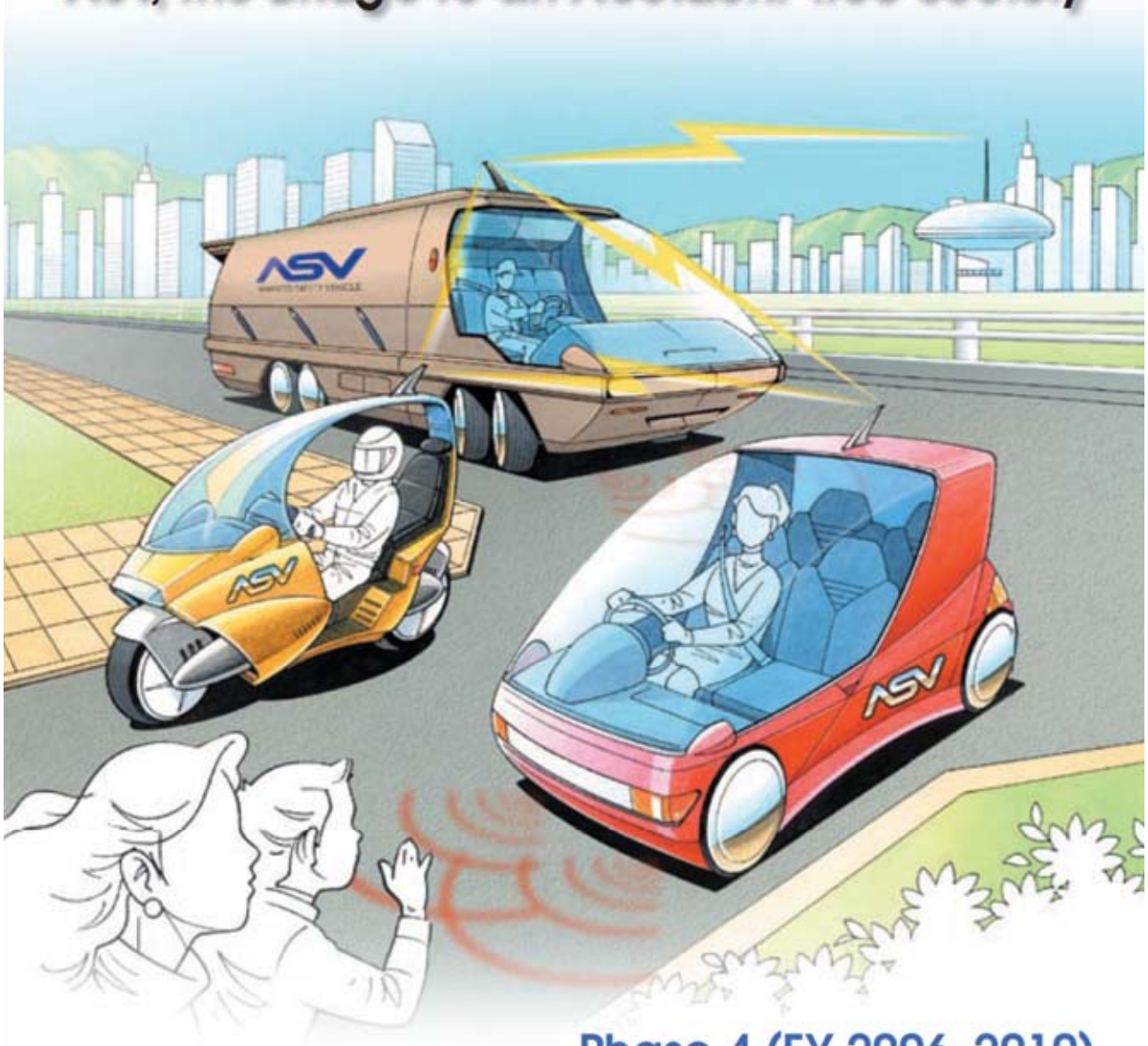
ADVANCED SAFETY VEHICLE

ASV, the Bridge to an Accident-free Society



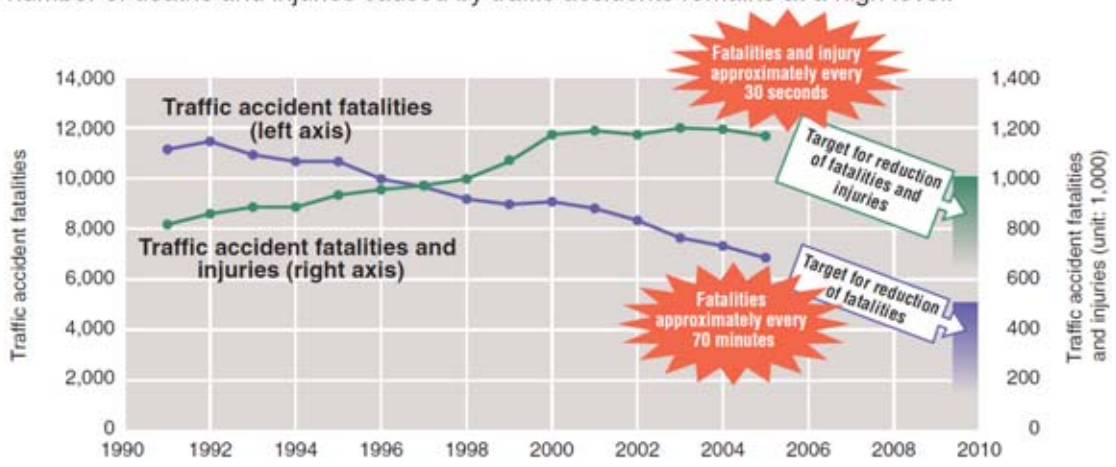
Phase 4 (FY 2006–2010)

Study Group for Promotion of ASV
Ministry of Land, Infrastructure and Transport

Advanced Safety Vehicles (ASV) are vehicles equipped with systems using advanced technologies to assist in safe driving. The ASV Project aims to promote the development, commercialization and popularization of ASV technologies.

Traffic Accidents and Reduction Targets

●The number of deaths and injuries caused by traffic accidents remains at a high level.



●In order to improve the serious traffic accident situation, targets have been set for reducing fatalities and injuries and safety measures are being introduced.

