will be required to be developed in tandem with technological development ✓ Since these frameworks ensure security and safety of the citizens, the dialogue was intended to deepen citizens' understanding by disseminating accurate information and to invoke interest in the efforts made for security and safety of automated driving | <p>④ <u>Graphic Recording to make the dialogue more active</u></p> <ul style="list-style-type: none"> ✓ In the citizens' dialogue, graphic recording introduced in FY2017 was implemented ✓ There are various ways to record dialogue, but graphic recording can be shared immediately on the spot ✓ In this event, citizens of various attributes from high school students to members of the aged club got together. Visualization of the content of the dialogue facilitated deeper understanding among participants |

5. Takeaways/ opinions obtained from the citizen's comments

5-1. Analysis of the content of the citizens' dialogue in Shodoshima Island

- In this citizens' dialogue, expectation for the "**realization of a people-oriented automated driving society**" and "**future orientated**" opinions that "**expect realization of regional services by utilization of data**" were voiced.

Main takeaways/ opinions obtained from the citizens' comments

[Realization of a people-oriented automated driving society]

- Expectation that utilization of automated driving will eventually broaden human potential, for instance, energetic elderly people will be able to become active
 - Expectation that it will eventually facilitate social participation of the elderly, because autonomous cars do not require driving and the risk of accidents also decreases.
- Expectation for the realization of a people-oriented automated driving society
 - Automated driving plus "people" oriented. There is a recognition that in tourism, logistics, mobile sales, and mobility support for the elderly, etc., people are required to be involved in services.
 - Comments such as, "it can not be done with machines alone, people always need to be at the core and help each other" and "even if AI is introduced, the system should be formed in such a way that people can sympathize with," reflect expectations to realize people-centered automated driving, even if technological development advances.

[Future oriented visions expecting realization of regional services by utilizing data]

- Future-oriented opinions that anticipate realization of services desired by local residents by utilizing data
 - Comments such as, "we can provide service that citizens in Shodoshima desire by sharing and linking of various data," and "by utilizing data, we want to measure the energy level of Shodoshima with Shodoshima's own measure in thinking about mobility service," reflect expectations to realize mobility services that accommodate needs of the region by utilizing data.

5. Takeaways / opinions obtained from the citizens' comments

5-1. Analysis of the content of the dialogue in Shodoshima Island

- The dialogue was held in two parts, namely, "sharing issues and needs relating to transportation" and "the whole concept of mobility in the future and utilization of automated driving."
- In the first segment of Part one, various issues and needs concerning transportation specific to rural areas were identified together with the local citizens.

Current issues on mobility and transportation

- Many people drive their own cars even when they become 90 years old and over. There are many cases of elderly people carpooling for shopping, but I feel it is dangerous
- Some students have long school commuting hours because of not only far distance but also due to service planning diagrams. I wish they could make better use of their time by studying and having club activities, etc. instead of commuting.
- I am afraid the customers are not fully satisfied with public transportation. Because of the limited number of vehicles owned, customers sometimes have to wait for buses for long time or cannot get on the bus during peak seasons.
- Child-rearing generation has children's transport issues. There are cases when we asked our employees to work overtime or take trainings, but it was turned down because they "must pick up children". Although it is an opportunity to encourage growth of employees, picking up children cannot be avoided
- Also, even if parents want their children to do after school activities, sometimes they have to give up because they can not drive/ pick up their children. Children's potential may be ruined due to the circumstances of the parents.
- Public transport is struggling to respond to foreign tourists. Various measures are devised, such as the use of interpretation apps by the driver, but there are times when they cannot communicate, and it takes time and effort.
- Service planning diagrams of ships and buses are not well coordinated

Anxiety about the future

- It is hard for elderly people to get on/ off a bus while carrying shopping bags.
- Securing drivers responsible for logistics is a difficult issue
- If a share taxi is packed to capacity, it is convenient because each person's payment is cheap, but it is not always the case. When the number of passengers is insufficient, who will pay the rest of the fee?
- Services for people with disabilities must accompany aid for boarding and alighting, which unmanned self-driving car will not be able to do. If people other than the driver are to assist boarding and alighting, accidents may not be covered by the current insurance

