UniversityCity
Prosperity Project
Advanced Transit Oriented Developments and
Informed Traveler Program
Table of Contents

I. Project Description: ..................................................................................................................... 1
   A. Introduction ................................................................................................................................. 1
      1. The Challenges ......................................................................................................................... 3
   B. UniversityCity Prosperity Project TIGER Proposal Components ............................................. 5
      1. Advanced Transit Oriented Development ................................................................................. 5
      2. Informed Traveler Program and Applications ........................................................................... 13
II. Project Parties: ............................................................................................................................. 20
III. Grant Funds and Sources/Uses of Project Funds: ....................................................................... 21
IV. Selection Criteria ....................................................................................................................... 23
   A. Long-Term Outcomes ............................................................................................................... 23
   B. Job Creation & Near-Term Economic activity .......................................................................... 25
   C. Innovation .................................................................................................................................. 27
   D. Partnership ................................................................................................................................ 27
V. Project Readiness and NEPA ....................................................................................................... 28
VI. Federal Wage Rate Certification ............................................................................................... 29
VII. Material Pre-Application Changes ........................................................................................... 29

Table of Figures

Figure 1. Map of the UniversityCity Prosperity Project geographic area........................................ 1
Figure 2. TYLIN Conceptual Plan & Dimensions........................................................................... 3
Figure 3. Pedestrian Oriented Spaces (Traffic Calmed Street, Multi-Modal Accessible Plaza, Transit Greenway, and Waterfront Pedestrian Corridor) ......................................................... 6
Figure 4. UniversityCity ATOD Elements .................................................................................... 7
Figure 5. Proposed ATM ............................................................................................................... 8
Figure 6. Map of the Express Enhanced Bus Service ...................................................................... 8
Figure 7. City Hall to Green Library Advanced Pedestrian-Oriented Complete Streets & Corridors (APOCSC)... 9
Figure 8. Planned Sweetwater Development around City Hall ...................................................... 9
Figure 9. Overview of Planned Sweetwater Development .............................................................. 10
Figure 10. Planned City of Sweetwater City Hall Plaza .................................................................. 10
Figure 11. Upgraded pedestrian plazas and pathways on the US41/109th Ave. intersection on the FIU campus.......................................................... 11
Figure 12. Covered walkway and gazebos in FIU that lead to the center of campus ...................... 12
Figure 13. UniversityCity ITPA Prototype .................................................................................... 16
Figure 14. Proposed ITP Architecture based on Smart Cities technologies ..................................... 18
UniversityCity Prosperity Project: FY2011 Discretionary TIGER Grant Submittal.

I. Project Description:
   Every now and then, you’ve got to ask the hard questions. The one we choose to ask is: How will Miami-Dade County shape itself in the knowledge-based economy of the 21st century?

   A. Introduction
   Throughout the region, cities and neighborhoods are actively seeking to redefine themselves to align more closely to their human and material assets. The UniversityCity Prosperity Project seeks to begin such a transformation effort and envisions an economically robust, sustainable, affordable, and equitable community centered on Florida International University (FIU) as Miami-Dade County’s (MDC) Anchor Public Institution for the global knowledge economy.

   As FIU develops a new engagement strategy, it must find a way to ensure that the entire community can improve as a consequence of a civic-minded, forward-facing, and energized university that sees itself as a solutions center for 21st century challenges. As can be seen in Figure 1, the UniversityCity Prosperity Project will help transform the FIU/City of Sweetwater relationship from one of friendly neighbors to a truly collaborative relationship that will create a growing, sustainable and innovative community. The UniversityCity Prosperity Project is an important part of this process and proposes to help achieve a shared community vision in two innovative ways.

   First, Advanced Transit Oriented Development (ATOD) for UniversityCity creates a best practice model for infrastructure improvements that help to shift trips away from private vehicles while simultaneously supporting the economic growth related to a major public research university and an adjacent small city. The ATOD strategically weaves together:
   - vibrant and mixed-use pedestrian pathways and pedestrian bridges;
   - high quality public spaces, Main Street, and multi-modal transit station environments;
   - innovative transit greenways and mixed-mode streets;
   - traffic-calmed streets, metered street parking, structure parking, and liner buildings;
   - shared community transit local feeder vehicles;
   - safe bike paths and multi-use corridors;
   - private development projects that establish higher residential densities; and,
   - Advanced Transit and Multimodal Station (ATMS);

   Figure 1. Map of the UniversityCity Prosperity Project geographic area, consisting of FIU and the City of Sweetwater, and illustrating key project components
• express bus service connecting the ATMS with the Miami Intermodal Center (MIC) that operates with Bus Rapid Transit (BRT) efficiencies given the ATOD components.

The UniversityCity ATOD overcomes a number of very real pedestrian obstacles and encourages a significant modal shift from private vehicles to pedestrian, bicycle, and transit modes by those people who travel to or from FIU and Sweetwater for at least some portion of their travel.

Secondly, the Informed Traveler Program and Applications (ITPA) provide personalized, timely information and advice regarding the most efficient and cost effective travel paths for consumers. This includes information about whether to use transit, delay the start of a trip to avoid congestion, or take an alternate route to avoid construction, accident or other delays. This unique and innovative combination of technology and transit will be a first-of-its-kind effort that shall serve as a model for other communities throughout the nation. The software is predictive in nature, allowing users to make better travel decisions even before they get in their private vehicles. It also offers ITPA users express transit routes and faster parking in smart garages as major time savers. ITPA gives travelers both the information and the courage to change routes or take transit instead of following a reflective pattern of automotive travel.

Significant benefits include reductions in congestion, travel time, accidents, vehicle miles travelled, and travel costs for businesses and households. The UniversityCity Prosperity Project is the first of its kind to demonstrate the connections between sustainability, innovative mobility, technology transfer, new urbanism/smart growth and equitable economic prosperity led by a major public research university. In a globally competitive knowledge economy, the project points the way forward.

At the same time, this is a down-to-earth, real project addressing systemic and urgent problems in western MDC. Communities such as City of Sweetwater (Sweetwater) and City of Doral (Doral) have used annexation and incorporation as a strategy to revitalize themselves and give shape to new opportunities for their residents. The rapid growth and expansion of nearby FIU, a public university whose enrollment is approaching 50,000, gives these cities and their neighbors an unprecedented opportunity to build new partnerships, generate fresh approaches to problem-solving, and improve their quality of life. This sustainable prosperity plan of FIU, its partners and participants foster a more seamless campus-community dynamic that help fulfill the need for talent development, job creation, sustainability, enhanced public transportation, and new forms of residential and neighborhood development.

This unique combination of innovation with a very strong and enthusiastic alliance of public and private participants, with further the goals and principles of the Sustainable Communities Initiative partnership and the TIGER program like nothing that has gone before it. IBM brings with it the world-class solutions from its Smarter Planet and Smarter Cities initiatives1, private real estate developers are poised to invest over $35 million in the first of many phases of mixed

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use projects, international business interests have begun discussions about future investments, and the entire MDC Congressional delegation has expressed their very strong support.

Using both of these innovative constructs and world-class partners and participants, FIU will build at full scale one of the most advanced sustainable communities living laboratories in the world.

1. The Challenges

This proposal is the first step in catalyzing the long needed transformation of an important segment of our region that has been isolated and often too passive in the face of significant opportunity to move forward. Despite being a densely-populated area, Western Miami-Dade County noticeably lacks alternative forms of transportation (i.e., non-automobile) and walkable communities. It builds upon FIU’s nascent role as an anchor institution and a neighborhood awakening about the need for a more deliberate and determined effort to create a prosperous and sustainable future.

Public Research Universities such as FIU play a major role in creating global economic competitiveness for the US. Strategic investments in the places surrounding those universities are essential to attract, develop, and retain the very best talent that drives the innovation economy. In western MDC, we call this emerging place that surrounds the FIU Maidique Campus “UniversityCity” and a number of partners have organized themselves around a series of shared goals and visions to form the UniversityCity Alliance (UCA).

As the only public research university in Florida’s most populous and diverse metropolitan area of MDC, FIU is among the top 25 largest universities in the country, and it plays a very special role in the Southeast Florida Region. In addition to attracting, developing, and retaining the internationally savvy talent, FIU continues its role as the largest Hispanic serving university in the country. FIU expects to quickly grow enrollment to over 50,000, including many students who are the first in their families to attend college and come from limited English households. With over 7,000 faculty/staff and 150,000 alumni in South Florida, FIU serves as an anchor for the emerging South Florida Life Science corridor, attracts over 500,000 annual visitors for cultural and sporting events, and leads the development of a billion dollar economic development cluster centered on the new College of Medicine.

UniversityCity Prosperity Project
But traffic congestion, emerging water supply and drainage issues, looming parking shortages, and the lack of vibrant urban places adjacent to campus threaten both FIU and its partner Sweetwater. Affordable living options and limited transportation choices are also frequently stated concerns of both local residents and talented FIU recruits. With completely congested major roadways acting as barriers to nearby communities, FIU and Sweetwater are in danger of becoming isolated locations that few want to visit. If it takes too much time and effort to reach FIU, anchor institutional missions cannot be accomplished. If the residents of Sweetwater are stranded within their community, prosperity will just be a slogan, but not an economic reality.

