UniversityCity Prosperity Project
Advanced Transit Oriented Developments and Informed Traveler Program

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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 and City of Sweetwater (Sweetwater) relationship from one of friendly neighbors to a truly unique and collaborative relationship that will create a growing, sustainable and innovative community. This FY2012 TIGER Discretionary Grant submittal is an important part of this process and proposes to help achieve a shared community vision in two innovative ways.

First, an 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, structured parking, and liner buildings;
- shared community transit feeder service vehicles;
- safe bike paths and multi-use corridors;
- private development projects that establish higher residential densities; and,
- Advanced Transit and Multimodal Station (ATMS) adjacent major highways; and;

Figure 1. Map of the UniversityCity Prosperity Project geographic area, consisting of FIU and the City of Sweetwater, and the key project components illustration.
express bus services that connect the ATMS with major intermodal facilities and operate with Bus Rapid Transit (BRT) efficiencies given the various 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 and between these UniversityCity communities and the Miami Intermodal Center (MIC) for at least some portion of their travel.

Secondly, the Informed Traveler Program and Applications (ITPA) provide personalized, accurate and timely information and advice regarding the most efficient and cost effective travel paths for consumers. This includes information about whether to use transit, delay your 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 will 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 UniversityCity Prosperity Project points the way forward.

At the same time, this is a down-to-earth, near term 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, Sweetwater, their partners and other participants fosters a more seamless campus-community dynamic that helps to 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 and adaptive community building, with a very strong and enthusiastic alliance of public and private participants, will further the goals and principles of the Sustainable Communities Initiative partnership and the TIGER program like nothing that has gone before it. Pedestrian-oriented urban design grounded in an uplifting socioeconomic mission and very smart artificial intelligence to optimize the day. Unique project roles and contributions include: the use of National Science Foundation Industry-University Cooperative Research Center for Advance Knowledge Enablement (I/UCRC-CAKE) as an organizational platform for expert multi-disciplinary and inter-institutional collaborations: IBM, as a I/UCRC-CAKE member, brings with it the world-class solutions from UniversityCity Prosperity Project
its Smarter Planet and Smarter Cities initiatives\(^1\); private real estate developers are poised to invest over $35 million in the first of many phases of mixed use projects; international business interests have begun discussions about future investments; and the entire MDC Congressional delegation has expressed their very strong support.\(^1\)

By using both of these innovative constructs and engaging world-class partners and participants, FIU can 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. The UniversityCity Prosperity Project builds upon FIU’s nascent role as an anchor institution and a community 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. U.S. strategic investments in the places surrounding universities are essential in order to attract, develop, and retain the very best talent that drives the innovation economy. In western MDC, we call this place surrounding 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) to secure necessary strategic investments.

As the only public research university in Florida’s most populous and diverse metropolitan area, FIU is among the top 25 largest universities in the country, and it plays a very special role in the Southeast Florida Region. While continuing to attract, develop, and retain internationally

experienced talent, FIU fulfills its role as the largest Hispanic serving research 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.

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 frequently stated concerns of both local residents and talented FIU recruits. FIU has limited 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 Sweetwater residents and businesses and the FIU students, faculty, employees and visitors. This situation is expected to worsen as traffic conditions increase the danger for pedestrians over the next five years when the Florida Department of Transportation (FDOT) widens SW 107th Ave. and the nearby Florida Turnpike. 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; lessen positive impacts on surrounding communities; reduce the ability of FIU and Sweetwater to serve students and resident needs; and inhibit the development of knowledge workers essential for economic prosperity.

