

**AARP/ Future of Privacy Forum Workshop
Representation of Older Adults in Digital Products
and Services**

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**Senior Mobility, Health, &
Automation**

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Driving Still Accounts for Majority of Trips for Seniors

Travel Mode	Ages 65–74			Ages 75+		
	2001	2009	2017	2001	2009	2017
Walk	8%	9%	10%	9%	9%	10%
Bike	0%	1%	1%	0%	0%	0%
Driver*	69%	69%	68%	61%	62%	62%
Passenger	21%	18%	18%	27%	25%	25%
Transit	1%	2%	1%	2%	1%	1%
All other modes	1%	1%	2%	1%	3%	2%

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

From: Federal Highway Administration (2019). *Travel trends for teens and seniors: 2017 National Household Travel Survey*, U.S. Department of Transportation, Washington .C. Available online at <https://nhts.ornl.gov/>

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



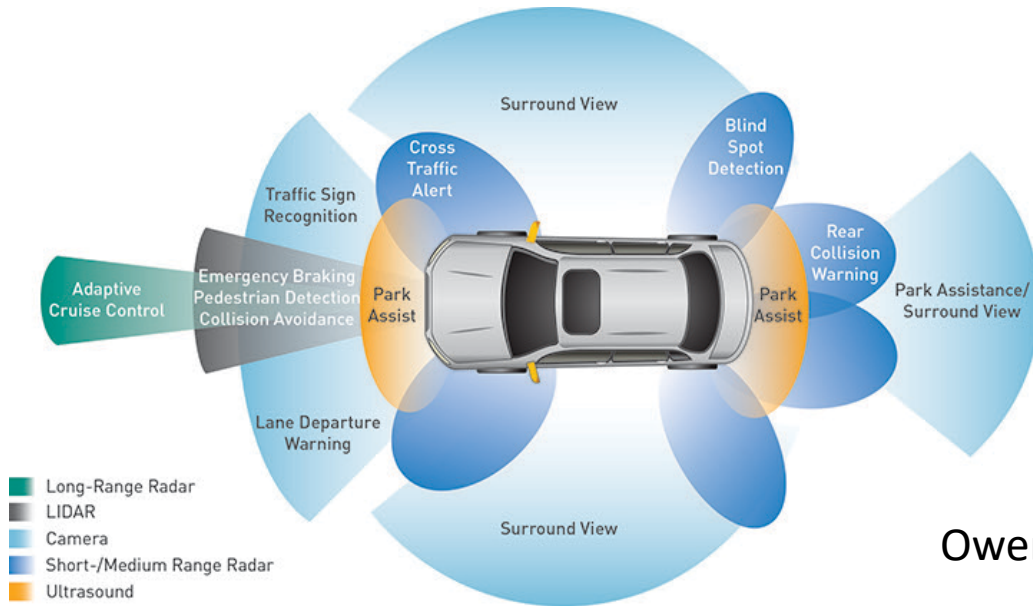
Senior Driver Solution Space

- 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 → 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)

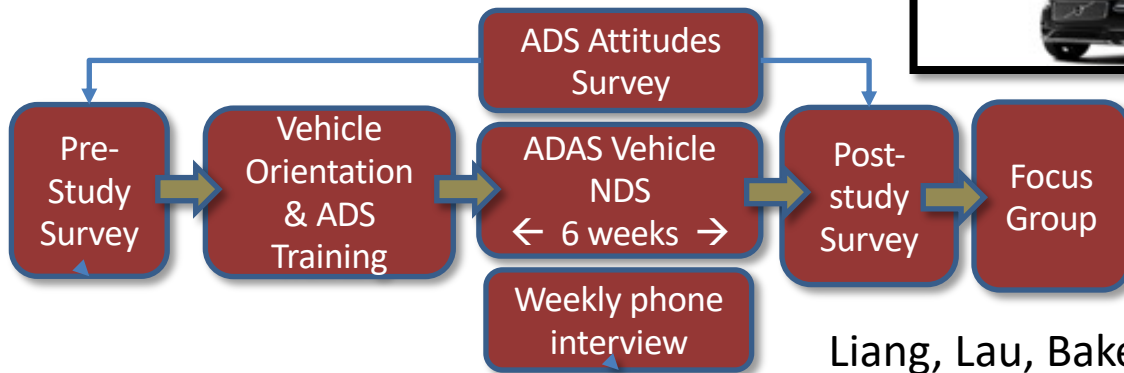
Seniors (70+) are doing VERY few OTS checks during lane changes!