Additionally, FIU has very little room on campus to expand and therefore seeks to attract additional housing, retail, smart parking and other uses to quality, livable Sweetwater places that with infrastructural improvements can provide high quality and large scale walking movements within reasonable ½ mile walking distances to campus. But poor mobility linkages across the 8 lanes of high-speed traffic on US 41 (and similar conditions on SW 107th Ave. and W Flagler St.) have hindered private investment and prevent a meaningful and daily connection between the residents and businesses of Sweetwater and the students, faculty, employees and visitors to FIU. This situation is expected to worsen, and increase the danger for pedestrians, over the next five years as the Florida Department of Transportation (FDOT)-financed projects widening SW 107th Ave. and the nearby Florida Turnpike are completed. Without the kinds of innovative solutions contained in this UniversityCity Prosperity Project proposal, the combination of these challenges will stifle FIU’s plans to grow and Sweetwater’s plans to redevelop, will lessen positive impacts on surrounding communities, and will reduce the ability of FIU and Sweetwater to serve students and resident needs and inhibit the development of knowledge workers essential for economic prosperity.

Still, Sweetwater envisions a high-density, vibrant urban neighborhood that helps FIU attract students, global talent, businesses, and investors, but also acknowledges that it needs additional capacity to emerge as a high quality urban built environment. Sweetwater also seeks to create new jobs, connections to the amenity-rich FIU campus, improved public spaces for a downtown Sweetwater, and quality educational opportunities for their predominantly low-income, immigrant residents (Sweetwater’s population is 93% percent Hispanic). For this reason, the
Mayor and the Sweetwater City Commission have agreed to have Sweetwater actively participate in the UCA and the UCA Steering Committee.

The transformation from a place of isolated congestion to a sustainably connected global UniversityCity requires strategic and innovative infrastructure investments. TIGER funding will help FIU, Sweetwater, MDX, and our other transportation and development partners accomplish this major prosperity and sustainability oriented initiative.

These unique combinations of proposed improvements in the UniversityCity Prosperity Project do not fit typical funding categories or programs, but they offer great promise beyond MDC once they are built, measured, and proven. In fact, once successful, they will create completely new standards for very smart, pedestrian-oriented, and multimodal mobility systems that intentionally and directly support national, state, regional, and metropolitan area goals, strategies, and desire outcomes for prosperity and sustainability.

To accomplish this vision, UCA and other partners have agreed to accelerate the UniversityCity Prosperity Project by engaging in a number of coordinated activities including:

- endeavoring to procure TIGER funds via this proposal;
- funding requests to the John S. and James L. Knight Foundation for $250,000 in additional planning funds for the City of Sweetwater enhanced land use planning efforts to ensure they meet the goals and objectives of the Sustainable Communities Initiative;
- launch of the $408,000 Sustainable UniversityCity Sub-Area Mobility Study with FDOT and Sweetwater immediately; and,
- proceeding with a $265,000 Miami-Dade Expressway Authority (MDX) research study to produce a ITPA Work Plan & Way Forward Strategic Vision regarding efforts to complete any needed ITPA technology development and undertake the deployment a robust localized ITPA pilot
- funding requests for an additional $10 million in matching ITP Technology Development & Deployment funds derived from MDX and elsewhere after the achieving a proof of concept funded by this TIGER grant

B. UniversityCity Prosperity Project TIGER Proposal Components

This section provides a detailed description of the UniversityCity Prosperity Project components for which TIGER funding is being requested. It also provides an overview of other aspects of the project that will be undertaken through the use of non-TIGER funds. One goal of this plan is to create pedestrian oriented spaces similar to spaces that have been successfully created in other areas of the world (see Error! Reference source not found.). A summary of this proposal is contained in the UniversityCity Powerpoint from March, 2012 here.

1. Advanced Transit Oriented Development

Near-station environments have a major impact on transit ridership, bicycle use, and distances travelers will walk as part of a multi-modal trip (Please see LCTR, SR-836 Express Bus Study, Dec 2010, found here). This is clearly evidenced by current DOT funded efforts across the country to create better catchment areas for trains and express bus systems by improving crosswalks, installing sidewalks, and adding bike lanes. In UniversityCity, users get great real-time information from the ITPA that helps them reach their destinations faster and easier,
including through increased use of transit. With our Advanced Transit Oriented Development (ATOD) improvements (see complete ATOD description (found here), they also experience a near-station environment that rivals the best places in Europe. This combination creates extensive mode shifts to transit/biking/walking, more affordable living opportunities, greatly improved pedestrian safety and comfort, and further reduced congestion, pollution, and energy use. (Gustafson, T., Growing the New American Economy, Feb. 2009, found here; Zacharias, J., The Amsterdam Experiment in Mixing Pedestrians, Trams and Bicycles, ITE Journal, Aug. 1999, found here).

The UniversityCity ATOD contains a number of new and traditional components innovatively woven together to address the total travel path of individual travelers and many of these components connect integrally to the ITPA for enhanced travel choices. As can be seen in Error! Reference source not found., the various elements use both TIGER and other sources of funding, and include:

- Advanced Transit Multimodal Station (ATMS) inside a new Smart Garage;
- Pedestrian bridge across US 41;
- Advanced Pedestrian-Oriented Complete Streets (APOCS) improvements to travel lanes, sidewalks, medians, and intersections along a mixed-use Main Street Corridor;
- New City Hall Plaza and Mixed-Use Garage;
- Improved pedestrian safety features at the intersection of 109th and US 41;
- Upgraded pedestrian plazas and pathways on the FIU campus;
- APOCS improvements on SW 5th & 6th Streets between 109th and 107th Ave.;

Figure 3. Pedestrian Oriented Spaces (Traffic Calmed Street, Multi-Modal Accessible Plaza, Transit Greenway, and Waterfront Pedestrian Corridor)
- Special attention to personal security throughout the ATOD area, using environment, program, and strategic communications improvements;
- Complete street improvements on 107th Ave between US 41 and Flagler Street;
- Upgraded Sweetwater transit vehicles, coordinated use of FIU collector bus vehicles, and expanded use of FIU motor coaches on the Miami-Dade Transit express bus routes; and
- Miami-Dade Transit Express bus improvements between the ATMS and MIC.

The UniversityCity ATMS serves as the transit hub for western MDC. It accommodates existing FIU bus service between the Maidique and Biscayne Bay campuses; actively supports the proposed Express Bus services to the MIC along SR-836 (a complementary TIGER proposal that will also provide great access to Metrorail, Tri-Rail and other express bus routes); serves as a hub for the local UniversityCity shuttles and trolley vehicles operated by FIU and Sweetwater; accommodates bicycles and car sharing facilities and equipment; provides airport-quality retail services and air-conditioned waiting area amenities for transit customers; and is connected to a number of safe and friendly pedestrian and bike pathways that flow through nearby mixed-use areas and encourages a combination of walking and transit trips. Security cameras and other design and operations features create a very comfortable waiting environment. Finally, with a special access drive providing bus entryway and exit directly from and back onto US 41, a raised platform, and pre-ticketing, the ATMS also reduces boarding time and headways. (Please see LCTR, SR-836 Express Bus Study, Dec 2010, found [here](#))

As part of the ITPA system within the ATMS, transit vehicle arrival and departure information is communicated via: i) direct view of transit vehicles from the conveniently located terminal waiting area and platform; ii) automated audio broadcasts to terminal waiting areas and retail establishments; and iii) notifications sent to the smart phones of the ITPA customers.

The new Smart Garage contains the ATMS (see Figure 5), and both elements will regularly feed information into the ITPA system to let users know when parking is available, when various buses will arrive, the availability of bike lockers, and real time rates for car sharing rentals. The garage contains a total of 2,000 parking spaces for private cars, 50 spaces for bicycles, 32 reserved spaces for ITPA subscribers, and at least 6 spaces for the car sharing program. In addition, at least one small retail space provides activity, amenity, and natural surveillance both day and night to enhance transit rider comfort and safety. As part of an economic inclusion and UniversityCity Prosperity Project
small business policy, preference will be given to potential retail business operators who are current residents of University City.

The Pedestrian Bridge across US 41 at SW 109th Avenue (see Figure 4) provides a safe and critical link between the residential neighborhoods, FIU parking garages, ATMS, FIU Main Campus, FIU Engineering Campus, and pedestrian mixed-use districts along 109th Avenue in Sweetwater. By using a sloped parabolic structure, the bridge also allows disabled persons and bicycles to use it safely and easily. Lighting and other features help create a safe pathway after dark as well, and the design eliminates the need for elevators. The design also provides opportunities to enliven the pathway with vendors, public art, and other activities. Additionally, this bridge will serve a key "place-making" purpose by connecting the City of Sweetwater and FIU, and as a symbol of the University City. Bridge designs and images can be found here (University City Alliance, Sept. 23-24, 2011 Charrette Report).

As indicated on Figure 6 below, the new Smart Garage will be located west of the existing FIU Red Parking Garage and will eventually be surrounded by mixed use liner buildings on the north and west, further enhancing the pedestrian-friendly environment.

