Special Feature

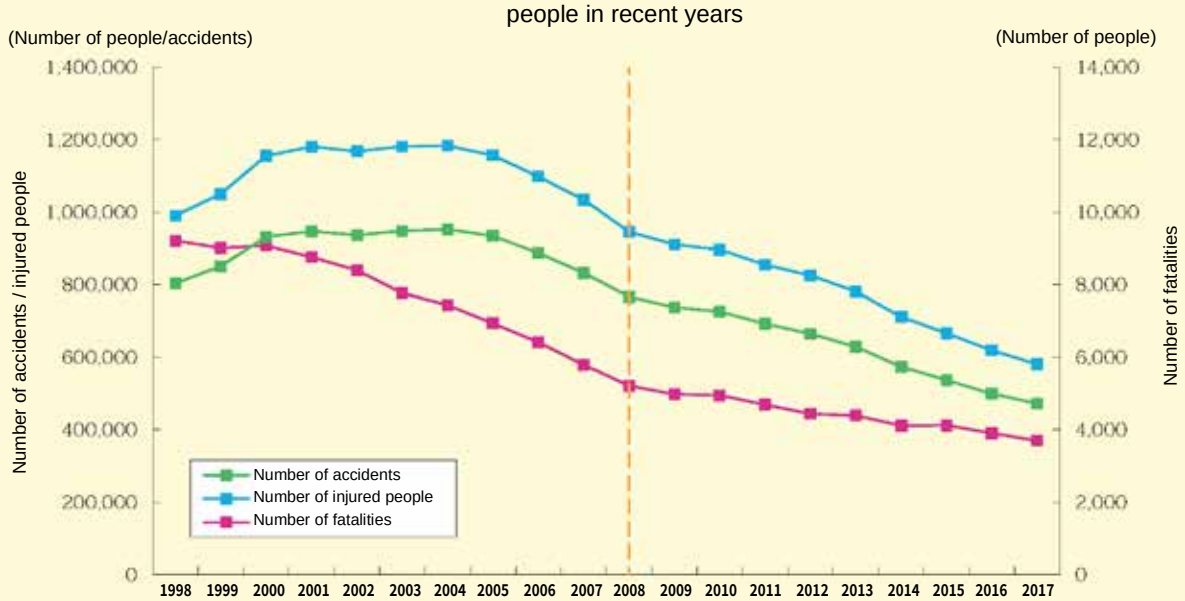
Efforts Made for Traffic Safety Leveraging Advanced Technologies

Introduction

The number of traffic fatalities in 2017 was 3,694, which was the record low since 1948, when the current traffic accident statistics system was adopted, and also less than a quarter of that in the worst year in the past, as a result of efforts made by the government and the private sector in a unified manner. However, still nearly six hundred thousand people were killed or injured by traffic accidents in 2017. In recent years, the decrease in the number of traffic fatalities has slowed down due to an increase in the elderly population resulting from Japan's aging society.

As for the causes of fatal accidents, the percentage of accidents caused by drivers' carelessness has been relatively high in recent years. As for elderly drivers in particular, the majority of accidents were caused by mistakes in maneuvers such as steering and braking due to the deterioration of the drivers' physical faculties and other reasons.

Trends in the numbers of traffic accidents, fatalities, and injured people in recent years



In such a situation, it is important to make efforts to prevent accidents and reduce damages so as to reduce the numbers of fatalities and injured people caused by traffic accidents. For that purpose, the promotion of measures making use of advanced technologies is considered helpful. The 10th Fundamental Traffic Safety Program (approved in March 2016) describes how it is necessary not only to further strengthen current measures but also to strongly promote the development and dissemination of safety support systems leveraging advanced technologies and the effective use of information in order to realize the world's safest road traffic by decreasing the number of fatalities within 24 hours after accidents down to 2,500 or less by 2020.

This special feature starts with a summary of topics such as the characteristics of recent traffic accidents, the situations and issues surrounding emergency life-saving activities when accidents occur, and expectations for advanced technologies, followed by current status of and future plans for the efforts made for traffic safety by applying advanced technologies.

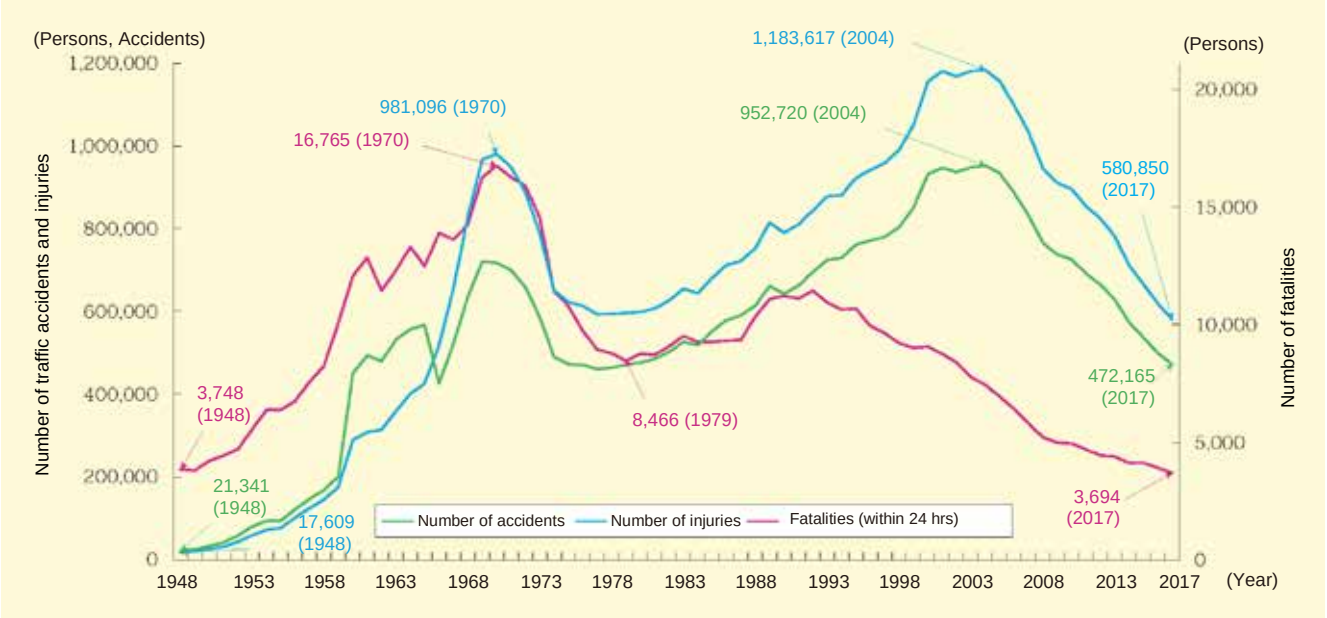
I Necessity of Advanced Technologies for Traffic Safety Measures

1. Recent road traffic accident situation

The number of traffic accidents occurred in 2017 was 472,165 in which 3,694 were killed and 580,850 persons were injured. In comparison to the preceding year, the number of accidents, the number of people killed and the number of people injured decreased by 27,036 (5.4%), by 210 (5.4%), and by 38,003 (6.1%), respectively.

Not only have the number of traffic accidents and the number of injured people decreased for 13 consecutive years, but the number of people killed has also decreased, recording the lowest number since 1948 when the current traffic accident statistics were adopted. However, in recent years, the rate of decrease in the number of traffic fatalities tends to decline. (Feature article – Chart 1).

u Feature article / Chart 1 Changes in the number of road traffic accidents, fatalities and injuries by road traffic accidents



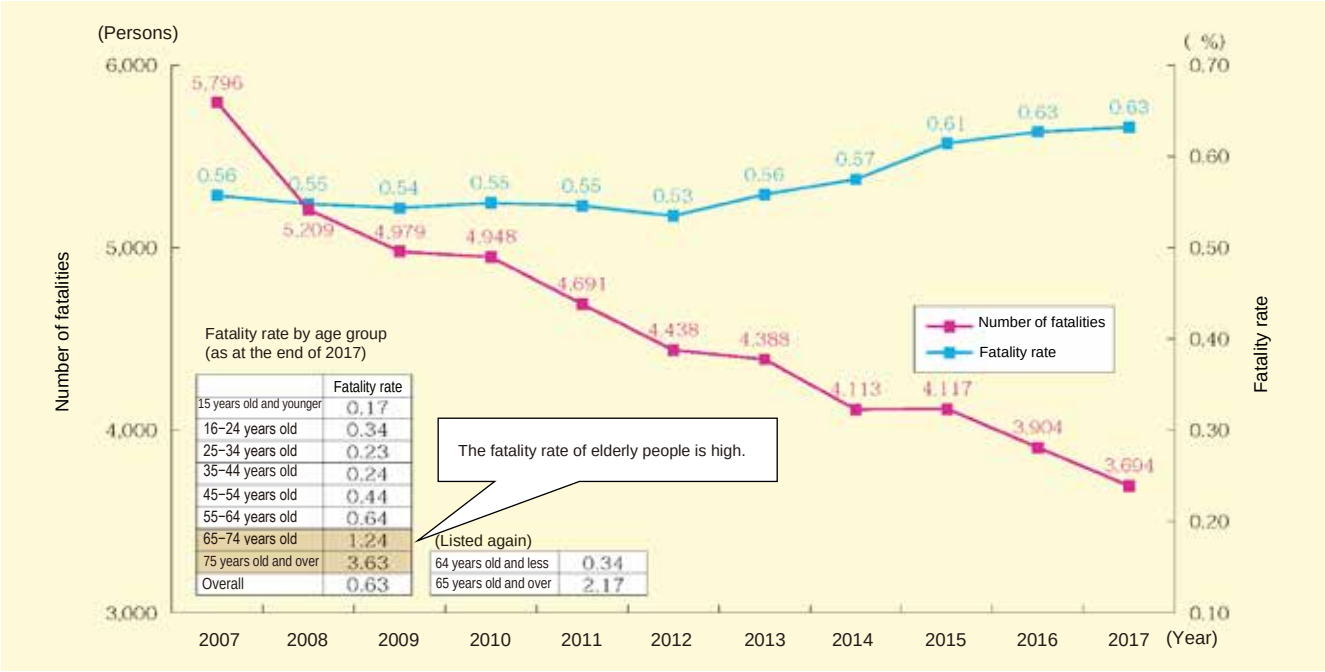
Note:
1. Source: National Police Agency
2. Data for 1965 and all preceding years include property damage-only accidents. Data for 1971 and all preceding years do not cover Okinawa Prefecture.
3. "Fatalities (within 24 hrs)" means the number of persons who died due to a traffic accident within 24 hours after its occurrence.

(1) Characteristics of road traffic accidents in recent years

In recent years, the population of elderly people aged 65 years old and over (hereinafter referred to as "elderly people"), whose fatality is higher by about six times than other age groups, has been increasing year by year, and the percentage of elderly people in the whole of traffic accident fatalities also remains at a high level (Feature article – Chart 1 and Chart 2). This fact is considered to be related to the small rate of decrease in the total number of fatalities and increase in the whole fatality rate.

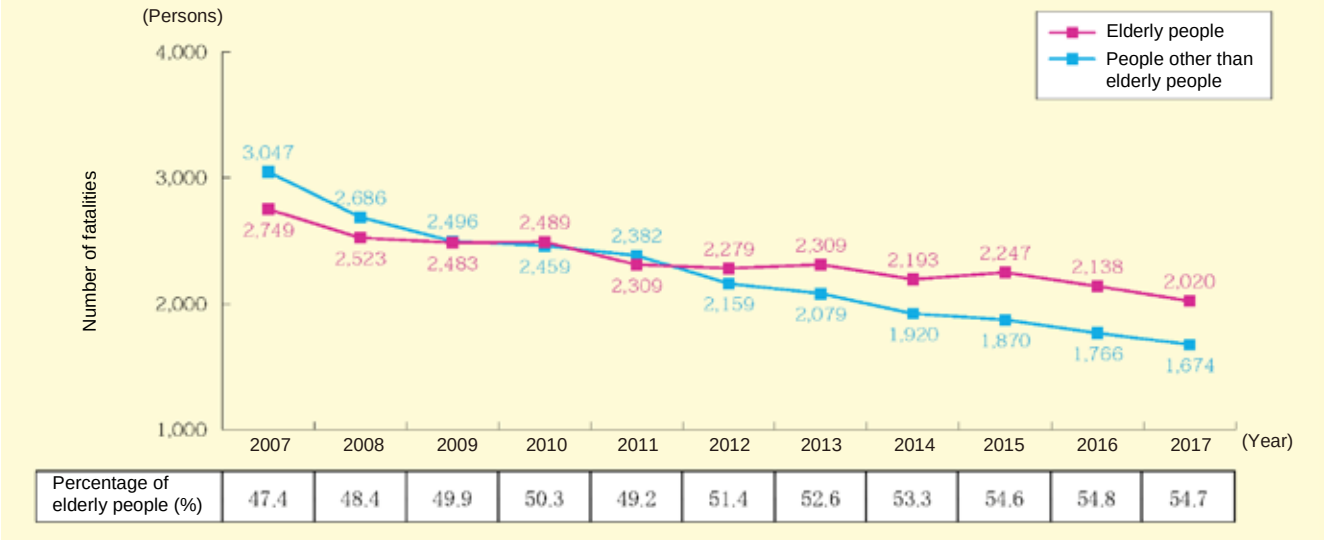
If we examine the state in which elderly people were killed, the number of people killed while walking (972 people: 48.1%) remains at a high level, in comparison to the number of those while riding on a car (579 people: 28.7%), the number of those while riding on a bicycle (326 people: 16.1%), 88 people (4.4%) while riding on a moped bike, and 48 people (2.4%) while riding on a motorbike (Feature article - Chart 4).

