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Safety concerns determine level of public support for driverless vehicles, finds study

by Nanyang Technological University



An NTU Singapore study has found that safety concerns determine the level of public support for driverless vehicles. To enable the safe and effective rollout of autonomous vehicles (AVs) in Singapore, the Centre of Excellence for Testing and Research of Autonomous vehicles at NTU (CETRAN), designed to replicate the different elements of Singapore's roads, facilitates testing of AVs in a real-world setting. The world's first full size autonomous electric bus, launched by NTU and Volvo Buses in 2019, is one such AV that has undergone rigorous testing at CETRAN. Credit: NTU Singapore

When it comes to the use of driverless vehicles, an individual's support for their adoption hinges on how safe they are, rather than their economic impact or privacy concerns stemming from the data they might collect, a Nanyang Technological University, Singapore (NTU Singapore) study of 1,006 Singaporeans has found.

The NTU Singapore study led by the Wee Kim Wee School of Communication and Information exposed its participants to positive and negative blog posts about [driverless vehicles](#) and their safety, their impact on jobs and the economy, and their collection of data. These three 'frames' – how something is presented to the public—were selected from a content analysis of The Straits Times news reports from 2015 to 2020.

The respondents were then asked if they thought that driverless cars were bad/good, foolish/wise, unpleasant/pleasant, useless/useful, dangerous/safe. Their support for driverless cars was also measured on a five-point scale.

After being exposed to information on how potentially dangerous driverless vehicles could be, the respondents held less favorable attitudes towards driverless vehicles even when showed a positive blog post on how autonomous vehicles (AVs) could create many high-paying jobs, or on how driverless cars could provide convenience and efficiency using the data they collect, for example by remembering our schedules or monitoring our preferences.

Professor Shirley Ho, who led the research team, said: "One major debate about driverless cars, which hinges on the use of artificial intelligence technologies, lies in their limitation to make judgments that lie at the intersections of human values, moral rights, ethics, and social norms. This limitation may present safety risks, particularly in cases when traffic accidents are unavoidable. This could potentially explain why the negative safety messages in our study had a stronger effect on the respondents."

She added that with the drive towards AV adoption globally, these findings provide policymakers with important insights. Singapore has expanded AV testing to cover all [public roads](#) in its western areas and aims to serve three areas with driverless buses from next year.

Prof Ho, who is also NTU's Research Director for Arts, Humanities, Education and Social Sciences, said: "With AVs expected to be integrated into Singapore's land transport master plan, there is an urgent need for policymakers to examine the different strategies to communicate about driverless cars to the Singapore public.

"Our study has found that it is important to address the safety considerations. Even after all the safety measures are in place, public consultation is still necessary to ensure that the public's concerns, especially those of a moral and ethical nature, are taken into consideration in the process of developing the technology, before launching driverless cars on a large scale."

The study was published in the *International Journal of Public Opinion Research* in February.

Pre-existing values drive perception of AVs

These findings build on a 2020 NTU study that surveyed the same sample of 1,006 Singaporeans. This study, published in the scientific journal *Transportation Research*, found that public willingness towards using driverless cars, which is "marginally positive," is driven by their value predispositions such as their perception of the risks and benefits of AVs, as opposed to general science knowledge or AV-specific knowledge.

In this study, Prof Ho and her team also found that while the public acknowledged the potential benefits of AVs—such as helping the elderly and disabled to be more independent, lowering fuel consumption, and increasing human productivity—they also had a high level of risk perception towards driverless cars. In addition to technical errors that may lead to safety consequences, the respondents were concerned about potential security issues from hackers and privacy issues caused by exact location tracking capabilities found in AVs.

Prof Ho said: "These findings suggest that [driverless cars](#) may not achieve widespread usage in Singapore if there are no efforts to promote it, limiting the degree to which the society can reap the technology's benefits."