Sweetwater envisions a high-density, vibrant urban neighborhood that helps FIU attract students, as well as global talent, businesses, and investors. Sweetwater also acknowledges the need: for
additional capacity to emerge as a high quality urban built environment; to create new jobs, connections to the amenity-rich FIU Maidique campus; for improved public spaces for a downtown Sweetwater; and for 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 with FIU 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 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 of a localized and potentially robust 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 Figure 3). 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 (see LCTR, SR-836 Express Bus Study, Dec UniversityCity Prosperity Project
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 Figure 4, the various elements use both TIGER and other sources of funding, and include:

- Advanced Transit Multimodal Station (ATMS) inside a new Smart Garage (with Intelligent Parking System technologies);
- 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 (SW 109th Avenue);
- 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.;
- 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 with FIU collector bus vehicles;

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- Expanded use of FIU Panther Express motor coaches on the SR-836 Express Enhanced Bus Service (836 Express) routes; and
- Proposed 836 Express and station improvements between western MDC/ATMS and MIC (a complementary MDT TIGER proposal)

The UniversityCity ATMS is planned to serve as the transit hub for western MDC. It will: accommodate existing FIU Panther Express bus service between the Maidique and Biscayne Bay campuses; actively support the proposed 836 Express to the MIC along SR-836; serve as a hub for the local UniversityCity community transit vehicles; accommodate bicycles and car sharing facilities and equipment; provide airport-quality retail services and air-conditioned waiting area amenities for transit customers; and connect to a number of safe and attractive 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 indoor and outdoor 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. (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.

A 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 small business policy, preference will be given to potential retail business operators who are current residents of UniversityCity.

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The Pedestrian Bridge across US 41 at SW 109th Avenue (see Figure 6) provides a safe and critical link between the residential neighborhoods, FIU parking garages, ATMS, FIU Maidique 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 UniversityCity. Bridge designs and images can be found here (UniversityCity Alliance, Sept. 23-24, 2011 Charrette Report).

As indicated on Figure 6 below, a 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.

APOCSC Improvements (See Figure 7) 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. Detailed description of APOCSC can be found in the APOCSC Definition document found here.
City Hall Plaza and Mixed-Used Smart Garage. This garage (see Figure 8 & Figure 9) is planned at the intersection of 109th Avenue and SW 5th Street and has a mixed-use liner building facing City Hall Plaza and Intelligent Parking System (see Figure 10). It also provides a terminating feature and focal point for events that support the pedestrian nature of the ATOD. The City Hall Mixed-Use Smart Garage is planned to contain 180 spaces, be bordered by mixed-use liner buildings, and is to be completed by or prior to 2017, and be strategically located to direct traffic flow to and from 107th Avenue instead of the pedestrian-oriented 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 City Hall 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 CHIPA 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 safely pause at the middle of the 8 lane highway (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 Maidique 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 through improved and widened crosswalks and sidewalks 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 12 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 feeder community transit route will stop along the pathway just south of the FIU Red Garage. This crucial connection greatly improves the accessibility of FIU Maidique Campus 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.
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 and 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 eventually support the transit/bicycle/walking environment between FIU’s Maidique and Engineering Campuses and in support of the many small businesses along the strip.

Upgraded Sweetwater transit vehicles, coordinated operating schedules, use of FIU CATS shuttle bus vehicles on SW 109th Avenue, expanded use of multi-passenger FIU golf carts, and use of FIU Golden Panther Express motor coaches (see images of vehicles [here]) on the 836 Express routes combine to provide a frequent community transit feeder system and convenient transit experience. Supported by the ITPA with real time arrival times and enhanced trip planning capabilities for UniversityCity residents and businesses, FIU students, faculty and staff, and the many visitors to UniversityCity this shared community transit system will become a major UniversityCity amenity. Sweetwater will refurbish three 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 Avenue for FIU students, faculty, staff, and UniversityCity residents and visitors. Finally, to help reduce travel times, FIU and Sweetwater will ask Miami-Dade Transit to assist with installation of transit signal prioritization equipment in all these transit vehicles.

