Planning Multimodal Networks in a Connected and Automated Future

Stefanie Brodie, PhD  Toole Design
Katie Heuser  Toole Design
Darren Buck  Federal Highway Administration
Housekeeping

- Submit your questions
- Webinar archive: www.pedbikeinfo.org/webinars
- Live transcript: https://link.ai.media/session?plink=HSRC
- Certificates and professional development hours
- Follow-up email later today
- Review previous episodes and sign up for upcoming sessions
Today’s Panel

Stefanie Brodie, PhD  
Toole Design

Katie Heuser  
Toole Design

Darren Buck  
Federal Highway Administration
PBIC Resources on Automated and Connected Vehicles

Topic Page: Automated and Connected Vehicles

Central repository for research, reports and guidance related to biking/walking and CAVs

https://www.pedbikeinfo.org/topics/automatedvehicles.cfm
PBIC Resources on Automated and Connected Vehicles

**Discussion Guide for Automated & Connected Vehicles, Pedestrians, and Bicyclists**

Presents ten key challenges at the center of discussions around CAVs and implications for nonmotorized road users

Establishes key definitions and lays out potential needs for both policy and research

https://www.pedbikeinfo.org/resources/resources_details.cfm?id=5082
Planning Multimodal Networks in a Connected and Automated Future

July 12, 2021

Katie Heuser | Planner II
Stefanie Brodie, PhD | Research Practice Lead
Agenda

- What are we talking about?
- What are we doing?
- What have we found?
- What is next?
What are we talking about?

Definitions
Automated Vehicles (AV)

0. No Automation
- Zero autonomy; the driver performs all driving tasks.

1. Driver Assistance
- Vehicle is controlled by the driver, but some driving assist features may be included in the vehicle design.

2. Partial Automation
- Vehicle has combined automated functions, like acceleration and steering, but the driver must remain engaged with the driving task and monitor the environment at all times.

3. Conditional Automation
- Driver is a necessity, but is not required to monitor the environment. The driver must be ready to take control of the vehicle at all times with notice.

4. High Automation
- The vehicle is capable of performing all driving functions under certain conditions. The driver may have the option to control the vehicle.

5. Full Automation
- The vehicle is capable of performing all driving functions under all conditions. The driver may have the option to control the vehicle.

Autonomous Vehicles

Source: US DOT
Connected Vehicles (CV)

Source: US DOT
CV/AV Technology

- **Detection**: monitoring the external environment of the vehicle, including roadway infrastructure and other road users
- **Prediction**: understanding location, speed, and trajectory of other road users and responding accordingly
- **Communication**: exchanging information on the vehicle’s intentions with other road users
Multimodal Networks
What are we doing?

Project Overview
Project Overview

- Examine how planning and program development for pedestrian and bicycle networks might change with CV/AV technologies
- Explore how policy and operations can harness CV/AV technologies for the good of active transportation users
Literature Review

Goals:
Document the current state of practice for CV/AV technology and active transportation
Identify gaps and prominent issues

Outputs:
Synthesized current CV/AV technology
Developed and categorized uncertainties
Interviews

10 interviewees

- Cities
- States
- Transit agencies
- Technology providers

Topics

- Technology
- Policy
- Equity
- Land use Context
- Transit

- Original equipment manufacturers (OEMs)
- Third-party companies
- Research institutions
Interviews

Goals:
Validate findings from the literature review
Understand how different actors are responding to uncertainties

Output:
Identified 5 scenarios based on uncertainties
Workshop

Goal:
Discuss scenarios with practitioners, researchers, and experts

Output:
Policy and regulatory considerations for FHWA to support state and local regulation of CV/AVs
What have we found?

Uncertainties and the Big Questions
Market Penetration

When and where will CV/AV technology be commonly deployed?

How will the public receive CV/AV technology?

Source: US DOT
Communication and Connection

How will CV/AVs communicate with other road users?

How will CV/AVs be connected to pedestrians, bicyclists, infrastructure, and vehicles outside of their fleet?

Should cyclists and pedestrians be required to be connected?
Vehicle Occupancy

Will the future fleet be dominated by autonomous vehicles that are shared or privately-owned?

Source: US DOT
Programming and Decision Making

How will CV/AVs make decisions?

How will social and cultural norms influence programming?

How will technology producers address algorithmic bias?
Interventions and Recommendations from the Interviews

- Testing
- Technology for interacting with vulnerable road users
- Standardize communication technology
- Cybersecurity
What is next?
# Workshop Scenarios

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<td>Pedestrian and bicycle communication via cellphones</td>
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Next Steps

- Workshops
  - July 2021
- Summary report
  - Early Fall 2021

Source: US DOT
Thank You!

⇒ Keep an eye out for follow-up email later today

⇒ Follow up with us:
  ⇒ Stephanie Brodie  sbrodie@tooledesign.com
  ⇒ Katie Heuser  kheuser@tooledesign.com
  ⇒ Darren Buck  darren.buck@dot.gov
  ⇒ General Inquiries  pbic@pedbikeinfo.org

⇒ Archive at  www.pedbikeinfo.org/webinars