AARP/ Future of Privacy Forum Workshop
Representation of Older Adults in Digital Products and Services
March 18, 2021

Senior Mobility, Health, & Automation

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Senior Mobility, Awareness, Safety, & Health
Virginia Tech Transportation Institute
Driving Still Accounts for Majority of Trips for Seniors

<table>
<thead>
<tr>
<th>Travel Mode</th>
<th>Ages 65–74</th>
<th></th>
<th>Ages 75+</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Walk</td>
<td>8%</td>
<td>9%</td>
<td>10%</td>
<td>9%</td>
</tr>
<tr>
<td>Bike</td>
<td>0%</td>
<td>1%</td>
<td>1%</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Driver</strong>*</td>
<td><strong>69%</strong></td>
<td><strong>69%</strong></td>
<td><strong>68%</strong></td>
<td><strong>61%</strong></td>
</tr>
<tr>
<td>Passenger</td>
<td>21%</td>
<td>18%</td>
<td>18%</td>
<td>27%</td>
</tr>
<tr>
<td>Transit</td>
<td>1%</td>
<td>2%</td>
<td>1%</td>
<td>2%</td>
</tr>
<tr>
<td>All other modes</td>
<td>1%</td>
<td>1%</td>
<td>2%</td>
<td>1%</td>
</tr>
</tbody>
</table>

*The term “driver” refers to trips with a travel mode of “auto-driver” on the assigned travel day.*

Health-Related Impacts of Reduced Mobility for Seniors

- **Depression** (Chihuri et al., 2016; Choi and DiNitto, 2016 Edwards et al., 2009)

- **Feelings of isolation/loneliness** (Musselwhite and Haddad, 2010; van Den Berg et al., 2016; Jackson et al., 2019; Chihuri et al., 2016; Edwards et al., 2009)

- **Shortened lifespan** (Chihuri et al., 2016; Edwards et al., 2009)

- **Poorer physical condition** (Chihuri et al., 2016; Edwards et al., 2009)

- **Reduced participation in outside life/activities** (Chihuri et al., 2016)

- **Impaired cognitive function** (Chihuri et al., 2016)
Risk Factors for Senior Drivers

• Functional Impairment
  – Cognitive
  – Perceptual
  – Psychomotor
  – Physical (strength and flex)

• Medicines and medical conditions

• Frailty/Fragility

• Training issues/bad habits

• Reduced mobility – Safety not the only concern
Senior Driver Solution Space

- **Training**
  - Cognitive, Physical, or Driver (e.g., AARP)

- **Driving Restrictions**
  - Night
  - Distance from home / unknown dest.
  - Unprotected turns across path (UTAP)
  - High speed roads

- **Fitness to Drive Screening**
  - F(x)al limitations $\rightarrow$ prescribed restrictions
  - Cessation (last resort)

- **Technology**
  - Safer cars: active & passive safety
  - Low tech assistive devices – SW grip, pedal xtenders, etc.
  - High tech – ADAS & automation
Seniors Attitudes towards Advanced Technology

- Generations Survey (NHTSA) – 1,000 drivers

- oldest generation (“Silent”) exhibited least interest and comfort with advanced technology
- But they owned & used ADAS at approximately the same rates as middle generations

Owens, Antin, Doerzaph, and Willis (2015)
Older Driver Lane Change (NSTSCE)

- Antin, Wotring, Perez, and Glaser (2020)

Seniors (70+) are doing VERY few OTS checks during lane changes!
ADAS (i.e., BSM) can play a role
ADAS Exposure Study

- Pilot NDS (Blacksburg/New River Valley area of VA)
  - 18 participants
    - 9 male, 9 female
    - Age range: 70-79
- ADAS-Equipped Vehicles

Liang, Lau, Baker, Antin (2020)
Focus Group Findings - Attitudes

- Negative initial attitudes towards the advanced features
  e.g. “Nervous”, “confused” and “anxious”

- Positive post attitudes towards the advanced features
  e.g. “Positive” and “Confident”

Liang, Lau, Baker, Antin (2020)
## Focus Group Findings - Safety

<table>
<thead>
<tr>
<th>YES</th>
<th>MAYBE</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;You will love…&quot;</td>
<td>&quot;Not all of the…&quot;</td>
</tr>
<tr>
<td>&quot;Mostly it is a…&quot;</td>
<td>&quot;Don’t get distr…&quot;</td>
</tr>
<tr>
<td>&quot;Learn about 1…&quot;</td>
<td>&quot;Conside the…&quot;</td>
</tr>
<tr>
<td>&quot;Yes, but still be…&quot;</td>
<td>&quot;Have salesp…&quot;</td>
</tr>
<tr>
<td>&quot;Yes and learn…&quot;</td>
<td>&quot;Use only…&quot;</td>
</tr>
<tr>
<td>&quot;Safer&quot;</td>
<td></td>
</tr>
</tbody>
</table>

| "I’m still in…" | "Have limitati…" |
| "It definite…" | "Must study it…" |
| "See if setting…" | "Don’t get com…" |
| "These feature…" | "Do not beco…" |
| "Go for it" | "Not for tight spo…"

| "See if setting…" | "Yes – if featu…" |
| "Learn first…" | "Ma make sure con…" |
| "Safety is increas…" | |
| "Yes, blind…" | |
| "Features will…" | |
| "These safety…" | |
| "Be sure to get…" | |
| "Be sure to get…" | |

| NO | |
| "Wait for the pull” | "Lane control isn’t…" |

- Most agreed that the features improve safety
  - Learn how to use first
  - Do not become over dependent on them

"Learn first then buy”
"Don’t get complacent”

8/26/2018

Liang, Lau, Baker, Antin (2020)
Drivers Knowledge of Correct Use of New Technology Features in Vehicles

- **Sponsor:** NHTSA, Dr. Kathy Sifrit, COR (TO)/Project Manager
  - Prime Contractor: Dunlap & Associates

- **Objectives** Explore...
  - drivers’ attitudes regarding ADAS before and after having used the systems
  - how drivers use these systems during on-road driving
  - extent to which such systems affect safety behaviors such as seat belt and child restraint system use, speeding, and distracted driving

- **Methods**
  - 120 participants (50% M/ 50% F); Two age groups (40-49 and 70+)
  - Data:
    - Knowledge and Attitude Questionnaire
    - baseline and final drives involving approximately 2-hour planned routes
    - NDS – 4 weeks with the ADAS activated
Expanding Senior Mobility Space

Personal Mobility

Personal Vehicle

Public Transit

Biking/Walking

Volunteer Drivers

Ride Hailing

Livable Communities

Para-transit

Connected & Automated Tech

Advancing Transportation Through Innovation
Future Senior Mobility Landscape

- Growth in senior population
- Next Gen Seniors – Boomers same or different?
- Technologies continually emerging; transportation landscape rapidly evolving
- Livable Communities
- Drone Deliveries
- Telehealth
- COVID-19
- What constitutes a social interaction?

Advancing Transportation Through Innovation