

Appendix 2

Autonomous Vehicle Project Delphi Panel Survey Phase 1

Thank you for agreeing to be part of the MI-DDI Autonomous Vehicle Project Delphi Panel. The aim of the project is to assess the possible impact of the use of autonomous, self-driving vehicles by individuals with both physical and intellectual and developmental disabilities (I/DD). The possible impact of this new technology on the disability community is largely unknown at this time. The possibility for positive outcomes (e.g. increased mobility, independence and inclusion) appears to be high. However, there are considerations to be made to minimize the potential for harmful or outcomes (e.g. legal impact, financial exclusion, accessibility of the technology by users with disabilities).

Your Role as a Delphi Panel Participant

Your role as a Delphi Panel participant is to complete this survey, using your expertise to provide insight and recommendations related to the topic of autonomous vehicles and their use by individuals with both physical and I/DD.

In 2019, focus groups were completed with individuals with disabilities and family members around the state of Michigan. The focus groups gave people chances to ask questions, share their transportation-related issues, and offer ideas, hopes, and concerns over the prospect of using driverless vehicles in the near future. The data gathered from the focus groups has been used to build the survey you are about to complete.

Directions: Please be sure to read through all of the statements that follow. You will be asked to rate the statements on a scale of 1 to 5, with 1 being No Priority and 5 being A Top Priority. You will also be asked to provide written responses to identify any topics or ideas that you feel were not included in the survey but that should be considered by this group in the future. It should take between 25 and 45 minutes to complete the survey. If you have any issues, please email mikebray@wayne.edu for help.

Statement of Consent to Participate

By clicking on **I Agree to Continue**, I am consenting to my participation as a member of the Autonomous Vehicle Project Delphi Panel. I understand that my responses to the items in the following survey will be anonymous and that they will be combined with all other responses. I also understand that the results of this project will be written into a paper that will be sent to stakeholders across Michigan. The results will be used to help inform those working in areas related to the design, development, and use of autonomous, driverless vehicles as to the potential impact of these vehicles on the lives of individuals with disabilities and their families.

To move on to the survey, please select I agree to continue.

Yes, I agree to continue

Topic 1: Current Transportation Barriers

The statements that follow refer to **current transportation barriers**. These statements were identified by focus group participants who have different lived experiences related to disability and transportation in Michigan.

Please read each statement and then choose how high of a priority you feel each should be for policy makers, automobile companies, public transportation authorities, and social and healthcare systems to consider. In other words, how important is it to address each barrier in order to improve transportation for persons with disabilities and their family members across Michigan? Please read through each statement and then rate them as to their level of priority on a scale of 1 to 5, with **1 = No Priority, 2 = Low Priority, 3 = Not Sure, 4 = High Priority, and 5 = A Top Priority**.

1. Lack of consistent public transportation options in rural Michigan communities.
2. There is a lack of ride-share (e.g. Uber, Lyft) transportation options in many rural communities in Michigan.
3. High cost of regularly using a taxi or ride-share (e.g. Uber, Lyft) service to get around the community.
4. Difficult to schedule door-to-door transportation (e.g. must be done several days or several weeks in advance).
5. Reliance of persons with disabilities on direct care staff to drive them to all appointments.
6. Unreliable public transportation schedules in many places.
7. Inaccessibility of public transportation and ride-share (Uber, Lyft) options (e.g. people who use wheelchairs or have sensory or mobility-related disabilities).
8. Weather conditions during the winter months in Michigan.
9. Medicaid and other insurance options do not cover many of the transportation expenses that persons with intellectual and developmental disabilities are expected to pay for.
10. Public and private transportation options have limited hours of operation.
11. Income restrictions for individuals with intellectual and developmental disabilities.
12. The high costs to own or lease accessible vehicles.
13. Difficulty in getting a driver's license for people with intellectual and developmental disabilities.
14. Limited schedules of public buses and shuttles in many areas of Michigan (e.g. do not run on Sundays).
15. Extra time that people with disabilities must use to plan to travel in their communities using public transportation.
16. Limits on the number of bags (e.g. grocery bags) a rider can carry when using public and door-to-door service vehicles.
17. Regular "travel training" is NOT offered for persons with intellectual or developmental disabilities.
18. Public and regional transportation services usually cannot cross county lines.
19. Risk of being bullied or singled out when using public buses or shuttles.
20. A critical shortage of direct care staff.

21. Are there things missing? If there is a current barrier or issue related to the ability of individuals with intellectual or developmental disabilities or family members to use transportation to engage with their communities that is not listed here, please add it below. Also, if you have any comments related to this topic, please feel free to add them below as well.

