Seeking Even Greater Traffic Accident Reductions through Vehicle Advancements
—Promotion of ASV in Order to Realize Automated Driving—

Phase 6 (FY 2016–2020)
Study Group for the Promotion of ASV
Ministry of Land, Infrastructure, Transport and Tourism

Advanced Safety Vehicles (ASV) are vehicles equipped with systems to contribute to safe driving via advanced technologies. The ASV Project aims to promote development, introduction, and popularization of ASV technologies.
Although traffic accident fatalities and injuries have decreased in recent years, the situation remains serious. In 2016, 3,904 people lost their lives and 618,853 people were injured.

Targets have been set for reducing traffic accident fatalities and injuries, and safety measures are being introduced.

March 2016  
10th Traffic Safety Basic Plan
“Reduce to below 2,500 the number of traffic fatalities occurring every 24 hours. Ultimate goal is to build a safe society with no traffic accidents.”

June 2016  
Road Transport Subcommittee of Land Transport Committee of Transport Policy Council
By the year 2020, reduce annual traffic accident fatalities by 1,000 (compared to 2010) via vehicle safety measures

In order to achieve traffic accident fatality and injury reduction targets, the Road Transport Bureau of the Ministry of Land, Infrastructure, Transport and Tourism is implementing vehicle safety measures focused on three projects: ①Vehicle Safety Regulation, ② ASV Project, and ③ New Car Assessment Program.

Vehicle Safety Measures

- Better relations between popularization measures and development of regulations on new technologies
- Development and popularization of new technologies based on cooperation among industry, academics, and government
- Contribution to the overall activity of ITS (Intelligent Transport System)

Expansion and Enhancement of Safety Regulation
- Developing vehicle safety measures including vehicle safety regulations and the ASV popularization measures based on traffic accident analyses.

ASV Project
- Development and popularization of new technologies based on cooperation among industry, academics, and government
- Contribution to the overall activity of ITS (Intelligent Transport System)

Reduction in Accidents
- Better relations between NCAP and safety regulations
- Better relations for user understanding of new technologies

NCAP (New Car Assessment Program)
- Conduct safety comparison tests and provide information to users
- Provide information on the ASV

Safety regulations specify performance levels that must be met so that vehicles are safe.
ASV Project activities began in FY 1991 and have continued for more than 25 years with the aim of reducing traffic accidents through the introduction of ASV technologies.

Taking into consideration factors such as the development status of new technologies to enable the introduction of automated driving via advanced safety technology progress and integration, in Phase 6, automated driving will also be considered in the measures implemented.

**Contributions to Accident Reduction via ASV Technologies / The Significance of Automated Driving**

The project aims to realize more sophisticated and wide-ranging safe driver assistance, and make a major contribution to traffic accident reduction.

*Medicine-engineering collaboration: To consider more detailed vehicle safety measures by collecting and sharing injury and emergency medical data in the event of accidents.*

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**Phase 1 FY 1991–1995**
- Study Technological Possibilities
  - Set development goals
  - Verify accident reduction efforts
  - Demonstration by 19 ASVs

**Phase 2 FY 1996–2000**
- Research and Development for Market Introduction
  - Formulate ASV Design Principles
  - Formulate guidelines for ASV technology development
  - Verify accident reduction effects
  - Demonstration by 35 ASVs

**Phase 3 FY 2001–2005**
- Promote Popularization and New Technology Development
  - Develop concept of driver assistance
  - Formulate ASV popularization strategy
  - Promote development of communications-technology-based systems
  - Trial of communications-technology-based systems in 17 ASVs

**Phase 4 FY 2006–2010**
- The Challenges and Further Contributions to Accident Reduction
  - Review evaluation methods to measure traffic accident reduction effects and implement assessments
  - Formulate basic design guidelines for communication-based driver-assistance systems
  - Comprehensive trial of communications-technology-based systems in 30 ASVs on the public roads

**Phase 5 FY 2011–2015**
- Achieve Dramatic Increase in Sophistication
  - Formulate guidelines for emergency driving stop system
  - Formulate basic design guidelines for vehicle-to-pedestrian communication systems
  - Demonstration of communication-based systems at ITS World Congress 2015 Tokyo driver assistance

**Phase 6 FY 2016–2020**
- Promotion of ASV in Order to Realize Automated Driving
  - Review the state of advanced safety technology with automated driving in mind
  - Investigate practical technology with the definition of guidelines in mind
  - Popularize automated driving technologies, including existing ASV technologies

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**History of ASV Project and Plan for Phase 6**

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**Contributions to Accident Reduction via ASV Technologies**

The introduction of automated driving technologies can be expected to reduce the number of accidents caused by driver error.
Safety regulations specify performance levels that must be met so that vehicles are safe.

