Sharing Rides in Ridehailing Services and Autonomous Vehicles

*Insights from TOMNET T4 Survey*

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*School of Sustainable Engineering and the Built Environment*

2021 TRB Annual Automated Road Transportation Symposium

Workshop: Sharing AVs: Policies and Impacts in a Post-COVID World

Monday, July 12, 2021
Background

• True ridesharing currently has a very small mode share

Question:

• Will MaaS and AVs help enhance ridesharing?
Study Purpose

Provide a better understanding of preferences for ridesharing in a future of automated ridehailing
TOMNET D-STOP Transformative Technologies in Transportation Survey (T4 Survey)

- Phoenix, Atlanta, Austin, and Tampa metro areas
- Summer and Fall 2019
- Random address-based sample with online instrument
- Comprehensive attitudinal survey on MaaS and AV
- Weighted to better represent Census distributions

<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>

The 2021 TRB Annual Automated Road Transportation Symposium
Revealed Behavior and Attitudes Towards Shared Ridehailing Services
Familiarity with Ridehailing Services

N=3358

- Private ridehailing (e.g., Uber, Lyft)
  - Use it weekly: 5%
  - Use it monthly: 11%
  - Use it rarely: 39%
  - Familiar but not a user: 34%
  - Not familiar: 11%

- Shared ridehailing (e.g., uberPOOL, Lyft Share)
  - Use it weekly: 2%
  - Use it monthly: 5%
  - Use it rarely: 14%
  - Familiar but not a user: 54%
  - Not familiar: 26%

Shared services are less known and less used in comparison to private ridehailing.
Attitudes towards Shared Ridehailing

More than 50% are uncomfortable sharing rides with strangers and only about 25% feel the lower cost is worth the additional time.

- **Traveling with a driver I don't know makes me feel uncomfortable. (N=3298)**
  - Strongly disagree: 11%
  - Somewhat disagree: 16%
  - Neutral: 27%
  - Somewhat agree: 30%
  - Strongly agree: 16%

- **For shared ridehailing (e.g., uberPOOL, Lyft Share), traveling with unfamiliar passengers makes me uncomfortable. (N=3298)**
  - Strongly disagree: 8%
  - Somewhat disagree: 11%
  - Neutral: 30%
  - Somewhat agree: 32%
  - Strongly agree: 19%

- **The lower cost of shared ridehailing (e.g., uberPOOL, Lyft Share) is worth the additional time picking up and dropping off other passengers. (N=3298)**
  - Strongly disagree: 12%
  - Somewhat disagree: 18%
  - Neutral: 44%
  - Somewhat agree: 20%
  - Strongly agree: 6%
Ridehailing: Willingness to Share

Last actual ridehailing trip* (N=1,219)

- 12% chose to share
- Low income shared at a rate twice that of high income
- Women shared 1.5 times more than men
- Frequent users shared 1.4 times more than infrequent users

*Shared ridehailing only for Austin and Atlanta
* Frequent= monthly or higher
Private Ridehailing Trips
Most common trip purpose: social/recreational
Most cited alternative mode: taxi/drive alone

Shared Ridehailing Trips
Most common trip purpose: shopping/errands
Most cited alternative mode: ride the bus/ride with others
Intentions and Attitudes towards Shared Ridehailing Services Using Autonomous Vehicles
### Attitudes towards Shared AV Ridehailing

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly disagree</th>
<th>Somewhat disagree</th>
<th>Neutral</th>
<th>Somewhat agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I would feel comfortable leasing my personal AV to ridehailing companies so that I can earn money when I am not using it. (N=3358)</td>
<td>36%</td>
<td>14%</td>
<td>24%</td>
<td>19%</td>
<td>7%</td>
</tr>
<tr>
<td>I will use AV ridehailing services with other passengers I don't know. (N=3358)</td>
<td>29%</td>
<td>23%</td>
<td>27%</td>
<td>15%</td>
<td>5%</td>
</tr>
<tr>
<td>I will use AV ridehailing services alone or with coworkers, friends, or family. (N=3358)</td>
<td>19%</td>
<td>10%</td>
<td>25%</td>
<td>32%</td>
<td>14%</td>
</tr>
</tbody>
</table>
# Age and Gender

