

Exhibit D – Research Project Requirement Template

Towards Building-Level Modeling: Human-Driven Agentic Workflows for Multi-Source Data Synthesis

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): Dr. Jorge A. Laval

Project Partners: CATsim

Research Project Funding: \$247,894 total project value (\$123,947 UTC funds requested; \$123,947 non-federal in-kind match).

Project Start and End Date: June 1, 2026 - May 31, 2027

Project Description: Travel demand modeling is limited by the aggregation problem: data are often synthesized at census-tract or traffic-zone scales that obscure building-level mobility patterns. This project develops a human-directed agentic workflow in which a transportation planner orchestrates specialized artificial intelligence agents that discover, evaluate, and integrate open geospatial data from sources such as OpenStreetMap, building footprint databases, census repositories, municipal portals, and selected sensor feeds. To address risks from plausible but incorrect agent outputs, the pilot will use a bounded proof-of-concept geography, source-provenance tracking, human review, conflict checks, and explicit accuracy metrics against benchmark data. The work will demonstrate the workflow through an open Digital Forum where practitioners and students can access tools, data, and examples for building-level demand modeling.

US DOT Priorities: The project supports U.S. Department of Transportation priorities by improving the mobility of people and goods through more granular, transferable, and lower-cost demand modeling. It advances research, development, and technology goals by testing a transformative but controlled approach to data collection and data fusion: human experts remain responsible for validation while agentic tools expand the scale and speed of open-data discovery. The work also contributes to workforce development by training students and practitioners to manage human-in-the-loop artificial intelligence systems responsibly, with attention to privacy, source quality, uncertainty, security, and ethical use of public data.

Outputs: Expected outputs include a Human-AI Agentic Workflow methodology; an open-source software pipeline that converts enriched OpenStreetMap and related geospatial data into building-level travel demand inputs; a curated, version-controlled database of discoverable open-data sources with source-provenance records; validation procedures and accuracy metrics for handling conflicting sources; a pilot Digital Forum that serves as an educational resource and practitioner-facing decision-support tool; at least one peer-reviewed publication; and training or curriculum materials for students learning to manage artificial intelligence ecosystems in transportation planning.

Outcomes/Impacts: The project will expand access to high-resolution demand modeling, especially for agencies and regions that cannot rely on costly proprietary surveys. Practitioners will gain a practical pathway for using open-source geospatial data to improve planning processes, evaluate mobility needs at finer scales, and support better-targeted infrastructure decisions. Students trained through the project will add to the pool of transportation professionals capable of responsibly directing and validating artificial intelligence workflows. Through CATsim, the pilot Digital Forum provides an implementation-oriented

product and deployment pathway that can accelerate broader adoption by public agencies, researchers, and private-sector modelers.

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