u Feature article / Chart 2 Changes in the number of traffic accident fatalities and fatality rate



Note:
1. Source: National Police Agency
2. Fatality rate = Number of fatalities / number of fatalities and injuries x 100

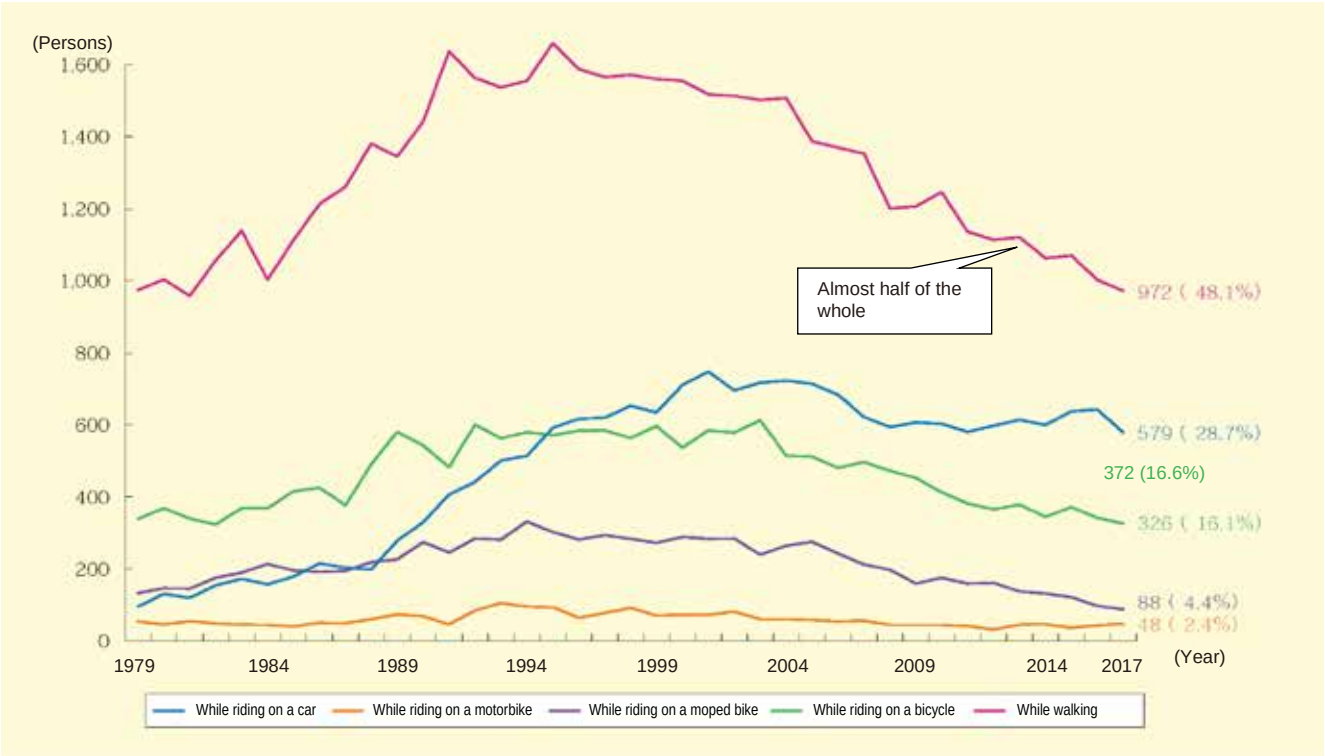
u Feature article / Chart 3 Changes in the number of traffic accident fatalities of elderly people and others



Percentage of elderly people (%)	47.4	48.4	49.9	50.3	49.2	51.4	52.6	53.3	54.6	54.8	54.7

Note:
1. Source: National Police Agency

u Feature article / Chart 4 Changes in the number of traffic accident fatalities of elderly people by road user group



Note:
1. Source: National Police Agency
2. Figures in brackets show the component rate.

(2) Causes of fatal traffic accidents

If we examine changes in the number of fatal traffic accidents by violation of law, fatal accidents of people riding on a moped bike or larger vehicles (primary party[1]) caused by careless driving, inattentive driving or inappropriate driving are more numerous than fatal accidents caused by other violation of law (Feature article - Chart 5).

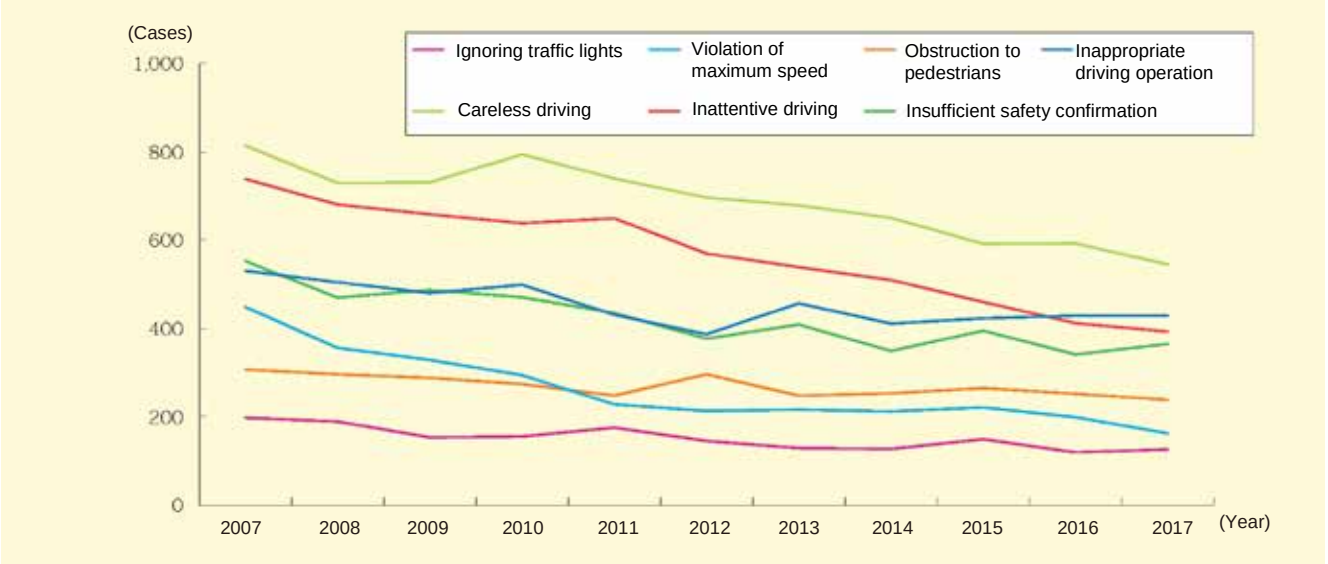
In addition, an inappropriate driving operation is most numerous as the human factor for fatal accidents caused by people 75 years old and over riding on a moped bike or larger vehicles (primary party), and in particular, the percentage of sudden unintended acceleration is higher than that of drivers younger than 75 years old (Feature article - Chart 6).

In view of the fact that many of traffic accidents are caused by drivers' negligence as seen above, the development of automated driving technologies, for example, may greatly contribute to the reduction of accidents. In addition, advanced safety technologies, such as automatic braking, are expected to decrease accidents.

In the meantime, since advanced safety technologies aim to merely help drivers drive safely and their functions are limited, drivers must understand their limitations and points to bear in mind and drive safely in a responsible manner without relying too much on their functions.

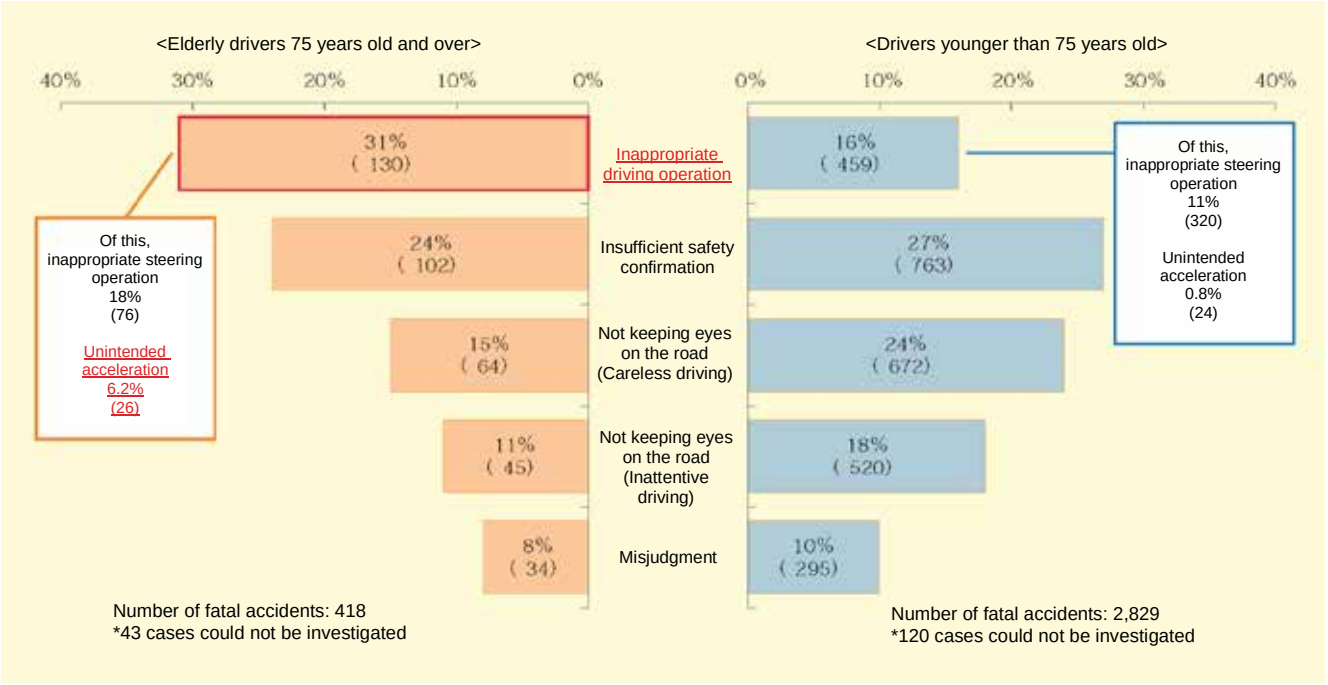
1 Primary party: Among those who are involved in a traffic accident, the person with the highest negligence or the person with the least damage when the negligence is the same degree.

u Feature article / Chart 5 Changes in the number of traffic accident fatalities by violation of law (people riding on a moped bike or a larger vehicle (primary party))



Note:
1. Source: National Police Agency

u Feature article / Chart 6 Number of fatal accidents by people 75 years old and over and people younger than 75 riding on a moped bike or larger vehicles by human factors (primary party)



Note:
1. Source: National Police Agency

Topics

Nationwide Attitude Survey on Advanced Safety Vehicles

According to the results of an internet questionnaire survey on the "Actual Status of Use of Advanced Safety Vehicles" conducted by National Consumer Affairs Center of Japan on 2,000 people who had purchased and used advanced safety vehicles, about 20% of survey respondents of the 2000 people reported that they experienced unexpected events, and 20% of them said that they had suffered physical damage. In addition, while about 80% of the surveyed people responded that they "understood" or "understood well" that "the advanced safety devices currently in practical use are not fully automated driving devices and drivers have to drive safely the vehicles not relying too much on their functions," about 20% of them responded that they "heard about them, but did not understand," or "did not understand."

Advanced safety vehicles are expected to reduce traffic accidents. However, if driver use the functions of the devices without sufficient understanding and rely on them too much, there is a risk that the devices may function unexpectedly, or they may not work, resulting in an accident. Under the circumstances, it is important not only to give advice to consumers about that "the functions of advanced safety vehicles are limited," "drives must drive safely without relying too much on them," etc., but also to instruct automobile manufacturing and sales industries to "give consumers clear and well understanding explanation" and "acquaint consumers thoroughly with matters that require attention regarding advanced safety devices."

(Prepared by the Cabinet Office based on the press release materials of National Consumer Affairs Center of Japan dated January 18, 2018.)

2. Status of Rescue and Emergency Activities at the Time of a Traffic Accident

(1) From the occurrence of a traffic accident to transportation to hospital

When people are injured in a traffic accident, usually, notification about the place of the accident and status thereof is given by the proper people involved in the accident (including occupants, witnesses, etc.) to a fire department, and a rescue team etc. is dispatched to the scene of the accident from the notified fire department. A hospital is selected in view of the first-aid treatment provided by the rescue team arriving at the accident site and degree of injuries, and injured people are transported to the hospital for emergency treatment by ambulance, helicopter ambulance, etc.