◇Reduction targets set by the 8th Traffic Safety Basic Plan

- Reduce traffic accident fatalities to below 5,500 by 2010
- Reduce traffic accident fatalities and injuries to below 1 million by 2010

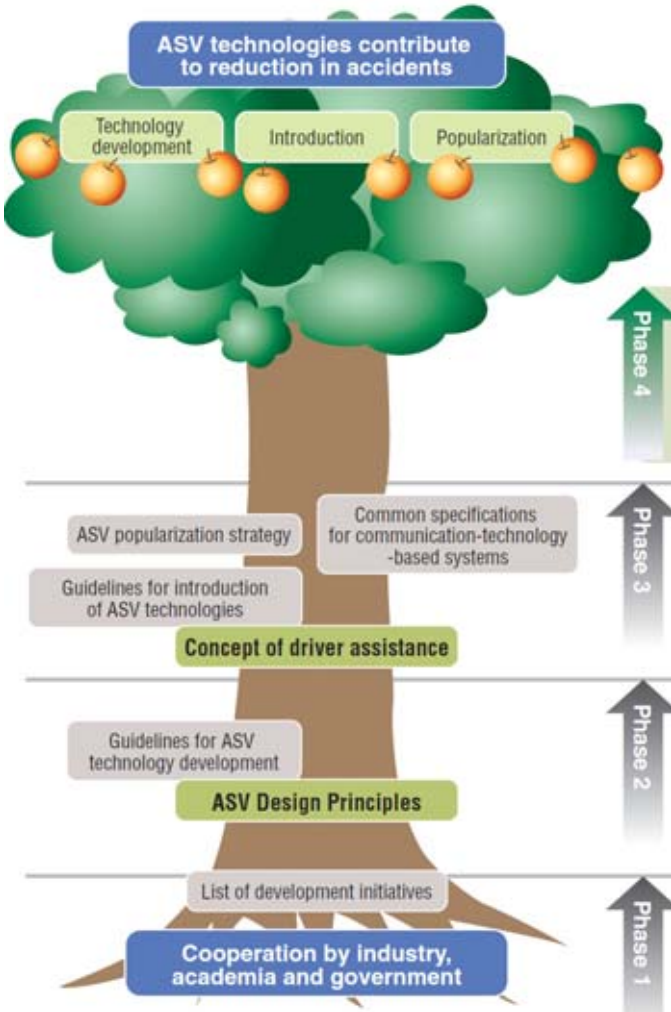
◇Reduction targets to be achieved through vehicle safety measures (set by the Council for Transport Policy)

- By 2010, reduce traffic accident fatalities to 2,000 below 1999 figures
- By 2010, reduce injuries to 25,000 below 2005 figures

Road Transport Bureau Initiatives to Reduce Traffic Accidents

●The Road Transport Bureau of the Ministry of Land, Infrastructure and Transport implements vehicle safety measures focused on three policies.
The ASV Project promotes the development, introduction and popularization of driver assistance technologies for safety.