Advanced Pedestrian-Oriented Complete Streets & Corridors (APOCSC) improvements (See Figure 6) to travel lanes, sidewalks, medians, and intersections along a mixed-use Main Street corridor (109th Avenue between University Drive and SW 5th Street) are crucial to the creation of a near-station environment that serves to "capture" pedestrians and funnel them to non-car travel modes. See a more complete description of APOCSC can be found in the APOCSC Definition document found here.

University City Prosperity Project
A new City Hall Plaza and Mixed-Use Garage (see Figure 8 & Figure 9) is planned at the intersection of 109th Avenue and SW 5th Street. The plaza (see Error! Reference source not found.) provides a terminating feature and focal point for events that support the pedestrian nature of the ATOD. The City Hall Parking Garage is planned to contain 180 spaces, be bordered by mixed-use liner buildings, and is to be completed by 2017, and be strategically located to direct traffic flow to and from 107th Avenue instead of the pedestrian-friendly 109th Avenue. The garage will also have technology that feeds into the ITPA to allow users to know when spaces are available. Local shuttles will stop at the plaza and garage, and ITPA users will have real time information about their arrival. Plans and diagrams for the plaza and garage are available here: (See Images from Ramon Trias & TYLIN of CHIPPA here)
Improved at-grade **pedestrian safety features** at the intersection of 109th and US 41 are expected to include narrowed travel lanes on both roadways to reduce speeds, specially designated crosswalks, widened and protected medians on US 41 to allow for pedestrians to pause (particularly useful for the elderly or disabled), improved signage to make drivers aware of pedestrians, higher lighting levels for pedestrian visibility after dark, improved sidewalks across the canal on the north side of US 41, “countdown” pedestrian crossing signals, and similar features.

**Upgraded pedestrian plazas and pathways on the FIU campus** (see Figure 11) will begin with the addition of wide plazas and small pavilions at the southwest and southeast corners of US 41/109th. These will link to a new covered walkway providing rain and sun protection along a more direct route to the center of campus, including the Graham Student Center and the Green Library. (see Figure 11 and See Images from Ramon Trias & TYLIN [here](#) for details). The pathway will include resting points with benches, shade producing gazebos, and a large terminating gazebo classroom structure. At least one local collector trolley route will stop along the pathway just south of the FIU Red Garage. This crucial connection greatly improves the accessibility of FIU Campus.

University City Prosperity Project
amenities to Sweetwater residents. A quick and safe walk, bike ride, or transit ride will make visiting the Frost Art Museum, Green Library, FIU and Tamiami Park sports venues, Graham Center, and Wertheim Performing Arts Center and open spaces (see http://campusmaps.fiu.edu/) a normal and enjoyable part of life for Sweetwater residents.

Figure 11. Upgraded pedestrian plazas and pathways on the US41/109th Ave. intersection on the FIU campus
Special attention to personal security throughout the ATOD area, using built environment, program, and strategic communications improvements will ensure that after-dark portions of the travel path remain pleasant and comfortable for transit/bicycle/walking. Lighting, natural surveillance, retail store layout and hours, maintenance schedules, and land use patterns will all be carefully designed and managed to maximize both real and perceived safety. Each new project will be reviewed early in the design phase and recommendations provided to FIU, Sweetwater, and the UCA Steering Committee.

**Complete street improvements on 107th Ave** between US 41 and Flagler Street will also support the transit/bicycle/walking environment between FIU’s Main and Engineering Campuses and in support of the many small businesses along the strip.

**Upgraded Sweetwater transit vehicles**, coordinated operating schedules and use of FIU CATS shuttle bus vehicles (See images of vehicles [here](#)), multi-passenger FIU golf carts, and expanded use of FIU Golden Panther Express motor coaches (link to image) on the Miami-Dade Transit express bus routes combine to provide a robust local transit feeder system and convenient transit experience. Supported by the ITPT with real time arrival times and enhanced trip planning capabilities for UniversityCity residents, FIU students and staff, and the many visitors to UniversityCity this shared system will become a major UniversityCity amenity. Sweetwater will refurbish two existing 12-passenger buses and will add an electric small rubber tire trolley to create a unified look and comfort standard in line with the FIU CATS shuttles. FIU busses and motor coaches will adjust routes and schedules in coordination with Sweetwater to minimize headways and enhance mobility across US 41 and 107th Ave. for students, staff, and Sweetwater residents. Finally, to help reduce travel times, FIU and Sweetwater will ask Miami-Dade Transit to assist with installation of traffic signal prioritization equipment in all these transit vehicles.

**Miami-Dade Transit (MDT) Express bus** improvements between the ATMS and MIC will connect the ATOD quickly and easily to the major transit routes throughout South Florida. As more fully described in MDT’s complementary TIGER proposal summary (Found [here](#)), this western express bus route will use shoulder lanes on the Dolphin Expressway (Route 836) to transport riders to the Miami Intermodal Center (MIC) at Miami International Airport with UniversityCity Prosperity Project
express transit connections to downtown via Metrorail, Fort Lauderdale and West Palm Beach via Tri-Rail, and South Beach and Kendall via other express bus routes. With a key stop at the UniversityCity ATMS and with supportive information from the ITPA, this combination of ATOD, ITPA, and Express Bus service is expected to increase transit ridership by UniversityCity users by at least 10% (See Gustafson, T., Growing the New American Economy, Feb. 2009, found [here]; Please see LCTR, SR-836 Express Bus Study, Dec 2010, found [here]). In addition, there is a potential for the FIU Golden Panther motor coaches (See images of vehicles [here]) to add service from the ATMS along the MDT express bus route and improve headways significantly during peak demand periods.

2. Informed Traveler Program and Applications

The Informed Traveler Program and Applications (ITPA) uses a smartphone-based interface to provide personalized, timely information and advice regarding the most efficient and cost effective travel paths for users. This includes information about whether to use transit, delay the start of a trip to avoid congestion, or take an alternate route to avoid construction or accident delays. The software is predictive in nature, allowing users to make better travel decisions even before they get in their private vehicles, and it also offers the potential of faster parking in smart garages as a major time saver. The system will work on any smart phone, and will include audio and visual capabilities similar to standard car GPS devices, but with intelligence behind the system that considers user needs, situational conditions and safety concerns.

Both the ATOD and ITPA components of the UniversityCity Prosperity Project work together with substantial previous ITS investments by FDOT and MDX to help reduce congestion, accidents, travel time, VMT, travel stress, and travel costs, and both contribute significantly to regional economic development by supporting the growth of FIU and area businesses. Using advanced information technology platforms, intelligent transportation systems (ITS), and smartphone-based software, the ITPA also substantially reduces travel time, travel and travel stress. Three separate initiatives will be undertaken to accomplish this:

- First, with funding from the TIGER program, our team will develop a location-specific working prototype linked to the surface transportation improvements of the ATOD;
- Second, with funding from MDX, our team will research and identify the needed systems improvements and plan to fully operationalize the UniversityCity-centric ITPA, including deployment plans, feedback systems, and user interface systems; and
- Finally, with funding from MDX and others once an acceptable prototype and operations plan are in place, our team will fully deploy ITPA. Initial pilot deployment for 20,000 users will be UniversityCity-centric, but with a robust, scalable, and flexible platform, further deployment throughout MDC and South Florida is the ultimate objective.

The transportation system benefits of basic ITSs are well known. They have been found to maximize the capacity of infrastructure and reduce the need to build additional highway capacity. For example, ITS can contribute significantly to reducing congestion, which costs U.S. commuters 4.2 billion hours and 2.8 billion gallons of fuel each year, costing the U.S. economy up to $200 billion per year. Overall, ITS can reduce congestion by as much as 20 percent or more. ITS also enables transportation agencies to collect the real-time data needed to measure and improve the performance of the transportation system, making ITS the
centrprise of efforts to reform surface transportation systems and hold providers accountable for results.

For a better understanding of how the ITPA benefits users, consider the following scenarios:

_The Frustrated Employee_ - Annette is driving on a congested I-95 on her way to FIU. Using real-time information on current traffic conditions combined with Annette’s current location and desired destination, the ITPA determines that that S.R. 836 is equally congested, and an alternative route that uses public transit would make her travel faster and easier. Based on this, the system automatically alerts her and she decides to park at the Sheridan Street Tri-Rail Station and take the Tri-Rail train that is scheduled to leave within minutes of her station arrival. Annette rides to the MIC station where she boards the FIU-MIC Express Enhanced Bus Service that departs 10 minutes after she arrives, giving her time to call her office and order a cup of coffee. She arrives at FIU 40 minutes faster than Bob, who was traveling in the car next to Annette in Hollywood but stayed on I-95 and S.R. 836 all the way to FIU. Because the ITPA updates and alerts Annette automatically, there is no need for her to fumble with buttons while she’s driving. She knows she can trust the system and feels safe using it.

_The Rushed Student_ – Francisco, an FIU Honors College freshman, is so focused on exams, studying, after school activities, and paying his rent that he forgets to leave on time for a critical final exam. He knows that finding a parking spot at school could be the longer part of his trip, and he is late! He quickly connects to the ITPA program via his smartphone. He reserves a spot in the Smart Parking Garage. When arrives he immediately parks his car in the reserved space. He not only made it to school on time for his final exam but he also saved 20 minutes and lots of gas trying to find a parking spot.

