Crash Safety of Autonomous Vehicles Based on a Survey Result
Malfunctions
- Autonomous Driving System (HW/SW) failures
- Hacking, etc.

Market penetration
- 90% (Level 4) in 2040 (w/positive scenario)
- AVs and Non-AVs on a road for tens of years

Passive safety demand
- Customer’s expectation


* AV: Autonomous Vehicle, Non-AV: Non Autonomous Vehicle
Overview

- **Objective**
  - investigation of customers’ cognition w.r.t. autonomous vehicles passive safety
- **Subject**
  - driver’s license holders aged 20 and above
- **Sample**
  - 1,000 persons
- **Period**
  - Sep. 14., 2021 - Sep. 29., 2021
- **Confidence level**
  - 95% ± 3.10%
- **Funded by “Development of safety assessment technology of driving and collision response for level 4 automated vehicle”**
  (Ministry of Land, Infrastructure and Transport of Republic of Korea)
  - Budget: 19.8 Billion KRW
  - Coordinator: Jo, Kwang-sang (@KATRI)
Public Survey of Autonomous Vehicle Crash Safety

Result

- Crash Safety Performance Level
  (fully autonomous vehicles - SAE Level 5)

![Bar chart showing survey results]

- Need more advanced crash safety performance than the current level: 61.5%
- Need same crash safety performance as the current level: 31.6%
- No need for crash safety performance: 6.9%

Unit: %
Research on Autonomous Vehicle Crash Safety

**Result**

- Willingness to purchase fully autonomous vehicles (when they are released to the market)
- Reasons not to purchase

**Willingness to purchase fully autonomous vehicles**

- Yes: 47%
- No: 53%

**Reasons not to purchase**

- Anxiety about failures of autonomous driving function: 68.1%
- Higher price than the current vehicles: 16.1%
- Responsibility issues in crash accidents: 6.4%
- Preference to driving by oneself: 5.3%
- Car sharing service: 2.6%
- Others: 1.5%
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Result

- Time to purchase fully autonomous vehicles

![Bar chart showing the percentage of people who would purchase fully autonomous vehicles at different time intervals after market release.]

Unit: %

- 1 year after market release: 1.7%
- 3 year after market release: 15.9%
- 5 year after market release: 15.7%
- When the safety of autonomous driving function is guaranteed: 65.4%
- Others: 1.3%

When the safety of autonomous driving function is guaranteed is the most preferred time to purchase fully autonomous vehicles, followed by 5 years after market release.
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Result

- Occupant protection devices/technologies preference

<table>
<thead>
<tr>
<th>Device/Protection</th>
<th>Priority 1</th>
<th>Priority 1+2</th>
</tr>
</thead>
<tbody>
<tr>
<td>New type of devices for autonomous vehicles</td>
<td>44.3%</td>
<td>57.8%</td>
</tr>
<tr>
<td>Safety belts</td>
<td>26.9%</td>
<td>49.8%</td>
</tr>
<tr>
<td>Airbags</td>
<td>23.0%</td>
<td>73.0%</td>
</tr>
<tr>
<td>Seats</td>
<td>5.1%</td>
<td>15.5%</td>
</tr>
<tr>
<td>No need for occupant protection devices</td>
<td>0.7%</td>
<td>0.7%</td>
</tr>
</tbody>
</table>
Opinion

- Autonomous vehicles can be involved in crashes
  - Malfunction or hacking may occur
  - Mixture of AVs and Non-AVs on a road

- Autonomous Vehicles will provide more flexibility of seating layouts and postures
  → new passive safety test methods are necessary

- Crash safety performance of autonomous vehicles should be required to be equivalent to or more advanced than the current level, considering the traffic situation and market expectation and so on
Thank you for your attention