Past ASV Project Activities and Plan for Phase 4



- ASV Project activities began in FY 1991 and have continued for more than 15 years with the aim of contributing to traffic accident reduction.
- With a view to further reduction of accidents, in Phase 4 the project will promote the popularization of ASV technologies and encourage the development and introduction of new technologies.

Phase 4

The Challenge and Further Contributing to Accident Reduction FY 2006–2010
- Formulate comprehensive ASV safety strategy
- Promote full-scale popularization of ASV technology
- Promote development and introduction of communication -technology-based systems

Phase 3

Promote Popularization and New Technology Development FY 2001–2005
- Develop concept of driver assistance
- Formulate ASV popularization strategy
- Promote development of communication-technology-based systems

★*Trial of communication-technology-based systems in 17 ASVs*

Phase 2

Research and Development for Market Introduction FY 1996–2000
- Formulate ASV Design Principles
- Formulate guidelines for ASV technology development
- Verify accident reduction effects

★*Demonstration by 35 ASVs*

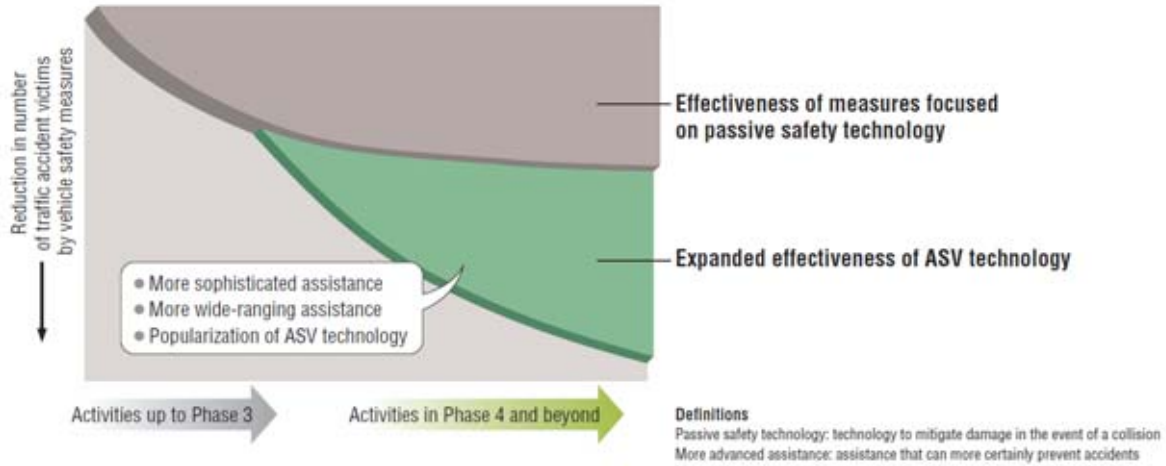
Phase 1

Study Technological Possibilities FY 1991–1995
- Set development goals
- Verify accident reduction effects

★*Demonstration by 19 ASVs*

The Challenge and Further Contributing to Accident Reduction through ASV Technology