836 Express 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]), the 836 Express route will use the shoulder on the Dolphin Expressway (SR-836) to transport riders to the MIC whenever congested traffic impedes

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a timely arrival. The MIC is connected to the Miami International Airport (MIA) via the Miami Mover (a people mover transit system). Express transit connections to downtown Miami are provided via Metrorail and Metro Mover. Access to Downtown Fort Lauderdale, Fort Lauderdale-Hollywood International Airport, downtown West Palm Beach and Palm Beach International Airport are provided via Tri-Rail and community transit. South Beach access is provided via Airport Flyer express bus service as seen here. Kendall access is provided via the Kendall Cruiser express bus service and Metrorail. Florida City can be accessed via the South Miami-Dade Busway and Metrorail. Broward County destination can be reached via 95 Express, Metrorail and Tri-Rail. Amtrak connections to points north provide national access from the MIC.ii

With a key 836 Express stop at the UniversityCity ATMS and with supportive information from the ITPA, this combination of ATOD, ITPA, passenger rail, rail transit 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; 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 836 Express route and improve headways significantly during peak demand periods.

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

The *transportation system benefits* of basic ITS’ 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 centerpiece 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 SR-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 836Express 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 SR-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 longest 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 he 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 living. His children are doing excellent in school, and he likes the local trolleys that take them to FIU for tutoring and advanced classes. To save money he is a regular transit user. He is excited about a new transportation gateway and hub being constructed near his neighborhood because it will provide easy walkable access to a complete regional transit system via Express buses to the MIC and other destinations. 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 member of I/UCRC-CAKE, along with expert support from The Lehman Center for Transportation Research (LCTR) and additional support from The University of Illinois in Chicago Computational Transportation Program and other experts within the field, 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 private passenger 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 ITPA research and prototype technology development project; focused on investigating, determining, and demonstrating the best way to create an ITPA 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, weather conditions, 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 while simultaneously the Sweetwater-affiliated subscribers will be informed of the parking status within the Sweetwater’s Smart Garages. The first installation 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, initially 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 UniversityCity Prosperity Project
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](#).

Figure 13. UniversityCity ITPA Prototype
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 836 Express and the Airport Flyer
4. Real-time traffic and accident information on SR-836 and SR-112
5. 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** are an important part of keeping ITPA users informed about their travel options and to provide route-related recommendations to users. Recommendations inform a traveler of travel related suggestions or travel 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 schedule, or transit mode choice. Recommendations can include the following:

- Alter traveler’s schedule for a specified period of time (e.g., leave in 10 minutes or wait 1 hour to avoid traffic congestion)
- Reroute planned travel via an automobile (e.g., take local roads instead of the SR-836)
- 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 expected 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 traveler’s 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 SR-836, Airport Flyer and Panther Express buses operating between FIU and the Miami Intermodal Center (MIC).

**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.

![Figure 14. Proposed ITPA Architecture based on Smart Cities Technologies](image)

**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 specifications 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 here.

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 work plan and way forward to a localized and potentially 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 system corridors and Parking 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 (LDP) Phase involves the deployment of an operational pilot system that provides all the features of R&D Phase plus a capacity for expanding the geographic coverage, real-time situational awareness and improved system capabilities for approximately 20,000 subscribers. The four primary capabilities will be provided 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 LDP 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 include major roadways and transit corridors (i.e., Amtrak
The Localized Pilot Deployment Phase will also introduce an “Alerts” capability. “Alerts” involve 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 (a public instrumentality who performs the FIU university function for the State of Florida) 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 UniversityCity Prosperity 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 an I/UCRC-CAKE member will work closely and extensively with FIU’s I/UCRC-CAKE to develop the unique ITPA. RRAC University Apartments, LLC will build the first mixed-use project along SW 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 likely 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; studying and assisting with the at-grade pedestrian improvements at the 109th/US 41 intersection; and will provide advice and support for construction and development of all UniversityCity components. 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 836 Express connections between the UniversityCity ATMS and the MIC/MIA. 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
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 and will be completed projects within a five year term ending 2017. 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 plan to determine how best to provide UniversityCity Prosperity 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, other metered street parking capacity, complete street improvements on SW 107th Avenue, 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 with transit

UniversityCity Prosperity Project
signal prioritization technology for supplemental and flexible routing and scheduling; while 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 Localized ITPA deployment and its regional expansion. Finally, MDX has agreed to provide access to data streams from its extensive ITS.

