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The Impacts of Emerging Mobility Options and Vehicle Technologies on Travel Behavior

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Current Situation

Technology evolves continuously as concepts become reality and change the way people live their daily lives. With the spread of wireless communications and intelligent infrastructure, a new class of vehicles has become possible such as vehicles that interact with other vehicles to drive in a coordinated way or interact with infrastructure to drive autonomously. Many projects are underway to integrate these connected vehicles (CVs) or autonomous vehicles (AV) into everyday traffic. Much remains to be done, but with the expectation that these vehicles will become available in the near future, it is important to understand public attitudes toward this new technology in this formative period.

Research Objectives

Florida International University researchers investigated potential travel behavior changes that may result from the introduction of automated, connected, electric, and shared-use vehicle (ACES) technologies.

Project Activities

Three main aspects of choice behavior were investigated: automated vehicle (AV) adoption and willingness to pay (WTP); shared mobility adoption; and mode choice. This study focused on the role that individuals' attitudes play in determining their travel choice behavior. Some of the attitudes measured were joy of driving, technology savviness, choice reasoning, trust issues, data privacy concerns, preference based on private vehicle usefulness, on-demand services, green travel preferences, and desire for efficiency and technology.

Data were collected through a stated preference (SP) survey that included a series of attitude-related questions covering various aspects of user attitudes, including general mobility preferences, perceived benefits and concerns of shared mobility, reasons against or for private ownership, and motivations for using AVs and desired features of AVs.

The data were examined using various modeling techniques to identify which factors were influential and to examine the impacts of attitudes. Models used included error component models, structural equations model, and the support vector machine method. The models identified various attitudes that played significant roles in individuals' choices.

Attitudes were found to play an important role in shaping travelers' choice behavior. For example, "riding with a stranger" and "joy of driving" were significant barriers to using ridesourcing services for many auto users. Similarly, the survey provided important insights into the underlying attitudes that influence a consumer's mode choice. Incorporating these factors improved the ability to accurately predict travel behavior choices, which can lead to a more reliable assessment of the likelihood and magnitude of behavioral shifts toward future mobility options and a better understanding of the markets for alternative transportation modes.

Project Benefits

This project produced valuable insights about how the public views autonomous and connected vehicles and what role these vehicles are likely to play in the travel choices

For more information, please see www.fdot.gov/research/.



Small autonomous buses are being tested on city streets, like this one in Gainesville, FL.