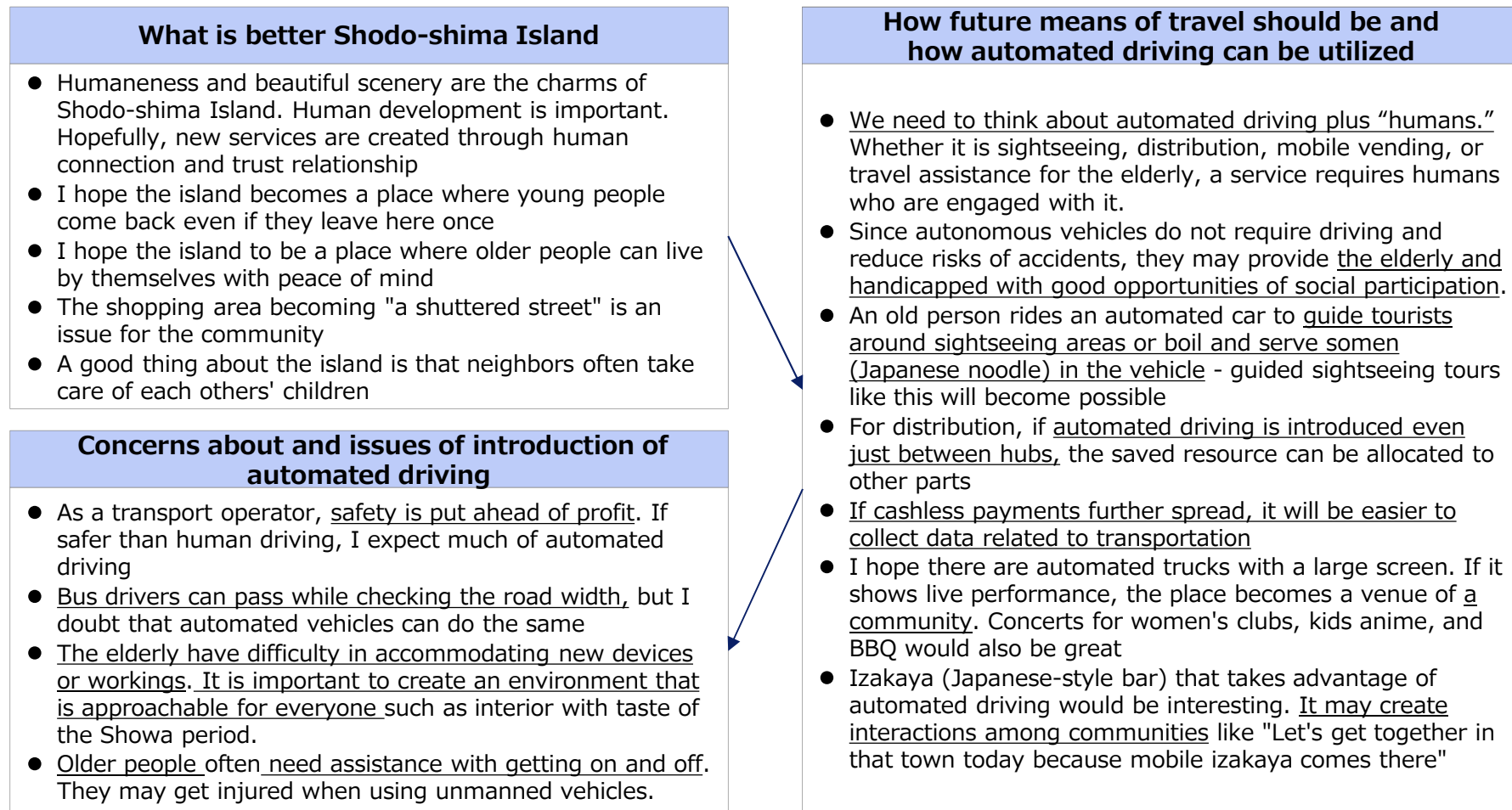
Needs and expectations related to mobility and transportation

- There is a need for demand-based share taxi for elderly people and people with disabilities.
- It will be helpful if there is some data on the use of fixed route buses. Seamless management of fixed route buses might be achieved if riding sections and purposes of transport are identified by data
- If automated driving is realized, it means not only we move by car, but also cars may bring things and services to the proximity of our homes.
- We provide mobile sales service, but items the customers want tend to change by day. So, it may be more convenient if order data are sent to us in advance.

