Autonomous Vehicles: Considerations for People with Disabilities and Older Adults

M-City test shuttle at the University of Michigan

June 2018

About the National Center for Mobility Management (NCMM)

The National Center for Mobility Management is a national technical assistance center funded through a cooperative agreement with the Federal Transit Administration, and operated through a consortium of three national organizations—the American Public Transportation Association, the Community Transportation Association of America, and Easterseals Inc. The mission of the Center is to promote customer-centered mobility strategies that advance good health, economic vitality, self-sufficiency, and community.

"Cutting-edge advances, such as automated vehicles and drones, have the potential to significantly improve safety, increase access for our elderly and people with disabilities, and change how we transport goods. … [T]his technology is evolving so rapidly that we [at USDOT] are already working on AV 3.0, which will be intermodal and address barriers to the safe integration of autonomous technology, not just for passenger cars but also for buses, rail carriers, trucks, infrastructure and port operations." USDOT Sec. Elaine Chao

The age of autonomous vehicles (AVs) is upon us. The AV world is changing rapidly with daily developments; multiple billions of dollars are being spent on testing and altering how AVs operate. Many cities are planning or conducting AV shuttle pilots (but only a few with transit involvement). Many states are actively considering what changes will occur and what planning is required as we transition to an AV future.

These fully autonomous vehicles have been lauded as "the" solution for those who cannot currently drive themselves because the vehicles do not require a human driver. However, the National Center for Mobility Management (NCMM) finds the reality to be more complicated. Automation simply refers to the method by which a vehicle is operated; it does not imply anything further with regard to vehicle type, the accessibility of those vehicles, public or private ownership/control, user cost, and perhaps most importantly, how humans inside and outside of the

Nutonomy Autonomous Vehicle.
Source: Boston Metropolitan Area Planning Council

vehicle will interact with it. The promise of fully accessible AVs that respond to the needs of older adults and people with disabilities will be realized only if full attention is given to all of these other characteristics before design/infrastructure decisions become baked into communities' designs. This can only be accomplished through inclusive planning efforts to include older adults and people with disabilities themselves during the development phase, and collaboration across all modes that will be impacted by AVs.

AV technology must also be considered along with the simultaneous development of connected vehicle (CV) technology. The term CV refers to the capability of the vehicle software to communicate. It does not necessarily mean that the vehicle is automated at all. To be discussed below is to what a CV will be connected to – whether other CVs, infrastructure, or both – and the implications for state and local responsibilities and expenses.

AV Laws and Regulations

Federal Level

At the present time, there is no federal law that specifically governs AVs. Legislation has been introduced in Congress, but there is a fierce debate in the Senate regarding the level of regulation, preemption of state regulation, and safety concerns. However, it is clear that a majority of both houses of Congress strongly favor passing a law that provides flexibility to private companies in the tech and automotive industries to continue to innovate test, and eventually operate AVs on public roads.

Pursuant to its jurisdiction over modes of transportation and vehicle safety standards, the U.S. Department of Transportation is paying close attention to and encouraging the development of AVs as well as related CV technology. The department has hosted forums for stakeholders across its modal administrations and for people across the country. The National Highway Transportation Safety Administration (NHTSA) has issued Automated Driving Systems 2.0 and version 3.0 is expected in the summer of 2018. FTA has led with its Strategic Transit Automation Research Plan, which explores automated transit service, on-demand modes, and the consequences of automation for the transit workforce.

State Level

States have been busy laboratories relating to AVs and CVs. Most states have passed laws that address AVs, but most of those laws only provide for a study to be conducted, for a committee to explore AV issues (often in connection with CV issues), and/or to provide rules for platooning[1] on public roads. Some states allow AVs to operate on public roads, whereas others provide for a framework for testing, and still others, such as California, have established a graduated regulatory system with separate permitting for AVs operated without a human versus those operating with a human back-up driver.

Accessibility

What exactly do we mean by accessibility in the context of AVs? Accessibility refers to the ease with which people with differing physical, sensory, and cognitive abilities can 1) access physical equipment for entering, using, and exiting AVs; 2) use communication interfaces to obtain information about available AVs and summon, cancel, and pay for an AV service as well as quickly and reliable communicate with the AV and its central control system while the vehicle is in operation, particularly in the event of an emergency.
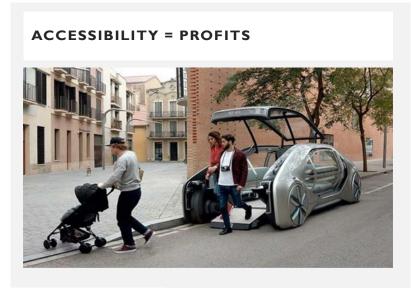
Physical Accessibility