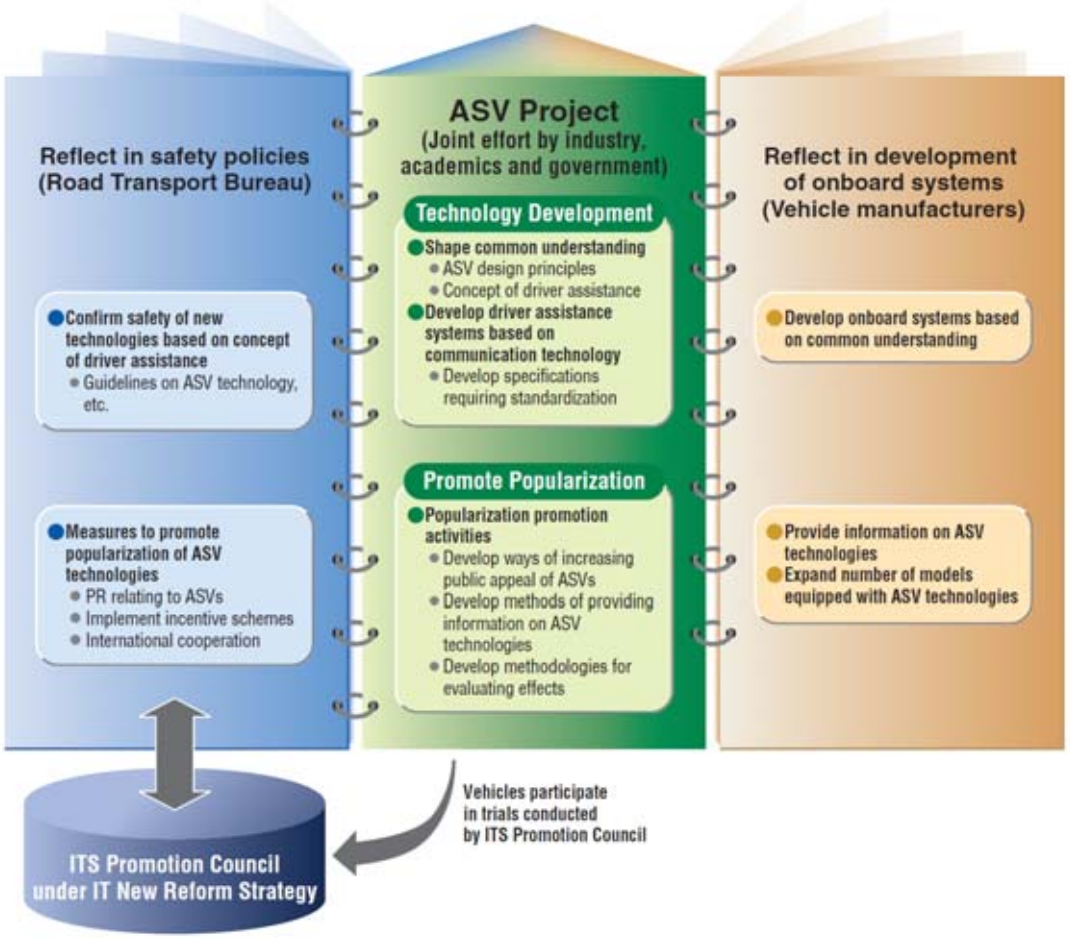
- The project aims to achieve more advanced and wide-ranging results, and make a major contribution to traffic accident reduction.



Definitions
Passive safety technology: technology to mitigate damage in the event of a collision
More advanced assistance: assistance that can more certainly prevent accidents
More wide-ranging assistance: assistance aiming to prevent all kinds of accidents

ASV Project Activities and Roles

- By sharing basic concepts with industry, academics and government, the ASV Project aims to promote the development of new technologies. The project also conducts development of technologies requiring a standardized approach, such as communications technologies.
  - Vehicle manufacturers proceed with development and commercialization on the basis of these fundamental concepts.
- The ASV Project examines measures to promote the popularization of ASV technologies.
  - Specific popularization measures are reflected in the safety policies of the Road Transport Bureau.
- As part of the ASV Project, vehicles participate in trials by the ITS Promotion Council.

