Exhibit D

Research Project Requirement Template

The Effects of Changing Commutes on Home Delivery Activity

Recipient/Grant (Contract) Number: The University of Texas at Austin; City College of New York /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): Alison Conway

Project Partners: New York City Department of Transportation

Research Project Funding: $238,319 (Federal + non-Federal funding)

Project Start and End Date: 12/1/2023 - 5/31/2025

Project Description: Since the COVID-19 pandemic, New York, like most US and global cities, has seen rapid evolution of (1) work location and time flexibility and (2) adoption of online shopping alternatives for diverse commodities by varying shopper populations. It is expected that changes in work location – particularly the increased opportunity for some individuals to work from home at least a few days per week – could have profound impacts on the choice of location for shopping activities and on the likelihood of receiving home deliveries.

Relying on the New York City Department of Transportation's forthcoming 2022 Citywide Mobility Survey (CMS) and publicly-available land-use and employment data, this project will explicitly investigate the relationship between work-related travel activity (or lack thereof) and propensity for home delivery. This study will distinguish individuals based on demographic characteristics, home and work built environments (e.g. land uses and building types) and commute characteristics (e.g. frequencies, modes, times of day), and will evaluate shopping frequencies for several specific categories of goods - including groceries, prepared food, and parcels. Results are expected to provide insights on the expected impacts of changing work on local delivery activity, to inform the design of future urban freight infrastructure and city logistics strategies in work- and residence-oriented communities, and to provide insights for potential implications for local travel and retail activity.

US DOT Priorities: This project addresses the USDOT's **Freight Planning and Performance** research objective (*p. 24*) to "develop data and tools to assess freight system performance and support performance-based freight planning and policies" and its **Freight Safety and Operations** objective (*p. 24*), to "identify strategies to mitigate the negative impacts of freight transportation on communities and the environment," as it will inform the design of local policies (e.g. parking and loading requirements) and city logistics solutions (e.g. micro-distribution hubs and parcel lockers) in local communities. Specifically, this project supports the USDOT goals to "support operation of the freight transportation network through the incorporation of more accurate, real-time, and **localized freight data**" as well as "provide data, tools, and **technical assistance** to support the integration of freight considerations in the transportation planning and programming process."

This project addresses the following USDOT technology transfer priorities (p. 64):

"work closely with current and potential users of research products in the public and private sectors to accelerate T2 and deployment": This project is being conducted in collaboration (with in-kind support) from the New York City Department of Transportation.

"help stakeholders make informed decisions about whether to adopt new technologies, policies, or practices": this project will inform ongoing work to design and implement micro-distribution and parcel locker pilots and to improve urban freight infrastructure, including loading zones.

"publish technical papers and guides …deliver presentations to stakeholders": this work will be shared with the community of urban freight and travel behavior researchers and practitioners at relevant conferences.

Outputs: The two key outputs of this project will include:

1. A comprehensive report summarizing the prior research from two separate but related domains (travel behavior and city logistics) that have traditionally taken different approaches to understanding the passenger and freight travel demand impacts of e-commerce growth.
2. A replicable modeling approach to predict home delivery propensity as a function of work and work commuting activity and other demographic and built environment variables.

Results will be shared via a technical report, will be published in one or more publications submitted to peer-reviewed journals such as the *Transportation Research Record* or *Transportation Research: Part A*, and will be shared in conference presentations at relevant conferences such as the *TRB Annual Meeting*, the *ASCE International Conference on Transportation and Development*, or the *International Urban Freight Conference*.

Outcomes/Impacts: Key outcomes from this project are expected to include:

1. Recommendations for the design of future household surveys to best capture relevant variables and complex relationships between delivery and work-related travel activities.
2. Policy recommendations for the provision of street and curb space, provision of building delivery infrastructure, and design and implementation of city logistics solutions to enable more efficient delivery of various commodities to homes in diverse built environments with unique commute characteristics.
3. Development of transportation professionals with combined technical expertise in both travel behavior and city logistics. These individuals will bridge a gap between two traditionally segregated areas of research.

Improved understanding of the travel demand generated by home delivery activities can help to mitigate the negative externalities of freight transportation activities, including safety risk, congestion, air pollution, and CO_2 emissions that often result from infrastructure and curb management policies misaligned with modern freight demands, particularly in urban areas. By accounting for local commuting factors in the design and implementation of city logistics solutions, this project can enable broader participation by local residents in alternative delivery schemes.

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