The Americans with Disabilities Act (ADA), 42 U.S.C. § 12101, et seq., which was passed in 1990, does not require that privately owned automobiles and light trucks be accessible; nor are they required to be available at the same or comparable cost as non-accessible vehicles. Publicly funded transit service is required to be accessible and, under defined circumstances and for eligible riders, complementary accessible paratransit service is required to be provided for those who need it. (For more information, refer to transportation-related regulations and guidance provided by the Federal Transit Administration and the U.S. Department of Transportation.) However, the advocacy and lawsuits that continue 28 years after passage of the ADA are a testament to the difficulties that people with disabilities and older adults continue to experience with transportation services and transit that are not fully accessible. What the ADA has successfully accomplished is creating acceptance and general awareness of accessibility and the needs of different levels of ability.

---

[1] Platooning generally refers to trucking convoys where the lead truck is operated by a human driver and the rest follow by employing CV technology, either with or without human drivers on board. It is unclear, though likely, that all AVs will at some point have this capability. This type of CV technology raises cybersecurity concerns because hacking the point of control could conceivably disrupt or cause crashes involving an indefinite number of vehicles and bystanders.

For demand-response or on-demand transportation services provided by the nonprofit or private sector, such as taxis, ridehailing,[2] and microtransit, the picture becomes complicated due to federal legal requirements, public funding streams that have helped provide accessible vehicles and fleets, and additional local and state requirements, where they exist. In a nutshell, there is no requirement that every vehicle on American roads be accessible to all people regardless of their physical, sensory, and cognitive abilities.

ACCESSIBILITY = PROFITS

EZ-GO Concept Car by Renault

Interface Accessibility

The ADA is a law that predates the Internet, smartphones, apps, and emerging transportation modes. But other laws, ADA regulations, and judicial interpretation have extended accessibility mandates to technology as it has evolved since the ADA was passed. For example, courts have agreed that websites are effectively places of public accommodation and commercial websites are required to comply with ADA regulations. The Telecommunications Act (47 U.S.C. §§255, 716, and 718) requires telecommunications equipment and services to be accessible to, and usable by, individuals with disabilities, "where readily achievable." In §716, courts extended this mandate to smartphones, apps, and texts. It is reasonably safe to presume that soon interfaces developed for wayfinding, ridehailing, other transportation services, and AVs will be required to be accessible. Further, Section 508 of the Rehabilitation Act of 1973 (29 U.S.C § 794 (d)), enacted in 1998, requires federal agencies to make their electronic and information technology (EIT) accessible to people with disabilities.

What Is a Mobility Management Professional to Do?

Mobility management professionals have an important place at the AV table. Significant issues are not yet being discussed to the level at which they should be, such as the accessibility of AVs for those with physical disabilities, how to ensure the safety and trust of physically and cognitively frail riders when using AVs, and the passenger transportation needs of rural and small metropolitan areas.

Stay Current on the AV Discussion

To prepare for a role in the AV discussion, mobility management professionals can be educating themselves about AV planning and legislation in their states and localities. It is valuable to pay attention to what is going on in your own state, region, and locality (or localities). You are the expert in the political

---

[2] Ridehailing and other terms are used to refer to the types of services that Uber and Lyft provide. These primarily app-based, on-demand transportation services are also referred to as ride sourcing and transportation network companies (TNCs). State laws generally use the term TNCs.

culture, who works well together, how success is achieved, the transportation needs that exist, and what possible solutions will not be acceptable and which are apt to be embraced or will require lots of preparation and coalition building.

Here is a list of issues that mobility management professionals should be knowledgeable about and be ready to speak with others about:

- Law in your state regarding AVs and CVs.

- Any statewide council that is considering or has addressed AV issues and planning.

- Advocacy efforts relating to AVs in your state, who is involved, and what issues are being considered.

- AV impacts for state and local revenue streams and costs. Implications for your organization and for your partners.

- Needs of your population segment in terms of access to AV transportation, caretaking, and regional connectivity.

Learn More About Relevant Issues

Planning and disability rights organizations are releasing publications on AVs to help educate planners, advocates, and others about accessibility, land use issues, funding programs, and ways to rethink transportation. Disability organizations are poised for action so that their constituencies will be able to take full advantage of the freedom that AVs have the potential to produce. While organizations serving older adults have not produced written work specifically about AVs, many are educating themselves and their constituencies as they consider next steps. In the public arena, no city or state has a definite planning to-do list for getting ready for AVs.

