[R&D] Take-over safety evaluation and social acceptability of automated driving vehicle
Contents

1. Project overview
2. Research objectives
3. Participating institutions
4. Major research contents and achievements
5. Connecting research outcomes
### 1. Project Overview

**Project Title**
- Study on take-over safety evaluation and social acceptability of automated driving vehicle

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SP1</strong></td>
<td>Development of evaluation technology of safety on control takeover for autonomous vehicle (SAE Level 2,3)</td>
</tr>
<tr>
<td><strong>SP2</strong></td>
<td>Autonomous driving vehicle based human factor in-depth study</td>
</tr>
<tr>
<td><strong>SP3</strong></td>
<td>Fundamental methods for improving social acceptance for autonomous vehicle</td>
</tr>
<tr>
<td><strong>SP4</strong></td>
<td>Development of evaluation platform for control transition safety of autonomous vehicle</td>
</tr>
</tbody>
</table>

**Durations and Budget**
  - Current year study period: 2018. 01. 01 ~ 2018. 12. 31
- $12,500,000 (15,700,000,000 Won)
  - Current year budget: $4,959,211

**Sponsor & Coordinator**
- Sponsor: Ministry of Land, Infrastructure and Transport
- Coordinator: Korea Transportation Safety Authority (KATRI)
2. Autonomous Vehicle Research

Roadmap to reach the level 3 in autonomous vehicle by 2020

- Driving safety based on real world driving scenario
- Fail-safety of autonomous driving system

Driver Assistance
- Secure the safety against cyber terror

Autonomous Driving Safety Evaluation

- Take-back control & Human factors
- Driver’s acceptability

Communication security

Build and operate K-city

DVI safety

Driving and trouble safety

Goals by 2020
- Level 3 autonomous driving on designated roads
- Parking based on designate space

- develop evaluation environment based on repeatability & reproducibility of autonomous driving on simulated real-world road systems
3. Participating institutions

Host organization

KATRI
(Korea Automobile Testing & Research Institute)

Professional Institution

MOLIT
(Ministry of Land, Infrastructure and Transport)

Like U.S. NHTSA?

<SP1>
Development of evaluation technology

SP1 Collaboration (KATRI)

[SP1-1]
Development of evaluation technology

[SP1-2]
Research Methodology

<SP2>
Human factor in depth study

SP2 Collaboration (ETRI)

In-depth study of human factors

<SP3>
Study for social acceptance

SP3 Collaboration (KOTI)

Law/Ethics/Technology

<SP4>
Evaluation platform development

SP4 Collaboration (KATRI)

[SP4-1]
Evaluation platform development

[SP4-2]
Performance management
Study on safety evaluation technology and social acceptability of automated driving vehicle
4. Major research contents and Achievements

Major research contents

SP1/SP4 Development of safety evaluation technology
- Vehicle-based control take over safety evaluation technology
- VR-based control take over safety assessment methodology

SP2 Human factors in-depth study
- In-depth study of human factors in autonomous driving situation
  - Driver psychology/behavior analysis technique and DB development in the take over situation of autonomous vehicle control

SP3 Study for social acceptance
- Improvement of legal/ethical/Technical/standard Viewpoints for improving the acceptability of autonomous vehicles

Key performance

- Control take over safety evaluation criteria and platform
- Control take over evaluation Support system
- Autonomous vehicle driver’s Psychology/behavior DB
- Driver psychology/physiology-Based workload quantification model
- Autonomous driving policy proposal
- Autonomous driving ethics guidelines

Utilization plan

- Apply domestic vehicle safety standards
- Leading international standards for automated driving vehicles
- Derive control shift design guidelines
- Supporting the development of R&D related to autonomous vehicles
- Improve the legal system
- Identification of accident liability
5. Connecting research outcomes (4 years)

1st year
- Autonomous driving definition (Lv3 and Scenario)
- Evaluation techniques
- Evaluation support DB

2nd year
- Basic Take-over VR experiment environment design
- Evaluation methodology
- Alarm methodology design and simulation preparation
- Experimental environment design
- Alarm methodology definition
- Evaluation support system construction
- VR upgrade

3rd year
- Development of evaluation (Plan) technology
- Data collection and DB design
- Experimental environment design and partial construction
- Autonomous driving VR

4th year
- Establishment and verification of evaluation index
- Evaluation support DB construction
- Development of VR evaluation method
- Development of multi-modality method
- Multi-modality method
- Method to increase performance alerts

Output
- Development of Evaluation criteria
- Development of Evaluation support DB
- International standards
- Evaluation index
- Evaluation support system
- 2SP Human factors in-depth study
- 4SP Development of evaluation platform based on real-vehicle
- Assessment support system
- Evaluation criteria