(2) Status of emergency transportation etc. in connection with traffic accidents

A. Emergency rescue status in connection with traffic accidents

The number of emergency ambulance dispatch in 2016 was 6,209,964 times and a total of 5,621,218 people were transported, and of which, the number of emergency ambulance dispatch and people transported due to traffic accidents were 488,861 (7.9%) and 477,689 (8.5%), respectively (Feature article – Table 1)

B. Required time from arriving to the site to transporting to hospital

The average time required for ambulance to arrive at the site after receiving request was 8.5 minutes as a whole in 2016, whereas it was 9.2 minutes in traffic accidents, and if we look at the details, the percentage of the number of cases in which 10 minutes or more were required is more numerous than in other types of emergency (Feature article - Table 2).

In addition, the time required for ambulance to arrive at hospital after receiving rescue request was 39.3 minutes as a whole, whereas it was 40.6 minutes in traffic accidents, and if we look at the details, the percentage of the number of people in which 30 minutes or more were required is second to common injuries (Feature article - Table 3).

C. Need for quick response

It is known that the survival rate of a person seriously injured in a traffic accident declines with time before he/she is treated by doctor, and thus, an injured person needs to be treated by doctor as soon as possible. Therefore, if a traffic accident has occurred, it is important that notification about the place of the accident and status thereof is correctly given by the proper people involved in the accident, etc. to a fire department (by calling 119).

In addition, in the case where a person suffers a serious life-threatening injury alone or in midnight time zone in a traffic accident, there are cases in which the proper person involved in the accident is unable to give notification. Therefore, a technological innovation which may contribute to rapid notification is highly expected due to its importance.

u Feature article / Table 1 Changes in the numbers of emergency dispatch of ambulances and transported people

Category / year	Number of emergency dispatch			People transported in emergency		
	Total dispatches			Total people transported		
		Number due to traffic accidents	Ratio to total dispatches		Number of people due to traffic accidents	Ratio to total people transported
	Case	Case	%	Persons	Persons	%
2012	5,802,455	543,218	9.4	5,250,302	539,809	10.3
2013	5,915,683	536,807	9.1	5,346,087	529,544	9.9
2014	5,984,921	518,372	8.7	5,405,917	508,013	9.4
2015	6,054,815	501,321	8.3	5,478,370	490,797	9.0
2016	6,209,964	488,861	7.9	5,621,218	476,689	8.5

Note: Based on data from the Fire and Disaster Management Agency of Ministry of Internal Affairs and Communications

u Feature article / Table 2 Average time required for arriving at the site (2016 : cases)
By accident type

By type of accident \ Time required for arriving at the site		Less than 3 min.	Less than 3 min., more than 3 min., less than 5 min.	Between 5 and 10 min.	Between 10 and 20 min.	More than 20 min.	Total	Average (min.)
Number of cases		79,574 (1.3)	467,980 (7.5)	3,778,131 (60.8)	1,768,940 (28.5)	115,339 (1.9)	6,209,964 (100)	8.5
	Sudden illness	44,417 (1.1)	269,790 (6.8)	2,463,003 (62.0)	1,139,735 (28.7)	57,435 (1.5)	3,975,380 (100)	8.5
	Traffic accidents	6,037 (1.2)	33,789 (6.9)	279,297 (57.1)	150,705 (30.8)	19,033 (3.9)	488,861 (100)	9.2
	General injuries	11,086 (1.2)	63,393 (6.8)	555,965 (60.0)	277,227 (29.9)	18,685 (2.0)	926,356 (100)	8.7
	Others	18,034 (2.2)	101,008 (12.3)	479,866 (58.6)	201,273 (24.6)	19,186 (2.3)	819,367 (100)	8.2

More time is required in the case of traffic accidents than the average.

Note:
1. Based on data from the Fire and Disaster Management Agency of Ministry of Internal Affairs and Communications
2. The number between brackets is the component rate.
3. There are cases where the total of the ratio and composition rate is not 100% due to rounding of figures

u Feature article / Table 3 Average time required for arriving at the site (2016 : cases)
By accident type

By type of accident \ Time required for transporting to hospital		Less than 10 min.	Between 10 and 20 min.	Between 20 and 30 min.	Between 30 and 60 min.	Between 60 and 120 min.	More than 120 min.	Total	Average (min.)
Number of transported people		1,361 (0.0)	187,105 (3.3)	1,422,948 (25.3)	3,473,367 (61.8)	515,436 (9.2)	21,001 (0.4)	5,621,218 (100)	39.3
	Sudden illness	524 (0.0)	102,881 (2.9)	917,106 (25.4)	2,279,667 (63.2)	297,070 (8.2)	10,694 (0.3)	3,607,942 (100)	38.9
	Traffic accidents	76 (0.0)	13,379 (2.8)	111,147 (23.3)	298,506 (62.6)	51,599 (10.8)	1,982 (0.4)	476,689 (100)	40.6
	General injuries	165 (0.0)	22,225 (2.6)	190,322 (22.4)	537,262 (63.4)	94,017 (11.1)	3,880 (0.5)	847,871 (100)	41.0
	Others	596 (0.1)	48,620 (7.1)	204,373 (29.7)	357,932 (52.0)	72,750 (10.6)	4,445 (0.6)	688,716 (100)	38.6

More time is required in the case of traffic accidents than the average.

Note:
1. Based on data from the Fire and Disaster Management Agency of Ministry of Internal Affairs and Communications
2. The number between brackets is the component rate.
3. There are cases where the total of the ratio and composition rate is not 100% due to rounding of figures

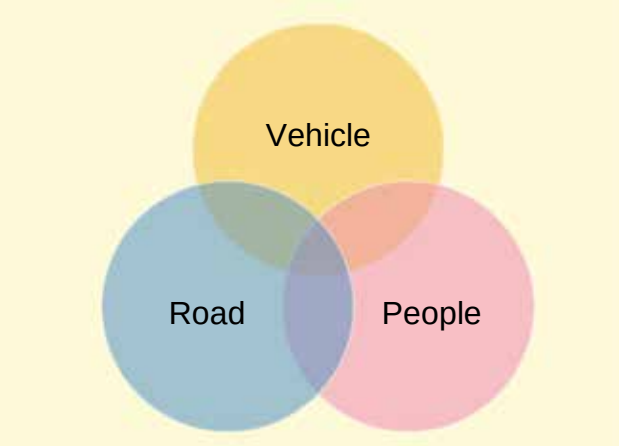
3. Need for advanced technology

In order to achieve the goal of the 10th Fundamental Traffic Safety Program which consists in "reducing the number of fatalities within 24 hours of hospitalization to 2,500 people or less and realizing the safest road traffic in the world by 2020" in light of the occurrence status of road traffic accidents in recent years, it is important to create an environment where accidents are unlikely to occur and it is necessary not only to further enhance the measures so far implemented, but also to strongly promote the diffusion and use of advanced technologies contributing to traffic safety and research and development.

There is a wide range of advanced technologies related to road traffic safety, mainly consisting of three technologies; technology related to "Vehicle," technology related to "Road" and technology related

to “People” such as drivers and pedestrians. A technology involved in a plurality of them is also conceivable (Feature article – Chart 7: Image of advanced technologies).
In addition, to implement effective measures for each type of traffic accidents, it is necessary to develop technologies in accordance with accident types, that is, person to vehicle accidents, vehicle to vehicle accidents, single vehicle accidents, etc.
Both technologies that contribute to the prevention of accidents (example: constant speed traveling control system and inter-vehicle distance control system) and a technology to reduce damage in the event of an accident (example: airbag, Fast Emergency Vehicle Preemption Systems, etc.) are important. Towards realizing the safest road traffic in the world, we must understand the characteristics of each technology correctly and grasp changes in population structure and social economy as well as expectation for technology and changes in needs accurately in order to promote the development and diffusion of diverse advanced technologies.

u Feature article / Chart 7 Image of advanced technologies



II Efforts on Advanced Technologies by both Public and Private Sectors

In the following, we describe the status of efforts focused on five topics: “Initiatives related to automated driving” which has seen remarkable development in recent years, “System to support safe driving including component technologies for realizing automated driving” as efforts mainly involved in vehicles, “Policies related to Intelligent Transport Systems (ITS)” mainly involved in roads, “Measures for community roads utilizing big data” and “efforts for upgrading emergency report system” to contribute to reducing damage in an event of an accident, among efforts relating to advanced technologies that contribute to a wide range of traffic safety (Feature article - Table 4).

u Feature article / Table 4 Efforts on advanced technologies contributing to traffic safety covered in the Feature Articles of the White Paper

1 Efforts relating to the whole – Automated driving technologies	
	l Public-Private ITS Initiative / Roadmap 2017 l Strategic innovation creation program (SIP): Automatic Traveling System l System development for automated driving
2 Technologies and efforts related to vehicles – Safe driving support system	
	l Advanced safety vehicle (ASV) promotion project l Diffusion of safe driving support vehicles (diffusion and dissemination, formulation of technical standards, car assessment)
3 Technologies and efforts related to infrastructure - Intelligent Transport Systems (ITS)	
	l Sophistication of traffic control systems l Diffusion of ETC 2.0
4 Measures for community roads utilizing big data	
	l Utilization of probe information of ETC 2.0
5 Systems for rescue and first-aid activities	
	l Sophistication of emergency report system

1. Initiatives on automatic driving

(1) Public-Private ITS Initiative / Roadmap 2017

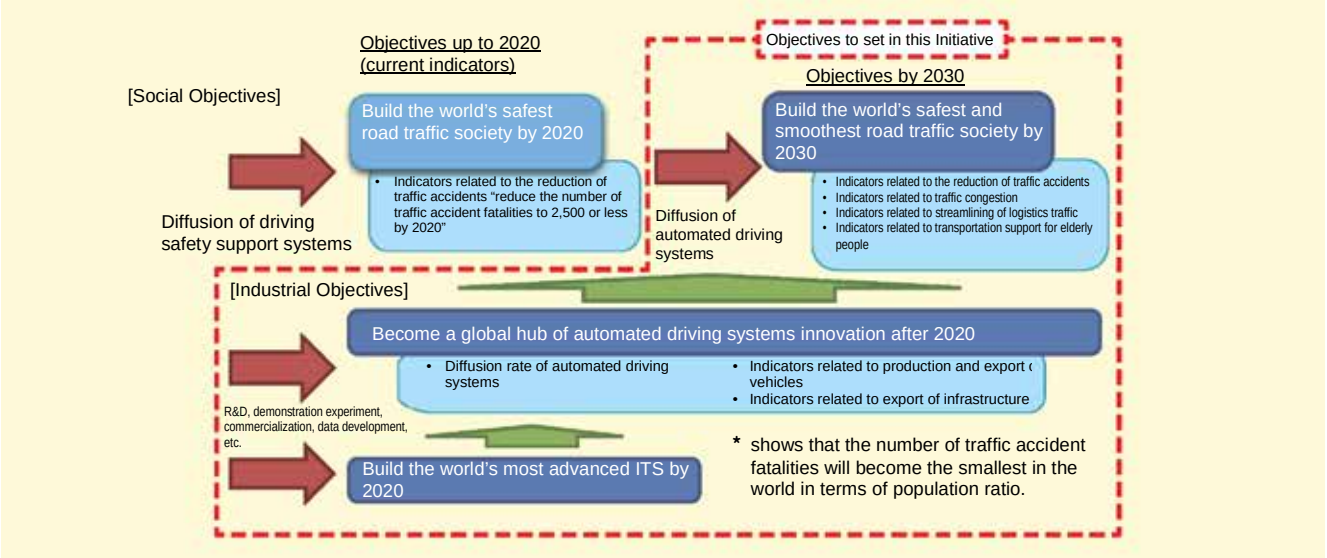
The Public-Private ITS Initiative / Roadmap (hereinafter referred to as the “Roadmap”) is a national strategy document showing our public-private policy on ITS (Intelligent Transport Systems) and automated driving which was decided by the Strategic Headquarters for the Promotion of an Advanced Information and Telecommunications Network Society (IT Strategic Headquarters). This Roadmap was formulated for the first time in 2014. Due to a remarkable development of industry and technologies in this field, it is revised every year in light of the latest situation, the “Public-Private ITS Initiative / Roadmap 2017” is the latest version formulated in May, 2017.

This Roadmap aims consistently to “build and maintain the world’s best ITS and contribute to Japan and the world” and sets the goal of “building the world’s safest and smoothest road traffic society by 2030,” as seen in [Feature article - Chart 8]. In addition, it shows the direction of efforts to be made by private sector and relevant ministries and agencies together and the specific schedule thereof.