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)

ADAS

Adaptive
Cruise
Control



Lane
Keep
Assist



Lane
Departure
Alert

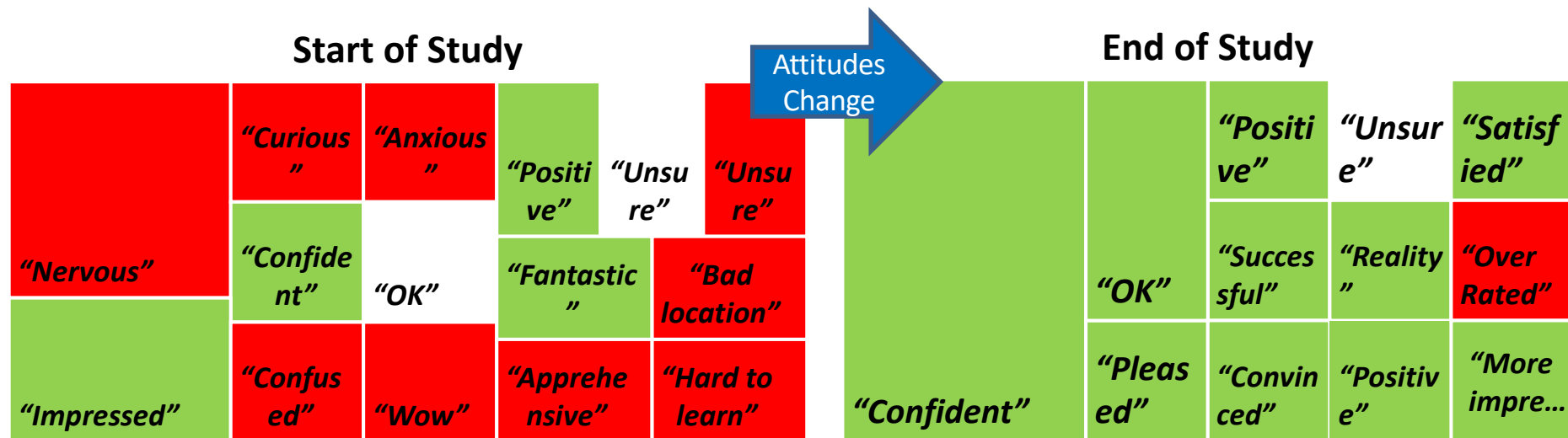


Blind
Spot
Warning



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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"

Focus Group Findings - Safety

YES

"You will love..."	"Mostly it is a..."	"Learn about 1..."	"Yes, but still be..."	"Yes and learn..."	"Safer"
"I'm still in..."	"It definite..."	"See if setting..."	"These feature..."	"Go for it"	"Have limitati..."
"Sure get it you..."	"Yes, but there is..."	"Features will..."	"These safety..."	"Be sure to get..."	"Be sure to get..."
"Learn first..."	"Safety is increas..."	"Yes, blind..."	"Makes changi..."	"I feel the vehicle..."	"The featur..."

MAYBE

"Not all of the..."	"Don't get distr..."	"Consi der the..."	"Have salesp..."	"Use only..."	
"Must study it..."	"Don't get com..."	"Do not beco..."	"Not for tight spo..."	"Yes – if featu res..."	"Ma ke sure con..."

NO

"Wait for the pull"	"Lane control isn't..."
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- Most agreed that the features improve safety
 - Learn how to use first *"Learn first then buy"*
 - Do not become over dependent on them *"Don't get complacent"*

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

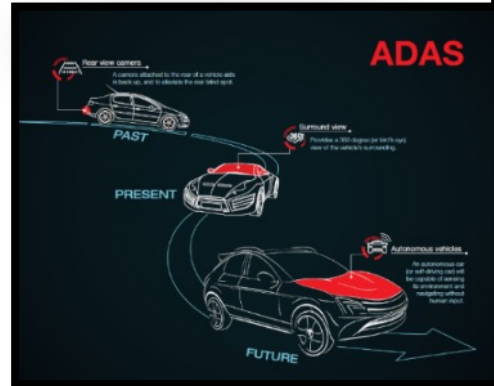
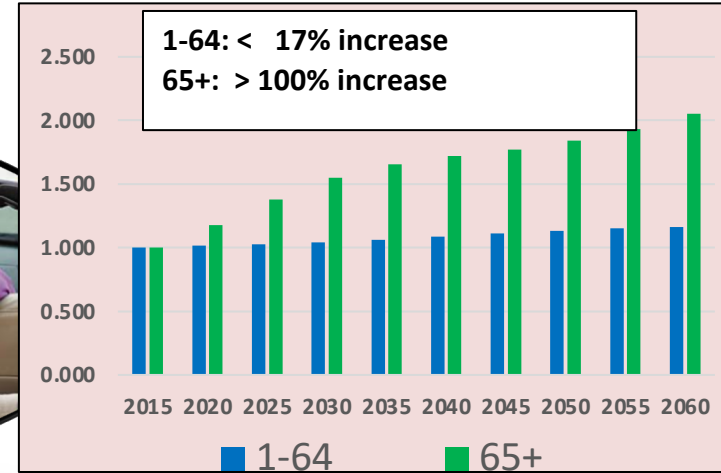
Expanding Senior Mobility Space



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



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