5. Takeaways / opinions obtained from the citizens' comments

5-1. Analysis of the content of the dialogue in Shodoshima Island

- The dialogue consisted of two parts: "Sharing travel-related issues and needs" and "How future mobility should be; utilization of automated driving utilization."
- Topics of Part II included how future means of travel should be and how automated driving can be utilized, thereby sharing expectations for and issues of automated driving.



5. Takeaways / opinions obtained from the citizens' comments

5-2. Visualization of dialogue content by graphic recording

- The discussion content was visually expressed on the spot in real time with an aim to deepen understanding by dialogue participants with various attributes.



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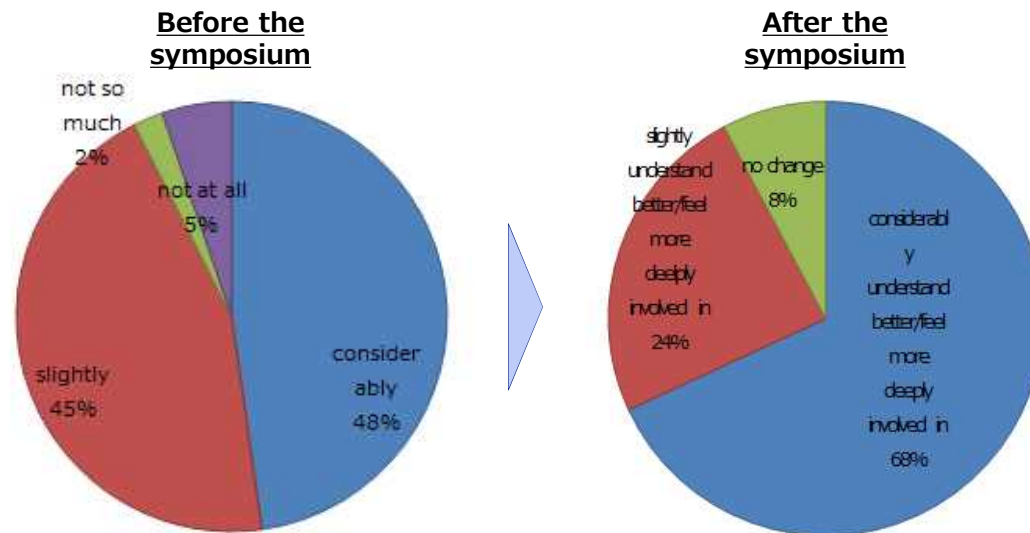


6. Effect of Fostering Social Acceptance

6-1. Quantitative aspect: outcomes suggested by survey results

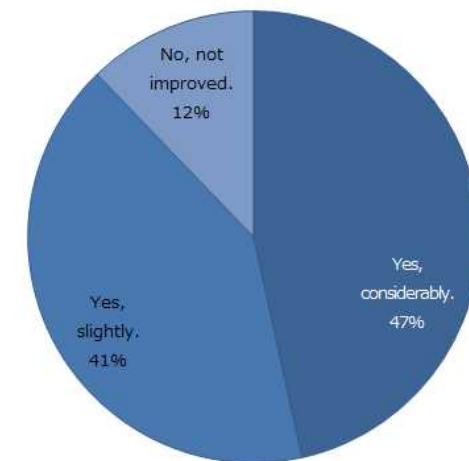
- Approx. 70% of the respondents to the questionnaire at the symposium in February, 2019 responded that they “considerably understood better/felt more deeply involved in the SIP’s activities to realize and diffuse automated driving. It became apparent that this event contributed to improve the social acceptance.
- Similarly, nearly half of the respondents answered that they “considerably understood better than before the symposium” that the traffic rules and legal responsibility at the occasion of traffic accident should be modified to realize automated driving.
This event was a good occasion to recognize the issues toward the introduction of automated driving.

