

Exhibit D

Research Project Requirement Template

Teleworking to Play or Playing to Telework? A Latent Segmentation Approach to Exploring the Relationship Between Telework and Nonwork Travel

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): Chandra Bhat

Project Partners: N/A

Research Project Funding: \$75,000 (Federal + non-Federal funding)

Project Start and End Date: 9/1/2023 - 5/31/2024

Project Description: Technology has evolved at a tremendous pace over the past decade, permeating into our everyday existence and affecting literally every aspect of our lives. Our activity-travel choices have been no exception in this regard, as we make continuous and joint decisions about which activities we can and want to undertake (either in-person or virtually). Add to this the pandemic's upheaval of habits and behaviors, and there emerges a critical and renewed need to understand the activity-travel choices and decisions of individuals within a new landscape of transportation, technology, and pandemic-altered lifestyles.

In this study, we explore the causal direction/jointness issue underlying the interplay of teleworking choice and nonwork travel, within the context of the telework landscape in the aftermath of the pandemic. In particular, we model the telework frequency, maintenance stop frequency, and leisure stop frequency decision-making process as a package choice to account for unobserved factors, as well as use a latent segmentation approach to recognize the two possible and distinct causal behavioral directions that may be at play. The methodology combines an ordinal choice model for telework adoption/intensity with weekly count models for the number of maintenance and leisure stops. The data for the analysis is drawn from a 2021-2022 weekly travel diary and survey of Minnesotan workers.

US DOT Priorities: The work proposed in this research will address several components of the RD&T Strategic Plan goals. First, the work will shed light and suggest strategies to address the existing equity divide, which the already marginalized sociodemographic groups may be facing with lower telework and leisure opportunities (see "Developing new analytic tools and frameworks to inform and evaluate decisions that support the equitable treatment of all individuals and communities" (Page 33)). This work will also address environment related issues, as recognizing patterns in trip generation will provide valuable insight into understanding emission impacts on the environment (see "Improve understanding of the environmental impacts of transportation projects and activities and to evaluate mitigation strategies" (Page 41)).

The proposed work addresses several of the technology transfer (T2) and deployment goals within the RD&T Strategic Plan. As remote working has become increasingly popular, researchers need to be in tune with the potential community wide impacts of the effects, and make the public and other stakeholders aware of the associated implications on their daily life, including potentially any negative environmental impacts and increased road congestion. The goal of this project is to disseminate the impacts of telework to the public and other stakeholders, through open-sourced journal publications, think pieces, and presentations. This research "helps stakeholders make informed decisions about whether to adopt new

technologies, policies, or practices” (Page 64), “Continually improve mechanisms to share promising research, outcomes of demonstration projects” (Page 67), while also suggesting new research directions for better understanding the implications at hand – “Identify potential research and lab efforts ripe for demonstration” (Page 67).

Outputs: Expected research outputs include a journal publication as well as several conference presentations. In this new telework environment, it is critical to understand the associated shifts in activity-travel behavior. The outcomes from this study will provide clear insights regarding telework intensity and its relationship with nonwork travel behavior. The pandemic has led to increased telework adoption, especially in the allowance of hybrid work arrangements (working remote on a few days of the week and working from the outside-of-home work office on other days of the week). Such a hybrid approach is appealing from social, personal and professional considerations. For example, working remotely may offer a better work-family life balance, while working from the office can provide a socialization outlet. Overall, altered work location preferences during the pandemic, combined with a generally lower telework resistance from employers, suggests that remote work will be more prevalent than in the pre-COVID era.

Outcomes/Impacts: Expected research outcomes include the increased understanding and awareness of transportation issues related to the rise in telework adoption and frequency following the pandemic. By exploring the direction(s) of the relationship between telework and nonwork travel, planners and other professionals will be able to anticipate how traffic patterns may change during both peak and non-peak hours due to teleworking arrangements. Insights from our results can, therefore, help transportation planners at city, regional and state levels to make appropriate changes in their travel demand model systems. Expected impacts include insights on the relationship between telework and nonwork travel, which will be valuable to urban planners, land-use professionals, geographers, labor market researchers, and those in the air quality and environmental fields. For example, if teleworking prompts individuals to participate more in out-of-home leisure activities as a means to seek companionship in public spaces immediately before and after work, this provides land-use planners with key information on how communities should be designed for an increase in out-of-home leisure engagements as more employees work remotely.

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