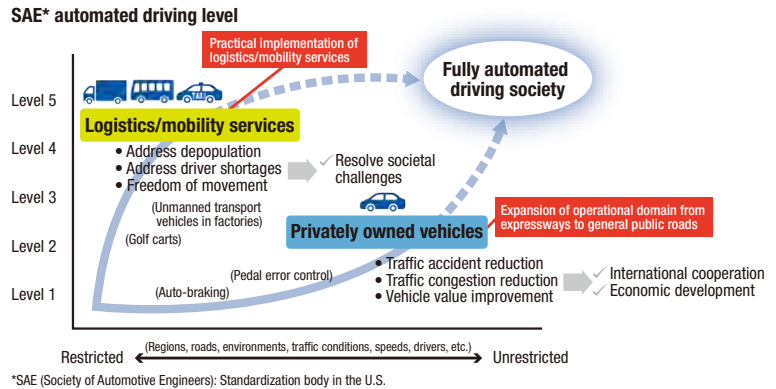




SIP Automated Driving for Universal Services (SIP-adus)

Ensuring safe and comfortable mobility for everyone in society

The operational domain of automated driving will be extended from expressways to arterial and general public roads, and automated driving systems will be implemented in mobility services including public transport and logistic operations in order to help solve social issues such as reducing traffic accidents and congestion, providing greater mobility for vulnerable road users in local communities, and alleviating the shortage of drivers in the logistics industry, and finally ensuring safe and comfortable mobility for everyone in society.



Program Director

Seigo Kuzumaki

Toyota Motor Corporation
Advanced R&D and Engineering Company
Executive General Manager

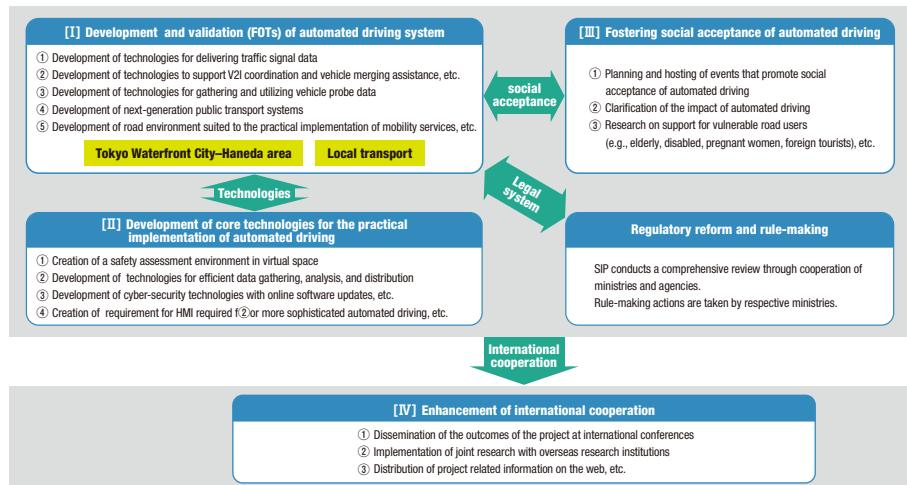
Profile

Mr. Kuzumaki received a master's degree in aeronautical engineering from Kyoto University in 1985. The same year, he joined Toyota Motor Corporation in the Body Design Department. In 2003, he began working in technology planning and technical development as the vehicle safety function supervisor in the Vehicle Technology Development Department at Toyota. He has served in his present post since 2017.

Research and Development Topics

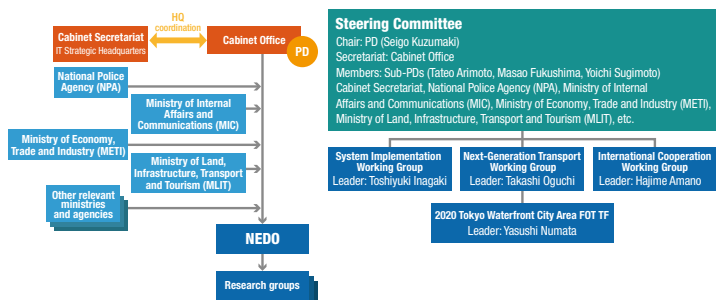
To implement automated driving in society, it is necessary to overcome obstacles in three areas: technology, legal system, and social acceptance.

SIP-adus promotes R&D by establishing cooperative areas as opposed to competitive areas, focusing on platform technologies such as the technology to provide traffic signal information for automated driving and advanced driver support and the development of simulation tools for evaluating safety. Efforts have been made to foster social acceptance and improve the system. We will overcome the obstacles in the three areas through field operational tests (FOTs), etc. based on cross-ministerial and industry-academia-government cooperation by promoting technology development and infrastructure improvement, identifying issues for implementation and reviewing solutions, and promoting international cooperation by offering opportunities for open review and discussion with the participation of automakers outside Japan.