*I will use AV ridehailing services with other passengers I do not know.*

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-30 years (N=853)</td>
<td>39%</td>
<td>35%</td>
<td>26%</td>
</tr>
<tr>
<td>31-40 years (N=609)</td>
<td>50%</td>
<td>25%</td>
<td>26%</td>
</tr>
<tr>
<td>41-50 years (N=578)</td>
<td>59%</td>
<td>23%</td>
<td>18%</td>
</tr>
<tr>
<td>51-60 years (N=527)</td>
<td>59%</td>
<td>25%</td>
<td>16%</td>
</tr>
<tr>
<td>61-70 years (N=446)</td>
<td>57%</td>
<td>26%</td>
<td>17%</td>
</tr>
<tr>
<td>71+ years (N=333)</td>
<td>63%</td>
<td>22%</td>
<td>15%</td>
</tr>
</tbody>
</table>

- **Male (N=1629)**
  - Disagree: 48%
  - Neutral: 29%
  - Agree: 23%

- **Female (N=1711)**
  - Disagree: 57%
  - Neutral: 25%
  - Agree: 18%

Willingness to share rides in AV decreases with age.
High income groups are the least willing to share AV rides.

I will use AV ridehailing services with other passengers I do not know.

<table>
<thead>
<tr>
<th>Income Range</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than $25,000 (N=514)</td>
<td>40%</td>
<td>37%</td>
<td>22%</td>
</tr>
<tr>
<td>$25,000 to $49,999 (N=729)</td>
<td>48%</td>
<td>30%</td>
<td>22%</td>
</tr>
<tr>
<td>$50,000 to $74,999 (N=600)</td>
<td>54%</td>
<td>25%</td>
<td>21%</td>
</tr>
<tr>
<td>$75,000 to $99,999 (N=428)</td>
<td>51%</td>
<td>34%</td>
<td>14%</td>
</tr>
<tr>
<td>$100,000 to $149,999 (N=554)</td>
<td>58%</td>
<td>21%</td>
<td>22%</td>
</tr>
<tr>
<td>$150,000 to $249,999 (N=279)</td>
<td>58%</td>
<td>13%</td>
<td>29%</td>
</tr>
<tr>
<td>$250,000 or more (N=146)</td>
<td>76%</td>
<td>14%</td>
<td>10%</td>
</tr>
</tbody>
</table>
Current Shared Ridehailing Usage

Not an user (N=2668)

- Disagree: 26%
- Neutral: 16%
- Agree: 58%

User (N=679)

- Disagree: 33%
- Neutral: 30%
- Agree: 38%

Current shared ridehailing users are more interested in the AV version of the service when compared to non-users (experience matters!)
### Attitudes

<table>
<thead>
<tr>
<th>Agree (N=2921)</th>
<th>Neutral (N=2107)</th>
<th>Disagree/Neutral (N=1531)</th>
</tr>
</thead>
<tbody>
<tr>
<td>33%</td>
<td>26%</td>
<td>55%</td>
</tr>
<tr>
<td>19%</td>
<td>27%</td>
<td>45%</td>
</tr>
<tr>
<td>17%</td>
<td>28%</td>
<td>57%</td>
</tr>
<tr>
<td>27%</td>
<td>26%</td>
<td>49%</td>
</tr>
</tbody>
</table>

- **Disagree/Neutral (N=425)**
  - I definitely like the idea of owning my own car
  - I am committed to using less polluting means of transportation as much as possible
  - I like to be among the first people to have the latest technologies

### Preferences towards owning a vehicle relates inversely to willingness to share rides

> I will use AV ridehailing services with other passengers I do not know.
• More than half of respondents do not want to share rides in an AV ridehailing future.

• Willingness to share varies across demographic groups: decreases with age; women less willing to share.

• Attitudes play an important role in shaping willingness to share: technology savviness and environmental orientation are associated with higher willingness to share.

• Current shared ride-hailing users are more likely to share in an AV future; first-hand experience matters!
Ridehailing in a Post-COVID World
Ridehailing Usage: Post-Pandemic vs Pre-Pandemic

- 3% Much more than before
- 11% Somewhat more than before
- 57% About the same
- 13% Somewhat less than before
- 16% Much less than before

Ridehailing users before the pandemic (N=3263)

Source: covidfuture.org
• Possible new ridehailing usage driven by transit users who were avoiding crowded vehicles.

• Possible decrease in ridehailing due to physical distancing concerns.

• Projected decrease is greater than projected increase.

• Attitudes towards sharing were influenced during the pandemic; the extent to which this shift will linger post-COVID-19 is still unknown.
Thank you!

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

Presentation pictures from the internet