Topic 2: Potential Positive Impact of Autonomous Vehicles

The statements that follow refer to the potential **POSITIVE effects of autonomous vehicles** on the lives of individuals with intellectual and developmental disabilities. These statements were identified by focus group participants who have different lived experiences related to disability and transportation.

For each statement, please choose how much of a priority each one is for ensuring that autonomous transportation has a POSITIVE impact on Michigan citizens with disabilities and their family members. Rate each statement as to their level of priority on a scale of **1 = No Priority, 2 = Low Priority, 3 = Not Sure, 4 = High Priority, and 5 = A Top Priority.**

1. Providing more transportation options overall.
2. Improved safety for persons with intellectual and developmental disabilities who use autonomous vehicles.
3. Increased opportunities for persons with intellectual and developmental disabilities and family members to own and operate a personal autonomous vehicle (e.g. financing options, overall cost of purchase and maintenance).
4. Accessibility features such as wider doors and voice command options that can make transportation more accessible.
5. Prioritized availability of autonomous vehicles to those who would experience significant gains in independence and quality of life from their use (e.g. persons with disabilities, aging adults).
6. Decreased dependence on other people (e.g. family members, direct care staff, friends) for transportation.
7. Increased availability of public autonomous buses and shuttles for individuals with disabilities to go to the places they work, worship, and meet in the community for leisure activities.
8. Increased availability of autonomous public buses and shuttles to improve service availability for all passengers.
9. Increased availability of autonomous vehicles used by door-to-door, or on-demand, transportation services.
10. Increased availability of autonomous vehicles to staffing agencies and service providers.
11. Improved reliability and reach of public transportation options.
12. Enhanced connection between urban and rural communities with autonomous transportation options.
13. Availability of options for pre-programmed destination and navigation information and multiple ways to interact with vehicle controls to accommodate persons with limited abilities to communicate.

14. Are there things missing? If there is a current or potential benefit of autonomous transportation for persons with disabilities that is not listed above, please add it below. Also, if you have any comments related to this topic, please feel free to add that below as well.

Topic 3: Potential Negative Impact of Autonomous Vehicles

The statements that follow refer to potential issues that could present barriers or lead to **NEGATIVE** effects of autonomous vehicle use on the lives of individuals with disabilities. These statements were identified by focus group participants who have different lived experiences related to disability and transportation.

For each statement, please choose the level of priority the statement should have for ensuring equal access to autonomous vehicles. Rate each statement as to their level of priority on a scale of 1 to 5, **1 = No Priority, 2 = Low Priority, 3 = Not Sure, 4 = High Priority, and 5 = A Top Priority.**

1. Increased risk of being bullied or taken advantage of when traveling alone in autonomous city buses or shuttles.
2. Higher costs associated with owning and maintaining a personal autonomous vehicle.
3. Without drivers on public buses or shuttles, persons with disabilities would be less connected to people working in their communities.
4. Unclear insurance policies and laws pertaining to autonomous, driverless vehicles.
5. Passengers with different sensory-related disabilities (e.g. blind, deaf) could be at risk due to the vehicle not orienting users to where it parked or dropped them off in relation to their destination.
6. A lack of wheelchair lifts, easy entry, lock downs for wheelchairs, or other accommodations for passengers using wheelchairs or other mobility assisting technology.
7. Autonomous vehicle breakdowns and technology failures that strand passengers and owners with disabilities.
8. Individuals who are non-verbal or unable to communicate in traditional ways unable to interact with technology that requires verbal input.
9. The need to possess a driver's license in some cases which may prevent individuals from using personal autonomous vehicles alone.
10. Inability to use transportation vouchers or other state or federal money to cover the cost of some autonomous transportation options.
11. New barriers when changing a flat tire, gassing up, or charging a personal autonomous vehicle if riding in them alone.
12. In the event of a medical emergency, there may be greater delays in notifying and receiving emergency medical services in the event of no driver or attendant on a public bus or shuttle or in a personal, self-driving automobile.
13. Are there things missing? If there is a current or potential negative impact of autonomous transportation for persons with disabilities that is not listed above,

please add it below. Also, if you have any comments related to this topic, please feel free to add them below as well.

Topic 4: Accessibility of Public Autonomous Vehicles

The statements that follow refer to the **potential accessibility needs** of persons with disabilities related to autonomous **PUBLIC or PRIVATE transportation** use. These statements were identified by focus group participants who have different lived experiences related to disability and transportation.

