Center for Understanding Future of Travel Behavior and Demand (TBD)

A National University Transportation Center in the Priority Area of Improving Mobility of People and Goods

Center Data Management Plan

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Lead Institution: The University of Texas at Austin

Partner Institutions:
Arizona State University (ASU)
California State Polytechnic University, Pomona (Cal Poly Pomona)
The City College of New York (CCNY)
Diné College
Georgia Institute of Technology (Georgia Tech)
University of Michigan (UMich)
University of Washington (UW)

The overarching vision of the Center for Understanding Future of Travel Behavior and Demand (TBD) is to undertake breakthrough research that will fundamentally re-examine and transform the scientific base for measuring, monitoring, modeling, and managing traveler behavior, thus fostering the design, development, and operation of a people-centric, multimodal, intelligent transportation system that meets the needs of people, institutions, and businesses for generations to come.

In addition to pursuing a multitude of research, technology transfer, and education and workforce development activities, the TBD Center will undertake two flagship endeavors of national, state, and local significance to bring about transformative impacts in planning and decision-making:

1. A *travel behavior data hub* that the public, transportation planners, and policy-makers alike can leverage to understand the state of the transportation system, with built-in *quality of life/well-being, energy footprint, and mobility poverty calculators* to aid in advancing system performance, economic development, community resilience and well-being, and sustainability and equity.

2. A longitudinal multi-year panel-based *Transportation Heartbeat of America Travel Behavior and Demand Survey, including surveys of individuals, employers, and service providers*, to understand how travel behavior and demand is evolving, and derive critical insights on the

future of transportation and the priorities of the nation and the states to which the Center partners belong.

The Center will also undertake a variety of innovative research projects, with a particular focus on integrating passenger and freight analysis in both urban and rural contexts. This work is highly germane to the mission of state and regional transportation agencies, cities, and communities throughout Texas. Specific topics that the Center will address include, but are by no means limited to:

- commute and location decisions (of households and firms) in a telework-friendly environment;
- effects of information/communication technology (ICT) on activity/travel demand;
- methods and data for integrated forecasting of freight and passenger travel in varied contexts
- impacts of emerging technologies (e.g., autonomous vehicles, shared mobility services) on travel behavior and demand

The goal of this data management plan (DMP) is to ensure that data generated from this project will be preserved and available in the future for fostering scientific collaborations, discoveries, and possible industry-academia partnerships based on findings of this proposed research. The DMP will serve as a living document through the project's duration and will be updated as needed to reflect changes during the project's lifecycle. All PIs will be responsible for data management in this research project. At UT Austin, the data and all relevant research documentations, along with format instructions for ease of interpretation, will be archived with the Texas Data Repository (TDR): https://dataverse.tdl.org/dataverse/utexas. Similar digital repositories will be used by PIs at partner universities, with the TBD central website having links to each digital repository. Each university's digital repository provides open online access to the products of the University's research and scholarship endeavors. The purpose is to foster the preservation of digital works for future generations, to promote increasingly rapid advances in scholarly communication, and to help deepen community understanding of the value of higher education. For example, according to the UTDR Preservation Policy (http://repositories.lib.utexas.edu/policies_preservation), the UTDR is committed to responsible and sustainable management of submitted works as well as associated descriptive and administrative metadata, by employing a strategy combining: a) Nightly secure backups; b) Storage media refreshment; and c) File format migration.

To the extent possible and feasible, data will be made publicly available at these digital repositories soon after data collection, though PIs may decide to keep some data collected as part of their projects internal for a specific duration of time so they can analyze the data thoroughly before releasing for public consumption.

Specific components of the data management plan are described in some more detail in the following sections.

Expected Data

The team will develop a series of computational/analytic algorithms and models for data collection and processing, and will collect and process a large amount of data. Additionally, the team will conduct surveys and focus groups to learn about social, behavioral, organizational, and public policy considerations. The data and relevant deliverables obtained in this proposed research will include (but not be limited to) transportation network and characteristics data; travel behavior and travel demand pattern data; and human demographics, preferences and attitudes data. Any externally facing survey data collection or focus group efforts in connection with TBD activities will be preceded by appropriate institutional IRB approvals. A consent form will clearly indicate that participation is completely voluntary and will not affect any relationship with the institution undertaking the data collection effort. Additionally, when working with, or conducting research that includes Indigenous populations or Tribal communities, TBD researchers will adhere to the CARE Principles for Indigenous Data Governance https://www.gida-global.org/care.

Period of Data Retention

All data will be retained for at least three years after the conclusion of the award or three years after public release, whichever is later. All of the data expected to be generated from this project will be archived to ensure that data is never lost.

Data Formats and Dissemination

The data collected and results from the many research investigations may be stored in a variety of commonly used and widely available proprietary formats, such as Microsoft Excel "xls" or "xlsx", the Mathwork Matlab "fig" or "mat", or the Microsoft Word "doc" or "docx" file formats. To the extent feasible and possible, these common proprietary formats will also be translated into a non-proprietary version for universal public access (for example, all .xlsx files will also have a .csv counterpart). The font type font will be one that is easily read by individuals with vision limitations or dyslexia, and will have a font size of 12pt or larger. While files in these formats will be made publicly available, the application software used to open and manipulate these files will not be made publicly available and will require the interested party to purchase software licenses as needed. To the extent possible, the team will choose file formats that represent widely-adopted standards and can be imported into a variety of open source or commercially available software packages for research and development.

The team will make data pertaining to the two flagship endeavors; **The Travel Behavior and Data (TBD) Hub** and the **Transportation Heartbeat of America survey**; and associated documentation available to other researchers at no more than incremental cost only under a data-sharing agreement that provides for: (1) a commitment to using the data only for academic purposes and not to identify any individual participant interviewed in the investigation studies; (2) a commitment to securing the data under appropriate computer security mechanisms; and (3) a commitment to deleting the data after the particular research project is completed. UTDR will be the main infrastructure of data dissemination. Any data shared publicly and to other researchers will be anonymized. Also, any metadata generated as part of the Center activities will follow the DCAT-US metadata schema (https://resources.data.gov/resources/dcat-us/).

Data Storage, Policy of Data Sharing, and Preservation of Access

The team will store all organized data, processed data, models, algorithms, research reports, and publications, and conduct daily automated back-up and undertake periodic bi-monthly reviews of the current practice for better data organization. A backup and mobile disk capable of storing several terabytes of imagery data and analysis results will be used for preserving on-site scenarios and rapid condition screening. A data server (a disk array) will be used to store and backup a duplicate copy of the data and all other relevant deliverables produced in the course of the project, and be synchronized with a central server on a regular basis. Students working in this research will be trained by the PI and the research foundation to collect the data and to treat it using appropriate technical and ethical standards. In the event of the PI or co-PIs leaving the home institution corresponding to the starting time of the award, one of the remaining PIs or, if not possible, a representative from the institution will be designated to continue assuring data management according to this plan.

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Post-award Monitoring

A Project Management Team will be established to monitor data management after an award is made. Led by PI Dr. Chandra Bhat, data management and accessibility will be discussed at the project meeting to be held periodically (at least quarterly) at UT Austin. Data management and accessibility will also be a topic of review by External Collaborators who will meet biannually to review project results and advise on new data collection requirements and trends in the field. Following the required components of this data management plan, post-award data management will be monitored primarily through the normal Annual and Final Report process and through the evaluation of subsequent proposals.

Change log:

2023-09-28: Original draft
2023-10-30: Revisions based on feedback
2023-11-01: Revision, PDF created