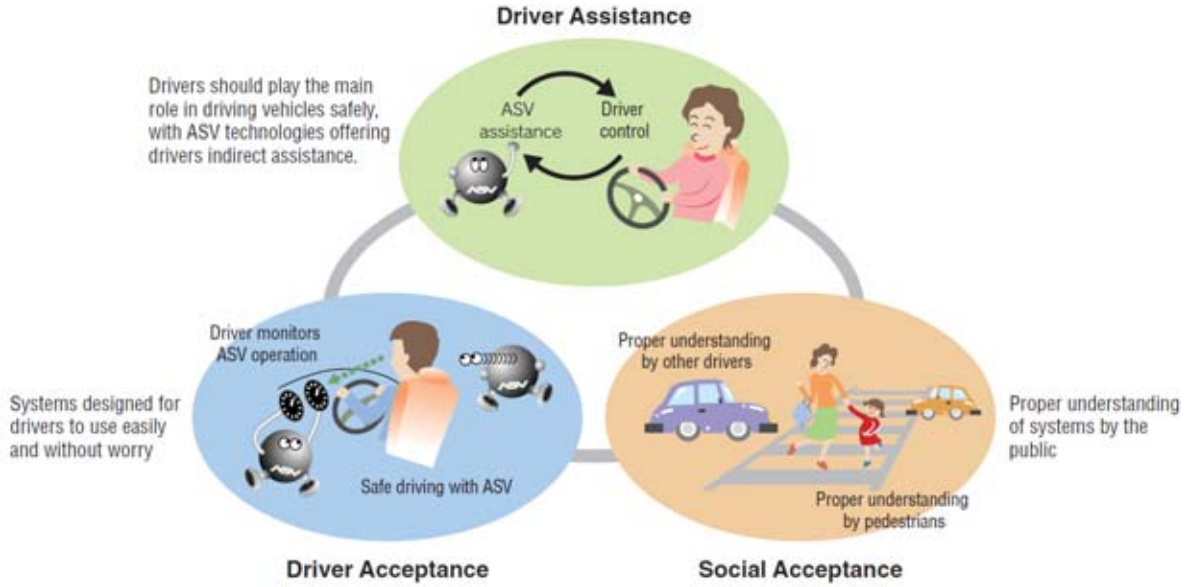


ASV Technology Offers Various Assistance Functions

- ASV technology operates under normal conditions and in emergency situations.
- Depending on the circumstances, it provides assistance such as information, cautions, warnings and control.