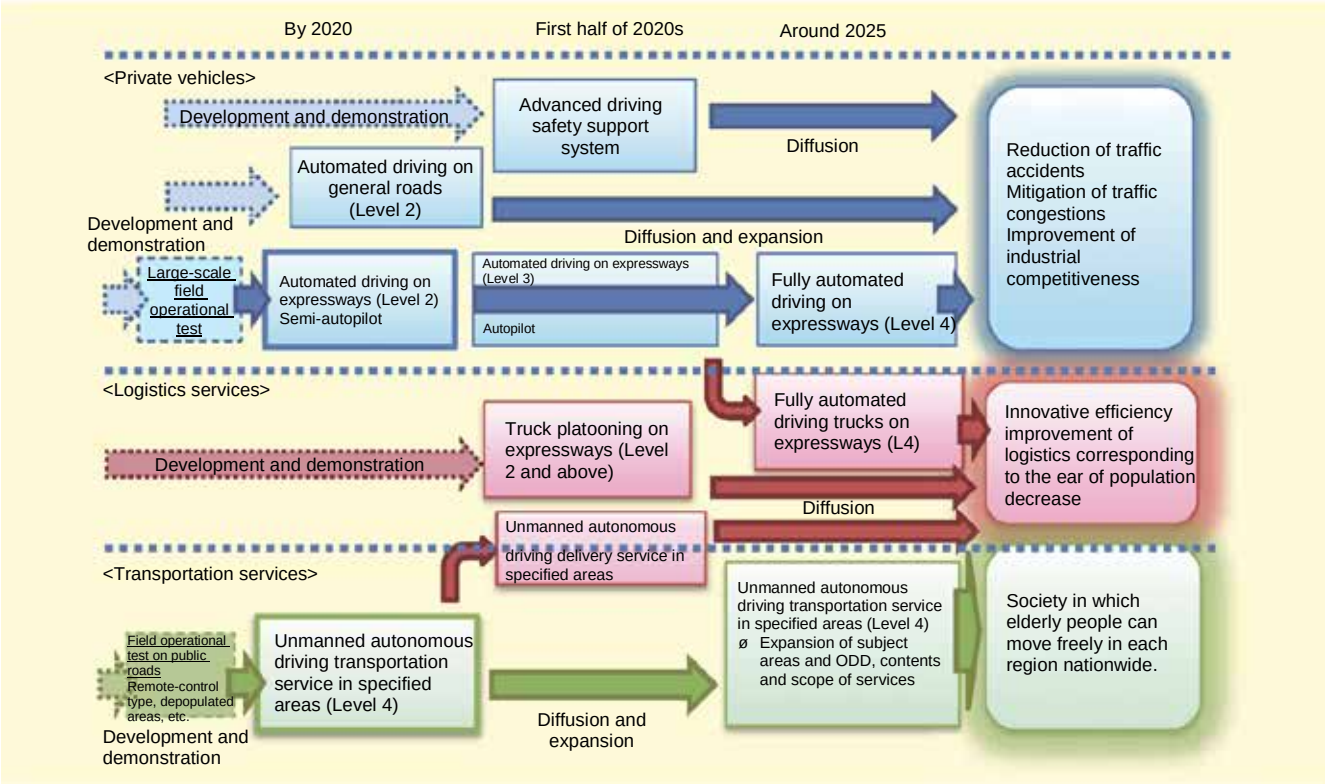
In particular, considering that it is an urgent issue to reduce accidents, secure transportation means for the elderly, etc. in regions such as under-populated areas, respond to driver shortage, etc., we do not only show the roadmap (an image) to aim at the realization of automated driving system (Feature article – Chart 9), but also clarify the specific schedule for the following three items.

- Realization of further sophistication of automated driving systems for private vehicles
- , Realization of innovative and efficient logistics services to address the lack of driver etc.
- ƒ Realization of unmanned autonomous driving transport services for rural areas and elderly people

u Feature article / Chart 8 Society aimed at and performance indicators of important targets



u Feature article / Chart 9 Roadmap overview (image)



In addition, in view of the definition of the automated driving levels (Japan has adopted the definition described in J3016 by the US SAE[2] International (see Feature article – Table 5), we have established the timing expected for commercialization and provision of service for the above items as in [Feature article – Table 6].

2 SAE: Society of Automotive Engineers

u Feature article / Table 5 Overview of the definition of automated driving levels

Level	Overview	Monitoring body for safe driving
Driver performs part or all of the dynamic driving tasks		
SAE level 0 No Driving Automation	• The driver performs the entire dynamic driving tasks	Driver
SAE level 1 Driver Assistance	• The system performs subtasks of the dynamic driving tasks related to either longitudinal or lateral vehicle control	Driver
SAE level 2 Partial Driving Automation	• The system performs subtasks of the dynamic driving tasks related to both longitudinal or lateral vehicle control	Driver
The automated driving systems perform the whole of driving tasks		
SAE level 3 Conditional Driving Automation	• The system performs the entire dynamic driving tasks (within operational design domainsø). • Fallback ready user is expected to respond appropriately when the system requests to intervene.	System (Fallback-ready user becomes the driver during fallback)
SAE level 4 High Driving Automation	• The system performs the entire dynamic driving tasks (within operational design domainsø). • The user is not expected to respond when the system is found unable to continue operating.	System
SAE level 5 Full Driving Automation	• The system performs the entire dynamic driving tasks (not within operational design domainsø). • The user is not expected to respond when the system is found unable to continue operating.	System

ø "Domains" here are not limited to geographical domains, but include conditions related to environment, traffic situation, speed, time, etc.

u Feature article / Table 6 Expecting timing of the commercialization of automated driving systems and start of services

	Level	Technologies expected to be realized (Ex.)	Expected timing of commercialization, etc.)
Private automobiles	Level 2	"Semi-autopilot"	By 2020
	Level 3	"Autopilot"	Around 2020
	Level 4	Fully automated driving on expressways	Around 2025
Logistics services	Level 2 and above	Truck platooning on expressways	After 2022 onwards
	Level 4	Fully automated driving trucks on expressways	After 2025 onwards
Transportation services	Level 4	Unmanned autonomous driving transportation service in specified areas	By 2020

ø1. Semi-autopilot:
A system equipped with an automated driving mode function on expressways (from the entrance ramp way to the exit ramp way, merging, lane change, keeping lane and inter-vehicle distance, branching, etc.) During the automated driving mode, the driver is charge of monitoring and action for safe driving, while the system informs the driver of the travelling conditions, etc.

ø2. Autopilot:
A system equipped with automated driving mode function under specific conditions such as on expressways. During the automated driving mode, the system performs the entire dynamic driving tasks, while the driver responds to requests from the system.

The industry and technologies related to the ITS and automated driving is rapidly developing after the formulation of the Public-Private ITS Initiative / Roadmap 2017[3], we are currently reviewing possible revision of the roadmap with the aim to play a central role in the innovation relating to the building the most advanced ITS and automated driving in the world.

(2) "Automatic Traveling System" in the strategic innovation creation program (SIP)

The Council for Science and Technology (currently "Council for Science, Technology and Innovation") selected the automatic traveling system as one of ten issues (currently 11 issues) of the Strategic Innovation Creation Program (hereinafter referred to as the "SIP") which is an initiative to tackle issues which are socially indispensable and important for Japanese economy and industrial competitiveness.

A program director (PD) that exercises strong leadership has been appointed to promote efforts for each issue, perform efforts through interdisciplinary approach and carry out research and development in a consistent manner from basic research to translation thereof into practical and business use.

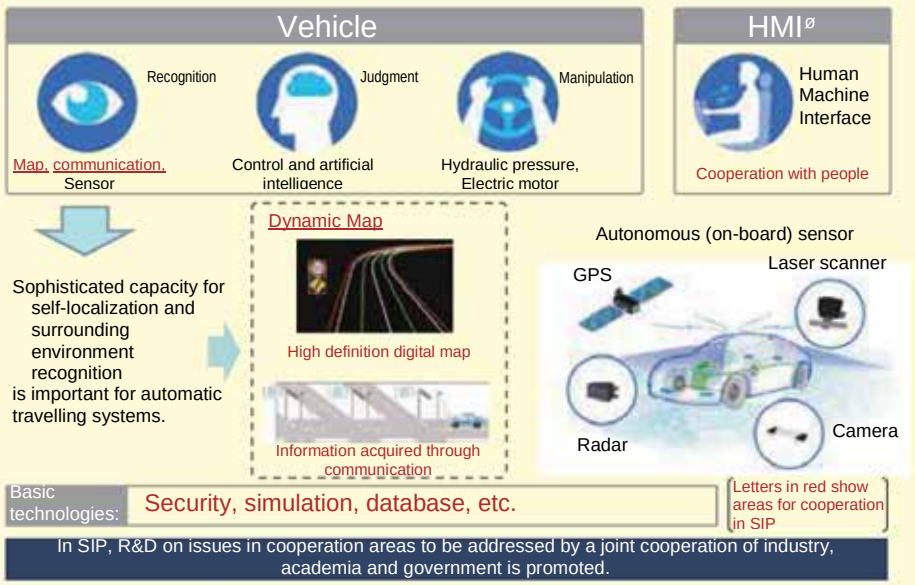
3 Data on the "Public-Private ITS Initiative / Roadmap 2017" is listed on the website below.
http://www.kantei.go.jp/jp/singi/it2/kettei/pdf/20170530/roadmap.pdf

R&D focused on areas of cooperation by industry, academia and government has been in progress in the field of automatic travelling system since FY2014 as part of a five year program with three main goals of:

- Ÿ Secure safety and reduce congestion in road traffic
- Ÿ Realize and diffuse automatic traveling system
- Ÿ Realize an advanced public bus system friendly to elderly and mobility-handicapped people

From FY2016, R&D is in progress focused on five technical areas (five important issues) of “Dynamic Map,” “HMI,” “Information Security,” “Pedestrian Accident Reduction” and “Next-generation Urban Traffic” (Feature article - Chart 10).

u Feature article / Chart 10 Areas for cooperation in SIP



In addition, we are promoting efforts to hold “SIP-adus[4] Workshop,” an international conference to share issues related to automatic traveling system and discuss efforts towards a solution thereof with experts leading the research theme internationally, and efforts to foster social receptivity, such as “citizen dialogue” aimed to reflect the problem awareness and future needs through dialogue with citizens on research and development in the future.

In FY2017, we entered a period of completing the outcome of the past R&D steadily to translate into practical use and commercialization and started demonstration experiments.

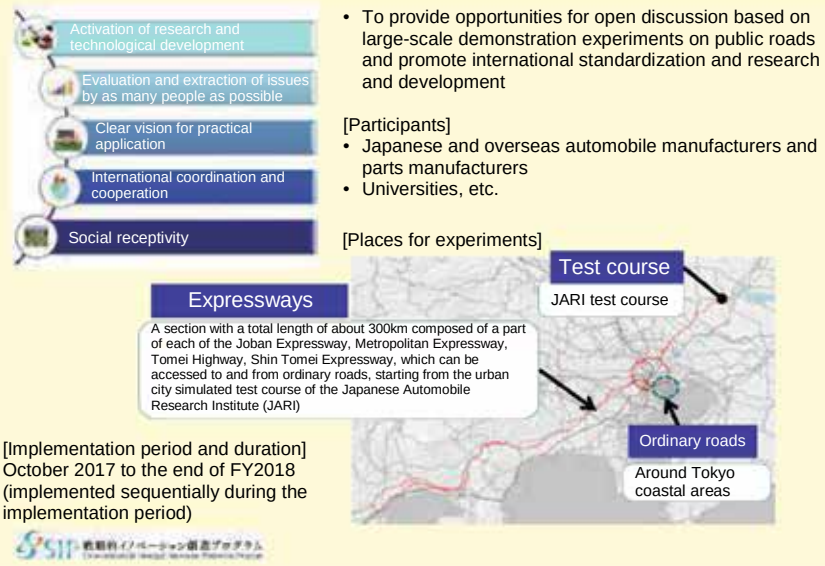
A. large-scale demonstration experiments

In October 2017, large-scale demonstration experiments involving more than 20 institutions including automobile manufacturers of both Japan and overseas were sequentially started in the Tomei Expressway, Shin Tomei Expressway, Metropolitan Expressway and Joban Expressway as well as ordinary roads in the Tokyo coastal areas.

The large-scale demonstration experiments are aimed to allow many people to evaluate the outcomes focused on the five important issues subject to the research and development with a view to promoting international coordination and international standardization with the participation of overseas manufacturers (Feature article - Chart 11).

4 SIP-adus: SIP- Innovation of Automated Driving for Universal Services

u Feature article / Chart 11 Overview of large-scale demonstration experiments



B. Expansion to rural areas

To promote implementation conforming to social issues in rural areas, we carried out the following demonstration experiments in FY2017.

a) Demonstration experiment on automatic bus driving in Okinawa

The Cabinet Office conducted demonstration experiments[5] on bus automated driving in Okinawa in March, June to July and November to December, 2017. We have proposed a new public bus system which can be used easily by the elderly and persons with disabilities alike by utilizing automatic traveling technology such as the Precise Docking Control System to stop a bus precisely at a bus stop and are conducting efforts to secure transportation means in the region and eliminate road congestion (Feature article - Chart 12).

u Feature article / Chart 12 Demonstration experiment on automatic bus driving in Okinawa

	Nanjo City, Okinawa	Ishigaki City, Okinawa	Ginowan City and Kitanakagusukuson, Okinawa
Implementation period	March 2017	June - July 2017	November - December 2017
Place	Around the “Azama Sun Sun Beach” ¡ Public roads (with a low traffic volume) ¡ Round trip route of about 2km	Ferry terminal Û New Ishigaki Airport ¡ Public roads ¡ Round trip route of about 32km ¡ On-time operation on the actual bus on a regular route	Aeon Mall Okinawa RyCom Û Ginowan Marina ¡ Arterial road in the urban area with a high volume of traffic ¡ Round trip route of about 20km
Objective	Technology demonstration Evaluation of automated driving performance and verification of system operations	Social demonstration Effort in which general public monitors including participants of the day participate in the experiment as a first trial in Japan	Technology demonstration Verification of the possibility and technical issues of automated driving of bus in an actual traffic environment with a relatively high traffic volume in the urban part of the main island of Okinawa



5 Press release of demonstration experiments of automated driving of bus in Okinawa (October 27, 2017)
http://www8.cao.go.jp/cstp/stmain/20171027artokinawa.html

b) Demonstration Experiments of Automated Driving Services based at Michi-no-Eki in Rural Areas

With the aging population in rural areas, it is becoming an urgent issue to provide a means of transportation for people and goods in everyday life. Meanwhile, most of the 1,134 Michi-no-eki across Japan are in rural areas, and are integrating services necessary for life, including retail, clinics, and administrative counters.

