Exhibit D – Research Project Requirement Template

Are We Ready? Evaluating Evacuation Preparedness, Behavior, and Vulnerability During Wildfires in Washington

Recipient/Grant (Contract) Number: The University of Texas at Austin; University of Washington/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): Lingzi Wu, PhD, P.Eng.

Project Partners: N/A

Research Project Funding: $65,000

Project Start and End Date: 06/01/2025 – 05/31/2026

Project Description: As wildfires intensify across the western United States, communities in the wildland-urban interface face growing risks to life, infrastructure, and mobility. Wildfire evacuations, often occurring under rapidly changing conditions with limited warning, require coordinated responses informed by real-world human behavior. However, current evacuation planning models often rely on assumptions that do not reflect the variability in household preparedness, perceived risk, and decision-making under stress. This project investigates evacuation preparedness, perception, and behavior during wildfire events in Washington State. Through a structured survey, we will collect data on residents' awareness of wildfire threats, their evacuation readiness, decision-making under hypothetical scenarios, and information preferences. The results will be analyzed to identify behavioral profiles and integrated with spatial data to assess how wildfire risk intersects with infrastructure resilience and community vulnerability. This research fills a critical gap by prioritizing the human dimension of emergency response. Outcomes will inform data-driven evacuation planning, community outreach strategies, and efficient investment in emergency infrastructure.

US DOT Priorities: This project addresses a number of priorities within the USDOT RD&T Strategic Plan. First, it supports the data-driven insight priority by developing and deploying a structured survey to capture real-world evacuation behaviors during wildfires: "Develop and make accessible data sources, data analysis, and visualization tools to support transportation stakeholders and researchers." (Page 59). Second, the work addresses integrated system-of-systems priority by incorporating human decision-making in wildfire evacuation: "Placing humans at the center of the transportation system with all outcomes oriented to supporting human needs" (Page 52).

The proposed project engages in advanced and transformative research by integrating behavioral insights into wildfire evacuation planning in ways that existing models often overlook. Rather than assuming uniform responses, this study collects detailed, individual-level data on preparedness, perception, vehicle access, and evacuation decisions. By prioritizing behavioral heterogeneity and linking it with spatial data on infrastructure resilience and community vulnerability, the project offers a more realistic and detailed understanding of evacuation dynamics. This approach enhances existing modeling efforts and supports the design of more effective evacuation strategies, particularly for at-risk populations in wildfire-prone areas.

Outputs: The project will result in the following specific outputs that can be scaled and or adopted by other researchers, policymakers, and public stakeholders: (1) a survey template that other regions can adopt for a better understanding of their local specific scenarios; (2) a survey dataset that reflects evacuees' perceptions, preparedness and decision-making under wildfire evacuation scenarios in Washington State;

and (3) an analytical framework that assess how wildfire risk, and infrastructure resilience intersect with social vulnerability. The above-listed outputs will be shared through academic publications and public data repositories. The publications will include one peer-reviewed journal article, one or two conference papers or presentations, and a final project report.

Outcomes/Impacts: The project will improve understanding of various evacuee behaviors in wildfire evacuation contexts, providing critical insights into decision-making around fueling, departure timing, and route selection. Outputs will be used by transportation planners, emergency management agencies, and utility providers to design more inclusive and resilient evacuation strategies. Findings will support the development of data-informed evacuation models that reflect real-world heterogeneous behavior and may inform updates to state and local emergency plans, transportation infrastructure investments, and public communication protocols. In the longer term, the research will contribute to safe and resilient transportation systems by informing policy and regulatory frameworks that account for human-specific needs during extreme events.

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