Scope of Work
Informed Traveler Program & Applications (ITPA) Analysis

Background

The UniversityCity Prosperity Project has been proposed for a FY2013 TIGER Discretionary Grant to address transportation mobility and safety problems facing parts of Miami-Dade County. One of the major components of this project is the Informed Traveler Program and Applications (ITPA). ITPA will provide personalized, timely information and advice regarding the most efficient and cost effective travel paths for consumers – in advance of their travel decision points. This includes information about whether to use transit or other modes, delay the start of a trip to avoid congestion, or take an alternate route to avoid construction or accident delays. The program software will be predictive in nature, allowing users to make better travel decisions even before they get in their private vehicles, and it will also offer the potential of faster parking in smart garages as a major time saver.

Using advanced information technology platforms, intelligent transportation systems, and smartphone-based software; the ITPA will provide significant benefits to the traveling public. The ITPA will be developed by a partnership between IBM, FIU Lehman Center for Transportation Research (LCTR), and FIU I/UCRC-CAKE and with support from experts at the University of Illinois in Chicago Computational Transportation Program and others. ITPA will evaluate historical and real-time information about events, traffic performance measures, emergency service calls, transit service measures, weather, construction, special events, and other information. The users will be able to query the system about multiple travel options (and their costs and benefits) before they begin their trip.

The development of this system will be based on a system engineering approach. This scope of work is for the development of the UniversityCity project to develop a concept of operations, system requirements, and high-level design of the ITPA system. This phase will focus on the following functional areas:

- Real-time situational aware data collection and integration from multiple sources
- Predictive guidance based on situational aware conditions
- Smart parking use and integration
- Other ITS/Signal control improvements to support mobility and safety within UniversityCity boundary

Phase 1 of the UniversityCity project will involve delivering an operational production platform to support 20,000 users and implementing the infrastructure required to support the above functional areas. Phase 1 of this is be funded by MDX once the TIGER grant for the project is selected by the U.S. Department of Transportation and accomplished prior to starting the TIGER grant project.
Goal and Objectives

The goal of this proposed scope is to lay the groundwork for the ITPA system implementation based on a system engineering approach. The specific objectives are:

- Develop a concept of operations for the ITPA implementation
- Develop and document data, end-user, and system requirements
- Provide high-level design specifications for Phase 1 and design modifications for subsequent phases

Work Plan

The work in this task order will be conducted based on stakeholder inputs to ensure that all the issues and needs associated with the implementation of the system are addressed and met. The project will employ standard project management best practices to provide research, analysis and documentation regarding project requirements and planning for the ITPA project. It is anticipated that the IBM platform will be used for predictive modeling. This platform will communicate with the off-line and on-line data integration and decision support tools (IRISDS and ITSDCAP) developed by FIU LCTR for FDOT to receive data from these tools and to allow these tools to utilize the predictive travel time for other regional applications. The FIU TerraFly is anticipated to be the main platform for traveler route/mode assignment and will also communicate and integrate closely with the IBM and LCTR platforms.

Work to be done will include:

**Task 1 - Additional Review of Existing Conditions and Stakeholder Involvements:** This task will include further review and assessment of existing data sources and tools (IBM platform, IRISDS/ITSDCAP, TerraFly platform, and traveler routing/assignment tools). In addition, it will include a workshop and face-to-face meetings with project stakeholders to identify additional project needs and issues.

**Task 2 – Refinement of Concept of Operation:** This task will include the refinement of the concept of operation based on the concept outlined in the TIGER proposal includes roles and responsibilities, needs, element, high-level capabilities, geographical and physical extents, sequence of activities, and description of the development, maintenance, and operation of the system. The concept of operation will define business rules, processes and procedures associated with the project and possible limitations and constraints. It will provide risk analysis and needed approaches to ameliorate these issues. In addition, it will provide cost estimates and estimated timelines

**Task 3 – Development of System Requirements and High-Level Design:** This task will involve the development of user and system requirements gathering and high-level design specifications to modify, integrate, and further develop the existing tools (IBM platform, LCTR tools, and TerraFly.) This will also include needed design modifications for subsequent phases. The design will include the development
and identification of system architecture and associated resources, deployment strategies and timelines, personal scenarios and use cases for each Phase of the project. The effort will include design and plan key test case approaches and scenarios for system functionality, fault tolerance, scalability and usability.

**Task 4 - Production of Final Report:** This task will produce a final report that documents all the activities and results of the project.

**Budget**

The work as summarized above is estimated to cost $265,000. The principal investigator for this project will be Dr. Mohammed Hadi, PE (LCTR at FIU). Dr. Naphtali Rishe (I/UCRC-CAKE at FIU) will serve as a Co-PI. Below is project budget estimate (including fringe benefits and indirect cost).

<table>
<thead>
<tr>
<th>Budget Item</th>
<th>Budget Amount</th>
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<tbody>
<tr>
<td>Mohammed Hadi, Ph.D., PE</td>
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<td>Naphtali Rishe, PE</td>
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<td>Consultant (Tom Gustafson)</td>
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<td><strong>Total</strong></td>
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