_The Hard-Working Immigrant Father_ – Jose, a Sweetwater resident, is focused on providing a comfortable home for his family. He is new to the area and works two jobs to make a sustainable living. His children are doing excellent in school, and he likes the local trolleys that take them to FIU for tutoring and advanced classes. He saves money however he can and is a regular transit user. He is excited about a new transportation gateway and hub being constructed near his neighborhood because it provides easy walking access the complete regional transit system via express buses to the MIC. His entire family uses the ITPA to manage their transit travel, and with the money he saves they are able to afford a larger home, save for college, and take in an occasional FIU sporting or cultural event. When he talks to his friends who must always drive to work and waste so much time and energy in traffic, he realizes that the ITPA and other UniversityCity Prosperity Project improvements have helped him create a high quality, yet affordable lifestyle for his family.

Once fully developed and deployed – with IBM as a key vendor and through a partnership between FIU’s National Science Foundation Industry/University Cooperative Research Center for Advanced Knowledge Enablement (I/UCRC-CAKE) and Lehman Center for Transportation Research (LCTR), with expertise support from University of Illinois in Chicago Computational UniversityCity Prosperity Project
Transportation Program and other experts- the ITPA will provide one of the most advanced ITS in the world. It will help users to confidently make safe, interesting, affordable, and convenient trips by vehicle, transit, bicycle, or walking using smartphone connectivity.

**a) ITPA Prototype Research and Development**

The ITPA Prototype Research and Development (R&D) Phase involves a UniversityCity-Centric research and prototype technology development project (UniversityCity ITPA) focused on investigating, determining, and demonstrating the best way to create an ITP that will help UniversityCity-affiliated subscribers to travel to and from UniversityCity faster, easier and more enjoyable. As shown in Figure 13, this phase will focus on four primary capabilities:

- Smart Parking use and integration;
- real-time situational aware data integration from multiple, heterogeneous sources;
- travel suggestions; and
- predictive guidance based on situational aware conditions such as traffic congestion, en route accidents, etc.

**Prototype Primary Capabilities**

**Smart Parking** is an important component of the ITPA. As travelers near their destination in UniversityCity, they will receive information on their mobile device indicating the location of available parking in designated garages (initially the Red Garage at FIU). The system will provide real-time information to University-affiliated subscribers regarding the availability of parking spaces within FIU’s Smart Garages. The first instantiation will include general parking availability, with future expansion delineating exact types and locations of spaces available.

Reserved parking will also be part of the system for those ITPA travelers willing to pay a premium. At FIU, 32 metered parking spaces in the Red Garage (next to the new ATMS) will be specially equipped with a wireless detection system, electronic signage and a siren. The sign will indicate that the space is reserved by displaying either the name of the subscriber for whom the space is reserved or a reservation number. An alarm will sound if anyone else parks in the space. As soon as the space is reserved by the ITPA, the electronic sign will begin to display the reservation information to indicate to others not to use the space. The mobile app will then tell the ITPA user which spot to park in. Using a wireless sensor and the user’s mobile device, the system will detect when the appropriate ITP user parks in the space. In future expansion of the system, users will have the option of having their account automatically charged, eliminating the need for coins or even extra time to use the phone to pay.

If a different vehicle enters the space, the system will set off an audible/visual alarm at the space location and notify FIU personnel to have it ticketed and towed immediately. Pricing for the reserved parking spaces may vary depending on peak availability, demand elasticity, and whether the user is making a transit connection.
ITPA users may reserve a space up to 20 minutes prior to their arrival, but will pay an additional premium for the service. If demand for reserved parking by ITP users regularly exceeds the number of metered spaces at FIU, the number of metered spaces will be expanded. The planned smart parking space configuration for FIU’s Red Garage can be found here (Final Proposed Smart Parking Garage (Intelligent Parking System) layout diagram).

During the pilot deployment, additional smart parking location options at FIU, MIA, Sweetwater, and downtown Miami will also be explored and evaluated with MDAD and the City of Sweetwater, as well as eventually the Miami Parking Authority, Miami Beach and others. Letters of support and interest in this expansion can be found here.

An important ability of the ITPA is real-time situational awareness - having advance knowledge and awareness of conditions along potential travel routes. This “situational awareness” is the capability for a traveler to be informed of situations that will impact travel. Many of these situations include everyday challenges such as traffic congestion, emergencies such as accidents, weather, events such as sporting events or concerts, construction, government notifications, parking information, or commercial notifications. Our R&D work will lay the groundwork for advanced situational awareness by engaging in research and development of the best methods for data integration and analysis of the following situational aware data:

1. Detailed maps, routes and driving directions
2. Express bus schedule between FIU and MIC
3. Real-time location and actual arrival/departure times for the FIU-MIC Express bus
4. Real-time traffic information on SR-836 and SR-112

Figure 13. UniversityCity ITPA Prototype
5. Real-time accident information on SR-836 and SR-112
6. Smart parking information at the FIU a parking garages.

All data will be updated at the most frequent intervals available. This capability will provide the system with the information needed to keep ITPA users up to date on information that will affect their travel and make intelligent recommendations to ITPA users as detailed below.

**Travel suggestions and options** are an important part of keeping ITPA users informed about their travel options is to provide route-related recommendations to users. Recommendations inform a traveler of travel-related suggestions or other options that may alter the traveler’s plans. These suggestions are based on the analysis of multiple situational awareness elements and may involve a specific action related to travel or a change in a traveler’s planned route. They are sometimes used in conjunction with routing guidance (see below). Recommendations can include the following:

- Delay travel for a specified period of time (e.g., leave in 10 minutes to avoid traffic congestion)
- Reroute planned travel via an automobile (e.g., take local roads instead of the Dolphin Expressway)
- Take public transportation on part or the entire route to the planned destination

One example is to inform a traveler that given the traveler’s plans and current situational awareness information, the typical delays for automobile transportation along a planned route is 75 minutes while the delays for public transport are typically 15 minutes. The system would recommend taking public transportation in this case, and provide information and routing guidance that includes public transit information (e.g., which trains/buses/etc. to take). This capability uses rules, analytics and prediction to calculate recommendations. For the R&D Phase, travel suggestions will be limited to the routes described in the situational awareness discussion above for which situational data is available.

An enhanced capability of the ITPA involves **routing instructions and guidance**. This includes the capability to provide the traveler with alternative travel information and routing instructions based on the travelers plan, smarter parking, situational awareness, and travel suggestions. This guidance includes showing the traveler additional choices for transportation. For example, alternative major routes, locations of metro stations, and availability of boarding on additional public modes of transportation such as a bus or train. Importantly, when routing is requested, the system will also specifically include an analysis of available data regarding return trip conditions such as time of day. This provides users with more viable options; particularly in terms of the availability of public transportation (e.g., is it available at the expected time for the return trip).

Routing guidance includes an analysis of real-time situational aware data for major routes when available. If real-time data is not available, then users are provided with, at minimum, turn-by-turn routing guidance similar to what is available in standard GPS devices. For the UniversityCity pilot, guidance will be limited to the following 2 routes to FIU: SR-836 and SR-112. For this phase, public transport guidance will be limited to express buses operating between FIU and the Miami Intermodal Center (MIC).

UniversityCity Prosperity Project
Prototype Architecture
To create the innovative ITPA, system and software assets already in use by IBM in “smart cities” around the world will be combined with intelligent transportation and business analytics, spatial analytics, and other components as suggested by the ITPA architecture shown below in Figure 14.

Prototype Operational Environment
ITPA server components will be installed on hardware and software running in a laboratory environment at FIU. This environment will provide a flexible and robust environment that will allow for the analysis and development of the most appropriate, scalable hardware and networking design specs and configurations to support the larger, production system in later phases. Support will be provided for up to 24 users in this phase.

Prototype Project Plan and Schedule
A more detailed plan describing the roles/responsibilities of the various experts and organizations, specific schedules and milestones, project deliverables, operational environment, user types and numbers, and more can be found at: (link).

b) Workplan Efforts
This effort is funded by the above mentioned MDX $265,000.00 grant and will commence at the same time as the R&D Phase funded by TIGER. It involves determining a workplan and way
forward to a localized and robust pilot phase by researching, planning and documenting the user, system and data requirements for pilot and full deployment of the ITPA project, including the analysis and determination of design elements that should be included to ensure appropriate scalability of the overall ITPA project. This work includes:

- Research the current and planned availability of relevant, situational-aware data sources on major thoroughfares, multimodal and public transportation corridors, and Smart Garages.
- Analyze available data to determine inclusion/exclusion in predictive modeling and routing recommendations.
- Review and update currently available situational-aware data modeling technologies and algorithms for ITPA region-wide applications.
- Complete and document end-user and system requirements gathering for the Localized Pilot Deployment Phase.
- Provide the Localized Pilot Deployment Phase preliminary project plans, statements of work and work breakdown schedules.
- Provide high-level design specifications for phase integrations and design modifications for subsequent phases.

