Exhibit D – Research Project Requirement Template

Neutralizing Onerous Heat Effects on Active Transportation (NO-HEAT) in Atlanta

Recipient/Grant (Contract) Number: The University of Texas at Austin; Georgia Institute of Technology/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): Rounaq Basu (PI); Subhrajit Guhathakurta (Co-PI)

Project Partners: City of Atlanta Department of Transportation; Atlanta Regional Commission

Research Project Funding: $102,842

Project Start and End Date: 6/1/2025 – 8/31/2026

Project Description: This project advances research at the intersection of heat resilience and multimodal transportation by combining urban microclimate modeling and sensing tools with big data and travel behavioral frameworks. We aim to explore how, and to what extent, people modify their activity-mobility patterns during periods of extreme heat in Atlanta, GA. We will extend recently developed automated workflows to generate high-resolution datasets describing state-of-the-art measures of perceived thermal comfort, which will be calibrated through field data collection using meteorological sensors. These network link-level datasets will then be used, in conjunction with anonymized cellphone data, to examine in detail how people adapt to extreme heat. Using daily cellphone data for a period of two months – one during the summer and the other as a reference, we will explore how extreme heat affects activity-travel choice dimensions, such as changes in trip-making choice, destination choice, departure time choice, mode choice, and route choice, as well as the inability to adapt. We plan on also exploring variations in heat adaptation and exposure across different neighborhoods in Atlanta. Our work will lead to the development of a 'cool' routing app that would provide recommendations for walking and biking routes that maximize thermal comfort and greenery, as opposed to simply minimizing distance. The outcomes of this project will support multimodal transportation by making it safer and more comfortable for residents to move around in their communities. We plan on working closely with the City of Atlanta and the Atlanta Regional Commission to ensure that our thermal comfort datasets are plugged into local and regional planning efforts. Our data development workflows can also be easily extended to other regions in the U.S., which we hope to explore in future years.

US DOT Priorities: This project supports USDOT's safety and transformation priorities by advancing innovative methods to understand and mitigate risks posed by extreme heat in multimodal travel. By developing state-of-the-art urban microclimate models and advanced data science methods to analyze 'big' mobility data sourced from cellphones, the project will create timely, accurate, and accessible information to support transportation planning and decision-making. We also plan to develop decision-support tools that will support scenario planning and robust-decision making around transportation policies. These methods and tools can be used to assess how travel behavior and access to multimodal transportation infrastructure and critical destinations change during periods of extreme heat, leading to insights that will aid in the integration of resiliency to extreme climate considerations into transportation planning and project development. By focusing on walking and biking experiences, this project will also elevate the consideration of those who do not have access to a private car or do not have the ability or desire to drive.

Outputs: We anticipate four major outputs from this project. First, we intend to publish a paper in a peer-reviewed scientific journal (e.g., Environment and Planning B: Urban Analytics and City Science or Computers, Environment and Urban Systems) summarizing the high-resolution urban microclimate modeling and sensing component of the project. Second, we intend to publish a second paper in a peer-reviewed scientific journal (e.g., Travel Behavior and Society or Transportation Research Part D: Transport and Environment) summarizing the travel behavior research component of the project. Third, we will develop a 'cool' routing app that would provide recommendations for walking and biking routes that maximize thermal comfort and greenery, as opposed to simply minimizing distance. This app will be released for public use by all Atlanta residents. Fourth, we aim to make the high-resolution thermal comfort datasets, along with supporting code and documentation, publicly accessible. We will evaluate different options to make that possible, including creating a website hosted internally at the Center for Urban Resilience and Analytics (CURA) that contains the datasets and documentation, while the code will be made available through GitHub. This will enable the use of these datasets beyond the duration of this project and in many urban planning applications beyond transportation.

Outcomes/Impacts: We anticipate the takeaways of this project to advance our understanding of how residents of Atlanta adapt or, in certain instances, are unable to adapt to extreme heat. This will inform how transportation planners can incorporate the growing influence of urban microclimates in transportation planning, especially when focused on multimodal transportation and Complete Streets. Interventions such as 'cool' corridors and shaded bus shelters can enhance both heat resilience as well as multimodal transportation safety and comfort.

We anticipate the outcomes of this project to directly impact how people move around by enhancing their safety and comfort, especially for those who walk, bike, and use transit. By making it safer and more comfortable to get around, we expect fewer people to transition to using vehicles during periods of extreme heat, which will have a moderating effect on congestion and air quality. Moreover, by improving multimodal access to destinations such as green spaces, community centers, and cooling stations during extreme heat periods, we expect positive effects on public health and quality of life. Supporting the groups that face higher challenges related to extreme heat, such as older adults and lower-income individuals, can also reduce the number of heat-related medical incidents and fatalities. Finally, we expect this project to showcase how to embed urban microclimate modeling into travel behavior research for advancing resilient multimodal transportation planning outcomes.

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