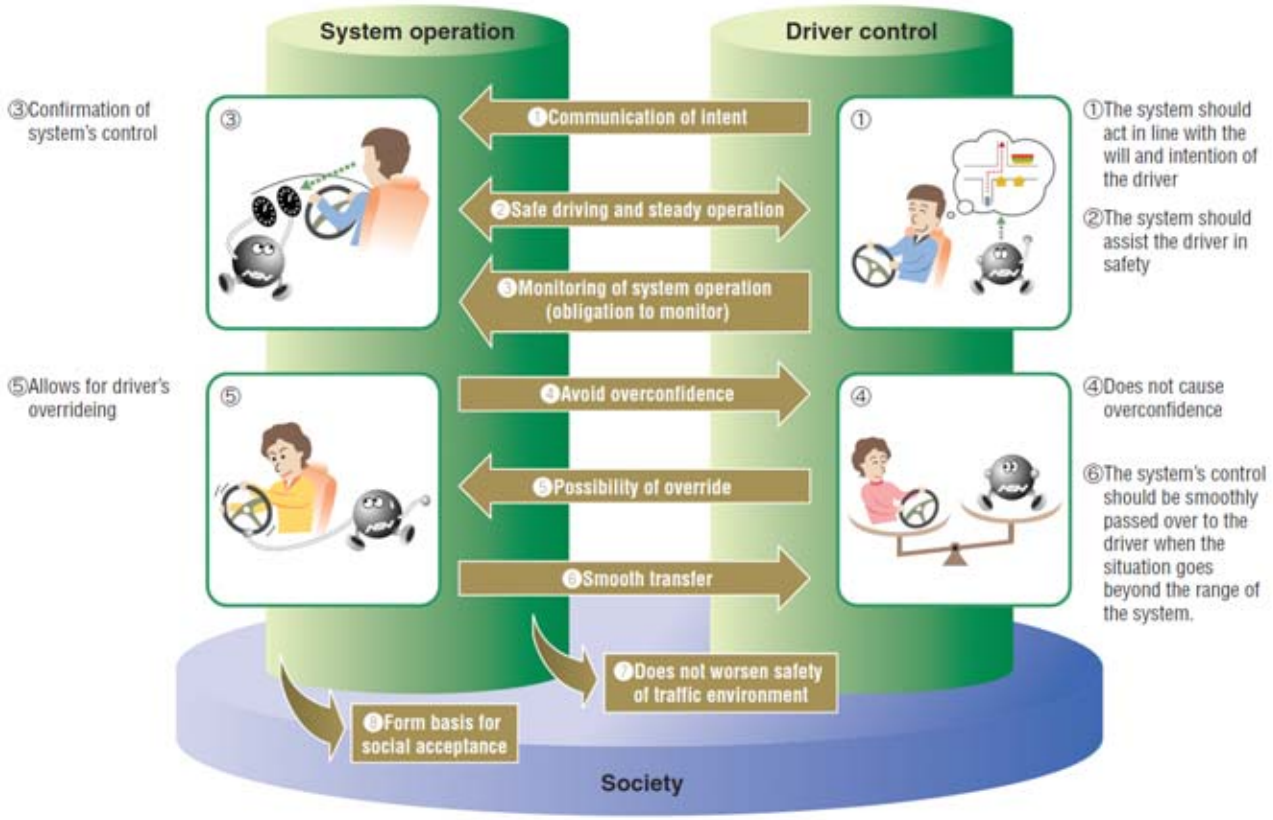
ASV Design Principles

●The ASV Design Principles set out basic concepts for ASV technologies



Concept of ASV Technology Development

●The concept of driver assistance embodies ASV design principles.
ASV technologies are being developed in line with this concept.



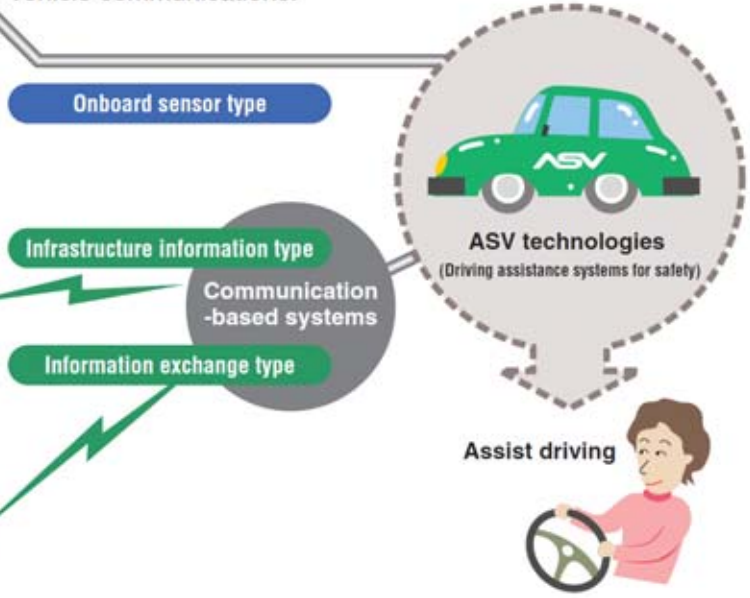
Types of ASV Technology

Information from onboard sensor

Information from roadside infrastructure (infrastructure-vehicle communications)

Information from other vehicles and pedestrians (inter-vehicle communications, pedestrian-vehicle communications)

- ASV technologies (driving assistance systems for safety) can be divided into two types: onboard sensor type[1] and communication-based type[2].
- Communication-based type technologies assist safe driving in coordination with infrastructure. They can be further divided into infrastructure information type[3] systems, which use information from roadside infrastructure acquired via infrastructure-vehicle communications, and information exchange type[4] systems, which use information from other vehicles or pedestrians acquired via inter-vehicle or pedestrian-vehicle communications.

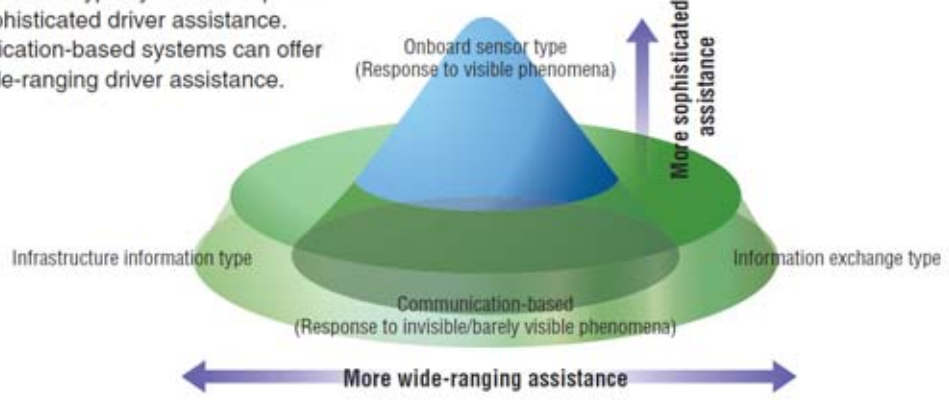


Definitions

1. Onboard sensor type: system that uses information from onboard sensors to assist driver
2. Communication-based type: general term covering roadside information type systems and information exchange type systems
3. Infrastructure information type: system that uses information from roadside infrastructure to assist driver
4. Information exchange type: system that uses information from other vehicles and pedestrians to assist driver

