

ORAL SESSION 9: SENSORS AND MONITORING

Re-thinking community mobility for older adults amid a revolution in automotive technology

T. Kajaks, S. Nazmul, P. Raina, B.H. Vrkljan

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Purpose Driving is a critical means of community mobility, independence, and self-worth among the growing number of older Canadians. Advanced vehicle technologies (AVTs) have the potential to modify an older driver's experience and safety by compensating for age and/or health-related changes that can affect their behind-the-wheel performance (Gish et al., 2017). However, our recent scoping review highlights a dearth of literature regarding the use of AVTs by older adults (Kajaks et al., 2018). Additionally, outcomes from our recent expert international panel on vehicle automation also highlight societal challenges regarding the future of this technology, particularly with respect to our aging population and driver demographics (Hancock et al., 2017). The purpose of this work is to describe the current transportation usage of older Canadians between the ages of 45 and 85 in the context of the research gaps related to use of advanced vehicle technologies by older drivers and the recent expert insights on vehicle automation. **Method** Data from the Transportation Module of the Canadian Longitudinal Study on Aging were used to identify the use of different modes of transportation by Canadians between the ages of 45-85 (Raina et al., 2009). A survey was administered to 51,338 Canadians either by phone or in-person from across urban and rural regions in 10 provinces. Sampling weights were used to extrapolate the data to the population source. Descriptive statistics were used to determine the usage statistics for each mode of transportation. A factor analysis using principal components was used to identify how common modes of transportation (i.e. passenger vehicle, public transit, taxi, accessible transit, wheelchair/scooter, walking, and cycling) load together. **Results and Discussion** The factor analysis identified that using a passenger vehicle, accessible mobility, and wheelchair/scooter usage load together on one factor (passenger vehicle is negatively correlated with the other two modes), while all other transportation modes form a second factor. The passenger vehicle is the most commonly used mode of transportation, with 87.8% of Canadians between the ages of 45-85 using this mode as either a driver or passenger (Figure 1). In those between the ages of 45-65, 84.6% of the population drove a passenger vehicle as their main mode of transportation in the previous year compared to 77.1% of the cohort aged 66-85. Although driving a passenger vehicle is not the only mode of transportation used by older Canadians, it far exceeds other modes of transportation as the primary mode of transportation. Researchers, policy makers, and healthcare providers have two primary challenges with respect to community mobility in our aging society: 1) to ensure that, given the current preference by older adults to rely on the personal vehicle as the primary mode of transportation, developing and adhering to evidence-based safety regulations that consider the needs and abilities of older adults is a priority in the design, manufacturing, and marketing of vehicle technologies, and 2) to improve the access to and usability of alternative modes of transportation in safe and efficient ways so as to encourage increased community mobility without dependency on the passenger vehicle.

References

- Gish, J., Vrkljan, B., Grenier, A. & van Miltnburg, B. (2017). Driving with advanced vehicle technology: A qualitative investigation of older drivers' perceptions and motivations for use. *Accid Anal Prev*, 106, 498-504. <https://doi.org/10.1016/j.aap.2016.06.027>
- Hancock, P., Kajaks, T., Caird, J., Chignell, M., Feng, J., Lavalliere, M., ..., Mizobuchi, S. (2017). Toronto Rehabilitation Institute: Autonomous Vehicle Working Group
- Kajaks, T., Vrkljan, B. H., Tiong, M., Babineau, J. Campos, J., Elzohaim, Y., ..., Furlan, A. (2018). McMaster Institute for Research on Aging Annual Research Day
- Raina, P., Wolfson, C., Kirkland, S., Griffith, L., Oremus, M., Patterson, C., ..., Brazil, K. (2009). The Canadian Longitudinal Study on Aging (CLSA). *Canadian Journal on Aging*, 28(3), 221-229. <https://doi.org/10.1017/S0714980809990055>

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Address: School of Rehabilitation Science, McMaster University, Canada

Email: kajakst@mcmaster.ca

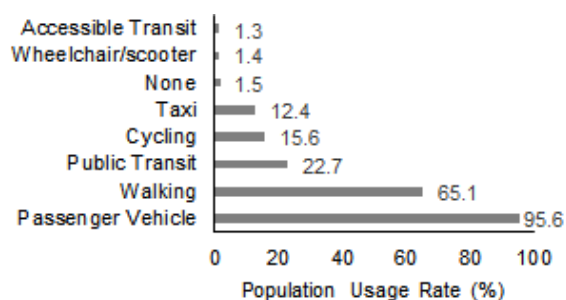


Figure 1: Monthly usage rate by mode of transportation