Modelling the Impact of Automated Driving

Private AV scenarios for Germany and the U.S.

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Context

- Market entry of autonomous vehicles (AVs) level 4+ (SAE) expected in the 2020s
- When drivers can safely engage in other activities they might be willing to spend more time in the vehicle
- Impact on travel choices expected

Objective

- Modelling the expected fleet of private autonomous vehicles for the U.S. and Germany in 2035
- Modelling travel behavior impacts of introducing AVs into the private car fleet
- Analyze changes in destination and mode choice and VMT

Methodology

<table>
<thead>
<tr>
<th>AV fleet modelling</th>
<th>Assign vehicles to households</th>
<th>Trip generation</th>
<th>Aspatial travel demand model</th>
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</thead>
<tbody>
<tr>
<td>• Take rates of AVs derived from historical deployment of ACC systems</td>
<td>• Vehicle age class differentiation</td>
<td>• Weighting NHTS datasets for 2035 (demographic effects)</td>
<td>• Combined distance and mode choice model</td>
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<tr>
<td>• Generate AV fleets using a diffusion model</td>
<td>• Allocation of AVs by mileage and user type</td>
<td>• Enabling AV-availability for relevant trips</td>
<td>• Adjustment of generalized costs for AV trips</td>
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Results

VMT increase by 2.4% in Germany and 3.4% in the U.S.

Autonomous vehicle fleet (level 4 & 5)

Modal split changes

Changes in trips per distance