Work for this initiative will employ standard project management best practices to provide research, analysis and documentation regarding project requirements and planning for pilot and full deployment of the ITPA project. Information garnered will also be used to help create a working prototype and a robust, scalable long-term solution.

c) ITPA Localized Pilot Deployment

The Localized Pilot Deployment (LPD) Phase involves the deployment of an operational pilot system that provides all the features of R&D Phase plus expanded geographic coverage, expanded real-time situational awareness and improved system capabilities for approximately 20,000 subscribers. The four primary capabilities will be expanded as follows:

- **Capability 1 – Smart Parking:** For this phase, it is expected that real-time usage information and reservations for parking spaces will be available for additional FIU Smart Garages and a Smart Garage located in Sweetwater. Support for other relevant Smart Garages will be implemented as they become available.

- **Capability 2 – Real-time Situational Awareness:** The LPD Phase will involve expanding the analysis of real-time situational aware data wherever it is available (e.g., any thoroughfares, express busses, trains, etc. for which information is currently available).

- **Capability 3 – Travel Suggestions and Options:** Routes in which travel suggestions will be available will be expanded to include additional major transit corridors (e.g., Metrorail, Tri-Rail, Express Buses, etc.) and additional types of information such as weather, major event information (e.g., sporting event), Miami Mover (to/from MIC and the Airport), Airline schedule and real-time departure/arrival information and common carrier information (e.g., Greyhound).

- **Capability 4 – Routing Instructions and Guidance:** For this phase, routing guidance will be expanded to include the major public transit corridors and routes.
The Localized Pilot Deployment Phase will also introduce a new capability, Alerts, to the ITP system. “Alerts” involves the ability to provide to the traveler with alerts and notifications for information relevant to the traveler’s planned route that may indicate a change in travel time, or a change in routing recommendations and guidance instructions. Alerts are generally triggered by a change in conditions along a traveler’s route based on situational aware data and analysis of the effects that change. For example, if a traveler’s route includes riding on a public transit bus, a traveler could be alerted if a bus schedule changes that would increase travel time. If desired, this could be coupled with new routing recommendations and alternate guidance instructions that would potentially decrease travel time (assuming such a change is available).

**d) Expanded Regional Deployment**

One additional phase to the ITPA is envisioned as a region-wide expansion of the system for use throughout the eastern South Florida region, from Indian River County to Key West. The focal point of the system will change from travel to and from UniversityCity to travel to and from the MIC. This will greatly expand the usefulness and desirability of the system.

II. **Project Parties:**

The Florida International University Board of Trustees (FIU) will lead the implementation of the UniversityCity Prosperity Project under the direction of Ken Jessell, Senior Vice President and Chief Financial Officer. Over 20 other FIU Vice Presidents, Department Directors, Deans, Project Managers, and expert faculty will also participate either directly or as part of the UniversityCity Alliance, with project management by the I/UCRC-CAKE. Detailed qualifications for key project personnel are available at [http://cake.fiu.edu/TIGER2012](http://cake.fiu.edu/TIGER2012)

A second key partner in the Project is the City of Sweetwater, including direct participation by Mayor Manuel Maroño and Chief of Staff Robert Herrada. We also expect regular participation and briefings with Sweetwater City Council. Notably, Mayor Maroño also serves as a member of the Florida Transportation Commission. The University City project will also receive support from the City’s Police, Maintenance, Building and Finance Departments as directed by the Mayor and City Commission.

Private sector partners, participants and vendors also play significant roles. As a primary expert vendor, IBM as a member I/UCRC-CAKE member will work closely and extensively with FIU’s I/UCRC-CAKE to develop the unique Sustainable Informed Traveler Program. RRAC University Apartments, LLC will build the first mixed-use project along 109th Avenue’s new “Main Street” and assist with infrastructure improvements. Other real estate developers are actively seeking to develop the private mixed-use liner buildings surrounding the new City Hall garage as well as additional mixed-use projects containing student housing. Trias & Associates and TYLIN will likely provide town planning and engineering guidance during construction, and Ken Stapleton & Associates/The Safedesign Institute will help implement the personal security review process.

Miami Dade Expressway Authority (MDX) is a third major partner. They have committed $265,000 in support of the ITP project components as well as access to extensive data sets and fiber optic connections when required and under conditions as they believe are helpful. They will provide technical guidance in the early phases of ITP, leadership in providing and raising
funds for the ITPA implementation, and a real-world platform in which to deploy ITPA. The MDX letter of support can be found here.

**Miami-Dade Transit** and FIU have agreed to closely coordinate our TIGER projects in order to create a seamless combination of new travel options and solutions for western MDC. Mutual letters of support are attached and can be found here.

**Florida Department of Transportation** (FDOT) District 6 is actively participating as well, with direct involvement of District Director Gus Pego and several members of his senior staff. They are providing partial funding for a Subarea Mobility Study (SAMS), coordinating the 107th Avenue improvements, and study and assist with the at-grade pedestrian improvements at the 109th/US 41 intersection, among other things. Their letter of support can be found here.

**Miami International Airport** is working as part of the team to explore ITPA smart garage opportunities at MIA/MIC and to support the Express Bus service connections to the UniversityCity ATMS. Their letter of support can be found here.

Finally, the entire congressional delegation from Miami-Dade County has pledged their support for the project in the form of a jointly signed letter. That letter and those of other partners can be found here.

### III. Grant Funds and Sources/Uses of Project Funds:

The UniversityCity Prosperity Project is the result of strong collaboration and has attracted resources from multiple organizations. A summary of the sources and uses of project funds is shown below, including the percentage of revenue from each source, and a more detailed budget is available here.

UniversityCity Prosperity Project Sources and Uses Summary

<table>
<thead>
<tr>
<th>Source Description</th>
<th>US Department of Transportation TIGER Funds</th>
<th>Florida International University</th>
<th>City of Sweetwater</th>
<th>RRAC University Apartments, LLC</th>
<th>Miami-Dade Expressway Authority</th>
<th>Florida Department of Transportation</th>
<th>Project Total</th>
<th>% of Project Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW 107th AVE Improvements - 6 lanes</td>
<td>$22,413,113</td>
<td>$20,000,000</td>
<td>$2,413,113</td>
<td></td>
<td></td>
<td>13.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sweetwater/105TH Hr Imporved Parking &amp; Access (CHIPA)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>13.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SW 109th AVE APOCSC Improvements</td>
<td>$2,076,000</td>
<td>$1,863,040</td>
<td></td>
<td></td>
<td></td>
<td>2.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community Transit Vehicle Restoration &amp; Operation</td>
<td>$330,000</td>
<td>$165,000</td>
<td></td>
<td></td>
<td></td>
<td>0.3%</td>
<td></td>
<td></td>
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<tr>
<td>Private Student Housing Development</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pedestrian Parabola Bridge over US 41</td>
<td>$5,437,413</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.7%</td>
<td></td>
<td></td>
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<tr>
<td>SW 109th AVE FIU Maidique Campus Entry Plaza</td>
<td>$814,700</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.6%</td>
<td></td>
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<tr>
<td>FIU Maidique Campus Pedestrian Paths and Boardwalks / Gazebos (APOCSC)</td>
<td>$1,472,860</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.0%</td>
<td></td>
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<tr>
<td>FIU Construction Support Staff, Advisory Consultants, and Expenses</td>
<td>$808,827</td>
<td></td>
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<td></td>
<td></td>
<td>0.6%</td>
<td></td>
<td></td>
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<tr>
<td>Informed Traveler Program &amp; Applications</td>
<td>$8,000,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New FIU Smart Parking Garage</td>
<td>$34,541,039</td>
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<td></td>
<td></td>
<td></td>
<td>23.7%</td>
<td></td>
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<tr>
<td>ATMS Terminal Retail Area and Platform</td>
<td>$860,000</td>
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<td></td>
<td></td>
<td></td>
<td>0.6%</td>
<td></td>
<td></td>
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<tr>
<td>Smart Parking Restri of Additional FIU Parking Garages</td>
<td>$200,000</td>
<td>$800,000</td>
<td></td>
<td></td>
<td></td>
<td>0.7%</td>
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<tr>
<td>Sustainable University City SAMS</td>
<td>$102,000</td>
<td>$102,000</td>
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<td>0.3%</td>
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<tr>
<td>FUMM</td>
<td>$20,000,000</td>
<td>$35,443,039</td>
<td>$22,130,040</td>
<td>$35,000,000</td>
<td>$10,265,000</td>
<td>100.0%</td>
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</tr>
</tbody>
</table>

With a total project cost of $145,455,192 and a total of $20,000,000 in requested TIGER funds, the percentage of project costs to be paid for by TIGER funds is 13.7%. As indicated in the
attached funding commitment letters, all non-TIGER funds will be available on or before June 30, 2013. The additional commitments are summarized below.

**FIU** has committed to fund the construction of a new Smart Parking Garage with room to house the ATMS platform and related amenities. It will also fund the retrofitting of additional parking garages using the technology and techniques developed for the TIGER-funded pilot Red Garage. FIU will also reroute both their CATS vehicles and their Golden Panther Express buses to serve the ATMS, and the CATS vehicles will shift their route to 109th Avenue. FIU will also planning to determine how best to provide Project support in the form of regular evaluation surveys; a student orientation effort to encourage transit ridership; specialized crime prevention services for project design; and, in conjunction with the UniversityCity Alliance, the development and management of a high quality web site to inform the community about Project construction and activities, ITP subscriptions and services, monthly transit passes, and related events.