Q. “Please let us know to what extent your understand / feel involved in the activities of SIP, before and after this symposium.”



- ✓ Before the symposium, considerably understand/feel involved in: 48%, followed by “slightly”: 45%
- ✓ After the symposium, “considerably understand better/feel more deeply involved in: nearly 70%, followed by “slightly” 24%

Q. “Do you understand better than before symposium, that traffic rules and legal liability should be modified toward the realization of automated driving ?”



- ✓ “considerably better than symposium” 47% followed by “slightly better” 41%

6. Effect of Fostering Social Acceptance

6-2. Qualitative aspect: Information distribution via media

- The Citizens' dialogue organized in Shodo-shima Island was covered by news on NHK Takamatsu broadcasting station on the same day and attracted a lot of local attention, effectively distributing information.
- The symposium held in October appeared in the whole nation edition of Yomiuri Shimbun (approx. 7 million copies), which widely spread the information in society.

NHK

自動運転 住民の意見聞く集会
12月04日 17時38分



地域が抱える交通手段の課題や要望に、自動運転をどう生かしていけばいいか住民から意見を聞く集会在、4日、香川県の小豆島で開かれました。

この集会是自動運転の開発を進める内閣府が3年前から開いているもので4日、香川県小豆島町で開かれた集会上は、内閣府の担当者や住民など、20人が参加しました。

集会では、地域が抱える交通手段の課題や要望に自動運転をどう生かすことができるか住民が意見を出し合いました。

この中では、観光地の小豆島では、通学で利用するバスが観光客で混雑して困ることがあるといった課題や自動運転で送迎や移動販売ができれば生活が便利になるなどといった意見が出ていました。

内閣府では、こうした集会在全国各地で開催し、集まった意見を今後の自動運転の研究開発にかしていきたくとしています。

参加した高校生は「自動運転の実現でバスの便が増えるなど地域の交通がもっと乗りやすく便利になってほしい」と話していました。

内閣府のくず※巻清吾プログラムディレクターは「地方では車が生活必需品で、その中で自動運転をどう生かしていくか議論ができて有意義だった。こうした意見を取り入れ要望を実現させていきたい」と話していました。

Source: NHK (Takamatsu broadcasting station, Yu 6 Kagawa, Kagawa News Web)(Dec. 4)

Yomiuri Shimbun

戦略的イノベーション創造プログラム(SIP)自動走行システムシンポジウム

「あなたと考える自動運転の安心・安全」



内閣府が主導する戦略的イノベーション創造プログラム(SIP)の一つである「自動走行システム」は、10月7日、東京国際交流館(東京都江東区)で、東京モーターフェス2018の併催イベントとしてシンポジウムを開催した。今回のシンポジウムは、「あなたと考える自動運転の安心・安全」をテーマに、自動運転の更なる社会受容性の醸成に向け、市民の理解向上を目的として実施されたもので、自動運転の技術や関連の法規制等、国土交通省や警察庁、日本自動車工業会、大学・研究機関の各方面で安心・安全について取り組む専門家がパネルディスカッションを行い、「自動運転はどれだけ安全でなければならないか」、「自動運転の事故の責任問題」、「自動運転の国際連携」等に関して議論を行った。

シンポジウム前半は登壇者によるプレゼンテーション。プログラムディレクターの葛巻清吾氏はSIP自動走行システムの活動内容を、国土交通省の平澤崇裕氏、警察庁の杉俊弘氏、日本自動車工業会の横山利夫氏もそれぞれの組織における自動運転の取り組みを紹介した。また、東京農工大学准教授のボンサートン・ラクシンチャランサク氏は「ヒヤリハットデータベースを活用した予防安全の進化」について、中京大学専門教授で弁護士の中川由賀氏は「自動運転をめぐる法的責任」について発表。

後半はSIP自動走行システムの構成員で国際モータージャーナリストの清水氏のモデレートによるパネルディスカッション。前半で紹介された法的責任の問題や事故回避のためのシステム開発などについて改めて議論したほか、人間が自動運転システムを過信することによる事故のリスクも話題になった。また、会場からは消費者のコスト負担についての質問が上がり、多様な観点から意見交換がなされた。

Source: Yomiuri Shimbun, morning edition (Nov. 24)

6. Effect of Fostering Social Acceptance

6-2. Qualitative aspect: Information distribution via media

- The activities were covered by PR magazines issued by both of the two town offices of Shodo-shima Island, introducing the activities to every household in the area.