The following are good sources that pose relevant questions for thought regarding older adults, people with disabilities, and AVs:

- [Mobility & Aging in Rural America: The Role for Innovation](#) from [Grantmakers in Aging](#).

- The [Ruderman Family Foundation](#) 2017 white paper, [Self-Driving Cars: The Impact on People with Disabilities](#), describes the demographics of people with disabilities, real-life consequences of unequal transportation access, and what must be accomplished in terms of law and policy in order to ensure that AVs will be accessible.

- The [Disability Rights Education & Defense Fund](#) (DREDF) hosts an excellent [AV webpage](#) that includes a thorough [checklist](#) of what must be included with AVs and accompanying interaction technology for these vehicles to be deemed accessible. DREDF has posted its comments about federal regulatory developments. The AV webpage also includes the National Council on Disability 2015 report, [Self-Driving Cars: Mapping Access to a Technology Revolution](#) (PDF), to which DREDF contributed. Although outdated in terms of its description of the state of AV technology, the excellent report explores the AV revolution in automobile technology and the promise it holds for people with disabilities, as well as the obstacles the disability community faces

to realizing that promise. The report examines the technology, then-current approaches to regulation, and potential technological and policy barriers to full use by people with disabilities; it also provides recommendations for preventing or eliminating those barriers.

- The American Planning Association (APA) hosts an [AV webpage](#) with good and varied resources.

- The National Association of City Transportation Officials produced a helpful [Blueprint for Autonomous Urbanism](#), which has been the model for AV city planning by focusing on municipal goals and thinking of AVs as tools for accomplishing those goals. It is useful to read for considering planning factors for localities large and small.

- [AVs in Cities](#) is a project of Bloomberg Philanthropies and the Aspen Institute. While not to be relied on as complete or updated in real time, the website provides a wonderful worldwide map – capable of zooming in to any AV planning or pilot location – and a synopsis of and links to information about planning and AV pilots in cities in the US and in other countries.

Begin Discussions in Your Community

Mobility management professionals can also begin discussions now with their peers in their regions and states as well as partners from other sectors. The devil is always in the details and mobility management professionals are perfectly positioned to delve into those details and to prepare their states, regions, and communities for AVs.

Many mobility management professionals are concerned about frail and vulnerable individuals. How we provide the caretaking assistance that people with significant disabilities need when they travel will depend on our commitment, but it will no longer be tied to whether an employee or a volunteer is able to drive.

Ligier EZ10 Self-Driving Minibus
Source: [Wikipedia](#)

Gather data or indicators of need for caretakers – paid or volunteer – on AVs to replace the caretaker role that drivers have traditionally performed. What percentage of riders need physical or other assistance? What percentage of riders could transition to access vehicles independently were they available at curbside on demand, via walkable streets, or with first-mile/last-mile options? Use this data for determining the percentage and number of riders who need personal assistance and the percentage and number of riders who may be able to access shared rides (either public or private) via an accessible and safe street network. The data will also be useful for producing cost estimates. Data and anecdotes about needs will be valuable for collaborating and communicating with these partners.

Also collect stories that paint a picture of the personal implications of what the data means to real people who need transportation.

Here is a list of actions to consider. The data and personal stories collected will be valuable for all of the following communications and collaborations.

- Connect with anyone else in your professional orbit who is educated about AV issues or is interested in them.

- Introduce AVs as a recurring topic in mobility management meetings to provide brief updates and remind peers that the opportunity to impact AV design and operation is now, as the industry is still developing

- Form a local, regional, or statewide mobility management committee to plan for changes.

- Connect with transportation-related partners, such as regional planning organizations, political leadership, and transit and public works agencies.

- Connect with partners in human services, health care, education, and business to educate them about how AVs will affect their delivery of services and their labor forces.

- Host a forum or periodic forums for a broad range of stakeholders so that they can begin to ponder, collaborate, and plan for the impacts AVs will have on their constituencies.

Conclusion

> *"There is a naïve view that AVs are in themselves beneficial. They can be beneficial only if we deliberately make them so." Peter D. Norton, Associate Professor of History, Department of Engineering and Society, University of Virginia*

Keep in mind that AVs are coming; there is no doubt about that. The timing is uncertain and they are not arriving right away. There is plenty of time to prepare. Mobility management professionals can influence how their states, regions, and communities plan for and respond to AV developments, and what governments, agencies, and businesses decide to require of AV technology, data, and the many ways in which our transportation networks will be transformed.

Like every other societal transition, we will all learn along the way. NCMM is here to help mobility management professionals as they work across the country. Feel free to refer to the [NCMM website](#) and to contact us in person. For more information about AVs, please contact Sheryl Gross-Glaser at grossglaser@ctaa.org.