**Sweetwater** has committed to fund the construction of the City Hall Plaza and Mixed-use Garage component of this project, completion of APOCS improvements on 5th and 6th Streets, and ongoing maintenance of the new “Main Street” amenities.

**RRAC University Apartments, LLC** has committed to building a 550–bed private housing tower that will include mixed-use retail space on the first floor and that will interface directly with the SW 109th Avenue APOCS and the SW 8th Street Pedestrian Bridge.

**Miami-Dade Transit** has agreed to explore sharing cost of the ATM Platform to be built in the new FIU Smart Garage. They will coordinate their proposed $24.5 million Express Bus Service with the UniversityCity Project by: using the ATMS as a key stop; working with FIU to determine how best to coordinate additional express service to the MIC and other FIU campuses (Biscayne Bay and Engineering) hopefully using the Golden Panther Express buses for supplemental and flexible routing and scheduling; and using the ITP to minimize wait time for transferring transit riders.

**MDX** has committed to fully support the ITPA preliminary planning phase. When proof of concept is complete, MDX will also lead the co-funding of the Informed Traveler Program Phase 1 and its Phase 2 expansion. Finally, MDX has agreed to provide access to data streams from its extensive ITS.

Another committed partner is **FDOT**. They will contribute improvements to SW 107th Avenue that will allow better traffic flow and access to the Sweetwater City Hall Plaza and Mixed-Use Garage. They have also initiated a study of potential pedestrian crossing improvements at the SW 8th Street (US 41)/109th Avenue intersection, and if warranted will make needed improvements to enhance pedestrian flow and safety at grade. Finally, FDOT has agreed to provide funding to FIU for a Sustainable UniversityCity Subarea Mobility Study (SAMS) over the broader geography of UniversityCity (Sweetwater, Madique Campus and adjoining properties). This analysis will examine multi-modal mobility challenges and potential solutions to achieve mobility and sustainability goals.

UniversityCity Prosperity Project
Given the multifaceted nature of the UniversityCity Prosperity Project, there are a number of other aspirational leveraged resources that would provide further support to the Project if funded. These include higher quality ACOPS improvements ($3.5 m), mixed-use liner buildings around the new Sweetwater and FIU Parking Garages ($208.8m), and additional smart parking garages at MIA ($2.4m).

Commitment letters from the various partners and cooperating entities are attached and available here.

IV. Selection Criteria
   A. Long-Term Outcomes

(i) **State of Good Repair** - Each of the components of the UniversityCity Prosperity Project help reduce vehicle miles travelled, eliminate unnecessary trips, reduce travel time, and increase the use of mass transit, walking, and biking. Various components also strategically upgrade surface transportation assets to reduce the current and projected levels of congestion that threaten network efficiency and roadway surfaces. In doing so, the project reduces wear and tear on existing roadway assets, creates additional sustainable revenues to maintain and expand transit operations, and enhances more efficient traffic flow. These benefits are more fully described and quantified in the Benefit/Cost Report found here. In addition, the commitment of FIU to support several of the Project components provides sustainable resources to reduce the long-term cost structure of the mobility systems.

(ii) **Economic Competitiveness** - The UniversityCity Prosperity Project substantially reduces overall travel time for workers and students, reduces total household expenses for transportation, attracts and retains more educated workers to support business growth, encourages technology transfer activities from FIU research, and helps attract additional private investment in businesses that operate globally. Given FIU’s crucial role in attracting, developing, and retaining talent, the resulting growth of FIU will improve both regional and national economic competitiveness in the global innovation economy. Significantly, a unique measurable impact is to cultivate the next generation of transit riders in the form of FIU students. By creating systems and places that encourage a culture shift toward more transit use, the Project creates a significant number of long-term mode shift users.

ITPA also allows users to spend less time on travel, more productive time when traveling on transit with wireless connectivity, and less energy-draining stressful time operating a vehicle in congested traffic. It also reduces employee tardiness and absences. This results in higher worker productivity and economic competitiveness for businesses. For those ITPA users who travel for work, this leaves additional time for more productive tasks and economic value. This includes the ability of government agencies to plan around patterns of travel more effectively. Finally, by transferring the technology developed by I/UCRC-CAKE to enhance previous systems, additional benefits, market value, and business development opportunities are created for the region.

(iii) **Livability** - By encouraging community engagement in land use planning, using mixed-use developments with higher density to make transit and walking/biking more convenient and efficient modal choices, and making FIU amenities and work/learn opportunities more

UniversityCity Prosperity Project
accessible, the Project provides major improvements in transportation choice, affordable lifestyles, equitable prosperity, educational opportunities and attainment, and health outcomes. The disadvantaged populations within the Project area, including significant numbers of low income and limited English households, elderly, non-driver immigrants, and first generation university students benefit more than others. By reducing VMT, facilitating the development of new housing close to work and school at FIU, and creating substantial shifts to transit-walking-biking, the Project also helps improve air quality, reduce energy use and dependence on foreign fossil fuels, and improve social equity in UniversityCity.

The ITPA solution also helps users increase personal time; provides timely information allowing easy access to more transportation choices; enables reliable and timely access to employment centers, educational opportunities, services, and other basic needs; is focused on existing communities; and enhances the unique characteristics of UniversityCity by providing more affordable, safe, and low stress transportation opportunities.

Finally, the special focus on personal security along the total travel path substantially improves real and perceived safety, a key livability issue. In doing so, the Project creates an even greater mode shift to transit-biking-walking and improves levels of exercise and daily activity that improve health outcomes and benefits.

(iv) Environmental Sustainability - The UniversityCity Prosperity Project creates more environmentally sustainable land use patterns and densities, realistic transportation modal alternatives, additional support for FIU’s sustainability initiatives, and a great opportunity to demonstrate how powerful university-community partnerships can create a more environmentally sustainable transportation system and equitably prosperous community. Significantly, by concentrating development in higher densities near FIU, the Project reduces development pressures on the nearby everglades, a sensitive and threatened ecosystem of national and international importance. As detailed in the Cost Benefit Analysis, the Project also creates significant reductions in greenhouse gases and other air pollutants as well.

ITPA reduces total trip time and related idle time, parking search time, and fuel expenditures for those travelling in private vehicles. It also creates substantial mode shifts to transit, biking, and walking. All of these reduce greenhouse gas emissions, fossil fuel consumption, non-point source roadway runoff pollutants, and particulate air pollutants

(v) Safety: One of the most significant aspects of the UniversityCity Prosperity Project is that the road separating FIU and Sweetwater (US 41) is deadly to pedestrians and bicyclists. Those who use their cars, once they leave the FIU Maidique Campus or Engineering Center, have no inclination to drive to Sweetwater and they pass by without thought. This is confirmed by recent survey results indicating that over 55% of FIU students and staff either never visit Sweetwater or visit only once per year. Creating a pedestrian environment that works for large scale walking and does not put either side at risk requires four strategies included in the proposal:

- cross with the light in a frequently arriving and departing small transit shuttle;
- cross by a wider than typical pedestrian bridge that is attractive, fun and wide enough for small vendors at the wider middle cross section (30 feet);

UniversityCity Prosperity Project
use for some parts of the day a golf cart-type small shuttle to travel back and forth over the bridge; and,
reduce the lane widths as US 41 traffic approaches the intersection with SW 107th Avenue and widen the median; placing hardscape, landscape and the pedestrian bridge support in the median.

No one wants students, residents, or faculty and staff dying for doing too little. The UniversityCity Prosperity Project substantially reduces the risk of that happening.

ITPA helps travelers avoid congestion or hazard conditions and reduces car trips and vehicular speeds in urbanized areas so that the likelihood of car accidents and bicycle/pedestrian injuries from interaction with motor vehicles is reduced. Reserved parking in the Smart Garages reduces urgent searching at unsafe speeds and minimizes accidents in the garages.

B. Job Creation & Near-Term Economic activity
This $145 million project will not go to contract in 2013 without the grant award. As scheduled, this project will be mostly completed by December, 2014 and will be fully complete by July 2015. Short-term job creation identifies the jobs immediately created by project spending and constitutes planning, design, administrative, and construction related positions. Per the “Estimates of Job Creation from the American Recovery and Reinvestment Act of 2009”, Issued and Developed by the Executive Office of the President - Council of Economic Advisors, one job-year is created for every $92,000 of government spending. Based upon this ratio, and the overall project budget and schedule, it is estimated that the UniversityCity Prosperity Project will generate approximately 527 short-term jobs. Over a longer term, beyond construction, there will be new jobs created for people hired to operate the improved community transit created through this TIGER grant and further expansions of thereafter. Further, new jobs will be created after the ATMS is built for people employed to operate the terminal facilities for the SR 836 Express Enhanced Bus Service and associated storefronts associated there to. Finally, new jobs will be created in general as SW 109th Ave. develops as a Main Street/Complete Street with mixed-use destinations from City Hall to the Green Library.

Complete detailed project schedules have been developed to ensure that DOT will be able to obligate funding on or before June 30, 2013. They include finalization of any NEPA requirements and local approvals, scheduling for construction of the ATOD elements, ITPA prototype research and development, and the related projects constituting match commitments. A complete scheduling document can be found here.