"Shodo-shima"

PR magazine issued by Shodo-shima town office



地 戦略的イノベーション創造プログラム(SIP)自動走行システム市民ダイアログ
域で創るモビリティサービス

12月4日、小豆島中央高校において、内閣府が取り組む戦略的イノベーション創造プログラム(SIP)の一つである自動走行システムへの理解と関心を深めることを目的として、初の地方開催となる「日本の未来図小豆島地域で創るモビリティサービス」をテーマとした市民ダイアログが開催されました。

住民や観光、交通事業者など約20人が参加し、移動に関する課題やニーズの共有、自動運転への期待や不安などについて、グループ討論などを行い、「小豆島独自のものさしでモビリティサービスを実現するために、各事業者がもっているデータを共有し、連携、活用することが必要ではないか」「小豆島の人や地域の絆の強さなどの良さを自動運転に活かし、人が共感できるシステムが創れるとよい。」など小豆島ならではの未来を考えた活発な意見が交わされました。



Source: Website of Shodo-shima town office

"Koho Tonosho":

PR magazine issued by Tonosho town office



Town Topics

12/10 笠滝でじゃがいも収穫体験
土庄町地産地消推進協議会によるじゃがいも収穫体験が笠滝地区で行われ、土庄小学校1年生84名が参加しました。子どもたちは宝探しをするようにじゃがいもを探し、次々と見つけては「あったー!」と歓声をあげて収穫していました。笠滝を守る会の皆さんが愛情込めて育てたじゃがいもはまるまると大きく、子どもたちはお土産のじゃがいもを詰めた袋を持って「農家の皆さん、今日はありがとうございました」と笑顔で感謝を伝えていました。



12/4 自動走行システムの理解を深めました
内閣府が取り組む自動走行システムの理解を深めるため、「日本の未来図小豆島地域で創るモビリティサービス」をテーマにした市民ダイアログが開催されました。会場の小豆島中央高校には観光・交通事業者など約20名が参加し、自動運転への期待や移動に関する課題などを討論し、「小豆島の人や地域の魅力を自動運転に生かし、人が共感できるシステム創りに期待したい」など活発な意見が交わされました。



Source: Website of Tonosho town office

7. Summary

- Below is the summary of directions toward future R&D activities that were obtained through the symposiums and Citizens' dialogue held in this fiscal year.

1. Fostering social acceptance requires continued efforts

- An important element for fostering social acceptance for automated driving is, along with technological advancement, constantly distributing information that deepens people's understanding while establishing new institutions and a social framework such as laws and rules.
- It is expected that providing new services while grasping users' needs creates value for users, which will advance and expand, further increasing social acceptance.
- In the future, we need to consider how to provide information on automated driving to those uninterested in automated driving.

2. Significance of organizing Citizens' dialogues in provincial areas

- Practical applications of automated driving require efforts that are in line with characteristics and needs of respective regions and implemented from users' perspectives.
- The awareness of mobility service can be heightened by creating opportunities for residents of respective regions to take the initiative in thinking about future mobility, leading to activities aimed at increasing social acceptance for automated driving.
- Data utilization would visualize each region's uniqueness, which may be deployed as its unique service.

3. About the running of Citizens' dialogue held in provincial cities

- Provincial cities have their own networks and connections; therefore, when organizing a Citizens' dialogue in such cities, careful preparation is essential to gain understanding and cooperation for Citizens' dialogue activities by repeatedly visiting there and explain to and consult with all parties concerned prior to the event.
- For example, a decision on participants took as long as two months or so, consulting with the town office and conducting interviews with residents on issues.
- To create an environment where participants do not hesitate to give their opinions, we asked a local person to facilitate the dialogue and carefully prepared for the event.



Important Disclosures

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