Session Title: Ensuring strong public support for automation in the planning process

Autonomous Vehicles: Familiarity, Concerns, and Perceptions
TOMNET Transformative Technologies in Transportation (T4) Survey

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TOMNET Transformative Transportation Technologies Survey
https://tomnet-utc.engineering.asu.edu/t4-survey/

- Phoenix, Atlanta, Austin, and Tampa
- Summer and Fall 2019 (pre-pandemic)
- Random address-based sample
- Online instrument
- Inclusion of attitudes, stated preference questions, and perceptions and choices of Mobility-on-Demand and Autonomous Vehicles

<table>
<thead>
<tr>
<th></th>
<th>Phoenix, AZ</th>
<th>Atlanta, GA</th>
<th>Austin, TX</th>
<th>Tampa, Fl</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Size</td>
<td>1,027</td>
<td>944</td>
<td>1,127</td>
<td>260</td>
<td>3,358</td>
</tr>
<tr>
<td>%</td>
<td>30.6%</td>
<td>28.1%</td>
<td>33.6%</td>
<td>7.8%</td>
<td>100%</td>
</tr>
</tbody>
</table>
Level of AV Familiarity

Only half are somewhat or very familiar with AVs!

- I have actually taken a ride in an AV. %1
- I am very familiar with AVs. %12
- I am somewhat familiar with AVs. %35
- I have heard of AVs, but don't know much about them. %36
- I had never heard of AVs before taking this survey. %15

AV awareness campaigns and media coverage have not necessarily brought about a high level of familiarity across the population in the study areas.

N=3358
What Matters for Level of AV Familiarity?

Level of familiarity increases among:

- Higher educated people
- Ridehailing users
- People with variety seeking attitudes
- Location matters...
  - Male
  - Non-hispanic
  - Higher income

<table>
<thead>
<tr>
<th>City</th>
<th>Not heard</th>
<th>Heard but not familiar</th>
<th>Familiar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austin (N=1127)</td>
<td>16%</td>
<td>35%</td>
<td>48%</td>
</tr>
<tr>
<td>Tampa (N=261)</td>
<td>21%</td>
<td>49%</td>
<td>30%</td>
</tr>
<tr>
<td>Atlanta (N=943)</td>
<td>16%</td>
<td>35%</td>
<td>48%</td>
</tr>
<tr>
<td>Phoenix (N=1026)</td>
<td>12%</td>
<td>35%</td>
<td>54%</td>
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The 2021 TRB Annual Automated Road Transportation Symposium
AV Safety Perception: Benefit or Concern?

I want the ability to take control of the AV at any time during the ride.
I am concerned that my travel logs and personal information stored in AVs could be leaked.
I am concerned about the potential failure of AV sensors, equipment, technology, or programs.
AVs would make traveling by car less stressful for me.
AVs would make me feel safer on the street as a pedestrian or as a cyclist.
AVs would help me avoid impaired driving (e.g., under the effects of medication or alcohol).

Higher educated people, female, and Atlanta residents are more concerned!
Increased Level of Concern with AV Technology Over Time!

- 50% (Bansal and Kockelman, Texas)
- 61% (Bansal and Kockelman, Texas)
- 67% (Nazari, Washington State)
- 71% (JD Power, US)
- 68% (T4 Survey, Southern US)

Percent Concerned with AV Equipment Failure
I am concerned about the potential failure of AV sensors, equipment, technology, or programs. (N=3,356)

- Familiar:
  - Strongly disagree: 8%
  - Somewhat disagree: 10%
  - Neutral: 12%
  - Somewhat agree: 38%
  - Strongly agree: 32%

- Not Familiar:
  - Strongly disagree: 5%
  - Somewhat disagree: 6%
  - Neutral: 22%
  - Somewhat agree: 32%
  - Strongly agree: 34%

Familiarity appears to influence those who are neutral towards the technology. However, familiarity does not appreciably change the fraction who are concerned.
Willingness to Ride AV

Using the entire weighted sample, **20%** said they will **never ride an AV**.

- Higher level of familiarity and higher education level enhances willingness to ride.
- Older (41+ years), female, and tech-concerned respondents are less willing to ride AVs.
- People in **Austin** expressed higher willingness to ride.
AV Applications

- Familiarity really helps with agreeing to use AV in various applications.
- 20-30 percent are not sure about their AV use for various applications.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I would feel comfortable having an AV pick-up/drop-off children without adult supervision.</td>
<td>62%</td>
<td>21%</td>
<td>18%</td>
</tr>
<tr>
<td>I would send an AV to pick-up groceries/laundry/food orders by itself.</td>
<td>28%</td>
<td>23%</td>
<td>49%</td>
</tr>
<tr>
<td>AVs would save me time and money for parking by dropping me off and parking themselves.</td>
<td>16%</td>
<td>31%</td>
<td>53%</td>
</tr>
</tbody>
</table>

Photo: Brian Tietz for Transdev

Photo: Ross D. Franklin, STF / Associated Press
What People are Expecting to Do While Commuting in an AV?

Respondents could choose up to three activities.
AV Purchase

Using the entire weighted sample, **38%** said they will **never buy an AV**.

**Willingness to buy increases by/among:**
- Familiarity with AV
- Ridehailing use
- Tech-savvy attitude
- Less concern about privacy
- Male respondents
- High income
- Driving limitation
AV Regulatory Perceptions

Laws should be passed to require AVs to travel at 25 mph or less on city streets.

AVs should prioritize the safety of pedestrians and bicyclists on the road over that of passengers in the vehicle.

AVs should be allowed on the market only when they prove to be at least as safe as human drivers.

- About one-third of the respondents are neutral toward AV regulations.
- The majority of respondents feel AVs should be at least as safe as regular vehicles.
Conclusions

• 50 percent are still not familiar with AVs.
• 22 percent are not willing to ride and 42 percent are not willing to buy an AV.
• Almost two-thirds of the respondents are still concerned about the technology.
• Attitudes and demographics play key roles in adoption pathways.

FUTURE

Lots more work should be done in public education and awareness domains to enhance public trust in the AV technology. We must plan for AV as a technology that is going to improve mobility across all segments of the population. Do more pilots and raise confidence in the technology!
Thank you!

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For more information:

https://tomnet-utc.engineering.asu.edu/t4-survey/