Benefit Cost Analysis
As part of the project development, a Benefit Cost Analysis (BCA) for a 30 year period life span of the project was performed in order to determine the financial and economic feasibility of the project. The summary of the analysis is listed in the appendix which shows a Benefit-Cost Ratio of 3.89 and 1.87 based on 3% and 7% discount rates. The following table summarizes the long term outcomes of the project as a whole and a summary of the types of societal benefits expected. The benefits are further explained in the subsequent sections of this analysis.
<table>
<thead>
<tr>
<th>Long Term Outcome</th>
<th>Types of Societal Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Livability</td>
<td>• Changes the character of the neighborhood from vehicle-centric to multi-modal promoting reductions in VMT.</td>
</tr>
<tr>
<td></td>
<td>• Make University Assets more accessible to the community</td>
</tr>
<tr>
<td></td>
<td>• Property Value Increase</td>
</tr>
<tr>
<td></td>
<td>• Promotes a healthy lifestyle through promoting a more natural and friendly walking environment</td>
</tr>
<tr>
<td>Economic Competitiveness</td>
<td>• Travel Time Reduction Savings through complete street improvements and ITP</td>
</tr>
<tr>
<td></td>
<td>• Vehicle operation savings</td>
</tr>
<tr>
<td></td>
<td>• Promotes the development of new business through more accessible real estate in the project vicinity</td>
</tr>
<tr>
<td>Safety</td>
<td>• Reduced Pedestrian involved traffic accidents through the implementation of complete streets, safe pedestrian environment, traffic calmed streets, and a new pedestrian bridge to cross the busy U.S. 41 highway at the 109th Ave. intersection</td>
</tr>
<tr>
<td>State of Good Repair</td>
<td>• Long-Term replacement</td>
</tr>
<tr>
<td></td>
<td>• Maintenance and Repair saving associated with new construction and maintenance schedules.</td>
</tr>
<tr>
<td></td>
<td>• Reduced VMT will result in less wear and tear on the infrastructure</td>
</tr>
<tr>
<td>Environmental Sustainability</td>
<td>• Reductions in VMT result in reduced emission benefits</td>
</tr>
<tr>
<td></td>
<td>• Landscaping and other sustainable surface treatments will be preferred throughout this project in lieu of traditional hardscape.</td>
</tr>
</tbody>
</table>

**Project Costs and Benefits**

The cost side of the BCA equation consists of all monetized expenditures incurred by the grantee and its partners in order to fully develop the project to a usable and beneficial piece of infrastructure. Project costs consist of the total project budget including design, administration, construction, and future maintenance as defined in the TIGER 2012 proposal budget and supplemented by this document. As defined by the 2012 TIGER NOFA, “Benefits include the extent to which residents of the United States as a whole are made better off as a result of the project”. With this key point in mind, the benefits associated with this project were derived solely from the societal benefits identified in each component of this project. No transfer costs or economic impacts were considered in the derivation of this BCA. The benefits identified in this project consist primarily of four categories: 1) Modal Diversion, 2) Pedestrian Involved Accident Reduction, 3) Travel Time Reduction and 4) Residual Value of Infrastructure.

**Benefit Cost Estimation versus Economic Impacts**

Based on 3% and 7% discount rate, the project has a benefit cost ratio higher than one implying net benefit from the project. However, in our view the presented Benefit Cost Analysis provides a very conservative estimate of this project. Probably the most important benefit of this project is linking a small town with a major university campus in order to establish a sustainable community. The value of this interlinked sustainable community goes beyond what can be quantified by a Benefit Cost Analysis. For example, over long run a major portion value creation

UniversityCity Prosperity Project
will occur through: i) increased demand for real estate within a more densely developed urban form and resulting investment; ii) job creation due to increased connectivity to university education and higher living standards designed into the built environment within the area; iii) healthier lifestyles in walkable communities; iv) benefits of ITP enabled optimal utilization of existing transportation infrastructures (e.g. underutilized parking facilities at MIA can be used more efficiently with Park and Ride option), and, v) lower cost and dependable mobility through the local community, throughout the metropolitan area and the region, and to modes of state, national and international transport. These indirect and induced benefits are not easily captured in Benefit Cost Analysis and so the reported Benefit Cost ratio is highly conservative. But these indirect and induced benefits can be measured through economic impact analysis and by collecting data on user’s demand and preferences over the long run (a suggested 10 year period).

**Tracking the Annual Trend of Users Demand and Preferences**

Considering that broader economic impact of the project can be substantial, we suggest annual tracking of users demand for services and amenities provided by this project. We propose to survey potential users at the beginning of the project (in August 2012) and then do follow up survey (in August 2013) when the project is partially operational to estimate the intended and realized demand for using the services and amenities provided by the UniversityCity project. Then subsequent annual surveys can be conducted for next 8 years funded by FIU in 2014 to 2021 would measure the trend of changing demand and preferences for key services and amenities provided by this project. By complementing primary survey data on users demand and preferences with secondary economic data using high tech survey techniques such as GPS tracking by independent profession firms, we will estimate the broader economic impacts (including generative, redistributive and financial Transfer impacts) of the UniversityCity Project (see TRB 1998).


**C. Innovation**

The UniversityCity Prosperity Project uses the ITPA based upon a selection of the best software programs, assets, services and capabilities available around the world through IBM. By combining Intelligent Transportation Systems (ITS) with information Technologies (IT), and advanced modeling to facilitate transportation demand management (TDM) with real time communications, the ITPA is INNOVATION. When used to plan for a complex multimodal system, ITPA helps you take advantage of Accelerated Bridge Construction (ABC) and its application to pedestrian walking areas, uses Every Day Counts (EDC) to complete significant transportation improvements without delay and disruption, and Highway for Life (HfL) and other long duration of use structural techniques and technologies so that work undertaken is not disruptive. Used together, these innovations provide highly effective relief of transportation delays and dangerous conditions, and therefore optimize and preserve the transportation system with limited resources.

**D. Partnership**

As shown in the Project Partners section above, This UniversityCity Prosperity Project is led by a non-transportation public agency as part of as part of a strong collaboration among a broad

UniversityCity Prosperity Project
range of participants including a City, a University, a global technology corporation, private developers, and several transportation entities. A series of community meetings, Charrette, partner meetings, and the creation of a partnership alliance were all part of the robust planning process leading to the development of the Project.

V. Project Readiness and NEPA

The proposed project would primarily use infrastructure associated with existing or planned projects that have either already gone through the regulatory permitting process or has begun initial coordination with the affected resource agencies. In March 2012 an Advanced Notification (AN) package was sent to the Florida State Clearinghouse for distribution to resources agencies that conduct Federal consistency reviews to solicit initial comments. This AN package included the project description, the purpose and need of the project, and potential impacts based on GIS analysis and field surveys. Comments from the resource agencies are expected in May 2012.

In addition, pedestrian/bicycle facilities and transit greenway improvements as proposed under this action may be identified as Categorical Exclusions under 23 CFR Part 771.117. Therefore, the proposed improvements associated with this TIGER Grant application are expected to be classified as a Categorical Exclusion under NEPA guidelines. As a Categorical Exclusion, NEPA documentation is anticipated to be completed within 6 months.

The project lies within a built urban environment and impacts to the physical, natural and social environments are expected to be minimal. No additional right-of-way is required to construct the project and community opposition is not anticipated. The project is planned to improve community connectivity, reduce vehicle and greenhouse gas emissions, and encourage energy savings.

A. Project Schedule: attached and is available here

B. Environmental Approvals: NEPA Status - The proposed project would primarily use infrastructure associated with existing or planned projects that have either already gone through the regulatory permitting process or has begun initial coordination with the affected resource agencies. In March 2012 an Advanced Notification (AN) package was sent to the Florida State Clearinghouse for distribution to resources agencies that conduct Federal consistency reviews to solicit initial comments. This AN package included the project description, the purpose and need of the project, and potential impacts based on GIS analysis and field surveys. Comments from the resource agencies are expected in May 2012.

In addition, pedestrian/bicycle facilities and transit greenway improvements as proposed under this action may be identified as Categorical Exclusions under 23 CFR Part 771.117. Therefore, the proposed improvements associated with this TIGER Grant application are expected to be classified as a Categorical Exclusion under NEPA guidelines. As a Categorical Exclusion, NEPA documentation is anticipated to be completed within 6 months.

NEPA Comment - The project lies within a built urban environment and impacts to the physical, natural and social environments are expected to be minimal. No additional right-of-way is required to construct the project and community opposition is not anticipated. The project is University City Prosperity Project
planned to improve community connectivity, reduce vehicle and greenhouse gas emissions, and encourage energy savings.

C. **Legislative Approvals:** None required.

D. **State and Local Planning:** In addition to Sweetwater and the associated private developer RRAC, Miami-Dade County (MDC), FDOT, MDT, MDX, and the Miami Dade Aviation Department have all agreed to assist with this Project and their commitment letters are attached. The Southeast Florida Regional Partnership, a Sustainable Communities Initiative grant recipient, is also involved and supportive per their attached letter. In conversations with the Miami-Dade County MPO, a review of the proposal will be made and after deliberations the project components will be presented for necessary approvals and included in their 5-year plan in the event of TIGER funding. Any additional approvals will be complete on or before 6.30.13.

