Automated Vehicles: Considerations for People Walking & Rolling

Safe Routes Partnership
Becky Gilliam, Regional Policy Manager
November 12, 2019
The mission of the Safe Routes Partnership is to advance safe walking and rolling to and from schools and in everyday life, improving the health and well-being of people of all races, income levels, and abilities, and building healthy, thriving communities for everyone.
We lock in change by advancing policies and increasing funding for active transportation and healthy, equitable communities at the federal, state, and local levels.

As part of our regional network, I work in Oregon to support walking and bicycling policies and funding within communities, to create a place where walking and bicycling are safe and convenient.
I’m not an AV expert. But I am an advocate. And you can be one, too!

- AV Advocacy in Oregon
- Policy considerations for people walking & biking
- Advocacy outcomes & recommendations
2018 Oregon Legislature creates **Autonomous Vehicle (AV) Task Force**, charged with developing a policy framework for both testing & deployment of AVs

**Challenges:**
- Task Force membership industry-heavy
- Quick timeline for policy & legislation
- Learning the issue

**Actions:**
- Establishing partnerships to advocate for bike/ped & frontline community issues
- Creating opportunities for engagement: testimony, outreach to members, activating partnerships
- Special meeting for deeper dive on bike/ped issues with advocacy & research panel
Automated Vehicles: Considerations for People Walking & Rolling

• Potential improvements & concerning downsides for people walking, biking & rolling
• Recommendations regarding AV design, state & local policy
Opportunity for People Walking & Rolling

- More mobility options
- Reduced expense for people who are low-income
- Freed up space for walking & biking and other uses
- Reduced fatality and injury rates
Safety & Social Equity Downsides

- Design flaws that increase risk
- Liability
- Local traffic laws
- Too costly for low-income families
- Inaccessible to people with disabilities
- Increased congestion & pollution
Considerations for AV Design

• AVs shouldn’t prioritize passengers over others
• Ensure AVs are accessible to people with disabilities
• Pass a “vision test” before deployment
• Recognize and respect traffic safety priorities, laws & regulations
Policy Considerations for Oregon

- AVs need to be safe for **everyone** on the streets
- Consider Revenue Implications & Identify Solutions
- Let localities in Oregon regulate AVs
- Consider impact on public transportation availability
Local Considerations

- Use freed up space to enhance livable communities
- Prioritize low-cost transit or shared vehicles
- Avoid further pollution and emissions
- Share data & protect privacy
• Helped to **shape policy** recommendations included in AV Task Force report to Legislature:
  • Road Markings
  • School Zones
  • Curb Space Management

• New and strengthened **relationships** with policy makers, planners & fellow advocates

• **Broadening perspective** for how transportation + emerging tech affects people walking & rolling
Advocacy Outcomes & Recommendations

- You don’t have to be an expert to advocate for change.
- Emerging technologies like AVs impact everyone and everyone should have a say, especially vulnerable and frontline communities.

- Find out what plans and policies are taking shape in your community.
- Start organizing with partners, identify allies and build relationships.
We believe that with thoughtful policies, regulation, and safety standards, the promise of AVs could be realized by people of all abilities and income levels, and create more transportation options in communities throughout the country.
Thank you!

Safe Routes Partnership
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Automated Vehicles and Schools: (Some) Deployment Issues

November 12, 2019

Michael Clamann, PhD, CHFP
UNC Highway Safety Research Center
Pedestrian and Bicycle Information Center
Part 1

AV Technology: How it Works (or Doesn’t)
AV Technology Building Blocks

The collection of hardware and software required to perceive, localize, decide/path plan and control the driving task.

Photo: Udacity
Computer Vision ≠ Human Vision

• Computer processors convert vision sensor data to useful information
  • Image acquisition by sensors
  • Preprocessing/enhancement
  • Segmentation
  • Feature extraction
  • Recognition

Photo: The Next Platform
Part 2

Key Themes for AVs & Schools
Theme 1: Variability

• Campus road infrastructure
  • e.g., separate parent drop off zones
  • What regulations apply?

• Street adjacent
  • Cars to queue on public roads for drop off/pick up
Theme 2: Parents

• Nearly half (45%) of students ride to school in a personal vehicle
  • Generates additional morning rush hour traffic
• Traffic volume adds to frustration
Recommendations

1. AV must be able to detect when they enter and exit school zones and prioritize posted speed restrictions

2. Localities should ensure roadway infrastructure is maintained to facilitate accurate detection by AV sensors
Recommendations

3. AVs should consistently comply with school zone traffic regulations

4. Developers should work with school transportation stakeholders to identify low-cost solutions that support safe AV navigation on school property.
5. Developers should ensure pedestrian detection systems account for children.

Recommendations

7. School administrators should plan to update local pick up and drop off procedures to account for AV-specific regulations and capabilities.