Utilization of ASV Technologies

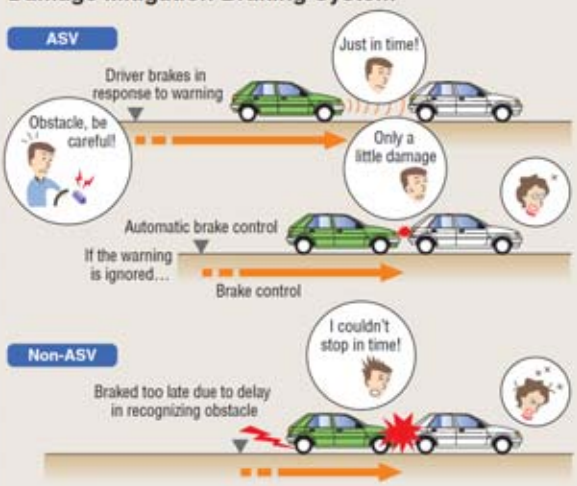
- Driver assistance within the range of capability of onboard sensors can be provided by onboard sensor type systems, as a basic principle.
- More advanced or more wide-ranging assistance can be provided by utilizing the particular features of each type of system.
  - Onboard sensor-type systems can provide more sophisticated driver assistance.
  - Communication-based systems can offer more wide-ranging driver assistance.



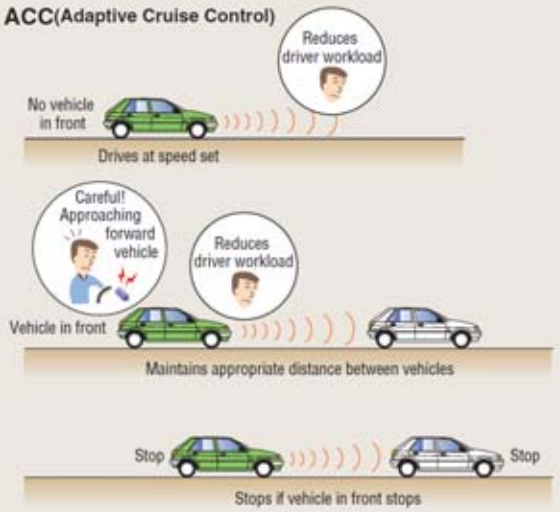
Typical ASV Technologies

●Many ASV technologies are already available commercially. Here are some examples.

