

need to be conducted, with a more inclusive approach in terms of the performance indicators being measured. More extensive testing and research is required to look at what the manufacturing and implementation entails on economic, social and environmental aspects, and hence conclude whether AVs can be classified as a sustainable, low carbon mode of mobility.

#2926

EQUITY CONSIDERATION IN AUTOMATED VEHICLES SAFETY: AN ANALYSIS OF ROAD FATALITIES

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Background: Automated Vehicles (AVs) have the potential to improve traffic safety and public health by preventing crashes and road fatalities. However, AVs' safety implications need to be explored adequately to better understand their impacts on different demographic groups, particularly low-income communities. Low-income communities are located near high-capacity roadways and interstates with poor roadway infrastructure, which increases their crash risk. Household's socioeconomic characteristics were shown to be negatively correlated with motor vehicle safety features, and therefore, increase the risk of crashes. Riskier driving behavior and more traffic violation were found among lower-income groups.

Methods: In this study, we explored the equity implications of AVs through their impacts on traffic safety. To this end, a retrospective study on the Dallas-Fort Worth area road crashes was designed. First, we identified the safety functionalities of AV technologies and their target crash scenarios. Then, we explored the conventional crash database in the studied area and identified those potentially preventable by AV technologies at different levels of automation. Next, we stratified the preventable crashes based on their severity. Finally, we assessed the relation between the number of preventable crashes and the communities' socioeconomic and demographic characteristics to assess equity implications.

Results: The results showed that AVs could potentially prevent up to 50%, 46%, 23%, 6%, and 5% crashes for automation levels 5 to 1, respectively. AVs were found to be more effective in preventing non-injury crashes. Among the advanced driver assistance systems (ADASs), pedestrian detection, electronic stability control, and lane departure warning have more significant potential in reducing fatal crashes. We found a U-shaped relationship between AVs' preventable fatalities and household median income. A more positive significant safety impact was found on ethnically diverse communities.

Conclusions: Our results indicate the higher bound of AVs' safety implications. Our analyses showed that low-income and ethnically diverse communities would benefit most from the implementation of AV technologies; hence, the benefit of AVs' deployment can be much higher for those communities. However, due to the potentially high cost of the technology, these communities are expected to be the last to adopt the technology, and therefore they may not take advantage of the benefits of AVs. The city and state planning and transportation agencies may consider implementing policies and strategies for making these technologies available to low-income and ethnically diverse communities at a lower cost. Potential policies could also target facilitating automated transit and/or shared AVs in low-income communities.

#2941

FACTORS ASSOCIATED WITH MUSCULOSKELETAL AND POSTURAL DISCOMFORT OF BUS DRIVERS

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Background: Sitting and driving for long hours can subject bus drivers' bodies to the stress of poor blood circulation and static muscle contractions. Body posture and workplace ergonomics influence musculoskeletal and discomfort. Consequently, musculoskeletal stress and inadequate posture increase muscle and joint overloads. Such factors contribute to the discomfort of these workers and increase their health problems. However, the factors associated with musculoskeletal pain and discomfort among bus drivers are insufficiently understood. The objectives of this study is to identify repetitive and forced postural changes, which cause musculoskeletal disorders, with bodily discomfort and worsening injuries and to detect incompatibilities between the anthropometry of drivers and the working environment of the bus, in addition to recommend preventive measures.

Methods: Through an empirical and observational method, 65 drivers and 38 buses were surveyed, over four months in a bus transportation company in Belém, State of Pará, Brazil. Ergonomics of the cabin features and techniques to assess postural discomfort have been implemented; Measurements of the vehicle cabin were made for the conformity evaluation to the Brazilian standards; Interviews with drivers to survey their socio-ergonomic profile and complaints about health problems; Questionnaire, performed after the drivers' working day, using Corlett and Bishop's body part discomfort scale to assess the interviewee's direct experience of discomfort in different body parts.

Results: The profile of drivers, most of them are over 50 years old and have more than 6 years in the occupation, and with frequent long time shifts and overtime, can explain tiredness and discomfort. The lower back region is the most prevalent for discomfort level. Repetitive and forced postural changes were observed, performed in an almost fixed position in the sitting posture. The permanent musculoskeletal disorder arises from this long-lasting static sitting posture between the seat and the steering wheel. **Conclusion:** Findings reveal that ergonomic layout of the cabin features could be improved by ergonomic changes in the design. Psychological and physical stresses characterize bus driving conditions and fatigue, overwork, and traffic environments, which contributed greatly to the symptoms observed and the respective diseases. Twenty six percent of bus drivers who participated in the study are burdened with musculoskeletal pain and discomfort that could eventually lead to the development of musculoskeletal disorders. Henceforth, ergonomic changes are recommended for posture adjustment and maintaining the driver vigilant for long working hours, including simple adjustments, such as instructing the driver to take more frequent breaks. **Keywords:** Musculoskeletal disorder(s). Bus drivers. Ergonomic features.

#2953

THE EFFECT OF COVID-19 ON INLAND WATERWAY ACCIDENTS IN BANGLADESH

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