

## Broadband USA Applications Database

**Applicant Name:** Fort Pierce Utilities Authority

**Project Title:** FPUA Broadband WiMesh Network (FBWN)

**Project Type:** Last Mile

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### Executive Summary

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Fort Pierce Utilities Authority (FPUA), the municipal utilities provider in Fort Pierce, Florida, seeks to deploy its Broadband WiMesh Network to provide more affordable broadband services to vulnerable and underserved citizens of FPUA's service territory. Since 2000, FPUA has been providing communications services to its customers with the goal to serve the public first by meeting customer expectations, operating with integrity, providing reliable and prompt service and maintaining the lowest price possible. As a community-owned electric utility, FPUA is focused on serving everyone in its service area. Competing with other Internet Service Providers, FPUA has been able to ensure its customers have access to a high quality, lower cost, and secure Internet service. A migration to a wireless broadband system will ensure that its customers and consumers in the Fort Pierce area have choices in selecting an Internet Service Provider that offers high speed, quality service at a more affordable price, than what is currently available in this market. This expansion of service will enable FPUA to provide public safety, educational, medical, governmental and other community and faith-based organizations with a higher quality, lower priced broadband service. This Grant award will enable FPUA to move forward with its plans to subsidize its WiMesh Broadband Internet service for low-income members of the community. The intent is to subsidize up to 10% of the WiMesh Broadband Internet services, including free Internet service to qualified customers. The FPUA Broadband WiMesh Network (FBWN) will also enable improved efficiency in the monitoring and operations of FPUA's utility provisioning resources, resulting in lower costs to the community. And it will create a more economic development friendly environment for new and existing businesses, ultimately providing economic growth and new job opportunities for local citizens. FPUA's Electric Service Territory covers a majority of the consumers in north St. Lucie County, Florida. The service area is comprised of 23,420 households; 5,157 businesses; and 87 community anchor institutions, public safety entities and critical community organizations. FPUA will be offering consumers in its electric service territory wireless broadband service. As a public electric utility, FPUA adheres to a strict set of non-discrimination policies to ensure all of its customers are provided high quality electric service. FPUA also adheres to all of the FCC's broadband policy guidelines, provides neutral traffic routing and uses network management policies to ensure its Internet services will be available to all customers in its service area. Also, FPUA has a dedicated department, FPUAnet Communications, which manages its network management policies and communications with customers of its Internet services. All the policies and terms of service for FPUA's Internet services are posted on a website, [www.fpuanet.com](http://www.fpuanet.com), and e-mailed directly to its customers when there are modifications to the service agreements or network use policies. FPUA has a proven track record of working with consumers and other entities to ensure they have access to the public Internet using its

services. FPUA will deploy a Broadband WiMesh Network – a multi-layered hierarchy comprised of a network operations layer, core backbone layer, broadband mesh layer, broadband access layer and client access layer. Each system layer provides communication throughout the network. It uses a distributed mesh architecture design to improve reliability and achieve system redundancy. The system is standards based open architecture, enabling FPUA to adhere to compatibility with NIST's (National Institute of Standards and Technology) emerging IEEE 802.16 Broadband Wireless Access interoperability standards and protocols. It has the ability to provide high bandwidth. Its scalability will enable FPUA to provide greater capacity to the system as FBWN's customers grow. The FBWN is designed for an operating life in excess of 20 years. Each component is conservatively designed, will be thoroughly tested, and closely monitored during installation and initial operation. The network is non-proprietary, open architecture which is modular in style with I/O expansion and communications on separate boards. It can be easily scaled upward or downward through the addition/removal of components within the system infrastructure. The FBWN network design will consist of 25 super nodes and 252 basic nodes, rated NEMA4x and IP65/66. These basic nodes will communicate back to the super nodes. The super nodes use sector and parabolic antennas to wirelessly connect multiple basic nodes to the wide area network (WAN) and are directly connected to the existing fiber infrastructure to complete the communications network backhaul. The basic nodes consist of the router enclosure (10"x10"x6") with several omni antennas which offer almost zero wind loading for hurricane integrity and their typical weight is around 10 pounds. These nodes offer very high resistance to wind and other adverse weather and environmental conditions; the node housings are completely sealed die cast boxes secured by multiple screws with weather tight seals. These nodes would have to be physically cracked to leak. Each node also contains a desiccant system that removes any moisture present in the air, keeping humidity to zero in the enclosure to maximize the life of contained components. A FBWN significant advantage is that it's component based, allowing for a communication card or the CPU to be changed out, eliminating the need for a complete replacement of the system to provide a new radio frequency or faster processor. The wireless nodes will transmit to one another over a mesh infrastructure at a 5.8 GHz frequency band. Wireless nodes will be integrated into the network through a connection into the aerial and underground fiber infrastructure that exists throughout FPUA's service territory. FPUA's existing fiber infrastructure consists of over 50 miles of strategically-placed 48- and 96-count single-mode fiber optic cable, designed and configured to self-heal during a failure and is capable of Gigabit network speeds or greater. The network is designed into Virtual Local Area Networks (VLANs) to provide for a highly secured network. FPUA was created in 1972 by the citizens of Fort Pierce and continues to be a community-owned utility. FPUA delivers electricity, water, waste water, natural gas and Internet services to over 28,000 customers. FPUA has been providing Internet services to its utility customers since 2000, focusing most recently on businesses. FPUA's technical, operational and financial departments are experienced at providing Internet services for its customers. Since 2004, FPUA has provided fiber optic cable to the business premise for their Internet service. FPUA has served customers with wireless Internet since 2001. In March 2009, FPUA began prototype deployments of its newly designed broadband wireless mesh project. So far, FBWN provides network connectivity for internal communication needs, two local government entities, and a few private commercial customers. FPUA's rich history in the broadband arena has prepared FPUA to be a successful residential and commercial broadband provider. BTOP funding will enable FPUA to serve approximately 1,147 residential and

commercial customers during the first year of FBWN operations, growing to 11,400 residential and commercial customers by the fifth year. Net revenues (equivalent to profits in private business) are projected to become positive within the first 12 months of operation. As a municipal utility, FPUA reinvests its revenues back into infrastructure and the community. With approximately 300 employees, FPUA is properly staffed to handle the marketing of its new broadband service, connecting existing and new users to the system, and tracking system usage, making needed adjustments to the broadband system and then providing customers with accurate and timely billing. The management structure is well established and successful. FPUA's Information Technology Services is a highly skilled technical set of 16 employees, who are very capable of implementation and management of the communications network. The Electric Dept. has all the skills and equipment for high line electrical, communication cabling and pole mounting work. Billing and Customer Service's 29 employees have the demonstrated technical and people skills to successfully work with customers on a daily basis. For the deployment of the FBWN, FPUA will partner with ISInets. Since 1999, ISInets has been an independent provider of outsourced communications and systems engineering, integration services and other technical services for the communications industry, federal, state and local government, and enterprise customers. The principal services they provide include the design, deployment, integration and the overall management of communications networks. They also provide communications systems engineering, systems integration, and the outsourcing of technical services such as operational test and evaluation, project market evaluation and program management. During the construction period of the broadband wireless mesh project deployment, over 45 individual jobs are expected to be used to install, configure and implement the broadband technology. Various manufacturers will need to supply equipment for FBWN such as wireless nodes, servers and other equipment requiring them to maintain or increase their staffing to fulfill their obligatory parts of the project. Construction is anticipated to take 6-12 months. There will be several jobs either created or retained for sales, maintenance and support due to the broadband wireless mesh technology being implemented. The proposed cost to develop and implement the FBWN is \$4,606,802.15.