Exhibit D

Research Project Requirement Template

Time Use, Travel, and Telework Dashboard (T3D)

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

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

Research Priority: Improving Mobility of People and Goods

Principal Investigator(s): Irfan Batur and Ram Pendyala

Project Partners: N/A

Research Project Funding: $200,000 (Federal + non-Federal funding)

Project Start and End Date: 6/1/2024 - 5/31/2026

Project Description: The American Time Use Survey (ATUS) provides an unparalleled wealth and breadth of insights into the daily lives of Americans, holding immense value for a wide range of disciplines, including transportation planning, economics, public policy, sociology, and urban planning. However, navigating the rich datasets of the ATUS is challenging for a broad spectrum of users, including policymakers, planners, researchers, and the general public. The complexity of ATUS data requires advanced analytical skills to extract insights, which constitutes a significant barrier for regular users. Moreover, even for experts equipped with these skills, the requirement for exhaustive and repetitive data analysis for each new inquiry becomes a significant burden. This complexity severely limits the broader application and utility of ATUS data. Motivated to address these barriers and contribute to the TBD Center's larger Data Hub initiative, this project endeavors to develop a web-based data dashboard named the Time Use, Travel, and Telework Dashboard (T3D), aimed at democratizing ATUS data to make it more accessible and interpretable for everyone. T3D will offer instant insights into the time use, travel, and work arrangement patterns of Americans, covering data from the beginning of the ATUS series in 2003 to the present. Featuring three dedicated pages for detailed analysis of time use, travel, and telework, T3D will facilitate within-year, between-year, and cross-segment analyses effortlessly, leveraging various socio-demographic attributes for customized insights. The project will also investigate and employ effective data processing and visualization techniques to ensure the dashboard's efficiency and user-friendliness. Ultimately, T3D is envisioned to broaden the reach and impact of ATUS data, fostering interdisciplinary research and promoting evidence-based decision-making.

       The primary data source for these analyses is the American Time Use Survey (ATUS). ATUS collects detailed activity and time use data from randomly selected individuals (15+) who are interviewed only once for their time-use diary on the previous day (4 am to 4 am), resulting in nationally representative estimates of how people spend their time. The survey, which is sponsored by the Bureau of Labor Statistics (BLS), has been conducted by the U.S. Census Bureau every year since 2003 and consists of a sample of approximately 10,000 respondents per year. The project will employ several methods in developing the dashboard. First, it will begin by conceptualizing the types of information to be presented on the dedicated pages for Time Use, Travel, and Telework. The project will then preprocess the ATUS data series to ensure it is structured for efficient analysis. This step involves cleaning the data, standardizing formats, and categorizing activities into meaningful groups pertinent to studies on time use, travel, and telework. Subsequently, the project will develop algorithms to enable within-year, between-year, and cross-segment analyses, facilitating dynamic and customizable exploration of trends and patterns. To ensure user-friendly

access, advanced data visualization techniques will be integrated into the dashboard, which will present complex data through intuitive graphs and charts. Special attention will also be given to optimizing the dashboard's performance to swiftly process data and visualize it to accommodate a wide range of user-driven inquiries. Finally, the project will adopt a systematic approach to user engagement and feedback, iteratively refining T3D based on user interactions and suggestions, thereby enhancing its usability and relevance for various stakeholder groups.

US DOT Priorities: The project aligns closely with the US DOT RD&T Strategic Plan goals, particularly in advancing research and development efforts related to transportation transformation, climate and sustainability, and equity. Specifically, T3D addresses the transformation research priority by enhancing data accessibility and usability, enabling more informed decision-making processes. By providing comprehensive insights into how individuals allocate their time, travel, and work arrangements, T3D enables transportation planners and policymakers to identify opportunities for optimizing transportation systems, thus having the potential to contribute to the climate and sustainability priority. Additionally, T3D supports equity goals by democratizing access to data and insights, ensuring diverse stakeholder groups can benefit from evidence-based research. This project directly corresponds to the objectives outlined on pages 50-62 for transformation research, pages 41-49 for climate sustainability, and pages 33-40 for equity priorities of the RD&T Strategic Plan.

Outputs: The anticipated outputs of the T3D project encompass several facets. Firstly, it will generate a comprehensive dashboard, providing users with intuitive access to ATUS data for in-depth analysis of time use, travel, and telework patterns. This innovative tool will be openly accessible to the public, facilitating broad utilization across academia, industry, and policymaking spheres. Additionally, the project will yield methodological advancements in data preprocessing and analysis algorithms, enhancing the efficiency and accuracy of extracting insights from large-scale datasets. These developments will be documented in academic publications and conference presentations, contributing to the advancement of knowledge in transportation planning and data science domains. Furthermore, the outcomes of this project are anticipated to encompass the development of innovative methodologies and software tools designed for the analysis of activity-travel patterns. This innovation may serve as a catalyst for the formulation of invention disclosures. Such advancements could, in turn, pave the way for the emergence of novel business ideas and ventures, fostering a new wave of entrepreneurial opportunities and stimulating growth in related sectors. Overall, the T3D project aims to deliver tangible outputs that not only advance research in the field but also have practical implications for transportation planning and policy development.

Outcomes/Impacts: The T3D project anticipates several outcomes that will contribute to advancing transportation research and practice. By democratizing access to ATUS data and providing user-friendly analytical tools, the project aims to increase awareness and understanding of activity-travel patterns among researchers, policymakers, and practitioners. The project's outcomes may also include the development of new methodologies and best practices for analyzing large-scale time use and travel datasets, thereby expanding the pool of skilled transportation professionals. Ultimately, the insights gained from T3D are expected to inform evidence-based policy decisions and improve transportation planning practices, leading to more efficient and equitable transportation systems. The T3D project will improve transportation practice by providing accessible fast, efficient, and actionable insights into activity-travel patterns. Its user-friendly tools will enhance decision-making, leading to better demand management, policymaking, and equitable planning outcomes. Beyond transportation, T3D's insights into telework, time use, and travel extend its impact to broader societal realms, shaping policies and practices across various fields. Additionally, the project's findings will advance scientific understanding of data analytics and visualization methodologies, contributing to the body of knowledge in data analysis. By promoting evidence-based strategies, it will foster resilience and equity in a rapidly evolving societal and technological landscape.

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