8. AV developers and law enforcement should develop and validate procedures for crossing guards.
9. AV test plans must account for school zones.
Further Reading

Send comments!
Michael Clamann
clamann@hsr.c.unc.edu
List of Recommendations

1. AV must be able to detect when they enter and exit school zones and prioritize posted speed restrictions
2. Localities should ensure roadway infrastructure is maintained to facilitate accurate detection by AV sensors
3. AVs should consistently comply with school zone traffic regulations
4. Developers should work with school transportation stakeholders to identify low-cost solutions that support safe AV navigation on school property.
5. Developers should ensure pedestrian detection systems account for children.
7. School administrators should plan to update local pick up and drop off procedures to account for AV-specific regulations and capabilities.
8. AV developers and law enforcement should develop and validate procedures for crossing guards.
9. AV test plans must account for school zones
FEDERAL REGULATION OF AUTOMATED VEHICLES – AND HOW IT MAY FAIL PEOPLE WHO BIKE AND WALK

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» **Who we are:** Non-profit membership organization

» **What we do:** Pursue our mission to Build a Bicycle Friendly America for Everyone

» **How we do it:** Policy advocacy, engagement programs, and education
We began working on automated vehicle issues in 2014
» https://bikeleague.org/content/automated-vehicles

Our basic ask
» Make sure that automated vehicles see people bicycling and walking and do not make people bicycling and walking less safe
## RECENT WORK

» The League opposed AV START in 2018

» [https://bikeleague.org/content/why-league-opposed-av-start-act](https://bikeleague.org/content/why-league-opposed-av-start-act)

<table>
<thead>
<tr>
<th>AV START Act</th>
<th>League Ask</th>
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<tr>
<td><strong>AV START required manufacturers to describe their process for testing</strong> their vehicles for the “avoidance of unreasonable risks to safety, including … sense of objects, motorcyclists, bicyclists, pedestrians, and animals in or crossing the path of travel” in a safety report.</td>
<td>A ‘vision test’ requiring manufacturers to <strong>prove the ability of autonomous vehicles</strong> to accurately detect, recognize, anticipate, and respond to the movements of all road users, including bicyclists.</td>
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</table>
RECENT WORK

» Bipartisan, Bicameral engagement in 2019
  » [https://bikeleague.org/content/league-leads-coalition-asking-av-restart](https://bikeleague.org/content/league-leads-coalition-asking-av-restart)

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<thead>
<tr>
<th>Circulated Language</th>
<th>League Ask</th>
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<td>In seeking an exemption, a manufacturer must provide “a detailed analysis that includes supporting test data, including on-road data, validation data, and testing data” showing that the feature or vehicle has a safety level “at least equal to” nonexempt feature or vehicle</td>
<td>A ‘vision test’ requiring manufacturers to prove the ability of autonomous vehicles to accurately detect, recognize, anticipate, and respond to the movements of all road users, including bicyclists.</td>
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WHERE ARE WE NOW?

Two Tracks of Work

1. Lower-end automation technologies
   » New Car Assessment Program update in 2020

2. Federal Legislation on Automated Vehicles
   » Legislation expected this year or next year
OPPORTUNITIES AT THE LOWER END

Euro NCAP has moved forward on automation
» Pedestrian AEB in 2016
» Bicyclist AEB in 2018

US NCAP has no published plans to include either system
NEW CAR ASSESSMENT PROGRAM

NHTSA plans to propose major upgrades:

» new technologies,
» new test procedures,
» updates to vehicle labeling,
» advancements in crash-test dummies, and consumer research.

“NHTSA will also consider new technologies tied to the safety of pedestrians and other vulnerable road users such as cyclists.”

NHTSA is working to publish a Federal Register Notice in 2020 that will seek comment on upgrades to NCAP.
US HAS FALLEN BEHIND

NHTSA NCAP had a NPRM in 2015, a meeting in 2018, and has announced something for 2020.
US LIKELY TO FALL FURTHER BEHIND

» Driver monitoring – distraction
» AEB improvements
» Pedestrian and Cyclist improvements
» Automated emergency steering
FEDERAL LEGISLATION ON AUTOMATED VEHICLES

Two Major Issues

1. Exemptions from Federal Motor Vehicle Safety Standards
   » Process to allow 25,000-100,000 vehicles per year

2. First step(s) toward regulations
   » No actual regulations
   » Some data sharing and transparency
   » Creation of Advisory Council
US TESTING OF AUTOMATION IS LIMITED

» AAA
  » Vehicles struck the dummy pedestrians 60% of the time in daylight hours at speeds of 20 mph.

» IIHS
  » Ranked most midsize cars as "superior" or "advanced"
  » But three models ranked as "basic," and three got "no credit" at all for their systems.
EURO NCAP TESTING IS ILLUSTRATIVE

### 2016 AEB VRU

**Current Test Scenarios**

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### 2018 AEB VRU

**PEDESTRIAN PROTECTION – AEB BICYCLIST**

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<th>CBLA</th>
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NCAP testing is illustrative of scenario testing
EDGE CASE ISSUES

Algorithms need “edge cases” to learn
» But also may be less safe in those cases
“Florida has quickly become the Wild Wild West for robot cars,” says Dale Swope, the former president of the trial lawyer advocacy group the Florida Justice Association.

“There is nothing stopping a Chinese tech company from beta-testing its autonomous 18-wheelers at 7:30 a.m. in an elementary school zone.”
OTHER FEDERAL LEGISLATION ISSUES

Preemption of state laws
» Traditionally, the federal government has regulated the vehicle and state governments regulate drivers – but what happens when the vehicle becomes the driver?

Accessibility
» Proposed legislation has exemptions for accessible vehicles

Research and Testing
» Limited funding in proposed legislation
WHAT’S MISSING?

» How Automated Vehicles and the built environment interact

» Anything about school zones

» Consumer protections

» Corporate responsibility for safety
TIPS FOR ADVOCACY

» Tell decisionmakers that lower-end technologies are important

» Engage at the state level – and tell us about your local needs

» Raise need to consider vehicles and infrastructure together
THANK YOU!

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