The Ministry of Land, Infrastructure, Transport and Tourism started demonstration experiments on autonomous-driving service centered based at Michi-no-eki roadside stations in rural areas in 13 places across the country in FY2017. The demonstration included various experiments, such as delivery of agricultural products and processed goods by automated driving vehicles which were shared by passengers and cargo, and transportation of agricultural products collected using automated driving vehicles to other areas via highway busses, which should provide an opportunity of considering a business model that is unique to the local area. We are planning to start a long-term experiment to build a business model in light of these results in FY2018 (Feature article – Chart 13).

(3) System development for automated driving

With the progress of automated driving technologies in recent years, its commercialization and start of service provision in 2020 are coming into sight. In the circumstances, in order to realize the practical application of automated driving at an early stage, it is indispensable for the public and private sectors to further accelerate efforts together towards its realization. To that end, in order to promote technological development and review the legal system related to road traffic as necessary, the Strategic Headquarters for the Promotion of an Advanced Information and Telecommunications Network Society and Strategic Council for Promotion of Public and Private Sector Data Utilization decided the “Outline for Development of Automated driving systems.”

In the Outline, a legal system will be reviewed for the so-called “transition period” between 2020 and 2025 which is an initial introduction stage of vehicles equipped with automated driving system (hereinafter referred to as “automated driving vehicles”) in which automated driving vehicles and conventional non-automated driving vehicles (hereinafter referred to as “general vehicles”) coexist on public roads with a lower proportion of the former.

A. Securing safety in an integrated manner

To guarantee safety, it is necessary that three elements of “People,” “Vehicle” and “Driving Environment” are at a certain level as a whole. It is understood by “People” the cognitive capacity and capacity for action of people driving vehicles, by “Vehicle” characteristics, structure and functions thereof, and by “Driving Environment” the rules for travel, road and communication conditions on travelling routes and natural conditions.

With progress in automated driving technologies, it is expected that safety will be increased by the fact that part of human operation is replaced by vehicle. However, since it is difficult to guarantee safety of vehicles alone in face of complicated traffic environment around 2020 in which automated driving will be introduced, it will be necessary to guarantee safety by also establishing traveling environment conditions for automated driving (Feature article – Chart 14).

When automated driving technologies are put into practical use, the levels of safety are expected to be superior to those required for, and along with progress in automated driving technologies, safety will be further enhanced in the future. Through the practical application of automated driving technologies, the safety so far ensured by people will be replaced and ensured by both vehicles and the travelling environment conditions for automated driving. However, as the percentage of safety ensured on the vehicle side is increased with progress in automated driving technologies, the percentage of safety ensured by the travelling environment conditions for automated driving is expected to be decreased. In addition, the safety levels of travelling environment for general vehicles are also expected to be enhanced due to the development of road traffic environment as a whole.

Regarding the safety of automated driving vehicles, we will review the safety levels of new technologies in accordance with progress thereof and establish the travelling environment conditions for automated driving by developing patterns for environment and conditions in areas where automated driving is introduced in order to check their safety.

However, the driving environment conditions for automated driving will not be uniform for the time being. We will ensure safety by considering regional characteristics and checking conditions for each case in cooperation with relevant ministries and agencies and respond elastically to technological progress, and will build a mechanism to ensure safety in an integrated manner by establishing safety standards and driving environment condition (operation and travelling environment) (Feature article - Chart 15).

u Feature article / Chart 13 Demonstration experiments of automated driving services in rural areas

Verification of “Road and Traffic”

Smooth traffic of both general vehicles and automated driving vehicle

Automatic traveling during snowfall

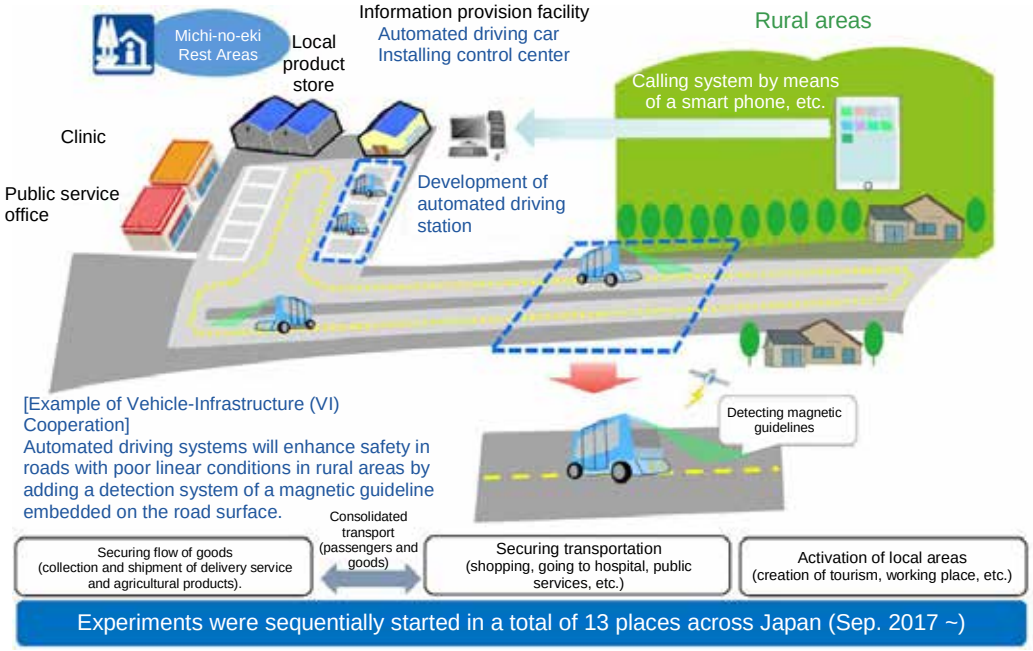
Verification of “social receptivity” (Reliance on automated driving technologies, ride quality, etc.)

Getting on and off of wheelchair user

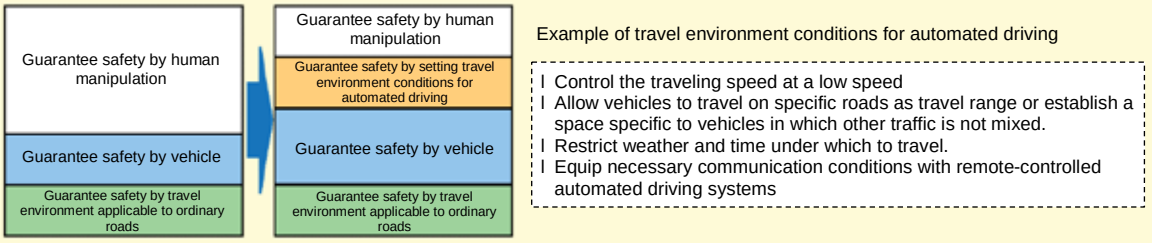
Verification of “effects on local areas”

Shipment of agricultural products from rural areas to Michi-no-eki

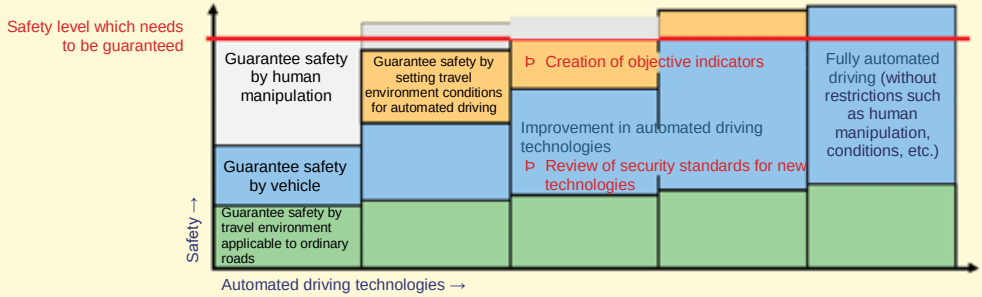
l Implementation of a social experiment of automated driving service through Vehicle-Infrastructure (VI) Cooperation based on “Michi-no-eki roadside stations” in rural areas where population is aging is in progress in order to secure flow of people and goods.



u Feature article / Chart 14 Way to guarantee safety by setting travel environment conditions for automated driving



u Feature article / Chart 15 Image of stepwise approach for practical application of automated driving



B. How to ensure safety of automated driving vehicles
We will continue to lead international discussions on the formulation of safety standards in order to spread the world's most advanced automobile technology of Japan to the world.
In parallel with this, we will develop the following systems in Japan.
- We will formulate safety requirements that must be satisfied by automated driving vehicles as guidelines around the summer of 2018 (example: safety of control systems, cyber security, etc.)
, We will formulate security standards for automated driving vehicles step by step in light of trends in technology development and international discussions.
ƒ We will review how to secure safety of vehicles in current usage.
„ We will review requirements for vehicles travelling in row (vehicle technology)

C. Review of traffic rules
We will continue to exercise leadership in cooperation with the relevant countries on discussions at the Convention on Road Traffic (Geneva Convention). In parallel with international discussions, we will study revision of domestic legal systems in view of international discussions and progress of technology development of automated driving.
- We will study necessary measures to ensure that automated driving systems comply with the road traffic laws and regulations
, We will allow the practical application of Unmanned Autonomous Driving Transport Services in restricted area to be accommodated in the current framework for demonstration experiments of the remote-controlled automated driving system for the time being.
ƒ We will review requirements for platooning of vehicles (traffic rules)

D. Liability-related matters
We will establish a framework for ensuring people to be rescued rapidly in the event of an accident. In addition, we will clarify liability-related matters and investigate the cause of the accident. We will also study data acquisition, storage and utilization for the purpose.
- We will maintain the current liability of automobile operator for damages caused during the use of automated driving system in the Automobile Accident Compensation Security Act.
, Accident damages caused by hacking will be covered by government guarantee in the Automobile Accident Compensation Security Act, except the case where the vehicle owner etc. has failed to take necessary security measures.
ƒ In judging criminal responsibility, we will clarify roles and obligations of various persons and entities concerned through traffic rules, and laws and regulations related to transportation before the commercialization of automated driving vehicles.

„ We will study whether it is necessary to oblige the installation of a data recording device and whether it is necessary oblige to the information holder to submit data recoding functions and records of accident.

E. Relationship with the legal system related to transportation business
We will study necessary measures to ensure transportation safety and passenger convenience when passengers are transported in an automated driving car without a driver in the car.

F. Others
We will study matters required for infrastructure such as the Cooperative Vehicle-Highway Systems and explanation to consumers.

2. Efforts utilizing Safe Driving Support System

(1) Safe driving support system technology

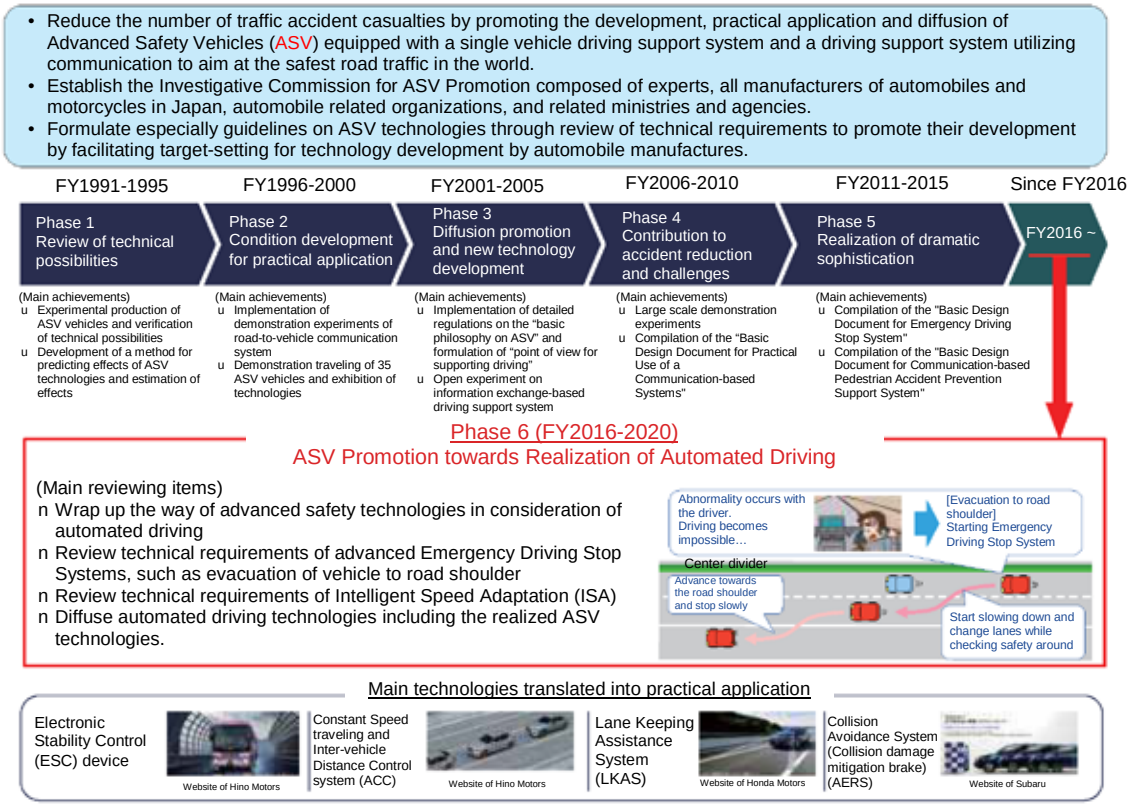
A. Project to promote Advancement Safety Vehicle (ASV)

"Advanced Safety Vehicle" (hereinafter referred to as the "ASV") is a vehicle equipped with a system to contribute to safe driving of drivers, such as driving support systems mounted on vehicles through the use of driving support system communication as advanced technology.