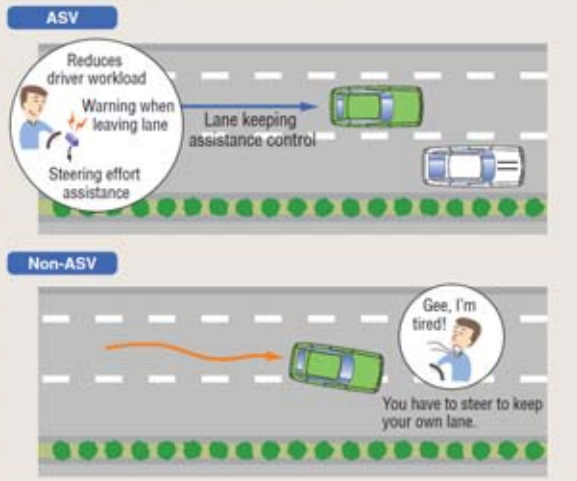
Damage Mitigation Braking System



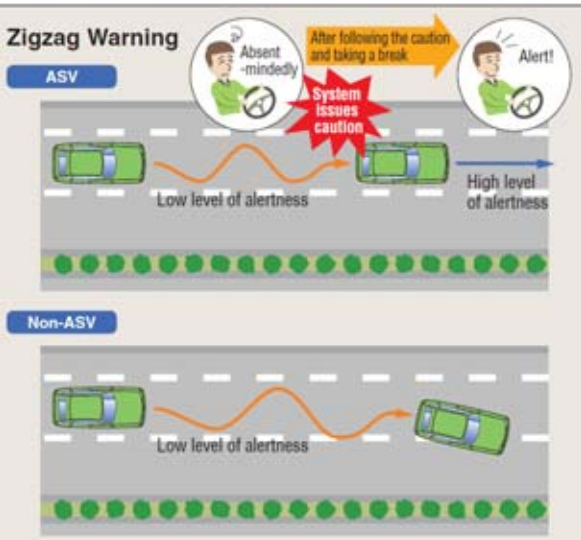
ACC(Adaptive Cruise Control)



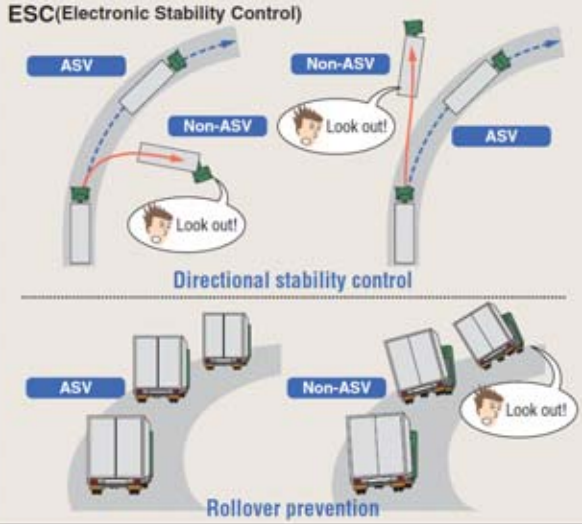
Lane Keeping Assistance System



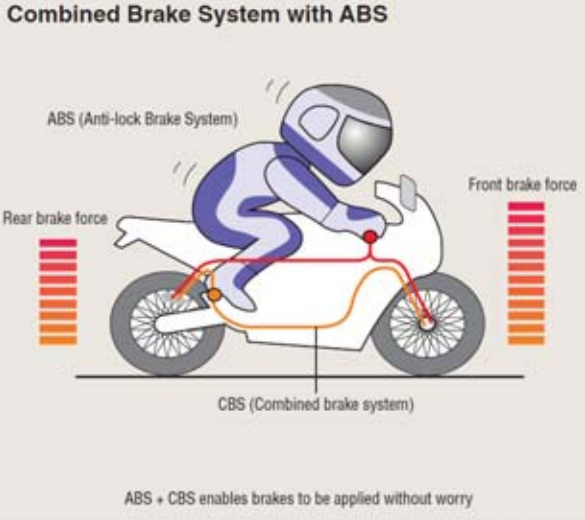
Zigzag Warning



ESC(Electronic Stability Control)



Combined Brake System with ABS



ASV Project Framework

●To ensure effective promotion of 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.

International Cooperation

●We are involved in various activities and cooperative efforts aimed at harmonizing international vehicle standards, including actively contributing to the UN World Forum for Harmonization of Vehicle Regulations (WP29) and the ITS World Congress

ITS Promotion Council under IT New Reform Strategy

IT New Reform Strategy
(Decided by IT Strategy Headquarters, January 19, 2006)

Reducing the number of traffic accidents, and related deaths and injuries, by introduction of driving assistance systems for safety using vehicle-to-infrastructure and vehicle-to-vehicle communication technologies*.

* Systems that enable vehicles to access information on traffic phenomena not directly visible from the vehicle via wireless communications with infrastructure devices (including devices installed at the roadside or in other vehicles and those carried by pedestrians) and that provide information, cautions and warnings to drivers as required.

ITS Promotion Council (established April 2006)

1. Membership

Government agencies
Cabinet Secretariat (provides council secretariat), National Police Agency, Ministry of Internal Affairs and Communications, Ministry of Economy, Trade and Industry, Ministry of Land, Infrastructure and Transport

Private Organizations
Nippon Keidanren, ITS Japan

2. Scope of Study
The council examines effective services and systems as well as vehicle trials, including comparative studies of the features of different communication media. By fiscal 2008 the council aims to conduct large-scale trials on public roads and achieve the introduction of some safe driving systems coordinated with infrastructure.

Secretariat of Study Group for Promotion of ASV

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