

Assessment on City/Community's Mobility Needs on Shared Autonomous Vehicles

The next revolution in the transportation world, Autonomous Vehicles (AV), will have a great impact on all aspects of our society, especially on mobility. The two types of AV in terms of ownership are private AV (PAV) and shared AV (SAV). SAV will increase mobility for those who do not own a car or are unable or unwilling to drive, such as people with disability, elderly, and households with low income. The benefits for these groups would include independence, reduction in social isolation, and access to essential services. Some of these services are currently provided by public transit or paratransit agencies, but each of these alternatives has significant disadvantages. Public transit generally requires fixed routes that may not serve people where they live and work. Paratransit services are expensive because they require a trained, salaried, human driver. Since these costs are generally borne by taxpayers, substituting less expensive SAV for paratransit services has the potential to improve social welfare. Nevertheless, outside of the vehicle manufacture and academic research arena, currently cities and communities do not have much knowledge of AV, not to mention any plan to take advantages of the benefits. The study will assess the community mobility needs of SAV on the following areas: 1) identification of potential user size of SAV, 2) current transportation mode of mobility for these potential users, 3) current unfulfilled mobility needs of these potential users, 4) current city/community spending on public transportation and paratransit, 5) current transportation spending of potential users, and 6) potential induced SAV users.

Surveys targeted to the potential user groups of SAV will be conducted. Findings and policy implications will be provided to the city/community policy makers.

Preliminary findings of the Work

An online survey was conducted through various disability advocacy groups in Michigan. 100 participants (27 males and 73 females, age 18 and above) responded to the online survey. The participants are evenly distributed among six disability types, namely vision difficulty (VD), hearing difficulty (HD), cognitive difficulty (CD), ambulatory difficulty (AD), self-care difficulty (SCD), and independent living difficulty (ILD), with the exception of hearing difficulty (about one third of other types). Among the participants, about three quarter of them are either full time or part time employed, or self-employed, or student, only a quarter are unemployed. The results found many commonalities across all disability types: lack of public and paratransit services, never or rarely take ride hailing services like Uber or Lyft, rate transportation as one of the biggest challenges facing daily, and their mobility limits affecting their independence. However, different disability types view their challenges in transportation differently, and therefore, have different level of receptivity for AV. Among the six types, VD and ILD have the highest the receptivity for AV, followed by SCD, CD, AD and HD. In addition, their receptivity changes with cost for taking AV. VD has the most consistent receptivity regardless of AV vehicle type or cost, while other types change their receptivity with cost. Although other studies found that social inclusion has been one of the challenges facing people with disabilities, it is interesting to find out that personalized AV service like Uber or Lyft, however, with cost like public transportation is preferred across all types. The findings indicate that people with disabilities view their transportation as a necessity or tool rather than a place or venue for socialization.

Collaboration with MSU Extension

A seminar and survey flyer were distributed through MSU Extension. However, additional survey responses from the MSU Extension were limited.

Impact and Next Steps

The preliminary findings of the research were presented to two conferences: 1) AV symposium (July 2019) and 2) ACSP (October 2019).

To continue the research, it is critical to increase the sample size. I am working on a few next steps:

- Reaching out to regional and national level disabilities communities.
- Forming collaboration among researchers both inside and outside of MSU; and
- Pursuing bigger funded research.