The Ministry of Land, Infrastructure, Transport and Tourism has been engaged in a project "Advanced Safety Vehicle (ASV) Promotion Project" (hereinafter referred to as the "ASV Promotion Project") since FY1991 which is aimed to reduce the number of casualties due to traffic accidents and realize the safest road traffic in the work through development, practical application and diffusion of ASV. In the ASV Promotion Project, we have established the Investigative Commission for ASV Promotion composed of experts, all manufacturers of automobiles and motorcycles in Japan, automobile parts manufacturers, automobile related organizations, and related ministries and agencies, in which we formulate guidelines wrapping up technical requirements of advanced safety technologies and study measures for diffusion of ASV.

In the 6th ASV Promotion Project which started in FY2016, we have included study of automated driving and are engaged in various activities, including • wrapping up the way of advance safety technologies for automated driving, , reviewing of technical requirements for Emergency Driving Stop System (evacuation of a vehicle to road shoulder), ƒ reviewing of technical requirements for Intelligent Speed Adaptation (ISA[6]), „ diffusion of automated driving technologies including the realized ASV technologies, etc., with "ASV promotion towards realizing automated driving" as the theme. (Feature article - Chart 16).

u Feature article / Chart 16 Project to promote Advancement Safety Vehicle (ASV)



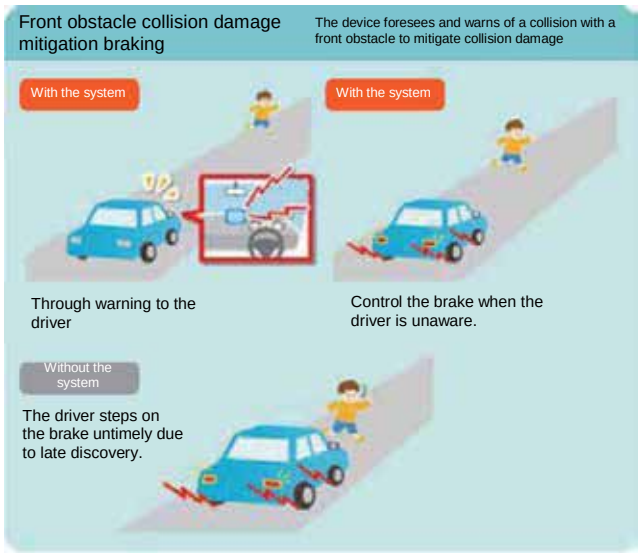
6 ISA: ISA is an device designed to automatically control speed in accordance with the speed limit by road

B. Representative ASV technologies translated into practical application

Many ASV technologies have been translated into practical application. Here, we will briefly describe the "Collision Avoidance System," "Unintended Acceleration Prevention System," "Constant Speed traveling and Inter-vehicle Distance Control system," "Lane Keeping Assistance System," and "Emergency Driving Stop System."

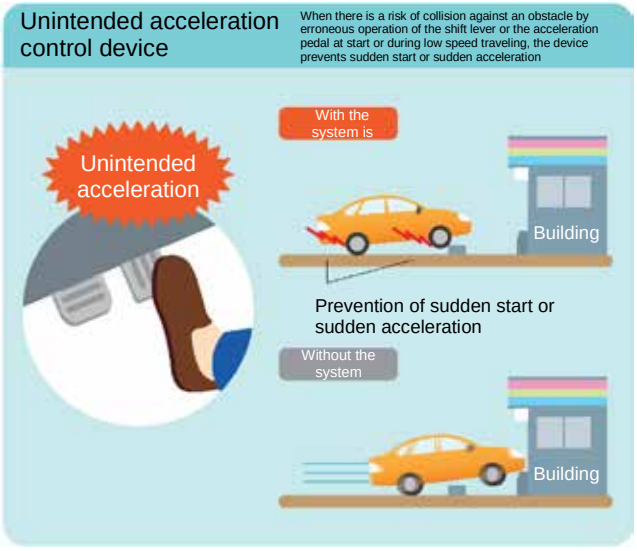
a) Collision Avoidance System (Collision damage mitigation brake)

The Collision Avoidance System is a system designed to warn by foreseeing a collision with a front obstacle and perform brake control to reduce collision damage. The system mounted on a vehicle, in a situation where a collision is foreseen with an obstacle in front, warns the driver with an alert to urge him/her to operate on his/her own, or brakes automatically if the driver is unaware of the warning. This system helps prevent a collision with a front obstacle. The adoption rate of the system in new passenger cars was 66.2% in 2016.



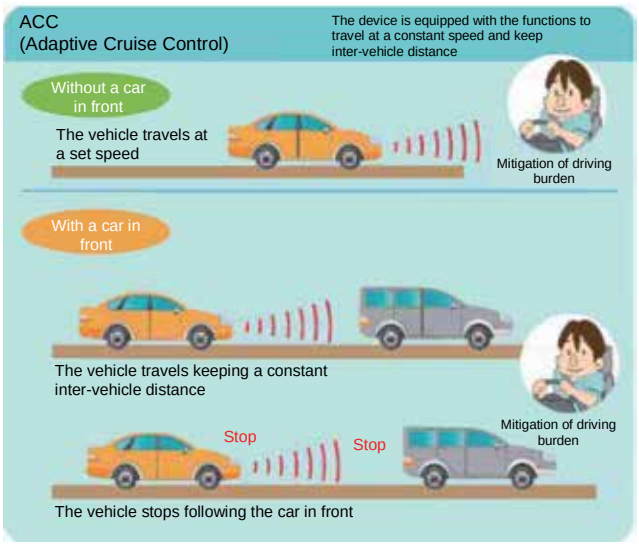
b) Unintended Acceleration Prevention System

The Unintended Acceleration Prevention System is a system designed to prevent sudden start or sudden acceleration when there is a possibility of a collision with an obstacle at the time of starting or when traveling at low speed due to an erroneous operation of the shift lever or a wrong step on the acceleration pedal. The adoption rate of the system in new passenger cars was 47.1% in 2016.



c) Constant Speed traveling and Inter-vehicle Distance Control system

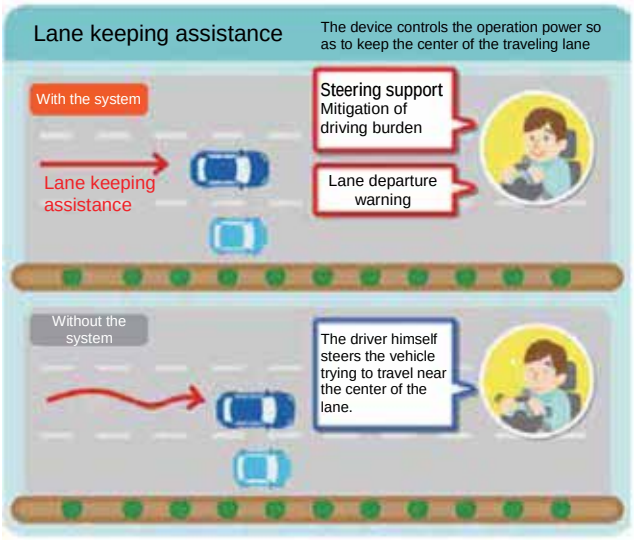
The Constant Speed traveling and Inter-vehicle Distance Control system is a system designed to control traveling at a constant speed and control inter-vehicle distance. It has the function to allow the car to travel at a set speed when there is no car in front and when there is a car in front, to travel keeping a constant inter-vehicle distance or to stop following the preceding vehicle where there is a car in front. The adoption rate of the system in new passenger cars was 12.2% in 2016.



d) Lane Keeping Assistance System

The Lane Keeping Assistance System is a system designed to help drivers maintain the vicinity of the center of the traveling lane. When the vehicle departs from the traveling lane, the system sounds a warning alarm or operates the steering itself so that the vehicles

travels in the vicinity of the center of the traveling lane to relieve the burden of the driver. The adoption rate of the system in new passenger cars was 13.7% in 2016.



e) Emergency Driving Stop System

Emergency Driving Stop System is a system designed to automatically detect abnormality of the driver and stop the vehicle in place of the driver as an emergency measure, when the he/she is found unable to continue driving due to a sudden change in physical condition, or by pushing the emergency stop button on the part a crew or a passenger.

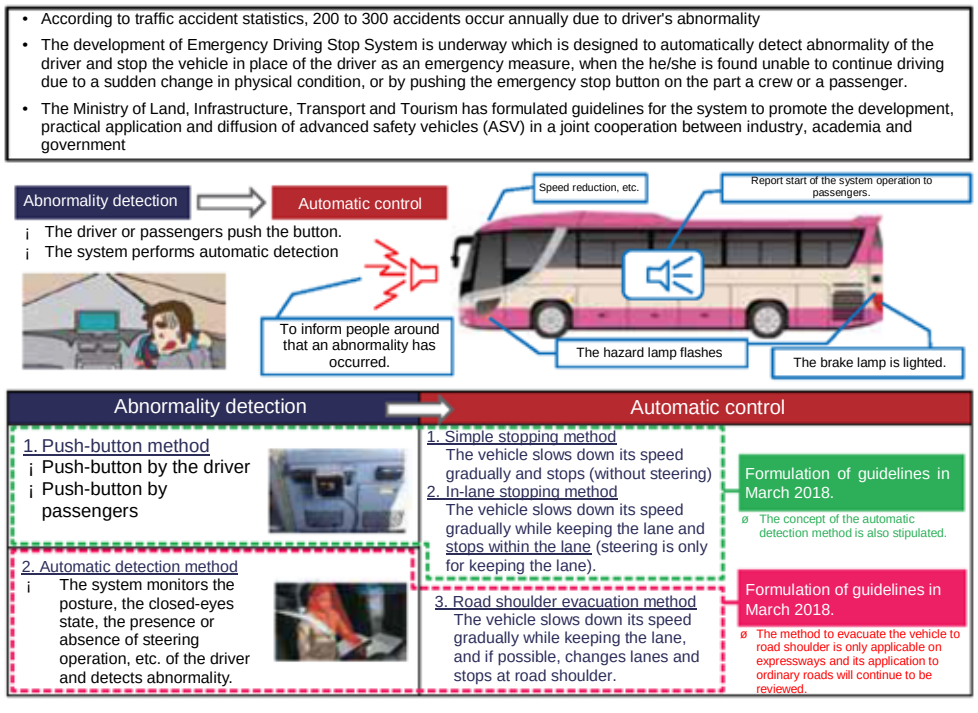
Considering that 200 to 300 accidents causing injury or death occur every year due to abnormality of the driver, the system is expected to prevent these accidents.

(2) Safety Driving Support Vehicle

A. Safety Driving Support Vehicle and efforts to diffuse and disseminate them

To prevent accidents of elderly drivers, the Ministry of Economy, Trade and Industry, the Ministry of Land, Infrastructure, Transport and Tourism, the Financial Services Agency and the National Police Agency jointly established the "Deputy-Ministers' Meeting of Relevant Ministries and Agencies on Diffusion and Dissemination of Safety Driving Support Vehicle" to intensively study measures to diffuse and disseminate vehicles equipped with advanced safety technologies including automatic brake and others in January, 2017, and wrapped up an "Interim Report" in March of the same year (Feature article - Chart 17).

In the Interim Report, vehicles equipped with automatic braking that contributes to preventing all drivers from meeting traffic accidents were defined as Safety Support Car (nicknamed as Sapocar) and vehicles equipped with Unintended Acceleration Prevention System that is expected to prevent accidents specific to the elderly and reduce damage were defined as "Safety Support Car S (nicknamed as Sapocar S) to intensively develop diffusion and dissemination activities in FY2017 and FY2018. In addition, the goal to increase the adoption rate of "automatic braking" in new passenger cars to over 90% by 2020 was set up.



u Feature article / Chart 17 **Overview of Interim Report wrapped up by the Deputy-Ministers' Meeting of Relevant Ministries and Agencies on Diffusion and Dissemination of "Safety Driving Support Vehicle"**

As a part of measures to promptly prevent traffic accidents of elderly drivers, in order to diffuse and disseminate "safety driving support vehicles", the Deputy-Ministers' Meeting of Relevant Ministries and Agencies on Diffusion and Dissemination of "Safety Driving Support Vehicle" was established under the traffic countermeasures headquarters (director: specially-appointed minister of the Cabinet Office).
[Members]: Deputy ministers of the Ministry of Economy, Trade and Industry, Ministry of Land, Infrastructure, Transport and Tourism, Cabinet Office (in charge of financial matters), and director of the National Police Agency
[Meetings held]: First meeting on Jan, 25, 2017, second meeting on Feb. 28, 2017, and third meeting on Mar. 22, 2017.


