

# Research Project Statement 22-256 FY 2022 Annual Program

<b>Title:</b>	Improve Traffic Analysis and Mobility Modeling Using Information and Communication Technologies
<b>The Problem:</b>	<p>One crucial task in TxDOT's Texas Transportation Plan (TTP) 2050 is to optimize the movement of people and goods by reducing congestion using both traditional and alternative strategies, enabling reliable travel times, and increasing access to jobs, services, and activity centers. Currently, TxDOT reports annual average daily traffic (AADT) data based on the information collected through traffic stations across the state; however, maintaining and updating such data can be time consuming and expensive.</p> <p>Data collected from traffic stations are tied to vehicles instead of individuals, so these datasets cannot directly reflect human mobility patterns on a finer scale. It remains a challenge to effectively and efficiently capture human mobility patterns and to understand how it may help traffic analysis and traffic reporting. Analyzing large-scale human mobility patterns in the information age requires new datasets, new strategies, and new analytical frameworks.</p> <p>The increasing prevalence of information and communication technologies (ICTs), such as smartphones and the Internet, has inevitably changed where, when, and how we understand the movement of people and goods. These technologies affect transportation engineering in two ways; 1. ICTs provide real-time mobility data and can capture human mobility patterns more efficiently and effectively compared to traditional travel surveys; and 2. ICTs affect transportation engineering by influencing the physical movement of individuals in societies in that ICTs have a significant effect on travel demands and may help alleviate traffic congestions.</p> <p>This research will quantify how ICT data can supplement traditional transportation data sources; e.g., socioeconomic data, survey data, and traffic counts, to make the modeling process more efficient and more accurate, as well as investigate how ICT use may affect travel demands. With the rise of telecommuting, more employees are working from home, which inevitably influences local travel behaviors. It is important for Texas, given its steadily growing population, to leverage ICTs for understanding travel demand and to accurately model mobility and traffic patterns with real-time ICT data.</p>
<b>Technical Objectives:</b>	<p>This research will assist policy makers in Texas to effectively integrate various types of ICT datasets for travel behavior analysis, mobility modeling, travel safety assessment, and traffic reporting. The work to be performed shall include:</p> <ol style="list-style-type: none"> <li>1. Perform an extensive literature review on the currently available ICT datasets in Texas regarding their data quality and completeness, as well as how these datasets have been used to inform decision making in the state of Texas.</li> <li>2. Identify how ICT datasets can help improve current traffic reporting data used by TxDOT.</li> <li>3. Develop metrics, algorithms, guidelines, and/or specifications that TxDOT can use to quantify the effectiveness of ICT datasets in mobility analysis and traffic reporting, as well as honor best practices in data privacy in ubiquitous computing.</li> <li>4. Conduct travel behavior analyses to investigate the impact of ICT use and telecommuting on travel demand in both urban and suburban areas.</li> </ol> <p>The expectation of the project end product(s) shall attain a Technology Readiness Level of 7.</p>
<b>Anticipated Deliverables:</b>	<ol style="list-style-type: none"> <li>1. Technical memorandum for each task completed.</li> <li>2. Monthly progress reports.</li> <li>3. Value of Research (VoR) that includes both qualitative and economic benefits, to be included in the final research report; <u>not a stand-alone deliverable</u>.</li> <li>4. Research report documenting the findings of the research, including a set of processes and recommendations to demonstrate and communicate the actual impact of ICT data on travel behavior analysis as a result of proposed/planned projects.</li> <li>5. Project Summary Report</li> </ol>

<b>Proposal Requirements:</b>	<ol style="list-style-type: none"><li>1. Utilize the "Proj/Agre" and "PA_Form" templates located at the <a href="#">TxDOT RTI website</a>.</li><li>2. Proposals will be considered non-responsive and will not be accepted for technical evaluation if they are not received by the deadline or do not meet the requirements stated in RTI's <a href="#">University Handbook</a>, which is also located at the RTI website.</li><li>3. Proposals should be submitted in PDF format, 1 PDF file per proposal. File name should include project name and university abbreviation.</li><li>4. This project will be tracked during the life of the project using a Technology Readiness Level (TRL) scale. For more information about the use of a <a href="#">TRL</a>, click.</li></ol>
-------------------------------	--