The Fourth Phase of Advanced Safety Vehicle Project
- technologies for collision avoidance -

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History of ASV

Phase 3: 2001-2005
- Crash mitigation brake
- Lane keep assistance
- ACC, etc have been introduced in the market

Phase 2: 1996-2000
- Demo2000
- System verification tests were done on the test course of Tomakomai

Phase 1: 1991-1995
- Concept of Driver Assistance
  Based on “Design Principle”
- Cooperation among academia, industries and government
- Study of technical feasibility
- Design Principle
  Driver Assistance
  Driver Acceptance
  Social Acceptance

Concept Specifications for communication technologies
- Consideration on “Role of inter-vehicle communication” for driver assistance to avoid crash
ASV-4

Phase 4 ASV Promotion Project

Promotion:
1. Assessment of the effectiveness of ASVs.
2. Information for drivers.
3. Others

New technologies:
1. Development of inter-vehicle communication
2. Study of a comprehensive safety strategy
3. Others

Goals

Promotion:
Full-scale introduction of autonomous detection type driver assistance systems

New technology:
Introduction of some inter-vehicle communication type driver assistance systems

Project Period
5 years from FY 2006 to FY 2010
The 2006 MLIT Transport Policy Council’s Report on vehicle safety

Target of vehicle safety measures

Reduction of fatalities since 1999

The graph shows the reduction of fatalities since 1999, with targets set for future years.
What is appropriate driver assistance?

- “Autonomous systems” with on-board sensors have been developed and introduced in the market along with considerations on better HMI from the viewpoint of “driver assistance” and “driver acceptance”.

![Diagram](achievements_of_ASV3)

- **Control as an assistance for operation**
  - Example: Collision mitigation brake

- **Normal driving** keeping the idea of
  - “driver in the Loop”
  - Example: ACC, Lane Keep Assist

- **Advanced Driving**
  - **Advanced Technologies (Driver Assistance Systems)**
    - Assistance for Recognition: Information presentation
    - Assistance for Decision: Warning
    - Assistance for Operation: Control

- **Human Driver**
- **Vehicle**
- **Feedback of Vehicle Behavior**
- **Conventional Driving**
Role of inter-vehicle communication is to help autonomous systems

- Autonomous, on-board sensor type, driver assistance systems have been developing and systems are already in the market.
- On the other hand, such autonomous systems cannot respond to events that are not detected by on-board sensors. (How to detect invisible cars?)
- So, desired role of communications technologies is to cover invisible events to help autonomous technologies.
Concept Specifications for Communication Technologies

- **Modeling of collisions** to be covered by communication tech.
- **Communication range** derived from accident (collision) models
- **Concept specifications** defined from the communication range.

Verification test at TOMAKOMAI in 2005
Trials on public roads of applications using communication technologies

- Trials are planned from 2007 by the cooperated efforts of industries and government (related ministries are joining).
- Applications of “infrastructure to car communication” and “car to car communication” will be tried.
- Target is to realize partial market introduction in 2010.
- The ASV is joining the project and building on what was achieved in TOMOKOMAI.
The ASV project has been contributing to the activities of UN/ECE/WP29/ITS informal Group for 2 years process to exchange of views to make clear direction of the role of WP29. Common understandings on safety concept of systems to assist driver were discussed.

Results of Verification of car to car communication have been shared through various occasions like the international symposium held in Tomakomai in 2005.
Conclusion

- The new safety policy and achievements of ASV3 are the base of ASV 4.
- "Concept of Driver Assistance" and "Concept Specifications for communication technologies" were important achievements of ASV3 and should be further developed in ASV4.
- The ASV project is joining “Trials on public roads using communication technologies by the effort of industries and government”.
- International cooperation is one of key issues.