

## Exhibit D – Research Project Requirement

### Examining Heterogeneity in Public Attitudes Toward Shared Autonomous Vehicles by User Experience

**Recipient/Grant (Contract) Number:** The University of Texas at Austin/Grant # 69A3552344815 and 69A3552348320

**Center Name:** National Center for Understanding Future Travel Behavior and Demand (TBD)

**Research Priority:** Improving Mobility of People and Goods

**Principal Investigator(s):** Yongping Zhang

**Project Partners:** N/A

**Research Project Funding:** \$131,660

**Project Start and End Date:** 06/01/2025 - 5/31/2026

**Project Description:** The rapid development of autonomous driving (also called self-driving or driverless) technologies is transforming the landscape of urban mobility. As a byproduct of autonomous vehicles, the emerging Shared Autonomous Vehicles (SAVs) are increasingly positioned at the intersection of economic viability and competitiveness, time savings and productivity, technological innovation, and transport policy. SAVs are fleet-operated, fully autonomous vehicles that provide on-demand transportation services to users without private ownership. A couple of regional pilot projects have been conducted to test the viability of SAVs and their impact on existing transportation systems, whereas relatively few models (e.g., Waymo, Cruise, and Zoox) operate SAVs commercially at scale in the U.S. At this stage, public attitudes and concerns toward this emerging travel mode remain predominantly perception-based, with limited grounding in real-world SAV ride experience. This leads to a significant gap in understanding the heterogeneity of public attitudes toward SAVs between individuals with and without direct experience using commercial SAV services.

A growing body of literature has examined public perceptions and acceptance of SAVs using social media analysis, stated-preference surveys, and simulation-based approaches. These studies have generated valuable insights into the anticipated benefits, perceived risks, intentions, and psychological barriers associated with SAVs. However, most existing work has been conducted in contexts where SAVs remain conceptual or experimental, and respondents typically lack direct, real-world experience with driverless ride-hailing services. User experience represents a critical missing dimension, as it bridges the gap between speculative cognition and experience-informed attitudes that could shape actual behavioral responses during the early stages of SAVs deployment. For example, users may move away from “fear of the unknown” toward an understanding of the SAVs’ actual capabilities and limitations. Consequently, identifying heterogeneity in public attitudes across users and non-users is essential for understanding the true drivers of SAVs acceptance and adoption.

The 2024 California Vehicle Survey, conducted by the California Energy Commission, provides a unique opportunity for this research, as commercial SAVs services like Waymo have already been operating in San Francisco and Los Angeles before the survey’s completion in November 2024. The survey collected

respondents' socio-demographic characteristics, vehicle ownership information, and mode choice data, and particularly introduced a new focus on perceptions, opinions, intentions, and motivations related to autonomous vehicles and SAVs. The survey indicates that approximately **one in four respondents** has experience using on-demand driverless ride-hailing services. Leveraging the 2024 survey data, this project attempts to answer the following questions. **First**, from an overall perspective, what segments of the population are most likely to adopt SAV's services, and what are the driving factors influencing the intention to use SAVs? **Second**, focusing on the user groups, what are the significant differences in attitudes toward SAVs between groups with and without direct ride experience? Statistical models like Structural Equation Models and Fixed Effects model will be established to control the effects of a series of latent factors. The results will facilitate the understanding of both perceived and observed barriers to adopting SAVs.

**USDOT Priorities:** This section is left blank until USDOT's new priorities and RD&T strategic goals are available in Spring 2026.

**Outputs:** This project will reveal the drivers and barriers to the use of SAVs among different population segments, as well as the heterogeneity in the public's attitudes towards SAVs between users with and without direct SAV ride experience. The outcomes of this work will be documented in a final report and disseminated through one to two peer-reviewed journal articles. In addition, the findings will be presented at transportation conferences, such as the Transportation Research Board Annual Meeting and meetings of the American Society of Civil Engineers.

**Outcomes/Impacts:** Through a comprehensive analysis of recent vehicle survey data in California, this project will generate evidence-based insights to guide technology innovation and inform policymakers and stakeholders in designing policies for more efficient, reliable, accessible, and affordable SAVs. This research may also help mitigate psychological barriers to the transition from human-driven ride-hailing services to autonomous vehicle-based ride-hailing, promoting the vitality of existing mobility services.

**Final Research Report:** A URL link to the final report will be provided upon completion of the project.