By the year 2020, reduce annual traffic accident fatalities by 1,000 (compared to 2010)

- **Driver Assistance**
  - Drivers play their own role in driving vehicles safely, while ASV technologies provide this driver with assistance.

- **Driver Acceptance**
  - Drivers can use ASV technologies easily and comfortably.

- **Social Acceptance**
  - People can understand ASV technologies properly and accept them.

- **Communications use**
  - Coexistence with two-wheeled vehicles

### Phase 6 ASV Project Study Items

1. **Review ASV design philosophy and Guideline principles ASV Technology Development with automated driving as a premise**

2. **Consider the impact and key points requiring attention when automated-driving vehicles are introduced with mixed modes of transport**

3. **Technical requirements of evolving emergency driving stop system for taking refuge on shoulder, etc.**

4. **Technical requirements and issues for practical driver monitoring techniques**

5. **Technical requirements and issues for implementation of vehicle platooning and unmanned automated driving transport services in a limited area**

6. **Technical requirements and issues for ISA (Intelligent Speed Adaptation) devices**

7. **Revision of common definitions and names of ASV technologies**

8. **Popularization of existing technologies via dissemination of knowledge on correct usage collaboration with NCAP, etc.**
Up through ASV Project Phase 5, the following ASV technologies were introduced. Vehicles equipped with these technologies are already being marketed by each vehicle manufacturer.

### AEBS (Advanced Emergency Braking System)
A device that warns the driver by predicting a collision with obstacles ahead and then provides emergency brake control to mitigate collision damage.

- **ASV**: Driver brakes in response to warning
- **Non-ASV**: Braked too late due to delay in recognizing obstacle

### Pedal Misapplication Prevention Device
When starting or proceeding slowly, if there is a danger of colliding with something (obstacle, etc.) due to a shift-lever or accelerator-pedal error, the device limits sudden forward movement or sudden acceleration.

- **ASV**: Brake control if warning is ignored
- **Non-ASV**: Braked too late due to delay in recognizing obstacle

### Lane Keeping Assistance System
A device that helps to control the steering operation to keep the vehicle in the middle of the lane.

- **ASV**: Steer, Warning when leaving lane
- **Non-ASV**: The driver is in charge of the steering effort to keep the vehicle in the middle of the lane

### Lane Departure Warning (LDW) Device
A device that warns the driver that the vehicle is about to move out of its lane.

- **ASV**: I’m outside the lane!!
- **Non-ASV**: Goes unnoticed in some cases!

### Device for Rear View when Backing Up (Backup Camera)
When backing up, the camera shoots the area behind the vehicle, and the device displays the images on a screen inside the vehicle.

- **ASV**: Blind spot reduced on interior screen
- **Non-ASV**: Even looking backward, there is a blind spot beyond the rear window.

### Rear Approaching Vehicle Warning Device
Detects vehicle in rear while moving and provides that information. At that time, if the lane-change blinker is operated, the device gives a stronger warning.

- **ASV**: Warning light blinks on door mirror
- **Non-ASV**: Goes unnoticed in some cases!
To effectively promote the development, introduction, and popularization of ASV technologies, the ASV Project is carried out under the auspices of the Study Group for Promotion of ASV, a joint initiative involving industry, academics, and government.

We are involved in a variety of activities, such as actively contributing to the UN World Forum for Harmonization of Vehicle Regulations (WP29) and the ITS World Congress.

**International Cooperation**

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**ASV Project Framework**

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**Study Group for Promotion of ASV**

- **Secretariat**: Ministry of Land, Infrastructure, Transport and Tourism
- **Study Group for Promotion of ASV**

**International Cooperation**

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**United Nations Economic Commission for Europe (UNECE)**

**ITS/Automated Driving Informal Group**

- **World Forum for Harmonization of Vehicle Regulations (WP29)**
- **General Safety Provisions (GRSG)**
- **Passive Safety (GRSP)**
- **Brakes and Running Gear (GRRF)**
- **Pollution and Energy (GRPE)**
- **Noise (GRB)**
- **Lighting and Light-Signaling (GRE)**

**Secretariat of Study Group for Promotion of ASV**

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