Organization

The Steering Committee determines and administers the R&D policy under the initiative of the Program Director (PD). Cross-ministerial and industry-academia-government cooperation is essential to provide data such as traffic signal information and road closure information. Based on R&D in the first phase of SIP-adus, the second phase of SIP-adus will aim to achieve higher goals to promote the cross-sectional efforts and develop a national industry-academia-government cooperation system.



Deployment Milestones

Stakeholders of implementation participate in the R&D phase to commercialize mobility services smoothly upon completion of the project. Specifically, investment and business planning by private operators will be promoted by:

✔ taking full advantage of the Olympic and Paralympic Games Tokyo 2020 to accelerate implementation of automated driving (Level 2 to 4 on expressways and general roads)

FOTs will be conducted in cooperation with automakers in line with the Olympic and Paralympic Games Tokyo 2020, an event that will attract much public attention. SIP-adus will offer open opportunities for FOTs to solicit the participation of automakers, etc., encourage investment, and promote implementation and commercialization.

✔ commercializing mobility services (Level 4) in underpopulated areas and local communities, etc.

FOTs will be conducted in cooperation and collaboration with stakeholders (e.g., businesses and local governments) to ensure means of mobility and offer mobility and logistics services in underpopulated areas, etc. on a commercial basis. Long-term FOTs will be conducted to verify the possibility of establishing a sustainable business model, increase social acceptance by involving the general public, etc., and create multiple implementation examples.

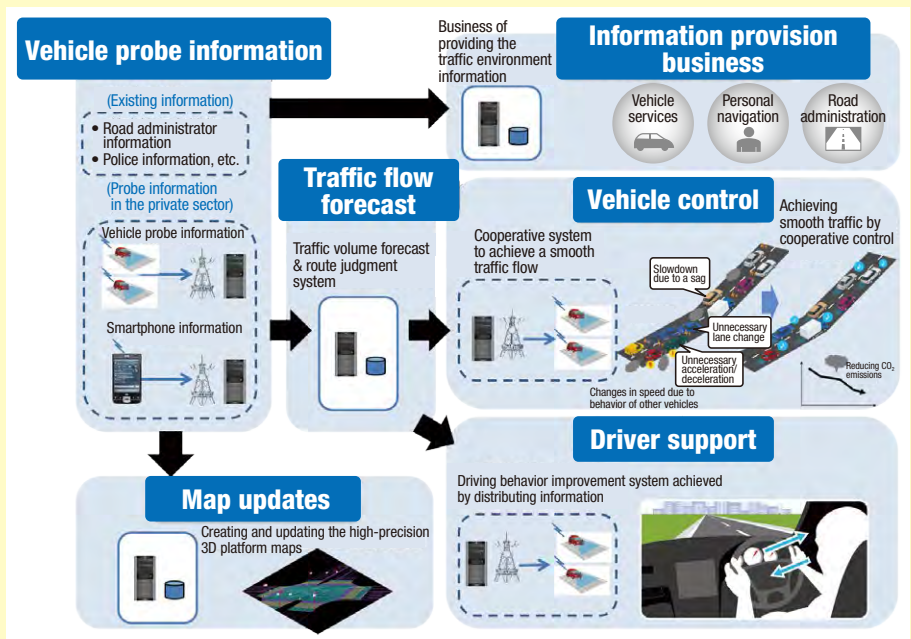
Expected Outcomes

To achieve safe and comfortable automated driving, the traffic environment data (e.g., traffic signal information, traffic regulation information, congestion information) will be linked with high-precision maps for distribution. Vehicle probe information will also be utilized to offer more current and comprehensive information. A safety evaluation environment will be established by developing simulation tools that can simulate various traffic environments.

The information will be utilized for multiple purposes to contribute to early realization of a cyber physical system to be achieved by Society 5.0.

Developing technologies to utilize the vehicle probe information in automated driving and driver support systems (map updates and provision of information)

- ✔ The vehicle probe information (e.g., driving information) that is collected and accumulated during the development of automated driving may be used in various applications such as map updates, congestion forecasting, and the information provision business. To achieve this, the amount of information required, data format, etc. will be reviewed by taking into account issues such as privacy and communication cost.
- ✔ Efforts will also be made to create new digital infrastructure industry using the vehicle probe information, enhance the competitiveness of the sensor industry, and develop the information security and simulation industries.



Developing virtual safety evaluation technologies for automated driving

- ✔ When evaluating vehicle safety, it is difficult to evaluate all the potential events on public roads using actual vehicles, and innumerable man-hours are required. To overcome the difficulty, a virtual evaluation and demonstration simulation environment will be created to simulate various targets (vehicles, motorbikes, bicycles, and pedestrians), weather conditions (e.g., rain, snow, backlight) and traffic environments (e.g., expressways, general roads).

