

Exhibit D – Research Project Requirement Template

Modeling Preferences for Autonomous Vehicle Access Types and Usage Intentions

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): Chandra R. Bhat

Project Partners: N/A

Research Project Funding: \$75,000

Project Start and End Date: 06/01/2026 – 05/31/2027

Project Description:

As autonomous vehicle (AV) technologies continue to advance, it is increasingly important for transportation agencies to understand how individuals will access and use these technologies, as different access models have substantially different implications for travel demand, system performance, and infrastructure investment. This project examines preferences across two primary AV access modes, private ownership and ridehailing-based services, and analyzes how these preferences relate to anticipated AV usage behaviors. The study considers three key usage dimensions: willingness to use AVs for transporting children, anticipated in-vehicle time use, and willingness to relinquish driving control. In addition, the analysis incorporates three individual-level constructs that influence AV-related decisions, including perceptions of AV safety, prior experience with advanced vehicle technologies, and affinity toward shared mobility. Using data from the 2024 California Vehicle Survey, the project develops an integrated behavioral modeling framework that jointly represents AV access preferences and usage intentions. The results will provide actionable insights for improving travel demand forecasting, supporting infrastructure and fleet planning, and informing policy strategies related to AV deployment, system operations, and long-term transportation system performance.

US DOT Priorities:

This project aligns with several U.S. DOT priorities, including transportation system safety, transformation, economic strength and global competitiveness through data-driven decision making. As AV technologies continue to develop, transportation agencies face substantial uncertainty regarding how travelers will access these technologies and how resulting travel behavior may affect transportation system performance. Existing planning efforts often rely on simplified assumptions regarding AV adoption and use, despite evidence that ownership-based and ridehailing-based access models may produce substantially different travel outcomes, including differences in vehicle miles traveled, congestion, parking demand, and travel demand. Prior research has demonstrated that AV usage behaviors have important implications for transportation system operations and long-term planning.

This project develops an integrated behavioral framework that jointly examines AV access preferences and anticipated usage behaviors. Rather than focusing solely on whether individuals will adopt AVs, the research investigates how adoption modality influences key behavioral outcomes, including willingness to transport children, in-vehicle activity participation, and relinquishment of driving control. These behavioral

dimensions represent critical inputs for future travel demand forecasting and scenario planning efforts. The research supports USDOT goals related to transformative transportation technologies by providing evidence-based insights into how AV deployment may alter travel patterns and infrastructure needs. The project further contributes to data-driven transportation planning by developing behavioral models that can be incorporated into future forecasting frameworks and policy evaluations.

Outputs:

The primary output of this project will be an integrated behavioral modeling framework that quantifies relationships between AV access preferences and anticipated usage behaviors. Specifically, the project will produce statistically estimated models describing how individual characteristics, perceptions of AV safety, prior experience with newer vehicle technologies, and attitudes toward shared mobility influence preferences for private ownership versus ridehailing-based autonomous vehicle services and associated usage intentions.

Outcomes/Impacts:

As a tangible implementation-oriented product, the project will serve as the foundation for an Autonomous Vehicle Scenario Planning Toolkit for transportation planners. The toolkit will translate the study's behavioral model results into a practical resource that summarizes expected behavioral responses under different AV deployment scenarios, including varying levels of private ownership and ridehailing-based service adoption. By distinguishing between ownership-based and ridehailing-based AV adoption, the research can improve forecasts of travel demand, vehicle miles traveled, and network utilization. Improved behavioral assumptions may support more effective infrastructure investment decisions, roadway operations planning, fleet deployment strategies, and AV-related policy development. The findings may also help agencies anticipate potential unintended consequences associated with AV adoption, including changes in travel frequency, empty vehicle movements, shifts in mobility service usage, and evolving traveler expectations regarding vehicle automation.

Ultimately, the research contributes to safer, more reliable, and more efficient transportation systems by reducing uncertainty surrounding AV usage and access modes and enabling more informed planning and policy decisions. The findings may support future updates to travel demand forecasting methodologies, AV planning guidance, and regulatory frameworks used by transportation agencies and policymakers as AV technologies continue to mature.

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