Example of automatic braking (from Nissan Motor HP)

Concept of "Safety Driving Support Vehicle" (ver. 1.0)

- o 70% of fatality accidents of drivers older than 75 years old are caused by frontal collision, person-to-vehicle accidents and rear-end collision. In addition, the number of fatality accidents due to unintended acceleration stands at a high level in comparison to that of drivers younger than 75 years old.
- o In light of the actual accident situation of elderly drivers, in order to diffuse and raise awareness of the efforts implemented since FY2017 in public-private partnership, we defined the concept of "Safety Driving Support Vehicle" (ver. 1.0) as follows:

Nickname: Safety Support Car S (nicknamed as Sapocar S) (for elderly drivers)	
Wide	Automatic braking (against pedestrians). Unintended acceleration prevention device*1 Lane departure warning*2 Advanced light *3
Basic +	Automatic braking (against vehicles). Unintended acceleration prevention device*1
Basic	*4 Low speed automatic braking (against vehicles). Unintended acceleration prevention device*1

Since automatic braking contributes to traffic accident prevention not only to elderly drivers, but also to all drivers, diffusion and raising awareness thereof to all drivers will be performed with the nickname of safety support cars for vehicles equipped with the device as a whole (abbreviated as Sapocar) (referred to later)

*1 Manual vehicles are excluded. *2 Lane keeping support device is also possible. *3 This refers to automatic switching type headlight, automatic anti-glare type headlight or variable light distribution type headlight. *4 This refers to operating speed range of 30 km/h or less.
*5 An expansion of devices on board "safe driving support vehicles" is assumed in the future, depending on the evolution of the technology and purposes.
*6 In addition to this, technologies effective for preventing accidents by elderly drivers can be added as functions for safe driving support vehicles at the discretion of each company for diffusion and dissemination.

Diffusion and raising of awareness in public-private partnership (FY2017 and FY2018 were established as intensive periods)

- Request for cooperation to relevant ministries and agencies, local governments, organizations and companies related to automobiles
- Active public relations activities through websites, distribution of enlightenment leaflets, etc.
- Expansion of experience opportunities at driving schools, car dealers, etc.
- Diffusion and raising awareness of elderly people and family members thereof

Expansion of car assessment and formulation of standards for advanced safety technologies

- Expansion of car assessment aimed to incorporate advanced safety technologies which are effective for prevention of accidents by elderly drivers
- To lead international standardization of advanced safety technologies which have been demonstrated to be effective for safety to a certain extent, and review formulating safety standards.
- To study the creation of a system whereby the government confirms that advanced safety technologies such as automatic braking is effective to a certain extent and publish the results thereof in response to a request by automobile manufacturers and others until the standards have been formulated.

Efforts by automobile manufacturers *7

- Improvement of performance of advanced safety technologies and expansion of installation on board
  - To install both automatic braking and unintended acceleration prevention systems as standard equipment or as options in all vehicles (new passenger cars by 2020.
- Awareness raising and provision of opportunities for a ride by car dealers etc.
- Sales and installation of alarm devices for retrofit installation (some manufacturers) *8

*7 From the "Program to prevent accidents of elderly drivers" submitted by eight domestic passenger car manufacturers
*8 We are studying creating a framework to evaluate and announce the effects and precautions on use of retrofit devices developed by manufacturers other than the 8 automobile manufacturers.

Introduction of ASV discount for voluntary auto insurance

- 9% discount on voluntary car insurance premium for vehicles equipped with automatic braking system (from January, 2018)

Setting the diffusion rate target of automatic braking system

- To achieve the diffusion rate of 90% or more of automatic braking system on new passenger cars by 2020

Points for discussion for further diffusion promotion

- We will continue to examine what kind of measures are effective for further diffusion of vehicles with excellent safety performance.
- In addition, since advanced safety technologies such as automatic braking contribute to prevention of traffic accidents and damage mitigation not only of elderly people, but also of all drivers, we will engage in diffusion and raising awareness of vehicles equipped with automatic braking system as a whole ("Safety Support Car (abbreviated as Sapocar) in public and private partnership.

Logos of "Safety Support Car" and "Safety Support Car S"

Posters of "Safety Support Car" and "Safety Support Car S"

Specifically, based on the "Interim Report," not only that the nicknames and logos have been developed, but also that (1) posters and leaflets in which advanced safety technologies installed on the Safety Support Car S are described in an easy-to-understand manner are distributed; (2) a portal site[7] designed to manage and transmit information on test driving events held by

7 Portal site for Safety Support Cars: https://www.safety-support-car.go.jp/

automobile dealers and all kinds of information on the Safety Support Cars in an integrated fashion has been launched; (3) test driving events of the Safety Support Cars and traffic events are held at Driver and Vehicle Licensing Centers, driving schools across Japan as well as at the Nagoya Motor Show, and (4) information is provided on the concept of the Safety Support Cars and advanced safety technologies in an easy to understand manner using government official bulletin.

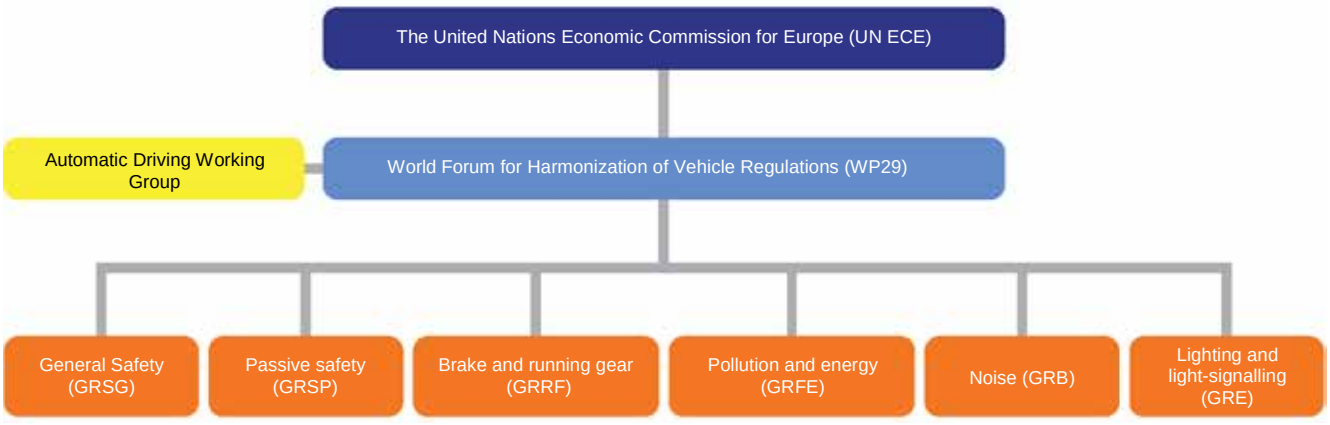
B. Formulation of technical standards

As part of measures to prevent traffic accidents by elderly drivers, the Ministry of Land, Infrastructure, Transport and Tourism intends to lead international standardization starting with advanced safety technologies which are expected to contribute to safety, such as automatic braking, and review formulation of safety standards, etc. Currently, review for formulation of international standards on automatic braking is under way at the expert meeting with Japan and EU serving as co-chairs under the Working Party on Brake and Running Gear (GRRF) of United Nations Economic Commission for Europe, World Forum for Harmonization of Vehicle Regulations (WP29) established by the proposal of Japan (Feature article – Chart 18). In addition, prior to the formulation of said standards, we established a system whereby the performance of automatic braking is recognized by the government in March 2018, in Japan. Moreover, we plant to promote diffusion of safety devices that can be attached to existing vehicles while guaranteeing their safety.

C. Car Assessment

Advanced safety technologies such as automatic braking are expected to be effective in preventing traffic accidents and reducing damage caused by accidents. In order to develop and environment whereby car users may choose safe cars and encourage automobile manufacturers to develop safety technologies, the Ministry of Land, Infrastructure, Transport and Tourism conducts car assessment in which it compares and evaluates safety performance of commercially-available vehicles and publish its results. It has been evaluating and publishing the performance of automatic braking and lane departure warning devices of vehicles since FY2015, of rearview vision information provision devices (rear cameras) since FY2016, of lane departure prevention devices since FY2017, and will evaluate and publish the performance of unintended acceleration prevention devices, etc. since FY2018.

u Feature article / Chart 18 Efforts for international standardization



3. Efforts utilizing ITS (Intelligent Transport Systems)

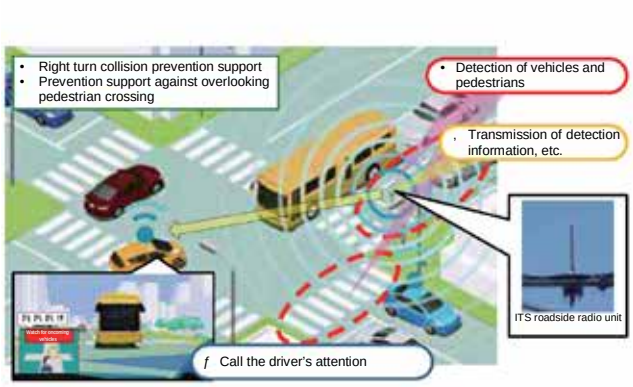
(1) Sophistication of traffic control system

The traffic control system is a system designed to ensure a safe and smooth traffic flow and prevent traffic accidents by analyzing data on traffic volume and running speed, etc., collected from the vehicle detectors, etc. and controlling traffic signals in accordance with the traffic situation, and to guide and distribute traffic flow and traffic volume by providing traffic information utilizing traffic information signs, etc.

To control traffic more effectively, the police are promoting sophistication of traffic control system through expansion of traffic control areas, development and increased arrangement of infrared beacons, provision of detailed traffic information utilizing probe information, improvement of traffic signal control, etc.

(2) Driving Safety Support Systems (DSSS)

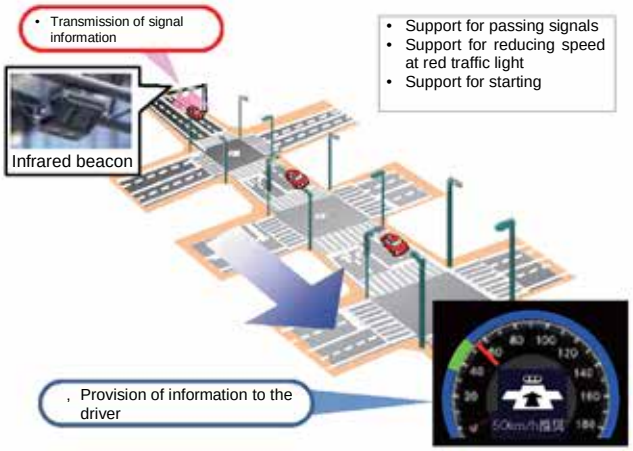
The Driving Safety Support Systems are systems designed to provide information on traffic conditions in the vicinity through visual and auditory information to the driver from radio equipment installed on the road and to prevent traffic accidents by creating an environment to urge attention towards risk factors and allow the driver to drive at ease.



* ITS roadside radio unit is a device designed to continuously and extensively provide information on the presence of vehicles and pedestrians, traffic situation in the vicinity, etc.

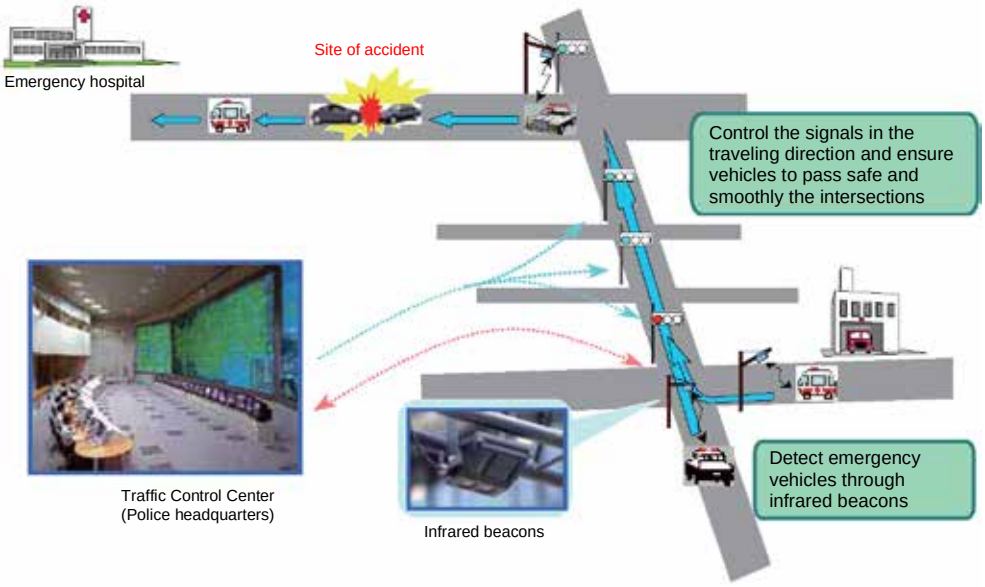
(3) Traffic Signal Prediction Systems (TSPS)

The Traffic Signal Prediction Systems are systems designed to provide information on the signals before arriving at the traffic signal intersection to the driver in advance to urge the driver to drive at ease and prevent accidents by sudden stop and/or sudden start.