E. **Technical Feasibility:** TYLIN, IBM, Ouri Wolfson, Perkins + Will, FIU’s I/UCRC-CAKE and LCTR, and Trias and Associates have provided the professional and expert information needed to ensure technical feasibility for the Project. Additional technical review and guidance has been provided by FDOT, MDX, MDT and others.

F. **Financial Feasibility:** The parking garage has been approved by the FIU Board of Trustees and, as with other parking garages, FIU has the capacity to finance the construction through Florida Division of Bond Finance and pay back the debt with student, faculty, other staff, and FIU visitors parking fees. The remaining funding commitments are well within the financial capabilities of FIU and other partners.

VI. **Federal Wage Rate Certification**
Attached and available [here](#).

VII. **Material Pre-Application Changes**
Two material changes have been made since the pre-application. First, the anticipated amount of non-federal match has decreased to $125,455,192.00 million. This is largely due to timing of future projects related to the UniversityCity Prosperity Project that extend past a five year commitment period (some components of the UniversityCity Prosperity Project take longer to complete and cannot be committed to yet). Secondly, the ITPA aspects of the proposal have been adjusted to better focus and connect geographically with the various physical infrastructure improvements that are part of the UniversityCity ATOD and connection via the Dolphin Expressway, Airport Expressway, SRT-836 Express Enhanced Bus Service, and multimodal connections to and from the MIC including the FDOT, District 6 proposed South Florida Express Lane System Improvements (I-75 Express Bus including capital purchase/regional park-and-ride lots) that links to Metrorail and therefore the MIC and UniversityCity. As to these changes, we anticipate that our initial projections and assumptions will eventually occur and provide additional benefits for surface transportation, sustainable development, and equitable prosperity.

UniversityCity Prosperity Project
Federal Wage Rate Certification

I, Roberto M. Gutierrez, on behalf of Florida International University, as an applicant for FY 2012 U.S. DOT TIGER Discretionary Grants funding, certify that we will comply with the requirements of subchapter IV of chapter 31 of title 40, United States Code (Federal wage requirements) if awarded FY 2012 U.S. DOT TIGER Discretionary Grants funding for the University City Project.

Date: 3/16/12
Signature: [Signature]

Title: Director, Pre-Award

Grant Applicant: Florida International University
§ 3141. Definitions
In this subchapter, the following definitions apply:

(1) Federal government.— The term “Federal Government” has the same meaning that the term “United States” had in the Act of March 3, 1931 (ch. 411, 46 Stat. 1494) (known as the Davis-Bacon Act).

(2) Wages, scale of wages, wage rates, minimum wages, and prevailing wages.— The terms “wages”, “scale of wages”, “wage rates”, “minimum wages”, and “prevailing wages” include—
(A) the basic hourly rate of pay; and
(B) for medical or hospital care, pensions on retirement or death, compensation for injuries or illness resulting from occupational activity, or insurance to provide any of the forgoing, for unemployment benefits, life insurance, disability and sickness insurance, or accident insurance, for vacation and holiday pay, for defraying the costs of apprenticeship or other similar programs, or for other bona fide fringe benefits, but only where the contractor or subcontractor is not required by other federal, state, or local law to provide any of those benefits, the amount of—
(i) the rate of contribution irrevocably made by a contractor or subcontractor to a trustee or to a third person under a fund, plan, or program; and
(ii) the rate of costs to the contractor or subcontractor that may be reasonably anticipated in providing benefits to laborers and mechanics pursuant to an enforceable commitment to carry out a financially responsible plan or program which was communicated in writing to the laborers and mechanics affected.

§ 3142. Rate of wages for laborers and mechanics
(a) Application.— The advertised specifications for every contract in excess of $2,000, to which the Federal Government or the District of Columbia is a party, for construction, alteration, or repair, including painting and decorating, of public buildings and public works of the Government or the District of Columbia that are located in a State or the District of Columbia and which requires or involves the employment of mechanics or laborers shall contain a provision stating the minimum wages to be paid various classes of laborers and mechanics.

(b) Based on Prevailing Wage.— The minimum wages shall be based on the wages the Secretary of Labor determines to be prevailing for the corresponding classes of laborers and mechanics employed on projects of a character similar to the contract work in the civil subdivision of the State in which the work is to be performed, or in the District of Columbia if the work is to be performed there.
(c) Stipulations Required in Contract.— Every contract based upon the specifications referred to in subsection (a) must contain stipulations that—

(1) the contractor or subcontractor shall pay all mechanics and laborers employed directly on the site of the work, unconditionally and at least once a week, and without subsequent deduction or rebate on any account, the full amounts accrued at time of payment, computed at wage rates not less than those stated in the advertised specifications, regardless of any contractual relationship which may be alleged to exist between the contractor or subcontractor and the laborers and mechanics;

(2) the contractor will post the scale of wages to be paid in a prominent and easily accessible place at the site of the work; and

(3) there may be withheld from the contractor so much of accrued payments as the contracting officer considers necessary to pay to laborers and mechanics employed by the contractor or any subcontractor on the work the difference between the rates of wages required by the contract to be paid laborers and mechanics on the work and the rates of wages received by the laborers and mechanics and not refunded to the contractor or subcontractors or their agents.

(d) Discharge of Obligation.— The obligation of a contractor or subcontractor to make payment in accordance with the prevailing wage determinations of the Secretary of Labor, under this subchapter and other laws incorporating this subchapter by reference, may be discharged by making payments in cash, by making contributions described in section 3141 (2)(B)(i) of this title, by assuming an enforceable commitment to bear the costs of a plan or program referred to in section 3141 (2)(B)(ii) of this title, or by any combination of payment, contribution, and assumption, where the aggregate of the payments, contributions, and costs is not less than the basic hourly rate of pay plus the amount referred to in section 3141 (2)(B) of this title.

(e) Overtime Pay.— In determining the overtime pay to which a laborer or mechanic is entitled under any federal law, the regular or basic hourly rate of pay (or other alternative rate on which premium rate of overtime compensation is computed) of the laborer or mechanic is deemed to be the rate computed under section 3141 (2)(A) of this title, except that where the amount of payments, contributions, or costs incurred with respect to the laborer or mechanic exceeds the applicable prevailing wage, the regular or basic hourly rate of pay (or other alternative rate) is the amount of payments, contributions, or costs actually incurred with respect to the laborer or mechanic minus the greater of the amount of contributions or costs of the types described in section 3141 (2)(B) of this title actually incurred with respect to the laborer or mechanic or the amount determined under section 3141 (2)(B) of this title but not actually paid.

§ 3143. Termination of work on failure to pay agreed wages
Every contract within the scope of this subchapter shall contain a provision that if the contracting officer finds that any laborer or mechanic employed by the contractor or any subcontractor directly on the site of the work covered by the
contract has been or is being paid a rate of wages less than the rate of wages required by the contract to be paid, the Federal Government by written notice to the contractor may terminate the contractor’s right to proceed with the work or the part of the work as to which there has been a failure to pay the required wages. The Government may have the work completed, by contract or otherwise, and the contractor and the contractor’s sureties shall be liable to the Government for any excess costs the Government incurs.

§ 3144. Authority of Comptroller General to pay wages and list contractors violating contracts
(a) Payment of Wages.—
(1) In general.— The Comptroller General shall pay directly to laborers and mechanics from any accrued payments withheld under the terms of a contract any wages found to be due laborers and mechanics under this subchapter.
(2) Right of action.— If the accrued payments withheld under the terms of the contract are insufficient to reimburse all the laborers and mechanics who have not been paid the wages required under this subchapter, the laborers and mechanics have the same right to bring a civil action and intervene against the contractor and the contractor’s sureties as is conferred by law on persons furnishing labor or materials. In those proceedings it is not a defense that the laborers and mechanics accepted or agreed to accept less than the required rate of wages or voluntarily made refunds.
(b) List of Contractors Violating Contracts.—
(1) In general.— The Comptroller General shall distribute to all departments of the Federal Government a list of the names of persons whom the Comptroller General has found to have disregarded their obligations to employees and subcontractors.
(2) Restriction on awarding contracts.— No contract shall be awarded to persons appearing on the list or to any firm, corporation, partnership, or association in which the persons have an interest until three years have elapsed from the date of publication of the list.

§ 3145. Regulations governing contractors and subcontractors
(a) In General.— The Secretary of Labor shall prescribe reasonable regulations for contractors and subcontractors engaged in constructing, carrying out, completing, or repairing public buildings, public works, or buildings or works that at least partly are financed by a loan or grant from the Federal Government. The regulations shall include a provision that each contractor and subcontractor each week must furnish a statement on the wages paid each employee during the prior week.
(b) Application.— Section 1001 of title 18 applies to the statements.
§ 3146. Effect on other federal laws
This subchapter does not supersede or impair any authority otherwise granted by federal law to provide for the establishment of specific wage rates.

§ 3147. Suspension of this subchapter during a national emergency
The President may suspend the provisions of this subchapter during a national emergency.

§ 3148. Application of this subchapter to certain contracts
This subchapter applies to a contract authorized by law that is made without regard to section 3709 of the Revised Statutes (41 U.S.C. 5), or on a cost-plus-a-fixed-fee basis or otherwise without advertising for proposals, if this subchapter otherwise would apply to the contract.