For each statement, please choose the level of priority the statement should have for ensuring equal access to autonomous PUBLIC or PRIVATE company-run vehicles. Rate each statement as to their level of priority on a scale of 1 to 5, **1 = No Priority, 2 = Low Priority, 3 = Not Sure, 4 = High Priority, and 5 = A Top Priority.**

1. Financial equity in the use of **publicly** available autonomous vehicles (e.g. buses, shuttles, ride-share vehicles).
2. Ability to use local, state or federally issued transportation vouchers to pay for **publicly** available autonomous vehicles.
3. Multiple ways in which the **public** autonomous vehicles can alert passengers to changes in service, malfunctions with vehicle technology, or dangers. For example, using alarms, voice messages, flashing color lights, text display or video screen, or seat vibration.
4. Presence of a porter or attendant on board buses and shuttles to assist individuals if needed.
5. Expanded schedule (for example, more hours of availability) of door-to-door or on-demand autonomous transportation services.
6. Easy pay options such as a phone app, pre-paid cards or passes in the absence of drivers or attendants.
7. Enhanced, real-time scheduling for accessible vehicle pick-up and drop-off services using autonomous shuttles.
8. Regular availability of autonomous, self-driving vehicles with wheelchair lifts and ramps from ride-sharing companies like Uber and Lyft.
9. Regular training for local, regional and state transportation authorities (e.g. MDOT, DDOT, DATA, MYRIDE, etc.) on the transportation experiences of individuals with intellectual and developmental disabilities, the importance of Universal Design, and the accessibility of autonomous buses and shuttles.
10. Involvement and engagement of individuals with different disabilities - including physical, intellectual, and developmental disabilities - in the testing and regular use of emerging autonomous vehicle technology being rolled out by **public transportation authorities.**
11. Are there things missing? If there were **public** autonomous vehicle accessibility options, features or ideas for individuals with intellectual and developmental disabilities that were not mentioned above, please add them below. Also, if you have any comments related to this topic, please feel free to add them below as well.

Topic 5: Accessibility of Personal Autonomous Vehicles

The statements that follow refer to the potential accessibility needs of persons with disabilities related to **PERSONAL autonomous vehicle** use. These statements were identified by focus group participants who have different lived experiences related to disability and transportation.

For each statement, please choose the level of priority the statement should have for ensuring equal access to **PERSONAL autonomous vehicles**. Rate each statement as to their level of priority on a scale of 1 to 5, with **1 = No Priority** and **5 = A Top Priority**.

1. The low-cost ability to add a wheelchair lift or ramp to a personally owned autonomous vehicle.
2. The ability to tie or lock in place a wheelchair or other mobility aid if used by a passenger or user.
3. The cost to purchase or lease an autonomous vehicle to maintain financial accessibility for those who could benefit the most.
4. Multiple ways for users to interact with the vehicle's operations. For example, using voice commands, touchscreen input, push buttons, visual gestures, or smartphone apps.
5. Multiple ways in which the vehicle can alert passengers to changes in traffic, malfunctions with vehicle technology, or dangers.
6. Regular training for autonomous vehicle manufacturers (e.g. Ford, General Motors, Toyota, May, Navya, etc.) on the transportation experiences of individuals with intellectual and developmental disabilities, the importance of Universal Design, and accessibility.
7. Ability to have the vehicle automatically come to the person using a remote control or smartphone app.
8. Accessible safety belts that can be configured to the needs of each individual user.
9. Vehicle airbag placement when considering passengers who use wheelchairs, other mobility aids, and other passengers with disabilities.
10. Easy in and out of the vehicle, using wide doors and seats that swivel or pivot.
11. GPS, integrated maps, or other methods so passengers can choose the destination prior to riding in the vehicle.
12. Autonomous vehicles should have the ability to identify and park in accessible parking spaces if passengers require it.
13. Options to configure the vehicle cabin to fit the accessibility needs of passenger(s).
14. Compatibility of vehicle software with current phone-based assistants (e.g. Siri, Alexa, Google, etc.) and assistive technology.
15. Involve and engage individuals with different disabilities - including physical, intellectual, and developmental disabilities - in the testing and regular use of emerging autonomous vehicle technology being rolled out by automakers.
16. Are there things missing? If there were personal autonomous vehicle accessibility options, features or ideas for individuals with intellectual and developmental disabilities that were not mentioned above, please add them

below. Also, if you have any comments related to this topic, please feel free to add them below as well.