(4) Fast Emergency Vehicle Preemption Systems (FAST)

The Fast Emergency Vehicle Preemption Systems are systems designed to control traffic signals to allow emergency vehicles such as police cars, ambulances, etc. to travel preferentially when they travel in emergency. The systems shorten the response time to emergency calls and contribute early first-aid to victims, in addition to preventing accidents during emergency traveling.



(5) ETC 2.0

The ETC 2.0 is not only capable of sending and receiving a large amount of information in both directions between the road and the vehicle, but also of providing route information. Thus, ETC 2.0 has far more advanced functions than ETC[8] (which provides only toll collection function on toll roads). The ETC 2.0 system provides a variety of advantages to road users through information provision services, such as congestion avoidance, safe driving support, etc., and route information collected by the road side devices and greatly contribute to ITS promotion. Examples of services provided by ETC 2.0 include provision of wide area information and images on the route, one-time application for and automatic updating of special vehicle permit, discount of highway fees on the route, etc.

As of March 2018, a total of approximately 2.61 million vehicles are equipped with devices compliant with the ETC 2.0. Under the circumstances, we are promoting efforts aimed at realizing smooth traffic and safety, including provision of wide-area congestion information, alerting of dangerous situations such as invisible traffic congestion at a curve, etc., utilizing the ETC 2.0 roadside devices installed in about 1,700 locations on expressways across Japan (Feature article – Chart 19).

u Feature article / Chart 19 Overview of ETC 2.0

8 ETC: Electronic Toll Collection System

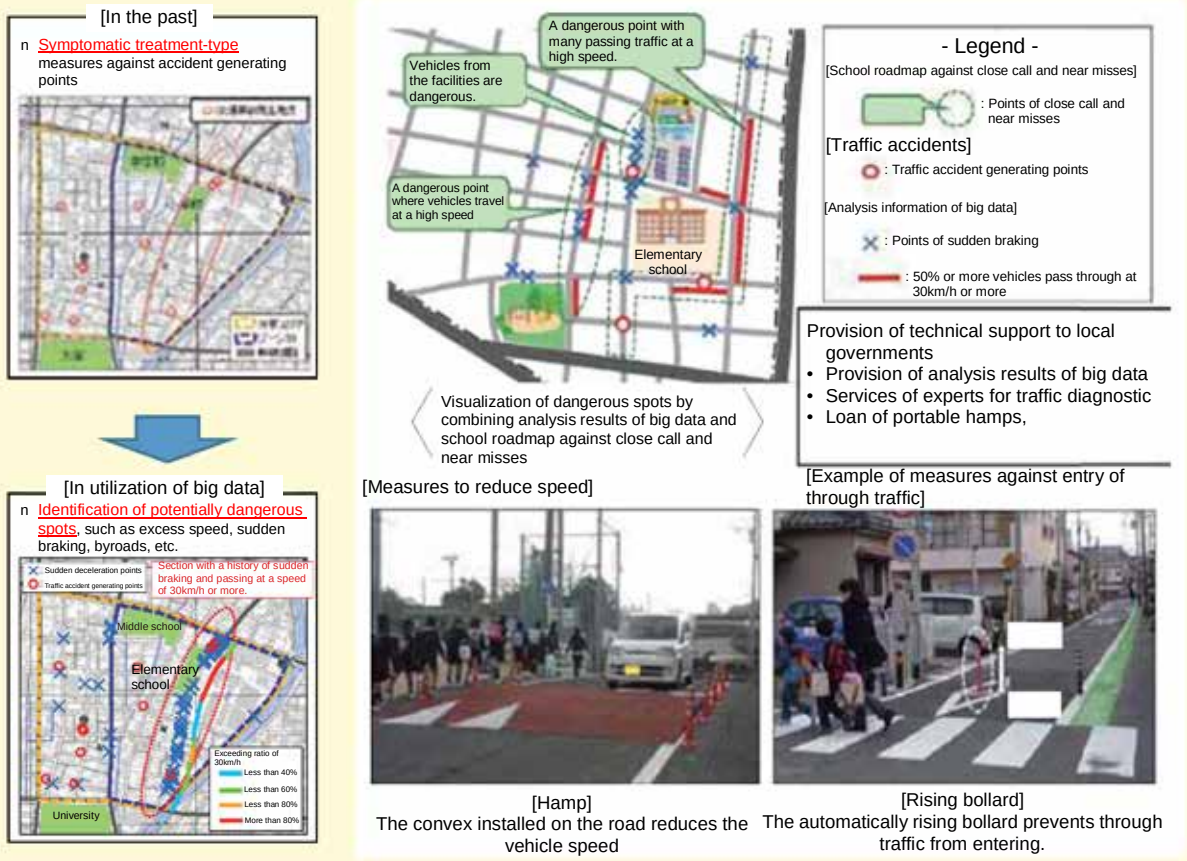
4. Measures for community roads utilizing big data

Utilization of probe information of ETC 2.0

With ETC 2.0, it is possible to collect a large quantity of a wide variety and diversity of detailed car traveling history records (probe information) such as its traveling speed, traveling routes, data on sudden braking, etc. which are collected by roadside device.

The Ministry of Land, Infrastructure, Transport and Tourism is shifting efforts from symptomatic treatment-based measures to efforts to restrict speed and entry of transit vehicles by identifying potential danger areas, such as excess of speed, sudden braking, etc., in "areas subject to measures for community roads." (Feature article – Chart 20).

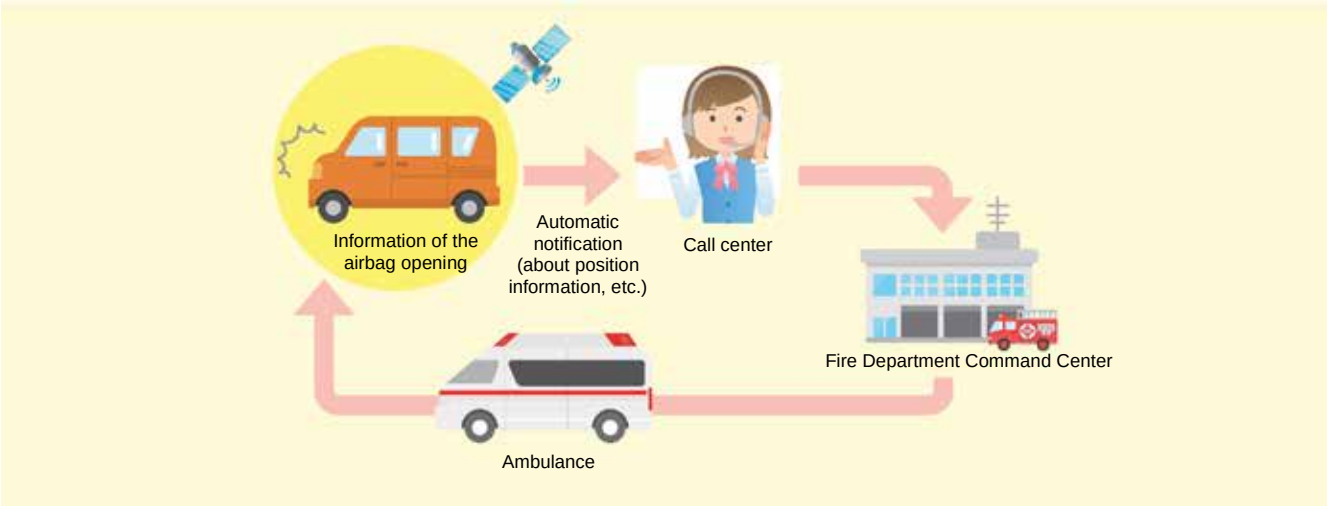
u Feature article / Chart 20 Use of big data for community roads



5. Efforts on Help system for Emergency Life saving and Public safety (HELP), Automatic Collision Notification (ACN) system, and Advanced Automatic Collision Notification (AACN) system

The "Help system for Emergency Life saving and Public safety (HELP)" and "Automatic Collision Notification (ACN)" system are systems that, when a large accident occurs such that the airbag is opened, notify the call center of the place of the accident, etc., automatically through the equipment mounted on the vehicle or mobile phone, instead of the driver and/or witnesses. The operator who receives notification from the systems hears the situation and conveys information including the occurred place of the traffic accident as well as presence or absence of driver's consciousness to a fire department and police as necessary. The systems are expected to help shorten the time required for emergency vehicles such as ambulances and police cars to arrive at the accident site and rescue injured people quickly, and deal with aftermath of the accident (Feature article - Chart 21).

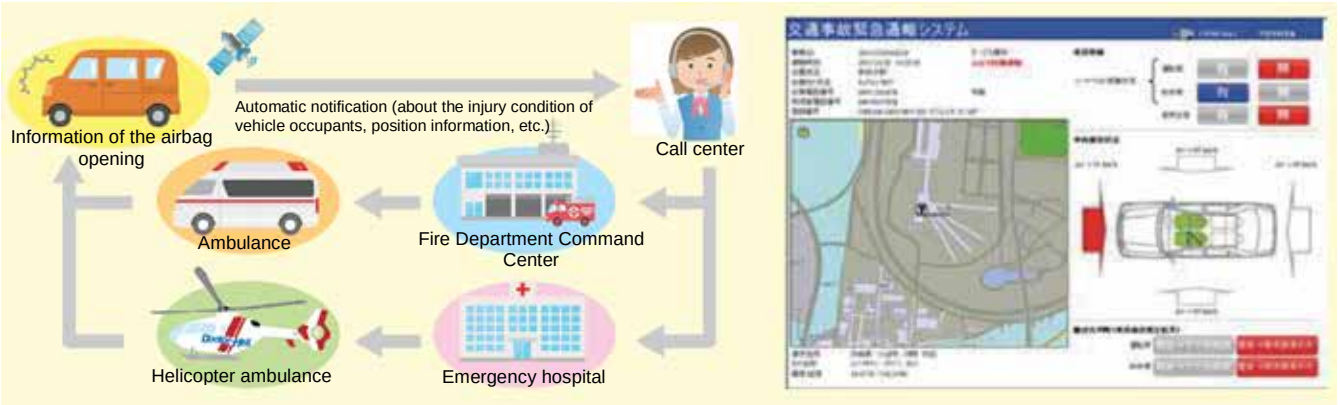
u Feature article / Chart 21 Image of Automatic Collision Notification (ACN) system



In addition, in the “Advanced Automatic Collision Notification (AACN)” system, information capable of allowing the status of injuries of vehicle occupants to be predicted is included in the information to be automatically notified from the vehicle when an accident has occurred, and thus, the operator who has received the notification conveys the position information and predicted injury status to a fire department and emergency hospital. In this manner, the system is expected to help shorten the time required for ambulances and helicopter ambulance to arrive at the accident site and for inured people to be treated by a doctor (Feature article - Chart 22).

These systems are designed to inform fire departments and police of information related to accidents quickly and accurately. Since it is possible to prevent a decrease in survival rate of traffic accident victims by shortening time before they are treated by a doctor, we are engaged in the diffusion of the system. Furthermore, the Ministry of Land, Infrastructure, Transport and Tourism plans to perform evaluation according to the presence or absence of the Automatic Collision Notification (ACN) system and Advanced Automatic Collision Notification (AACN) system within the framework of Car Assessment and promote their diffusion from FY2018.

u Feature article / Chart 22 Image of Advanced Automatic Collision Notification (AACN) system



III Aiming for a Society without Traffic Accidents

These feature articles explore challenges regarding traffic accidents in recent years and expectations for advanced technologies, followed by a brief report on the present status of major advanced technologies along five pillars. These include both the Roadmap towards practical application of automatic traveling, and those already in practical use by applying advanced technologies and information such as the Safety Driving Support System designed to prevent accidents caused by delay in recognizing danger by drivers or driving errors, a system to provide first aid and rescue promptly once an accident occurs, etc. In addition to these efforts, the safety of road traffic is supported by a variety of technologies, and development and dissemination of advanced technologies that contribute to traffic accident prevention, and effective utilization of information have thus been promoted by public and private collaboration. At the same time, no matter how excellent are the developed and introduced technologies, without users' right understanding thereof, the intended effect cannot be produced. The whole society needs to improve literacy in progress of advanced technologies that contribute to traffic safety.

To realize the safest road traffic in the world, an effective use of advanced technologies and information, and safety education and awareness raising will become more important in the future, so that people could correctly understand those technologies.

Science and technology, such as information communication and artificial intelligence, continues to evolve rapidly and further technology development is expected. Facing the progressive development of technologies, we will facilitate introduction and use of new technologies appropriately, while strongly promoting efforts for traffic safety, by ensuring safety throughout the introductory stage of new technologies, and dealing with new challenges.