Another committed partner is FDOT. They will contribute $22,413,113 for improvements to SW 107th Avenue that will allow better traffic flow and pedestrian access to the Sweetwater City Hall Plaza and Mixed-Use Garage. They have also initiated a study of potential pedestrian crossing improvements at the US 41 and SW 109th Avenue intersection, and will make needed improvements to enhance pedestrian flow and safety at grade. Finally, FDOT has agreed to provide $204,000 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.

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 UniversityCity Prosperity Project
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, faculty, employees and visitors, along with the Sweetwater residents, business owners, business employees and visitors. 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 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 UniversityCity Prosperity 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 by increasing personal time; providing timely information allowing easy access to more transportation choices; enabling reliable and timely access to employment centers, educational opportunities, services, and other basic needs; is focused on existing communities; and enhancing the unique characteristics of UniversityCity through the development of pedestrian oriented 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 with little 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 to cross US-41 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);
- use for some parts of the day, of a golf cart-type or other small shuttle to travel back and forth over the bridge or through to intersection; and,
- reduce the lane widths as US 41 traffic approaches the intersection with SW 109th 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 because transportation system managers and decision makers did too little. The UniversityCity Prosperity Project substantially reduces the safety risk at this critical US41 and SW 109th Avenue crossing.

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 UniversityCity Prosperity Project will be mostly completed by December, 2014 and will be fully complete by July 2015. Match funded projects will be underway or completed by 2017. 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 the UniversityCity Prosperity Project.
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 836Express and the associated storefronts associated therewith. Finally, new jobs will be created in general as SW 109th Avenue. develops as a Main 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 TIGER funds 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>
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<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>
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<tr>
<td></td>
<td>• Property value increase</td>
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<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 ITPA</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, community transit and a new pedestrian bridge to cross the busy U.S. 41 highway at the SW 109th Avenue. intersection</td>
</tr>
<tr>
<td>State of Good Repair</td>
<td>• Long-term replacement</td>
</tr>
<tr>
<td></td>
<td>• Maintenance and repair savings 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 from the 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 an upwardly mobile, better educated, sustainable community. The value of this interlinked sustainable community goes beyond what can be quantified by a Benefit Cost Analysis. For example, over the long run a major portion value creation 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 ITPA-enabled optimal utilization of existing transportation infrastructures (e.g. higher use of parking facilities at MIA and elsewhere, more effectively used Park-and-Ride and easier to access passenger rail/transit stations). 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 and August 2014) 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 the next 8 years funded by FIU in 2015 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, we will estimate the broader economic impacts (including generative, redistributive and financial transfer impacts) of the UniversityCity Project. See Economic Impact Analysis of Transit Investments: Guidebook for Practitioners (TRB 1998).

UniversityCity Prosperity Project
C. Innovation
The UniversityCity Prosperity Project uses the ITPA, which will be developed based upon a selection of the best software programs, assets, services and capabilities available around the world through IBM. By combining 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 can help 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 a strong collaboration among a broad 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 a thoughtful planning process leading to the development of the UniversityCity Prosperity 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 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 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 staff, in the event of TIGER funding a review of the proposal will be made and after MPO deliberations, the project components will be presented for necessary approvals in order to be included in their 5-year plan. Any approvals will be complete on or before June 30, 2013.

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. 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 connections via SR-836, Airport Expressway (SR-112), 836 Express, 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’s Palmetto Station 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.

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i This sentence was revised for clarification with the remaining portions of the document and the intent of the submission

ii This list of available multimodal opportunities has been expanded from the original more generalized description in order to incorporate all passenger-rail and express transit services accessible from the MIC.

iii Airport Flyer reference was inadvertently left out of the narrative as submitted to the DOT on March 19th, 2012. It is included now to be consistent with traffic information provided for both the SR-836 and SR-112.

iv Extra text added clarify that transportation managers and decision makers need to make safety a priority before predictable tragedies occur.